Esther Ebole Isah

Physicians’ information practices:
A case study of a medical team at a Teaching Hospital

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Physicians’ information practices:
A case study of a medical team at a Teaching Hospital

Esther Ebole Isah

Borås

Valfrid

2012
The Alpha and Omega; El-Shammer is the greatest physician of all ages

In memory of my parents

Jacob Owuzo Isah
&
Maria Chukwuka Isah
Abstract

This thesis is a user study within library and information science on participatory practices of a professional group in work activity. This has been investigated only to a minor extent in previous library and information science research. The qualitative empirical focus alternates between physicians’ engagements in work practice and workplace learning within patient care. The overall research problem was to learn how people in workplaces interacted with information that was embedded, intricately intertwined, and tightly bound to the ongoing routines of their everyday work. This thesis aims at understanding information practices of professionals in occupational settings as exemplified by a team of physicians in a Nigerian teaching hospital. In this thesis, the focus was on the collective work activity, and the specific goals identified include how physicians interact and make meaning in the context of the social activities in the workplace, how professionals individually or collectively gather, understand, produce, share and use information, and how workplace learning influences information practices. Information practices are viewed as sociocultural practices that occur inside other practices. The thesis focuses on a nuanced, contextualized understanding of the interplay between the participating actors in activity, the activity per se, and the intermediary role of tools and artefacts.

The epistemological point of departure is the sociocultural perspective that emphasizes the dynamic interdependence of the individual with the social and collective development focusing on mediation through tools and artefacts in cultural, institutional, and historical situations. I have chosen cultural-historical activity theory and the practice theories to analyse the dynamic processes in the context of patient care. Their underlying principles guided the empirical study, facilitating extrapolations and illustrations in the analysis. The cultural-historical activity theory was used to understand contextual issues that influence information practices in work activity: the object and subject of activity, division of labour, rules and norms, community, tools and artefacts, as well as the activity system itself and the hierarchical structure of the activity. Theories and concepts employed from a practice perspective on learning were considered useful for understanding the participatory modes in workplace and the influence of social learning communities on diverse information processes. In so doing, the study strives to provide a holistic understanding of information practices, workplace learning, and the relationships between them.

The empirical data was gathered through a qualitative case study that lasted over a period of two years. Direct observation was the dominant data collection technique.
used throughout the preliminary and main empirical studies to capture physicians’ information practices and experiences. The observation focused on the Clinical Pharmacology and Therapeutics (CPT) team’s encounters with patients; the interactions they had amongst themselves, and events and situations surrounding patient care. During the main study, other data collection techniques were employed alongside the observation method. In-depth open-ended interviews were conducted with 17 physicians and 9 non-physicians who were selected to provide rich and varied descriptions of the phenomena under study. The interview time totalled at 1,535 minutes. Physical artefacts were another data collection technique employed: 30 patients’ medical records were assessed during the empirical study. Finally, informal interactions in the research setting were an additional data collection technique used continuously throughout the two empirical periods. The results were analyzed through a combination of inductive and deductive methods of analysis.

There are four parts to the empirical results in this thesis. In the first, contextual elements that showed how work environment can be an influencing factor in the information practices of a professional group are described from the perspective of cultural historical activity theory. In the second part, the nature of information access in the real-world information environment was portrayed. It was found that information sources and strategies contributed to the overarching goal of restoring patient health to normalcy. The information sources and strategies were also found useful for mediating the information environment both subjectively and intersubjectively. An equally important result concerns the authority issues related to information sources and strategies. In the third part, available tools and artefacts were presented as useful information aids that also played a mediating role. Tools were categorised into physical tools and language. Language was categorized according to the social situations or classes of speakers. The case notes were seen as useful artefact and occupied a central niche in the studied work activity. These tools and artefacts enabled affordances around which social practices were built on in the work activities. In the last part of the results, various information practices that mirror the participatory practices rather than those of isolated individuals are highlighted. Six dimensions made up and covered the most vital spectrum of the information processing: information gathering, meaning making, information sharing, information use, reading, and documentation. Furthermore, the study revealed that learning took place simultaneously with the work activity and that it influenced information practices at the same time.

Language: English, with summary in Swedish

Key words: Activities; Activity theory; Artefacts; Clinical Pharmacology and
Therapeutics (CPT); Context; Contextual elements; Information; Information access; Information practices; Information seeking; Physicians; Participation; Practice; Practice theory; Social learning theories; Tools, Work activity; Workplace learning.
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Esther Ebole Isah

Borås, October, 2012
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1 Introduction
1.1 Context of the study

The title of this thesis is “Physicians’ information practices: A case study of a medical team at a Teaching Hospital. This thesis is a qualitative case study in the research field of library and information science (LIS), which focuses specifically on practices relating to information seeking, needs and use (INSU). In this study, I seek to explore the information practices of physicians within an occupational learning setting in a developing country.

My presupposition is that people in workplaces may not be fully aware that information practices are embedded in the ongoing routines of their everyday work activities (Talja & Hansen, 2005, p.128). Such information practices require an understanding of how people interact with each other in work settings, the specific and varying tools and artefacts at their disposal, and the established set of norms and standards in their workplace.

My work is part of the growing body of research, which emphasizes the social aspects of information and how interactions with others in concrete and situated activities influence how people, produce, share, and use information. As follows, this thesis falls into the LIS research area that approaches information-related activities from a socio-cultural perspective. This chapter introduces the statement of the problem, motivation, research perspectives and contributions, goals of the study and research questions, scope and limitations of the study, and the structure of the thesis.

The medical profession stands out as one of the most information-intensive professions in Nigerian society, requiring extensive formal and practical knowledge, and may thus be described as highly information intensive. Because the medical profession spans the knowledge spectrum from practical to theoretical, the teaching hospital in Nigeria is a highly suitable environment for investigating information practices.

This thesis is grounded in an empirical study of physicians’ information practices. This is an area of research that is still largely unexplored especially in developing countries such as Nigeria. According to Leckie (2005, p.159), the body of LIS and other professionally oriented literature shows that there has been strong interest in examining the information practices of those in various professional fields, including health professionals. Besides addressing the information practices of
professionals, this study also contributes to the understanding of information practices in formal and informal settings. These areas have also been largely neglected in LIS research (Davies and McKenzie, 2004, p. 2).

Gorman (1999, p. 231) points out that the primary goal of physicians is to restore patients’ health to normalcy, and that physicians regard issues pertaining to INSU to be extraneous to their work activities. As a result, healthcare institutions disregard the role of information in favour of more tangible issues such as administrative and medical services. When healthcare institutions lack interest in the role that information plays in patients’ healthcare, it becomes difficult to keep track of instances of information activities. As follows, when information activities go untracked, it is difficult to project and plan for system developments. This, in turn, affects the quality of administrative and medical services.

INSU investigations in real life settings seem to serve as a fruitful basis for understanding physicians’ everyday work activities. This is not an original statement as over the years, INSU researchers have emphasized that INSU studies can be effectively undertaken in the broader context of work activities and tasks (Byström & Järvelin, 1995; Talja & Hansen, 2006, p.116; Davenport & Cronin, 1998). Since information is affected by, and dependent on work activities, the focus of attention needs to shift to exploring and documenting everyday work situations. In order to have a proper understanding of information practices in work settings, it is then necessary to examine the role of information.

Information is often seen as something essential that intermixes with purposive, conscious, and intended actions of actors in pursuit of desired goals. This proffers a priori the ‘pragmatical’ understanding of a common shared world (c.f. Talja & Mckenzie, 2007, p.101; Capurro, 1992; Hjorland, 2002; 1997; Sundin, 2003; Sundin & Johannisson, 2005). Understanding information practices in work settings requires emphasizing different elements from social, cultural, historical and institutional perspectives.

Tools and artefacts have a pivotal and constitutive role in work activities. This study emphasizes the profound role of tools and artefacts as opposed to simply viewing them as sources of specific information. Tools and artefacts are seen as explicit or tacit ranging from physical to linguistic forms, as well as being active in the intersubjective constructions and reconstructions of situations. Tools and artefacts serve as material and symbolic evidence in work activities. For example, physicians use them to interact with patients and colleagues, take clinical decisions and institute management therapy. However, their self-evident nature makes them
sometimes “invisible” and anonymous. Susi (2006, p. 4) argues that it is strange that tools and artefacts have been neglected to such an extent although one of the fundamental findings of cognitive science is that tools and artefacts shape cognition and collaboration. Among others, Talja and McKenzie (2007, p. 100) have promoted the need to study how work activities are undertaken in interaction with co-workers through the use of tools and artefacts. In my attempt to understand the role of tools and artefacts, I take as the point of departure the sociocultural perspective that, according to Sundin and Johannisson (2005, p. 34), “focuses on people’s actions as they are assisted by tools and artefacts that have been developed historically out of the context that has at the same time been formed by those actions.”

In this study, I focus on physician’s work activities that are organized and centred around patients. In this thesis, physician’s work activity is understood in terms of an activity system (Engeström, 1987), whereby physicians as actors in the activity system play a key role in health service delivery, interacting with the patients, other key players, and the community at large. The activity system is made up of several components and includes subjects, objects, goals, the wider community, instruments, division of labour, rules, and norms. The system involves complex relationships and reflects the fluid and flexible nature of physicians’ information practices. Such complexity suggests that physicians are not only constantly engaged in a wide array of work activities, they are continually constructing information while engaged in work activities. This study also focuses on workplace learning whereby the workplace is a social learning site where highly skilled professionals engage in meaning making collectively. Learning in this sense implies going beyond the conventional sites of formal education that are limited within ‘spaces of enclosures of classroom, the book and curriculum’ (Edwards, 2005) to create and recreate the profession (Lave and Wenger, 1991).

The topic of this thesis, which is the information practices of physicians is placed in the field of information seeking research in the context user-centered paradigm within LIS, and falls under the umbrella concept of information practices. Historically, the concept of information practices sparsely appears in the information seeking literature as early as the 1960s and 1970s (Savolainen, 2007, p. 119). In recent times, the concept has been proposed as an alternative to the dominant umbrella concept of information behaviour in order to emphasize the

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1 The user-centered paradigm denotes an acknowledgement of a shift in focus from study of people interacting directly with systems (system-centered) to study of people themselves as constructive active users who seek and use information independently of specific sources and systems (person-centered) (Pettigrew, Fidel & Bruce, 2001).

2 Information behavior is the first and dominant umbrella concept within the research field. Information behavior research has been criticized as being oriented towards the behaviourist paradigm in psychology. The common
social nature of information. The concept is therefore described and elaborated on as a social practice. Talja and Hansen (2005, p. 125) assume information practices as instances and dimensions of participating in the social world in diverse roles, and in diverse communities of sharing. According to Savolainen (2007, p. 122), the social practice approach focuses on “the accomplishment of work through the organization of interaction and the use of supporting technologies and artefacts such as information objects and information repositories.” To Savolainen, the social practice approach involves a mutually shaping relationship between information, collaboration practices and the tools developed for purposes of information sharing (p. 122).

In this thesis, I will focus on physicians’ information practices from a sociocultural perspective as an emerging and competitive approach for investigating INSU (e.g. Limberg & Alexanderson, 2008; Sundin & Johannisson, 2005). Information practices will be viewed through the prism of the interactions of participating actors in the complex environment of a shared world. This is not a very original aim as a range of information studies show that the variations in different work environments were rational only within the framework of their contextual characteristics (e.g. Lloyd, 2007, Veinot, 2007). Attention will also be drawn to the dynamics of the role tools and artefacts play in the physician’s interactions. Information practices will therefore be investigated in context.

1.2 Motivation for the study

The high premium placed on health in Nigeria is expressed in such popular aphorisms as “health is wealth” and “a healthy nation is a wealthy nation.” This implies that the sustainability and viability of a country’s economic, political and social growth depends largely on medical care, and it is thus seen as a cornerstone for development. The medical profession is considered highly esteem in Nigeria and other African countries. According to Alubo (2001, p. 313) medicine bridges the gap between science and society, and thus portends a useful index for measuring development standards in countries. Thus, undertaking research on the phenomenon is composed of cognitive, physical and social actions where emphasis is placed on need as central trigger (Wilson, 2000; 2009).
medical professional practice from any perspective is envisaged as a fruitful venture. One such area pertains to INSU phenomena situated in the real life setting of the medical professionals. Medical practice has a strong tradition of interactions and collaborations to diagnose maladies and restore patients’ health to normalcy. Since there have been no INSU studies in Nigeria, conducting an INSU investigation of physicians in the real life setting of this magnitude is a welcome development for INSU research in Nigeria.

The motivation to embark on this study is not so much about developing theories or conceptual models. Rather, it is about the cravings to explore information phenomenon among professionals in authentic real life work practice, and exploring the applicability of the theoretical and conceptual perspectives relevant to the phenomenon in developing country. The medical profession represents a prototype of professions grounded in systematic fundamental knowledge and preoccupied with specialized skills. Since the focus of this research is on information practice as embedded in authentic real-life workplace, I will use theories and concepts that cut across various disciplines in understanding the object of study. My aim is to find out whether the theoretical abstractions and generalizations that build on ideas and findings in Western traditions can be extrapolated to fit into the analysis of findings in the occupational settings of developing countries.

1.3 Research perspectives and intended contributions to knowledge

This research perspective is oriented towards cultural relativism as my interest in investigating information practices in context stems from the cultural variations amongst countries. Cultural relativism is a view of the world in which human beliefs, activities and practices are understood by others in terms of that individual’s own culture (Herskovits, 1948). Although medicine is practiced according to international standards, the sociocultural environment in which it is practiced in the different countries of the world is obviously different from each other. Cultural relativism assumes diversity in culture and therefore adheres to the idea that no one set of standards would adequately fit every individual cultures or in every given situations and events. This thus leaves the creation of standards to the community as the appropriateness and inappropriateness of such standards must be evaluated with regards to that specific community. The community itself makes the judgments based on its specific culture, history and individuality. Therefore, the key to understanding a community’s culture and practices is simply accepting that community’s standards and norms. For example, having several wives makes
economic sense among herders, but not among hunters. Thus, the varying cultural context of human groups can only be described and not evaluated as every cultural system is seen as a solution to the problem of living that is workable in the particular setting in which the culture evolved (Segall et al. 1999). The assumption thereof is that every standard is relative to its culture, and all practices and activities are equally valid.

An investigation of the information practices of Nigerian medical professionals in a university teaching hospital within the sociocultural context of a community was seen as justified and legitimized. Early texts advocating a sociocultural perspective by Sundin and Johannisson (2005) and Johannisson and Sundin (2007), were in line with the sociocultural approach outlined by pedagogical researchers such as Säljö (1996, 1999) and Wertsch (1991, 1998 & 2002). Based on the neopragmatic assumption developed by Richard Rorty  in which human actions are judged in relation to their contexts, Sundin and Johannisson (2005) called for an approach towards visualising and elucidating the meaning of people’s information practices within a social perspective. They reasoned that adopting such an approach contributes to making visible how and why certain way of carrying information seeking may work in one community of practice and not in another (2005, p. 34). In their study of the professional information of nurses in Sweden, they argue that the analytical questions that drive the justification and legitimacy of formal or informal information practices are context specific (Johannisson and Sundin, 2007). They thus proposed that “professions and the expertise of professionals should not be seen as objective, stable, and fixed, but seen as a community of justification in which knowledge claims are negotiated” (Johannisson & Sundin, 2007 pp. 205-206). Moreover, they envisaged that information practices can be fruitfully understood against the backdrop of the instrumentality of action as oriented toward specific objectives (Johannisson and Sundin (2007). In this vein, information production, seeking, evaluation, and use are analyzed as expressions of available tools in the promotion of specific interests as to what is justifiable in a given community of practice. Specific methods can then be adopted in identifying and investigating the phenomenon of information practices as social practices. This thesis responds to Sundin and Johanniesson’s call, and as such contributes to the relatively few studies on information practices from a sociocultural perspective.

On a theoretical level, this thesis adapts to a socioculturally based concept of knowledge which does not accept a dualistic conception of an isolated and

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3 Kluckhohn, Clyde, 1994 Mirror For Man- Cultural relativism from Wikipedia, the free encyclopedia

4 See Richard Rorty’s (1999; 1991; 1979) work on neopragmatic philosophy
independent “mind” (Talja, 1997). Based on the literature surveyed in this thesis, some perspectives are drawn from the different unrelated disciplines such as library and information science, education, anthropology, communication, and psychology, and integrated into a conceptual framework for understanding work activity itself as the empirical base for information to be sought, created, produced, shared, and negotiated. The different perspectives include situated learning and communities of practice, and cultural-historical psychology, and models from INSU. The identified conceptual themes and the ensuing theoretical framework constitute one major contribution of the present work.

On a methodological level, a multiplicity of methods based on human and non-human sources were used for this study, an eclecticism that aims at revealing different aspects of empirical reality in order to develop a rich understanding of the different constructions. The challenge therefore is that no single method is all encompassing and the multiplicity of methods helps to capture the complexities and multiple level of understanding (c.f. Byström, 1999; Wang, 1999, p. 80; Wilson & Streatfield, 1977, p. 277). Although the overall methodological profile of the case study consists of direct observations and interviews of humans, non-human sources are used in order to serve as background material (Silverman 2001, p. 119), and are presented as ‘the official’ or ‘common-sense’ versions of the phenomena being studied. Exactly how different methods inform each other and to what extent a particular method can be used to capture a phenomenon is guided by my research object, focus and questions. The use of multiple methods in investigating information practices provides a fruitful tool-box for a comprehensive coverage of different aspects of the situated characteristics of the phenomenon under study. For this reason, the introductory chapters provide the background against which the method of inquiry will be based, beginning with the cultural-historical context of work in Nigeria.

On a practical level, this thesis intends to contribute to the emerging practice-based perspective in INSU research, which connotes the actual “doing” in historical and social context in the workplace. As Wenger (1998, p. 47) pointed out that practice includes “both the explicit and the tacit. It includes what is said and what is left unsaid; what is represented and what is assumed.” In Wenger’s view, the explicit includes “language, tools, documents, images, symbols, well-defined roles, specified criteria, codified procedures, regulations, and contract.” While the implicit includes “all the implicit relations, tacit conventions, subtle cues, untold rules of thumb, recognizable intuitions, specific perceptions, well-tuned sensitivities, embodied understandings, underlying assumptions, and shared world views.” Taking Wenger’s features of the explicit and tacit into consideration, the present study aims for relevance when making projections and plans of new information systems as well as guide the development of the new systems as a
compliment to more technical approaches. With its ambition to take on both explicit and implicit issues in practice, relate them to information practices and make them visible through the prism of practice, this study expects to have a direct understanding of how work activity influences information practices, and vice versa, in the pursuit of the goals of work activity.

1.4 Goal of the present study and research questions.

Whereas the aim, in general, of INSU studies is to facilitate access to information (Byström, 1999, p. 17), the focus of such studies should be on information activities such as information needs, seeking and use on various professional and other everyday life settings (Byström, 1999, p. 15). In my study, I focus on physicians’ actual work activities as I examine the varied activities in the study’s context. The overarching goal of this study is to gain a deeper understanding of physicians’ information practices through an empirical case study of patient care in a university teaching hospital. The main goal may be further divided into more specific goals as follows. The first goal examines how physicians interact and make meaning in the context of the complex sets of social activities, actions, situations, and events of their everyday work. This goal also entails seeing how physicians’ actions are assisted by mediating tools. Thus, it takes into consideration the nature and constitutive role of tools and artefacts in work activities, and how they, in turn, shape information practices in context. The second goal is to examine and describe how physicians individually or collectively gather, make meaning of, produce, share and use this information through the use of tools and artefacts in order to accomplish their goals. In so doing, this study aims to identify the legitimate sources and types of information in work activity. The third goal is to identify the influence of workplace learning on information practices. The fourth goal, and according to Byström (1999, p. 17) the commonly explicated goal in INSU studies, is to support the planning and development of information systems, practices, and services (see also Talja & Hansen, 2006, p. 127; Foster, 2006, p. 329).

In sum, this study examines information practices as embedded in work activity per se, in which both the participating actors alongside with tools and artefacts are tightly interwoven, highly interdependent, and constantly evolving. In the process of doing this, though not presumed as a research goal, an integrated framework of information practices may be proposed to describe the context and phenomena of information practices. While striving to contribute “to the growing body of work that views information practices as a social phenomenon” (Veinot, 2007, p. 159), it will therefore be the general tendencies rather than specific details that this research will contribute to the knowledge of INSU.
The approach to generating the research questions in this study was a fluid question generating process taking into consideration the emergent and flexible nature of the research. My research questions kept changing as the study proceeded, and pinpointing the exact question was not a single act or decision. The choice process for selecting the research questions could be seen as what Campbell et al. (1982) describe as non-linear and involving considerable uncertainty and intuition. With the purpose of making a critical inquiry, the starting point for framing the questions was therefore to broaden their understanding by including the contextual elements at play in the study, rather than narrowing down the questions to information practices. The following research questions were formulated and addressed in order to focus the inquiry.

1) **What distinguishing attributes of physicians’ work activity frame information practices?** The purpose of this research question is to identify the contextual elements in the study. This sets the boundaries for investigations by situating physicians’ work activities within the frame of the sociohistorical context of patient health care in Nigeria.

2) **How do physicians gain access to information?** This research question addresses the distinctive information sources and strategies that enable access to information in physicians’ work activities.

3) **What characterizes information practices related to physicians’ work activities?** Information practices can be seen as “a set of socially and culturally established ways to identify, seek, use, and share the information available” (Savolainen, 2008, p. 2). Information or knowledge is studied through the representations that it occurs within either through the media or artefact (Perry, 1999). In answering this research question, the social processes used to coordinate activity will be evident as well as the media used for information practices.

4) **How does workplace learning relate to physicians’ information practices?** This research question aims to unfold the influences of participatory modes of engagement in work activity on information practices emphasizing learning.

5) **How do tools and artefacts materialize and frame physicians’ work activities?** The aim of this research question is to identify the available tools and artefacts. Without tools and artefacts, physicians can do very little in attending to patients. During any encounter with patients, the prominence tools and artefacts are at play.

1.5 Structure of the thesis
This study is organized into eleven chapters. In this chapter, which is the introductory chapter, I have presented the general background of the study: the problem statements, the motivation for the study, research perspective and contributions, research goals and questions. The research topic is information practices, and the chapter seeks to explain and argue for the relevance of the research topic, to study physicians in work activity in Nigeria.

The next four chapters relate to the background of the study. Chapter 2 is the historical context which deals with the developmental trends of the Nigerian health sector starting from the pre-colonial period to the present day. Special attention is paid to medical education and training in Nigeria, and the University of Benin Teaching Hospital as the research setting. Chapter 3 reviews the past literature in the relevant area of research interest. The chapter begins with a review of information seeking research noting the under representation in the research literature of African countries. The aim is to offer insights into information seeking in context as a variant of user study while specifying information practices as the lens for investigating and describing the object of this study. Relevant studies on information practices are highlighted, with a specific focus on physicians’ professional information and information seeking. In addition, the last section in Chapter 3 workplace learning discusses as a relevant area of research interest.

Chapter 4 introduces the theoretical framework as guided by the sociocultural perspective, and comprising of cultural historical activity theory and social practice theories in combination with models from information seeking research. Based on the theoretical framework described in Chapter 4, Chapter 5 describes the research methodology. The different research methods used are explained in detail and how the study was conducted concerning each method. The next four chapters (6-9) concentrate on the empirical results and their analysis. Finally, Chapter 10 is about the discussions and contributions based on the empirical results, theoretical framework and literature review. In Chapter 11, which is the concluding chapter, the results are evaluated in terms of the trustworthiness, implications of the theoretical framework, knowledge contributions, limitations and suggestions for further research.

2 Study background

This chapter introduces a short overview of the background setting in Nigeria. The aim of this chapter is to present some historical aspects that can provide some
insights into the understanding of physicians’ work environments in Nigeria. I first discuss the political-economic trajectory of Nigerian health delivery beginning with the indigenous health interventions and the origins of modern medicine tracing back to the European trade merchants during the pre-colonial era. This is followed by the introduction of formal health services later during the colonial and post-colonial periods. Thereafter, I turn the attention towards medical education, training and rules, as well as the institutional identity of my research case, the University of Benin Teaching Hospital (UBTH).

Nigeria, officially the Federal Republic of Nigeria, is located in West Africa with a total land area of 356,667 square miles (923,768 sq km). Known as the most populous and diverse black nation in Africa, it has an estimated population of 168 million (2011 est.).

Figure 2.1 Map of Nigeria (www.theodora.com/maps)

Nigeria is a multi-ethnic and multi-lingual country with over 250 ethnic groups and
over 521\(^5\) varying languages. This makes for a country with rich ethnic diversity, ways of life and terrains. The official language is English, which was chosen to facilitate the cultural and linguistic unity of the country. The country started with one central and three regional governments at independence in 1960, and has since evolved into one central government consisting of 36 states divided into 774 local government areas and the Federal Capital Territory of Abuja. By the provisions of the Federal Constitution, each of these units has concomitant and concurrent responsibilities for providing health services through the structure of the three-tier government (Nigerian Health Review, 2006, p. 11). Nigeria has multiple religious groups with the dominant religions being Christianity, Islam, and indigenous African religions.

2.1 Developmental trends of the Nigerian health care sector

Nigerian health care development is intricately linked to its underlying political economic trajectory (Alubo, 2001, p. 313; 1985, p. 319; Alubo & Vivekananda, 1995, p. 22). The geopolitical entity known today as Nigeria came into formal existence in 1914 with the amalgamation by the British Colonial Government of the Northern Protectorate with the Southern Protectorate. The development of the Nigerian healthcare system reveals three distinct but overlapping periods: pre-colonial, colonial and post colonial. What could be assumed as health care predates the colonial era, but the Western medical paradigm\(^6\), which is the conception of disease that focuses primarily on bio-physiological pathology started with the activities of the slave merchants, colonialists and religious missionaries. This paradigm also is antithetical to the religio-moral views of the indigenous healers as the focal point of these pathologies.

2.1.1 Pre-colonial era

Before 1861, Nigeria was not yet colonized\(^7\) by the British and was also not

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\(^6\) The prevailing health care epistemology is alien, incomprehensible, and in many respects antithetical to the indigenous ones (Alubo, 1995, p. 33).

\(^7\) The beginning of the colonial era is still doubtful and cannot be distinguished. If 1861 is taken as the pivotal point of colonization by the British empire, it would exclude the preceding six decades that witnessed the overthrow (in 1804), in the north, of Hausa rule by the Fulanis, which is an enduring act of colonization similarly replicated throughout history.
incorporated into the capitalist world system. This sub-Saharan area, with a booming economy based on agriculture and commerce\(^8\) (Ityavyar, 1987, p. 487), was occupied by diverse empires and kingdoms\(^9\). The agricultural economy, in particular, was self sustaining with abundance; the economic boom that resulted enabled some members of the community to pursue specialized areas of knowledge, one of which was the indigenous form of medicine and healing (Ityavyar, 1987, pp. 487-488). The effect was the provision of a decentralized health care system available to all (Nigerian Health Review, 2006, p. 3). For centuries, indigenous medicine was intertwined with African cosmology and culture confined within the ethno-political contexts of clans, tribes, and later kingdoms and empires.

Indigenous medicine is rooted in mysticism, fetishism, the occult, and metaphysics, and dwells more on the supernatural, juju worship, cultic practices, the esoteric and paranormal phenomena. The popularity of this form of medicine was dominated by the belief system in which disease was explained in “religio-moral terms through which afflictions are regarded as breaches against these religious and cultural mores” (Alubo, 1995, p. 54; Mbiti, 1970). In this regard, ill-health, disease, and misfortune were seen to be caused by ancestral spirits, ghouls, vampires, sorcerers, witches, wizards, or the violation of taboos. Hence, indigenous healing practices, shades of which still persist in some communities to date, were based on a mixture of witchcraft and traditional herbalism, including the use of crude forms of therapeutically active concoctions (Nigerian Health Review, 2006, p. 3). Indigenous medicine also took into account the socio-cultural background of the people. According to Ityavyar (1987, p. 488), the important aspects of indigenous medicine in pre-colonial Nigeria were the acclaimed medical and religious skills of the indigenous practitioners, especially their claimed relationship with the supernatural. This could also account for its survival to date despite the following challenges: incurring the wrath of the colonial masters and government; persecutions from modern day physicians; challenges from foreign Christian missionaries; rebuff from Nigerian Christians; and blatantly being ignored by the successive post colonial governments until most recently. This form of medical practice has thrived and continued unabated to this day, even having their own ‘professional body’, the Nigerian Alternative Medical Association (NAMA), with major implications for the present day health system.

\(^8\) Famous trading centres were Kano and Ibadan and they have remained active to this day.

\(^9\) Nigeria during the colonial era was a conglomerate of powerful kingdoms such as Ife and the Yoruba kingdom of Oyo along the Atlantic coast; further north were Kanem-Bornu empire with a known history of more than a thousand years; there was also the powerful kingdom west of Kanem-Bornu called the Sokoto Caliphate; south of the Sokoto Caliphate were small but powerful kingdoms of Tiv, Jukum etc which occupied region now know as the Middle Belt (Ityavyar, 1987, p. 487).
Although indigenous healing tended to take a holistic approach to illness and focused on treating the patient’s physical, social and spiritual well-being as a whole, indigenous healing lacked transparency. The methods of consultations were often shrouded in secrecy and mystery. Therapy in this vein included treatment as well as self-purification, sacrifices to deities, and other religious rituals based on the patient’s cultural, social and physical environment. Thus, therapy was often seen as an avenue for cementing fragmented relationships between individuals and offended spirits (Ityavyar, 1987, p. 488). Public scrutiny of any sort was vehemently discouraged and highly resisted by the practitioners, who viewed it as an encroachment of their psychic abilities. This can be explained in terms of economic terms as follows. The knowledge of indigenous health practices was embedded in a network of family, social or communal affiliations and handed down from generation to generation as a means of ensuring continuity in the eventuality of death. Hence, practitioners guarded their knowledge as secrets since their livelihood depended on and were sustained by the incomes derived from their indigenous practice (Nigerian Health Review, 2006, p. 3).

The modern medical history of Nigeria, which dates back to the 15th Century when malaria inflicted a heavy scourge on the explorers (Alubo, 1995, p40), is directly tied to the trading of African slaves by the European slave merchants on the Atlantic coast and across the Sahara (Nigerian Health Review, 2006, p. 1). Commerce, which was the primary motive for the initial contact by the European explorers, soon became focused on and dominated by the lucrative slave trade (Nigerian Health Review, 2006, p. 5). As the trade in human cargo intensified, expanded and accelerated, the European slave merchants were exposed and subjected to various types of tropical diseases. This compelled the slave merchants to introduce and provide limited health services for their staff, which resulted in medical facilities being made available on board the slave ships. Because the slave traders never ventured inland beyond the coastal areas, no

10 The indigenous practitioners during the pre-colonial era were generally divided into two categories- those that serve the role of the diviner-diagnostician (or diviner-mediums) and those who were healers (or herbalists) (Jolles & Jolles, 2000, p. 230).

11 For the European explorers, the so called “white man’s burden” malaria was a major impediment to their civilizing mission. As Ross put it in a characteristically condescending language: “malaria fever is import not only because of the misery it inflicts upon mankind but because of the serious opposition which it has always given to the march of civilization in the tropics….it strikes down not only the indigenous population but with still greater certainty, the pioneers of civilization-the planter, the trader, the missionary, the soldiers. It is therefore the principal and gigantic ally of barbarism (quoted in Alubo, 1995, p. 40).

12 The European slave traders, suffered from a high rate of infection from locally endemic diseases, notably malaria, yellow fever, and the ubiquitous dysenteric diarrhoea (Nigerian Health Review, 2006, p. 4).
hospitals were built on the mainland until the latter part of the 19th century, and no provisions were available for the indigenes (Nigerian Health Review, 2006, p. 5). But as slavery continued, the high morbidity and mortality rate amongst the slaves, who were held in transit fortresses located along the coast prior to their transfer to the slave ships, meant a proportionate loss of revenue to the slave merchants (Nigerian Health Review, pp. 4-5). This led to the act by the British Parliament to improve the hygienic conditions for slaves in transit, and made it obligatory: “for all ships carrying slaves to have on board a licensed surgeon...the trade (thus) brought with it the first doctors and (western) medicine to the shores of Nigeria” (Schram, 1971: p. 10).

2.1.2 Colonial era

The colonial era may be seen as the turning point for the evolution of health services delivery in Nigeria (Alubo, 1993; Ityavyar, 1987). The discussion here outlines the country’s developmental trends in health services; the standards of medical practice; structural and operational fundamentals and procedures; and the quality of health care practitioners.

Modern medicine, as is practiced today in Nigeria, did not exist until the 19th century. Religious missions13 (also called Voluntary Agencies), which predate the formal colonization of Nigeria by over one decade also played a major role in the development of health care delivery. According to Ityavyar (1987, p. 489), by 1504, a Roman Catholic mission had already opened a hospital at St Thomas Island off the Bright of Benin. Since modern medicine did not exist until the 19th century, the staff at St. Thomas Hospital was not medically qualified. However, the limited role of missionaries in the provision of health services which began on the eve of Nigeria’s colonial era, increased considerably during the colonial era (1881-1960). This led to the establishment of Sacred Heart Hospital by the Roman Catholic missionaries (RCM) in Abeokuta in 1865. The RCM had more medical establishments14 than any other Christian mission in Nigeria (Ityavyar, 1987, p. 489). According to Alubo (1995, p. 41), medical care given by these missionaries was essentially an instrument for evangelism and saving souls, a reward for

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13 According to Alubo (1995, p. 41), there were several of these missions, and the major ones were the Catholic Church, Church Missionary Society, and the Baptist Mission.

14 According to Ityavyvar, (1987, p. 489), between 1987 and 1960, the Roman Catholic Church (RCM) had a total of 38 hospitals and leprosariums distributed in all regions of Nigeria. That was three times more hospital than any other Christian mission in Nigeria
acceptance of the new faith as well as an incentive for the non-believers. The influence of these missionaries remained an important component of the health care sector thereafter for a long time.

The growth and development of health services during the colonial period can be divided into two categories - the establishment of health care institutional facilities; and the human resources development for the health sector (*Nigerian Health Review*, 2006, p. 5). Health services were established to serve the needs of the colonial masters, and not the native inhabitants. Hospitals and clinics were built for the Europeans and the Africans they employed (Ityavyar, 1987, p. 494). Hence, the health facilities were seen as a corollary or appendage of capitalism - a colonial invention connected to the political economic system and concerned with external interests of the central Western countries and their activities in the ‘periphery’.

The first hospital established in Nigeria was founded in 1881 when the Lagos Centre for Sick Seamen of the Royal Navy was renovated and converted into a 42-bed hospital (Ityavyar, 1987, p. 492). The West African Frontier of the British Imperial Army also played a contributory role by extending health services to the main centres of the European population. The integration of the army with the colonial government enabled the government to treat local civil servants and their relatives living close to the stations (Alubo, 1995, p. 45). The European settlers relied on their home country for doctors, nurses, drugs, equipment, and other supplies (Ityavyar, 1987). It was for this reason that health care services were centralized mainly in the urban centres and strategic economic centres close to the target population (Ityavyar, 1987).

Due to the high morbidity rate of the European settlers during the colonial era, medical care during this period was patently curative towards disease containment. Ill-health, which used to be viewed during the pre-colonial era as a lapse in the socio-religious order of the society, was now considered a biological phenomenon that can only be mitigated by modern diagnosis and therapy. These services were later extended to the general public as part of the colonial policy of *cordon sanitaire* (Alubo, 2001, p. 314; Ityavyar, 1987, p. 495; Schram, 1971). With this curative conception of medicine, and its later extension to the local indigenes, the colonial regiments laid the foundation for the development of modern health services in Nigeria. The colonial regimes placed emphasis on medicine, building of

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15 European traders, miners, missionaries and colonial stations (Ityavyar, 1987).

16 The policy of *cordon sanitaire* entailed forced ministrations of vaccination and other therapies for which colonial medicine was infamous (Alubo, 2001, p. 314).
hospitals, clinics and dispensaries (Ityavyar, 1987, p. 491).

The First World War of 1914-1918 had devastating consequences for the development of health services infrastructure in Nigeria (Ityavyar, 1987; Schram, 1971). Construction of new hospitals was halted and established ones were so badly decayed that some were even closed down. However, a significant impact of the war was that it became the catalyst for political and economic independence from Britain. The positive response by the colonial government led to the construction of roads and railways, which, in turn, aided the growth of economic activities and invariably more health services (Ityavyar, 1987, p. 493). In this respect, health infrastructure development\(^{17}\), which was abandoned during the period of the World War I due to lack of funds and manpower, was revived by the colonists and missionaries.

The colonial administration and religious missions also saw the need for the development of the health sector. This led to the recruitment of the indigenes and the establishments of institutions\(^{18}\) for training of hospital assistants to assist foreign doctors and nurses. One such training institution was the Yaba Medical School (YMS) founded in 1930 to train a cadre of medical assistants\(^{19}\). Some of the medical assistants were later trained in England and qualified as the first Nigerian physicians, who later became active in the nationalist struggles for political independence and economic liberations (Ityavyar, 1987, p. 493). While the impact of World War I led to the construction and reconstruction of hospitals, World War II brought together capitalism with a growing sense of nationalism amongst the elite such as physicians. Nigeria’s economic development was then greatly enhanced as she emerged out of the war with an abundance of natural resources\(^{20}\) (Ityavyar, 1987, p. 494). As a consequence “practically every aspect of life in Nigeria moved forward after an initial delay and period of recovery” (Schram, 1971, p. 249).

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\(^{17}\) e.g. the Lagos General Hospital was constructed. New Hospitals and dispensaries were located at Jos, Mubi, Enugu, Aba, and Ijebu-Ode. Missionaries also revived their health facilities and added many new ones after the war (Ityavyar, 1987, p. 493).

\(^{18}\) Another example of a training institution established after the First World War was Dispensary Attendant School, which was founded in 1920 (Ityavyar, 1987, p. 493).

\(^{19}\) “Graduates of the YMS were regarded and treated as no more than medical assistants. And for a long time, even after being trained in Europe, they were subordinate to their European professional juniors and were allowed to treat only African patients”. Many of them ended up in private medical practice, but some of them went to Europe “to acquire standard British professional medical degrees and were in due course accorded recognition appropriate to their professional qualifications” (Nigerian Health Review, 2006, p. 10).

\(^{20}\) The unprecedented prosperity was due to the fact that natural resources such as rubber and tin became commodities in high demand in the world market.
The aftermath of World War II had an immense impact on the health sector. There was rapid expansion of health services in economic centres (Ityavyar, 1987, p. 494). There were also political and economic contradictions engendered by the colonial capitalism as well as agitations by Nigerian nationalist movements. According to Ityavyar, one of the outcomes was the reform to revolutionize health services and extend services to much of the Nigerian population. In 1946, a ten-year National Development Plan\(^\text{21}\) (1946-56) was announced for which the major “landmark feature was the establishment of the Ministry of Health whose primary function was to coordinate health services throughout the country” \((\text{Nigerian Health Review}, 2006, \text{p. 9})\). The coordination of the health services by the Ministry of Health included those provided by the government, by the missions, and by private companies. The plan also projected and budgeted funds for the establishment of new hospitals and maintenance of older ones. The establishments of new hospitals led to an increased need for personnel. As a consequence, the first university in Nigeria, the University of Ibadan (established in 1948), included a faculty of medicine and a teaching hospital (University College Hospital) for the training of physicians. Some years later in 1954, the Kano Medical School was founded. In addition, a number of schools and institutions were opened for the training of other health personnel\(^\text{22}\). The missions played a particularly important role in providing training for nurses in Nigeria as well as advanced training in Europe.

### 2.1.3 Post-colonial era

The health system was yet to be fully developed when Nigeria gained her independence from British imperial power and became a sovereign state within the Commonwealth of Nations in October, 1960 (Ityavyar, 1988, p.1223). In 1963, it was declared a republic as the Federal Republic of Nigeria, and became a full-fledged member of the United Nations Organization. This meant becoming an automatic member of the World Health Organization in 1963 \((\text{Nigerian Health Review}, 2006, \text{p. 10})\). However, Nigeria remained peripheral in the global

\(^{21}\) There were plan revisions (1951-55) and other plans (1955-60 that were later extended to 1962). However, as the authors of the First National Development Plan, 1962-68 after Nigeria gained her independence commented, these “were not ‘plans’ in the truest sense of the word…..(but) a series of projects which had not been coordinated or related to any overall economic target”.

\(^{22}\) For example, a number of training schools were opened for nurses and by 1960 the total figures were 32 and 33 midwifery training centres in Nigeria. Two schools of pharmacy at Zaria and Yaba were also established for training junior hospitals for pharmacist. Also both government and mission hospitals had programs for training paramedical staff such as laboratory technologists.
The post colonial period has been characterized as a volatile and turbulent era as the country experienced both a civil war23 (1967-70) and frequent and sometimes violent change in governments, alternating between democratic and military forms of rule24 (Alubo, 1993, p. 230). Moreover, until the 1970s, the Nigerian economy shared features characteristic of undeveloped countries that were incorporated into international capitalism (Frank, 1981 cited in Alubo, 1993, p. 230). That is, Nigeria was still considered an appendage to Britain, serving for the most part as a market and source of raw materials for Britain. According to Alubo (1993, p. 230), Nigeria exported ground (pea)nuts, cocoa, cotton, and palm products in exchange for manufactured goods, the prices of which were determined by the metropolitan countries.

The economic situation of Nigeria was dramatically altered by the discovery and exploitation of large oil reserves, which replaced cash crops as the major source of foreign exchange. Nigeria became a member nation of the Organization of Petroleum Countries (OPEC) in 197125. The oil boom (1973-82) enabled significant development of the health sector including the expansion of hospitals across the country and an increase in the number of health professionals. The healthcare sector thus witnessed tremendous and continued growth during the oil boom period. For example, the number of government hospitals, teaching hospitals and medical schools tripled (Alubo, 1995, p. 45) during the time. According to Alubo, the same phenomenal growth was recorded for other health centres and western bio-medicine in general (1995, p. 45).

By 1960, there were 1,079 registered medical practitioners in Nigeria; by 1970 the number more than doubled...and by 1970 it further experienced a six fold increase to 6,584...The total number of hospital beds in the country was 20,277 by 1968; 29, 789 in 1970 and 69, 750 by 1979. In terms of hospital/population, in 1960 the ratio was 1:2520 and improved further to 1:1180 by 1979. (FGN, 1981: pp. 273-4 cited

23 That was the secession of the then Eastern Region of Niger in May 1967 as the would-be state of Biafra.

24 The first democratic government which took over from the British government was ousted in 1966, after which the military continued until 1979. There was a second democratic government between 1979 and December 1983 which was later overthrown by the military. Military dictatorship continued with a truncated transition program to democracy through to 1993 followed by an interim government. Another military regime followed the short-lived interim government till 1993. Presently, Nigeria has experienced democratic governance since 1999 to the period of this study.

The general increase in hospitals, other health centres as well as medical personnel notwithstanding, the Nigerian health sector faced acute crisis\(^\text{26}\) that was related to the overall underdevelopment of the country. Alubo (1985, 1993, p. 231) noted that although the country was rich, it had difficulties defining how to divide the fortunes. As a result, the majority of the population has remained poor.

In 2010, not only did Nigeria rank first in Africa and 11\(^{\text{th}}\) in the world as the largest oil producer, it also ranked the 10\(^{\text{th}}\) in largest proven oil reserves and the 7\(^{\text{th}}\) in largest proven reserve base of natural gas (OPEC, 2010). In 2010, an OPEC report ranked Nigeria as the second largest oil exporter shipping 2.464 million barrels a day\(^\text{27}\). Nigeria also has a wide array of mineral resources such as coal, bauxite, tantalite, gold, tin, iron ore, limestone, niobium, lead and zinc. However, at the same time, Nigeria was one of 41 countries considered to have the “least human development” by the United Nation Development Programme (Human Development Report, 2010)\(^\text{28}\). It was also revealed that 83.9 per cent of Nigerians live on less than $2 per day. In that same report, Nigeria also ranked 142\(^{\text{nd}}\) out of 169 for least prosperous countries in the world. Ten years earlier, Nigeria was ranked as 187\(^{\text{th}}\) by the World Health Organization out of its 191 member nations for its abysmal performance (World Health Report, 2000). The 2012 annual Index Data\(^\text{29}\) of the Fund For Peace revealed that Nigeria ranked among the top 10 failed states in Africa and 14\(^{\text{th}}\) in the world. Transparency International\(^\text{30}\) has consistently rated Nigeria as a nation with high abuse of public power for private gains.

\(^{26}\) According to Alubo (1995, p. 45), crisis in the health sector were as a result of the non-supportive characteristics of various institutions. For example, Nigeria depended on imports for about 90\% of hospital equipment supplied and drugs. The availability of these items were hampered because of foreign exchange difficulties in the overall economic crisis. Shortages of hospital equipment and drugs were also compounded by the problems of fake and dangerous drugs estimated at 60\% of all drugs in the country (Alubo, 1995, p. 45).


\(^{29}\) The 2012 report is the eight annual Failed States Index report- Nigeria was 15\(^{\text{th}}\) in 2009, 18\(^{\text{th}}\) in 2008, 17\(^{\text{th}}\) in 2007, 22\(^{\text{nd}}\) in 2006, 54\(^{\text{th}}\) in 2005. This implies that its 14\(^{\text{th}}\) position assumes its worst stagnant status since 2007 (Source: Nigeria is 14\(^{\text{th}}\) Most Failed State in the World. Available at http://www.nairaland.com/753013/nigeria-14th-most-failed-state).

\(^{30}\) Since 1995, the Transparency International (TI) had published the Corruption Perceptions Index (CPI) in which countries are ranked according to their perceived levels of corruption. The definition of corruption according to CPI, is “the misuse of public power for private benefits (Source: Wikipedia, the free encyclopedia – http://en.wikipedia.org/wiki/corruption_perceptions_index.)
The oil boom was short-lived and the economy began to face a major crisis due to unchanging external control (Alubo, 1993, p. 231). It was obvious that the monetary gains from the oil boom period\(^{31}\) (and subsequent heavy dependence on oil revenues\(^{32}\)) had not been prudently utilised, but instead were squandered by the ruling class. The consequential outcome was a health care system bedevilled with numerous problems and challenges. Though there have been numerous and gigantic infrastructural changes and development at all levels of the health care sectors, there have not been corresponding structural changes in the unaltered colonial state (Ityavyar 1988, p. 1225).

As a result, many Nigerians still lack access to public health care. Alubo (1993, p. 233) highlighted that some of the constraints to effective healthcare, such as the perennial shortage of drugs, equipment, and other essentials, have escalated. Alubo (1993, p. 233) further explained that across Nigeria, “hospitalized patients are required to have a relative on hand to buy drugs, surgical dressings and whatever else might be prescribed”. Compounding the problem is the poor working environment where most hospitals, particularly in the rural areas, work with obsolete equipment and suffer from intermittent or outright power failure. Consequently, the poor and less privileged are either denied treatment or patients discontinue treatment altogether when they can no longer afford the cost (Alubo, 1993, p. 241). Thus, healthcare delivery and services in Nigeria still depend on one’s social, economic, or political class.

Different types of health care delivery packages have been put in place by the various successive governments. These packages have been based not only on the curative, but also on systems that are promotive, protective, preventive, restorative, and rehabilitative to every citizen of Nigeria, according to the available resources. Despite these postures by varying successive governments and promises to both improve the health status of all Nigerians and to attain a level of health care that would enable all Nigerians to live a productive life, changes remain unattained. The diversionary flow of funds has made the health sector not only bereft of adequate basic infrastructures, but also lacking in modern tools and facilities. In the same way, policies pertaining to health services are either scuttled, sidelined or even completely discarded. However, the situation has greatly improved as the Nigerian health care sector has moved beyond the curative, urban-based system inherited

\[^{31}\text{The oil boom period (1973-82) was characterized by ambitious--some of them white elephant--projects and general expansion, particularly of the public sector (Alubo, 1990, p. 1075; 1993, p. 231).}\]

\[^{32}\text{Nigerian heavy dependence on oil revenues led to decrease in dependence on agriculture and other areas thereby reducing growth capacity in these areas.}\]
from the colonialists to a more comprehensive delivery of health services as stipulated in the various National Health Policies.

Present day health services in Nigeria are made available from three parallel sources: public, private and voluntary. The Nigerian health sector is now adequately structured along this three-tier system of primary, secondary and tertiary levels of care\(^\text{33}\). The state of the Nigerian health system has been and is still precarious. Since development in medical care systems reflects developments of the larger society, Alubo (1985, p. 319) argued that the modernization paradigm will definitely not place Nigerian’s healthcare services in the context of development. An intermittent electrical power supply has been a constant over the years. There is also a problem of brain drain of highly skilled medical personnel moving to developed countries\(^\text{34}\). There are other challenges facing the healthcare system. These include the diversity of language, the level of poverty and illiteracy, the menace of fake drugs\(^\text{35}\), nefarious activities of quacks, spiritual and indigenous practitioners, and poor health care standard issues in many private practices and even some public health care institutions.

The Nigerian health sector has also been plagued by a pervasive anxiety due to numerous and incessant industrial strikes and other forms of acrimonious confrontations between the different unions and state authorities. At present, physicians in public hospitals have been involved in numerous strikes at the national and state levels. Some strikes have been sparked off by failing to implement the Consolidated Medical Salary Structure (CONMESS) approved by the Federal Government for physicians. Other strikes were due to challenges of residency training in Nigeria. Physicians have also embarked on strikes in order to protest various sorts of criminality such as armed banditry, kidnappings, and the murder of colleagues. For example, at the time of my empirical data collection, the Chief Medical Director (CMD) of the teaching hospital was abducted by unknown gunmen, subsequently disrupting medical and administrative services as all the physicians in the hospital were instructed to embark on indefinite strike for the

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\(^{33}\) Primary health care is concerned largely with the responsibility and provision of health care at the local government level with support from the State Ministries of Health. Secondary healthcare is available at the district, divisional and zonal levels of the states. Tertiary healthcare consists of highly specialized services provided by teaching hospitals and other specialist hospitals. However, this three-tier system is fluid and runs concurrently such that all three levels of governments, even though they hold their own primary responsibilities can exceed it and provide services at any of the other two levels of care (Asuzu, 2004, p. 1).

\(^{34}\) The physicians-to-population ratio in Nigeria is 3 per 10,000 as compared to the United States where it is 26 per 10,000. This could be explained by the rapid increase in the trend of ‘brain drain’ syndrome and flight of highly qualified physicians from Nigeria to developed countries of the world.

\(^{35}\) It has been shown that 20% of all drugs circulating in Nigeria market are adulterated.
unconditional release of the CMD (*Nigerian Tribune*, 2010-04-7). Six months later, when an ex-CMD of the same teaching hospital was also abducted by unknown gunmen, the same measure was taken (*Sun News*, 2010-11-7; *This Day*, 2010-11-7).

Such actions by physicians often have political repercussions and been viewed in different ways. In embarking on a strike in 1984 against the Buhari government, physicians under the aegis of the National Association of Resident Doctors (NARD) charged that “hospitals are no longer consulting clinics but now mortuaries where sick are helplessly passing away into irretrievable eternity....the situation is alarming” (Alubo, 1995, p. 88). During the military regimes, strikes were viewed as acts of subversion and sedition. The Federal Military Government resorted to the high-handedness of threat of disciplinary action and intimidation, which impeded negotiations and conciliations. For example, the then Military Government of General Buhari resorted to mudslinging and denounced physicians as “unpatriotic, selfish and callous professionals” who have no regard for “the serious economic predicament” and “the much needed peace to revamp the economy” (*New Nigerian*, 23/2/85 quoted in Alubo, 1995, p. 93). Such threats and intimidations have only provoked stronger resistance from the physicians as reminiscent of their agitations and struggles for independence against the colonial masters. In response, then Nigerian Medical Association’s President (NMA) had said;

....the same spirit of patriotism, nationalism and commitment to the cause of our fatherland that made it impossible for the military to sit back and fold its arms while the politicians ran the nation to a standstill also makes it difficult for us of the medical profession to sit back and fold our hands while the medical services of the country remain in shambles....We have a responsibility to assist in salvaging the sector that we are professionally trained to serve. (NMA, 1985, p. 5 cited in

36 Disciplinary actions and intimidation include such stringent measures as the proscriptions of the two unions governing the medical bodies (Nigeria Medical Association (NMA) and National Associations of Resident Doctors (NARD); threat of dismissal or even outright dismissal of the union leaders and making alternative employment contingent on government approval; appointing military commandants to take over teaching-hospitals in particular; arrest and detention of union leaders; forceful ejection from official quarters; threat or even outright stoppage of salary; and as it was during the Buhari’s government, the same heavy hand was extended to sympathizers as deterrence.

37 Nigerian physicians are not alone in such struggles against state power as Alubo (1995, p. 77) averred that many known revolutionaries were physicians: Fidel Castro, Salvador Allende, Norm Bethune and Frantz Fanon. “Clearly medicine is Janus-faced, the Social context of practice and the philosophy which informs the context however determine whether medicine is used as an oppressive or liberative weapon....the liberation of medicine was part of a broader struggle against oppression and the fetters that accompany it” (p. 77).
But these incessant strikes “raise questions about the contradictions between professed adherence to the Hippocratic Oath, a core attribute of allopathic medicine, material pursuits and the objective reality within which both may be attained” (Alubo, 1995, p. 73). Critics have insisted that the physicians’ incessant strikes at the slightest disagreement or provocation are not only unprofessional, but also inhumane, with strikes taking the heaviest toll on patients who occupy the lower rung of the socio-economic ladder in the society. Unlike in the past when only severely adverse conditions provoked doctors to strike, the Punch Editorial Board noted that it now takes only a little inconvenience for physicians to “hang their stethoscope and use the strike weapon at the flimsiest excuse” (Punch, 2010-9-6). Just like the aphorism that when “two elephants fight the grass suffers”, there can be little dispute that the defenceless patients always pay the ultimate price for any industrial strike by physicians, some literally with their lives as they have limited or no options to avail themselves of medical services offered by expensive private hospitals. Not only do strikes deepen the problems of the not very impressive health care delivery systems in the country, these strikes have also subsequently led to the loss of faith in the entire health system. The general consensus by the critics is that the 2,500 year old Hippocratic Oath recognises the sanctity of life. Physicians, therefore, have the burden of responsibility and are duty-bound to respect and observe at all times their allegiance to the Oath, as a life lost can never be brought back. It is imperative that physicians should exploit all other avenues of dispute resolution before considering the withdrawal of services.

Some critics have placed the blame on the Federal Government and various state governments for failing to act fast and decisively “especially as those who pay the supreme price are the weak and vulnerable” (Punch, 2010-09-6). Matters pertaining to health, they have argued, are too important to be mismanaged during such disputes. The hostile approach of military regimes was removed by the return to democratic rule in 1999 in Nigeria. Some stakeholders opined that there is a distinction between legality and sentiments: “Every professional has the legal right to protest. And strike is a form of protest. The doctors have the right to express themselves within the bounds of the law, which is what they are currently doing. There should be no sentiment because of the peculiarity of their profession” (Punch, 2010-8-18). There seems to be no end to crises in the Nigerian health sector. As late as 2010, the Permanent secretary of the present government said that “the Federal Government through the Health Ministry was currently looking into

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38 The crisis of the healthcare system can also be said to be related to Nigeria’s overall underdevelopment in which the various health institutions are not self-supporting. For example with reference to hospital equipment -down to syringes and drugs-, Nigeria depends on imports for about 90% of supplies (Alubo, 1995, p. 47; 1985, p. 319).
policy parameters that would redefine the existing rules of engagement of consultants and resident doctors in the tertiary hospitals to be able to hold them to their responsibility and obligations of observing the ethics of their profession” (Business Day, 2010-12-17).

Although there seems to be no end to the industrial strikes, respite is expected to be coming for patients as the Medical and Dental Council of Nigeria (MDCN), the regulatory body for medical professional practice in Nigeria, has issued on 2011-07-01 new conditions (as prescribed in the extant Code of Medical Ethics in Nigeria approved by the MDCN) that physicians must meet before they can embark on an industrial strike (The Guardian, 2011-07-02). Under the new dispensation, physicians “embarking on a strike must first look for and hand over their patients to competent and qualified persons to continue with treatment” before proceeding on an industrial strike action only when it is absolutely necessary. The President of the MDCN had stressed that the strikes that physicians embark on frequently are clearly in conflict with two of the components of the Hippocratic Oath, which are: “the health of my patient shall be my first consideration” and “I will maintain the utmost respect for human life” (The Guardian, 2011-07-02). Under the new rule, the President said that “the emergency and accident departments must remain open even when the strike is going on” (The Guardian, 2011-07-02). Also, the new rule stipulates that “no branch medical association can go on unilateral action without obtaining the permission of the national body of the NMA and that of the council” (The Guardian, 2011-07-02). As follows, “before any affiliates at national, state or local levels can embark on strike, the national body of the Nigerian Medical Association (NMA) must approve such actions. The aggrieved party must follow laid down procedures as contained in the constitution of the NMA” (The Guardian, 2011-07-02). The President also directed that henceforth, any Nigerian that loses a relation due to strikes declared by physicians can petition the regulatory body for disciplinary action.

2.2 Medical education, training and rules in Nigeria

It is imperative to represent the nature of medicine as a discipline that is concerned with patients’ health care as a hybrid field of both science and art. It is insufficient to understand only the scientific aspects of medicine as represented in the medical conceptual knowledge, and not to understand the art described in the medical terminology as “practice at the bedside” 39. Such a view emphasizes that medical expertise is not reducible to what Prawat and Floden (1994, p. 37) see as a uniform

39 The bedside is a metaphor in medical folklore for all patient care (Patel et al., 1999, p. 75).
base of knowledge⁴⁰. Patel et al., (1999, p. 82) recognize two types of expertise that can fit into this bifurcation of medicine as specific and generic expertise. Specific expertise is most often domain-specific⁴¹ comprising orders of the declarative type⁴² of scientific knowledge of the cognitive tradition. This knowledge is on the realm of the nomothetic that is concerned with the objective, universal and general. Its acquisition and possession is only authenticated through certification. On the other hand, generic expertise corresponds to the procedural⁴³ knowledge that relies on the use of intuition, skills, observations, and experiences which every physician acquires through training in situational context. This form of knowledge is subjective and emerges from the temporal and social interactions of physicians in unique, concrete and idiographic cases.

Nigerian medical education and training entail both scientific and the practical knowledge. As earlier noted, the history of medical education can be traced back to the colonial era. Presently, medical training in Nigeria entails a two-stage process of pre-certification and post-certification. The pre-certification stage is usually a six-year programme of study. It entails several sub-stages leading to the award of a Bachelors of Medicine and Bachelors of Surgery (M.B.B.S). The curriculum is approved by the Medical and Dental Council of Nigeria (Code of Medical Ethics in Nigeria, 2004, pp. 21-22). The first stage is a one-year period of taking courses in basic sciences. The second stage is a two-year pre-clinical period where students are taught courses that teach them what is normal (such as histology, anatomy, physiology, and biochemistry), and the deviations from normalcy (such as pathology, microbiology, and pharmacology). In the last stage of pre-certification, students are taught the more advanced applied medical sciences starting from the fourth year of undergraduate training. This period also requires students to have adequate exposure to clinical practice through a combination of lectures and practical experience. In the sixth and final year, the students are given time to pursue other disciplines and subspecialties. In recent years, there have been over 2,000 physicians produced annually in Nigeria. However, this number is still insufficient for effective health care in a country with an estimated population of over 168 million people. There are now many medical schools owned by the federal government, state government, religious missions, and private individuals to educate more physicians.

⁴⁰ This means that there are different viewpoints about the conception of knowledge, as there are different assumptions about the nature of truth.

⁴¹ Domain knowledge is organized around fundamental generalizations, as has been defined by Alexander (1992, p. 34) “as the realm of knowledge that individuals have about a particular field of study”.

⁴² Declarative (knowing that) means conceptual knowledge exemplified by explicit knowledge.

⁴³ Procedural (knowing how) is exemplified as tacit or implicit knowledge.
The MBBS enables the newly qualified physicians only to have a pre-full registration with the Nigerian Medical and Dental Council (NMDC), which is the apex body for defining programmes in all medical faculties in the country. It is also at this stage that medical schools abandon the responsibility for further training. Medical practice is a continuum of training, coordinated not only by the tertiary hospitals but also by external bodies. Physicians continue their training in patients’ health care in a varying number of coordinated programmes and postgraduate specialist training in different institutional settings. Medical training is composed of different levels of training from internship to residency. For example, medical licensure typically requires one year training period when physicians are trained locally as interns or House Officers soon after graduation and before they are fully registered. The complete training leading to specialty certification takes several years of residency in the form of professional apprenticeship.

There are two notable certified licensing bodies that assist in the coordination of postgraduate medical education: 1) National Postgraduate Medical College (NPMC); and 2) West African Postgraduate Medical College (WAPMC). The NPMC have clearly defined roles and responsibilities in the coordination of postgraduate medical education (FGN, 1969). NPMC’s functions include conducting professional examinations for candidates in medical and dental faculties, accrediting professional postgraduate programmes for other higher education institutions, curriculum development, research and academic publications (Fatunde, 2008). The inception of postgraduate medical education was a practical attempt by the Federal Government to respond to the need for specialists/consultants in Nigeria’s expanding medical sector (Alubo, 1995, p. 51). NPMC programmes indicate that their postgraduate offerings are tailored to the needs of Nigerian medical education as the numbers of medical schools have increased rapidly since independence and specialists are needed in the expanding public sectors. For over three decades, around 75% of teachers in Nigeria’s medical and dental schools have been NPMC graduates (Fatunde, 2008).

The WAPMC covers the West African Sub-region and has an international

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44 The National Postgraduate Medical College (NPMC) was formerly established in 1969 though its activities are traceable back to 1966 (Bankole, 1988).

45 The West African Postgraduate Medical College (WAPMC) became a college in 1972. The college draws students from the former British West African colonies of Nigeria, Ghana, Sierra Leone, the Gambia and Camerons, including Liberia. One of its main objectives is “to assist in the coordination of postgraduate medical education among member countries with a view to establishing recognition and reciprocity of postgraduate medical qualifications” (Alubo, 1995, p. 53; Bankole, 1988, p. 10).
orientation. It started as “a forum for the exchange of ideas in the subregion as was typical of the Pan-Africanist regionalist fervor of the time” (Alubo, 1995, p. 52). Residents in Nigeria train in tertiary hospitals and take the examination of either NPMC or WAPMC or both where their competencies, skills and knowledge are assessed before they are awarded fellowships, which will then qualify them to become Consultants. While WAPMC certification is for the general physician, that of NPMC is specialty-oriented.

The structure of the accreditation of institutions, curriculum and examinations are also similar and in three stages: primary, Part 1 and Part 2. The primary is equivalent to the British MRPC Part 1-examination, and essentially involves basic knowledge in medical sciences and some initial aspects of clinical medicine. It is taken after the National Youth Corp Service as a prerequisite to entry into residency programme.

The residency programme is an intense period of clinical training that starts with Part 1 for a period of two to three years (physicians at this stage are called Junior Registrars). It requires rotating through some selected subspecialty units in the teaching hospital with an emphasis on one’s core subspecialty, and later taking examinations as stipulated by the accrediting bodies. During this period, Junior Registrars are exposed to a wide range of clinical procedures in the hospital setting and participate in various conferences, seminars, and courses to enhance their clinical specialist skills.

Part 2, (physicians at this stage are called Senior Registrars) which lasts for a period of three years, is dedicated to one’s sub specialty with greater requirements of being involved in research. The final completion of the residency entails examinations and the dissertation defense in order to qualify as Consultants. After finishing residency in the form of professional apprenticeship, the Consultants are seen as “subspecialty fellows and the ranks of the professoriate work to advance clinical knowledge and to refine clinical practice” (Hunter, 1991, p. 33).

In Nigeria, all practicing physicians must belong to the two corporate bodies that have the responsibility for maintaining and enhancing the standard of health care service to the public. Firstly, the newly qualified physicians must be inducted formally into the medical profession by the statutory and regulatory laws of the Medical and Dental Council of Nigeria. This is performed in a ceremony that requires the administration of the Physician’s Oath which is the modern version of
the Oath of Hypocrates. At this ceremony, the newly qualified physicians pledge to obey the Rules and Regulations in the Code of Medical Ethics in Nigeria. The standards and guidelines of this Code follow the principles and regulations of the International Code of Medical Ethics (Declaration of Venice, 1983). The Code also calls into question some other relevant issues that seem to instill the public trust on the Nigerian health care system. In addition, all practising physicians must belong to the Nigerian Medical Association (NMA). The stipulated codes are statutory and backed by law, and as such all physicians are duty-bound to familiarize themselves with codes such as:

- The laws setting up the council and which spell out its functions and modus operandi (Medical and Dental Practitioners Act, Cap 221 Laws of the Federation of Nigeria 1990).
- The Code of Medical Ethics, i.e. rules of professional conduct for medical and dental practitioners in Nigeria prepared by the Council.
- The constitution of the Nigerian Medical Association, all its by-laws and standing orders at national and relevant state levels. (Code of Medical Ethics in Nigeria, January, 2004, p. 12).

2.3 The information environment of the Nigerian health care sector

Although the information communication and technology (ICT) industry appears to be making significant inroads in Nigeria, according to the United Nations Economic Commission for Africa, like most African countries, the promise of a viable information environment for the Nigerian healthcare seems far from reality. The information systems in Nigeria are manually-based and depend on traditional paper-based operations. The situation in the health care sector charged with the responsibility of maintaining quality health care remains bleak as manual systems are prone to enormous inaccuracies hindering the flow of information and impeding the integration of effective healthcare delivery services. Whenever ICT facilities and services are available, only a few people have access to it within the sector (mostly for administrative and secretariat purposes). There is no central place that stores national health care data or supports hospital activities on tactical, operational and strategic levels.

46 The Modern version of the Oath of Hypocrates is in line with the Declaration of the Geneva Convention adopted by the General Assembly of the World Medical Association at Geneva, Switzerland, in September 1948 and amended by the 22nd World Medical Assembly at Sydney, Australia in August 1994.
Investments in terms of improved information systems that could make a profound change to the efficiency of health care are very low, despite both the enactment of a National Information Technology Policy (NITP)\(^{47}\) and the subsequent establishment of the National Information Technology Development Agency (NITDA) to implement the policy. In addition, the federal government of Nigeria has laid the foundation for e-government in order to fully exploit the potential of ICTs in a sustainable democracy (Nwabueze & Ozioko, 2011; Aragba-Akpore, 2004).

As in other African countries, information poverty is one of the most serious obstacles facing health professionals in Nigeria. According to the United Nations Economic Commission for Africa, the lack of efficiency in health care systems in African countries such as Nigeria can be attributed to the lack of accurate and timely information. The infusion of ICT into health care services enhances efficiency. Several problems, including the high mortality rate in some disease conditions, could have been avoided and overcome if adequate provision of ICTs were made as an effective tool for accessing information when needed by health professionals.

Information and communication technologies, which ought to be viewed as remarkable tools for providing optimal communication and comprehensive, fast, efficient, and relatively cheap access to information in the health sector, are not well developed. The importance of ICT for sustainable delivery services in the health sector has long been recognized by the various Nigerian governments over the years. However, innovations, in terms of flexible electronic means and new technologies which should have altered cost, quality, accessibility, and delivery of health care, are not in adequate provision to make meaningful contributions. There are limited concerted efforts on the part of the government with the resultant outcome of limited provision of ICTs such as hospital information systems, electronic medical records, Intranets, public networks, health decision-support and expert systems, telemedicine, and community health information systems in the health sector.

As with most African countries, there is poor telecommunication infrastructure, which poses the challenge of Internet availability and sufficient bandwith. As stated

\(^{47}\) The formulation of the National Information Technology Policy (NITP) was approved in March 2001 by the Federal Executive Council. The implementing agency -the National Information Technology Development Agency (NITDA)- was established in April 2001 and charged with the responsibility of implementing Nigeria’s IT policy “as well as promote the health growth and development of the IT industry in Nigeria” (Isoun, 2003 cited in Nwabueze & Ozioko, 2011).
in the report of United Nations Economic Commission (1999), there are inadequate vehicles and media for disseminating ICT applications ranging from locally networked computers, the Internet, radio-based links, dial-in-services, cable, satellite and other wireless modes, CR-ROMs or diskettes, DVDs and other information storage and delivery technologies. Even though there are several Internet providers for internet services, telecommunication infrastructural problem in Nigeria is further compounded by an intermittent power supply or outright non-supply in some areas. This problem of shortage in electricity supply makes access to information difficult. Lack of access to information through the Internet implies that health care professionals are not abreast with current guidelines and practices for health care delivery services.

The potential of information and communication technologies has been acknowledged by the decision of the World Health Organization (WHO) to take immediate steps for telematics to become part of its health-for-all strategy for the 21st century (WHO Report, 2010). ICTs, such as those used in telematics initiatives have shown to be effective tools for connecting remote sites thereby opening up channels between rural and remote sites with health professional around the world. The WHO report (2010), acknowledged that telemedicine uses ICTs to overcome geographical barriers, and this in turn increases access to health care services. There is no doubt that the integration of ICT into efficient and effective health care delivery services would be of much benefit to the medical profession in Nigeria in the 21st century. However, this potential has not been fully looked into in Nigeria, and it is obvious that ICT applications in the Nigerian health care sector are implemented in uncoordinated ways that make them have little impact on the efficacy of health care.

Telemedicine was proposed and even launched in 1995 by the Federal Government of Nigeria to improve quality consultations between rural workers and specialists in urban areas and also to increase access to health care, especially for rural dwellers. This was intended to play a significant role in transferring diagnostic information to specialized rural centres. Recently in 2010, a pilot project was launched at the University of Lagos to test the feasibility of delivering such services. But on the national level, the communication infrastructure in Nigeria cannot support the bandwidth necessary to carry the signals for telemedicine using two-way interactive video.

Compounding the problem of ICT is the fact that health professionals have difficulty keeping abreast with the magnitude of medical literature. The explosion of medical knowledge continues to gain pace as more than 360,000 articles are published in medical journals yearly (Clark, 2000). There have also been enhanced
popping up of new health-related web sites; it has been estimated that medicine accounts for 10% of the information on the internet. The average medical library in Nigeria subscribes to very few scholarly medical titles that are not up dated compared to libraries in the developed world\textsuperscript{48}.

2.4 University of Benin Teaching Hospital (UBTH)

The research setting for this study, which is the University of Benin Teaching Hospital (UBTH), falls within the category of tertiary health care institutions in Nigeria. According to the Code of Medical Ethics in Nigeria (2004, pp. 26-27), a tertiary health hospital is an institution that is “fully developed, accredited for teaching and organized along departmental lines...” \textsuperscript{49}. UBTH, one of the high standard tertiary health facilities in Nigeria, was first established as the Midwest Medical Centre through State Edict No. 12 of 1971. It was commissioned by the government in 1973 to complement the already established University of Benin nearby. This enabled UBTH to provide the facilities for training high and middle level personnel for the health sector in Nigeria and to support research opportunities for the University and other interested parties. More importantly, it was aimed for UBTH to provide secondary and tertiary health care to the then Midwest state, and out-reach primary health care to nearby communities. UBTH was subsequently taken over by the Federal Government of Nigeria, with its status raised to a Federal University Teaching Hospital.

With its goals encapsulated in the philosophy of “healing, teaching and research”, UBTH’s mission is thus to focus: 1) qualitative and equitable health service delivery offering succour to people afflicted by diseases and ill-health; 2) effective and continual training of health professionals both at the undergraduate and post graduate levels; and 3) providing the platform for conducting quality research aimed at improving quality care for patients. Over the years, there have been giant developments in structural and infrastructural facilities. UBTH is a highly complex organization; apart from the central administrative unit responsible for the coordination, organization, and management of the hospital, there are three functional departments (diagnostic, therapeutic, and service) to ensure that health services are rendered and delivered accordingly. The diagnostic and therapeutic

\textsuperscript{48} The gloomy picture of scholarly journal subscription is painted by the United Nations Economic Commission for Africa - the average medical library in the United States has 3,000 journals in its collection, while many African libraries often have less than 30 titles.

\textsuperscript{49} These are a combination of the following departments: anesthesiology, dental surgery, general medical practice (family medicine), internal medicine, obstetrics and gynecology, pediatrics, psychiatry, public health and primary health care, radiology and radio diagnosis, and surgery.
departments are intertwined and streamlined together as their functions take place concomitantly in patient care.

To attain the goals of the teaching hospital as enscupsulated in its mission statement, UBTH has several professional groups that cut across departments. The hospital is organized on a departmental basis with several different functions that focus on specialties, patients groups and supportive functions. These departments include all the separate Consultants clinics for out-going patients, Internal Medicine, Obstetrics and Gynaecology, Child Health, Institute of Child Health, Anaesthesiology, Mental Health, Community Health, Radiology, Dentistry, Surgery, Orthopaedics, and Ophthalmology. In addition, there are Laboratory services such as the Hormonal profile, Blood Chemistry, Medical Microbiology, Morbid Anatomy and Histopathology, Virology, Cytology, Chemical Pathology, HIV Serology/Antigens, Medical Jurisprudence, Forensic Medicine, Physical and Occupational Therapy and Rehabilitation, Mental Health, Endocrine, and Haematology. There are also many special units such as Accident/Emergency Unit, Children Emergency ward/clinic (CHER), Intensive Care Unit (ICU), Staff clinic, and the Casualty Theatre. The hospital has also a number of supportive services like: the Medical Records Department, Physiotherapy, Nursing Services Department, Catering Department, the Dietetics Department, Laundry/Linen Services, Accounts Department, Pharmacy Department, Engineering Department, Internal Audit Department, and the Stores and Supplies Department. The hospital engages in miscellaneous services such as family practice, community outreach programme, counselling, adherence-monitoring, community medicine and epidemiology, cancer screening and counselling, youth advisory centre, emergency care, health visiting/Social Services and comprehensive Health Centre.

UBTH has organized the training programmes for physicians to cut across different parts of the hospital’s departments. One example is the Postgraduate Medical Training Programme coordinating the Fellowship of the Nigerian Medical College Residency Training Programmes which started in 1978, which is being run in almost all the discipline of Medicine to support the continuing professional development of physicians. In addition, the Teaching Hospital provides the platform and facilities for practical aspects of the medical education of students at the School of Medicine of the nearby sister university. Furthermore, there are various training schools and programmes at UBTH such as the School of Nursing, School of Midwifery, School of Medical Laboratory Sciences, and School of Post Basic Nursing. Also there is the Fellowship of Nigerian Medical College (F.N.M.C.) which is very interesting in this research as it concerns the training of physicians.
It is in this highly complex setting that I aim to explore the activities of physicians in the Clinical Pharmacology and Therapeutic (CPT) Unit, which is one of the specialist units of the Internal Medicine department. This group of physicians occupy a central position as technical problem solvers\(^5\) in health care that make them visible, conspicuous and highly esteemed within the entire hospital.

\(^5\) This is in line with the model of technical Rationality whereby practitioners of professions are seen as technical problem solvers (Schön, 1983, p. 168).
Figure 2.2 Picture of the signpost of the research setting, University of Benin Teaching Hospital
3 Earlier research relating to information practices

This chapter discusses research literature in library and information science (LIS) and other areas of research useful in building my understanding of the phenomenon of study. A review of the literature reveals a dearth in publication of research on such geographical location as Nigeria. I have identified two general and relevant research areas in LIS: the area of information seeking research and the research field of information practices. The latter is, however, seen by most researchers as part of the former. I have chosen these main concepts for guiding the formulation of the research problem and the construction of my research questions from the body of research. They include: information, tools and artefacts, information sources, information access, professional information, workplace learning, and activity.

3.1 Information seeking research

The research area of information seeking, a sub-field of LIS, is concerned primarily with the way people deal with information, and implies a broad focus on information sources/systems, information environments, as well as uses of information. The developmental trends and interdisciplinary nature of information seeking research has been well documented in ‘user studies’ which have had a relatively long history since the beginning of the 20th century (e.g. Dervin & Nilan, 1986; Case, 2007; Wilson; 1981; 1994; 1999; 2000; 2008). The propensity in the ‘user studies’ and the preponderance in writings led to the paradigm shift in the 1980’s from mainly system-centred research with a focus on system features to user-centred research focused on people seeking and using information independent of specific sources and systems. Hence, the landmark article by Dervin (1976), challenged the ten “dubious assumptions” that had dominated past research from a systems approach.

This paradigmatic shift extensively acknowledged seminal publications such as Wilson’s (1981) “On user studies and information needs” and the chapter of the Annual Review of Information Science and Technology (ARIST) by Dervin &

51 It may be said that views differ on the exact date of the beginning of the paradigm shift as Case (2007) has traced it to the early 1970s. As Case notes, “it was not until the 1970s that investigations begin to branch out beyond the focus on formal channels and task-oriented needs. The emphasis shifted away from the structured “information system” and toward the person as finder, creator, and user information” (Case, 2007). Bates (2004) traced the beginning of person centred approach to the studies on scholarly communication conducted in the 1950s and the 1960s.
Nilan (1986) on “Information Needs and Uses”\textsuperscript{52}. Information needs, information seeking, and information use are the central concepts in user-centred research. However, in a special issue of the *Journal of Information Science*, Wilson (2008, pp. 457-458), describes the history of user studies, and summarizes the major differences between user studies conducted between the period before and after the paradigm shifts in the 1980s. He explained that early readership studies did not actually take into account: “what the individual reader read, how they read and why they read”. He then deduced that it took a long period of time before the “user as ‘a living, breathing person’” become the focus of attention in information research” (p. 458). The perception of the individual user\textsuperscript{53} as a subject of concern led to the main discussion of what the paradigm shift actually signifies.

Revisiting the history of user-centred research, Talja and Hartel (2007) noted the unnecessary and destructive dichotomy between system-centred research and people-centred research. This dichotomy has led to the exclusion of research that is focused on interacting and inseparable actants – people, technologies, and documents. Talja and Hartel (2007) argue for probing deeper into the differences in diverse user-centred traditions. They showed how a particular type of user study which focuses on the information activities of groups or a social community, rather than the information needs of individuals alone, has been excluded from Dervin’s and Nilan’s seminal paper of 1986. Talja and Hartel further argue that studies that focus on the information activities of groups or social communities can still be described as having a user perspective rather than a systems perspective, even though the systems are not excluded in the studies. Talja and Hartel reasoned that determining both how to draw the boundaries of a research field and what to include or exclude should, to a large extent, depend on what is perceived to be the central issues of the study. They then concluded that “it is quite possible to study information needs sociologically and in user-sensitive manner also in the context of library-oriented, site-specific and service-oriented research” (Talja & Hartel, 2007). Talja and Hartel also advocated for the reintroduction of theories that will allow the analyses of studies that are focused on the group and social community to the INSU field, which has since the 1980s been superfluously inspired by theories focusing

\textsuperscript{52} Dervin and Nilan (1986) argue that a paradigmatic shift is taking place in the study of information needs and uses. The ‘alternative’ paradigm, in contrast to the ‘traditional’ posits “information as something constructed by human beings. It sees users as beings who are constantly constructing, as beings who are free (within system constraints) to create from systems and situations whatever they choose. It focuses on how people construct sense, searching for universal dimensions of sense-making. It focuses on understanding information use in particular situations and is concerned with what leads up to and what follows intersections with systems. It focuses on the user. It examines the system only as seen by the user. It asks many ‘how questions’ e.g., how do people define needs in different situations, how do they present these needs to the system, and how do they make use of what systems offer them”.

(Dervin & Nilan, 1986, p. 16)

\textsuperscript{53}
on the individuals. This thesis study focuses on the information activities of a professional group in work activity thereby acknowledging Talja and Hartel’s point at group-sensitiveness.

There has been increasing interest in the LIS research literature on information seeking in context, though with preciously little representation from African countries. Various conferences such as the biannual conferences of “Information Seeking in Context” (ISIC), which started in 1996, provided common ground for reflecting on the research area. These conference proceedings alongside other refereed journals such as the Journal of the American Society for Information Science and Technology (JASIST) 54, Journal of Documentation; and the Information Processing and Management 55, could be said to be the largest repository of studies on information seeking in context mirroring the different discursive paradigms 56. Also, there has been an increase in the number of reviews extensively contributing to a better understanding and illumination of information seeking in context research. For example, Courtright’s (2007) review examines and compares existing models of context in the information seeking literature. However, in spite of the growing interest in context, there is the challenge of explicating what context actually entails in the corpus of literature on information seeking research (Courtright, 2007, p. 275; Dervin, 1997).

Furthermore, there is a challenge of clarifying relevant concepts in the information seeking research field. In a discourse analytical study of “information-seeking studies”, Savolainen (2007, pp. 109-110) extensively describes the major differences between the two major “umbrella” concepts for investigating information seeking research – “information behaviour” and “information practices”. The major difference between these two concepts is that, according to Savolainen (2007), they draw on different discourses, ontologies, epistemologies, and metatheoretical perspectives.


55 The Journal on Information Processing and Management publishes articles on information seeking research; notably was the 1999 special issue on Information Seeking in Context guest edited by Kuhlthau and Vakkari.

56 There are different ways of understanding discursive paradigm, but Talja and Mckenzie’s (2007) understanding reflects the full-range of discourse analytic perspective described by Wetherell, Taylor and Yates (2001). Talja and Mckenzie (2007) categorized the three central topic areas in the study of discourse as: (1) the study of social interaction; (2) the study of minds, selves, and sense making; and (3) the study of culture and social relations. Also, Budd identified two distinct but related varities of discursive approaches: linguistically based approaches that rely on techniques such as conversations analysis and the analysis of culturally or socially based discursive practices, drawing largely on the work of Foucault (cited in Talja and Mckenzie, 2007).
Research on information behaviour, which emphasizes their purposive and problem-based nature\(^57\), often implies a foundation in psychologically-oriented theories aimed at building both a general understanding and universal models of individual cognitive processes and abilities. The term “information behaviour” was first coined by Wilson to cover all aspects of information-related behaviour and activity such as information seeking behaviour, information exchange and information transfer\(^58\) (Wilson, 1994). It was originally referred to in the ARIST literature (1966-1980) as “user needs” or “information needs” research (Case, 2006, p. 294), until Wilson (1981) suggested the term “information-seeking behaviour.” Later, Wison argued that “information behaviour” was the most appropriate term from a broader perspective for this area of research\(^59\). Wilson’s (2000, p. 49) widely accepted definition describes information behaviour as “the totality of human behaviour in relation to sources and channels of information, including both active and passive information seeking and information use”. While researchers use various definitions of information behaviour, Pettigrew, Fidel and Bruce’s (2001, p. 44) definition of it as, “the study of how people need, seek, give and use information in different contexts, including the workplace and everyday living” is mostly consistent with Wilson’s definition. These generalized definitions connote the meaning of information behaviour to include active information seeking and purposeful retrieval of information, as well as the passive serendipitous or chance encountering of information (Case, 2006, p. 293). It also entails intentional instances of giving, sharing, and use of information (Case, 2006, p. 293), and situations of nonconsequential passive reception of information (Wison, 2000).

However, Savolainen (2007) argued that the term “information behaviour” is largely used by researchers in an unreflective manner. The umbrella concept was criticized as fruitful for investigating information studies (Kari & Savolainen, 2003; Mckenzie, 2003, p. 24; Savolainen, 1995; Erdelez, 1999, p. 25) yet too closely bound with the cognitive frameworks of psychological behaviourism, in which external observation of human behaviour is used to draw inferences about the actor’s state of mind or intentions and therefore failing to capture contextual

\(^{57}\) Information behavior research emphasizes the role of needs as originating from individual minds (Wilson, 2000); their purposive and problem-based nature (Wilson, 1997; 1999); “concerned with the variety of methods people employ to discover and gain access to information resources” (Wilson, 1999, p. 263). In recent times, researchers have included the individual user’s active construction in the process of sense making or meaning making (Belkin, 1978; Kulthau, 1993; Solomon, 2002).

\(^{58}\) Wilson (2000, p. 49) also categorized information behavior into subcategories that include information-seeking behavior, information searching behavior, and information use behavior.

\(^{59}\) According to Pettigrew, Fidel and Bruce (2001, p. 44), the term “information behavior” seems to have received general acceptance, and is now widely used in the titles of journal articles and academic courses.
elements, such as social and cultural, that are of interest to information behaviour research. Also, a number of questions remained unresolved, exposing gaps in research in the field of information-seeking and information behaviour.

Dervin and Nilan (1986) warn against this pitfall in their definition of user-centered research. However, the field has matured since the early 1990s and some authors such as Pettigrew, Fidel and Bruce (2001, p. 67) have reasoned that “a unifying theoretical body is emerging that, beyond its strong, user-centred core, emphasizes the contextual interplay of cognitive, social, cultural, organizational, effective, and linguistic factors and asserts that information behaviour phenomena are part of the human communicative process”. The focus, they argue, should be on meanings and values associated with these aspects of information behaviour. Furthermore, Pettigrew et al (2001) categorized a number of distinct established traditions and emerging tributaries in the research field that provide clear conceptual frames for the study of information behaviour. There is considerable intersection among these traditions, including behavioural, cognitive, social, physical, perceptive/affective, and multifaceted conceptual frameworks.

Mckenzie (2003, pp. 19-20) argues that “information behaviour” research tends to focus mainly on need and active information seeking at the expense of a more holistic consideration of a variety of less directed practices that reflect the realm of the socioculturally shaped practices, which she claims encompasses all information practices. Earlier on, Savolainen (1995) suggested that the emphasis on the individual’s cognitive processes fails to capture the richness of information as constructed at the realm of the sociocultural. Hence, Mckenzie proposes the term “information practices” as a more accurate way to describe the broad range of information practices. Information practice research that is influenced by the practice turn in sociology is based on social-psychological and discursively oriented theories, which emphasize both the collective, discursive, and intersubjective nature of interactions and knowledge production through the use of tools and artefacts in specific social, cultural, historical and political contexts.

60 Since the early 1990s, researchers (e.g. Mckenzie, 2002; 2003; 2004; Kari & Savolainen, 2003; Savolainen, 1995; Erdelez, 1999; Talja & Hansen, 2005; Hjorland, 2004; Talja, 1997; Sundin & Johannisson, 2005) have advocated that the focus should be on contextual elements to overcome the limitations inherent in the cognitive psychology of information behavior.

61 Discursively oriented theories draw from several theoretical traditions that include social studies, ethnomethodology, conversation analysis, semiology, post-structuralism and postmodernism. For example, the constructionist discourse analytic approach seeks to incorporate insights from a variety of discursive theories to study and understand the information seekers within their social contexts (Mckenzie, 2003, p. 20).
Both “umbrella” concepts appear to exhibit considerable overlap. As Savolainen (2007) points out, there is the tendency for researchers to be trapped in their own discursive formation. For Savolainen, these two concepts are not synonymous. Understanding the differences between them both at the metatheoretical and methodological levels is necessary for this thesis as they raise the question of how the findings are explained and analyzed, and also what is emphasized. Theoretical foundations are of great concern and interest within LIS; the insightful article on “ism’s” in information science by Talja, Tuominen and Savolainen (2005) pinpoint the major differences between the two concepts. It could therefore be claimed that information behaviour research is typically based on the constructivist and cognitive constructivist traditions of how the “individual mind construct reality but within a systematic relationship to the external world” (Gergen, 1999, cited in Talja, Tuominen & Savolainen, 2005, p. 81); in contrast, information practices research draws on the social constructionist and social constructivist theories and information needs are viewed as being formed in and by social processes.

To illustrate the dichotomy between the two “umbrella” concepts, Byström (1999) described three types of information users: the “Platonian man”, the “Debater” and the “Chessman”. System-oriented research often adopts the Platonian man view of an autonomous actor actively making sense of their world in isolated activities. It can be assumed that most information behaviour research adopts the “debater” view. The “Debater” suggests that researchers view their actors from a contextualized perspective that emphasizes the dynamics and interactions of the individual and the sociocultural context. The “Chessman” view of an anti-individual being moved by particular social and cultural norms is related to information practice studies in the most polarized sense. This thesis is primarily oriented towards the Chessman view because of its heavy emphasis on information practices research. The focus is to capture the contextual and social aspects of information seeking by a group of professionals in an interactive setting of a workplace. The varying viewpoints in research advocating information practices serve as a general framework in which to present and discuss the phenomena and concepts central to this thesis. The starting point is the concept of information from the sociocultural perspective.

3.2 Physicians’ professional information and information seeking

Professional\textsuperscript{62} information within various fields of professional work has been a

\textsuperscript{62}The term ‘profession’ means “service-oriented occupations having a theoretical knowledge base, requiring extensive formal post secondary education, having a self-governing association, and adhering to internally developed
recurring and topical issue in information seeking research (Leckie, Pettigrew, & Sylvain, 1996; Leckie, 2005, p. 159; Sundin & Hedman, 2005, p. 293). According to Lekie and Pettigrew (1997, p. 99), scientists were the first major professional group to come under the scrutiny of information seeking research generating a large body of literature that dates from the 1940s to the 1960s. This was subsequently followed by academic researchers. In the 1960s, engineers and other types of professionals such as physicians, nurses, dentists, and other health professionals began to be studied. Davies (2007, p. 42) notes that while academics could be subdivided by their typical information practices according to broad discipline such as the natural/physical sciences, social sciences and humanities, professionals were subdivided by their particular occupational group and at times, particularly in the case of professionals in healthcare, by their specialty.

Taylor (1991) explored the information use environment (IUE) of different professionals and found that certain variables such as organization and domain of interest, access to information, media use, social networks, attitudes toward new technology, education, risk-taking and innovation, can make a difference and give value to professional information. Taylor’s IUEs illustrate that different professionals exhibit different kinds of information needs and uses, varying types of problems, and various approaches to problem resolution. Taylor notes that the IUE of the practicing physician poses a different set of information concerns as the emphasis is on the practice of medicine and not on medical research. To Taylor, the physician is “generally not part of an organization, or, if he or she is affiliated with an organization such as a hospital, the relationships are not those to be found in the usual bureaucratic organization” (Taylor 1991, pp. 243-244). Physicians’ professional information is particularly patient-oriented, and physicians have as their primary concern the well-being of patients. However, Taylor’s study found that physicians are faced with tremendous challenges in medical situations everyday as patients have widely varying disease conditions, which demand exercising judgement and making decisions often without recourse to any external information sources. In sum, Taylor found that information pertaining to patients is derived from three sources: the patient via interviews and investigative tests, personal experience, and other external sources.

It has been recently argued that for professional information to be meaningfully understood, it must be related to the social practice that individuals are part of. Sundin (2003, pp. 172-173) found nurses’ professional information as a key component of the symbolic value of knowledge and knowledge claims that convey codes of ethics or other statements of principle” (Leckie et al., 1996). This understanding is significant for this thesis as it can be said that the medical profession exhibit all these criteria.
different perspectives of social reality. This is understandable considering the evidence that studies of the profession and professionals tend to focus on macro-sociological issues such as authority, control, and legitimation (Davies, 2007, p. 40).

Professionals work within specific environments, which differ greatly by organizational structure, mission, goals and social culture (Leckie & Pettigrew, 1997, p. 101). Studies on professional information therefore examine what information behaviour or practices are embedded within specific environments. Leckie (2005, p. 159) sees the focus to be on professional work, how information practices contribute to the work, or whether or not the practices can be improved. Wilson and Streatfield (1977), in their study of a government department, found that the investigation of the information seeking behaviours of professionals entail examining and understanding the broader working context in which professional practice is conducted. A meta-review conducted by Leckie et al. (1996) on studies on professional information reveals common patterns and trends, which include deconstructing professional practice into multiple and complex work roles and associated tasks that become the primary impetus for work-related information practices. Generally, the workplace environment is seen as presenting the platform that relevant studies on professional information can be undertaken.

This thesis specifically pertains to medical professional information. A meta-analysis of professional information has shown that the quantity of user studies on medical professionals far outnumbers that of any other group in the health sector (Leckie, Pettigrew, Sylvain, 1996, p. 169). Even though it is not the largest professional group in the health sector, Sundin (2003, p. 172) notes that the dominance of the medical profession over the other professions in the health care sector is strong.

The entry point into the literature on physicians is found in selective reviews by Gorman (1995, 1999). Gorman’s reviews provide a picture of the position of medical professional information where the central activity of physicians is patient management and information is seen as extraneous and supportive of clinical work and diagnostic activities. Gorman (1995) reviewed 11 studies conducted between 1979 and 1995 on the “information needs of physicians” to establish a taxonomy of types of information needed by physicians. Gorman’s taxonomy divides medical professional information into five general types that include: patient data (on an individual as taken from the patient’s medical record, family, friends, and self-reports); population statistics (aggregated data on many patients, recalled from memory or taken from public health reports); medical knowledge (general research and practice or taken from journals and textbooks); logistical information (policies,
procedures, and forms used “to get the job done”); and social influences (the patterns of local practices as learned from talking with colleagues). Gorman was emphatic that a typical clinical question contains multiple categories of information. In Gorman’s (1995) analysis of “needs”, actions such as seeking and use are also included.

There is no explicit consensus in the literature regarding what the medical profession information exactly is. Case (2002, p. 243) reasons that researchers need to differentiate between the world of medical practice and research findings, on the one hand, and about their patients’ condition on the other. To Case, both aspects receive treatment in the information seeking literature. However, the overwhelming emphasis has been on how health care providers learn about different medical aspects such as treatments, modalities, procedures, equipment, and medication. Interest may also centre on medical knowledge and education, including: patients’ management, information needs, sources, and channels. Forsythe et al. (1992, p. 182) argues that what is studied as medical professional information is dependent on the particular interest and expertise of the researchers from a wide range of phenomena.

Physicians’ professional information can be both formal and informal (Perley, 2006). Empirical studies of physicians’ professional information reveal that they involve more of interpersonal processes through consultation with colleagues and other human sources than the generally cited medical literature (books and journals) (Gruppen, 1990, p. 169; Leckie et al., 1996; Perley, 2006, p. 137; Davis et al., 1995, p. 700). Haug’s (1997) meta-analysis of twelve studies on physicians’ information seeking revealed that the most common patterns of sources consulted showed strong preference for colleagues followed by textbooks on-hand. Of interest is that physicians’ information seeking includes viewing up-to-date/experienced colleagues as “opinion leaders” or “educationally influential” colleagues within the information networks for continuing education in medicine (Gruppen, 1990, p. 169; Davis, Thomson, Oxman, & Hayes, 1995; Urquhart, 1998). Studies also reveal an important aspect of medical professional information known as consultation, which Perly (2006, p. 138) refers to as “curbside” consultation. This form of consultation entails “the joint knowledge about a patient case by physicians sharing their expert knowledge, guided by similar sets of assumptions about how medicine is done in a particular community” (Perley, 2006, p. 142). Curbside consultation enables conversations that facilitate collaboratively arriving at a consensus on patient management, mentoring and sustaining collegiality. Case’s (2002, p. 244) review affirms the above picture of his finding that relatively little use is made of either the library or Internet sources.
According to Osheroff et al (1991), about half of the information that physicians need to treat a patient can be answered by the medical record. They argued that answers to the remaining needs are evenly split between published sources and a synthesis of the information from both the patient’s and physician’s existing knowledge. However, as Gorman’s review revealed, the primary information comes from human beings rather than recorded sources since doctors ask questions that “tend to be highly complex, embedded in the context of a unique patient’s story” (p. 729). The first implication of Gorman’s review is that the primary information is collected by the physicians, analyzed and then interpreted before it is documented in the medical record. The second implication is that physicians rely heavily on human sources of information, which could be taken as a narrative, such as the story of the patient’s history of symptoms and treatments (Tannenbaum, 1994). A related finding is that physicians often develop confidence in their knowledge after treating as few as two cases, suggesting the significance of practical experience in information seeking pertaining to patient care (Case, 2002, p. 247).

In this thesis, physicians’ professional information is clearly seen as significant in understanding physicians’ work activity and information practices within it. Furthermore, the physicians’ professional information is to be understood within the frame of its “situatedness” or “embeddness”. The context of professional information is, with few exceptions seldom seen as a de facto element (e.g. Bennett et al., 2004; Gruppen, 1990, p. 165; Forsythe et al. 1992, p. 181, Gorman, 1995). Gorman (1995) and Forsythe et al. (1992) argue that medical professional information ought to be examined across complex situations that are defined during interactions. Thus, they call for studies of medical professional information on a number of issues ranging from social and communicative attributes to other features such as patient care settings that include institutional, professional, cultural, and linguistics milieus. Studies of professional information needs also address more than the descriptive medical knowledge (e.g. textbooks and journals) and have a preference for higher order interpersonal processes (e.g. confirmation, explanation, analysis, synthesis, and ultimate judgment). In this thesis, physicians’ professional information, as an object of study, will entail interactions of participating actors in work activity. The argument is that it is through the study of work activity that a fruitful discussion of the medical professional information is possible.

3.3 The research field of information practices

After scrutinizing a number of sources from the information-seeking literature since the 1960s, Savolainen (2007, p. 109) noted the dominant role of the
discourse of information behaviour. He proposed the concept of information practices as an alternative for investigating and describing variations and phenomena in information seeking research. Savolainen (2008, pp. 2-3) defines information practices as “a set of socially and culturally established ways to identify, seek, use, and share the information available in various sources”. The assumption thereof is that information practice “gives a central role to the social and cultural factors qualifying information seeking and devotes attention to the processes of information sharing” (Savolainen, 2007). He then drew the conclusion that:

A basic characteristic of the discourse on practice, in general, as well as “information practice” in particular, is the emphasis placed on the role of contextual factors of information seeking, use, sharing, as distinct from the individualist and often decontextualized approaches that are seen as characteristic of assumptions of information behaviour. (Savolainen, 2007).

Savolainen means that the focus on practice, rather than behaviour, implies a shift in attention from cognitive processes such as action, motives, and skills of monological individuals, to research where members of various groups and communities are seen in context of mundane activities. Accordingly, information seekers are studied in context with emphasis on social practices within concrete and situated activities of where people are interacting with others as reproduced in routine social contexts across time and space (Mckenzie, 2003; Savolainen, 2007). Talja and Mckenzie (2007), for example, question the validity of models that “de-domain” information practices. They see “information needs, seeking, and use as part of or embedded in a cultural, social, or organizational practice” that is untransferable between different settings. This also suggests exploring information seeking as a social practice in interactional settings (Talja & McKenzie, 2007, p. 97; Sundin, 2008). There has been an increase in the amount of research on information seeking in social context such as the workplace or among professional groups, which are relevant to this study.

The research field of information practices is relatively young, having emerged only since the early 21st century. Most researchers agree that the concept itself is ambiguous as to its purpose, definition of content, and scope. Furthermore, there is no single framework or model that covers the concept since it is the social reality of the phenomenon investigated that is the signifier, which opens up the set of questions to be explored by information researchers. Savolainen (2007) traced the associated problems of information practices to their links to various interdisciplinary fields such as philosophy and psychology, and also their affinities
to other relevant concepts such as “information work”, domain analytic approach, communication practices, and information use environments. Perhaps it would be more accurate to say that the concept has bearing to other relevant studies, notably among them: workplace studies (Arminen, 2001); learning (Lave & Wenger, 1991; Wenger, 1998), situated cognition and culture (Brown, Collins & Duguid, 1989; 1996). Moreover, the scope of the concept is seen as very broad; though this seems to be more of an advantage than a weak point for this thesis as the study can draw from other areas of relevant research interests. However, these relationships, so far, have been scrutinized in very few empirical studies.

The major distinctive characteristic of the information practice approach is that it represents “a more sociologically and contextually oriented line of research” than information behaviour research in general (Talja, 2006, p. 123). This suggests that studies on information practices are not related to a single person or a very specific and narrowly defined task. Rather, the focus of this research field tends to be towards gaining a deeper understanding of information processes that, by nature, originate from how groups organize their work practices through interactions among a group of persons or a community of practice. Lloyd (2011, p. 285) defined information practices within the frame of social sites as:

An array of information related activities and skills, constituted, justified and organized through the arrangements of a social site, mediated socially and materially with the aim of producing shared understanding and mutual agreement about ways of knowing and recognizing how performance is enacted, enabled and constrained in collective situated action. (Lloyd, 2011, p. 285).

Hjorland (2004) reasoned that information needs, seeking and relevance are shaped at the collective rather than at the individual level. Tuominen, Talja, and Savolainen (2005, p. 328) maintain that: “All human practices are social, they originate from interactions between the members of community”. In this vein, researchers point out that the practices involved in the processes of information seeking and use are constituted socially and dialogically between participating actors (Talja and Hansen, 2006, p. 128; Tuominen, Talja, Savolainen, 2005, p. 328). Thus, information practices are determined within the context of a dialectic relationship between persons and their cultural, social, and historical environment. The focus in research is on social and cultural dimensions and the dialogical nature of relationships in participatory environments (Byström & Lloyd, 2012). From this viewpoint, the processes involved in information seeking are not linear by proxy. Lloyd (2005, p. 85) notes a simultaneous and interrelated process enacts the individual into the discourse of social context. However, the ways the processes
involved in information practices are approached may vary considerably.

Other authors describe the social reality of information practices in slightly different words. For example, Johannisson and Sundin (2007) describe information practices as “social practices actively engaged in by people in relation to the social context of which they are a part”. By social practice, they mean an institutionalized activity that consists of more or less formal sets of rules concerning, among other things, what should be considered “proper” information seeking (Sundin and Johannisson, 2005). Limberg and Alexandersson (2010, p. 3253) used the term “information practices” implying that “information seeking can only be understood as embedded in the practices in which it takes place”. Talja and Hansen (2006) adopt a social practice approach in defining information practice in the context of collaborative work setting as practices firmly embedded in the work and social practices of a community of practitioners, a sociotechnical infrastructure, and a common language (2006). They denote information practices as “practices of information seeking, retrieval, filtering, and synthesis”, and assume that these practices are “dimensions of social practices and that they are instances and dimensions of our participation in the social world in diverse roles, and in diverse communities of sharing. Receiving, interpreting, and indexing information...are part of the routine accomplishment of work tasks and everyday life” (Talja & Hansen, 2006). The concept of information practices is, however, linked to the social constructionist tradition, which has language as its prevailing theme (Tuominen, 1997; Talja, 2005; Talja & Mckenzie, 2007, p. 100).

3.4 A practice turn in information seeking research

The practice turn in information seeking research is in response to a call by Davenport and Cronin (1998, p. 266) for a practice-oriented approach known as the ‘pragmatic turn’ earlier proposed by Robert (1982) and Wersig (1985). This approach focuses on the patterns and processes of information practices exhibited by people in the authentic real life work practices rather than as isolated instances external to work activities. This approach signifies a stance whereby the information user is viewed as inseparable from the context in which he/she is embedded and of which he/she is a part. It also proffers insights into the information practices of a

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63 According to the constructionist perspective, the emphasis is that the production of knowledge is ongoing in conversation (Talja, 2005; Talja, Tuominen & Savolainen, 2005). This implies that the focus is on the way people use language constitutively and constructively as meaning is produced among participants in interactions.

64 Compared to the research field of information behavior, there are not many empirical studies of information practices. Although a trend is emerging in this direction as one only need skim through the special issue of Library Quarterly 2007, Volume 77 to see the several articles along this direction.
common shared world, where meaning-making, according to Capurro (1992), takes place in relation to how activities in the common shared world are created, promoted and maintained. van House’s (2004) compendious ARIST chapter; Palmer and Cragin’s (2008) ARIST chapter; and Wilson’s (2008) ARIST chapter on activity theory are all very valuable in explicating the ‘practice turn’ in the field of INSU. In the discussions that follow, some empirical studies are taken up in order to view their relevance to this thesis.

The proponent of the concept is Mckenzie (2001; 2002; 2003), who in her empirical study, subsequently developed a model of information practices based on everyday life information seeking (ELIS). In this study, Mckenzie aimed to broaden the scope of information seeking research from a multiple range; this is based on the premise that active engagement in information seeking does not account for all of information behaviour. Mckenzie initially charts her research to explore the characteristics of two modes of information seeking – active seeking and active scanning. However, the original dichotomous goal seemed inadequate as the data that emerged from the accounts of the participants of their ELIS were so rich; the data revealed a saga and features characteristic of other modes of information practices encompassing both purposeful and less-directed goals, extending even to communicative activities. She then categorized them into four modes: active seeking, active scanning, non-directed monitoring, and obtaining information by proxy. Mckenzie also describes the information processes as a saga of continuum that involves two-stage model of “connecting” and “interacting” with information sources in everyday life.

Given the repertoire of the identified information practices, Mckenzie’s study is relevant for the present study because it covers a number of activities related to information practices. These activities capture a general picture inevitable in interactive context of information seeking in work activity. However, Mckenzie’s ELIS model is of the adhoc type of discursive practices, and does not readily accommodate stable systems and structures that persist over time and across different activities and situations. Mckenzie’s study is particularly relevant to this present study as her study covers a broad range of activities that broadened the scope of information seeking research; though from the perspective of this thesis, the focus is more on the stable system put in place for interactions within a spatial location and across distance for the participating actors.

Savolainen’s (2008) comparative empirical studies draw upon the social phenomenology of Alfred Schutz. Both studies explore practices of information seeking of activists and unemployed people on how they monitored their everyday events and sought information to solve specific problems. Savolainen identified
three modes of information practices, including: everyday life information seeking, information use, and information sharing. Savolainen found that everyday life information seeking is influenced by such contextual factors as educational and income differences and entails seeking ‘orienting information’ that is information needed for monitoring daily concerns and seeking ‘problem-specific’ information. Though Savolainen argued that there is no consensus in information studies about the definition of information use, his study found a variety of topics associated with information use such as media credibility, cognitive authority, and information overload as factors that influence one’s willingness to accept and use information. Savolainen found two strategies as coping devices for information overload: filtering that implies a rational approach to the problem and withdrawal, which is similar to the ‘blunting’ concept found in the health information literature. Finally, Savolainen found that information sharing was influenced by factors that arise out of context such as social networks and motivations, where acting as a proxy in information sharing and the notion of reciprocity are significant.

Savolainen’s study revealed these three variants of information practices (information seeking, use and sharing) as tools used to further everyday projects. At the same time, Savolainen found the instrumentality of information practices to be significantly made manifest by situationally bound opportunities and constraints. Interestingly, Savolainen (2008) distinguished between two types of actions related to regions of relevance according to the interest of the actors coping with the environment or specific situation. ‘Doing’, for example specifically stands for cognitive activities that entail bodily actions; in contrast, ‘sayings’ refers to linguistic activities. The ways in which Savolainen viewed ‘doing’ and ‘saying’ with regards to information practices as social practices varied considerably and had the potential of being all encompassing in the collaborative interactions of a shared world. Savolainen found this distinction useful to describe information sources and information activities that extended to formal and informal communications.

Savolainen’s (1995) earlier empirical studies of two working class groups (workers and teachers) from which he developed his model of everyday life information practices also proffers insights to actual information practices in everyday activities. Using Bourdieu’s theory of habitus and drawing from his understanding of the concepts of ‘everyday life’ and ‘everyday practice’, Savolainen found that

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65 Savolainen notes two types of issues that may influences information practice: “everyday life” and “everyday practice”. “Everyday life” is referred to as events that are characterized as regular, repeated, familiar, quotidian, banal, and even boring (Morgan, 2004, p. 37). On the other hand, Savolainen sees “everyday practice” as organized composites of actions that are either bodily doing or saying, or the actions that these doings or saying constitute (Savolainen, 2008, p. 25). However, the characterizations of both issues may not go beyond the understanding of
contextual determinants of a view of a life world crystallizes into two concepts (way of life and mastery of life). Although Savolainen’s concept of ELIS is conceptualized around non-work information seeking, it can also be applied to work-related information seeking which is the focus of this thesis.

Both McKenzie’s and Savolainen’s findings have implications for information seeking research as the notion of a broader dimension of information seeking entails focusing deeply and holistically on contextual phenomena. In the same vein, Veinot’s (2007) qualitative case study examined the information practices of blue-collar workers -‘Kelly’, a vault inspector at a hydroelectric utility company. Drawing from the work of social practice theorists such as Wenger, Schatzki, and Reckwitz, Veinot’s study foregrounds the concepts of “embodied knowledge” and “situated judgement” adding to the understanding of how a work practice creates information essential to an organization. Veinot describes a wide range of information practices such as finding, interpreting, documenting and classifying that a vault inspector engages in within the workplace. Veinot also describes a wide range of physical, perceptual, cognitive, and navigational skills in making fine-tuned situated judgements to categorize observations. Veinot’s study is relevant to this study as it highlights that information practices are dynamic aspects of a professional practice and that information practice itself constitutes professional expertise.

Johannisson and Sundin’s (2007) study is on information-seeking research by nurses in Sweden. Their study showed how discourses, from a neopragmatist perspective can be explored as tools that people employ when they actively engage in information practices in varied social contexts. Using the exemplification of nurses and the nursing profession, Johannisson and Sundin’s study showed how the scientific-oriented medical discourse and the holistic oriented nursing discourse are two tools employed in the nurses’ accounts of their information practices. They then highlighted how the information practices of the two competing discourses existed within the profession. They deduced that institutionalized social practices take place in a “community of justification” where they understood nurses and the nursing profession as examples of such a community built in relation to professional agents. They identified the attitudes towards seeking, use, and production alongside the criteria through which the relevance of information was assessed. They viewed and analyzed the nurses’ accounts of their information practices within this framework of community which operated both at the workplace and occupational level. They concluded that the accounts of the nurses mundane phenomena and the context is often seen as trivial and taken for granted, and practices pertaining to them are ubiquitous and self evident by nature.
of their information seeking were expressions of their use of discourses as tools to justify the social practices in the community and promote their specific interests as to what the nursing profession should be and also what is considered as relevant information.

Hartel (2006) explores the information activities involved in gourmet food production by hobbyist cooks. Like any social world, Hartel notes that the hobby of gourmet cooking exhibits a central activity that coalesces around a shared interest. Hartel’s study reveals that gourmet cooking unfolds as an episode with nine distinct yet concatenated steps. These steps serve as a framework to locate and relate to the information phenomenon more precisely and are seen as not only instrumental in gourmet food production, but also interwoven and varied across the process. Hartel differentiates between the two types of information phenomena within this process as: information activities and information resources. Whereas information activities are partly cognitive processes that manifest in the physical manipulation of information, information resources are the artefacts that communicate the meaning of cooking. Hartel’s study shows that the hobbyist is an active producer of information in a central activity of cooking that entails a range of information activities that include imaging, browsing, reading, talking, experiencing, seeking, searching, comparing, producing documents, recording, using, and re-using. The relevance of Hartel’s study to this thesis is in viewing how the central activity of cooking was cast as a context for locating and understanding information activities and resources. Also of interest is the acknowledgement that the information produced by the hobbyist plays a significant role across the activity.

This section, which focuses on earlier studies in the research literature, discusses the conceptual understanding of information practices and empirical studies which have have relevance to this thesis. In all these studies, the main finding is that information practices can be viewed as social practices aiming to achieve collective goals. The studies emphasize that information is socially situated within a context where it is incorporated into a broad range of information-related activities. It is in this vein that the concept of information practices is understood in this thesis. In addition to the information-related activities, the view of information, different kinds of information sources, and, the role of tools and artefacts are all relevant elements and ways to assess information; it is through them the information seekers become co-creators of information.

3.4.1 Information

An important aspect of this research is the conceptualization of information, which
varies by the epistemological, ontological, and discursive positions adopted (c.f. Sundin & Johannisson, 2005, p. 38; Lloyd, 2006, p. 577; Wilson, 1981). Wilson argues that these variations may be attributed to the fact that information itself is a complex entity having affinities with other concepts such as ‘data’ and ‘knowledge’. Information in LIS is strongly associated with prints and in recent times, with other media formats such as digital culture, information technology, etc. In this thesis, the conception of information is socioculturally oriented. Sundin and Johannisson (2005) present information as a purposeful and instrumental tool playing a constitutive and pragmatic role in problem situations. This suggests that information is devoid of objective or subjective value limited to information structures; instead, it is constructed subjectively and intersubjectively through experience among a community of practitioners. They also suggest information to be a symbolic object which plays a useful role in the communication and interactions between actors. In this regard, information does not have an objective value as the “representation of facts that are to be mediated between a ‘sender’ and a ‘receiver’” (Sundin & Johannisson, 2005, p. 36), but rather as a sociocultural tool whose meaning and relevance are created in contexts and practices (Sundin & Johannisson, 2005, p. 37; Sundin, 2008; Lloyd, 2007, p. 85; see also Cappurro & Hjorland, 2003). In this sense, information processes cease to be a “black box” caged in the mental representations of individuals, but are instead entities that are parts of or embedded in their sociocultural and historical contexts. Such a viewpoint on information is illumined even by other similar definitions of information such as by Byström (1999, p. 45) and Lloyd (2006, p. 578). Lyold (2006, p. 578) conceived of it as “the building block we use in our construction of meaningful reality”. Byström (1995, p. 45) sees information as an abstract tool which enables, or is expected to enable task completion. According to Byström, information need in this regards is considered as a perceived necessity to acquire information in order to complete a task. Thus, Byström reasoned that both information and the need for it are viewed from the task performer’s specific situation.

Information, when viewed as an instrumental tool is based on several assumptions that have implications for information seeking research. Firstly, it is assumed that information can be classified in several meaningful ways relating to its purpose in an activity such as factual, procedural, tangible or intangible, and even evidential. It is also assumed that information cannot be seen as a distinct entity but as one element among many other elements. Brown and Duguid (2000, p. 138) use the analogy of the pebble breaking the calm of a still lake to explicate how these elements work. The pebble is only one among many forces at work to register a change, and “create not only grounds for reception, but grounds for interpretation, judgement, and understanding”. In the same vein, they propose that information can be seen as a dynamic entity located in the context of information processes. In this
respect, Talja (1997, p. 71) maintains that information holds “variable and constantly changing versions of reality”. The implication of these assumptions for this study is that the status assigned to information is negotiated and given meaning by the participating actors in work activity.

Drawing from ecological theory of Bateson (1972, p. 453), this thesis, in underlining the several considerations of information as an instrumental tool, views information as “any difference which makes a difference”. The difference may be textual, social, physical, or a combination of all three. But for it to be meaningful, it “must be situated and made intelligible through the contextual lens of social life” (Lloyd 2010, p. 274). Lloyd’s suggestion implies that information needs to be contextualized for it to become meaningful. The allusion thereof is that knowledge is arbitrary outside the social field, but is situated inside the social site by practices. Information viewed in this way reveals the interactions between the social and cultural aspects of phenomenon under investigation. According to Barad (1996, p. 179) “knowledge is always a view from somewhere”. Barad’s perception is significant because knowledge determines, among other things, what is considered to be the generally accepted information, and the symbolic role that information can play.

In this thesis, information is conceptualized as an instrumental tool that is used in pursuit of the goal of an activity. In this vein, information is seen as useful for problem-solving and coping mechanisms. Information is in the activities that participants engage in in order to attain some specific goal. Information is constitutive and active, and it shapes the activity. At the same time, the symbolic value of information is emphasized and it relates to the instantiations, details, and materialization of knowledge in the situatedness of work activity or task performance. Few studies have shown the situatedness of information in the complex environment reflecting the practice of interconnected social systems or community. Knowledge in this sense implies judging whether its claims are “legitimized-justified or not, rather than the judging of whether it is “true” or not” (Johannisson & Sundin, 2007, p. 203). This study will therefore examine information through the prism of the participating actors as specifically determined by the sociocultural and historical context of work activity.

3.4.2 Tools and artefacts

66 According to Johannisson and Sundin (2007, p. 203), this is where neopragmatism’s emphasis on language as the most important available tool comes into play; in as much as it is through language that we present arguments and debate what knowledge claims and what actions are most justified.
One question that this study seeks to answer deals with the role of tools and artefacts in information practices. The literature review shows that in the past, tools and artefacts were generally referred to as information sources and information systems, but seldom considered as actors of their own. For example, Sundin and Johannisson note that in LIS, studies in the field of information retrieval (IR) are linguistics tools that are used to develop systems while physical tools might be just those information systems seen as artefacts. However, research on tools and artefacts have been extensively covered in other research fields and disciplines such as pedagogy focusing on variables in the classroom such as teaching, learning, discourse (Vygotsky, 1978; Wells, 1999); and situated cognition research (Susi, 2006; Susi & Ziemke, 2001; Hutchins, 1995; Engström et al., 1999; Heath & Luff, 1996). All these studies point at the crucial role of tools and artefacts in the coordination of collective activities.

By emphasizing that what people do is always enacted with the help of historically and institutionally developed tools it is clear that actions should not be studied in isolation from these tools. (Sundin & Johannisson, 2005, p. 34).

The view expressed in the above quote entails an emphasis on the assumption that studies of tools and artefacts will be fruitful in elucidating the meaning of people’s information seeking. In fact, the study of tools and artefacts can be seen as a significant part of information practice research (e.g. Sundin & Johannisson 2005; Lundh, 2011). It can be assumed that understanding information seeking entails examining the symbolic and material role of tools and artefacts in interactive settings. Such studies can be used to illuminate theoretical perspectives and the subject positions they form (Sundin & Johannisson, 2005, p. 33). One of the most important contributions of Sundin and Johannisson’s (2005) article is the way they articulate their ideas of tools and artefacts with a perspective on the concepts of learning and community of justification. As an example, a web-based tutorial on information seeking and use does not only create a learning opportunity but also mediates a particular theoretical perspective on learning that is built into the construction of the tutorial and its contents (Sundin & Johannisson, 2005).

Despite the shortcomings in the information seeking research field, empirical studies in other research fields provide valuable insights into the role of tools and artefacts. Susi’s (2006) two empirical studies of situated cognition illustrate the central role tools and artefacts play in ongoing work processes. The first study was conducted at the children’s admission unit in a hospital focusing on the individual use of tools within a social context. The second study, which was much more detailed than the first one, was conducted in the control room of a
grain silo and focused on the use of tools in social interactions. Susi’s (2006) study reveals that tools and artefacts become evident as they provide scaffolds for different cognitive processes within the social context, and to which individual actions are related. To Susi, tools and artefacts only make sense and can be understood by those who use them in context. He argues that a participating actor cannot be separated from its environment or from its relation to significant others. Though some tools and artefacts may have the same or similar functions, Susi found out that their usefulness depends on who is using them, where they are used, their functional coupling to other tools and artefacts, the social context and ongoing subjects (cf. Hutchins 1995; Susi and Ziemke, 2001).

The potential importance of tools and artefacts in information seeking research has been stressed by some researchers. Talja & Mckenzie (2007, p. 97) see the potentiality in research on information practices emerging as a result of the meaning and values that people attach to tools and artefacts for locating information. This viewpoint does not imply that other variants of information seeking are less significant; rather the attention ought to be drawn to all the fuzzy and dynamic elements which use tools and artefacts tend to incorporate. Examples of such elements are language, conversation and interactions, shared discourse and physical tools.

This kind of approach is rare in information seeking research, but allows for more detailed and deeper analysis of information sources. It would therefore seem appropriate to inquire more precisely into their roles in relation to information practices.

### 3.4.3 Textual, social and physical sources of information

The view that emerges from the research described here represents a shift from viewing information sources as textual or social to examining the multiple realities of information as a complex phenomenon socially produced and situationally distributed alongside the diversity of information sources. It is assumed that three types/kinds of sources present a reality in work activity. For example, Lloyd’s (2007) study of fire fighters explored a range of information modalities used in firefighting. Through a holistic constructivist oriented method, Lloyd describes the multiplicity of information sources by characterizing them as: 1) textual sources that outline formal requirements of work and are presented in published documents and training manuals; 2) social sources that rely on the development of social relationships between group members and facilitate an intersubjective view of
practice; and 3) physical sources that acknowledges the centrality of the body as a source of information (Lloyd, 2006, p. 575).

In the research literature, much of the studies on information sources in the workplace has been limited to the first two kinds of sources (textual and social). There has been a tendency to neglect the role played by physical information. As such, it has not often been a centre of focus in information seeking research, and has usually been, in most cases, taken for granted. Lloyd’s (2010, p. 254) work on firefighters is one of the few studies on information seeking with an awareness of the body as a source of information. She portrays the central role of the body in the generation of information: “bodies act as collector of sensory information, a site of situated knowledge and a disseminator of information about physical experience” (Lloyd, 2006, p. 185). Bodies also act as a communicator of practice by providing visual clues that could lead to the establishment of shared vocabularies. The body-in-action provides its own narrative and in this way acts as a socially and historically situated symbol of a community and its professionalism.

Other researchers draw attention to the centrality of the body in social practice, which has implications for research on information practice. Schatzki (1996, p. 44) highlights the signifying role of the body suggesting an instrumentality that demonstrates practical reasoning as bodies are read and accessed by co-participants who actively interrogate the bodies of others in practice. The assumption thereof is that the human body “offers itself as the point of connection between the individuals and social manifolds” (Schatzki, 2001, p. 8). While, Schatzki (1996) sees the body as central to both practice and the representation of practice, for Beckett and Morris (2001) and Merleau-Ponty (1962), the body occupies central locations of learning and experience which become storehouses of information. The understanding of the body as an information source can also be derived through a commonality of shared meanings within a culture. Crossley (1995, p. 51) says it well by reasoning that “one of the chief characteristics of the body, qua active body is that it speaks and listens, and reads and writes”.

Viewing the body alongside other information sources (textual and social) has implications for the study of information practices. Firstly, it promotes a broader exploration of the affordances inherent in work activity and by so doing, the researcher is able to explore and understand the overall sociocultural discourse about practice and profession in a community. Secondly, framing information sources within the conception of the metaphor of landscapes suggests a big-picture and holistic understanding of the multiple realities of the phenomenon.
In this thesis, it thus becomes necessary to examine the three sources together. The main difference between the sources is that they belong to different domains (cf. Gibert, Ryle, 1949; Billett, 2001; Lloyd, 2007). While the understanding of textual sources is within the realm of ‘know-what’ or ‘know-why’ knowledge, social and physical information rests in the domain of the ‘know how’ knowledge. The differences could also be found in their connections to information. Lloyd (2007, p.188) points out that textual sources of information could assist individuals in constructing a sense of individual subjectivity, a sense of self and an understanding of the agreed-upon work practice. On the other hand, social and physical information renders the individual as an inter-subjectively embodied member of the community (Lloyd, 2010). This suggests that the individual’s involvement in the relationship to and experience of information is socially afforded and physically located.

However, it is assumed that information sources neither exist in isolation nor are mutually exclusive. For example, Lloyd (2007, p. 188) found that fire fighters view a textual source, which is seen as an explicit form of knowledge, as the institutionally sanctioned “gospel”. Textual sources can even become the information resource for the social and physical sources in concrete and situated activities of people interacting during activities. Yet, there is not much research concerning how these three information sources together are found in information seeking processes.

3.4.4 Practice theoretical view on information access

Within the information practice research field, few researchers have explored how information is accessed through different information sources or modalities. Lloyd (2010; 2007) makes some space of difference to the research field by characterizing information access as modalities or sites depicting complex ecologies that afford a range of opportunities for people to engage with these sources. According to Lloyd (2006, p. 574), information access is achieved by navigating pathways that require a more diverse and complicated information relationship. The description builds on her notion of the information landscape and describes the different sites through which information can be assessed. Although the description was derived from her studies on information literacy of fire-fighters, it can be applied generally in the research field of information practices. Lloyd’s work opened up for the socio-cultural ontological notion of site and the theoretical framing of practice developed by Schatzki making a case that site ontology provides access to information. For example, a textual source, which is assumed to be the initial point of access to information, acts as the site of conceptual knowledge required for practice. Information can only be accessed within this site through print or digital sources.
Physical sources act as sites of embodied knowledge that evoke their own narrative and Lloyd (2007) notes that the focus on accessing information through this site is by observation of the body in actual practice. Community membership and knowledge acts as site for social source of information recognized and sanctioned as legitimate by significant stakeholders.

It is clear that access to information is by no means restrictive to any one of the information source with regard to the others. Lloyd’s portrait makes it possible to understand information access through connections that exist between people, artefacts, text, and bodily experiences. The three sources work in tandem. It is one thing to have access to textual information which may even be viewed as “detached from practice or obscures the intricacies of that practice” (e.g. Brown & Duguid, 1991, p. 40). It is quite another to have access to information that stretches well beyond specific propositions, concepts and theories and “must have to be auctioned by the body in everyday practice” (Lloyd, 2007, p. 187). It is yet another thing to recognize access through what is sanctioned as “appropriate or valuable by experts within the community of practice” (Lloyd, 2007, p. 187).

The role played by the community in providing access to information is worthy of further discussion here. Information access in one community could be different from another community. It is problematic to share knowledge or information existing in one community of practice with another community as each community understands information according to its own generally acceptable standards (Brown & Duguid, 1998; 2001). Sundin (2008) refers to the idea of community of practice as a community of justification guided by certain sets of discourse that guide what can be said and done. Based on positive judgement, a group can give information not only as a seal of approval, which Sundin (2008) links to community of justification, but also as enhanced access to information. Chatman’s conceptualization of a habitualized “small world” is also useful in explaining information access through the totality of a community that determines the existential definition of the actors in the world, their social norms, language and social heritage (including tools and artefacts). Thus, Chatman’s (1992; 1996; 1999; 2000) numerous ethnographic studies reveal that access to information can be gained through this habitualized and enclosed “small worlds” such as retirement homes and prisons. Chatman thus found information to be compatible with what members of the small world perceive to be plausible to the extent that information seekers would shield themselves from information originating outside their own everyday environment even if this information might potentially be helpful.

Other notable studies include those of Chun Wei Choo (2007) and Solomon (1997). Chun Wei Choo’s study is on how organizations seek and use information to
understand and enact their worlds. According to Choo, information constitutes what
the organization ‘knows’ about its environment and its tasks, and thus creates a
basis for undertaking actions (Choo, 2007). Choo considered three case studies that
highlighted different aspects of interaction within organizations. The first case
compares information seeking and use; the second case reveals the epistemic
properties of information seeking; and the third case recollects the experience of
participants involved in large-scale information sharing in an organization. The
study found that to understand information behaviour in organizations is to
understand how organizations are simultaneously involved in information-seeking
and belief-forming social systems; that is information is shaped by epistemic
practices that simultaneously affect beliefs as much as outcomes of information
seeking and use. Choo then concluded that information practices are revealed in the
activities by which people find, use and share information to do their work and
sustain their identities. Solomon’s (1997) ethnographic study explores the social
role of communicative events such as meetings, conversations and written
messages as important structures for information access. Chatman’s, Chun Wei
Choo’s and Solomon’s studies are relevant to this thesis as they proffer insights
into understanding information access through a deeply contextualized social
world.

When information access is studied from the perspective of the social community,
as in this thesis, it is necessary to restrict oneself to studying information access
afforded by the community per se. Patrick Wilson’s (1983) cognitive authority
acknowledged social community as a point of access for information, particularly
in recognizing that cognitive authority resides in the collective memory of a group.
Wilson (1983) notes that the world is full of competing rivals willing to instruct us
and influence our decisions (p. 124), and as such “what one needs to know also
depends in part on what others expect one to know”. Thus, Wilson’s definition of
cognitive authority is that of a relationship involving at least two people in which
the influence of one’s thoughts is acknowledged as legitimate or appropriate in
some issues of interest (Wilson, 1983, p. 14). In this regard, he stresses the
importance of second-hand knowledge that has been learnt from others as people
seek and evaluate information from the world at large. Wilson further explains that
only those who are deemed individuals who “know something we do not know”
and who “know what they are talking about” are recognized as cognitive
authorities, at least to some degree.

3.5 Workplace learning

The final central theme of this thesis is workplace learning. The lack of a single
definition of workplace learning reveals the broadness and complexity of the
phenomenon. Traditionally, ‘work’ and ‘learning’ are concepts which used to belong in separate categories\textsuperscript{67}. Different accounts of what is encompassed by learning in the workplace and different learning purposes underlie the various interpretations. For example, workplace learning studies viewed from a sociocultural perspective are often directed towards the social phenomenon of being embedded and influenced by complex elements that individuals encounter through their ongoing interactions in the workplace (e.g. Billet, 1995; 2004). In fact, the purposes are not always immediately apparent, and can be seen in different ways: (a) a means of improving performance for the benefit of the organization (in terms of the self, the team or work community, and the enterprise); (b) improving learning for the benefit of the learner (in terms of the self, for one’s personal growth and lifelong learning); and (c) improving learning as a social investment (for team or work community) (Boud and Garrick, 1999, p. 6).

Lesser attention has been paid to studies on workplace learning in comparison to learning in educational institutions such as schools. The general assumption is that learning is dependent on teaching and that the main area of inquiry should be in places where teaching or instruction take place rather than learning\textsuperscript{68}. These conventional ideas associated with classroom pedagogy are not plausible premises for understanding workplace learning (Prawat, 1993; Billet, 2002). Over the past two decades or so, interest in studies of workplace learning has intensified. One major challenge facing workplaces today is a necessity to offer access to authentic learning activities due to situations that are increasingly complex, diversified, specialized, changeable, and difficult to predict. It has been argued (e.g. Billet, 2001; 2005; Lave, 1990) that the ‘pathway’\textsuperscript{69} curriculum of workplace learning is not hostage to constructs and practices arising from educational institutions but that it has its own pedagogic qualities embedded in work activity. The pragmatic concerns ought to focus on how workplaces invite workers to participate and

\textsuperscript{67} Work implies producing or doing things to earn a living while learning was about education; learning occurs in life before work. Training might be necessary at first in the workplace, but everything else that was needed for a lifetime of employment could be picked up from experienced fellow workers. (Boud & Garrick, 1999, p. 2)

\textsuperscript{68} In many educational settings, learning is conceived as being individualistic, dependent of transmission pedagogies and associated with the transfer of decontextualized knowledge separated from the activities of life (Wenger, 1998). However, researchers view learning in this regard as ignoring the complexities of human interactions and thereby failing to consider learning as a social process with its meaning being in the “lived-world”. That is to say, meaning derived from experience and activity, meaning derived from practice through participation, meaning derived from belonging to a community and the shaping of identity within the social world (Campbell, Verenikina & Herrington, 2009).

\textsuperscript{69} Pathways provide incrementally greater access to the capacities that are required for workplace learning in everyday life experiences. According to Billet (2006; 2002) it is worth noting that these three interdependent planes are enacted synchronously in work activity. According to Wenger (1998), the pathway curriculum is itself a complex process that combines a wide range of actions such as doing, thinking, feeling, and belonging.
engage in activities that serves the organization’s goals and at the same time the
interest of those who are participating. In the absence of didactic interactions in
workplaces, studies should then focus on what Billet (2006; 2002) identified as
three interdependent planes along the pathway: (1) engagement in everyday
activities; (2) direct guidance between the learner and the more experienced expert
in conscious goal-directed activities; and (3) indirect guidance that is the
recognition of the influence of the environment. Broadly considered, studies of
workplace learning seek to overcome the Cartesian dualism of mind and body, given
that the workplace provides a legitimate learning environment that
emphasizes social processes.

Empirical studies on workplace learning have focused on different contexts such as
workplaces or professional groups (e.g. Hutchins, 1983; Billet, 1993; Jordan, 1989;
Lave, 1990). Yet, until recently, workplace learning has been a relatively unexplored concept in the field of information practices. Arievitch (2003) notes this
by saying that whenever social practices are investigated from the perspective of
learning, information practices are not usually included in either the investigations
or analysis.

Within the field of information seeking research, a few researchers have explored
the relationship between learning and information practices. Most of this research
focuses on these relationships in educational settings. Lloyd’s study is one of the
few exceptions from the point of view of a workplace. There is no single pattern or
procedure for understanding these relationships and Lloyd’s (2006; 2007) work on
fire-fighters is indeed inspiring. Lloyd examines the transition from an individual
institutional construct of practice toward a collective construct of practice and
profession that people engage in using information modalities through the
information landscape. Lloyd interprets this idea by weaving together constructivism (the development of personal constructs) and constructionism (the
creation of intersubjective meaning). These provide insights into understanding of
the transformation of professional roles/positions from novice to experienced practitioners as they engage with information sources. Lloyd (2007) identified
discursive practices as facilitating this transformation that both informs practice
and shapes the development of professional identities. Lloyd (2006, p. 572) also
notes the affordances through “a range of opportunities, activities, symbols,

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70 Cartesian dualism is closely associated with the philosophy of Rene Descartes (1941) ’cogito argo sum’ that holds that the material body and the immaterial mind are two completely types of substances that interact with each other. (Source: http://en.wikipedia.org/wiki/Dualism_(philosophy_of_mind)

71 According to Lloyd (2007), discursive practices refer to the practices that are constituted and sanctioned according to the social, historical, economic, or political rules that constitute ordered activity within time and space.
artefacts and practices that the workplace offers as a space, and the people who work in that space, provide to facilitate learning and knowing”. Although Lloyd’s study was based on the information literacy of fire-fighters, it can also be applied to studies on information practices as well.

Lloyd’s study moves away from viewing information practices as such to examining them as a catalyst to learning. The relationship with information in this respect is seen to be characterized by “the discourse and through the discursive practices of a community with a vested interest in ensuring the transition of novices from individual workplace subjectivity to collective workplace intersubjectivity” (Lloyd, 2007). Lloyd’s study does not focus on workplace activity as such, which is the main area of interest in the present thesis. Rather, her emphasis is on how information processes are intricately enmeshed in learning. In this respect, her concern is mainly in exploring the modalities of information that are required to learn about the practice and a profession.

3.6 Concluding remarks on earlier research

In this chapter, the present thesis has been situated in the broader field of information seeking research and the sub field of information practices. The relevant studies that were reviewed and presented offer perspectives as well as reflect the research traditions that are predominant for the present understanding of the phenomenon of information practices in work activity. Although the extant research has contributed to my understanding of information practices, such studies surprisingly seldom focus on authentic workplace learning. Hence, the field of learning was reviewed to proffer further insights to understanding information practices in learning in the context of work.

From the review, it is worth noting that the two major concepts for this thesis (information practices and workplace learning) are not easily defined or distinguished. The review of physicians’ professional information was considered significant alongside with studies on the role of tools and artefacts. Taken together, the prior research facilitates an understanding as to how information practices can be positioned in this study. This study aims to contribute to the field of information seeking research by providing a detailed empirical reflection of information practices with specific focus on the role of tools and artefacts within a case of medical workplace learning.
4 Theoretical Framework

In this chapter, the theoretical framework to guide the analysis of the empirical data is described. Information practices are a specific part of social practices embedded in authentic real-life settings. Information practice is understood as “a set of socially and culturally established ways to identify, seek, use, and share the information available” (Savolainen, 2008, p. 2). This implies that information practices cannot be investigated as an isolated phenomenon out of a context. It also implies that the object of study will be examined from a variety of multidisciplinary theories and conceptual models.

This thesis is a research study on information seeking in context, for which the theoretical and conceptual foundations fall under what is called a sociocultural perspective (Wertsch, del Río & Alvarez, 1995). The first section of this chapter focuses on the understanding of context followed by the discussion of the sociocultural perspective as the metatheory that guides the research. The prime or operative theory chosen for this study is the cultural-historical activity theory (CHAT), also known as activity theory. Activity theory is not a predictive theory, but a clarifying descriptive tool that provides a conceptual framework for the analysis of social practices. Thus, it can serve as the backdrop for other theories of relevance to the object of study. Since this study considers the participatory modes of engagement in workplace learning, social practice theories also form the basic foundation for the analysis. The specific object of this study is information practice, and I focus on an overview of context as a distinct entry point for the discussion of the theoretical chapter. In the following, I focus on those theories and models that I have found contributory to the research problem and the five research questions of this thesis.

4.1 Understanding context

This thesis is on information seeking research in context. Context per se has been a topical issue in the field of INSU72. Conceptualizing ‘context’ per se remains ill-defined and problematic because of its largely amorphous, ambiguous, fragile, myriad, and elusive nature that makes it subject to different stereotypical

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72 Since the 1990s, there has been increased attention to context as reflected in the biennial International Conferences on “Information Seeking in Context, starting with the first one held at the University of Tampere in Finland in 1996. Different researchers have highlighted its role (e.g. Wilson, 1981, 1986, 1999; Ingwersen, 1996; Dervin, 1997; Solomon, 2002). INSU research focus on context has been its social and cultural components (Hjorland, 2002).
interpretations and meanings (Dervin, 1997; Courtright, 2007). This difficulty alludes to the fact that context is used interchangeably with some other similar concepts such as ‘situations’; ‘information arena’, and ‘information spaces’. However, LIS researchers such as Cool (2001, p. 5) and Sonnenwald (1999, p. 176) try to disambiguate context from other similar concepts as both authors conceive of context within the broader perspectives in which different situations or a flow of situations occur. Also, the theoretical clarifications of context are far from being addressed (Johnson, 2003; Dervin, 1997; Courtright, 2007), in as much as there is a lack of consensus within INSU literature of what ‘context’ is, and how it influences information behaviour and vice versa (Allen, Karanasios & Slavona, 2011, p. 778; Courtright, 2007). According to Talja et al. (1999), this may be explained by the degree of ontological ambivalence or unconscious assumption of particular theoretical perspectives within traditions. In this regard, Allen, Karanasios, and Slavova (2001, p. 778) note that “the traditions start from opposing and contradictory ontological positions and so mean different things when they use the label context”. There are therefore no absolute rules for determining a priori what will count as context in a study (Lee, 2011, p. 95). In her analysis of various contextualist approaches, Dervin (1997) describes context as an ‘unruly beast’ that is difficult to tame methodologically, and thus concludes that there is no term more often used, less often defined, and when defined is so variously defined, as context.

Within the field of INSU, there have been different approaches to investigating context. For example, Johnson (2003) proposes three senses in which context is used: situational, contingency, and major frameworks for meaning systems or interpretation. Talja, Keso and Pietiläinen (1999, p. 752) identified two polarities to context: ‘objectified’ and ‘interpretative’. According to the objectivist approach, context refers to objective reality, which implies that the social, cultural and historical elements are treated as ‘outside factors’. Context in this regards serves

73 Sonnenwald (1999, p. 180) for example, defines “context” as the “quintessence of a set (or group) of past, present and future situations” with features of “boundaries, constraints and privileges as perceived by participants and outsiders”. To Sonnenwald (1999, p. 3), situations are characterized as embedded in context as a set of related activities that occur over time, which in any given context are not necessarily linearly-ordered discrete events. For Cool (2001, p. 8), situations are “dynamic environments within which interpretative processes unfold, become ratified, change, and solidify”. Situations, however, are regarded as social constructs, because they are based on and guided by the need for the interpretation of meanings (Miller, 1984, p. 156). Miller (1984, p. 152) argues how reoccurring situations occur from day to day and year to year, and that the recurring forms become a tradition which tend to function as a constraint upon any new recurrence. Johnson defines context simply as “an elaborate specification of the environment within which information seeking is embedded” (p. 739). Thus, it can be said that what distinguishes context from situation is that it has elements that have a more lasting and predictable influence on information practices than situations; in contrast, situation is seen as a potential part of context (Courtright, 2007, p. 276).

74 The goal of this approach is therefore predictive and aimed at finding universal laws or patterns of behaviour (Talja, Keso & Pietiläinen, 1999, p. 753). Viewing it in this light also depicts what has been labelled as “positivist” (Dourish, 2004). It can be conceptualized independently of the activities of their participants, and is presented as a
as a backdrop to the findings whose relationship to the actors is implied rather than stated or problematized (Courtright, 2007, p. 286). For the interpretative approach, context is understood as phenomena embedded, constituted, and mediated by social, cultural, and historical entities (Talja, Keso & Pietiläinen, 1999, p. 751). The essence is to connect the phenomena being investigated to reality, thereby bringing multiple aspects of the researched phenomena into sight. What this seems to suggest is that, “context is usually produced in research by naming the entities (actors, structures, and attributes) which affect the research object” (Talja, Keso & Pietiläinen, 1999). In this vein, contextual entities and factors are not static but instead interact with each other, are constantly negotiated, and are recreated in social activity in the same way as the research object (Talja, Keso & Pietiläinen, 1999, p. 754; Rieh, 2004, p. 751). Talja, Keso, and Pietiläinen (1999, p. 759) also acknowledged that there are “in-between approaches”; approaches which are constructionist, but not explicitly social constructionist”.

Because context is amenable to interpretations and not causal explanations, the differing standards for understanding what is meaningful to the phenomena for study raise the question of what to consider in investigating context. According to Johnson (2003, p. 738), “most researchers become embedded in a taken-for-granted reality in which context becomes a set of initial assumptions or a limiting conditions on their area of inquiry”. Earlier on, Weick (1983, p. 27) noted that, “despite repeated appeals for contextual inquiry and sensitivity to context...no one is exactly sure what is being requested or how to produce it”. According to Dervin (1997, p. 15), the only thing common to all approaches which emphasize the contextualization of the research object is the emphasis on everything that happens in a certain time and space. Hence, in understanding context, the pertinent question to start with is, what does it exactly mean in and for a specific research project.

The debate about context parallels other disciplines and cuts across a variety of philosophic and theoretic positions. For example, Lave (1988, p. 151) regards context as “…an identifiable, durable framework for activity, with properties that transcend the experience of individuals, exist prior to them, and are entirely beyond their control”. Although context is critically important to understanding social practices, Schatzki (2002, p. 60), however, notes that theorists marshall it as a “wand for empty gestures” though neither the modus operandi nor identity is rarely

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Rousseau (cited in Johnson, 2003, p. 738), for example, notes that there is the problem of level of analysis, and this introduces the problem of implicit hierarchy in terms of which subordinates lower level phenomena to higher ones.

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investigated\textsuperscript{76}. It is not simply given in the physical setting, but is constituted by what people are doing and where and when they are doing it (Erickson & Schultz, 1997, p. 22). Erickson’s and Schultz’s conception of context assumes social interaction as constitutive of an environment, which defines the situations and on the basis of the situations, is where social actions take place. But broadly speaking, context is “the circumstances that form the setting for an event, statement, or idea” (Compact Oxford Dictionary of Current English, 2005). The emphasis on it has become more or less a ritualistic invocation as “context has the potential to be virtually anything that is not defined as the phenomenon of interest” (Dervin, 1997, p. 14). Stressing further, Dervin notes that “virtually every possible attribute of person, culture, situations, and behaviour, organization or structure has been defined as context”. According to Fisher, Landry, and Naumer (2006), context is a paradigmatic cornerstone for capturing the holistic picture and nuances of how information activities are undertaken. This underlies the earlier stance by Dervin & Nilan (1986) that information seekers ought to be viewed holistically. Equivalent terms also used for context as reviewed by Courtright (2007) include:

1 “container in which phenomenon resides” (Courtright, 2007, p. 286);
2 “carrier of meaning” (Courtright, 2007, p. 287);
3 “setting” (Byström, 1997; McKenzie, 2004; Davies & McKenzie, 2004; Pettigrew, 2000).
4 “Environment” (e.g. Janes & Silverstein, 2003; Lamb, King, & Kling, 2003; Rieh, 2004; Taylor, 1991).
5 “Information world” or “life-world” (e.g. Chatman, 1996; Kari & Savolainen, 2003; Lievrouw, 2001; Talja, 1997).
6 “Information ground” (e.g. Fisher, Naumer, Durrance, Stromski & Christiansen, 2005; Fisher, Durrance, & Hinton, 2004; Pettigrew, 1999).
7 “A site of struggle” (Dervin, 1997).
8 “Frame of reference” (Vakkari et al, 1997).

INSU researchers view context from different perspectives. For example, Talja,\textsuperscript{76} However, Schatzki (2002, p. xiv) defines context as the “setting or backdrop that envelops and determines phenomena”, and then identified three entities that can be investigated: (a) embracing and entangling the phenomenon; (b) shaping the phenomenon and entities within it; (c) having the composition and character which will vary ‘with the entities or phenomenon that exist in context’ (Schatzki, 2002, pp. 61-63). These enveloped entities help to determine their existence and being (Schatzki, 2002, p. 20).
Keso, and Pietilänen (1999, p. 751), whose analysis of context is that of a site where the phenomenon of information seeking is constituted as a research object, provide a particularly illuminating perspective. This implies understanding and examining the object of study as phenomena mediated by social and cultural meanings and values. Lloyd (2007, p. 5) puts the meaning of context succinctly, when she further stresses that “a context shapes the sites of knowledge (knowing locations), and legitimizes the modalities of information that are valued and through which identities and positions are spoken into existence”. Lloyd (2007, p. 5) seems to suggest that context shapes and influences what is learnt at the site, how it is learnt, the forms of learning which are legitimized, what information is valued, and what is contested.

Though not an INSU researcher, Schatzki (2005) presents two opposing site ontologies to explicate context: that of the individualist and the societist. He argues that individualists hold that social phenomena can be both decomposed into and explained by properties of individual people (Schatzi, 2005, p. 466); that is, he explains social reality as based on interrelated individuals, in which a given person’s action often depends on those of others. The societists, according to Schatzki (2005, p. 466), can be analyzed and explained in reference to groups, and as such, the features of collected individuals cannot be treated as sets of particular individuals. Schatzki (2005, p. 469) then presents his own concept of site ontologies as a possible mid-way point -a path between individualism and societism. He maintains that the thrust of site ontology is that human co-existence inherently transpires as part of a context of a particular sort.

Context may also refer to a frame of reference for the sufficient understanding of the phenomena of INSU study (Vakkari, Savolainen & Dervin, 1997, p. 9). According to Talja, Keso and Pietilänen (1999, p. 761), frame of reference allows us to choose the relevant elements for study indicating both a way of viewing the world and of subjectively interpreting it. For example, Fidel and Petersen (2004) advocate that context is to be identified within the frame of reference of a bounded organization such as a work environment or work-domain versus that of everyday life activities. Savolainen (2008, p. 3) distinguishes between two frames of reference: job-related and non-work settings. Taylor (1991) viewed the environment as a frame of reference and subsequently developed a model of context known as the information use environment (IUE) to account for information uses of professional groups such as physicians and engineers functioning in predictable workplace settings. Taylor’s model consists of four categories of elements in the environment: -1) demography (primarily education and profession); 2) how actors conceptualize the problems that would spark information practices; 3) the constraints and opportunities that characterize actors’ settings, including organizational and infrastructural attributes; and 4) what types of
problem resolutions are sought or would be acceptable. Nardi and O’Day (1999) developed a model which they termed ‘information ecologies’. Though delineated by an organizational setting, it is applicable both to the workplace and home and stresses the diverse array of human activities that take place within a closed setting as a bounding element for context. In sum, context in INSU research usually refers to:

Any factors or variables that are seen to affect individuals’ information-seeking behaviour: socio-economic conditions, work roles, tasks, problem situations, communities and organizations with their structures and cultures, etc. (Talja, Keso & Pietilänen, 1999, pp. 752-753).

Besides accounting for professional groups and both, job-related and non-work frames of reference, frame of reference can also be narrowed to emphasize work roles as a viable instrument for understanding information practices at work (Huwila, 2008; Fidel and Pieijtersen, 2004; Leckie & Pettigrew, 1997). For example, although Leckie and Pettigrew (1997, p. 101) suggest that researchers examine “the broader working context in which professional practices are conducted”, the principal contextual influences on information practices they analyzed are both the actors’ roles at work and, stemming from those roles, the tasks with which they are charged. Other studies that proffer insights into the understanding of context as a frame of reference include the works of Huwila (2008) and Algon (1997). For Byström and Hansen (2005) and Huwila (2008), a task is a workable analytical unit of human activity. Huwila means that it describes work and work roles as effective concepts at explicating the broad patterns of professional information activity. For Byström and Hansen (2005), a work task binds together different information-related activities.

When the issue of context is applied to INSU study in analyzing and explaining phenomena, it seems right to specify what aspect or area of it is being applied. In this thesis, I advocate context according to Schatzki’s mid-way path that focuses both on the individualists and societists. According to Allen, Karanasios, and Slavova (2011, p. 778), this has motivated their desire to solve the puzzle of the dualities enforced by paradigmatic closure. In viewing context on the level of a mid way path, it can be seen as a significant site for understanding the phenomena of

77 Although a site can be seen as a sort of context, Schatzki (2005, p. 468), argues that it is important to emphasize that sites need not be spatial. For example, documentation, intrinsically occurs as part of the information practices embedded in patient health care. Along with the other information practices such as reading, information gathering, and meaning-making, documentation can be seen as part of the information practices that pertain to health care. Patient health care is the site through which information practices are investigated. In this regard, the context and contextualized entity constitute one another. Hence, it can be said that a site is inseparable from that of which it is the site (Schatzki, 2005, p. 468).
workplace learning activity within the occupational job-related bounded framework of a professional group (i.e. physicians in a teaching hospital). As such, the examination of information practices will cut across the workplace in as much as the phenomena investigated are seen “as belonging to the context of work and being an essential part of it” (Huvila, 2008, p. 801).

I have, in this regard chosen to examine context through the prism of activity theory (Engeström, 1987; 1990). This study also presents context as a frame of reference for investigating the information practices of the participatory modes of engagement of a professional group (i.e. physicians). The frame of reference in this study entails viewing the social practices of the participating actors in the workplace learning activity. The interpretative approach will be used in this thesis, in which context is seen as “some kind of a background for something the researcher wishes to understand and explain” (Talja, Keso & Pietilainen, 1999). The background in this thesis, as we will see, comprises of the different interacting components of an activity system.

4.2 Epistemological underpinning of the sociocultural perspective

The basic meta-theoretical position that informs this research is the socio-cultural perspective on pedagogy that is traceable to the work of Soviet psychologist Vygotsky (1978; 1986) and other theorists that cut across different fields such as education, psychology, anthropology, sociology, and linguistics (c.f. Werstch, 1995, p. 56). The sociocultural perspective evolved as a reaction against behavioural psychology in the West (Wilson, 2006). The emphasis initially was on the use of language as the ‘tools of tools’ in the mediation of behaviour.

The significance of adopting this perspective for this study is that it addresses the nuanced contextualized understanding of phenomenon that lies in the ways the dynamic interdependence of social and individual processes are viewed. It relies on the premise that the individual is inseparable from the social, cultural, and historical elements of her human activity (Rogoff & Chavajay, 1995, p. 872; Daniels, 2001). In this way, it encompasses the structural/interpersonal domain of any activity. The sociocultural viewpoint in LIS acknowledges that knowledge and knowledge structures are intersubjective, produced within a shared system of meanings (Talja, 1997, p. 73), and actualized from communicative interaction (Sundin & Johannisson, 2005; Limberg & Alexandersson, 2008, p. 12). This implies that the individual engaged in dynamic processes cannot be separated from contextual elements, and that the processes are viewed as situated events rather than general
modes of coping with given situations. In particular, emphasis is placed on the relations between people, actions, contexts, meanings, communities, and cultural histories (Wertsch, 1995), as well as cultural tools and artefacts (Robbins, 2005, p. 142). Within the sociocultural approaches, Rogoff and Chavajay (1995, p. 872) see the aim as understanding the interactions and developments in activities involving individual, interpersonal, and community/cultural processes. Wertsch (1995, p. 3) succinctly puts the goal of a sociocultural approach as explicating the relationship between the individual in the activity and the sociocultural and historical context in which the activity occurs.

More importantly, the sociocultural perspective asserts that cognition is not only an individual construction, but a collaborative process that is inherently related to participation with significant others (Rogoff & Chavajay, 1995, p. 871; Robbins, 2005, p. 143). Hence, cognition is seen as distributed across people where individuals are conceived as contributing participants in culturally relevant activities and working with and transforming specific cultural tools and artefacts, practices, and contexts in which they are engaged (Rogoff & Chavajay, 1995). The ontological standpoint of the sociocultural tradition is non-dualist (Packer & Goicoechea, 2000, p. 227). This implies that it seeks to dispense with the Cartesian dichotomy between the mind/body duality. The development is conceptualized as the transformation of socially shared activities into internalized processes. In this way, it provides a new way of understanding human activity as cognition is then seen as “a complex social phenomenon…distributed…stretched over, not divided among-mind, body, activity and culturally organized settings (which include other actors)” (Lave, 1988, p. 1). From this standpoint, both human and non-human beings are viewed as mutually constituting. Rather than being a universal skill, thinking is seen as contextually specific, guided by significant others, and mediated by particular tools and artefacts (Robbins, 1995, p. 143).

In Western branches of sociocultural theories of learning, especially in theories of participatory learning (e.g. Wenger, 1998; Lave and Wenger, 1991; Rogoff, 1990; Billet, 2002), the tendency is to move further away from an individualistic approach and move towards a contextualized social approach. The acknowledgement is that the distinctive quality underlying workplace learning is conducted through the intermediacy of tools and artefacts, and that these are patterned by social practices through participation. Participation, according to a dictionary definition, simply means “the act of taking part or sharing in something” 78. This may include some activity, enterprise, etc. Participation is connoted as many things by different researchers, but in general it refers to collaborative

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activity and intersubjectivity (Arievitch, 2003). The understanding of collaborative activity and intersubjectivity as the goal for learning was first illuminated in the work of educational theorist Dewey (1938-1998). Dewey promoted the idea that learning is not an abstraction and does not reside in the individual’s mind as a container of knowledge. Instead, it is the external material and social sources that give rise to experiences and involves moment-by-moment interactions, discussions, and engagements in activities that are constituted by social processes. This is opposed to the traditional notion of education that, according to Clancey (1995), learning is a matter of ‘transmitting’ knowledge from teacher to learner. In this study, participation is defined as “a process of taking part and also to the relations with others that reflect this process” (Wenger, 1998, p. 55).

Processes of internalization and externalization are two basic processes from the sociocultural perspective that are inseparably intertwined and operate continuously at every level of human activity. According to Allen, Karanasios, and Slavova (2011, p. 781), these two concept are important for examining information behaviour as researchers are able “to observe the absorption of information, the habituation of behaviour into practice and the manifestation of these in the form of knowledge and skills”. Nonaka and Takeuchi (1995, p. 284) used these processes among others to explain a spiral knowledge process interaction between explicit knowledge and tacit knowledge. In their model, knowledge follows a cycle that entails socialization (tacit-to- tacit), externalization (tacit-to-explicit), combination (explicit-to-explicit), and internalization (explicit-to-tacit). In this way, implicit knowledge is ‘extracted’ to become explicit knowledge, and explicit knowledge is ‘re-internalized’ into implicit knowledge. The internalization process occurs through diffusing newly acquired and consolidated knowledge and concerting or integrating it into individual mental models. Once internalized, the new knowledge is then used by individuals to broaden and reframe it within their own existing knowledge. Hence, internalization can be seen as related to the reproduction of culture (Engeström and Miettinen, 1999, pp. 10-11).

Internalization also refers to “the process through which higher forms of mentation comes to be” (Lantolf, 2000, p. 13). John-Steiner and Mahn (1996, p. 10) interpret internalization as “simultaneously a social and an individual process”. In this regard, the source of consciousness is assumed to reside outside of the head and, in fact, in social activity. Xu (2007) sees it as the internal reasoning and

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79 It can be said that internalization refers to how the external object finds its role in determining actions in practice. According to Lantoff (2000, pp. 13-14), at first, activity of individuals is organized and regulated (i.e. mediated) by others, but that eventually, in normal development, the individual then organizes and regulates his own mental and physical activities through the appropriation of the regulatory means employed by others. At this point, psychological functioning comes under the voluntary control of the person.
reconstruction of external objects (i.e. a child observes a pencil being used and learns to use it). Far from being a monocular, clear-cut process, internalization embodies a wide range of techniques that make mental life and activity more efficacious, i.e. reading to oneself, thinking to oneself, and doing sums in one’s mind (Toulmin, 1999).

On the other hand, externalization gives a visible form to tacit knowledge and converts it to explicit knowledge. It can be defined as “a quintessential knowledge creation process in that tacit knowledge become explicit, taking the shapes of metaphors, analogies, concepts, hypotheses, or models” (Nonaka and Takeuchi, 1995). This implies the creation of new artefacts that make transformation possible (i.e. a child uses the pencil to draw a picture or to communicate his/her feelings). For Engeström and Miettinen (1999, p. 10), it is no longer true to say that human agents create society and reproduce culture. Rather, it is worth noting that they transform the society and culture as well. This seems to suggest that if society is already made, and as such any concrete human praxis-like act of objectivation can only modify it and the totality of such acts can only sustain or change it. Sociocultural theorists argue that both terms are compatible particularly as they are highly integrated and continually iterating. Given that human thinking and activities are to a large extent social processes, Wilson (2008, p. 124) notes that our mental processes must be created as a consequence of our external activities being internalized. To Wilson, consciousness of the world around us is formed by our acting upon it, in the same way; our internal conception of the world is fixed through our activity in the world. The tools and artefacts of an activity are therefore considered as not only external things, but also as an extension of the human mind, a reification of a person’s activity (Wenger, 1998, pp. 58-62).

The term ‘reification’ means “making into a thing”, and it is central to any practice (Wenger, 1998, pp. 58-59). Wenger refers to reification as the process of giving form to experiences by producing objects that congeal this experience into “thingness”. Wenger then argues that by so doing, points of focus are created around which negotiation of meaning becomes organized. For example, a medical record reifies in its form the physicians’ encounters with patients as aspects of their interactions are congealed into fixed forms and given the status of object. This form then becomes a focus for the negotiation of meanings, as physicians subsequently use the object for future interactions, to refer to the past, and to perform an action. What is important about the reified object is that it is only the tip of the iceberg, and indicates larger contexts of significance realized in human practices. Wenger (1998, p. 61) notes that its character as a reification is not only in the object’s form, but also in the processes by which it is integrated into practices.
The sociocultural perspective brings certain issues to the fore when it comes to understanding information practices, and is, in this study, used as a metatheory to understand and set the boundaries of the phenomena to be investigated. For example, information practices are examined within the context of an activity system and community of practice of a team of physicians. Furthermore, these information practices are enacted in relation to the available tools and artefacts in the activity system. The understanding of information practices is from a ritual perspective. According to Sundin and Johannisson (2005), this perspective is obtainable in communities of justifications that the actors participate in. Ritual perspective is not directed towards the extension of messages that demonstrate the transmission model of sender-receiver, but instead towards the maintenance of society in time (Sundin & Johannisson, 2005, p. 37). This implies active participation in communities as activities or practices rather than as a mental quest for acquiring ‘new’ knowledge or information carried out by individuals in isolation. The implication of the ritual perspective is understanding information within the realm of the explicit and implicit knowledge working together in tandem to constitute the shared practices of a community (e.g. Polanyi, 1996; Ryle, 1949; Brown & Duguid, 2000, p. 133; 2001, p. 204; Wenger, 1998, p. 47). Shared practices are revealed in terms of the individual-social relationship. This implies that “part of what is known about a given domain is possessed by the individual, part by groups” (Cook & Brown, 1999, p. 386).

Explicit knowledge (knowing that) is referred as knowledge that is codified, structured, and accessible to other people besides the individual originating it, and that could be passed on from expert to novice (Leonard & Sensiper, 1998, p. 113). Although the rudimentary explicit knowledge is acquired mostly through institutional training (e.g. classroom lectures, seminars, conferences), it has to be improved on consequent upon institutional requirements, professional orientations, and personal histories. Expertise in explicit knowledge is ‘specific’, and refers to acquiring skills within a particular domain (Patel et al., 1999, p. 82). Tacit knowledge (knowing how) or practical knowledge refers to knowledge that is obtainable by virtue of practice. Expertise in tacit knowledge is acquired through repeated acts of procedural activities, and according to Schatzki (2001, p. 2), involves embodiment in the expression of bodily experiences. From the sociocultural perspective, attention is drawn from the explicit and tacit categories of knowledge to the situated social practice also involving conditional knowledge (Alexander, 1992, p. 32). According to Billet (2001, p. 433), this type of knowledge is shaped by the historical and sociocultural lines of development. Thus, expertise

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80 Conditional knowledge implies knowing when and where.
is context-specific\textsuperscript{81}, and social practice involves processes that are both interpsychological and intrapsychological. According to Billet (2001, p. 433), this manifestation is a “result of a long series of developmental events” and can only be understood within particular social circumstances (Billet, 2001, p. 441). Hjorland and Albrechtsen’s (1995, p. 400) domain analytical perspective in LIS explained this kind of expertise when they stated that, “the best way to understand information in IS is to study knowledge-domains as thought or discourse communities, which are part of a social division of labour”.

### 4.3 Cultural-historical activity theory (CHAT)

The object of this study, which is physicians’ information practices in workplace learning, requires a well-developed framework for analysing the complex dynamics of the sociocultural context involved in patients’ health care. Activity theory provides the naturalistic framework for such an analysis as the study context involves interaction between human and non-human elements embedded in a historical setting. Wilson (2006) proposed that an activity theoretical approach can be applied to information seeking research\textsuperscript{82} in order to provide a sound basis for elaborating on contextual issues that influence information behaviour and information exchange (Wilson, 2006)\textsuperscript{83}. The activity system comprises of an

\begin{itemize}
  \item \textsuperscript{81} The situational approach to expertise does not mean that the individual’s capacity to perform is welded to one setting (Billet, 2001, p. 431).
  \item \textsuperscript{82} Although activity theory originated in Russia and had its early prominence in other Eastern countries, Wilson’s (2006) review acknowledged an early, fleeting interest in the Western library and information science. His review reveals that only a few examples of LIS research employ activity theory explicitly. They include Spasser (1999; 2002) and Hjorland (1997). Spasser (1999) promotes the benefits of activity theory as an appropriate approach, highlighting the core values of activity theory as a conceptual framework for studies in information science. His later work on digital libraries is significant because of its emphasis on practice, setting, and context, which reflect the interactions of people with tools. Hjorland (1997) advocated activity theory within the broader conceptual framework of social realism. However, Wilson (2006) notes that despite the sub-title, Hjorland devotes little space to the actual exposition of activity theory. Earlier on, Sundin and Johannisson (2005) had proposed activity theory for investigating information seeking and use from a sociocultural pedagogic perspective. Also, Talja, Tuominen, and Savolainen (2005) draw attention to activity theory in their consideration of the ‘isms’ as the basic premises of three metatheories that represent the emerging perspectives in information science. As part of ‘collectivism’, they noted in particular the influence of Vygotsky’s and Leontiev’s activity theory, mainly through reference to the work of Hjorland and Albrechtson (1995).
  \item \textsuperscript{83} Wilson enumerated the number of ways that activity theory can provide the much needed stimulus to human information behaviour research to include: 1) it directs attention to contextual aspects in research through a consideration of the wider organizational framework that allows the intersection of behaviour and processes to be observed and assessed over time and across a range of organizational activities; 2) it would be relatively straightforward to incorporate ideas of learning and interventions such as zone of proximal development into the
\end{itemize}
interrelated *bricolage* of several elements that characterize work activity *in situ*. Wilson (2006) then exhorts LIS researchers to consider using activity theory because of its flexibility both theoretically and methodologically. To Wilson, it broadens the researchers’ view by taking into account other elements that affect information behaviour, such as the dynamic interplay of the actors in activity overtime, the tools at their disposal, patterns of the actor’s experiences, and the information processes that either emerge or are inhibited by the set goals of the activity system. I will introduce Engeström’s model to provide a sound basis for elaborating on the activity system in this thesis.

The relevance of activity theory to this thesis is manifold. Its main advantage is it provides a comprehensive and unifying analytical framework in a *bricoleur* fashion by conflating the multiplicity of other theories and models within the study context. In other words, activity theory is not a specific theory of a particular domain offering ready-made techniques and procedures (Engeström, 1990, p. 104) but instead offers conceptual tools and methodological principles to concretize the specific object under scrutiny. It has the characteristic features that consider aspects of activity as phenomena of study. In this way, it takes into account the different component parts of an activity system such that concrete sociocultural contexts are brought into the spotlight. Instead of limiting oneself to the channels and sources of information, activity theory registers the shift in focus from the information activities of the isolated individuals to a larger sociocultural context that influences information practices. However, the basic unit of analysis must essentially be an activity at the collective, rather than the individual level. Allen, Karanasios, and Slavova (2011, p. 781) reasoned that activity theory allows the analysis of information behaviour as a collective and individual process. They argue that when activity is taken as the unit of analysis, it provides a hierarchical structure and framework “that afford researchers insight into the sequential process of information seeking and its underlying tools, within context” (2011, p. 781). Adopting activity theory therefore provides the possibility of considering both the micro- and macro-context* of the information activity by examining detailed and concrete processes embedded in activity.

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84 Wilson (2006) differentiates between two aspects of analytical investigation in LIS research that adopts activity theory: the ‘micro-context’ and ‘macro-context’. He referred to the ‘macro-context’ as “the cultural-historical setting of the activity and the relation of the activity to the external environment”; on the other hand, he referred to the ‘micro-context’ as “the goals and motivators of the activity, together with artefacts, rules, norms and divisions of labour in the setting”
Activity theory also offers a practical guide for analyzing the object of study as it helps to provide direction in the employment of other research methods. The practical implication of this is that activity theory can accommodate other theories of particular relevance. As Wilson (2006) argues, human information activity can be explored with the application of many theories, and there is no reason why a proponent of any particular theoretical position should not adopt an activity theory framework. Allen, Karanasios, and Slavova (2011, p. 786) even acknowledged that activity theory may come attached with some limitations and that at present, there is a lack of operationalization in the field of information seeking concerning activity theory. In order to fully understand my specific research problem as it relates to understanding information practices as social practices, I needed to incorporate other theories and models such as social practice theories with a background understanding of concepts from information seeking research in order to emphasize some characteristic features of context.

Activity theory can be employed in INSU research to provide the horizons within which to observe behaviour or practices in the workplace. It is this relevance of activity that made me contemplate using it as the naturalistic framework for investigating this study, particularly for investigating the complex dynamics of the sociocultural-historical context involved in patients’ health care. Given the characteristic features of activity that takes context into consideration, activity theory is intended to provide the base for the analytical framework of this study. Some of the basic guiding principles of activity theory that I have chosen for this research are: the basic activity system and the hierarchical structure of activity, mediation and mediational means, and appropriation which is not really a guiding principle in activity theory but is linked to it. The particular interpretation of activity theory used in this thesis is grounded in the works of Engeström (1987).

4.3.1 Development of activity theory

This section describes the origin and development of activity theory in order to appreciate its theoretical and methodological implications. Activity theory is traceable to the influence of two schools of thoughts. First is the 18\textsuperscript{th} and 19\textsuperscript{th} century classical German philosophy from Kantian transcendental idealism to Hegelian dialectical idealism\textsuperscript{85} in which the concept of activity was first introduced.

\textsuperscript{85} The Classical German philosophy from Kantian transcendentalism to Hegelism dialectical idealism recognized activity only in its abstract and speculative form as it holds that ‘external or real world’ is inseparable from mind, consciousness or perception (Kuutti, 1996, p. 25).
Second is the influence of the dialectical materialism of Marx and Engels\textsuperscript{86}, who elaborated more on the concept of activity as an alternative to the then existing basis for psychology in behaviourism and psychoanalysis. The concept of activity was formulated and developed by the Russian psychologist Lev Semyonovich Vygotsky (1896-1934) during the 1920s and 1930s. Vygotsky had as his goal the reformulation of a psychological theory along Marxist\textsuperscript{87} lines as opposed to the schools of thought that dominated behavioural psychology during his time\textsuperscript{88}. Vygotsky then proposed the theory as a theory of human consciousness and as an explanation of the nature of human behaviour. For Vygotsky, human behaviour consisted of varied activities of all sorts, and at the root of activity is the proposition that consciousness is formed through activity (Wilson, 2008, p. 120). Central to Vygotsky’s work were the ideas of the social origins of cognition, the role of sign systems as mediators in human thinking, and internalization – all concepts that became important in activity theory (Wertsch, 1981). Although Vygotsky outlined most of the major features of activity theory, his work was completed by two of his students and subsequent co-workers Alexei Nikolaevich Leont’ev (1904-1979) and Alexei Luria (1902-1977). They formulated the theory’s basic principle in the 1960s and 1970s and at that time started to use the term ‘activity theory’ (Kuutti, 1996, p. 41).

Today, activity theory is seen as a multidisciplinary research approach drawing

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\textsuperscript{86} Marx in his \textit{Theses on Feuerbach} was the first philosopher to explicate pointedly the theoretical and methodological core of the concept of activity (Engeström, 1999, p. 3). Marx explained activity in a strictly materialistic sense as his writings show that neither mechanical materialism nor idealism is sufficient for understanding human activity. Mechanical materialism eliminates human agency, and idealism puts it in the head or soul of the individual. Marx figures out that what both are missing is the concept of activity that overcomes and transcends the dualism between the individual subject and object societal circumstances (Engeström, 1999, p. 3). For Marx, activity in its primary and basic form was the sensory, practical activity in which people enter into practical contact with objects of the surrounding world, test their resistance, and act on them, acknowledging their object properties (Leont’ev, 1978, Sect. 1.1). Thus Marx’s writings elaborated that it is not only the consciousness of humans that determine their social being, but social experiences that shape their consciousness.

\textsuperscript{87} The Marxist understanding of mind or consciousness is the central principle that underlies the philosophy of activity theory. It is conceived as inseparable from the material conditions of human existence, and is a challenge to the predominant enlightenment philosophical principle of dualism, or the separation of mind and bodily existence, of individual and society. According to Marx and Engels (1970, p. 47), it is in the direct opposition to dualism that the viewpoint of dialectical materialism is based –“life is not determined by consciousness, but consciousness by life” To Marx and Engel, consciousness is the product of man’s practical activity (labour) as he goes about producing the means of his existence. Hence, they reason that consciousness does not have an autonomous existence, independent of the lives of individuals. It is neither biologically innate, fixed and unchanging, nor the result of individual contemplation as in Descrates’ formulation, “I think therefore I am”.

\textsuperscript{88} At that time, psychologists were intents on developing simple explanations of human behavior. Vygotsky developed a rich multifaceted theory through which he examined a range of subjects including the psychology of art, language and thought, and learning and development, including a focus on the education of students with special needs (John-Steiner, 1996, p. 2).
from hybrid concepts that cut across disciplines, including cultural anthropology, cognitive anthropology, sociology, behavioural psychology, educational psychology, cognitive psychology, and social epistemology. Though activity theory has its origins in the discipline of psychology and education, it has been applied as a framework to a wide range of subject fields and research areas such as education (Engeström, 1987); computer-mediated learning (Baker et al., 1999; Berge, 2006); work studies (Bedny & Karwowski, 2004; Engeström, 2000); organizational studies (Blackler, Crump, & McDonald, 2000), and the information systems field such as human-computer interaction (HCI), Computer-Supported Cooperative Work, and Information Systems Development, (e.g. Engeström, 1987; Kaptelinin & Nardi, 2006; Nardi, 1996, p. 87; Christiansen, 1996; Bardam 2000; Bertelsen & Bodker, 2000; Bodker, 1997). Activity theory has also encompassed research topics that account for complex phenomena of human activity such as learning in work situations (Engeström, 2000, 2001), implementations and application of technology (Mwanza & Engeström, 2005), and issues of therapy (Engeström & Miettinen, 1999). The First International Congress of Research on Activity Theory was organized in Berlin in 1986. In 1987, an international scientific society for research on activity theory known as ISCRAT (International Society for Cultural Research and Activity Theory) was established. Recently, activity theory has attracted interest in library and information studies, having been applied to information seeking (Wilson, 2006; 2008; Davies, 2007); subject representation (Hjørland, 1997); information management (Nowé Hedvall, 2007); and digital library development (Spasser, 2002).

Activity theory shares many of the same attributes as other social theories such as situated action models (Lave, 1988) and distributed cognition (Hutchins, 1991), though not as a fixed body of defined statements (Engeström, 1990, p. 70; Kuutti, 1996, p. 25). However, activity theory is especially suitable for understanding the processes involved in work activity, and its focus is on work per se as the “prototype of activity” (Hedegaard, Chaiklin, and Jensen, 1999, p. 14). Scribner (1997, p. 299) used the significance and strategic position of work to make a case for its concentration by activity theorists. For Scribner, work is a principal activity for adults and occupies the bulk of adults’ time. It is work that defines one’s identity - he is a physician, she is a surgeon. Work also offers many occasions for acquiring knowledge and developing expertise. Because human beings spend so much of their time in either paid or unpaid work, Leckie (2005, p. 158) also makes a case that work is an area of life that is definitely worthy of in-depth consideration. To Leckie, investigating work ought to entail: what ‘work’ is? what distinguishes one kind of work from another; who is likely to engage in that work and why; and what the doing of that work actually means. According to Leont’ev (1978, p. 23) “work is the instrument that places man not only ahead of material objects but also ahead of their interaction, which he himself controls and reproduces”. Hence,
activity is not defined in terms of tasks, but in the Vygotskian sense of transformative activity (i.e. with the intention to transform something) (Anderson, 2007, p. 95). Unlike the typical understanding of a work task, work itself seldom has a recognisable beginning or an end (c.f. Byström & Hansen, 2005).

One of the main ideas of activity theory is the social nature of human activity. It is mostly about understanding the collective phenomena involving several actors. For example, Vygotsky had emphasized the process of cognitive development as involving social interactions that play a fundamental role as the precursors to, and the basis for such development. Hence, the theory strives to look beyond the immediate psychological realm to the contextual realm whereby the individual, social, and work dimensions are regarded as inseparably coupled. Its fundamental assumption is that the contexts of activity such as culture and society are not external factors influencing the mind but are generative forces directly involved in the production of the mind (Kaptelinin & Nardi, 2006, pp. 36-39). Thus, it can be said that the basic idea of activity theory is that human activity is a collective process that entails the following three points:

1. Consciousness is located in everyday practice that is firmly and inextricably embedded in the social matrix of which every person is an organic part (Nardi, 1996, p. 7). Therein lies the fundamental principle of activity theory acknowledged by Kaptelinin (1996, p. 107) which is the unity of consciousness and activity. ‘Consciousness’ in this sense means “the human mind as a whole”, and ‘activity’ implies human interaction with the objective reality (Kaptelinin, 1996, p. 107).

2. There is an asymmetrical relationship between people and things in that they are fundamentally different (Kaptelinin, 1996, pp. 103-113). That is to say, that people cannot be reduced to ‘nodes’ or ‘agents’ in a system (Nardi, 1996, p. 13).

3. Artefacts have a mediating role in everyday life. They mediate human thoughts and behaviour and, and by doing so they occupy a different ontological space than people (Nardi, 1996, p. 13).

4.3.2 The structure and hierarchy of activity system

According to Kaptelinin and Nardi (2006, p. 34), tasks are typically described in terms of the functionality of a system rather than their meaning for the subject and furthermore activity theory requires that the scope of analysis be extended from tasks to a meaningful context of a subject’s interaction with the world, including the social context. However, tasks have been understood and defined in many ways (e.g. Byström, 2007), and very few of all these definitions follow the narrow view that is attached to the subject’s interactions with a system.
4. 3.2.1. Basic structure of activity system

Central to activity theory is the notion of human work activity toward and upon objects. An activity is defined in this study as “a coherent, stable, relatively long-term endeavour directed to a definite goal or ‘object’” (Nardi, 1998, p. 243). It is seen as a historically and socially situated accomplishment performed by people either individually or collectively in order to reach a goal. Activity does not operate in a vacuum. It exists within a socially and historically situated human activity in a form of doing directed at an object. Object in this sense, according to Kuutti (1996, p. 27), can be “a material thing, but it can also be less tangible (such as a plan) or totally intangible (such as a common idea) as long as it can be shared for manipulation and transformation by the participants of the activity”. Object is also seen as concrete or abstract (such as signs, symbols, or images) that is to be transformed by the subject in pursuit of the activity goal(s). It is the object that distinguishes one activity from another (Engeström, 1987, p. 66). According to Leont’ev (1977), the activity is defined with the help of the concept of object, and it is the object that determines the horizon of possible goals and actions that function as the motivational force driving the activity forward.

Traditionally, an activity system has been represented by the “basic mediational triangle” (Cole, 1996, p. 119) as reformulated and extended by Vygotsky (1978, p. 40) from Marx and Engel’s “Stimuli-Response” model by introducing a third, intermediate term. The new model carries with it the history of the triadic relationship of subject, object, and mediating tools or artefacts as visualized in the famous and illustrative model below (Fig. 4.1). The object (that is the ‘lure’ by which activity is brought to life) reflects a ‘thing’ to which the subjects (i.e. a person/persons engaged in the activity) act upon (Leont’ev, 1978). The mediating tools or artefacts, according to Vygotsky, act as intermediaries between the subjects and object.
This way of understanding activity seems to suggest the possibility of analyzing multiple relationships within a triangular structure of an activity system. In this triadic model, the only human activities carried out without mediating artefacts, as represented by the base of the triangle (S-O), are physiological and biological. However, Leont’ev (1981) and Engeström (1987) consider the triadic model too simplistic and restrictive as the emphasis is on the individual relationships and interactions with the environment. That is to say, the emphasis is more situational than contextual thereby reducing activity to a set of actions that are local and particularized to an individual’s activity. This then does not guide a researcher clearly enough in studying the collective aspects of work activities within the same framework. This may also lead to the relatively weak support of activity theory as an analytical tool for understanding context.

Leont’ev (1978) used the example of primitive hunters of some tribal cultures who are engaged in collective game hunting to make the case and explain the collective activity in which some members of the community of hunting practices are engaged in during shared activities and actions. According Leont’ev, hunting has its basic motive in the biological need to satisfy hunger, but the actual form the hunt takes is culturally specified. In order to catch game, the primitive hunters separate into two groups: catchers and bush beaters. The bush beaters frighten and drive the game by beating the bush mediated by such artefacts as sticks, hands (clapping), voices (shouting), and drums to drive the game towards the catchers who are given the task of slaying it with the use of other artefacts such as arrows, spears, and bows. There may be some other members of the hunting community given the responsibility of butchering and distributing the carcass to the community at large. Considering the actions of the bush beaters in isolation may look irrational and senseless as the hunt then is an activity that can only be realized in the concrete
actions of the hunters under specific circumstances. They can then be understood within the framework of the activity system of game hunting in relation to the other hunters since they know that the catchers, butchers and distributors are waiting at the other end to achieve the goal of catching the game.

Kuutti’s (1996, p. 29) example of a software team programming a system for a client also illuminates the concern for collective enterprise. The object is to transform the awaiting system into a delivered, bug-free application. The team comprises of the community sharing the object, and the customer’s representatives. There is division of labour between the team members, such as between the manager and subordinates and, between the software developers and user representatives. There is also a set of explicit and implicit rules governing the programming activity. There are also tools and instruments that have a history of the culture of programming used in the transformation process. The team also have a link to a wider community. Whatever is done by members of the team is shaped by the context of the activity. These two examples illustrate the collective nature of human activity, and this is why Leont’ev and Engeström considered Vygotsky’s triadic model in explicating the individual tool-mediated action as a unit of analysis to be insufficient (Engeström, 1987).

To further emphasize the cooperative nature of human activity, Leont’ev (1981, p. 213) and Engeström (1978) stressed the need for extended interacting as a fundamental component of an activity system that can consider the context of the overall collective human activity. In this regard, the “initial form of a subject is not ego, but a subject of collective activity” (Lektorsky, 1999, p. 107). This implies a group, team, or community that acts upon and constructs the object in an activity. To Lektorsky (1999, p. 107), “the individual subjective world, individual consciousness, ego are not something given (as philosophers of the 17th and 18th centuries thought), but the result of the development and transformation of collective activity and practice”. But to Leont’ev’s, the individual still maintains a prominent position in a collective enterprise where the subject could be a collective and activity could involve several subjects. Unfortunately, Leont'ev model fails to elaborate on how the triadic model should be developed or extended in order to depict the structure of the wider collective and intersubjective context.
Since “(h)uman labour ...is cooperative from the very beginning. We may speak of the activity of the individual, but never of individual activity; only actions are individual” (Engeström, 1987, p. 66). Engeström adds to Leont’ev’S model by including the concepts of rules and norms, community, and division of labour. According to Engeström (1990, p. 79), the rules of an activity system refer to “the explicit and implicit regulations, norms and conventions that constrain actions and interactions within the activity system” (Engeström, 1990 p. 79). For example, physicians will undertake their activities as guided by the code of ethics of the medical profession and the implicitly accepted norms. The community can be elaborated on at different levels in representing the social context within which the subjects interact with the society at large such as the organizational community or professional affiliations. The division of labour refers to the explicit and implicit organization of the work activity of a community as related to the transformation process of the object into outcome. None of these components in the activity system are static; all parts are constantly interacting with each other, and the boundaries between them are blurred. With these three new concepts, a more complex model is achieved. The focus of activity theory moves from the individual actions to what is called an activity system. Thus, there is the shift from object orientation to activities within a wider community that reflects a ‘macro-level’ where the individual is submerged into the collective. Hence, Engeström defines the activity system as an “object-oriented, collective, and culturally mediated human activity” (Engeström, 1999, p. 9).

Engeström’s model is concerned with the process of social transformation that incorporates the structure of the social world. He provides a visual representation of
an activity system by indicating the relationships between the key components in the activity system, and even points to potential contradictions in the social world.

Engeström’s model has been criticized by Wilson (2006) as inadequate in bringing out a rich contextual framework, as Wilson was dissatisfied by the static character of the diagrammatic representation that makes the process blurred. In bringing out the contextual richness in activity, I have, in this regard incorporated social practice theories into the theoretical framework in this study (see section 4.3).

![Figure 4.3: Engeström’s Activity theory diagram](Engeström, 1987, p. 78)

### 4.3.2.2 Levels of activity

The fundamental principle of analyzing activities that is of particular value for investigating information practices is its hierarchical structure which Leont’ev (1978; 1981) schematized into three-levels: *activities, actions, and operations* related to motive, goal, and condition, respectively (See Fig. 4.4 below). This hierarchical structure serves as a unit of analysis. Activities involve patterns or series of conscious goal-directed actions or chains of actions that people undertake as members of a culture (Kuutti, 1996, p. 30; Wells, 1999, p. 170). There are durable high-level formations that enable the object to transform into outcomes not at once but through processes that typify more directed, short-term performances in several steps or phases (Kuutti, p. 30). Activities are necessarily bound up or generated by either material or ideal motives. Motive is therefore considered the moving force of activity (Leont’ev, 1978, pp. 62-63). Hence, Hasu and Engeström
(2000, p. 63) note that “activity is driven by collective object and motive, but is realized in goal-oriented individual and group actions”. Actions are processes subordinated towards activities, and also energized by their motives, but are directed at specific conscious and immediate defined goals (Leont’ev, 1978, p. 63; 1981, p. 60). The analytical level of actions describes what must be done or what result should be achieved to accomplish a goal.

Activity theory also calls attention to the goals of the activity system. Goals are abstractions that may be implicit or explicit, and represent the future desired result of actions. However, actions cannot be understood without the corresponding activity as its frame of reference. On the one hand, one activity may be realized using different actions, depending on the situation. On the other hand, single or multiple goal-directed action(s) may depend on different activities, in which case the different motives will cause the action to have different meanings and interpretations. For example, different actions are undertaken in the diagnosis of a patient ailment, and their relevance and meaning depends on the activity taken, e.g. the activity of therapeutics.

Actions cannot be abstracted from situations, and the analytical level for understanding them implies that they must have routine or operational aspects. When actually taken, the difference between actions and operations is not always easily distinguished. But it is necessary to distinguish between the two for the understanding of how each level fits into this study. Activity theory draws attention to the degree of consciousness in activity. While operations are routines performed subconsciously to accomplish the goal of action, actions are related to explicit goals that are performed consciously. Operations are regarded as the most basic level of activity because they determine the actual prevailing conditions or circumstances of the overall activity under which actions are carried out (Leont’ev, 1978, p. 65). They do not have their own goals, but take into account the situated nature of actions across time, space, and social conditions. These conditions are both historically and situationally shaped and can include individual/group configuration, resources, organization, and technology. According to Wells (1999, p. 170), “… they no longer require to be consciously attended to”. Rather, the operational level is characterized by the actual unfolding of events, with particular emphasis on the interactions that occur amongst the participating actors and the various artefacts that are involved in performing the actions (Wells, 1999, p. 171). Initially, operations are often transformed actions consisting of both orientation (planning) and execution phases. Over time as actions have been practiced repeatedly, the orientation phase is de-emphasized and the action is transformed into the operational level. Operations can adjust actions to current situations and can also be part of several actions.
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<th>Level</th>
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<td>Action</td>
<td>Goal</td>
<td>Individual</td>
</tr>
<tr>
<td></td>
<td></td>
<td>or group</td>
</tr>
<tr>
<td>Operation</td>
<td>Conditions</td>
<td>Routinized</td>
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<tr>
<td></td>
<td></td>
<td>Human or</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Machine</td>
</tr>
</tbody>
</table>

**Figure 4.4 The Hierarchical Structure of Activity**

(Leont’ev, 1978)

The distinctions between each of the constituent levels of activity are blurred as the constituent layers of activity are dynamic and it is possible for each constituent layer to shift and move between boundaries. However, what distinguishes these three levels is the degree to which they involve conscious attention (Wells, 1999, p. 170). Unlike activity that evolves and is situated in a socio-historical frame, actions and operations have clear-cut temporal dimensions carried out by the individual or group to meet the same or different goal(s). At the analytical level, they are irreducible, do not conflate, and can only be analysed as separate entities, through considering their internal relations. For example, a particular action can be part of different activities and can also move from one activity to another. While some actions may also be related to the object of the activity to accomplish goals, a range of auxiliary actions may be centred in the operation. Also, an operation can be part of several actions (together with other operations) and the same action can be realised through different operations. An operation can also become an action when conditions impede an action’s execution through previously formed operations. Kaptelinin and Nardi (2006, p. 63) saw this distinction as relatively absolute, and hence, none of the constituent levels can be regarded in isolation.

Given the complexity of human interactions, ‘contradictions’ might be expected due to internal ‘inconsistencies’ and discrepancies between activities or their elements in activity. Such contradictions provide a potential driving force for change. Contradictions may also arise due to external influences. Engeström (1987, pp. 82-91) identified four levels of contradictions within the activity system; 1) primary contradictions within the component of the activity (i.e. poly-motivated
actions - the same action executed by different people for different reasons, or by the same person as part of separate activities); 2) secondary contradictions arising between the elements of an activity (e.g. between the subject and the tools); 3) tertiary contradiction between different developmental phases of an activity (an activity is remodelled to take into account new motives or new ways of working); and 4) quaternary contradictions where activities occur between coexisting activities, neighbouring activities, or between activity systems. New ways of knowing and doing things in activity may bring about conflicts with traditional or currently accepted ways of thinking or doing, and lead to a change in work processes (Engeström, 1987; 1999). For example, newly introduced information tools can cause ruptures, breakdowns, conflicts, or tensions. Inherent dilemmas in the overall pattern of activity may also surface as actors are interpreting situations in different ways. The activity system develops through resolving, repairing, or negotiating the contradictions.

4.3.2.3 Mediation and mediational means

Mediation refers to “a process involving the potential of cultural tools, and the unique use of the tools, on the other” (Wertsch, del Rio, and Alvarez, 1995, p. 22). Though mediation is a focal point of activity theory, the question of what really is a mediating mechanism in an activity has not been explicitly addressed by activity theorists. As Scribner puts it, “as is the case with other ‘grand’ or metatheories, activity theory provides no formula for a search for specific mediating mechanism” (Scribner, 1997, p. 271). There is little if any discussion on what “mediating” means except that it is one of the themes that figures prominently in Vygotsky’s formulation of the sociocultural approach: the individual (subject) “actively modifies the stimulus as a part of the process of responding to it” (Cole & Scribber, 1978). Vygotsky used the description of a woman tying a knot in her handkerchief to remind herself of something, thus illustrating the fact that the subject-in-activity externalizes his/her behaviour and implies the act of remembering to achieve better control of one’s behaviour. Vygotsky’s view is individualized and does not really add to the understanding of how artefacts mediate activity in group settings. At the same time, as the object and outcomes tends to be the primary focus in research, there has been scant attentions to employing activity theory in understanding mediation in group activity.

The idea of mediation stems from the Marxian ideas of collective social activity presupposing the use of human made things, beginning with tools for work and finishing with language signs that mediate all human relations (Lektorsky, 1999, pp. 107-108). Marx was mostly concerned with how humanity progressively learns to control and shape the natural world, and how this, in turn, influences and
changes human society. Marx thus stressed that “a human being, in creating a world of artifacts, doubles himself and so creates the possibility of looking at himself from outside” (Lektorsky, 1999, p. 108). The Marxian idea of mediation has been effectively taken up by Vygotsky (1978) who, in his well-known genetic law of development, emphasized that higher mental processes are dependent on artefacts and practices that are first encountered intermentally in purposeful joint activities, and only later become a resource for intramental activity by the individual (Leont’ev, 1981, pp. 55-6; Wells, 1999, p. 136). Wertsch (1994) elaborates on Vygotsky’s idea noting the centrality of mediation in human activity. Mediation is the key to understanding how human mental functioning is tied to sociocultural settings. Wertsch (1998, p. 24) advocated that the focus should be more on the relationship between the agent and the mediational means, which forces us to go beyond the individual agent when trying to understand mediating artifacts.

Mediation is carried out through mediational means that may be referred to as the “carriers” of sociocultural patterns and knowledge (Wertsch, 1994, p. 204). Sundin (2008) explicated mediational means as sociocultural tools that are not only for acting upon the environment but for connecting people to the world at large as well as for helping to act, and to mediate perspectives and viewpoints. They thus connect humans, not only with the world of objects, but also help in the understanding of the relationship between the individual and social processes (Sundin and Johannisson, 2005, p. 34). In this vein, the concept of mediation may be particularly useful for explaining some aspects of work-related information processes (Allen, Karanasios & Slavova, 2011, p. 785). Vygotsky (1981, p. 137) listed a number of examples of mediational means: “language; various systems of counting; mnemonic techniques; algebraic symbol systems; works of art; writing; schemes, diagrams, maps and mechanical drawings; all sorts of conventional signs and so on”. John-Steiner and Mahn (1996, p. 4) also listed some other mediational means increasingly recognized in the sociocultural discourse such as “the paint brush, the computer, calendars, and symbol systems”. They may also be in the form of concepts, definitions, and procedures (Säljö, 1999, p. 150).

Mediational means are distinguished as ‘tools’ and ‘artefacts’. The terms ‘tools’ and ‘artefacts’ are difficult to differentiate as they are commonly used synchronously and interchangeably, and as such, are interpreted by common sense. For example, language is commonly accepted as an artefact and/or a tool (Cole, 1996). This implies that the meanings ascribed to both of them may look fuzzy, often leading to the misconception of concepts beneath. Given this difficulty, definitions that follow are not exhaustive but merely explanations on how the terms are applied in this study.
Tools serve as mediational means mediating people’s information practices (Sundin & Johannisson, 2005; Francke, Sundin, Limberg, 2011). Metaphorically speaking, they “stand between the individual and the world” (Säljö, 1996, p. 84). They are often seen to have general functional meanings across contexts. Vygotsky distinguished between two interrelated types of mediating tools in human activity: physical and psychological tools. Physical tools are technical in nature and comprise of instruments, machines, and apparatus. In a very fundamental sense, physical tools are crucial because they “extend, or rather transform, the capacities for physical and intellectual action that were bestowed upon human beings by nature” (Säljö, 1996, p. 90). Säljö (1999, p. 149) reasoned that people rely on physical tools in almost any situation in modern society because they enable the accomplishments of goals, for example, by using paper, pencil, a typewriter or a word processor to write, and telephones, faxes, and computers to communicate, and wrenches, screw drivers, and many other tools to mend a car. Thus, physical tools are functional for specific or general uses in activity, and lead to changes in objects. It implies that human “actions are performed by means of technical tools rather than by direct intervention in physical reality” (Säljö, 1996, p. 88). Such views go back to Vygotsky who sees such tools as “a means by which a human external activity is aimed at mastering and triumphing over nature” (Vygotsky, 1978, p. 58).

The function of physical tools is mainly to “serve as the conductor of human influence on the object of activity” (Vygotsky, 1978, p. 58). Through the use of tools, the physical environment can be actively transformed and controlled. Säljö (1996, p. 91) opines that increasingly complex and demanding activities are carried out by means of tools. However, he further argues that “tools cannot be conceived as external to cognition, on the contrary they are parts of our cognitizing as well as our physical action” (Säljö, 1996, p. 91). Drawing from Bateson’s (1972) and Polanyi’s (1964) interesting example, which is also discussed by Wertsch (1991, p. 33). Goodwin and Duranti (1992, p. 4), Säljö (1996, p. 91) illuminated the cognitizing aspect of tools by the example of a blind man using a stick. The stick and the blind man operate together as one functional and cognitive system in a particular activity. The stick is seen as an extension of the intellectual and sensory capacities of its user. However, the stick has “no power to communicate signals outside its use by a human being, it gains its power as a device for orienting oneself and for relating to the environment only when integrated into a human practice and when used by a cognitizing subject engaged in a purposeful activity” (Säljö, 1996, p. 91). The use of the stick demonstrates the importance of technical tools in human activity. Säljö (1999, p. 149) points out that modern day tools are imbued with sophisticated knowledge and require considerable training and expertise before they can be handled efficiently and competently. The computer in the office and the gas chromatograph in the chemistry laboratory are examples of such tools.
Psychological tools refer to “resources for thinking and acting that are stored in language, or rather, in discourse” (Säljö, 1999, p. 150). They are usually “directed toward the mastery or control of behavioural processes” (Vygotsky 1981, p. 137). For Vygotsky, the most important psychological tool is language as the “tool of all tools” (Wertsch, 1991, p. 90). Language is a crucial element in almost every situation where practical tasks are performed. Vygotsky’s main point was that language is always enacted in social interactions that accompany problem-solving activities. Thus, language is “first and foremost a system that serves purposes of coordinating human activities and also a means of actions and a practical resource rather than a device for contemplating the world in vacuo” (Marková, 1982; Silverman & Torode, 1980 cited in Säljö, 1996, p. 85). Bliss and Säljö (1999, p. 2) believe that language “is mostly conceived as a representational device, a tool that permits us to mirror the external world and, at the same time, a tool we use for representing what we think”. So it is seen as “the prime device for rendering the world intelligible and for communicating our intentions to others” (Säljö, 1996, p. 84). Language is also useful in mediating other tools. To Säljö, language is a tool used purely for practical purposes; it does not refer to “a formal system but should be conceived as a semiotic resource providing signs that can be flexibly and creatively used in social practices” (pp. 84-85). In this regard, “concepts and words do not mean anything in and by themselves, language use and the construction of meaning are always social processes dependent on people who interact, and meaning is always relative to options and constraints that are present in social situations” (Säljö, 1996, p. 85).

Language is also useful for communication, which is the process of more than one or multiple voices coming into contact, both within and across speaker-produced utterances. Communication is “always a two-sided affair in which the speakers (or writers) and the listeners (or readers) actively contribute to create what can be “conceived of as an intersubjectively established social reality” (Rommetveit, 1973; italics in original cited by Säljö, 1996, p. 85). The participating actors are, in Bakhtin’s (1981) words ‘half alien’ and lying on the borderline between oneself and others. What is more important is bringing to bear how the voices of others become woven into what the individuals say, write, and think. The speaker populates the words of others “with his own intention, his own accent, when he appropriates the word, adapting it to his own semantic and expressive intention” (Bakhtin, 1981, p. 294). Bakhtin’s use of the term ‘half alien’ does not necessary signal estrangement; rather, that what is one’s own is to be experienced by others and demonstrates some form of dialogism. Hence, Säljö (1996, p. 85) sees communication never as “an issue of simply reproducing meaning but rather an active and in some sense creative process in which past experiences are brought to bear on whatever is talked about”.

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Artefact is regarded as either something produced by man in goal-oriented activities or products of human activities or workmanship. Wartofsky (1979) describes it as anything practically “created for the purpose of successful production and reproduction of the means of existence”. As follows, the emphasis on ‘purpose’ underpins two central claims regarding artefacts, i.e. intentionality and representation (Wartofsky, 1979, p. xiii). Accordingly, an artefact is produced intentionally and mirrors “the mode of activity in which they are used, or the mode of their own production”. Moreover, they form context-specific symbolic or material objects that are created and used within socially and historically situated activities. They are continuously modified through use and shaped in attunement with problem-solving (Well, 1999, p. 136). In Cole’s (1999, p. 90) words, they are cultural objects that are modified in regulating interactions over the course of history for the purpose of goal-directed activities. In Vygotskian terms, “artefacts mediate the world for us in accordance with the traditions and knowledge generated by previous generations” (Bliss & Säljö, 1999, p. 1). Bliss and Säljö exemplified the significance of artefacts with the compass and the clock in mediating direction and time in a culturally meaningful and useful manner. Mediating means have historical and cultural lineages that are embedded in practice. In this regards, mediating means may have “no meaning out of the context of the activity in which it is used, and to master the use of artefact is to learn to participate in the practices in which it plays a functioning mediating role” (Wells, 1999, p. 136).

Wartofsky (1979) proposes a three-level classification of artefacts; primary, secondary, and tertiary artefacts. Engeström (1999, p. 381) elaborates further on Wartofsky’s categorization and identifies four types of artefacts: ‘what’ (basically the external entities used to identify and describe objects in the form of textbooks, journals, images, symbolic systems, well defined roles, language, concepts, documents, and embodied actions); ‘how’ (procedural rules used to guide and direct processes and procedures, e.g. consultations or metatalks); ‘why’ (used for diagnosing and explaining with the aim of elucidating the justifications for choices in the selection of primary artefacts); and ‘where’ (used to envision the future or potential developments of the objects, including the joint discussion of targets, agreed-upon future priorities, and pre-arranged agendas, which are then objectified). The artefacts of note-taking by pen and paper, the abstract tools of practical experience, and theoretical knowledge are all processes to make the production of the artefacts possible. Artefacts constitute a central part of the organization of activity particularly because they are crystallized in material form. They are seen as socially constructed by the participating actors in activity and could be said to be useful in mediating the actors’ relationships in activity.
Mediating tools and artefacts are not neutral means just serving certain predefined processes. Vygotsky’s interest was in the transformative effect of tools and artefacts in relationships between humans and their environments. Vygotsky sees all artefacts as having a dual nature, as they are simultaneously both material and ideal, and thus require both the physical and intellectual engagement of their users. Again, the mechanism underlying tool and artefact mediation can also be seen as the capacities of external components to perform a new function or to perform an existing one more efficiently (Kaptelinin, 1996, p. 109). For example, the sphygmomanometer, which is equipped with an inflatable cuff, is composed of a tool/artefact to elicit information from patients. Wells (1999, p. 138) argues that tools and artefacts must meet two requirements to perform their mediating function. Firstly, “they must be capable of contributing to the desired effects in the world; and secondly, they must be in the hands of a person who understands their meaning and mode of functioning in relation to the goals of the activity they mediate” (Wells, 1999, p. 138).

The concept of ‘boundary object’ is linked to mediation and is useful in understanding the role of artefact in work activity. A boundary object is theorized by Star and Griesemer (1989), developed in actor-network theory (ANT), and taken up by Wenger (1998) in his conceptualization of ‘community of practice’ (CoP). It is used to explain objects that inhabit multiple contexts simultaneously and have both local and shared meanings (Star & Griesemer, 1989; Bowker & Star, 1999, Anderson, 2007). Boundary object is defined by Bowker and Star (1999, p. 297) as “those objects that both inhabit several communities of practice and satisfy the information requirements of each of them”. They are used to bring coherence to information among the diverse groups in work places, which are weakly structured across site and highly structured in specific context.

In their study of museum artefacts, Star and Griesemer (1989) recognized heterogeneity in problem-solving, and observed that in spite of their tremendous differences boundary objects are pragmatic tools that maintain the coherence of information across multiple scientific worlds (p. 393). They appear to be robust enough to travel across context and between CoP in an identifiable form, yet flexible or ‘plastic’ enough to take on the meaning of the local context (Star & Griesemer, 1989, p. 393; Anderson 2007, p. 100). Like the blackboard, a boundary object “sits in the middle of a group of actors with divergent viewpoints” (Star, 1989, p. 46). For boundary objects to be effective there must be commonality of purpose between the participating actors. They are also regarded as boundary

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90 Cole (1993, cited in Wells, 1999, p. 7) in explicating Vygotsky, posits that tools are ideal in as much as they are contained in coded form, the interaction of which they were previously a part and which they mediate. They are also material in as much as they are embodied in material artefacts.
genres, which according to Popham (2005, p. 281), are “regulated textual forms functioning in repeating situations”. However, boundary objects are not fixed textual forms but instead represent social activity through textual regularities (Miller, 1984, p. 151). The focus of this research on patient records as boundary objects is neither on the substance nor the form (patient data), but on the social action that it is used to accomplish.

Boundary objects are not mainly material and they can take multiple forms. Miller (1984, p. 151) sees boundary object as more of a pragmatic tool in social action, and suggests that such objects are not merely fixed textual forms but represent social activity through textual regularities. However, Popham (2005, pp. 281-282) highlighted the pragmatic element in boundary objects, as she argued that it as “the means by which things get done within a community, ideas get transmitted, and plans get made”. Star and Griesemer (1989, pp. 410-11) identified four analytical distinctions that deal with the heterogeneity of the systems of boundary objects:

1 repositories as ordered piles of objects indexed in a standardized format (e.g. library, museum);
2 an ideal type, such as a diagram or atlas as an object, that does not accurately describe the details of any one locality; instead, it is easily adaptable to local sites as it is fairly vague because it is abstracted from all domains and serves as “a means of communicating and cooperating symbolically” (p. 410);
3 coincident boundaries as “common objects which have the same boundaries but different internal contents” (p. 410);
4 standardized forms as “boundary objects devised as methods of common communication across dispersed work groups” (p. 411).

Activity theory provides the practical framework for understanding the relationship between the subjects that act upon the object through the intermediary of tools and the artefact which is aimed at outcomes. Because tools and artefacts have evolved and developed historically in the culture of practice in the activity system, they can then function as boundary objects in a way that can mediate perspective between the participating actors in activity.

One of the main weaknesses of activity theory according to Iivari and Lyytinen (1998), is that its theoretical background is very general. However, this is not necessarily always a weakness, as activity theory can provide the overarching
paradigm\(^{91}\) for research in information seeking research (Wilson, 2008, p. 119). In research, activity theory serves as a unifying and conceptually clarifying tool that aims at explaining human behaviour or practices rather than doing predictive work (Nardi, 1996, p. 7). For example, it can be seen as an explanatory principle and be elaborated on, which Fichtner pointed out entails studying concrete activities on an empirical level by making activities the subject of our investigation (p. 51). It can also be informed by other theories of particular relevance (Wilson, 2006) for the object of study. Kaptelinin (1996, p. 46) argues that activity theory is itself a “special kind of tool” and that “…accepting this perspective does not exclude other approaches and does not reject the usefulness of other conceptual schemes (because no tool, no matter how powerful it is, can serve all needs and help to solve all problems)”. It is for this reason that I have looked at other relevant theories that play complementary roles to activity theory.

### 4.4 Practice theories

This section will discuss the features and conceptual understanding of some practice theories that are relevant to this study. The starting point for discussion is social practice. According to Lloyd (2010, p. 248), the notion of practice has a long heritage traceable to philosophers such as Aristotle, and with more recent work being done by Wittgenstein (1958) and Dreyfus (1991). Other prominent theorists include Bourdieu (1984), Giddens (1984), Foucault (1972), and Schatzki (1996, 1997). However, there is no precise definition of practice nor unified approach. As such, Lloyd (2010, p. 247) asserted that the understanding of practice depends on “the ontological and epistemological orientation of the enquirer”. In its normal day-to-day usage, practice is seen as rote exercises that people associate with phrases like ‘piano practice’ (Brown & Duguid, 2000, p. 57). The term practice refers to “the coordinated activities of individuals and groups in doing their ‘real work’ as informed by a particular organizational or group context” (Cook and Brown, 1999, pp. 386-387).

Practice is theorized as “organized nexuses of activity” (Schatzki, 2001, p. 48) or “interwoven activities in a given social domain” (Schatzki, 1997, p. 285) that extend through space and time. Orlikowski (2002, p. 256) refers to practice as

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\(^{91}\) Wilson (2008, p. 119) notes that there are no overarching paradigms for research in library and information science as they are conducted within separate silos, sometimes defined by problem areas such as information retrieval (IR), information-seeking behaviour and sometimes defined by institutional type, such as research libraries, college and university libraries, school libraries, etc. The consequence according to Wilson is that researchers in one area may not understand the problem area defined by another, may have no awareness of differences in methodologies, and may have no common language within which to exchange ideas and results.
“recurrent, material bounded and situated actions engaged in by members of the community”. Schatzki (2001, p. 2) theorized practice as “embodied, materially mediated arrays of human activity centrally organized around shared practical understanding”. Tuominen, Talja, and Savolainen (2005) narrowed down their own definition as detailed mundane activities through which individuals in situ become skilled workers or learners. Lave (1993, p. 3) sees it as “persons activity in activity”. For Anderson (2007, p. 94), practice is simply a process by which one experiences the world.

Three characteristics of practice can be adduced from the above meanings and definitions. The first is that activities and actions in practice are recurrent and repeated (Savolainen, 2007, p. 120). Secondly, practice is enacted by social communities where shared practices are the joint accomplishments and possessions of competent members of collectives. Thirdly, nexuses of practice are mediated by human and non-human materials (Schatzki, 2001). This seems to suggest that practices are constituted through and more frequently in dialectical relationships among people’s activities with tools and artefacts at their disposal. Schatzki identified two different types of practices: integrative and dispersed practices. Integrative practices are complex higher order practices that include dispersed practices and are constitutive of a particular domain of social life (Schatzki, 1996, p. 98). Examples of integrative practices may include teaching, working, and even library practices. Dispersed practices flow within all areas of social life and appear in many higher order practices which “centre around a single type of action” (p. 88) such as describing, ordering, questioning, reporting, and examining (Schatzki, 2002, p. 88).

Cognition, from a practice-based perspective, is seen as a social phenomenon that is distributed among people participating in socioculturally organized activities (Lave, 1988, p. 1). This emphasis on the social aspects in activities implies collective possessions and accomplishments as sustained through interaction and mutual adjustment among people. Lloyd (2010, p. 250) sees practices as social because “they are not constituted as individual self-sufficient activity, but are located within and through group activities –formed, interwoven and sanctioned through a dialogic intra-group process”. Hence, practice is theorized as a social site ontology, which Schatzki (2001, p. 2) described as “the primary generic thing”. Because practices resemble macro phenomena, it can be said that the concept is incompatible with individualism. That is to say, that the single individual as a bodily and mental agent is only seen as a ‘carrier’ of a given practice (Reckwitz, 2002, p. 250). Wenger (1998, p. 47) affirmed this point when he stated that “practice connotes doing, but not just doing in and of itself. It is doing in a historical and social context that gives structures and meaning to what we do. In this sense, practice is always social”. In other words, information practices,
including people’s understandings of these practices, are always social and should thus be studied in such contexts as workplaces, educational institutions, and even family life.

Schatzki (2001) suggests an intersubjective dimension to the concept of practice, which facilitates the development of shared understanding and shared skills. Within this view, an individual is bound up in practice in collaboration with significant others in activities that entail “saying, doings, tasks” (Schatzki, 2002, p. 73) that appear at different locales and points in time. In this vein, Schatzki (1996, pp. 104-5) sees practice as inherently social because “through participating in a practice a person eo ipso coexists with others not merely those individuals with whom she interacts but also wider sets up to and including the collection of all those party to the practice”. When the focus is on participation with significant others, the social and community aspect of practice becomes of paramount significance. Participation implies some form of embodiment, as “the human body, accordingly, offers itself as the point of connection between the individual and social manifolds” (Schatzki, 2001, p. 8). And therewith, the community becomes the determining phenomenon to account for much, if not all, human activity. In this respect, the discussions in the sub-sections that follow will focus on suitable social practice theories for understanding the community, such as community of practice and situated learning, along with the concept of appropriation.

4.4.1 Situated Learning

The concept of ‘situated learning’ was first proposed by Lave and Wenger (1991). It is an important concept for understanding information practices where learning is not viewed as a simple process of individual knowledge formation (Hakkarainen et al., 2004, p. 11), but as a socially situated constant flux of doing (Sfard, 1998). In situated learning, the transmission process from expert to novice in the latter’s acquisition of abstract knowledge is de-emphasized. Rather, emphasis is placed on situations of co-participation in everyday activities through which learners are given guidance either directly or indirectly based on the goals of the activity (Vygotsky, 1978; Rogoff, 1990; Lave & Wenger, 1991).

Situated learning implies a participatory mode that entails becoming a member of a sustained community of practice by learning ‘how to be’. The concept of situated learning emphasizes learning beyond the pedagogical forms taking place in educational institutions; it is anchored within context that is socially, historically, and culturally constituted. William F. Hanks comments on the work of Lave and Wenger (1991, p. 14) by stating that: “rather than asking what kind of cognitive
processes and conceptual structures are involved, they ask what kinds of social engagements provide the proper context for learning to take place”. Thus, he advances a view that is localized and specific to context “where activities, tasks and functions, and understandings do not exist in isolation; they are part of broader systems of relations in which they have meaning” (Lave & Wenger, 1991, p. 53).

Situated learning entails a process known as legitimate peripheral participation (LPP). LPP is a descriptor for a learning process that requires newcomers or learners to move from the periphery towards the core of full participation and become more actively engaged within the sociocultural practice in order to assume the role of expert. Through this process, there is increased access to information in the community as “the newcomers engage with information sources and practices that are sanctioned and legitimized by more experienced old timers in the setting” (Lloyd, 2010, p. 22). As a result, there is also increased accessibility to the complexity of the full round of activities thereby giving the newcomers broader ideas of the community practice than just the particular task (Lave, 1991, p. 69). This then leads to increased ability as the learner becomes more competent as a result of taking on a more central role in the practice. LPP can also be seen as a form of apprenticeship engagement in which participation for the learners is limited to the ultimate outcome. According to proponents, learning takes place as participation among colleagues with different experiences and different access levels to everyday practice. This involves a complex interactive process in which the learner is engaged in simultaneously performing several roles as subordinate, learning practitioner, aspiring expert, etc. The process also entails meaning-making and negotiations that take place between and around performance events, and also between learners and their respective communities. LPP thus offers a two-way bridge of a primary generative phenomenon where not only are the newcomers transformed, the active community of practice produces and reproduces itself.

Discussing the concept of LPP is significant to understanding multiple forms of membership in communities of practice, as the communities *per se* construct and sustain their own social configurations of participation according to different levels of peripheralities. These different levels imply and define ways of becoming individuals through engagements in the practices in the community. Wenger (1998, pp. 164-187) describes these levels by the principles of LPP and identify them to include: full participant, full non-participant, peripheral participant, and marginalized participants. However, Lave and Wenger also see LPP as an empowering phenomenon in which different individuals within a group maintain

92 The notion of apprenticeship may look simple, but the type of learning involved should not be understood as a formal apprenticeship, or even as informally organized apprenticeships.
different positions (Lave & Wenger, 1991). The relationship in LPP are highly asymmetric between the learners and experts, and the opinions of those at the centre always prevail as they have more at stake in the community. Lave and Wenger are quick to point out that in any form of learning context, participants may disengage before attaining mastery over core skills. This means that they leave the learning context with some but not all relevant skills, and transport what they have learned into another context.

An interesting aspect of LPP is the issue of identity, which is seen as the process of incorporating the past and the future into the meaning of the present. Identity may be of a group or a person, but it is neither condensed to specific time frame (like the age of a person) nor tied to a specific spatial location (i.e. school setting or work place) but rather, it is ongoing and pervasive. According to Holt, (2008, p. 55), identities exist and persist because of encounters with the language, manner, and material arrangements of the social world. Wenger (1998) sees identity as socially determined as our experience is shaped by participating in the community of practice and influenced by our existing competence in using the objects in the community. Sundin and Hedman (2005, p. 295) see identity in accordance with the concept of ‘occupational identity’. As a practitioner of an occupation, they relate identity at a collective level, which, in turn, affect the individuals’ physical and discursive actions. As Taylor’s (1991) IUE had earlier noted, Sundin and Hedman (2005) further argue that the professional discourse exerts a disciplinary logic that influences individual practitioners’ information needs, seeking, and use by mediating a suitable collective occupational identity.

The concept of ‘situated learning’ is linked to the concept of ‘community of practice’ (CoP). The concept of CoP originates in the anthropological work of Lave and Wenger (1991). Wenger (1998) explains social sites of significant learning as places where knowledge is created and resides as participants coalesce around a joint enterprise in a shared domain of human endeavour (Lave & Wenger, 1991; Wenger, 1998). The construct of CoP is central to and useful for understanding how information practice manifests itself and is constituted as a socio-cultural practice (Lloyd, 2010, pp. 20-21). People learn and engage in information activities as they participate in situ with significant others. They learn not only “about the actual performance of practice (e.g. the doing of practice), but they also engage with nuanced and tacit information” (e.g. the saying of practice) (Lloyd, 2010, p. 20). The community determines which practices and information are legitimate. The new members get enculturated into the community as they engage in and are introduced to the information modalities and information activities that are sanctioned and legitimized by the community as directed by the experienced members of the community. This dichotomy in membership is crucial in making the concept of community of practice analytically and conceptually robust for the
Originally, CoP was seen as an informal group, not a synonym for a work group, team or unit. Lave and Wenger\(^93\) (1991, p. 98) define CoP as “a set of relations among persons, activity and world time and in relation with other tangential and overlapping communities of practice”. Later, CoP was ascribed to well-defined work groups in occupational settings or professional bodies. The definition of CoP by Hakkarainen \textit{et al.} (2004, p. 58) as “a group of persons with particular skills or expertise who interact formally within an organization, or informally—but routinely—in a type of network for shared pragmatic or knowledge-related goals” fits this research well. In the same vein, Jubert (1999, p. 166) also describes CoP as a “flexible group of professionals, informally bound by common purpose interest, who interact through interdependent tasks guided by a common purpose thereby embodying a store of common knowledge”.

For Wenger (1998, p. 125), CoP constitutes a “rapid flow of information and propagation of innovation” between members. This enables the sharing of tacit and explicit information through conversations and interactions about meanings, specific tools and artefacts, representations, narratives, and embodied knowledge (Wenger, 1998, p. 125). In CoP, “developing a shared understanding about what constitutes information is as important as the information itself” (Lloyd, 2010). The shared understanding of information is made possible as members are involved in a set of relationships over time (Lave and Wenger, 1991, p. 98) and communities develop around things that matter to them (Wenger, 1998). However, CoP constitutes reality in a particular manner as they are more often than not implied and described at length rather than defined or spelt out in reality. Wenger (1998; 2000, p. 229; 2007) identified three fundamental elements that are crucial and must be present for a community of practice to exist:

\begin{itemize}
  \item [i)] a domain of knowledge implying that it has an identity defined by a shared domain of interest members are bound together by their
\end{itemize}

\(^93\) In another work, Wenger (2007, p. 229) sees CoP as essentially the “basic and social building blocks of a social learning system because they are the social ‘containers’ of the competencies that make up such a system”. In this way, Wenger’s notion of CoP is closely related to Bourdie’s (1977) concept of ‘habitus’, which is a set of cultural principles that generate in a coherent fashion the modes of activities, the life style and tastes and interest of a group, usually a social class. Wenger himself however differentiates between COP and habitus. Because the broadly structural and inescapably closed lifeworld of the habitus depicts it as having a social realm, but within a social body, this makes it difficult to account for reproduction and evolution. On the other hand, the structure of CoP is emerging properties of the organized social world that gives it a social body. In another of Wenger’s (2002, p. 4) works, he describes CoP as “groups of people who share a concern, a set of problems, or a passion about a topic and who deepen their knowledge and expertise by interacting on an ongoing basis”.

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collectively developed understanding of what their community is about and they hold each other accountable to this sense of joint enterprise. (2000, p. 229);

ii) a community of people who foster regular interactions and relationships in joint activities and discussions through mutual engagement based on respect and trust;

iii) a practice where members of a community are practitioners: they develop a shared repertoire of resources: experiences, stories, language, routines, symbols, tools, information, styles, documents, and ways of addressing recurring problems; it is, in short, a shared practice that embodies the distinctive knowledge of the community and allows members to negotiate meaning.

CoP can be complex, multilayered, and sometimes geographically dispersed (Davies, 2005, p. 106). It neither exists in isolation from the rest of the world nor is understood independently of other practices (Wenger, 1998, p. 103). It is usually located in a larger world that is closely interconnected with members and artefacts. The wider world also has a long history of an increasingly detailed and complex institutional structure that influences and controls all its enterprises. This has major implications for this study as joining a community implies “entering not only its internal configuration but also its relations with the rest of the world” (Wenger, 1998, p. 103). As a result, CoP facilitates access to information both internally and externally. As such, a powerful information landscape is created through which information is accessed in different ways such as “observation, mentoring, guidance and collaborative work” (Lloyd, 2010, p. 21; Leonard & Sensiper, 1998, p. 123; Lloyd, 2005: Billet, 1995; 2002). However, the very notion of a CoP implies the existence of boundaries created and delineated by full members who also have a key role in ensuring and maintaining conformity between what is acceptable in the group and what is not (Wenger, 2000, p. 232).

The significance of CoP in INSU research is highlighted by Hjorland (2002b), who argued that information activities should be concretized and given meaning in communities of practices. At this level, Hjorland reasons, the individual information needs and subjective relevance is evaluated from the perspective of communities of practice. Hjorland (2002b) used his notion of a domain-analytical paradigm to explain that information can best be understood by studying knowledge domains as discourse communities. The emphasis on domain analysis is that the creation of meaning (or meanings) of professional information is carried out not by single individuals but in collaboration with others within the knowledge domains where information appears.
4.4.2 Appropriation

The concept of appropriation is attributed to Russian linguist and critic Bakhtin and is crucial to understanding situated learning in community of practice. Leont’ev (1981) used the term ‘appropriation’ to describe the adoption of any of the socially available psychological tools. For Leont’ev, children “cannot and need not reinvent the artefacts that have taken millennia to evolve in order to appropriate such objects into their own system of activity. The child has only come to an understanding that it is adequate for using the culturally elaborated object in the novel life circumstances he encounters” (Cited in John-Steiner & Mahn, 1996, p. 5). Säljö (1996) used the term ‘appropriation’ to describe the means by which one acquires an intellectual tool or learns to master a particular material tool in order to employ it for certain purposes and in certain situations. Sundin and Johannisson (2005, p. 35) refer to it as how individuals adopt tools and artefacts through communication. They noted that tools and artefacts play a socializing role as people use them. In Vygotsky’s (1978) original formulation, appropriation directly involves the active intervention of the subject in the developmental process as as he/she encounters tools intermentally\(^{94}\) which, in turn, become a resource for intramental\(^{95}\) activity. The discussion here will focus on how people encounter mediating means and in what ways people acquire the skills and competencies to master them.

The purpose of appropriation is to enable the learners through the assistance of experts, to become fully competent, independent participants with skills to use these mediational means, and at the same time become their joint creators. Vygotsky’s notion of mediation can be seen to extend his idea of the zone of proximal development (ZDP) in understanding the concept of appropriation. ZDP is conceptualized as the distance between the actual level of cognitive development, or what the learner can achieve or accomplish independently, and the potential level of development, or what the learner can achieve with assistance, guidance, and collaboration with more capable peers or members of the community (Vygotsky, 1978). Rogoff (1995) uses the term ‘guided participation’ to describe this form of interdependence. Tolman (1999, p. 75) sees appropriation as emphasizing the essentially mediated nature of human learning. In the present study, appropriation is used as a key concept when analyzing and discussing how the expert must lead the learner to his/her ZDP, thereby providing the necessary conditions for internalization.

\(^{94}\) The intermental plane is a place where shared cognition emerges through interaction between and among individuals (Vygotsky, 1978).

\(^{95}\) Intramental plane is a place where shared cognition is internalized or appropriated (Vygotsky, 1978).
Appropriations may be in the form of an ‘utterance’. According to Bakhtin (1986, p. 71), an utterance belongs to a particular speaking subject and is shaped and developed in continuous and constant interaction with other individual utterances. It cannot exist outside of its context, and can exist in reality only in the form of concrete utterances of individually speaking people (Bakhtin, 1986, p. 71). Bakhtin (1986) identifies two types of utterances that facilitate intersubjective communication in activity: social language and speech genres. Speech genre implies utterances on the basis of the settings within which the speech is produced (Bakhtin, 1986, p. 78). This includes whether the listener keeps silent or responds verbally, though the listener is supposed to be active in the conversation as a subject rather than an object. Social language is a way of speaking that is characteristic of a particular group in a particular concrete sociocultural setting and is therefore unavailable to the uninitiated. Bakhtin was concerned with the social language of professionals such as physicians.

Wertsch (1998, p. 74) argues that the features inherent in both types of utterances must be prominent in activity, and any attempt to focus exclusively on one in isolation is bound to be incomplete, if not seriously misleading. Such an analysis moves away from an exclusive focus on unique (i.e. unrepeatable) utterances to a focus on types or categories of utterances. According to Wertsch (1991, p. 95), the focus is grounded on the essential assumption that linguistic expressions cannot be understood if they are treated as if they belong to no one. In Bakhtin’s view, the dialogical nature of social languages manifests itself in a variety of ways, producing unique utterances and shaping what the individuals’ voices can say. This applies to both listening and speaking: as the listener takes “an active, responsive attitude toward it…Sooner or later what is heard and actively understood will find its response in the subsequent speech or behaviour of the listener” (Bakhtin, 1986, pp. 68-69). The speaker is also responsible to preceding utterances that shape the response of the listener.

Bakhtin’s notion of utterance is not all-inclusive and to some extent is limited in understanding appropriation. Wells (1999, p. 139) considers appropriation from the point of view of both the oral and written languages that arise directly out of the context of activities of a specific group or community. For example, oral language is more likely to occur in a social setting, in which several participants are engaged in dialogue about their experiences, and also often involves ongoing actions (Wells, 1999, p. 146). Written language in the form of text is used as a means of representing objects, events, and relationships (e.g. handwritten sheets or published monologues). Compared with oral language, written texts have greater permanence and are read aloud in the same way the oral language is written down (Wells, 1999, pp. 145-147). Compared to oral language, the advantage of the written language is that its materiality continues to exist even when the words are no longer being
employed as mediational means (Wertsch, 1998, p. 31). Thus, the materiality of oral language seems to evaporate after a moment’s existence except for those rare instances when speech is recorded. Nonetheless, the relationship between oral and written language seems to complement and enrich each other through the exploitation of the interpenetration of oral language, written language, and actions in relation to particular activities (Wells, 1999, p. 146).

The concept of appropriation is also useful for understanding how physical tools are adopted in on-going activities (Säljö, 1996, p. 88). It is framed by the way members of the group determine how a tool is to be used. For example, carpenters and cabinet markers adopt chisels differently, and the ways they are used reflect the particular accumulated insights of the different professions. This may be the reason why Wertsch (1998) argues that utterances are not analyzable in isolation but must be studied with reference to the tools and artefacts of which they are instantiated. The significance of these tools and artefacts is that they are used within a cultural practice that carries a substantial portion of that practice’s heritage. For example, the alidade used by quartermasters for taking bearings in navigation has developed as a navigational instrument over hundreds of years, and embodies calculations invented long ago (Hutchins, 1995). This example also applies to physical tools such as the stethoscope and sphygmonanometer used by physicians as diagnostic tools developed over centuries, and embodying the art of medical practice invented long ago.

Appropriation is linked to the concept of mastery introduced by Wertsch (1998). Mastery implies being able to do something (Harré & Gillet, 1994 cited in Säljö, 1999, p. 151). Wertsch (1998) refers to it as “knowing how to use a mediational means with facility”. Lave and Wenger (1991, p. 101) put it this way that “becoming a full participant certainly includes engaging with the technologies of everyday practice, as well as social relations, production processes, and other activities of communities of practice”. As they argue that “…understanding the technology of practice is more than learning to use tools; it is a way to connect with the history of the practice and to participate more directly in its cultural life”. But mastery is quite different from appropriation in that it is just mastery of a particular skill such as mastery of the computer keyboard (Jonsson, 2004, p. 30). To Jonsson, the one who masters the keyboard knows where to find the different keys and will perhaps be able to key in the alphabet in a few seconds. On the other hand, appropriation implies a situation in which an individual gradually changes his way of doing things and increasingly makes use of the keyboard, for example, in carrying out authentic tasks (Jonsson, 2004, p. 30).

The concept of appropriation also implies that tensions and friction can occur in
activity, and the use of existing tools and artefacts may sometimes be resisted. Wertsch (1998, p. 54ff) calls this resistance a “friction”. The point Wertsch makes is that by using the tools and artefacts provided, people inherently identify with the affordances and constraints associated with the tools they employ. In sum, appropriation is associated with the notion of change as to what is potentially useful (cf. Wertsch, 1998).

4.5 Conceptual relationship between ‘practice’ and ‘activity’ in the present study

Practice and activity are terms that are interchangeably used in various disciplines. *Practice* is seen as an extremely polysemous concept: “it seems to inhabit a common semantic space with such concepts as activity, context, situation, and event” (Cole, 1995, p. 105). Cole cites Terezinha Nunes regarding the synomity between *practice* and *activity*: “symbolic tools shape…activity in much the same way as physical tools shape work practices...” Most often, researchers talk about a unit of analysis that appears to be an amalgam of the concepts of *practice, activity, and events*. Cole points out that: “we make use of ‘activity’ or ‘event’ as the unit of analysis, with active and dynamic contributions from individuals, their social partners, and historical traditions and materials and their transformations” (Cole, 1995, p. 105). Cole (1996; 1995, p. 111) refers to Karl Marx as a source of confusion between practice and activity in current academic discourse.

Researchers treat *practice* and *activity* as closely related terms or even as synonyms. Cole (1995, p. 106) cites Barbara Miller’s formulations of cultural practices as closely related to activity. This study focuses on practice as people’s routine activities, “which are inextricately linked both to the (societal) structures within which actors operate and to the meaning that actors give to their activities” (Cole, 1995, p. 106). Similarly, Scribner (1997, p. 270) does not make any distinction between activity and social practice, and talks about practice in terms of activities: “in every human society, socially patterned systems of activities (sometimes referred to as social practices) arise to satisfy human needs and aspirations”. Engeström (1997; 1999) reasoned along similar lines as Scribner when he defined an activity system as a social practice that includes the norms, values, division of labour, and goals of the community.

In whatever way *practice* and *activity* are understood, they also both suffer from a key ambiguity in meaning, and a consequent lack of uniformity. Miller and Goodnow (1995, p. 5) even opined that reconciling the definitions could be a major enterprise in itself. For example, Scribber and Cole (1981, p. 235) define practice
as “a recurrent goal-directed sequence of activities using a particular technology and particular systems of knowledge”. Engeström (1991) views as meeting human needs but considers activities as a subset of social practices; that is, “activities are social practices oriented at objects”. Most often, the synonymy between activity and practice seems right when used in common sense fashion. However, Cole (1995, p. 116) reiterates that “they are not always synonymous, although they may well often coalesce in human experience”. In short, practices may appear to be parts of activity systems. For example, distinct medical practices can be seen as elements of health care in a variety of activity systems evoked in a teaching hospital to maintain and restore health (as part of the practice of medicine, surgery, biomedical research, or medical technology). Activity systems can also be seen as elements in a practice (the term ‘medical practice’ implies involvement in patients’ health care, medical education, internal medicine, and clinical pharmacology, all of which are analyzable in activity theory terms).

In this thesis, the terms ‘practice’ and ‘activity’ will both be used to denote physicians work at the teaching hospital and of their information related activities. The version of Cultural-Historical Activity Theory that I am using as my theoretical framework frames activity as a subset of practice. The decision to talk about practice and activity as almost the same displays the flow of thoughts in research. While there is synonymy, or rather commonality, in the semantic usage of both terms in this study, their theoretical and conceptual inclinations are different. To me, the concepts of practice and activity borrow strength from each other as they broaden the analytical scope of understanding and explaining diverse contextually bound information practices. Even though the study does not focus on all the connections between both concepts, the sociocultural approach adopted implies that the concepts can stand in mid-point to fill the gap between the macro and micro levels in understanding the phenomenon of study. As Davies (2007, p. 35) notes activity theory is widely applicable in research on work activity by allowing investigation of the social by focusing on the individuals.

Activity plays a conspicuous part in this study and the basic categorization of the different components of the activity structure fits it well. Activity theory per se encourages one to take a broad view of the context in which activity occurs. At an operational level, an activity is useful as a unit of analysis to explore the phenomenon of study. Though the investigation and analysis could be done on a collective basis, by offering the structure of activity-action-operations, it allows for the deconstruction of an activity and provides the opportunity to reduce it into its observable individual/group short-term actions (Allen, Karanasios & Slavova, 2011, pp. 784-785). Also, the study of a formalized activity system can contribute towards the development of the idea of a situation in research (Allen, Karanasios, Slavova, 2011, p. 784). The implication is understanding that activity is a mid-point
between the individualist and societist perspective\textsuperscript{96} that is to say, it gives prominence to the mutual characteristics of the part-whole relations between the individual and the social in historicized events that are anchored in the real environment of time and space.

I adopted social practice theory also for this study for a full understanding of the macro-sociological viewpoints of information practices of physicians in work activity. Social practice theories are conceptually strong in emphasizing the investigation of human activities in well-bounded communities such as that of the present case study. For example, these theories are useful in identifying ‘communities of practice’ (CoP) as reflected by the sustained pursuit of a shared enterprise. It is also particularly relevant in understanding learning as a fundamentally social phenomenon (Wenger, 1998, p. 3; Lave & Wenger, 1991). Thus, practice theory can be viewed as representing a strong socio-cultural view on participatory knowledge creation (Byström and Lloyd, 2012). However, the actors involved in the learning and knowledge creation process may not necessarily name themselves as learners. According to Wenger (1998, pp. 124-125), the concept is seen as an analytical tool of midlevel category that is neither a specific, narrowly defined activity or interaction, nor a broadly defined aggregate that is abstractly historical and social. Moreover, CoP can be linked to activity theory by connecting the formation of collectivity and the experience of subjectivity. This highlights the inseparability of the social and the individual, which is the underlying theme of this thesis. In so doing, activity theory, with its systemic and developmental perspective on socio-historic activities will find meaning in the social structure, situated experience, social practice, and identity of the community. Because of this emphasis on the social aspect of human activity, Davies (2007, p. 35) notes that CoP is “not amenable to being broken into its constituent’s part, the individual members to be studied”. In the same vein, situated learning theory expresses the fact that membership and participatory modes of engagement enacted collectively are the salient prerequisite for learning.

Both practice and activity are fruitful concepts for understanding information seeking research. The focus is on a broader range of contextual phenomenon to enhance a greater theoretical awareness. For example, information practices could be seen as activity or social learning in practice. This presupposes that the phenomena associated with information practices are complex and tend to be socially oriented. Needs for both information and seeking information are

\textsuperscript{96} Schatzki (2005, p. 469) used his analysis of social ontology to illuminate two camps: that of the individualists and the societists. According to Schatzki, while societists analyze and explain by reference to groups, the individualists hold that social phenomena can be both decomposed into and explained by the properties of individual people. Hence, a framework of activity theory can be seen as a possible mid way point.
embedded in the actions, tasks and situations they are supporting (Vakkari, 1997, p. 457). Even the tools and artefacts are seen as a social manifestation that serves specific social purposes. Through the process of internalization and externalization, it becomes possible to “observe the absorption of information the habituation of behaviour into practice and the manifestation of these in the form of knowledge and skills” (Allen, Karanasios & Slavova, 2011, p. 781).

5 Research Methods

In this Chapter, the research approach and methods are described and discussed. In order to gain a deep understanding of information practices in activity, I have chosen a particular case for study and collected data about it through multiple methods. My research strategy is committed to the in-depth examination and contextually rich description of information practices in relation to social practices as embedded in context. In accordance with this strategy, the research paradigm to be applied to this study is naturalistic. The research questions will be addressed by the qualitative research methods of collecting and analyzing data. Vakkari (1997, p. 451) acknowledged that the qualitative methodology was already a common and conspicuously prominent trend in the mid 1990’s. Naturalistic research assumes that social life is dynamic and in a constant state of flux, and that it is within this state of flux that meaning itself emerges (Bryman & Burgess, 1999, p. 207). This entails an in-depth understanding of the social reality and minutiae of the lived-in-world experiences of participating actors in activity.

The qualitative method neither favors any one single methodological stance over another, nor possesses any theory or paradigm that is distinctly its own (Denzin & Lincoln, 2000, p. 6). It is surrounded by complex, interconnected traditions that cut across disciplines, fields, and subject matters (Denzin & Lincoln, 1998). It can employ or deploy a variety of methods, more so because it has a tradition of steering research towards a different outlook, where the primary goal “is not to develop theory that is testable in a narrow sense, but in understanding the complex world of lived experience from the point of those who live it” (Patton, 1990). The multiple methodologies of qualitative research may be viewed as a ‘bricolage’, and the researcher is often described as a ‘bricoleur’ (Denzin & Lincoln, 1994, p. 2). The meaning of ‘bricoleur’, according to Weinstein and Weinstein (1991) is “someone who works with his (or her) hands and uses devious means compared to those of the craftsman”. It can also refer to a person who assembles images into montages in filmmaking (Denzin, 2000, p. 4). The researcher-as-bricoleur uses any tool or method that is readily available (Denzin 1994, p. 501). In adopting the qualitative research method, I assume the role of a ‘bricoleur’, who is using and deploying different methods to piece together a close-knit set of analysis out of the
bits and pieces and chunks of data through a process of triangulation. In so doing, I fashion meaning and interpretation out of the experiences, situations, and events of the participating actors in the study context.

This research methods section is in five parts. The focal point of the discussions is on the processes and procedures involved in the entire field work. The first part of the Chapter describes the epistemological considerations that underpin the choice of methodology, followed by the key elements and unit of analysis. The second part of the Chapter concerns the research design, the choice of case study as the research strategy, the case selection, an explanation of entry gaining, and also presents ethical considerations. The data collection techniques and the process of gathering the data are taken up in the third part of the Chapter. The fourth part of the Chapter concerns the analysis and interpretations of the empirical data. The fifth part of the Chapter is concluded with consideration of the trustworthiness of the case study.

5.1 Methodological considerations of sociocultural perspective

5.1.1 Sociocultural interpretative methodology

The sociocultural approach emphasizes the methodological perspective that the individual cannot be dissociated from the sociocultural and historical context of which he is a part of. The basic assumption inherent in this methodology is that our knowledge of reality is gained through social construction such as language, shared meaning, documents, tools, and artefacts (Patton, 1990). Cobb and Yackel (1996, p. 185) point out that the sociocultural perspective typically positions the individual in a collaborative relationship with significant others in a broader sociocultural setting of situated activities. The strength lies in the dynamic interdependence of social and individual processes with the emphasis on the context of activity, and taking specific account of how the participants together make meaning of what they encounter. According to Vygotsky (1978), the choice of method becomes one of the most important challenges for understanding the unique human forms of psychological activity from a sociocultural perspective. In this case, “the method is simultaneously prerequisite and product, the tool and the result of the study” (Vygotsky, 1978, p. 65). According to Lyold (2007, p. 186), “this approach focused not only on the overt ‘acts and facts’, but also on the participants’ beliefs, values, and ideologies and on situations from which information could be gained, used or disseminated”.

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The key elements useful in the understanding of sociocultural phenomenon are embraced at different interrelated levels. This study focuses on these three levels: (a) social components; (b) cultural components; and (c) context; these two levels of social and cultural are best examined through context (Bliss & Säljö, 1999, p. 3; De Abreu, 1999, p. 17; John-Steiner & Mahn, 1996, p. 191).

*Social component* acknowledges a dynamic collaborative process, and Brown and Duguid (2001, p. 202) see the group as providing the context within which individuals construct their own social contexts. In this study, the focus is on the group in activity. However, activity is not limited to social interactions, and furthermore over time, individuals take on increasing responsibility for their own participation and learning in joint activity (Lave & Wenger, 1991). Hence, focusing on the individual activities in situations where they perform a broad range of practical tasks is also important (Bliss & Säljö, 1999, p. 2).

*Cultural component* acknowledges how the complex set of individual interactions is made possible either at the collective or individual level through the use of physical and linguistic tools to deal with the world that the actors are part of (Säljö, 2000, p. 20 cited in Sundin & Johannisson, 2005, p. 34; Robbins, 2005, p. 146). An important characteristic of cultural tools is that they do more than assist in activity; cultural tools also help in understanding how and in what ways specific tools and signs help to act and mediate perspectives and viewpoint” (Sundin & Johannisson, 2005, p. 34). Thus, cultural tools cannot be separated from either the activity that they are part of, or the meaning and purpose appropriated to them.

*Context* acknowledges that activity takes place under different cultural circumstances and in different historical time frames, thereby contributing to a contextualized rather than a universalistic knowledge of development that reflects absolute or objective abstractions (John-Steiner & Mahn, 1996, p. 197, Sundin & Johannisson, 2005). Context is characterized by different situations in this study. This approach is particularly appropriate in the study as the significance and relevance of conducting research in the ‘here’ and ‘now’ implies seeing reality, structure, persons, and information as instances of situated actions and practices. Determining what is to be extrapolated from context and the conclusions to be arrived at invites a contextualized approach whereby meaning emerges and is explored, discovered, and analyzed in relation to context.

For the qualitative researcher, it may seem problematic to overcome the ‘boundaries’ between the three levels. Instead of separating the three units and examining them as three separate entities, the activity system of physicians’
information practices will be examined as a unit of analysis using Rogoff’s (1992; 1997; 1998) three planes or foci of analysis. The focus of analysis will be on the team of the Clinical Pharmacology and Therapeutics (CPT) unit, which is participating as a group in an activity system. The focus of analysis will also include the cultural tools and artefacts used by the CPT team. It is important to note that at every point in time, one of the planes dominates and is fore grounded, while the other two planes remain in the background and are submerged. Using the analogy of the human body anatomy, Rogoff exemplified how individual organs can be studied by focusing separately on each organ. However, a full understanding of the organ’s function cannot be inferred without reference to the whole body. In this study, the three sociocultural elements discussed in the preceding paragraphs, though intertwined can variously become the focus of analysis. As it was during the study, it was obvious that at every point in time, there was foregrounding of one plane and submerging of the two other planes. It was necessary to temporarily pay attention to the significance of one plane at a particular point in time; it was assumed that meaning could be lost if all the units were focused on simultaneously. According to Pressick-Kilborn, Sainbury & Walker, (2005, p. 39), the ability to foreground and background different levels supports the notion of ‘fuzzy boundary’ that Rogoff illustrates with organ, and which underlines the presence of distinctions within a co-constituted whole. That is to explicate the fact that “each organ has a distinct role in the body, and its absence has a potentially profound impact on the overall functioning of the whole” (Ibid).

Along with the overall sociocultural perspective, the specific methodology chosen for this study is interpretative methodology. Interpretative methodology means “the systematic analysis of socially meaningful actions through direct detailed observation of people in a natural setting in order to arrive at understanding and interpretation of how people create and maintain their social world” (Neuman, 2006, p. 88). One of the strengths of using interpretative methodology in this study is the appeal of the researcher adopting a position that is internal to the research process and that it is seen as useful in ‘understanding’ the context of the study. Emphatic understanding is what Weber (1981, p. 159) referred to as “Verstehen”, which has the goal of intelligibility or the grasping of the meaning of the social phenomenon of study; that is the opposite of Erklären, which is to the search for universal truth or scientific explanation by the empiricists and positivists of the

97 Neo-Kantian German historians and sociologists (i.e. Dilthey, Rickert, Windleband, Simmel, and Weber) claimed that human sciences (Geisteswissenschaften) were fundamentally different in nature and purpose from the natural sciences (Naturwissenschaften), and defenders of interpretativism argued that human sciences aim to understand human action (Schwandt, 2000, p. 191).

98 Empiricism is the epistemological standpoint that experiences, observations or sense data are the most important or only method of acquiring knowledge (Hjorland, 2005). It is expressed in terms of causality and verification of facts that entails precisions, powerful predictions, laws and hypotheses and generalizability as its goals.
natural science tradition who emphasized objective reality (Denzin & Lincoln, 1998, pp. 8-9; Rosenberg, 2005; Rosenberg, 1995, Hjorland, 2005). Instead, the aim of this study is situation-specificity of complex goal-directed activities where the actors in activity assign meaning to what they do.

5.2 Research design and strategy

5.2.1 Case study as research strategy

Interpretative methodology implies going beyond the descriptive data, which entails prolonged and sustained contact with research subjects (Bryman, 1999, p. 37). To achieve the set goals of the research, I settled with using the case study as a primary research method. I chose this strategy because I envisaged that it can adequately address the ‘wholistic’ in-depth investigations. In such investigations as Stake (2000) affirms, the object must be a ‘functioning specific’ (such as a person or classroom) and not a generality (such as a policy). The case study method is used to cope with distinctive situations “in which there may be many more variables of interest than data points” and “relies on multiple sources of evidence, with data needing to be converged in a triangulating fashion”, and with “benefits from prior development of theoretical propositions to guide data collections and analysis” (Yin, 1994, p. 13). With the aim and the research questions of this thesis, the case study was considered suitable in providing further insight to the information practices of a team of physicians.

There is little agreement as to what constitutes a case study as definitions abound; in the same way, there are no specific guidelines for conducting case studies (Lincoln and Guba, 1985, p. 360; Yin, 1994). The term ‘case study’ refers to several different epistemological entities (Mitchell, 1999, p. 183), therefore making it necessary at the outset to specify the particular meaning of case study. Yin (1984, p. 23) and Mitchell’s (1999, p. 185) definitions proffered illuminating insights into understanding the case study as a research method. Yin (1984, p. 23)

99 The positivist believes in capturing reality out there to be studied (Schwandt, 2000, p. 191) as based on universal and a priori scientific methods (Hjorland, 2005, p. 137). Positivists argued that philosophy should be scientific and that metaphysical speculations are meaningless. However, the ‘logical positivist’, a modern version of the positivist believes that sensory knowledge or observations are not only important, but the sole criterion and the most certain kind of knowledge. Logical positivists also concern themselves with “knowledge in its linguistic and logical aspects (Hjorland, 2005, p. 137).

100 The empiricists and positivists assume that reality is objective, that it transcends an individual’s perspective, and is expressed in the observable statistical regularities of actions and behaviour.

131
defines it as “an empirical inquiry that investigates a contemporary phenomenon within its real-life context; when the boundaries between phenomenon and context are not clearly evident; and in which multiple sources of evidence are used”. Thus, the case study is useful when the researcher deliberately wants to both cover contextual conditions pertinent to the phenomenon of study, and portray features which may be constructed as a manifestation of some general abstract theoretical principle.

In its most basic form, Mitchell (1999, p. 193) affirms that a case study refers to “the basic descriptive material an observer has assembled by whatever means available about some particular phenomenon or set of events”. However, Mitchell attributes the term to “material from which some theoretical principles are to be inferred” (p. 183). Hence, Mitchell (1999, p. 185) characterizes the case study method as “a detailed examination of an event (or series of related events) which analyst believes exhibits (exhibit) the operation of some identified general theoretical principle”. Goode and Hatt (1952) describe the case study as “a way of organizing social data so as to perverse the unitary character of the social object being studied”. Similarly, Eisenhardt (1999, pp. 138-139) regards the case study as a research strategy which focuses on understanding the dynamics present within single settings, and where the purpose is to provide a description or test, or to generate a theory. In this regard, I intend to look at the connections between the social actors in activity, and the inherent cultural reality in context. Doing this implies mandating a walk towards complexity by digging deeper (Dervin, 1997, p. 32). As I will also emphasize context in the understanding of the complex phenomena being studied, I found the case study to be a suitable choice of research strategies, particularly since there are multiple sources of evidence.

The type of case study that I chose for my thesis is an extreme one that exhibits both typical\(^{101}\) and atypical\(^{102}\) elements rather than a representative type of setting. I wanted to find a setting that had the typical characteristics of a professional group, but I was also interested in the atypical features of the setting such as the particularities of the context of study, of the situations and of the actors. Atypicality in this study implies the social processes, which would be abstracted from the

\(^{101}\) A typical case implies that the particular set of events selected for report is similar in relevant characteristics to other cases of the same type (Mitchell, 1999, p. 182).

\(^{102}\) An atypical case study justifies the selection of the case for study in terms of its explanatory power rather than for its typicality (Mitchell, 1992, p. 194). This includes any set of events deemed to reflect the abstract characteristics that the researcher wishes to use in analysis. The researcher’s purpose in this regard is to demonstrate how general exploratory principles manifest themselves in the course of some ongoing set of events, and the particular set of events is in itself a subsidiary consideration (p. 194).
The unit of analysis for the case study in this research is a single CPT team that is viewed as the subject of the activity system or members of a community of practice. Despite the fact that the team is part of the entire hospital context, it is the team members who are engaged in a process of collective learning and common practice in a shared domain of human endeavour (Lave & Wenger, 1991; Wenger, 1998) or in pursuit of a common goal (Jubert, 1999, p. 166).

5.2.2 Case selection and delineating boundaries

Selecting a case for a study is both intrinsic and instrumental (Stake, 2000, p. 437). In other words, it is chosen to advance understanding and provide insight into an issue. The choice to concentrate on a team of the CPT was more or less paradigmatic, relying on “a set of basic beliefs (or metaphysics) that deals with ultimates or first principles” (Guba & Lincoln, 1994, p. 107). When choosing the CPT unit as the case, I relied on my assessment that it is an ‘information rich’ case. Patton (2002; 2002, p. 46) described information rich cases as “those from which one can learn a great deal about issues of central importance to the purpose of the research”. In this respect, firstly, I presumed that the CPT unit represents an arena where a detailed investigation of the phenomena to be studied may generate particularly useful information from an INSU perspective. Secondly, I envisaged that the data to be collected would fit into the theoretical propositions combining an activity system with situated learning. This is called a principle of theoretical
Initially, I sought to study multiple cases in the research setting. However, upon arrival in the field, I discovered that such an ambition would require immense effort. I decided to stick to the CPT unit, which was the first unit in the teaching hospital that I had made contact with just at the time of the onset of the preliminary fieldwork. This decision was largely supported by the method literature (Yin, 1994). Yin (1994) argues that the selection of a case or cases should be done for the maximum effect of what can be learned within the span of time of study. Neuman (2006, p. 386) argues that when ‘casing’ possible field sites, the researcher must consider such practical issues as time required from involved parties. Thus, the choice of case was much less structured than I had expected it to be, and in a sense, it was the case that chose me.

The case is enmeshed in a work environment that comprises of a multiplicity of work roles. This includes patient health care, teaching duties, administrative duties and even membership of professional affiliations that may be seen as the work per se. Many of the members of the CPT unit have multiple work roles that cut across and beyond the activity system in focus, so much so that I recognized the risk of getting entangled in areas and issues that were irrelevant to the study. Therefore, I made a decision to set boundaries in order to avoid ambiguities. According to Puustinen et al. (2003, p. 78), the core of medicine is the doctor/patient interaction where the physician approaches the patient as a person rather than merely as a biological phenomenon. With this in mind, I identified some of the CPT unit’s socially situated activities where a patient is seen as the focal point of activity. During the preliminary fieldwork, five activities were identified: ward rounds, morning review sessions, Consultants’ clinics, clinical meetings, and accident and emergency (A&E) care. My later field work centred on these five situations that

5.3 Gaining entrée and ethical considerations

Before it was possible to conduct the fieldwork, I needed to gain access to the case. Gaining access and ethical considerations were important factors in conducting the field study due to the sensitive nature of the case since a third party (i.e. patients)
was involved. Ethical issues needed to be carefully considered. Ethics define “what is or is not legitimate to do, or what ‘moral’ research procedure involves” (Neuman, 2006, p. 129).

In preparation for the study, I started by making enquiries through a primary contact, who acted as the gatekeeper for this study, about the feasibility of conducting an INSU study in the teaching hospital. After a positive first response, I followed up with a letter of application to the Board of Management of the Ethics and Research Committee, at the University of Benin Teaching Hospital (UBTH) and applied for a research permit. The approval, which was granted by the Board in November 2007, gave me admission not only to the unit under study, but also to the interconnected networks of the teaching hospital. This level of access may have made my study stronger from the onset since I could walk through the entire hospital environment without being questioned, as is the practice in the teaching hospital.

My actual data collection on the CPT unit continued from 2008 (preliminary field work) to June 2010 (main field work). The first contact consisted of informal discussions with one of the Consultants who was also the team leader. He approved the idea of using the CPT as a case in the study, and supported it through a formal approval process with the Head of Department of Internal Medicine. He also briefed me both about issues of anonymity and confidentiality to protect the participants, and the issue of maintaining secrecy throughout and after the study to protect the patients from undue exposure. To protect the anonymity of the research participants, I have used pseudonyms of male gender names for all the participants to disguise their identities. At times, references are made to medical professional titles (e.g. Consultants, Senior Registrars, Registrars, House Officers, nurses, or even students). When necessary, Romanic codes are attached to the titles. However, the locations of interviews posed difficulties in terms of protecting the privacy and confidentiality of participants as most of the interviews were conducted in either open offices or the House Officers’ room. However, the transcriptions were done away from the research setting, and I am in sole possession of electronic versions of the transcripts that have been forwarded to my supervisor. The transcripts are also available to the examiners of this thesis. To protect the patients, I have also omitted using any forms of name by simply referring to all the patients as “patient” with Romanic or alphabetic codes attached in order to differentiate one from the other. At times, the accompanying disease is also used to differentiate one patient from another. The anonymity of the identity of the case studied, however was waived.

The team leader also set other restrictions. Because of the sensitivity of issues
pertaining to health care, I was not permitted to do any form of audio or video recording of either the individual physician’s interaction with the patients or the team’s interactions with patients during ward rounds or at the Consultant clinics. Following the initial approval and setting of the guidelines, the CPT team leader introduced me to one of the Senior Registrars in the unit who then introduced me to the other two Senior Registrars. After these introductions, it was easy to join and follow the team. From thereon, gaining further access to other persons, observational, and social situations became just a matter of time, event, and place. Conducting research activities was facilitated by the fact that the research setting was a teaching hospital where person(s) undertaking research and scientific inquiries were not unusual.

I followed the rules and guidelines for research in the social sciences and the humanities as outlined by the Swedish Research Council (Vetenskapsrådet, 2002). I drew up an informed consent form (see Appendix) to seek the consent of the research participants. The form stated the purpose, aim and goal of the study, described how the data would be collected, and included a reminder of the preliminary observatory study in 2008. The informed consent form also outlined the participants’ rights and researcher’s obligations. For the observation method that I employed for one of my research methods, I had to follow the team all through the different situations during the study. Because of this, I was already known to the research participants. It was therefore not difficult to get their consent to participate in the interviews after I approached them. Some flipped through the informed consent form while others did not and simply went through the interviews without reading the form. By agreeing to participate in an interview, and agreeing to have the interview tape-recorded, the participants gave their informed consent.

The CPT unit has few members, and the social configuration is, to some extent, flexible, with the peripheral members moving in and out of the unit. That notwithstanding, all participants that I approached accepted my request to be part of the study. The issue of informed consent was unproblematic in observational and social situations like the morning review sessions and clinical meetings where members of other units of the Internal medicine department participated. I did not have to explain my role to members of the other units, and I assumed that they considered my attendance to be legitimate. Also, although I was prepared to present my preliminary framework to the participants, this was never required. Thus, it is my impression that the participants and those coming in contact with them accepted my presence effortlessly and without hesitation.
5.4. Data collection

Data collection required giving consideration to not only the actions and views expressed by the participants in the case study, but also to the context in which the participants operated, and the cultural variations embedded within that context (fundamentals of sociocultural methodology). Many INSU researchers (e.g. Wang, 1999, p. 80; Byström, 1999; Wilson & Streatfield, 1977, p. 277) argue for multiplicity of methods based on human and non-human sources in conducting research to reveal different aspects of empirical reality. Data collection for this research was therefore determined by following the principles proposed by Yin (1994, pp. 78-126) that a good case study utilizes as many sources of evidence as possible. Adopting this implied a process of ‘methods triangulation’ that refers to “checking out the consistency of findings generated by different data collection methods” (Patton, 2002, p. 556). It involves combining multiple “methods, observers, and empirical materials to produce a more accurate, comprehensive … representation of the object of study” (Silverman, 2006, p. 291), as well as to “verify the repeatability of an observation or interpretation” (Stake, 2000, p. 443).

Triangulation was seen as a major strength of the data collection strategy as it served to overcome partial views and presented “something like a complete picture” (Denzin, 1970). According to Fielding and Fielding (1986, p. 35), multiple theories and methods are worth pursuing, but not for reasons of presenting a complete picture. This view of triangulation is discussed by several authors (see, e.g. Hammersley & Atkinson, 1983, p. 199; Garfinkel, 1967; Bloor, 1978). For example, Hammersley and Atkinson (1983, p. 199) argued that “one should not adopt a naively ‘optimistic’ view that the aggregation of data from different sources will unproblematically add up to produce a more complete picture”. Researchers who favour triangulation argue that to be able to understand different aspects of empirical reality, it is necessary to look at the phenomenon using different sources of evidence. They believe that no single method is all encompassing and could capture the important nuances that can help researchers to understand complex social phenomena. Hence, “an arsenal of methods that have non-overlapping weakness in addition to their complementary strengths” (Brewer and Hunter, 1989, p. 17) was used to guide this case study and adequately address the research problems and questions.

My goal in employing a rich variety of data collection methods was to make possible vivid and certain representations of the findings, and in this way, strengthen the validity of the findings and conclusions (c.f. Brewer & Hunter, 1989; Patton 2002). I was able to study the same phenomenon using different methods as different sources of evidence yielded variations in views of a particular issue. This
made it possible to address a broader range of the sociocultural and historical issues in the activity system or community of practice. It was also possible to do cross-data consistency, because “different types of inquiry are sensitive to different real-world nuances” (Patton, 2002, p. 556). Furthermore, inconsistencies were illuminating and important and were therefore not “viewed as weakening the credibility of the results, but rather as offering opportunities for deeper insights into the relationship between inquiry approach and the phenomenon under study” (Patton, 2002, p. 556).

The main research goal is to gain a deeper understanding of information practices as a social practice in an activity system. Thus, I entered into the research field with a certain mindset about the problems to be addressed, and a general view about the underlying principles and the theoretical perspectives to be adopted. These types of concrete views were seen by Glaser and Strauss (cited in Taylor and Bogdan, 1998, p. 25) as the two interrelated categories: substantive and formal that come into play when entering the field. Substantive implied that I had a specific phenomenon that I was interested in investigating, i.e. the information practices of physicians in activity. The formal category implied that I had general theoretical insights that transcended the phenomenon to be investigated. This was a strong point in my research as the combination of these two categories of views enabled me greatly in making extrapolations as the phenomena of study naturally unfolded.

I was not bound by specific methods and operational variables that defined predetermined categories; hence there was no pilot study for this research. The specifics of the method to follow evolved as the research proceeded. A circular process allowed for flexibility in the methods in searching for categories that appeared meaningful and also in deciding the extent to which theories would be used based on the emergent data. Patton (2002, p. 40) categorized this strategy as emergent design flexibility in which “the researcher avoids getting locked into rigid designs that eliminate responsiveness and pursues new paths of discovery as they emerged”.

With activity theory as the base, several methods of data collection techniques were employed as Wilson (2006) advocated. These included direct observations, interviews, informal contacts, and physical artefacts. The emergent design of qualitative research implied that there was only an outlined plan for data collection before my venturing into the research site. Events however unfolded themselves in successive phases of inquiry similar to what (Lincoln & Guba, 1985, p. 265) researchers identified as: 1) orientation and overview phase: to get information on what is important to follow; 2) focused exploration: to obtain in-depth information about those elements that are deemed to be salient; and 3) team check and reaching
closure: report to be subject to scrutiny of the persons who provided the information and winding up (see figure below).

<table>
<thead>
<tr>
<th>Phases</th>
<th>Date</th>
<th>Action</th>
</tr>
</thead>
<tbody>
<tr>
<td>Orientation and overview</td>
<td>July 2007 - February 2008</td>
<td>Enquiries about the case study (via telephone)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Applied for research permit from Board of Management, Ethics and Research Committee</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Received approval (November, 2007)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Survey the feasibility of the study in the research setting</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Initial contact with the CPT unit</td>
</tr>
<tr>
<td>Focused exploration</td>
<td>July - September, 2008 February - June 2010</td>
<td>Preliminary fieldwork by observation (July - September 2008)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Main fieldwork through multiple methods of observation, interviews, informal contacts, documentation and artefacts (February - June, 2010)</td>
</tr>
</tbody>
</table>
Table 5.1: Data Collection steps

| Team Check and Closure | July - December 2010 | Winding up with the empirical data |

5.4.1 Observation

Qualitative observations are fundamentally conducted in naturalistic settings and are non-interventionist (Angrosino & Mays de Pérez, 2000, p. 673; Alder & Alder, 1998, p. 79). According to Patton (1990, p. 202), the purpose of observational data is to “describe the setting that was observed, the activities that took place in the setting, the people who participated in those activities, and the meanings of what was observed from the perspective of those observed”. The decision to employ this data collection technique was one of the first steps in the data collection process. The aim was to capture as much of the phenomenon as possible in the study context, and to presuppose as little as possible within the overall aim of the study. The implication of the committing to an observation method was that I began the field work in a way that was not prejudged as to its analytic interest either in advance or in the making. The data for observation, accordingly, was the CPT team in activity, the situations and events surrounding the activity, and the tools and artefacts used. More specifically, the team’s interactions with patients as object of activity was valuable in that the interactions disclose the flow of activity, what is involved in activity, how it is accomplished, what has already been done, what remains, and the rationale for doing things the way they are done.

The situated nature of the research meant that the dominant data collection technique used for the case study allowed no filters between the researcher and the phenomena under study since what is described must be “factual, accurate, and thorough without being cluttered by irrelevant minutiae and trivia” (Patton, 1990, p. 202). In this respect, observation entailed frequently visiting the various sites on a daily basis during the field study and following the CPT team members as they were engaged in their everyday clinical activities. I observed the participants’ interactions with patients in situ: during ward rounds, in Consultants clinics, in the emergency care unit, during morning review sessions, and in clinical meetings. I also observed how the participants availed themselves of tools and artefacts, alongside the ongoing learning activities and clinical education of medical students. This mode of observation in naturalistic occurrences brought about a first-order
perspective of the phenomena being investigated. Hence, it can be seen or argued as ‘naturalistic observation’ (Angrosino, 2005). One of the greatest strengths of this study was the advantage of being on-site to observe the lived-in-world experience of the CPT team members.

The type of observation that I used is called direct observation, where the researcher adopts a passive stance and only observes work activities, meetings, sidewalk activities, and the like. During the preliminary study, the observation method was the dominant data collection technique. But during the main study, I simultaneously employed other data collection techniques alongside observation. The membership role that I assumed during the period of observation was obviously ‘passive’ following the physicians in their day-to-day activities. I entered into the research setting as a doctoral student purely for the purpose of data gathering, and my identity remained as such throughout the data collection. I had the opportunity to attend and directly witness as many activities and events as possible, and I was careful not to interfere or attract attention to myself during the observations. I was in a completely unfamiliar professional terrain, and so saw myself as someone “interested in learning about the social life of a field” (Neuman, 2006, p. 395), which in this study is the medical professional practice.

One of the strengths of observational method is “its ability to shift focus as interesting new data become available” (Silverman, 2006, p. 93). To be able to explore information practices in activity, and not omit the vital contextualized aspects of the sociocultural variables, it was obvious that a well-structured observation with pre-determined categories and themes would not serve the purpose. Rather, in this kind of study, “the researcher is the instrument for measuring field data” (Neuman, 2006, p. 390). Instead of trying to be objective, it is familiarization and socialization with the research environment as the researcher is “directly involved with those being studied and is immersed in a natural setting” (Neuman, 2006, p. 414). Thus, I strived to be flexible about what to include as data and admitted my own subjective insights and feelings (Neuman, 2006, p. 390). Kleinman and Copp (1993, p. 19) reasoned that “if we avoid writing about our reactions, we cannot examine them. We cannot achieve immersion without bringing our subjectivity into play”. I noted the episodes of interactions with the patients and the patterns and frequencies of such interactions. I noted the flow of discussions, what the participants said or did, and also noted what were said in social gatherings with members of the wider community. My notes were essential for capturing what is referred to as “the ‘emic’ perspective -the insider’s perspective on reality” (Patton, 1990, p. 241). I also noted some information-related activities. When I observed issues that were not initially desired at the onset of the research, I noted them. The observations were continuous until I felt that I had achieved what Alder and Alder (1998, p. 87) referred to as ‘theoretical saturation’
that is “when the generic features of new findings consistently replicate earlier ones”. In total, the observation period lasted for four months; two months during the preliminary empirical study and two months during the main empirical study.

There are a number of problems associated with the use of direct observation as a method in a case study. One of the criticisms against observation method is that there are limitations as to what can be observed as the observer cannot see everything. This limitation was addressed in this study by method triangulation. Another problem concerns the validity and reliability of observational data due to the effect of the observer on what is being observed (Patton, 1990, p. 209). Patton (2002, p. 306; 1990, p. 209) points out that the observer may affect the situation being observed in unknown ways as the participant may behave differently, or in typical fashion when they know they are being observed. However, I did not become aware of such reactions to my presence all through the observation.

5.4.2 Interviews

One of the most important data gathering methods for the case study is the interview (Yin, 1994, p. 84) because it enables the researcher to examine the phenomena of study through the eyes and minds of the participants. It also allows in-depth discussions with the participant and provides informative and rich data that may even include thoughts and reasons that underlie behaviour (Wang, 1999, p. 67). Walsham (1995, p. 78) means that through interviews, “the researcher can best access the interpretations that participants have regarding the actions and events which have or are taking place, and the views and aspirations of themselves and other participants”.

The interview technique was used to address all the research questions. A lot of relevant phenomena were not possible to be directly observed. For example, it was not possible to observe participants’ past actions, feelings, thoughts, or intentions. Furthermore, it was not possible to observe previous events, how the team had organized itself over the years, or the meanings that members attach to what they do. Moreover, observations could not cast much light on why the participants acted and made certain decisions. It was then necessary to conduct interviews with the purpose of entering into the participants ‘perspective’ (Patton, 1990, p. 278), and in this way, try to learn about their experiences, why and in what ways they do what they do, and how they achieve their goals.

The interviews were usually of an open-ended nature and the participants were
asked questions regarding specific matters, as well as their experiences and opinions about their interactions and events (Yin, 1994, pp. 84-85). The interviews also provided important insights into certain occurrences; that is, they provided shortcuts to the prior history of a situation, suggestions for further inquiry, or possible other sources that could be collaborated or contradicted. This relates to how Kvale (1996, p. 105) reasoned that “interviews are particularly suited for studying people’s understanding of the meaning in their lived world, describing their experiences and self-understanding, and clarifying and elaborating on their own perspective of their lived world”. For exactly this reason, interviews became important during the study since I was not able to capture the participants’ perspectives through observational data alone.

Because the case study is a small unit, the participants were selected purposefully. According to Patton (1990, p. 169), purposeful sampling aims at the selection of information rich participants. To Patton, information rich participants are those from whom one can learn a lot about issues of central importance. Thus, the participants were chosen either because they were members of the CPT unit or the activities of their respective units/departments were linked to the activities of the CPT team, and were therefore persons who were knowledgeable about the unit’s activities. Again, the choice of the participants was also based on opportunistic sampling by taking advantage of opportunities that sprung up during the observations.

The interviews were conducted during the main field work and staggered over a period of four months. Interviews involved “asking questions, listening, expressing interest, and recording what was said” (Neumann, 2006, p. 406). Gaining access to the participants was not difficult. However, it was difficult to conduct the actual interviews. Working in the teaching hospital is overwhelming. Because the patient’s health care is paramount to a physician, few of the participants were able to make and keep appointments for the interviews. When the main study began, some travelled to participate in professional conferences and courses, resulting in their interviews having to be placed on hold for over three months until they returned.

For some of the peripheral members, I used the opportunity of attending the ward rounds and even the Consultants’ clinics to arrange interviews. Interviews with the House Officers depended on the contingencies of their work rather than when the interview was scheduled. I then adopted Chatman’s (1992, pp. 2-3) approach of ‘hanging around’ the participants in the data collection environment. This meant being at the research site daily, trailing, and following the House Officers, and waiting for opportunities to interview them. Interviews could be called off at
anytime, particularly when the participant needed to attend to a patient. Scheduling an interview with a House Officer might have taken up to four weeks. Despite the difficulties, this cadre provided me with the longest interviews. One of them even used his off-duty day to come to the hospital for the second interview. This was after a series of failed attempts to conduct the interview during work hours.

I conducted the interviews in a face-to-face format at various locations. The majority of the interviews took place within the teaching hospital such as the CPT unit office, the CPT Consultants’ clinic room, physicians’ offices, the House Officers’ room, the Ward Manager’s office (nursing), and a number of administrative offices. However, it was also expedient to use other locations outside the teaching hospital. For example, it became obvious to me that I was not going to be able to conduct an interview with one of the Consultants at the teaching hospital since he had a very tight work schedule. After many unsuccessful attempts to interview him, I changed tactics and instead paid unscheduled visits to his house. Though this tactic might seem inappropriate and that I was encroaching on someone else’s privacy, paying visits to people’s residences without appointments is a way of life in Nigeria. Making this effort paid off almost immediately as I was able to have my first interview with him on a public holiday. The second interview was also conducted at his house two-half months later.

Interviews were also conducted outside the research environment with two House Officers as earlier attempts to interview them failed due to the House Officers’ rooms being occupied by fellow colleagues. In both of these instances, we relocated the interview to the Librarian’s Office at the Faculty of Engineering Library at the near-by University of Benin. I conducted 26 interviews with 17 physicians - 15 CPT team members and two as members of the wider community. Five of the 15 were core members of the CPT team - Consultants and Senior Registrars. The remaining 10 were peripheral members - Registrars and House Officers. I also conducted brief interviews with nine non-physicians from various departments in the teaching hospital as their input was important in making connections between the case study and the community at large, and in helping me gain a fuller perspective of the entire activity system. For easy identification of the positions of the participants in the team, I used the first letter of their professional titles to stand for their position. For example, ‘C’ is for Consultants, ‘S’ is for Senior Registrars, ‘R’ is for Registrars, and ‘H’ is for House Officers. The letter ‘W’ is for members of the wider community, including physicians and non-physicians alike. Table 5.2 shows the full list of formal interviews conducted with the CPT team members, while Table 5.3 shows the list of staff members from other units/departments that were interviewed.
<table>
<thead>
<tr>
<th>Number of Interviewees</th>
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<th>Title</th>
<th>Name</th>
<th>Time Range</th>
</tr>
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<tbody>
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<td>5</td>
<td>Core Member</td>
<td>Consultants (2)</td>
<td>Dr C. Chukwuka</td>
<td>189</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Dr C. Chukwuezeke</td>
<td>52</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Senior Registrars (3)</td>
<td>Dr S. Idegbe</td>
<td>81</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Dr S. Igweh</td>
<td>49</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Dr S. Olowo</td>
<td>51</td>
</tr>
<tr>
<td>10</td>
<td>Peripheral Members</td>
<td>Registrars (4)</td>
<td>Dr R. Mgbeke</td>
<td>78</td>
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<td></td>
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<td></td>
<td>Dr R. Efangwu</td>
<td>52</td>
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<td>Dr R. Iyamah</td>
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<td></td>
<td>Dr R. Eweka</td>
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<td>House Officers (6)</td>
<td>Dr H. Aghogho</td>
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</tr>
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<td></td>
<td>Dr H. Ayidu</td>
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<td>Dr H.Ossai</td>
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<td>Dr H.Kehinde</td>
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<td>Dr H. Ebi</td>
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<td>Dr H. Atagwu</td>
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Table 5. 2 Formal interviews conducted with the CPT team members
<table>
<thead>
<tr>
<th>Number of Interviewees</th>
<th>Position in Activity System</th>
<th>Title/Department</th>
<th>Name</th>
<th>Time Range</th>
</tr>
</thead>
<tbody>
<tr>
<td>2</td>
<td>Wider Community (Specialist Physicians)</td>
<td>Consultants (2)</td>
<td>Dr W. Dalahatu</td>
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<tr>
<td></td>
<td></td>
<td>Neurologist</td>
<td>Dr W. Musa</td>
<td>30</td>
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<tr>
<td></td>
<td></td>
<td>Accident and Emergency</td>
<td></td>
<td></td>
</tr>
<tr>
<td>9</td>
<td>Wider Community other units/departments</td>
<td>Nurse (1)</td>
<td>W. Ejiro</td>
<td>11</td>
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<tr>
<td></td>
<td></td>
<td>Physiotherapist (1)</td>
<td>W. Otega</td>
<td>7</td>
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<tr>
<td></td>
<td></td>
<td>Anesthetician</td>
<td>W. Okon</td>
<td>8</td>
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<tr>
<td></td>
<td></td>
<td>Gas Attendant</td>
<td>W. Ayodele</td>
<td>8</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Accounts &amp; Revenue</td>
<td>W. Bala</td>
<td>11</td>
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<td></td>
<td>Medical Records</td>
<td>Archibong</td>
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<td></td>
<td></td>
<td>Pharmacist</td>
<td>Musa</td>
<td>6</td>
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<td></td>
<td></td>
<td>Chemical Pathology</td>
<td>Bassey</td>
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<tr>
<td></td>
<td></td>
<td>Haematogy unit</td>
<td>Ibrahim</td>
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</table>

Table 5.3 Interview conducted with staff members from other units/departments
Although I was working within the theoretical framework, I wanted to capture participants’ views of their world. Therefore I used semi-structured interviews based on my prior in-depth observations. With extrapolations from the study observations, I used specific concepts from the different theories and models in the theoretical framework. The interviews were supported by the interview guide, but the guide was not strictly followed during the conversations. The questions were continually refined and reframed throughout the interviewing process to be in tune with the changing situations or circumstances of the object in activity. There were also times when the flow of the interview invited further probing and follow-up questions. The interviewing process was flexible even for the participants who were allowed to re-adjust the questions according to their own understanding, often yielding important information. By having this flexibility, I ensured that many relevant themes were covered. This type of interview fits into what Silverman (2006) referred to as emotionalism whereby the “interviewees are viewed as experiencing subjects who actively construct their worlds”. This interview type was chosen in order to generate data that would provide authentic insights into the participants’ experiences.

Most of the interviews were unscheduled and participants were interviewed whenever the opportunity arose. A typical interview began with just one or two words about my research topic and asking permission to tape-record the interview. Then I asked for demographic details that mostly centred on the participant’s educational and professional background, membership in the unit, what they did and with whom they worked. However, the first interview with the team leader was different since I wanted to learn more about the unit itself and so many of the questions were accordingly centred on the unit, its aims, and goals. Following the introductory phase of the interview, I asked participants about their information sources as well as their information and learning strategies. I specifically probed into the participants’ information practices and the influences of significant others. I also elicited participants to talk about their interactions with patients, circumstances and events, highlighting their participatory modes of engagement in activity and the tools and artefacts they used. Finally, I asked the participants to talk about their challenges as physicians working in a developing country. This phase of the research was highly open-ended, often highly revealing, and ranged from 5 to 120 minutes. Some of the core members restricted the length of the interviews due to their busy schedules. I tape-recorded and transcribed all the interviews in full. The interview time period totaled 1407 minutes with an average of 94 minutes for the CPT team members; the total for the participants from the other units/departments was 128 minutes with an average of 13 minutes.
5.4.3 Physical artefacts

Physical artefacts are one of the sources of evidence in case studies identified by Yin (1994, p. 90). I concentrated only on patients’ medical records that are central artefacts in activity as “the intended and unintended residues” (Hodder, 1994, p. 394). It was through patients’ medical records that it was possible to assess the CPT team’s interactions with patients, past actions, decisions and events, and even their connectedness to the wider community in the activity system. The importance of using artefacts as a source of evidence is the realization that they are not simply a passive by-product of other areas of life (Hodder, 1994, p. 395). They can be seen as an artefact-in-progress, uncovering the trails left behind after the team’s interaction with patients, and even beyond, detailing events and circumstances surrounding the patient’s trajectory with the society at large. Hence, they are seen as active and necessary for most social interactions. Because artefacts endure, I had the obvious advantage of being able to reassess patients’ medical record to see if the extrapolations I had made fit into the general understanding of the study perspectives.

Patients’ medical records are authentic documents that are generated internally in the research setting. According to Altheide (1992, p. 2), a document is “any symbolic representation that can be recorded or retrieved for analysis”. Like the physical artefacts, documents “lend insights into perspectives, assumptions, and activities of those who produce them” (Taylor & Bodgan, 1984, p. 120). Yin (1994, p. 81) means that documents play an explicit role in any data collection in doing case studies. Apart from providing some specific details about the team’s interactions with patients, patients’ medical records were also useful in collaborating and augmenting the participants’ responses and even verifying the correct spellings of some of the medical terminology. More importantly, documents provided a view on practices that may not be directly observable. This is helpful since the interviewer may require leads provided through documents to ask appropriate questions (Patton, 1999, p. 307).

Throughout the data collection period, I had access to the patients’ medical records, particularly of those in the in-patient wards. I took time outside of the ward rounds to study them. I looked through the different components of the records, including the case note, nursing charts, treatment charts, drug charts, and the nurses’ Kardex. Most of the details in the records had long passed and could not be observed; at best, the interviews gave some insights into the contents and structure of the

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104 Nurses’ kardex is a nursing tool which nurses use to document all their interactions and activities with a patient while on admission in the ward.
records. Hence, it could be argued that patients’ medical records gave insights into the CPT team’s meaning-making in activity. Not only did these medical records represent the outcomes of the team’s activity, they also represented evidence of such activity. Although “the evidence cannot ‘speak back,’ it can confront the researcher in ways that enforce self-reappraisal” (Holder, 1994, pp. 398-399). In general terms, the researcher works “between past and present or between different examples of material culture, making analogies between them” (Hodder, 1994, p. 398). The sociocultural approach does not provide guidance as to how to use artefacts as a data collection technique; therefore, the researcher must decide, “what to take and how to evaluate what is taken” (Hodder, 1994, p. 398). This was done in a patterned way in relation to the full range of data in order to fit into the whole.

While working with the artefact materials, I studied the component parts of the patient medical records taking cognizance of their similarities and differences and paying the most attention to the physicians’ handwritten case notes. I studied the structure of the case note and the contents and pattern of entries in each case note. This prompted questions such as:

- Who made the entries?
- Was the person who made the entry a qualified physician?
- For what purpose? What may have been the underlying purposes for making entries?
- What is documented?
- How are the entries written?
- What seems omitted?
- In what ways does the entry connect with the activities of other units/departments?
- Does what is entered into the patient’s medical record fit into my general understanding of the phenomenon of study?
- What do I need to know as a researcher to make sense out of the patient’s medical record?

These questions helped me to better understand the high-level social processes in activity and the associations that were useful in investigating patients’ medical records. A medical record is the product of many social interactions and provides the backdrop against which the team’s activity, as a whole, can be reflected upon. I examined patients’ medical records during the main field study as the ‘official’ version to underscore the participants’ responses in the interviews and even made extrapolations from them during the study observations.
5.4.4 Informal interactions and unplanned activities

Observation necessarily combines observing and informal interactions (Patton, 2002, p. 287). Because of the beehive of activities and events in the research environment, informal contacts were seen as a strategy that made it possible for me to be continuously in touch with the data throughout the period of the field work. Informal contact with the participants, which was mostly on a one-to-one basis, was an additional and useful data collection technique during the study. Though informal contact is not one of the usually mentioned sources of evidence in case studies (see Yin, 1994). Although not as prominent as the other data collection techniques, it was relatively persistent. A lot of data would have been missed if I had excluded this method. For example, I found students to be particularly helpful, considering the fact that I was completely in unfamiliar terrain (particularly not being acquainted with medical terminology) and at most times had to ask for some of the spellings or even meanings. Informal interactions were particularly useful in asking such questions. Patton (2002, p. 286) saw that contacts “provide opportunities for participants to assimilate what has occurred during formal programmatic activities”.

The scenario illustrates the importance of staying open to the data and doing some forms of opportunity sampling (Patton, 2002, p. 286) by watching, listening, looking for opportunities to deepen observation, and recording what people do and say. Patton (2002) noted that researchers need to refrain from the assumption that they know everything happening without checking with those in the research setting. It was during one such unstructured time that I discovered that medical students clerk\(^\text{105}\) during their free time. I was able to watch the clerking process and listen to their conversations and interactions with patients. I was so intrigued when observing them that I asked some of them questions about what they were trying to get out of the clerking process. This short conversation turned out to be fruitful in understanding some of the phenomena of study from the perspective of peripherality in activity system.

Informal interactions also relied on the spontaneous generation of questions about something that occurred during the observations. Fontana and Frey (2000, p. 652) saw it as a form of ‘unstructured interviewing’. The questions are often open-ended, and during these informal contacts, “the persons being talked with may not even realize that they are being interviewed” (Patton, 1990, p. 280). Most of the

\(^{105}\) To clerk means to take the history of a patient’s illness and perform a clinical assessment.
questions that I asked flowed from the immediate context of the activity setting depending on the particular interaction with patients or even during the usual morning review sessions. I regarded everything that went on and around in the activity setting as worth paying attention to. For example, when the participants interacted with others who were not team members or when the team split into different groups, either during the Consultants’ clinics or ward rounds. I found that whatever was going on, even in the wider community in the activity system was worth noting. The conversations were not recorded nor analyzed because they were often impromptu and took place under tangential circumstances or situations. However, they were meaningful in providing further elucidations or elaborations about the phenomena of study. To capture a holistic view of the case, I tried as much as possible to stay alert to what usually happened during these informal periods (although most of these events would later prove to be of no interest to the focus of the study).

Informal interaction as a data collection method has been criticised in that it may require a greater amount of time to collect than systematic information (Patton, 2002, p. 343). According to the critics, data obtained from informal interactions can be difficult to pull together and analyze because different questions will generate different responses. The researcher has to spend a great deal of time sifting through responses to find patterns that have emerged at different points, in different contacts, with different people (Patton, 2002, p. 343). This problem has been adequately addressed in this study since informal interactions were not used exclusively to collect data, and as such, can be characterized as a supporting data collection technique.

5.5 Data analysis

It is particularly difficult to analyze case study evidence because there are few fixed formulas as to how to conduct data analysis and make sense of the large amounts of qualitative data. I needed to create my own guidelines to analyze the specific materials of my study (cf. Yin, 1994, pp. 102-103). I opted for a manual analysis instead of using any of the software programs for data analysis. I interspersed data collection and data analysis, which made the data analysis a continuously developing process of reconstructing a meaningful whole in an iterative fashion.

The analysis started with reading through the observational field notes soon after collecting data from the preliminary field-work. This was aimed at identifying themes and determining additional sources of evidence beside those originally planned. Thus, what I gathered from one source of evidence helped me to know
what to do with other sources, what questions to ask during interviews or informal interactions, and what to pay attention to both during observations and concerning physical artefacts. This first analysis was generally inductive and filtered through the lens of practice theories.

The analysis of the data collected later during the main field-work was more systematic and logically rigorous than that of the preliminary field work. This was prompted by the large amounts of data. The complexity of understanding sociocultural and historical components in the activity system made it necessary to impose order on the data. I used the three kinds of qualitative data coding techniques defined by Strauss (1987) and Neuman (2006, pp. 460-464): open coding, axial coding and selective coding. I also used the combination of what (Patton, 2002, p. 453) refers to as inductive analysis and deductive analysis, and what Neuman (2006, pp. 461-464) refers to as ‘passes’. The analysis of the data was ‘loosely’ inductive as the research motive was exploratory. In a first attempt to condense the mass of data into some order, I began by (re)reading through all the field notes and interview transcripts, locating themes and assigning initial codes, marking out different parts of the data with coloured markers, and noting comments, connections, and interpretations in the margins. This coding was not completely ‘open’ or purely inductive in the sense that codes would have arisen from the data itself. The coding brought various themes, or rather low level abstractions, to the surface based on my research questions, concepts identified in the literature, my flow of thoughts, and even terms used in the research setting. This constituted the ‘first pass’ at organizing the data into themes and files. Later, the copy on which these themes were marked became the index copy of the field notes. Also, the interview transcripts became a tool that facilitated data retrieval and category building. In the subsequent analysis, I repeatedly revised initial codes and themes, and even created new ones. In the process of doing this, I focused on not only what was evident in the data, but also on what was implied. I treated both as equally important.

I used axial coding on the ‘second pass’ through the data. The aim of axial coding is to “move toward organizing ideas or themes and identify the axis of key concepts in analysis” (Neuman, 2006, p. 462). However, I was mainly looking for themes that clustered together, and focused on how to combine and organize them into broader categories and sub categories. This implied Patton’s (2002, pp. 465-466) notion of convergence and divergence in figuring out what fit together and what did not. Thus, I began by looking for recurring regularities in the data and sorting them together into the categories of internal homogeneity (the extent to which data that belonged in a certain category held together) and external heterogeneity (the extent to which differences among categories were bold and clear). To this intent, paragraphs and lines in every interview transcript and field note were further coded
and marked. In so doing, I attempted to ensure that the overall patterns of relationships were found by making comparisons that highlighted similarities and differences. I noted that many passages illustrated more than one theme. This ‘second pass’ implied some ‘playing around’ with the analysis as I continually worked back and forth between the data and the coding scheme to verify the placement of data into categories.

On the ‘third pass’ through the data, I used selective coding to work through the established bank of themes while trying to organize the overall analysis around core generalizations or ideas. I employed a tighter confirmatory deductive method of analysis by relying extensively on theoretical propositions. At this stage, themes were imposed according to both the concepts in the theoretical framework and the themes reviewed in the relevant literature. For example, the discussions addressing the first research question were drawn from the data analysis of two broad categories of ‘activity system’ and ‘social learning community’ that focused on the noticeable attributes in the CPT team’s work activity. In the same vein, understanding the role played by tools and artefacts was another research question and therefore focused on a broad category simply called ‘tools and artefacts’. It was possible to break up the ‘tools and artefacts’ category into ‘physical tools’, ‘language’, and ‘mediating artefact’. In this process, I found out that further analysis into smaller bits was possible, but also that not all the data could fit into the identified themes. I carefully examined the deviant data and looked for appropriate themes to fit them into such as ‘affordances’. The whole analysis was a process of continual interaction, feedback, and refinement; that is, it was back and forth between the data and the comprehensive code and themes providing access to the data, and also between the theoretical toolbox and themes in the literature review.

Interpretative analysis involves a narrative analysis of the research experiences and is grounded in ‘thick interpretations’ (Patton, 2002, p. 503; Geertz, 1973, p. 10). Such thick interpretations build on thick descriptions that have the capacity to open up a world to readers through rich, detailed, and concrete descriptions of people, events, and places (Patton, 2002, p. 438). Hence, it is necessary to present findings with sufficient descriptions and direct quotations in order to illuminate and “allow the reader to enter into the situation and thoughts of the people represented in the report” (Patton, 2002, p. 503) are necessary to present. In my work, this entailed a complex and creative mapping of the activity in order to share the results with others. Although there is no precise way of setting the criteria for interpreting sets of data (Yin, 1994, p. 26), the process of writing this report is a critical phase of the research project. One of the main challenges in this reporting was finding the balance between what to include and what to omit in the data reduction. There was also the challenge of ensuring that the data reduction did not lead to either trivial
and mundane descriptions or cutting off unnecessary details

The interpretation also involved some form of ‘pattern-matching’ as described by Campbell (1975), where several pieces of coded information is matched against the theoretical propositions. In this way, “the voices, feelings, actions, and meanings of interacting individuals are heard” (Denzin, 1989, p. 83). Such analysis is not founded “on data whose meaning and validity are given” (Hammersley, 2004, p. 291), but on exercising subjective judgement and making claims about the meaning of the data. In my thesis, readers may have to encounter difficulties in reading medical terminology, but using them in the description was necessary to bring out the meanings of what I intended to convey. A glossary is provided to help readers with the medical jargon and terminology

**5.6 Establishing trustworthiness in the case study**

In this case study, establishing trustworthiness is of crucial significance. This corresponds to the question posed by Lincoln and Guba (1985, p. 290): “how can an inquirer persuade his or her audiences (including self) that the findings of an inquiry are worth paying attention to, worth taking account of?” The discussion in this section focuses mostly on the criteria for judging the trustworthiness of the research findings in this thesis. In the research literature, quality measures can vary from paradigm to paradigm and “different paradigms make different claims, with the result that criteria for what count as significant knowledge vary from paradigm to paradigm” (Lincoln & Guba, 1985, p. 301).

Quality measures in qualitative research have been widely discussed (e.g. Patton, 2002; Silverman, 2006). Denzin and Lincoln (2000, p. 17) refer to a ‘legitimation crisis’ concerning the criteria for evaluating and interpreting qualitative research. Most qualitative researchers have abandoned the traditional (quantitative) measures of validity and reliability. Causal explanation of the conventional scientific paradigm implies dominant standards of precision, repeatability, replicability, and predictability (e.g. Rosenberg, 2005; Rosenberg, 1995). These however are not the goals of the naturalistic paradigm. Qualitative research, and case studies in particular, are often regarded as subjective and criticized for giving too much scope to the researcher’s own myopic interpretations. For example, the criteria for establishing the trustworthiness of qualitative research have often been questioned by positivists because their two central concepts of ‘validity’ and ‘credibility’ cannot be addressed in the same way in naturalistic work (Shenton, 2004, p. 63; Silverman, 2006, pp. 281-303).
In order to meet this criticism in my work, I utilize four alternative criteria proposed by Lincoln and Guba (1985) to ensure the trustworthiness of this case study (See table 5.3). Lincoln and Guba’s constructs correspond to the criteria of measures used in qualitative studies. These are: credibility (analogous to internal validity), transferability (analogous to external validity), dependability (analogous to reliability), and confirmability (analogous to objectivity).

5.6.1 Credibility

Credibility is the ‘believability’ of the case study research results and pertains to authenticity. Authenticity means giving a fair, honest, and balanced account of social life from the viewpoint of someone who lives it every day (Neuman, 2006, p. 196). Merriam (1998) suggests answering the question: “how congruent are the findings with reality?” I was immersed in the culture under scrutiny during my prolonged engagements at the research sites, particularly during the preliminary study (July-September, 2008) and main study (February-June, 2010). This immersion led to an apparent familiarity with the unit as I was engaged in data collection. In addition, this immensely helped to assess and identify the salience of the case study and increased my confidence after the field-work that I had accurately gathered the data of the phenomena under study.

Credibility was strengthened by establishing a chain of evidence by the use of multiple methods. Brewer and Hunter (1989, p. 17) asserted that the use of multiple methods compensates for individual limitations and exploits their respective benefits. The persistent observations technique was useful in identifying the different features and elements in the activity system and community of practice that could address the research problems and questions. Purposeful sampling led to selecting an information-rich case for the study. Interviews with the participants were used to understand the complexities of many situations. Issues of central importance were also highlighted. The physical artefacts were seen as the ‘official version’ of the team’s past interactions with patients, and provided a great deal of information for affirming credibility. Furthermore, multiple methods were useful in cross-checking the truthfulness of the data. Again, triangulation via data sources was helpful in that the viewpoints and experiences of the participants were verified against others, thereby further enhancing an already rich picture of the phenomena under study.

Credibility was also gained through the influence and support of the research community. I tested my research design on my thesis supervisor through debriefing sessions to ensure adherence to “methodological designs and fitness, limiting biases
and drawing attentions to the flaws broadening the visions in interpretations” (Lincoln & Guba, 1985). Feedback during doctoral forums with senior researchers and peer scrutiny by doctoral students at a research seminar were also avenues for ensuring credibility. Thus, there were continuous revisions of the research problems and questions. This was a form of case analysis that ensured credibility in the process as I considered instances and cases that did not fit well into the patterns and trends of the findings.

5.6.2 Transferability

Transferability, according to Lincoln and Guba (1985), addresses generalizability. This implies, “the extent to which the findings of one study can be applied to other situations” (Merriam, 1998) or “the ability to generalize findings from a specific setting and small group to a range of settings and people” (Neuman, 2006, p. 198). The issue of transferability in naturalistic research is often problematic and difficult to attain like its parallel, external validity in quantitative research. This is because the findings in qualitative research are defined by a small number of individuals in specific contexts. Hence, Shenton (2004, p. 69) argues that it is impossible to demonstrate that the findings and conclusions are applicable to other situations and populations, and warns that such an approach should be pursued with caution as it appears to be of little importance in understanding the contextual factors impinging on the case. Merriam (1998) called such contextual factors the ‘typicality’ of studied environment(s). Shenton (2004, p. 70) concludes that “the results of a qualitative study must be understood within the context of the particular characteristics of the organisation or organisations and, perhaps, geographical area in which the fieldwork was carried out”.

Bearing this in mind, I cannot assume or claim to make transferability inferences for readers. Like Lincoln and Guba (1985), I firmly believe that the decisions for evaluating transferability should rest on the shoulders of the person(s) doing the generalizing. I strove to assure generalizability at two levels in this study. First, generalizability was addressed by providing sufficient thick descriptive data - the narrative. This will enable readers to have enough details and insights for the proper understanding of the phenomena under investigation and their context. Thus, reader(s) would be able to make comparisons of the phenomena described in this case study to phenomena they have seen in other cases. In this way, “judgements about the degree of fit or similarity may be made by others who may wish to apply all or part of the findings elsewhere” (Lincoln & Guba, 1985, p. 19). Second, generalizability was also promoted by the extensive reliance on the underlying propositions in the theoretical framework and examinations of the previous research findings in the analysis and interpretations. Silverman (2000) argued that
the generalizability of a piece of qualitative research can be increased by relating the findings to an existing body of knowledge. This case study had an obvious advantage of proximity to reality since it ‘closed-in’ on real-life situations and tested views directly related to the phenomena as they unfolded (c.f. Flyvbjerg, 2006, p. 235).

The readers should also take into consideration some of the operational procedures and characteristics of the fieldwork. The following are proposed as parameters to increase transferability: the ‘atypicality’ of this case study comprising of a homogenous group of professionals, the number of participants involved, their characteristics, data collection methods employed, the span of the field work, and the length of the time that was spent in the different data collections sessions.

5.6.3 Dependability

The concept of dependability is adjudged by making the research process transparent. The emergent nature of the research design rendered the issue of dependability problematic. Lincoln and Guba (1985, p. 317) see close ties between credibility and dependability stressing that a demonstration of the former is sufficient in ensuring the latter. Although this link may be strong in practice, it is weak in principle. The pertinent question in assuring dependability in this case study was: How can I ensure that by following the same procedures, in the same context, and in the same modes of engagements by the participants, that I would arrive at similar findings and conclusions?

Yin (1994, p. 37) notes that the general way of approaching the dependability problem is for the researcher to conduct the research and take as many operational steps as possible, as “if someone were looking above your shoulder”. But Shenton (2004, p. 71) drawing from Fidel (1993, p. 219) and Marshall and Rossman (1999), noted that “the changing nature of the phenomena scrutinized by qualitative researchers render such provisions problematic in their work”. The combined strategies for this case study were both emergent and partially fixed. That is, the strategy was to address the fundamentally non-causal nature of social phenomena with very large conditions in order to impact the outcome of the findings. So it was not designed to focus on the ability to make predictions from theory that dwells on control and keeps things constant. Rather, social and cultural attributes can bear some similarities or resemblance across contexts thus making empirical and analytical comparisons possible. Thus, based on the same contexts and circumstances, it may or may not be replicated across contexts in exactly the same way. The findings may be of relevance and empirical interest whenever similar
studies are conducted. For example, in-depth coverage enables the researchers to have a thorough understanding. Moreover, the operational details of data gathering and findings in this study were systematically documented, thereby addressing what was done in the field allowing a confirmability judgement (see 5.6.4). In this regard, dependability of my study should be assessed with the operational characteristics of the case and the internally coherent documentation.

5.6.4 Confirmability

The concept of confirmability is analogous to objectivity in quantitative research. Closely related to the concept of dependability, it refers to the degree in which findings can be confirmed or contradicted by other researchers studying the same topic. Lincoln and Guba (1985) suggested that objectivity can be attained either by more traditional notions of credibility, or by providing evidence of lack of the researcher’s own bias. This criterion was met in this study by the triangulation method that allowed for comparison of data from different data sources. In this way, comparison of data findings with the interpretations from different sources reduces discrepancies and inconsistency in analysis. (Patton (2002, pp. 50-51) sees objectivity as the strength of the scientific method and associates it with the use of instruments, which in principle are not dependent on human skill and perceptions. Patton argues that such understanding of objectivity is often naive since the intrusion of the researcher’s biases is inevitable. To Patton, the “ideals of absolute objectivity and value-free science are impossible to attain in practice and are of questionable desirability in the first place since they ignore the intrinsically social nature and human purposes of research” (p. 50).

Shenton recommended the following steps to assure confirmability: 1) the emphasis on the role of triangulation to reduce the effect of the investigator’s bias; and 2) ensuring detailed methodological descriptions. In this study, the former recommendation was met by employing multiple methods to reflect different aspects of empirical reality. The latter recommendation was met by ensuring explicit methodological descriptions (such as the assumptions, research strategy, design, and documentation of the procedures for data analysis). This recommendation was also met by collecting heaps of data that resulted in rich descriptions from the empirical data that confirmed the findings.
<table>
<thead>
<tr>
<th>Themes</th>
<th>Sub themes</th>
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<tbody>
<tr>
<td>Credibility</td>
<td>i) Prolonged engagement at the research site</td>
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<td></td>
<td>ii) Persistent observations</td>
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<td>iii) the technique of triangulation (cross checking)</td>
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<td></td>
<td>Multiple data collection methods</td>
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<td></td>
<td>Debriefing sessions</td>
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<td></td>
<td>Peer scrutiny</td>
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<td></td>
<td>Draft report</td>
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<tr>
<td>Establishing chain of evidence</td>
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<tr>
<td>Detailed documentation</td>
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<tr>
<td>Transferability</td>
<td>Sufficient background information</td>
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Table 5.4 Applying Guba’s Criteria in establishing trustworthiness in this research

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5.7 Prologue (The CPT team at the bedside of two patients in Ward 3)

The prologue described below illustrates the research method used for this study. I have used two episodes of the CPT team encounters with patients during ward rounds to create a narrative of the method that I used.

It was Monday morning, a normal day for the CPT team consultants’ ward rounds at the in-patient wards at UBTH. The team moved from the male in-patient ward where they had earlier attended to some male patients, to the adjacent female in-patient ward at the hospital complex. With the team members standing at the bedside of a chronically ill-looking and elderly female patient, Dr. S. Idegbe exchanged pleasantries with the patient and asked her how she felt that morning. Dr. R. Mgbekw then picked up and opened the patient’s medical record containing the case note, treatment charts, and the nurses Kardex\(^{106}\) where entries were recorded by physicians and nurses. After flipping through all the items in the patient’s medical record, Dr. R. Mgbekw informed Dr. S. Idegbe about the current health status of the patient, expressing concern that the patient’s blood pressure (B.P.) and temperature were both still very high at 190/130 and 42°C (110°F) respectively. Dr. S. Idegbe also briefly scanned all the items in the medical record. He then asked Dr. H. Atagwu to read the information in the case note out loud to the other team members who listened attentively.

Early that morning before 8:00 a. m., Dr. H. Atagwu, as part of his routine duties, had clerked the patient and updated the details about the patient’s condition in the case note. As Dr. H. Atagwu was reading the details from the case note, Dr. S. Idegbe was, at the same time, examining the patient’s eyes and looking deeply and straight into them. He instructed the patient to follow the movement of his fingers to enable him detect the level of the patient’s paleness. He then removed the stethoscope from around his neck and borrowed a sphygmomanometer from Dr. H. Ossai. Then, as the patient laid on the bed, he wrapped and fitted the inflatable arm-cuff, which was attached to a column of mercury, smoothly and snugly around the patient’s left upper arm, at the same vertical height as the patient’s heart above the brachial artery. The cuff was inflated to a pressure that shut off all of the blood flow through the artery. He used the mercurial mechanical manometer to measure the systolic and diastolic pressures.

\(^{106}\) Nurses kardex is a nursing tool, which contains information about everything that is ordered and done by nurses for patients during their stay on admission in the hospital.
The cuff is slowly deflated and, Dr. S. Idegbe, through a stethoscope placed on the brachial artery, listened for the first audible beat, which was the sound of blood rushing black into the compressed artery. He noted the number on the gauge.

He then asked the patient: *Your B.P. is not well-controlled? Why did you reduce the drug on your own?“*

He then looked at the patient who said: *Because I no longer felt the symptoms...* Dr. S. Igweh, standing nearby, smiled and took the case note from Dr. H. Atagwu, flipped through it and asked the patient: *What symptoms?*

The patient responded: *When I am dizzy...my eyes are doing me one kind, turning me up and down.*

Dr. S. Igweh nodded, looked down at the case note again, and asked the patient: *Oh, so when you are not dizzy, you know the hypertension has gone?*

And the patient said: *Yeah.*

Then Dr. S. Igweh asked her: *“Is that what you were told?”*

Dr. S. Igweh again flipped through the case note and told the patient: *The last time you came to the out-patient ward, you were told to be taking your drugs regularly so that you B.P. would be controlled, and we did not see you again for some time now.*

Dr. S. Igweh looked at the drug chart and discussed it with Dr. S. Idegbe. Dr. S. Idegbe told the patient to breathe in and out repeatedly, and then he left the patient to relax for a few minutes. In the interim, he expressed concern to Dr. S. Olowo that the patient was very weak and pale and asked for the results of the hematocrit or packed cell volume (PCV) and electrolyte urea tests as there could be signs of contributing factors to the patient’s weakness. Flipping through the case note and the various attached laboratory investigative slips, Dr. S. Olowo responded that the patient’s latest PCV was 25%; but that they were still expecting the Urea, Electrolyte and Creatinine (UEC) results from the laboratory. At this point, Dr. S. Idegbe pointed at one of the medical students to tell him what the normal level of urea was, and the student responded. Dr. H. Atagwu chipped in and told the other team members that he phoned one of the laboratory technicians and had received encouraging feedback that the results of the UEC would be sent in before 2:00p. m.

Dr. S. Idegbe told Dr. S. Olowo, Dr. S. Igweh, Dr. R. Iyamah to pay attention to the patient’s entire situation, not just the hypertension and ordered for further investigations. Dr. S. Idegbe then dictated the additional investigations to be done to Dr. H. Atagwu, who wrote them into the case note. After he finished the writing,
Dr. H. Atagwu brought the patient’s x-ray film out of its encasement and informed the other team members that the x-ray results had been sent from the radiology department. He then handed the x-ray film to Dr. S. Olowo. Looking at the x-ray film, Dr. S. Olowo informed Dr. S. Idegbe that the ECG scan showed evidence of cardiomegally, and that there were some abnormalities in the chest that required further tests. Dr. S. Olowo flipped through the case note and wrote into it while discussing with Dr. S. Idegbe that the patient once had had significant postural hypertension. He then wondered why the patient was not compliant with taking the drugs. Simultaneously Dr. S. Idegbe placed the stethoscope and his fingers over the patient’s brachial artery at the elbow, and with the stethoscope headphones in his ears, listened for the beats of the heart. Looking at the monitor of the sphygmomanometer, while at the same time listening to the heart sounds, he told the patient to relax; after he had elicited the blood pressure reading, he tweaked the cuff and released the pressure. Then, he announced to the team members that the patient blood pressure was 180/125mmHg and that it needed to be brought down further.

When Dr. S. Idegbe finished checking the patient’s B.P., Dr. S. Igweh took hold of the patient’s hand using his two fingers (index and middle) to locate the pulse on the wrist at the base of the thumb. With a second hand wrist watch, he counted the patient’s pulsating beats for some seconds to know the pulse rate. He beckoned Dr. H. Atagwu to assist him in changing the position of the patient on the bed. He examined the chest and ribs with the stethoscope and then listened to the heart sounds in different ways. The patient was then made to sit in an up-right position, while Dr. S. Igweh told Dr. S. Olowu to listen to the heart sounds and pulse rates together. After confirming the heart sound was at S₃ (i.e. third heart sound) and the pulse rate was at 92, Dr. S. Igweh dictated to Dr. H. Atagwu, who later wrote down the findings in the case note. Dr. S. Igweh examined the patient’s abdomen, using his hands to feel the ribs and occasionally made hard knocks on the different parts of the stomach and ribs, while Dr. S. Olowo and Dr. R. Iyamah flipped through the case note. Dr. S. Igweh used the stethoscope to examine the chest again, made the patient sit up again and then back down while the other members of the team looked attentively. Dr. S. Idegbe asked Dr. R. Iyamah if he had called for a review from the orthopaedic surgeon. Flipping through the case note Dr. R. Iyamah answered that he had sent a consultation request to them, but that the review team had not yet arrived, though the nephrologists had reviewed the patient’s case and ordered for further investigations.

At this stage Dr. C. Chuwuka walked in, took the sphygmomanometer and stethoscope from Dr. S. Idegbe, used it to examine the patient’s chest, asked the patient to breathe in and out as he listened to the heart sounds.
He asked the patient “How much of the fuesmide are you taking?”. Then Dr. C. Chukwuka turned around and asked one of the students, “What are the features of cardiovascular disease?” As the first student was answering the question, Dr. C. Chukwuka told another student to listen to the heart sounds with the stethoscope and enquired:

> This is not a formal examination or x-ray of the chest. The idea is to listen specifically...can you tell me the process we learn in terms of pulmonary oedema? Can you tell me the whole process so that I can be sure that we are on the same page? (Dr. C. Chukwuka)

Dr. C. Chukwuka then focused on the students, asking them questions one by one. In this way he was able to reach out to the students’ learning space. The other students were listening, and at the same time, some of them were either copying notes in their notebooks or consulting with the clinical manuals. Dr. C. Chukwuka then left the team members with Dr. S. Olowo, Dr. H. Atagwu and some students to visit another patient.

Dr. S. Idegbe asked Dr. R. Iyamah if there was any compelling reason why they should not start with the patient’s drug now. Flipping through the case note, Dr. R. Iyamah told him that there were still awaiting the urinalysis test. “When was it taken?” Dr. S. Idegbe asked, and Dr. R. Iyamah responded “Yesterday”. “These are days for actions.” Dr. S. Idegbe said and he took a thermometer from the nurses’ table, and inserted its tip into the patient’s mouth under the tongue.

Dr. R. Iyamah had in the mean-time gone to collect the ophthalmoscope and patellar hammer, and came back later with both items. Dr. S. Idegbe took the ophthalmoscope from Dr. R. Iyamah and used it to examine the interior of the eyes of the patient while directing a tiny beam of light through the pupil to detect if there were any abnormalities or pathological changes that could signal other associated diseases. Swinging the patellar hammer, Dr. R. Iyamah checked the reflex on the patient’s hands with his finger on the bicep, hit the fingers placed on the biceps and occasionally bent the ankles. He then used the patellar hammer on the wrist to check the reflex of the triceps and then carried the two hands together with the thumb in-between. Dr. R. Iyamah also checked the reflex on the knee by palpitating the knee and striking the patellar hammer on it (for the knee jerk) and hit the ankles (for the ankle jerks). Before using the patellar hammer to check for other reflexes, he used the tape to measure the length of both limbs, and the marker to delineate
the mass of the upper border from the lower border, putting distinct marks around the mass.

Before moving to the bedside of another patient, Dr. S. Igweh explained to the patient that hypertension did not have symptoms all the time, and that there was a need to be more medication-compliant after discharge as non-medication compliance could cause damage to the eyes, brain, liver, kidneys etc., eventually leading to stroke:

*If you miss your drugs and wait till B.P. comes up...it means that your body is getting used to fluctuating increase and that it is why it is a recipe for stroke. Treatment for B.P. is treatment for life.* (Dr. S. Igweh)

The encounter was concluded, and Dr. S. Idegbe instructed Dr. H. Ossai to write down their interactions while the team moved to the bedside of a patient with congestive heart disease and an abdominal disorder. At this stage, Dr. R. Iyamah moved to a different location, while Dr. C. Chukwuezeke entered, exchanged pleasantries with Dr. S. Idegbe, Dr. S. Igweh, and Dr. S. Olowo, and asked about the patient’s condition. Dr. S. Idegbe responded that the patient had congestive heart failure, secondary to cardiovascular heart disease, and also a significant abdominal disorder. Dr. C. Chukwuezeke exchanged pleasantries with the patient and asked for the student who clerked the patient. Dr. C. Chukwuezeke told the student to present the patient’s case to the team member. He interrupted the students intermittently with questions and comments throughout the presentation. Then, Dr. C. Chukwuezeke asked Dr. H. Ayidu to present his diagnosis, plan, and assessment of the patient. Dr. H. Ayidu presented his diagnosis and assessment and Dr. C. Chukwuezeke, while flipping through the patient’s medical record, asked Dr. S. Idegbe, Dr. S. Igweh and Dr. R. Efangwu about the challenges of treating the patient. Dr. C. Chukwukwuezeke then took the sphygmomanometer from Dr. S. Igweh and used the stethoscope on his neck to measure the patient’s blood pressure. He told one of the students to measure the patient’s blood pressure and asked the student about the gradation and systemic nature of the patient’s hypertension. The student responded, and he further asked the student.

*Tell me the difference kinds of B.P. and which other type that does patient have? When last did the patient take her medicine? What grade of B.P.? You must be able to grade B.P. Is the hypertension systemic or*
what do you think it is? Okay, give me two differentials in cardiovascular system. (Dr. C. Chukwuezeke)

Dr. S. Idegbe intruded and asked the students generally; “Do you know why it is important to grade B.P.? Then he went on to explain the different things that determined the aggressive method used in high blood pressure interventions. Dr. C. Chukwuezeke discussed the case with Dr. S. Idegbe, Dr. S. Igweh, and Dr. R. Efangwu and then asked them what they made out of the fact that the patient was still coughing. They all responded accordingly. He then flipped through the patient’s medical record and asked Dr. R. Efangwu if the patient had had an echocardiogram test. Dr. R. Efangwu responded in the affirmative and Dr. C. Chukwuezeke flipped through the echocardiogram result and informed the other team members that there was congestion in the patient’s chest. He recommended to Dr. S. Idegbe that the patient’s case should be discussed with the Consultant Microbiologist.

Bringing out the x-ray films from its encasement, Dr. C. Chukwukuzeke asked Dr. S. Idegbe about the patient’s x-ray resultS and then dictated to Dr. H. Ayidu, who wrote what Dr. C. Chukwuezeke was dictating in the case note. Dr. C. Chukwuezeke examined the x-ray films and then said to the other team members that x-ray examinations should not be compromised. He then asked Dr. S. Idegbe, Dr. S. Igweh, and Dr. R. Efangwu questions about the gold standard for x-rays. The three of them responded accordingly and Dr. C. Chukwuezeke further explained

When we are talking about standard, the issue of evidence comes in. At the top is random trial and at the bottom is expert opinion. It is better to look at the evidence from the use of random trial than expert opinion. (Dr. C. Chukwuezeke)

Looking at the drug chart, Dr. C. Chukwukwuezeke asked Dr. R. Efangwu about the drugs that were prescribed to the patient, and why he thought that a triple regimen was the best treatment for the patient. Dr. R. Efangwu answered and Dr. C. Chukwuezeke turned around and said to the other team members:
What lesson do we learn from this...? When we come to the bedside of our patients and see a medicine that we are not familiar with, write it down and go and find more information about it...their generic foundation. (Dr. C. Chukwuezke)

At this point, the patient coughed and Dr C. Chukwuezke asked Dr. S. Idegbe whether the patient was still coughing. He also started pointing at different parts of the patient’s abdomen, asking the Senior Registrars what struck them about the fact that the patient was still coughing. Dr. R. Iyamah re-entered and joined the team.

Dr. C. Chukwuezke examined the abdomen by pressing the different parts of the abdominal regions and asked the patient if she felt pain around those areas. Dr. C. Chukwuezke continually pressed the abdomen giving the patient hard knocks while looking for areas of superficial tenderness or other visible abnormalities such as the liver, kidney and spleen enlargement around the mass of the abdomen as he talked and asked the students questions. He told the patient to breathe in and out and while the patient was breathing in and out, he asked one of the students “What happens to the diaphragm?” He then pressed and pushed up the lumbar region, tried to see if there was any massive pressure hitting his fingers beneath the breast on the right hand space. He used a tape measure and announced to the team members that the liver was not enlarged and had a normal span of 9 cm. Dr. C. Chukwuezke then checked the patient for palpitation and ascites, demonstrating this by moving his hands up and down the chest to the throat, neck and back. He turned the patient to his side to check for ascites, and told the team members that the beating was dull, that “it is shifting dullness”. While demonstrating, Dr. C. Chukwuezke was asking the students questions one-by-one:

For example, to one student, he said, ...tell us what general examination are important in abdominal examination?

To another student he said, ...tell us which other examinations are necessary?

To the third, he said, ....tell us the things that cause abdominal problems?

To a fourth and fifth student, ...what are the causes of finger clubbing?

What is finger clubbing?
He continued asking the students questions and occasionally asked Dr. S. Idegbe, Dr. S. Igweh, and Dr. R. Efangwu to throw more light on the students answers. He then concluded the encounter with the patient by saying that:

*Medicine is derived from first principle...you start from the basic and it follows like that. The bottom-line of all this is that in systemic examination, anything you do is important... The point is that as a medical doctor, they are certain things you can make a diagnosis from...just looking at the face... like swelling face, you can make a diagnosis. You have talked about butterfly rash. You look at the face, what does it suggest?.... The lesson we learn here is that we approach our patient with open minds, not bias so as to explore all the possibilities.* (Dr. C. Chukwuezeke)

The above prologue illustrates the CPT team’s encounter with two patients at one of the wards observed during the study. It offers a fruitful episode for introducing the discussion of the information practices of the team and the role of tools and artefacts in work activity. In the team’s encounter with the patients, there was the prominence of interactions amongst the team members with the continuous use of the different various physical tools such as the sphygmomanometer, stethoscope, ophthalmoscope, and (re)turning to the case note. The writing by different members of the team on the case note implied that the information gathered from patients were collated and kept together giving rise to bodies of information that could be consulted on future occasions through the practice of (re)reading and (re)writing. It was also found in the study that language had a central role in work activity.
6 Clinical Pharmacology and Therapeutic (CPT) Unit as an activity system

This chapter will build on the background history of physicians in Nigeria as discussed in Chapter 2 by describing the occupational environments where the team members of the Clinical Pharmacology and Therapeutic (CPT) Unit work. The overall purpose of the chapter is to capture some of the dimensions and characteristics of a real-life work setting in a Nigerian university teaching hospital with the aim to situate the study in context. The CPT Unit’s specialty is of central interest to the other units due to the challenges related to drug prescriptions and the adverse effects of drugs. The description of the CPT team’s work environment in this chapter sets the stage for the subsequent analysis of information sources and strategies, role of tools and artefacts, and information practices in their work activity. The research question to be addressed in this chapter is: What noticeable attributes emerging from physicians’ work frame information practices?

6.1 Clinical Pharmacology and Therapeutic Unit (CPT)

In this section, the characteristic features of the CPT Unit are discussed. The CPT Unit is one of the ten units of the Department of Internal Medicine at the University of Benin Teaching Hospital (UBTH). At the time of this study, there were explicitly written documents proffering information about this unit to the public. Like any other units at UBTH, the CPT Unit has its own structure, aims and objectives, staff members, and modalities for attaining goals. The unit was established in 1996 with a focus on pharmacovigilance activities within the hospital because of the numerous challenges regarding drug prescriptions/abuse and adverse drug reactions. The CPT Unit has its own specialty, and its aim is to become a unit that addresses most of the pharmacological and therapeutic problems in the southern part of Nigeria. The CPT Unit is also involved in the health care of patients. This primary objective is the focus of this study.

The CPT Unit’s operations hinge on the main objective of UBTH, which is based on the triad of teaching, service, and research. With regards to teaching, the unit is involved in the training of undergraduate students in the following ways: 1) preparing them for the practice of medicine; and 2) offering them the requisite knowledge and skills on how to appreciate the pharmacokinetics and pharmacodynamics of various drugs. The unit is involved in providing various forms of post-graduate training to qualified physicians. It also provides the substrate for research as its members are involved in research activities that cut
across the different research areas in medicine. In addition, the unit engages in other departmental activities such as seminars, chart reviews, departmental clinical meetings, and grand rounds. The CPT Unit also collaborates with various national and international organizations.

The CPT Unit provides for the health care of patients, which is neither restricted nor localised to particular rooms and offices, but instead is distributed across the teaching hospital premises such as: 1) running a general outpatient clinic two days per week in the Consultants’ Out-patients’ Departments (COPD); 2) managing patients admitted into the wards; 3) attending to patients at the casualty unit of the Accident and Emergency Department (A&E); 4) Overseeing the Adverse Drug Reaction (ADR) Clinic; and 5) overseeing the supporting drug/poison information unit located at the same centre as the ADR unit. The unit gathers information about pharmacovigilance and the toxological reactions of patients and ensures that such information is disseminated and communicated to other units/departments within the teaching hospital and relevant health care agencies both nationally and internationally. The last two functions highlight the CPT Unit as a focal point of reference in UBTH and as the main provider of drug information in Nigeria. It is the first three (of the above five) functions that provide the basis for undertaking this study.

6.2 Membership in the CPT Unit

Work activity in the CPT Unit is carried out by a homogeneous group of professionals whose strengths lay both in their esoteric knowledge of medicine and the medical culture of practice as stipulated in the Code of Medical Ethics in Nigeria (2006). The distinctive hallmark of the CPT Unit is that all its members are strictly qualified physicians. Dr. C. Chukwuezeke, explained that medicine is not like other disciplines, meaning:

That you can start somewhere and end up somewhere else very far from where you started; without a basic training in Medicine, you can’t build a skyscraper where there is no foundation. (Dr. C. Chukwuezeke)

Many of the participants talked about how their undergraduate medical training equipped them to be part of the CPT team. Dr. H. Ayidu averred that because of this training:

We are not lost; we are not at sea per se when our senior colleagues
are talking and we easily catch up with the information being passed.  
(Dr. H. Ayidu)

All the participants agreed that the initial training was the foundation upon which their future professional careers rested. In medical practice, the attainment of the first degree certification is deemed insufficient to practice as a specialist. In Nigeria, internship programs and various forms of residency programs ensure continual education towards professional specialization. Dr. C. Chukwuka averred,

*It is not a first degree thing, even in the best medical school in the world you cannot come out with a first degree and try to practice as a specialist.* (Dr. C. Chukwuka)

In UBTH, the programs are a coordinated sequence of professional curricula alongside tutelage by apprenticeship in practice. Hence, the social configuration of the CPT Unit entails homogeneity within the profession and a heterogeneity that is disparate in terms of training, level of specialization, experience, and exposure. The CPT Unit is an example of a specialty-based unit structure depicting an elaborate academic hierarchy of learning and responsibility in teaching hospitals. Membership in the unit comprises of Consultants, Senior Registrars, Registrars, and House Officers. The Consultants are at the most specialized level and their role entails advancing clinical knowledge and functions in the unit. The other three groups are at different phases of the apprenticeship trajectory where the Senior Registrars play an active role in supporting the learning activities of the remaining two: Registrars and House Officers. Apprenticeship for the Registrars and House Officers means doing the bulk of the routine and administrative duties as they serve under the Consultants to gain knowledge and experience in patient health care. However, duties and responsibilities are rotational and distributed across the team.

In this study, membership of the participants is categorized into two groups by virtue of their participation in the unit as a social learning community – core membership and peripheral membership. Five core members were identified, which were the two Consultants and the three Senior Registrars in the unit. The core members have a key role in maintaining the conformity of the team members to medical practice and standards. Dr. C. Chukwuka explained it as follows:

*People build culture within the unit, some understanding, and all that, and we have to ensure conformity to the standards of medical practice,... when you build that and is on-going, everybody appears to understand what the standard is within the unit and attends to it.* (Dr. C. Chukwuka)
Membership at the peripheral level fluctuates heavily due to the high mobility of members, who frequently move in and out of the unit. The membership of this group ranged between 6 and 9 throughout the study period. They included the Registrars who underwent rotations for a period of three months as part of their preparation for the Part 1 Residency Programme Examination. The House Officers, who were newly graduated physicians were also on a three-month rotation with the Department of Internal Medicine as part of their compulsory one-year internship training. The House Officers were allocated by open ballot to the various units in the Department of Internal Medicine, including the CPT Unit. Dr. H. Atagwu, described it as:

*Like a game of mere chance where everybody resigns to fate to avoid preference or bias.* (Dr. H. Atagwu)

While the above description in the preceding two paragraphs represents the in-house operational configuration of the CPT Unit, there are other members assuming marginal positions as outsiders. These include specialty physicians from other University Teaching Hospitals both in Nigeria and West Africa undergoing fellowship programs in the unit. There are also undergraduate students (medical and dental) who do their clinical posting at the unit for a period of about three months. In essence, the CPT team members do have a clear vision of the unit’s goal to provide optimum therapy to patients. As Dr. C. Chukwuka explained, it is “because definitely we want to ensure that whatever we are doing, we are pursuing excellence”.

### 6.3 Motivation towards patients as object of activity

Patients are regarded in this study as the object or ‘lure’ that is the motivational factor for activity of the CPT team, which starts when a patient first visits the Accident and Emergency (A&E) Unit or the Consultants’ clinic for medical attention, to the time the patient is discharged from the inpatients ward. Thereafter, the activity is reactivated by subsequent appointments. Typical patients that the CPT team members attended to during the study period were adults with systemic diseases. These included cases of diabetes, hypertension, various forms of cardiovascular disease, geriatrics (elderly), retroviral diseases (HIV or AIDS), and drug reactions and allergies. There were also cases of kidney or renal failures, liver disease, obstructive respiratory problems, and gastrointestinal problems. The patients that the CPT team members attended to were categorized into; 1)
outpatients on appointments; 2) first-timers as outpatients; 3) inpatients on admission in the wards; 4) patients attended to at the Accident and Emergency Unit (A&E); and 5) patients from other units/departments and hospitals.

I had, in the course of the interview, tried to find out from the participants their own perceptions of patients. The participants made similar allusions to the patient as the central point of their activity in two ways. Firstly, the participants saw a patient as any individual who had a medical problem that required either clinical attention or a physician’s intervention and solution. Dr. H. Aghogho put it as follows: “a patient is somebody that comes to the hospital with complaints that he/she has some problems that required medical attention”. Dr. R. Efangwu reasoned that the fact that a person has sought medical attention is indicative of a sign of illness that needs the attention of a physician. The person may have sought medical attention on his/her own, were brought in by some other persons, or were referred to the CPT Unit by other physicians. Dr. C. Chukwuka, argued that most people do not even realize that they are patients and that they may have an ailment requiring medical attention. The line between wellness and un-wellness is very thin and Dr. R. Iyamah explained that someone who is slightly overweight may not seem to have any physical problems at that time, but may actually have medical problems that require attention.

Secondly, the participants saw patients as a useful information source for commencing a diagnosis and initiating a treatment plan. Dr. H. Aghogho pointed out that deciding immediately what the problem is could be problematic if a physician does not have information regarding events that preceded the ailment. He further explained regarding a patient in a coma:

Then we will be managing the patient based on sickness that can present with coma, we would not know the actual thing wrong with the patient unless we commence investigations ourselves. (Dr. H. Aghogho)

The initial information from the patient was necessary, but Dr. S. Idegbe argued that such information was not enough as:

You need to clarify from the patient from time to time whether what you have instructed to be carried out on him has been done. (Dr. S. Idegbe)

Dr. R. Efangwu saw it in the same way as Dr. S. Idegbe by arguing that
You have to keep your mind open to be able to pick up anything whatever not really directing your mind properly to any specific thing, because you may miss other things if your mind is not open. (Dr. R. Efangwu)

The views of Dr. H. Aghogho, Dr. S. Idegbe, Dr. R. Efangwu and Dr. C. Chukwuka echo the significance of the patient as the object of activity. They included: solving a puzzle of a problem at hand; managing the patient ailment to restore the patient’s health; and keeping track of the patient’s ailment trajectory during the course of treatment. All participants related all three together without giving a higher priority to any particular one. What information the participants normally looked for depended on the present symptoms of the disease(s). For example, Dr. H. Aghogho explained that if a patient exhibits symptoms of a liver disease, it may be indicative of environmental toxins or the patient’s lifestyle, e.g. factors such as drug-induced medications. Dr. R. Iyamah and Dr. H. Aghogho expressed concerns about some patients not being truthful. Dr. H. Aghogho exemplified it with a case of a known alcoholic with a liver problem who told the team members that he had:

Never taken alcohol before. Meanwhile, somebody that was staying with the patient at home told us that the patient has been taking alcohol for the past so, so, and so years. (Dr. H. Ahgogho)

In the absence of reliable information, Dr. R. Iyamah argued that:

Unless you have a strong hunch, you have a strong suspicion, you can actually be misled...and it is unfortunate, it can happen. (Dr. R. Iyamah)

The patient was also seen as an information source in the same sense as text or print material that could be studied, examined, understood, and interpreted. Some of the participants averred that they sometimes read patients like a book; others claimed that they read patients like a newspaper story. For others, it was reading patients in a less complicated manner like a piece of straightforward expository prose. This relates to Hunter’s (1991, p. 8) assertion that “like all readers, physicians read by understanding the signs and fitting them together into a recognizable, communicable whole” (emphasis mine).
6.4 Wider community

The CPT team’s work activity is not confined to the unit. The activity of the team cannot be considered independently from the rest of the UBTH environment and the surrounding world at large. The wider community comprises of the Department of Internal Medicine, of which the CPT team is part of, along with the broad range of other units/departments in the teaching hospital (See Chapter 2.4). The unit is also connected to the activities of other health institutions, different medical professional bodies, and affiliates. The interactions between the CPT team and members of the wider community were endemic and pervasive as exemplified by the case of a female, who was a known hypertensive and alcoholic patient with hepatitis cirrhosis. Although the CPT team primarily managed the patient while she was admitted at UBTH, the participation of members from the wider community was prominent. Series of tests were done by the various laboratories. Specialist physicians such as neurologists, nephrologists, physiotherapists, psychiatrists, dieticians, orthopaedists, and even the ophthalmologists were invited to review the patient’s case. Also, other units/departments such as the blood bank unit, the haematology unit and surgery department were involved in the management of the patient. Throughout the duration of the patient’s stay on admission at the hospital, nurses were on the ground to administer the team’s plans.

The boundary between the CPT team and the wider community is very clear and delineated. However, there seems to be the presence of what Wenger (1998, p. 112) referred to as ‘boundary encounters’, which is a process of negotiating a practice with outsiders. The encounters reflected a commonality of shared purposes. I recount an episode where the team did a presentation on problems associated with “The Use of Antibiotics and Need for Caution” at a clinical meeting of the Internal Medicine department. The topic was Cephalosporium Acremonium and focused on the use of a skin test for penicillin reactions. After the presentation, there was dialogue between the CPT presenters and specialist physicians from other units as follows:

Consultant A and B (wanted to know about the importance of such a research)

CPT Presenter 1: “The need to make physicians to be aware of adverse drug reaction of antibiotics and to advise physicians to be weary and listen to complaints of their patients.”
Consultant A and B continue asking questions about a reported case of drug allergy from the use of the antibiotic and the three presenters responded accordingly.

CPT Consultant: *On a practical note, there is a lesson to be learnt from it. A number of times patients complain about drugs. Don’t overrule them as the patient may have eclectic reaction...As regards skin test to penicillin reaction, I do not recommend it because it could trigger out a whole lot of chain reaction.*

Consultant B does not agree with the CPT Consultant about not using the skin test to test penicillin reaction.

CPT Consultant: *Most people who have these reactions have been sensitized and if you are sensitized, you have the ability to develop an eclectic reaction. If you have to administer penicillin, you have to have your adrenalin. The message is that if you want to administer the drugs, you should be prepared in case of any eventuality.*

Consultant B: *Are you saying that we should not administer penicillin?*

CPT Consultant: *No, I am not saying that we should not administer penicillin. What I am saying is that we must put the precautionary measures in place in case of any eventuality.*

CPT Presenter 1 continues with presenting cases of patients who had had adverse drug reactions and were managed and treated by the unit.

Consultant C: *What then is the difference between drugs carbapenem, which are B-lactams from penicillin?*

CPT Presenter 2: *The use of the drug is getting commoner. We are having sensitivity pattern.*

Consultant D: *At what stage did the surgery come in?*

CPT Presenter 1: *Day 35*
CPT Consultant: *In fact, we have to regulate the use of this drug, otherwise we will run into trouble*

Consultant E: *What I expect you to say is that in cases where there are anti retroviral…it is not a familiar case. It is nice to know from our colleagues who are using it so that we can become familiar with it, too.*

The above extract exemplifies boundary encounters and reflects the kind of interactive dialogue between the CPT team members and members of the wider community in shared practices. Such interactive dialogue provides a forum for discussions, brainstorming, and information sharing; hence the comment from Consultant E “…it is nice to know from our colleagues who are using it so that we can become familiar with it, too”. Consultant B did not agree with the CPT Consultant about using the skin test to test penicillin reactions. This reaction underscored the fact that boundary encounters are not merely routine procedures, but are situations where meaning is negotiated between the participating actors. How pervasive and endemic the wider community is to the CPT team’s work activity is seen when Consultant D asked the presenters about the surgery of one of the patients who had had a reaction to drugs. The question indicated that patients’ treatment by the CPT team is not done in isolation from the wider community.

The interactions between the CPT team and the members of the wider community went even beyond boundary encounters. Over time, encounters had gained a history that was sustainable. The excerpt below shows how the Consultants and Senior Registrars echoed the need to establish a defined approach to antibiotics policy and maintain protocols for their use in the teaching hospital. Consultant F acknowledged that the problem was real and voiced concerns about the escalating cost of establishing the policy and even maintaining the protocols.

CPT Consultant: *Some time ago, we found out that there were fungal growth in the drugs…so please before you give any infusion, make sure that it is clear. The point is that we need a very sensitive and defined approach to our antibiotics policy.*

Consultant B: *We did a study in this unit, and a new practice that I have found…all the infusions invented was contaminated…We should be conscious about the IV infusion¹⁰⁷.*

¹⁰⁷ IV infusion is an acronym for intravenous infusion - a medical term that describes the way certain kinds of medicines or other substances are administered to the body.
CPT Consultant: *What should we do? I have seen it several times where a patient can bleed to death.*

Consultant F: *We have to be very careful. It is a question of being between the deep blue sea and the lion. We really need to be careful and abide along the line. Do patients really need drugs...if you have to give between carbapenem and penicillin?*

CPT Consultant: *I think it is something that we have to put in perspective to forestall dangers in giving IV infusion...We have to have protocols about giving it.*

Consultant F: *I think we should really set a policy.*

CPT Consultant: *I think the best thing to say, is that in the administration of IV infusion, there should be procedures to follow.*

Consultant F: *The reason that I am asking you is that for a drug that is very expensive, we have to justify its use...It has to be free.*

Presenter 1 presents directives for use: 1) Suspend content of vial with 10mls of appropriate solutions; 2) Do not infuse directly; 3) Transfer to 100mls solution; 4) Repeat with additional 10mls; 5) Agitate mixture till clear; 6) Infuse over 20

### 6.5 Activities

Restoring patients’ health to normalcy seemed to be the overarching motive of the CPT team’s activity, though the activity *per se* was not monolithic. The CPT team members individually or collectively assemble in pursuit of a series of goal-directed activities. Their activities included diagnostic, therapeutic, monitoring, and discharge activities. However, the team’s work activities were not achieved through static and rigid processes. The dialectical relationship between the team members and patients implied that activities were seen as emergent, ubiquitous, fluid, and dynamic.

Diagnostic activity involves both the subjective and objective assessment of
patients. The subjective assessment entails information proffered by the patient in response to the physician’s questions, as exemplified by Dr. H. Ayidu.

Physician:  *How do you feel?*

Patient:  *Oh, I am feeling fine…I am feeling better…I am feeling worse…I have pains all over my body.* (Dr. H. Ayidu)

The objective assessment is the physician’s own assessment of the situation, which Dr. C. Chukwuka categorized into three: 1) the initial or tentative diagnosis; 2) other possibilities known as differential diagnosis; and 3) a host of investigative activities.

Therapeutic and monitoring activities were undertaken simultaneously. Therapeutic activity pertains to interventions in the form of treatment of the disease mostly by prescribing appropriate drugs. Monitoring implied a step-by-step follow-up after therapy had commenced. Dr. C. Chukwuka explained:

*The treatment itself, observing the patient itself, and monitoring the parameters is part of the treatment in quote.* (Dr. C. Chukwuka)

Monitoring involves engagement with the wider community and offers the team members an opportunity to frequently see patients alongside specialist physicians from other units/departments in order to review and re-evaluate the patient’s medical status and clinical parameters, to do further investigations, and to (re)adjust the treatment.

*You must monitor the clinical parameters, and we even invite our specialist colleagues to review and re-evaluate patients. We monitor clinical parameters to ensure a patient is improving. We look at the indices…how far are they deranged, especially different from normal and all that, and when you find that those parameters are tending towards normal, you say that the patient is improving. If the parameters are deviating and getting away from normal, it then means that the patient is deteriorating…We are able to carry out more tests to see the current status of the patient, whether it shows stability or whether there is any deterioration or warning sign that we ought to look at. We are then able to re-examine…and then look at potential dangers, potential stress, potential harm that can occur to the patient…and see whether they are being adequately taken care of.* (Dr. C. Chukwuka)
Hospital care cannot be perpetual, and patients admitted in the in-patients wards undergo discharge activities. The participants enumerated some of the objectives as: 1) complete cure of the ailment; 2) controlling the parameters; and 3) just alleviating the pain or suffering, knowing fully well that much cannot be done. When a patient is well or cured, he/she can return back to normal daily life. Dr. C. Chukwuka, explained that the patient is therefore advised that whenever there is any problem, to “get back to us and let us know, and at that point you try to offer advice by saying well try to avoid this or do that, the do’s and the don’ts”. Dr. C. Chukwuka further explained that there may be some chronic disorders or ailments that occur in repeated episodes, such as hypertension, epilepsy, and angina of the heart, that call for follow-ups. According to Dr. C. Chukwuka,

*When you have been able to control what appears to be some form of aberrations in the patient’s life at that point in time, you know that it is likely to reoccur if not suppressed in cases of diseases when you have exerted control or even the episodic ones as well. In this vein, it may be quite well to say that for the moment your problem is alright but you may have to be on some drugs, we may have to see you periodically, we may have to do some investigations periodically. The patient is then allowed to go home and visit back at intervals for follow up. (Dr. C. Chukwuka)*

Often, the team engaged in all the activities simultaneously, as illustrated in extract below of the team attending to a diabetic patient. Thus, activities tended to be pervasive and dynamic, swinging the pendulum towards where the team’s motives were geared.

Dr. S. Idegbe to Patient: *Will you say you have done well? How do you feel?* Patient seems to concur.

Dr. S. Igweh: *What is the blood sugar? Was his blood pressure taken this morning?*

Dr. H. Ayidu: 130/80

Dr. S. Idegbe to Dr. S. Igweh: *He is a little bit pale. What is his*
Dr. S. Igweh: 31%

Dr. S. Idegbe: Checks pulse, touches, and examines the foot with his hands.

Dr. S. Idegbe: *He said that he has rigor and headache.*

Dr. S. Igweh: *How long did the rigor last?*

Dr. H. Ayidu: *Two hours.*

Dr. S. Olowo: *But the headache lasted for two days.*

Dr. S. Idegbe to Dr. S. Igweh and Dr. S. Olowo: *What do we do? Are we to continue with the sizzling? We must place him on antibiotics.*

Dr. S. Igweh: *I gram daily.*

Dr. H. Ayidu brought out the x-ray results, and handed it over to Dr. S. Olowo, who examined them.

Dr. S. Idegbe to Student: *Please check the patient’s eyes and lips to see if he is pale.*

Student examined the patient’s eyes and lips.

Dr. S. Idegbe: *We will do further test on him.*

Dr. S. Igweh looked at and examined the x-rays results. He gives it to Dr. S. Olowo who looked at it again and further examined it.

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108 PCV stands for packed cell volume, a measure of the proportion of blood volume that is occupied by red blood cells. (Wikipedia, the free encyclopedia, assessed at http://en.wikipedia.org/wiki/PCV)
Dr. S. Idegbe tells the student he had earlier instructed to examine the patient eye’s for paleness to report on his findings: *Is he pale?*

Student: *He is mildly pale.*

Patient complains.

Dr. S. Idegbe looked and examined the patient’s lips and then asked Dr. S. Olowo: “*He is on vitamins, is he not?*”

Dr. S. Idegbe to Dr. S. Igweh: *How many patients did you assign to the students for clerking?*

Dr. S. Igweh: *Two students to one patient.*

Dr. H. Ayidu read and wrote in the patient’s medical record.

Dr. S. Igweh also wrote in the patient’s medical record.

Activities often intersect. For example, the diagnosis of a disease condition would be the basis for initiating some forms of treatment, and the treatment trajectory requires some forms of monitoring. Dr. C. Chukwuka reasoned:

> If the patient requires prompt treatment, you have to start it following your initial diagnosis, what we call the empirical treatment, you initiate some therapy. So when therapy is initiated, you monitor the patient to see whether the patient is benefiting, the various parameters are improving, and if there is no change, you have to note that. So that you can now reconsider, reassess or reevaluate your treatment. Or if it is causing harm, you have to immediately intervene. In order to stop treatment or something else, or to counter it in one way or the other, you must be able to take the appropriate steps, you know after initiating therapy. (Dr. C. Chukwuka)

### 6.6 Operations in the CPT unit

The CPT team’s work activity is dependent upon a series of concrete conditions
and a myriad of actions. Five operational levels were identified in the study context. These included the Consultants’ clinics, ward rounds, Accidents and Emergencies (A&E), morning reviews, and clinical meetings.

6.6.1 Consultants’ clinics

The CPT consultants’ clinics were held twice a week in the Consultants’ Outpatients Department (COPD) in three sparsely furnished rooms that offered no privacy. On a typical working day, the COPD department is crowded with patients and UBTH staff (particularly nurses) coordinating activities.

The consultants’ clinics are for various patient groups: 1) previous patients on follow up appointments; 2) new patients; 3) patients referred from other units/departments; and 4) patients referred from elsewhere. The total attendance per day ranges from 50 to 70 patients. Clinical activities regarding time management are not computerized, and patient appointments are manually scheduled two to four weeks out. There are provisions for urgent appointments, but usually, consultations take place on a first-come, first-served basis. On a normal working day, patients arrive at the COPD beginning at 7:30 a.m. and consultations take place between 9:00 a.m and 2:00 p.m. Hence, some patients are required to wait for few hours before the staff is able to attend to them.

I once asked Dr. C. Chukwuka about the possibility of slot time management at the Consultants’ clinics. He smiled and responded, “Esther, you seem to be at sea here you know”. Being a Nigerian citizen, I understood what Dr. C. Chukwuka’s response implied. Adhering to slot time management would not be workable considering a number of extraneous factors as discussed in the background history (cf. Chapter 2) and the inherently prevailing phenomenon of ‘African time’ in Nigeria. “African time” is a common Nigerian adage, meaning the lack of punctuality with appointments, meetings, and events, depending on the conveniences and constraints of the participating actors. The first-come, first-served basis seems to be the most practical in avoiding disruptions to the team’s work activity. Dr. C. Chukwuka said:

you slot a patient for appointment by 9 am, and you see him/her coming in around 1 pm, what would you expect the team to do?........ You and I know very well that this kind of lapse would happen more frequently than expected or even imagined and then everything gets muddled up.

(Dr. C. Chukwuka)
Depending on the problem, the amount of time spent by the CPT team with each patient varies at length between 10 to 45 minutes. There are usually no time intervals between consultations.

6.6.2 Ward rounds

Ward rounds are one of the most important operations in the CPT team’s work activity. When I first started following the CPT team at the onset of the empirical study in 2008, my initial impression of the ward round fit well with O’Hare’s (2008, p. 309) description from the patient’s perspective of “a passing parade of white coats that arrive at the bedside unannounced, speaks, listen (occasionally), and murmurs in jargon only to pass on all too quickly”. On week days between 9:00 a.m. and 4:00 p.m., groups of physicians were at different locations within the vicinity of UBTH’s over 500 beds, moving arbitrarily from bedside to bedside. As the study progressed, it became clear to me that the ward round was more than just “a passing parade of white coats” that sometimes caught patients unprepared. Rather, the ward round was an aspect of the lived-in-the-world practice of the specialized esoteric knowledge of the physicians. The orientations in ward rounds were practical in addressing not only clinical issues pertaining to patients, but were also geared towards ‘bedside teaching’, an important and integral aspect of the medical professional practice for learning.

There were various forms of ward rounds identified in the study context. They included Consultants’ ward rounds, Senior Registrars’ ward rounds, Registrars’ ward round, and House Officers’ ward rounds. The length of time spent with each patient during ward rounds varied and ranged from 10 to 45 minutes, or even more depending on the patient’s health condition. The ward round is one of the forums that allows all the members of the CPT team to obtain good insight into all the inpatients managed by the team. Before the ward rounds, the House Officers in charge of each patient ‘clerk’¹⁰⁹ patients to gather information from them. The medical students (usually assigned in pairs) also do this same ‘clership’ as part of their training. The information gathered is usually presented to team members during the ward rounds.

During presentations, both the core members and the peripheral members ask

¹⁰⁹ While to ‘clerk’ means to take the history of patient’s illness and to do a clinical assessment, ‘clerkship’ is the entire process or stage of training that entails the history and assessment of the patient.
questions, but as Dr. H. Ebi explained, the decision-making is done at the higher levels of the hierarchy. Dr. H. Ebi admitted that he was reluctant to ask questions most of the time because he was a House Officer: “just want them to say okay, this is what you are going to do”. However, Dr. H. Ebi further explained that he found himself answering questions from his senior colleagues most of the time during ward rounds, with the latter making all the decisions. According to Dr. H. Ebi:

> Then you will give answers to such questions; they are the ones that actually ask questions most of the time. They ask questions and you answer. Then they tell us that this is what we should do for this patient though they would also need to have information from us to make concrete decision...Then they can continue from there and tell us that what we said was right or that we didn’t say it well and all that. There would be probably positive decisions taken, but that is at their level. So it can go that way. So most of the time, they are the ones who really ask us questions. (Dr. H. Ebi)

Ward rounds provide a forum for reviewing and evaluating patients’ cases. While the team members proffer contributions and opinions, the core members make the decisions and plan for future courses of action. This is done repeatedly throughout the duration of the patient’s stay in the hospital until either they are discharged or transferred to another unit. Information gathered at this level of operations is for the practical purpose of managing the patient, though Dr. H. Ebi noted that because medicine is academically oriented, “the information could be for academic purpose”. Ward rounds thus offer a forum for the attainment of the stated objectives of UBTH, which is legitimizied by the value placed on learning. In this respect, ward rounds are seen as avenues for the teaching seminars led by the core members. The teaching seminars are mostly interactive as the team members share experiences. Dr. C. Chukwuka viewed them as “a learning session...because each patient forms a substrate for learning...from the students’ right to the professors”. Dr. H. Ossai shared this view on ward rounds as teaching seminars noting that:

> If a Consultant comes for a ward round, it is partly to see patients and to teach the resident doctors, the interns, and the medical students.(Dr. H. Ossai)

The benefits of ward rounds are ample. First and foremost, there is the free flow of information and medical knowledge. The peripheral members are not limited to only listening to the discussions and brainstorming of the core members. They are full participants and gain directly by being actively involved in the presentation of cases and also by being able to practice their presentation skills in a supportive
environment; the core members provide feedbacks, e.g. they nod in approval, question, and expressly communicate their opinions and contributions. This supportive environment also includes the occasional expression of social disapproval. The core members focus on the presentations of the peripheral members, the medical students in particular, as a way of ensuring that proficiency is enhanced. They kept saying, “practice makes perfect”. Secondly, ward rounds provide a forum for peripheral members to gain practical hands-on experiences with physical examinations. The peripheral members not only participate in physical examinations under the tutelage of the core members, they also have the benefit of gaining from the experience of the core members.

Ward rounds support professionalism, as stipulated in the Medical Code of Ethics, and the advancement of knowledge, in accordance with the Hippocratic Oath. Both documents enjoin that physicians share their knowledge with each other. Through ward rounds, the core members of the CPT team ensure that they pass on their knowledge to the peripheral members. In addition, this practice ensures conformity to the standard of medical practice. For example, Dr. C. Chukwuezeke had asked a medical student questions about the differentials in cardiovascular system; not being satisfied with the answer given by the student, he said:

No, I will not take that from you because in my almost 20 years as a practicing physician...(Dr. C. Chukwuezeke)

6.6.3 Morning reviews

The morning review is a fixture and an integral part of the academic training program in the Department of Internal Medicine. It is seen as the connecting point between the CPT team members and the wider community of the Internal Medicine Department as they all sit around the conference table. Medical students on clinical posting also attend these sessions. Morning review is usually a 60-minute full-house conference of physicians. It is held every week-day and entails Registrars who were on call the previous night or during the weekend. The Registrars present patients’ cases admitted through the Accident and Emergency (A&E) Unit. The scenarios at the morning review sessions are different from that of ward rounds and Consultants’ clinics, in that the patient, who is the object of activity, is not present.

Medical students and physicians from the Internal Medicine department enter the seminar room beginning at 7:30 a.m. The medical students place their workbooks on a desk in the centre of the seminar room. By 8:00 a.m., all the participants are seated, and one of the Consultants or Senior Registrars asks, “Who is to present
case(s) now?" or “Who are those to present cases today?” The presenting Registrar moves to the centre of the conference room, opens the patient medical record folder, and says something like “I am ready” or “May I present now” or “Right here”. The Consultants or Senior Registrars then say “Okay, you can carry on” or “Go on”, or “We are listening”. Presentations normally take about 10 minutes while the other presenting Registrars wait for their turns. Patients’ management protocols are read aloud to inform the audience of respective cases.

The presenting Registrar starts by informing the audience of how many patients were admitted during his duty and then moves on to presenting the individual cases, as exemplified in the data extract below.

This is the first admission for patient X, a 49 years male (occupation) (tribe), (religion) who presented to the A&E last night about 11 p.m with recurrent cough of 5 months about the same time he developed difficulty in breathing as evidenced by orthopnea, PND which has been recurring since the past five months. Patient was apparently well till 5 months ago when he developed cough which was whitish, frothy, and recurring sputum. There is no history of drenching night sweat, no history of alleviated chest pain, no contact with anyone with clinic cough, weight loss or night sweats, no history of asthma. Patient complained of generalized body weakness with positive history of easy fatigability of about four months, but no history of anorexia. Not known diabetes, no history suggestive of D.M- no history of nocturia, frothiness of urine, no history of poly urea, polydipsia, polyphagia and haematuria. There is history of bilateral legs swelling which has increased progressively. There is associated facial swelling early in the morning which regresses as the day progresses...no history of diahorrea, and bilateral legs swelling...No history suggestive of liver disease, he is a know hypertensive diagnosed 5 years ago with poor drug adherence, but drug history shows that there is no history of drug allergy. Positive history of 2 packets of cigarette per day for 10 years, but no history of alcohol consumption, no history suggestive of thyroid disease, no history of loss of consciousness, no history of surgery, no know history of kidney disease, no history of use of mercuric soap and creams, no history of poisonous insects or snake bits, no history suggestive of obstructive neuropathy, no history of chronic use of NSAID. Patient had running temperature for 2 weeks, he was taken to a private hospital where he was admitted and given malaria tablets and anti-hypertensive drugs as he was told that his B.P. was elevated. To be managed by Consultant X.

In summary: 49 years old managed for the past 5 months with
recurrent cough and acute sinusitis.

On examination: Chronically pale middle aged man with severe respiratory defect, no finger clubbing, pulse rate 134 per minutes, B.P 180/125...diffused apex, abdominal examination showed the kidney as enlarged and tender, liver 6cm, conscious and alert, well oriented in time, person and place.

Assessment: queried persistent hypocacalaemia, congestive cardiac failure precipitated by pneumonia with tuberculosis, possibility of chronic renal failure secondary to heart disease. The assessment of the renal team is correcting for hypokalemia.

Plan: encouraged to get sprinolactone...nursed in cardiac position...oxygen by face mask... commenced on anti...when x-ray was out.

Patient was admitted into the ward under Consultant X.

The emphasis of morning reviews is on medical education, and it provides a forum for training physicians to gain from the broad knowledge-base of experts from the different specialties and sub-specialties within the Department of Internal Medicine. The goal of morning reviews is primarily to consolidate and enrich the diagnostic skills of the Registrars as they work through the diagnostic puzzle of patient care. The sessions are normally interactive and provide an opportunity for in-depth and open discussions amongst the participating actors. It also allows those in attendance to grapple with a better understanding of clinical processes in a somewhat tense atmosphere, as Consultants and Senior Registrars ask the presenters questions that are built up by diagnostic problem-orientation. The questions vary depending on the presenter’s presentation and may go this way:

*What about the heart sound strikes you in particular?*

*On what basis was this diagnosis of angina made initially? On what side was the obstruction of the coronary arteries, can you demonstrate it to us?*

*Why do you think the patient is sinused? Why does the patient have finger clubbing?*

*Patient is sinused, has finger clubbing, do you think the heart disease is congenital?*

*Is there any reason why you did not give this patient Heprain? What are the side effects of Heprain?*
I am trying to find reasons why you diagnose acute myocardial infarction. Let’s take to the man’s history; the man said that he had a history of tobacco smoking, and recently nasal irritation that has lasted for about 10 days. Did you try to find out if the patient had a history of excessive alcohol consumption?

...then bring the reference so that we can agree with you. We are talking about the nomenclature for presenting a diagnosis. (Data Extracts)

Often, the participating audience, particularly the Consultants and Senior Registrars, try to figure out the facts in the presentation: “tell us about...”. They also try to find why certain measures were adopted and not others. For example, after looking at the chest x-ray, a Consultant asked the Registrar presenting the case, “Can you comment on the celloids? What are colloid signs? Is it suboptimal.....and why do you think it is suboptimal and not ...?” At times, the Consultants and Senior Registrars proffered suggestions about the line of action that should have been taken, like “You have to do this in case of interventions”. Comments were also intended to admonish presenters regarding important points that should be addressed in clerkship; “You did not ask for joint pains, skin rash and many other things you should have asked for?” At other times, it was the way specialist physicians in the department obtained clarification about issues of importance and broadened perspectives on patients’ problems. For example, a specialist Consultant explained the difference between acute liver failure and fulminant hepatic failure to clarify issues about a patient with acute liver function secondary to hepatic encephalopathy:

They are not the same thing -acute liver failure is much broader term than fulminant hepatic failure. It encompasses both fulminant hepatic failure and subfulminant hepatic failure. Different books will give you different definitions. Fulminant hepatic failure is used primarily to describe the development of encephalopathy within 8 weeks of the symptoms in a patient with previously healthy liver. The case is different for subfulminant hepatic failure as it applies to patient with liver disease of up to 20 weeks prior to development of hepatic encephalopathy. (Data Extract)

Also, another specialist Consultant talked about the palpitation of the bladder to clarify issues regarding urinary obstruction.
We are saying that the palpitation of the bladder will show the distention of the bladder. If the blockage is between the bladder and the uretha, then we can say that placing a catheter may relieve the obstruction and lack of urine output. On the other hand, if the blockage is before the bladder, the placement of a catheter will result in little or no urine output. (Data Extract)

The presentation of cases in a real-time format enhances active participation by those in attendance. At the end of each presentation, the participating physicians construct a differential diagnosis from the initial diagnosis. I asked some of the House Officers (Dr. H. Ossai, Dr. H. Atagwu, and Dr. H. Ayidu), why they did not present cases at morning reviews. They explained that presentations at morning reviews were only for Registrars as part of their residency-training programme. The House Officers explained that at their level, presentations were done during ward rounds and handover rounds. Medical students attended morning reviews to listen to how to analyze and present cases, but without making any form of contribution. Thus, morning reviews seemed to imply an aspect of ‘rite of passage’ that takes place at different levels in the professional practice of physicians.

Not House Officers but Registrars. You start presenting when you are a Registrar. You must become a Registrar to start making presentations. It is part of the training of the Registrar; it is a way of training the Registrar because he actually manages the patient. The bulk of management is by the Registrar. So it is being done by the Registrar. (Dr. H. Atagwu)

As House Officers, the only role we play is to make sure we attend..., we make sure we come to the morning review sessions as early as 8:00am. We sit down and listen to our senior colleagues discuss...We learn from them because by staying there we learn. At our level as House Officers, we don’t usually make contributions. We just listen...so my role is to be a learner and ask questions when I am confused. (Dr. H. Ossai)

Handover rounds begin by 2:00 p.m., and ends by about 3:00 p.m. or 4:00 p.m., and we present cases as House Officers there the same way we present during ward rounds. The House officers, Registrars, and Senior Registrars are around. It cuts across all the units and is an opportunity for interactions between all the units. Once in a while we may be lucky to have a Consultant around. At the handover rounds we go from one patient’s bedside to another patient’s bedside, and we discuss with the patient after respective House Officers have presented
their patients regardless of the unit the patient belongs to. It is an academic exercise.... So that is the only role we play. (Dr. H. Ayidu)

The morning review is an integral part of the daily practice of the wider community of the Department of Internal Medicine. I asked Dr. H. Ayidu why it was so. He explained that morning reviews provided learning opportunity for the medical students. He continued that morning reviews were usually:

*The gathering of the Chiefs and army commandants from different cantonments where we have our big ogas, our chiefs from different units and departments, so it is like a military drill sort of a thing. (Dr. H. Ayidu)*

After the tense atmosphere at the review, there are casual discussions and laughter amongst the participating actors as they find their ways back to their respective units.

### 6.6.4 Emergency and call duty

Emergency care is one of the CPT team’s activities, which takes place when the CPT Consultants are on-call at the Accident and Emergency (A&E) Department. Members of the team are expected to be at the emergency unit of the A&E department during that period to offer emergency care and the initial stabilization of traumatic conditions and life-threatening illnesses. The House Officers and Registrars of the team assess patients who were initially seen by nurses. Their findings are documented and discussed with the Senior Registrars. Cases are then sorted out and sent to the different Consultants of the teaching hospital after patient’s traumatic condition has been stabilized. This activity shows the CPT team’s role and interdependence with the wider community of the teaching hospital.

The tasks of the A&E include: first aid, triage, resuscitation, and stabilization of patient, making accurate diagnosis or assessment, giving immediate treatment, arranging for further care if necessary and referring patients to other specialists’ units/departments accordingly. Dr. W. Musa, a Consultant at the A&E, categorized these tasks into primary and secondary surveys. He explained that the unit is self-sufficient in achieving the primary survey, which is when the patient first arrives. Dr. W. Musa further explained that the information required at this stage is for resuscitating the patient, rather than for completing the patient’s health history.
We ask a few questions as to how the patient was rescued from the scene of the accident by the rescuer or who ever brought the patient to the hospital. And also, we would like to establish the mechanism of the injury such as whether the patient fell from behind; the patient was assaulted; and the patient was stabbed or hit with a blunt object on the head. We would have enough information just to resuscitate the patient so that we may not depend on the complete history, rather we would like to establish what led to the present condition, the actual event surrounding the incident. (Dr. W. Musa)

Once the patient’s condition is stabilized after resuscitation, the next stage is to go on to the secondary survey. The secondary survey entails a complete history of the patient’s past health conditions. Patients are asked questions pertaining to their past health profile as well as family and social history. This helps physicians to assess and plan for the definitive management. At this stage, cases that have been triaged are referred to other units/departments for specialist management. It is at this stage that the CPT team takes over the health care management of patients that are referred to them from the A&E. Dr. W. Musa proffered reasons why patients were referred to the CPT Unit, including: 1) the need for surveillance when patients reacted in unpredictable ways to any medication, especially when some unusual side effects with the patients are detected. For example, some types of allergic reactions to a group of drugs; 2) the need to assess patients when there is suspicion that they have abused some drug substances; 3) the need for a higher level of management for trauma patients such as diabetes, respiratory, or patients with cardiovascular diseases as exemplified in the excerpt below:

We know that the blood sugar control could be erratic particularly with the problem of getting the patient to be on regular medication...then we start observing undue response to drugs...following traumas they can have open injuries. They are very prone to infections. Their wounds heal improperly, they have poor wound healing, and that can jeopardize procedures, our surgical repairs and even the response to our treatment. In such a case we normally treat with a group of antibiotics that we regard as secondary generated...then we have to go very high, we have to go very aggressive. So those peculiarities are taken into account and we refer to other specialists for appropriate and definite management. (Dr. W. Musa)
Clinical meetings connect the CPT team with the wider community of the Department of the Internal Medicine. They are important because they entail many seminar presentations, which the participants regarded as “... avenue for learning” (Dr. C. Chukwuka). This learning forum is useful for the evaluation of disease conditions of difficult cases from different specialists’ positions and also for learning about the therapeutic management approach used for such cases. Clinical meetings are scheduled once a week, and like morning reviews, the object of activity (i.e. patients) is not physically present. They offer opportunities to acknowledge where research attention is needed, as well as to learn about new discoveries and the latest reports. Interesting clinical cases are uncovered and obscure occurrences are scrutinized and edified by specialist physicians to ensure that the standard of health is met.

I was fortunate to attend two of the CPT team members’ presentations at the clinical meetings. One of the presentations that I attended focused on “the trends of adverse drug reaction in suicidal cases as outcome of diazepam”. After the presentation, the audience proffered suggestions regarding the new trends of knowledge on suicidal cases and the directives to follow in such problematic occurrences. Dr. C. Chukwuka explained that some of the issues raised at the clinical meeting would be further probed and researched. The findings would then be written up for publication, which may appear in a case report, proceedings of clinical-pathological conferences, as journal articles, or even as a dissertation. In some instances, Dr. C. Chukwuka averred, existing protocols are revised or new protocols are developed. In some other instances, new developments of the discipline of internal medicine are discussed.

I have, in this study, identified five levels of operations. This neither means that these five were the only operational levels of the CPT team, nor that they were more important than the others. I have chosen these because of their socially-situated nature and the way they shaped the conditions for the articulations on which the CPT team’s work activities were based. The operational levels provided forums for interactions between the CPT team members, the patients, and also amongst the wider community. The operational levels also determined how activities were undertaken. For example, activities during ward rounds, emergency care, and Consultants’ clinics were centred on patients as the focal point, while activities related to clinical meetings and morning reviews were focused on discussions and brainstorming. Thus, operations provided the conditions or rather the situational level, by which the physicians’ activities were realized.
6.7 Division of labour

The CPT team’s activity features a division of labour that is team-based, and takes into consideration a participatory style of management. Participatory management ensures a maximum level of care to all patients, as it is a practice that allows all members of the team to participate in decision-making. Though the Consultants retain the final decision-making, authority and responsibility, the other team members are actively involved in giving input and influencing the processes related to patient care. All participants agreed that they had a responsibility to provide care whenever patients sought medical attention. Dr. C. Chukwuka talked about this participatory style of management by explaining that he had to see all patients in the unit whether he had ward rounds or not, “just walk through to ensure that all the patients are alright”. In doing this, he claimed that he had to have:

An eagled eyed view to ensure that every person in the unit is working in tandem, so that we can have the result which we desire that is the patient’s ultimate health... not a question of anybody just sitting out there and calling the shots from one or two obscure rooms...you don’t stand up shouting orders and giving commands...we do not play boss and leave issues; when issues have to be handled quickly, we get to it. Who ever happens to be there has to do it...everybody is called into play depending on the needs of the patient. (Dr. C. Chukwuka)

The division of labour in the CPT Unit has its own hierarchical structure in line with the Code of Medical Ethics in Nigeria (2004), and as stipulated by the UBTH regulations. Dr. C. Chukwuka explained:

We have a protocol here that patients’ care should be handled at different levels. You expect a House Officer to take blood sample, for instance, which should be easy for anyone on that level. But if it gets higher, and a lumbar puncture is to be done, you need a Registrar to be there or a Senior Registrar especially for adults.... issues of lower or less difficulties might be handled by the House Officer, and when he or she is unable to handle this, or when things are of standard of high difficulties, the Registrar comes in, the Senior Registrar, and then the Consultant comes in to offer leadership and advisory roles and take final decisions on issues. So these are some of the basic things we look for, but everything is for the benefit of the patient. (Dr. C. Chukwuka)
At the routine level, activities were undertaken either collectively by the whole team or individually, but it was found that there were interdependencies that had been built up over time. Each participant’s task was dependent upon somebody else’s task. Three questions were therefore used to elicit responses from the participants regarding their job and role: 1) Can you describe the job you do?; 2) With whom do you usually work with?; and 3) How would you see your role as an access or reference point to other members of the CPT team? Everybody within the CPT team had contributions to make in what Dr. S. Olowo referred to as a “cadre kind of relationship” and what Dr. H. Ebi described as “a flow chart or a food chain”. Thus, knowing what other team members were doing was significant.

Registrar now comes and does a ward round to see the patient again... maybe refer or decide on some other higher plans in addition to the ones we have done. And then may be the Senior Registrar then comes later on, and also decide on some other plans in addition to what the Registrar has earlier documented. Then the Consultants may then come subsequently and then effect some other plans. (Dr. H. Kehinde)

What I do? I see the patient, but I am not the first person to see the patient. The House Officer would have seen the patient; the Registrar would have seen the patient. So I come, and review what they have done. I also make sure that I see the patient with fresh ideas.... and I take decisions...I make sure the Consultants are kept in the know about the patients. (Dr. S. Olowo)

So, we get the information first. If what the patient complains to us is more than us, we go and tell our Registrar and our Registrar equally goes and tells our Senior Registrar. So we get the information first and pass it on, you saw me yesterday, when I was going to the Registrar. That is how it is done. I get the information, and had to pass it to my Registrar. (Dr. H. Aghogho)

The person to turn to is the next person we report to which is the Registrar. Everybody has an immediate superior. I am supposed to report to the Registrar, the Registrar reports to the Senior Registrar, and the Senior Registrar reports to the Consultant. So if I report to the Registrar, and he is able to take decisions, fine, but if he is not, he will communicate; get back to the Senior Registrar. We also pass details, but the decision is being passed up the ladder, and you are not able to take it. So you must recognize your limit and pass it to the next person in command. But at the end of the day, it would fall back finally on the Consultants who are actually in charge of the patient...So he or she
knows what to do for the patient most of the time. That is why as a matter of fact, they are called Consultants because they have been trained for several years to be competent in taking decisions. As a matter of fact, the role of the Consultants, let’s say 99% is decision-making because they know what to do. (Dr. H. Ossai)

Realistically, no one person or even cadre attended to patients without other persons at the other cadres. The Consultant’s role was to ensure that other caregivers were properly supervised and continually trained on the job. For example, Dr. C. Chukwuka averred that, as a Consultant, he had a responsibility to impart knowledge on his younger colleagues. Dr. C. Chukwuezeke explained that he also felt the need to personally impart some of his values to the people with whom he worked. He opined that he may not be able to impart on everybody, but he strongly believed that he had a certain sphere of influence and valuable knowledge on a diversity of patients’ cases.

I have to see that the senior residents supervise the younger residents, who supervise the interns and then have oversights of the activities of the students which apart from attending to patients in the wards include learning and acquiring skills in all the places that they should like the accident and emergency unit and the various laboratories. (Dr. C. Chukwuezeke)

The Senior Registrars saw themselves as the bridge or the interface between the two Consultants and the peripheral team members, and they worked closely with each other. They were clinically involved in the day-to-day management of patients, but they also played a supervisory role by overseeing and reviewing what the peripheral members were doing. It was the duty of the Senior Registrars to send for specialists at other units/departments when needed as well as to pass information to other units/departments. They also had some degree of autonomy in that they made decisions “which later may be rectified by the Consultants or may not” (Dr. S. Olowo). In addition, the Senior Registrars were actively involved in the teaching of the peripheral members.

The job description of the Registrars entailed supervising and coordinating the routine duties of managing patients. They also worked closely with one another. This involved attending to and following up with all patients admitted in the unit, supervising the House Officers, ensuring that investigations were done, and ensuring that patients were receiving their prescribed treatments. Their duties also entailed making decisions (but at a lower level than Consultants and Senior Registrars) and performing life-saving procedures as Dr. R. Mgbeke explained:
I can start management even before the Senior Registrars become aware. I can prescribe drugs; I can do procedures that will need to be done probably life-saving for investigation purposes like lumber puncture, tapping the test tube insertion, chest, draining of pleural fluid, draining of ascetic fluid from the abdomen that is fluid collection from the abdomen. I can pass out fluid when necessary. I can virtually do most of the procedures that are done in UBTH; we are allowed to do them. (Dr. R. Mgbeke)

The House Officers are at the lowest cadre of the CPT Unit hierarchy, but their role is invaluable to the other team members because they have the first contact with patients on a day-to-day basis. They have an administrative role, which means that they are involved in the execution of the CPT team management plans for patients. Their routine duties entail being at the inpatients wards every morning before other team members on order to attend to each patient being managed by the unit. Dr. H. Aghogho explained:

*We don’t expect our Registrars and Senior Registrars, Consultants or Professors to come to the ward before us or see the patients first.* (Dr. H. Aghogho)

At the patient’s bedside, they clerk patients and provide feedback to other team members either through documentation or verbal contact. They ensure that the patients are receiving their medication daily. They continually observe the essential signs in patients. They ensure that various investigations are carried out. Dr. H. Kehinde explained that they made sure that things moved smoothly up to the point where a Registrar’s attention may be required to tell them either what to do or which steps to take next. However, they are minimally involved in the decision-making process in patients’ health care management.

As a way of reaching out to the patients, Dr. H. Atagwu and Dr. H. Aghogho explained that the House Officers distributed patients amongst themselves. They also met often to discuss the patients admitted in the unit so that there were ‘in the know’ about each patient’s management protocols. House Officers worked almost exclusively with the Registrars, and saw themselves as the go-between the Registrars and the patients:

*It is a team work, so I am supposed to be like an intermediary, the first intermediary between the patient and the next higher than me, and then*
if the team is involved subsequently. (Dr. H. Kehinde)

The Registrars are next in hierarchy to our cadre, so it just follows that I relate more with the Registrars in the unit. It is only when they happened to be a break; perhaps I can’t reach any of the Registrars that I could contact the Senior Registrars. (Dr. H. Ayidu)

There is no explicitly stated document regarding job roles in the unit, but the team members derived their roles from the culture of medical practice that ascribes job roles according to level of hierarchy. They worked together and everybody knew what to do. The core members were engaged mostly in mental tasks of executing decisions; some of the peripheral members, such as the House Officers, engaged in physical execution of the decisions made, with the Registrar falling mid-way between the two. Differentiations were reconciled through discussions.

When we have challenges, we come together and discuss and we rub minds together. And we don’t just do things on our own individually, it is a unit and it is a unit decision and so we would have challenges, we would sit down together and have meetings concerning patients in such a way that information about a patient is passed across amongst us. And each person makes his or her own input, and a general decision is taken for the benefit of the patient. (Dr. S. Igweh)

When I am on call, I have to work with my fellow Registrars because I won’t expect the Senior Registrars to be around. But when we are doing a ward round, everybody is around, then we work together...and if I have something a bit difficult, I discuss with my superiors. (Dr. R. Iyamah)

Yes, you would always call on your senior colleagues. Yes, that is the training, anything that is more than you; you will call on your senior colleagues. (Dr. H. Kehinde)

That is why I am not alone...when we are in group and there are things that I don’t get clear in the case note, I could ask how is this relevant to this case. Right there and then, my seniors would put me through. (Dr. H. Aghogho)

I would ask whoever is around, a house officer, a colleague, I will ask him. If they can’t offer answers, I will ask the Registrar, the Senior Registrar, or even the Consultant as the case may be. (Dr. H. Ebi)
Dr. R. Iyamah’s description of “something a bit difficult” is not because he did not understand his task, but rather that he wanted a second opinion on cases that were unusual and problematic. The CPT team works with members of the wider community. Dr. H. Ebi, for example, said that he worked hand-in-hand with the nurses. He explained that as a newly trained physician, he believed that:

_There are some things that you would learn from nurses especially those who have vast wealth of experience, who have been there over time._ (Dr. H. Ebi)

It was found that there was unequal distribution of ties in work activity as the level of interdependency of tasks depended on the hierarchy. For instance, the House Officers had less contact with the Consultants than with the Registrars or even the Senior Registrars. The Senior Registrars worked with every member of the team and had more contact. Sometimes, Dr. C. Chukwuka explained that protocols could be skipped.

_If the House Officer has to see me or tell me something...he relates directly to tell me, to inform me what is happening...The Registrars themselves if there are issues they don’t understand, they might send them to me knowing that I may know my patients who they may not have interacted with._ (Dr. C. Chukwuka)

The CPT team’s work activity is guided by the structures of established and explicit rules\(^\text{110}\). The Code of Medical Ethics in Nigeria (2004) outlines the sequence of rules and guidelines as discussed in Chapter 2. The Code determines medical professional practice in Nigeria. However, UBTH has its own goal-setting mechanism generated from its set objectives of patient care, teaching, and research. They include: “empathy”, “professionalism”, “transparency”, “commitment”, “team spirit”, “diligence”, “promptness”, “equity in quality services delivery”, and “responsiveness” (UBTH brief, unpublished paper). These values reflect UBTH’s vision and mission statement and serve as the ‘umbrella’ that guides work modalities for all its employees (UBTH brief, unpublished paper). However, values are generally abstractions, and their lack of precision in interpretations and applications provides the necessary leeway for enforcement by the collective efforts.

\(^\text{110}\) Explicit rules refer to the principles or regulations governing conducts, actions, procedures, and arrangements.
of a group or team, such as the CPT team, in the form of implicit norms\textsuperscript{111}. The norms give coherence to the practices and behaviour of the team members, though none of the participants were asked questions about the team’s norms. I made deductions and even allusions from the nuances in the participants’ responses. The remaining part of this section will focus on how implicit norms influence the hierarchical division of labour.

The predominant norm in the CPT Unit is the norm of total patient care. This norm takes a pre-eminent position over all other norms. For example, the CPT team members ensure that standard procedures are followed in ways that offer optimal care to patients. The CPT Unit gives the norm of specialization a high priority. Dr. S. Idegbe described how he became especially interested in the CPT as a specialty, from looking at the Consultants in the unit, whom he regarded as mentors. Dr. S. Igweh claimed that he became interested in the specialty during his three-month compulsory internship as a House Officer in the unit because of the emphasis on the rational use of drugs. Dr. R. Mgbekel also noted this same emphasis on the rational use of drugs. He averred that the CPT core members were very thorough and proactive when it came to rational drug prescriptions, and that this made him realize that when a physician goes ‘extra mile’ for a patient, it can be helpful to the patient and can even clinically improve the physician. On a lighter note, he reasoned that:

\begin{quote}
  I don’t think it has to do with the training as a clinical pharmacologist or medical rule generally, I just think it has to do with the people running the unit. (Dr. R. Mgbekel)
\end{quote}

There is the norm of collegiality that defines the associations and structures of relationships between team members. This norm is based on the rules of “respect to colleagues” in the Code of Medical Ethics in Nigeria (2004, p. 13). It reflects some hegemonic orderliness between team members. For example, a House Officer cannot bypass a Registrar to reach a Senior Registrar. My attention was drawn to an instance when Dr. C. Chukwuezeke, tried to find out from Dr. R. Efangwu about the contact made with the orthopaedic unit regarding a stroke patient, who had complication of a fracture in the femur. Dr. R. Efangwu’s answer was that one of the House Officers had made the contact. Dr. C. Chukwuezeke then admonished all the team members, emphasizing the need for hegemonic orderliness in patient care.

\begin{flushright}
\textsuperscript{111} Implicit rules refer to norms that are regarded as “the blueprint for social action – the expectations that people will act according to what is ‘right’ desist from behavior that is defined as ‘wrong’ or ‘inappropriate’ (Mumford, 1970, p. 155).
\end{flushright}
When it comes to such contacts, it is not the House Officer that should make contact. I have said it again and again Senior Registrar to Senior Registrar, Registrar to Registrar, House Officer to House Officer. (Dr. C. Chukwuezeke)

Sometimes, the hegemonic orderliness was disrupted when the individual team members faced challenges. Dr. H. Aghogho recounted how he bypassed the Registrar and went directly to a Senior Registrar in the orthopaedic unit with respect to a diabetic patient whose leg was to be amputated on that very day. Sensing the urgency in taking action, Dr. H. Aghogho explained:

I had to meet the Senior Registrar over there in the orthopaedic surgery. I met him one-on-one. He told me that look at the reason why we have to transfuse him. He told me verbally, and I came here and brought the information verbally. I came here and equally told my Senior Registrar verbally, look at what we have to do, see why they are telling us we have to transfuse the patient for the benefit of the patient. (Dr. H. Aghogho)

The norm of collective responsibility implies shared responsibility amongst the team members. The norm was observed in the utterances of the team members using ‘we’ and ‘us’ for individual actions.

The patient’s B.P. is 170/100...We are referring her to another unit. We can’t keep her longer than this. (Dr. S. Idegbe)

He has hypokelamaelya. So let’s give him potassium. What is the ECG? (Dr. S. Igweh)

Let’s do prosthesis and ultra scanning. (Dr. S. Olowo)

There is also the norm of collective learning. Through this norm, members acquaint one another about current trends in medical practice and new discoveries or findings, particularly in regard to problematic and unusual clinical cases. The norm also ensured possibilities for the exchange of ideas and information.

We should be very professional, the attitude should be professional...if one person cannot get at something, call on another person. We have to
be professional, so that at the end of the day, you cannot be faulted.
(Dr. C. Chukwuezzeke)

During ward rounds, a Consultant could just turn to a Senior Registrar or Registrar to ask questions about issues of importance regarding patients’ diagnoses or treatments. Most often, the discussions went beyond the patient and were aimed at reaching out to the learning spaces of the peripheral members. An instance was when Dr. H. Ayidu presented the case of a gastroenteritis patient to the team members. Dr. C. Chukwuezzeke turned to Dr. S. Idegbe to ask if an endoscopic examination had been done for the patient. After looking at the x-ray, Dr. C. Chukwuezzeke asked Dr. S. Idegbe several questions that indicated that Dr. C. Chukwuezzeke wanted the peripheral members to learn something from their discussion in that encounter. Examples of such questions were:

What is the gold standard for the x-ray?
Do you agree that triple Regimen is the best for this treatment?
What is Avanta Cream?
What is ptitcphen? (Dr. C. Chukwuezzeke)

The norm of collective learning spotlights an apprenticeship mode of engagement in work activity. This allowed for increased interactions between the core members as teachers and the peripheral members as learners with approvals and disapprovals emanating from top to bottom. During a ward round, Dr. C. Chukwuezzeke, had admonished the team members as follows:

There is no better way to learn medicine than to learn from what you see here every day, what you see us do here...to enhance your level of confidence, we too we can learn from you, our younger colleagues.
(Dr. C. Chukwuezzeke)

However, collective learning between peers usually occurred spontaneously during interactions with patients, and required discussions on a peer-to-peer basis.

6.8 Concluding remarks on activity

This chapter has provided an overview of the findings in the background of the case study, and aimed to give an understanding of the dimensions and characteristics of
the context in the study. In their article, Fidel and Pejtersen (2004) note that from the standpoints of both the information actor and the researcher, it may be easier to identify context for information practices within a bounded organization than to define a context in everyday activities. After all, they muse that in order to view information systems, one has to understand the participating actors and the context in which they work.

The characteristics features of the CPT Unit have been discussed, and the team’s membership, in particular has been analyzed. Membership in the unit was categorized into different groups, which depended on a number of factors. Membership influenced participation as determined by one’s position on the team. The fluctuating level of membership apparently had a great impact on the stability of the social configuration of the team. Another and more important aspect was the role of the wider community, affirming the fact that the CPT Unit was not an isolated unit, but one that exists within the interconnected network of a wider community. The members of the wider community may be specialist physicians working in other units/departments or non-physicians.

To understand the context of study, it is necessary to know the motivating factor that enacts activity, which in this study, is the patient. To know the significant role of the patient, it is essential to find the allusions of the participating actors. Goal-directed activities pertaining to patients were always the reason why the team members assembled individually or collectively. However, activities often intersected and this implied that information could be more or less elaborated and more or less explicit, because it will be in a continuous process of the interactions in work activity. To what extent activities are actualized depends on the series of concrete conditions and the myriad of actions. Consultants’ clinics and ward rounds, for instance, were operational levels that proffered forums for examining, reviewing, and evaluating patients’ cases. However, the operational levels also provided the forums for learning and for boundary encounters with the wider communities.

In the section on Division of labour, I described what looked like a participatory style of management on the one hand, and a division of labour that was hierarchically-based on the other. While each of the individual participating actors in work activity knew their exact tasks, they collectively worked together as a team. I realize how that division of labour is guided by the structures of established explicit rules and implicit norms. It is the division of labour, when viewed individually and collectively, that reveals the information practices in work activity, how the participants gain access to information, and how they make use of available tools and artefacts. The information practices, access to information, and
the role of tools and artefacts are the focus of the next three chapters.
7 Information access: Sources and strategies

This chapter describes information access in the real-world information environment of the case study. The research question to be addressed is: “In what ways do physicians gain access to information in work activity?” This research question will address the distinctive information sources and multiple strategies that enable access to information in work activity. The discussions will therefore set the stage for the broader topic of information practices in Chapter 9. To some extent, it will also touch on the fourth research question, which has to do with the influence of learning in activity, as discussed in the previous chapter. The analysis of the empirical data was based mostly on the study observations and interview transcripts. As a prelude to the discussions on information access and strategies in work activity, there will be a brief discussion on what knowledge in the CPT Unit’s activities entails.

7.1 Medical knowledge

The starting point for the discussion on information access is the knowledge-base of the CPT team’s activity system. The participants possessed medical knowledge, which both the core and peripheral participants all claimed they had acquired through their medical training. This form of knowledge is known as ‘explicit’ knowledge, which deals with medical facts and scientific propositions. However, knowledge in the CPT team’s work activity showed that it was not limited to the explicit; it also entailed the ‘tacit’ and both forms of knowledge worked in tandem. The ‘tacit’ knowledge reflects practical or implicit processes that form the basis for problem-solving and achieving outcomes: what is done and how it is done? It may thus prove useful to identify the different types of knowledge from the responses given by the participants. In the study context, explicit knowledge, as found in printed and digital materials, seems to suggest that knowledge of patient care is based on absolute truth:

Deal with facts, real facts. There is no room for unnecessary speculations, assumptions or guess work when it comes to that. (Dr. C. Chukwuka)

Dr. C. Chukwuezeke describes it in this way:

It appears.....that there is an absolute truth. That our approach we
believe is rather positivist, we feel that there is absolute reality, which
experiment can verify and most of our therapeutic interventions are
based on that epistemology. For example, we feel this patient is
diabetic, because we took blood glucose, and it is beyond certain level.
We are going to intervene, which is experiment with insulin and oral
medicine and we expect that this is going to be the result and it is
verifiable, it is repeatable. (Dr. C. Chukwuezeke)

However, as was found in the study context, the assumption that medical scientific
knowledge is founded on absolute truth, which is a value-free state or reality, is not
all-encompassing in medical practice. Instead, a complimentary role is played by
tacit knowledge. As I observed during the study, tacit knowledge generally had to
do with the wide range of clinical procedures involved in patient care. It is the
knowledge used for establishing the link between the CPT team members and
patients. It also maintains their standing within the teaching hospital, relative to the
members of the wider community and even in the society at large. Thus, without
tacit knowledge, the explicit would be meaningless, or vice versa. Both types of
knowledge are required in the CPT team’s work activity; hence Dr. C. Chukwuka
and Dr. S. Olowo described tacit knowledge as a kind of extension or continuum of
the explicit:

If you don’t have factual knowledge, you can’t be a good doctor. But
also, if you don’t have good procedural knowledge and you have good
factual knowledge, you will not be able to pick up signs. You may just
know that patients with dermatitis will have a tender liver, but you
don’t know where the liver is or you don’t know how to elicit for a
tender liver. You will just be there and you say the patient doesn’t have.
So they are related. You must have a good grasp of both. You must be
good in all the fields. (Dr. C. Chukwuka)

You cannot have good procedural knowledge without good factual
knowledge in medicine. It is not possible, if your knowledge based is
poor in factual knowledge, you can only go just a little bit far in
procedural knowledge. You can be cut up, because what you are doing,
for every step, every procedure you do; there is a pathologic basis for
it. There is a pathogenetical basis for it. There is a reason why you are
doing what you are doing. You don’t just tell a patient for instance to
breathe in and out, because you want to observe how he is breathing in
and out. You ask the patient to breathe in so that for instance, you are
checking the abdomen, you are examining the abdomen and liver. You
ask the patient to breathe in, because you want the liver to descend
because you know from the pathology which you have learnt, or the
physiology you have learnt that the lungs are pushed down when a
patient breathes in... and since the liver is under the lungs, it will be pushed down. So if you don’t have the factual knowledge, and you just say breathe in, breathe out, you might not know when to expect the liver or not. So they are related, in applying it to clinics or the ward. (Dr. S. Olowo)

The above excerpts illustrate that both the explicit and tacit are required in patients’ care. Dr. R. Mgbeke puts it in this way:

You need those theories, those medical concepts, and those medical propositions to actually practice, but you need the practical stuff...the clinical procedures...in managing the patient. (Dr. R. Mgbeke)

On a more social level, Dr. H. Ossai explained that when they come together as a team, both types of knowledge are at play:

We want to discuss and ask why, what, and how? Why this is this, what is it, and how do we go on with it? (Dr. H. Ossai)

It was found that apart from the explicit and the tacit types of knowledge, there is also the type of knowledge that cuts across social circumstances and environments: where and when? This kind of knowledge was constituted by situational factors enacted across social circumstances. The participants believed that their actual work activity gained significance in the knowledge that constituted the acceptable and unacceptable practices of the team. Dr. C. Chukwuezeke confirmed my impression when he said that knowledge in work activity depended on:

The people who actually have the upper hand in interactions and to how far those who seems to have the upper hand is always dictating the pace of things to the others. (Dr. C. Chukwuezeke)

In this regard, the social interactions of the participants determined the social type of knowledge and to some extent how information was enacted, determined, and shaped.

7.2 Information sources
The CPT team members utilize a wide range of information sources. It is through these that the CPT team members are able to mediate their information environment. The members are positioned inter-subjectively and share a common world in which they work together in the care of patients. The CPT team members do not only use textual sources of information. Other information sources also emerged in the team’s activities. These include human sources (e.g. patients, patients’ relatives, nurses) along with print materials. These sources may be categorized into three types: textual, social, and physical. While the sources are listed separately here, their interconnectedness is discussed later in this study.

7.2.1 Textual sources

The CPT team members sought explicit information from printed sources such as textbooks, journals, manuals, handbooks, and digital sources on the Internet. All the participants averred that these materials contained facts, concepts, or propositional types of knowledge required for medical practice. They also claimed that the information in textbooks and digital sources assisted them in understanding institutionally- and professionally-sanctioned standards of health care. Dr. H. Ayidu and Dr. C. Chukwuka articulated this view as follows:

When you are faced with a challenge, a clinical challenge, you should go back and check it in your books or the net: how does this patient’s case meet with what is known about this ailment? What am I seeing new in this patient that is not even a routine, what is the best way to manage this patient? What should I do, and what have I not done. (Dr. C. Chukwuka)

We are training ourselves as much as our senior colleagues are training us. We have a responsibility also to seek self improvement. And so you don’t just want to be spoon-fed because you are a House Officer. (Dr. H. Ayidu)

Some of the main reasons that the CPT team members connected to textual sources included the need to continually keep abreast with the explicit medical knowledge, happenings in the medical field, and continual modifications due to new discoveries. In this regard, the participants affirmed that it was mandatory for them to have their own personal collection of textual sources. They found journals to be more valuable than other textual sources because they were more current in the field of their specialization. Though journals were more current, the participants believed that textbooks were more comprehensive and gave a baseline overview.
A good physician must have not only the more recent journals in medicine, but also back files of journals alongside with different textbooks in medicine. Whenever you have challenges in the field, you go back home and look at those things from the prints in patient care. (Dr. S. Igweh)

It was generally agreed upon that textual sources were valuable in the CPT team’s activities, but that their usefulness in different situations was influenced by the participants social position. For example, the core members of the CPT team averred that they did not openly engage with textual sources during encounters with patients. Instead, they read them at home. They acknowledged that whenever there were contentions, they referenced textual sources such as textbooks, journals, or even Internet sources, in order to arrive at a solution. They exemplified their quest for textual sources in cases of diagnostic dilemma that “seek for clarifications” (Dr. S. Igweh) or “the need to check for accurate drug doses” (Dr. S. Olowo & Dr S. Idegbe). Dr. S. Igweh explained the role of textual sources:

We once had a patient; we were thinking about something, but when the Consultant came in, there were other things she found out, but we could not tie them up to everything we found out. And we gave ourselves an assignment: let’s go back to the print materials, and check if there is a syndrome that ties up everything. Is there a syndrome that has been documented that contains all these vital signs, which we are not aware of? That is how such textual materials help us. (Dr. S. Igweh)

The situation was different with the peripheral members of the team. They found textual sources useful in facilitating their work activities and in enhancing their information base. Handbooks, such as Clinical Methods and Clinical Examinations were particularly prominent. Some of the peripheral members, like the House Officers, admitted that the handbooks were important in providing procedural information on how to care for patients. These handbooks were even regarded as either ‘bible’ or ‘gold standard’ since they dictated the generally acceptable standards for clinical procedures. The participants agreed that medical practice entailed a large number of diagnoses at the patient’s bedside and also, that a good grasp of the information contained in handbooks was required. Hence, Dr. R. Mgbeke reasoned that without handbooks, a newly trained physician would sometimes find it difficult to make a good diagnosis. He stated, “no textbook will
describe how you will examine the abdomen or how you will do a procedure, but Clinical Methods tell you step by step”. Dr. H. Ossai and Dr. H. Ebi explained:

We always carry them so that we just quickly open and verify information or quickly open and cross-check or quickly open and get to see something new. (Dr. H. Ossai)

If during a morning review session, something is said that you are not sure of, then you are hooked somewhere, you want to quickly look it up, check it up in that clinical method or whatever material you have. But most of the time, if a House Officer opens a textbook or handbook; it is because he has heard something that he really can’t figure out well. So he wants to just quickly brighten his knowledge by looking it up in the reference material. (Dr. H. Ebi)

Because textual information was institutionally sanctioned, the peripheral members viewed it as ‘gospel’. However, not all of them carried textual sources during work. Doing so depended on one’s experience. Dr. R. Mgbeked, a Registrar who was higher on the hierarchy than the House Officers, claimed that he only referred to textual information when he was a little confused or when he wanted to ensure that he was passing on correct information to his junior colleagues. He gave this reason because in his position he had read the textual information many times. Dr. H. Kehinde provided another view that by seeing specific handbooks as reference guides they enabled him to “make sure that he does the right thing that is supposed to be done”. Dr H. Ayidu offered yet another view of the usefulness of textual sources from a global perspective beyond the immediate activity setting as follows:

Especially in these recent times of information and computer technology where you have sub topics of almost any reference material in the world in easy downloaded format where you can just have them on your phones, on your smart phones, there are smart phones everywhere, 3G phones, 4G phones, you can now have any information you want on them. You have your torn down; you have your iPad. You can have reference materials on them, easy to use. (Dr. H. Ayidu)

The above excerpts explain the reason why some of the peripheral members (notably students and sometimes the newly trained House Officers) were always in possession of reference materials such as standard treatment formularies. I observed that they sometimes consulted these materials during the team’s encounters with patients. Dr. S. Olowo explained that because the House Officers were newly trained, they did not possess the in-depth knowledge that the core
members had. Dr. S. Olowo then gave an example of a patient calling on a newly-trained physician; “Oh doctor, my chest is paining me”; the physician cannot say: “I am sorry, they taught me cases of chest pains in medical school, but none comes to mind now”. What is expected is that the physician in possession of “this small book should just quickly check, and it reminds them of the things that they had previously learnt”. Dr. H. Aghogho confirmed this and explained that there were some diseases that were very rare, and that a newly-trained physician with no experience of such cases would have to consult any available printed or digital material.

The participants believed that textual sources of information increased their active role in the professional discourse of medicine. It also allowed them to be recognized as legitimate members of the activity system. It was acknowledged by some of the participants that because knowledge was in quantum, they had to keep learning every day. Dr. R. Mgbeko gave an example of when he and a more senior colleague examined a patient and how textual sources came into play, enabling him to do an in-depth examination of the patient. Dr. R. Mgbeko claimed that the senior colleague was able to tell what was wrong with the patient before investigations because of his experience. Dr. R. Eweka explained:

You have read so much in the textbooks, journals and all that, but because of limited resources and unavailability of certain facilities and equipments, you don’t get seeing these things being done practically. (Dr. R. Eweka)

7.2.2 Physical sources

The CPT team members recognized physical sources of information as exemplified by bodily information. They reasoned that a patient’s body was located mid-way between the subject and the goal of activity, which they referred to as essential signs or as “the seat of all other sources of information”. The participants saw essential signs as all-encompassing in their interactions with patients. For example, the participants examined the tongue as an indicator of the patient’s faintness, dehydration, or sinuses depending on whether the tongue was smooth, rough, or decapitated. They saw the swelling of the legs as indicative of oedema, and a stiff neck as indicative of a haemorrhage to some extent. A patient’s ‘fluffy hair’ was viewed as a sign of abnormality, the eyes implied faintness or alertness, and red eyes indicated conjunctival suffusion due to liver disease. In this section, a number of identified information and learning strategies - feelings, sensations, observations, and demonstrations- are described in order to illustrate how they are necessary
sources of physical information in activity.

7.2.2.1 Feelings and sensations

Information accessed through feelings and sensations was significant for the CPT team members’ work. I observed several instances of members of the CPT team eliciting information by feelings and sensations through bodily contact. For example, I once saw Dr. S. Idegbe explain to the students during a ward round how symptoms or signs of motor sensory sensation occurred in different grades in cases of complaints of cramps. For example, Grade 0 indicates no response at all; Grade 1 is a flicker of motion; Grade 2 is the movement of the limbs; Grade 3 indicates that limbs are functional to some extent; and Grade 4 there is complete movement. Likewise, I heard Dr. S. Idegbe explain to the students how the pulse was manually palpitated by placing one of the fingers near the artery of the patient:

*Something must be felt under the skin like a shrill...with the volume increasing, hitting the thumb and running out... The heaviness of the pulses can also be felt.* (Dr. S. Idegbe)

There were also instances where the participants used their hands to press the different parts of the abdomen to see if there were any areas of superficial tenderness such as an enlargement of the liver, kidney, or spleen. The participants were also seen patting their fingers on the palms and hands of patients to check for capillary veins and finger clubbing. Other observations I made were of the participants checking the anterior and posterior triangle for the neck; the supra curricular groups of the shoulder, and the lymph nodes for lymphoma. Other common observations throughout the study included the participants measuring the blood pressure of patients, listening to patients’ heart beats, and eliciting heart sounds with the stethoscope.

7.2.2.2 Observation

The CPT members saw observation as an important information strategy of learning. According to Dr. S. Olowo, who is one of the core members, some persons may take the role of the assessor by observing and pointing out missing gaps or errors committed. Dr. H. Atagwu explained that sometimes, he would just observe the core members teaching other members of the team about how to examine patients. Dr. H. Atagwu claimed that, while giving precedence to the students, he did utilize observations regularly “*so as to perfect my own skills*”. The
Peripheral members generally agreed that they learned more from what they saw, than from what they were taught. Dr. H. Aghogho admitted that as a newly trained physician, there were areas that he was not confident enough, “so I have to observe everyday to perfect my skills”.

The core members’ views on observations were different from those of the peripheral members. Dr. C. Chukwuezeke explained that observations were needed to identify gaps: “and you want to explore what those gaps are, because as long as those gaps are there and they are not filled, the patient is at risk”. Dr. C. Chukwuezeke did not believe that any one person was the sole reservoir of knowledge, and saw observation as a strategy for collaborative learning. These explanations signify the existence of a community of practice where observation was employed by the core members to guide and assist the peripheral members in what they were doing. Thus, both Dr. C. Chukwuezeke and Dr. S. Idegbe claimed they sometimes assumed the role of an observer during ward rounds to assess the peripheral members’ level of knowledge. Dr. S. Idegbe stated that:

As a leader, you don’t always have to do the talking. Sometimes, you watch to know what the other members of the unit do, what they feel and what they know. (Dr. S. Idegbe)

Dr. C. Chukwuka agreed:

You cannot all the time be the one asking questions because you are the leader, no...at times, it is good to see how your students’ or residents’ interactions with patients play out. See the questions asked and see what is being extracted from the patient, the modes, the style and all these, you want to see these things play out; are they on the right track? Is he asking the questions appropriately? Is he relating to the patient properly? You know these are some of the things you want to watch. (Dr. C. Chukwuka)

To Dr. C. Chukwuka, observation was not only an educational strategy, but also a useful information strategy that enabled one to appreciate different personal approaches:

A few things from the standby point of the interactions of other members of the team with patients; by seeing how the patient relates to someone other than you, yourself, because it can be pretty different, the personalities involved are different ...what is played out may also be
different. (Dr. C. Chukwuka)

The CPT unit had an interest in the continuity of the practice, and the core members employed observations as an effective information strategy.

_I actually watch to see if they have learnt what they have been taught...I am being trained by my Consultant; my Consultant expects me to train the Registrars; and so the ball is passed from the top to the bottom._

(Dr. S. Igweh)

The peripheral members had a reversed view of observations; that is they saw observations as useful for their continued integration into the CPT community of practice. When questioned about the usefulness of observation as an information or learning strategy, Dr. H. Ossai responded, “when we watch, it sticks better. So we learn by watching and being corrected in the way we do things, and we learn better as we do it ourselves”. Dr. H. Aghogho summed up the different ways that observation enhanced learning:

_YES, it makes us to know about new things, it makes us to examine our patients very very well. It makes us...you know to perfect our skills. If we think we can examine patients 100%; no, but when a Senior Registrar examines patients, you find out that there are a lot of things that you do that he doesn’t do. Most times, we just observe, we take note of what he is doing, so that we can do it on our own when he is not there._ (Dr. H. Aghogho)

Apart from observation being a useful information or learning strategy, the CPT team members also employed observations as an actual form of engagement; that is observation allowed them to be able to follow progress of the patient’s health even when they were not involved in the primary management. For the core members, observations entailed seeing whether instructions given to the peripheral members were carried out properly. Dr. R. Iyamah explained this correctional purpose as:

_Occasionally, you see one or two things that are off tracked, and then I have to point to them why they need this information, where the problems are, clarifying the murky areas._ (Dr. R. Iyamah)

In response to my question about what he was really keen to find out during observations, Dr. R. Eweka answered that he was not looking for anything specific, but that he simply tried “to observe the technique of the person involved, how it
helps the person in formulating his diagnosis, and see how he goes about what he does”. He explained further that the majority of what he saw may not have been necessarily new, but “the way the person goes about it, the finesse attached to it, is what I would necessarily be looking out for”.

7.2.2.3 Demonstrations

Demonstrations of techniques (i.e. how to elicit signs and symptoms) were prominent throughout the study, and were highly rated by the participants as an invaluable information and learning strategy. One of the most salient features of the CPT Unit was their apprenticeship mode of engagement. Many reasons were proffered as to why demonstrations were mandatory. These included: 1) to ensure that the information and knowledge being passed on to other members of the team was clear and objectively convincing; 2) since learning happen audio-visually, it is necessary to watch how clinical procedures were carried out in certain stages of learning; 3) as a reminder of what had already been learnt; and 4) to prove that a patient had a particular problem. Dr. S. Olowo put it simply: “we demonstrate because we have medical students who need to be taught”. He added that even already qualified physicians needed to avail themselves of the benefits of demonstrations as “there is a particular way in which a case should be handled or something should be done, and you might not be too familiar with it” (Dr. S. Olowo). Dr. S. Olowo thus summed it up as follows:

The only way to train in medicine is by apprenticeship: “do as I do”, “this is what the book says”, “and this is how you will do it”, “don’t do it this way” because at times what is written in the book might be a bit confusing. So we demonstrate, we ask them to do it again, and again, and again. There is a particular way in which this should be done, and you might not be too familiar with it...It is a form of reiterative process, so we do it, and then do it, and then do it. (Dr. S. Olowo)

Demonstrations also involved the framing of clinical activity in a context of social practice. The peripheral members increasingly faced the challenges involved with encountering different patients. Dr. C. Chukwuka opined that it might:

Determine what our younger colleagues ultimately do when they are left with the tasks of handling patients individually. (Dr. C. Chukwuka)

The CPT members used demonstrations to introduce and induce appropriate habits
on the peripheral members, and the steps taken were usually sequential and rigidly enforced into the flow of activity. Dr. H. Aghogho noted that:

*If you forget any step while demonstrating, the senior members may just chip in and let you know that you have forgotten the step.* (Dr. H. Aghogho)

The demonstrations were communicative by their very acts and largely based on gestures. All participants affirmed that demonstrations were fundamentally embedded in the team’s work activities. They also agreed that demonstrations were intricately intertwined and integrated into the trajectory of the team’s learning activities. Dr. H. Ossai explained that medicine was not just a science or an art, but “*a habit. The more we demonstrate, the more we get to do it better. It becomes part of us*”. Dr. C. Chukwuezeke argued that there is no shortcut or substitute for it:

*One may learn in the textbooks that anaemia causes pain conjunctival, even when he sees a pain conjunctival, until he is able to compare normal with abnormal, he may not appreciate these clinical signs.* (Dr. C. Chukwuezeke)

For the CPT members, the demonstrations in actual activity entail how to get things done. Dr. R. Mgbeke expressed that the information provided in the books was somewhat vague since it focused on what was to be done, and not how on to do it. Apart from the above information strategies and sources, advanced investigative methods were also used to confirm body information, e.g. biomedical laboratory tests, radiographic imaging, or ultrasonic applications to confirm the provisional diagnoses.

### 7.2.3. Social information sources

The CPT team members also relied on information gained from other people. The discussion in this sub-section will be in two parts: 1) identifying human sources; and 2) identifying the social nature or strategies that enable access to information such as: discussions, questioning, instructions, and listening within the CPT team’s activities.

#### 7.2.3.1 The patient
The patient is an essential and valuable source of information as the object of activity, and is, in most cases, the first information source. Dr. H. Ayidu explained that:

We get the information concerning the patient from what the patient tells us and then what we can observe by examining the patient. (Dr. H. Ayidu)

This, according to Dr S. Idegbe, is due to the fact that every patient has his/her own characteristics:

It is the patient that knows exactly what is going on, what has happened to him. (Dr. S. Idegbe)

A similar line of reasoning is described by Dr. R. Efangwu, who stated that “because the patient wears the shoes, he knows how it pinches most”. However, the participants acknowledged the fact that the patient, as a source of information, was not always adequate, particularly in instances when a patient was comatose, incoherent, or not telling the truth. Dr. S. Olowo explained that, to arrive at logical conclusion, the team members also consulted other sources of information, such as the patient’s relatives or witnesses, physical examinations, radiographic imaging, or test results from laboratories.

Apart from being a valuable human information source, participants saw patients as affordance that enhanced learning in activity. Dr. S. Olowo explained that the peripheral members of the team were usually left to work individually on patients in order to come up with their own assessments, and if they were wrong, “you correct them. It is all about training to become better doctors”. Affirming Dr. S. Olowo’s explanation, Dr. R. Mgbeke noted that:

The more patients you get in contact with, the more exposed you are. So a lot of things that look like mirage before, because you have seen them over and over again, you get used to them as simple things, which initially looked complex. (Dr. R. Mgbeke)

7.2.3.2 Social relationships
Throughout the study, the social relationships amongst colleagues and other participating actors emerged as a viable source of information. The peripheral members found the core members of the team and even their peers as valuable and reliable sources of information. For example, Dr. R. Efangwu noted that what the core members did or said as experts may “just be so many books combined into one”. Dr. H. Aghogho recalled an instance when he did not know the stage or progression of a patient’s diabetes mellitus. He then recounted how his senior colleague told:

...us that this patient’s foot is infected and has ulcer, he told us the ulcer is four/five grades, and that the patient cannot function with the feet. He told us that the patient’s ulcer is grade four. The patient has to undergo amputation. For me, I wouldn’t have known that the patient must undergo amputation. (Dr. H. Aghogho)

While the participants acknowledged that there were some basic things that a physician should know, the peripheral members gave reasons as to why they called on the core members or peers;

When some things are more than you, you should not relent in telling your senior colleagues, we beckon on them all the time to assist us. (Dr. H. Ebi)

It makes me to learn better, it makes my knowledge to be broadened. (Dr. H. Aghogho)

When a patient’s case becomes a little bit problematic, if there was something that I could not pinpoint, I could ask the Registrar or Senior Registrar to come and review that patient. (Dr. R. Efangwu)

Even if I was in another room, I would still come to the Senior Registrar to discuss the case with him. (Dr. R. Mgbeke)

Like the clinic I attended today, I saw patients, when I had problems; I consulted with my senior colleagues who were by my side. (Dr. H. Atagwu)

The participants saw the medical profession as a continuum of practice. Accordingly, the peripheral members saw the core members as a useful source of
information; “when you are new in the profession, you have to rely on your senior colleagues most of the time” (Dr. H. Atagwu). The core members on the team were regarded as having a wealth of knowledge and experience that they passed on to others:

There are some things that we have tried to rack our brains on; we have read the books, we have done everything but we could not put two and two together; and even while examining the patient we could not get those signs. But our senior colleagues would come, they will examine, they would show us the signs and demonstrate it, and it sticks. It sticks better than when we probably have read it in books or journals before. When they have taught us, we now go back and read it and it now makes more sense. So the interactions with senior colleagues are something I think we cannot do without. (Dr. R. Iyamah)

Because they are our seniors, they know better. Then we would ask them why in spite of doing this, this has not been proven. What do you think it is? Then they will explain to us. They also learn from us, so that is what it is. It would not be a team if we just come to the patient bedside, examine a patient and leave. That is not a team work. That is that you are just being on your own. (Dr. H. Ossai)

The participants believed that social interactions, particularly with the core members, helped them make appropriate decisions. Per Dr. R. Mgbeke explains:

The interactions expose you, it shows your deficiencies, and it shows your strength...so you now go back and reinforce on those areas. And you won’t forget again...at least you don’t make mistakes too often. (Dr. R. Mgbeke)

The same applied to cases that were controversial and needed the input of a core member. Dr. R. Mgbeke claimed that interacting with other members of the team, particularly the core members gave him an understanding of a patient’s case. He then claimed that it helped him to to realize that “ah, so this is why this and that happened the other time” (Dr. R. Mgbeke). In a similar way, Dr. R. Efangwu explained social interaction as:

Sometimes you come to a deadlock; you come across cases that you need to verify, and you need to be clear what you want to do and why you have to do it, what are the possible complications and outcomes, and you look on to your senior colleagues. (Dr. R. Efangwu)
In addition, Dr. H. Atagwu pointed out that when a senior colleague came to review cases, there would be modifications and alterations because of their experience, and these would lead to seeking additional information from the patient. Thus, interactions with core members sharpened the way further information was sought. This implies that the latter acted as a point of reference about professional practice and were in a position to make formal statements due to their experience with practice. However, the contributions of every team member were considered important, as Dr H. Atagwu noted:

> As your senior colleagues are thinking, you should be thinking as well. If there is anything that has been left out in the patient’s management, you bring it up as a suggestion in which when looked upon can be added to the patient’s management...if I am correct, I will be told what is appropriate; if I am also wrong they will tell me no in such a case; this is what you should say or do first and this is what you should say or do last. (Dr. H. Atagwu)

Dr. C. Chukwuezeke claimed that his contributions mostly focused on challenging his subordinates to “try to think outside the box”. He reasoned that rather than ask a question like:

> What are the causes of anaemia?... I would rather say, look at this patient, what do you see? Get the person to identify whether the patient is anaemic or not...and then challenge the person’s mind to think outside the listed five to ten causes of anaemia. (Dr. C. Chukwuezeke)

The social sources of information also entailed peer-to-peer interactions. Dr. H. Aghogho talked about how one of his peers gave him information about the diabetic patient he was managing, that the patient had walked over long distances in tight fitted shoes; this was a fact that the patient tried to conceal, which resulted in a lacerated ulcer on his legs with severe consequences. Dr. H. Ebi averred that he did not restrict his knowledge to the social interactions within the activity setting. Dr. H. Ebi believed that whatever was being done within the team could be compared to what was being done in other places.

Members of the wider community in the activity system were seen as the third source of social information. For example, the nurses played a vital role in providing information due to their position of having constant one-on-one contact with patients. Dr. H. Kehinde stated that he often went straight to the nurses on the
ward to ask them about a particular patient because of their close proximity to patients. The nurses were usually able to give useful information about patients’ health progression to the team members. Dr. H. Kehinde put it this way, “this or that is happening to the patient”. Apart from giving information about patients, the wider community was also a useful source of information about clinical procedures. Dr. H. Ebi talked about how he once asked a nurse to show him how to do bladder training. As a newly trained physician, he said that he only knew how to spigot the urethral catheter done in surgery: “I thought I could just learn how to do it”.

Co-patients were another useful source of social information. This group was particularly useful in giving information to the team members about a patient whenever the latter did things that were contrary to good health management. Dr. H. Aghogho exemplified this by the information proffered by the co-patient of a diabetic patient that secretly ate food that he was not supposed to eat: “Doctor, your patient was eating what he was not supposed to eat yesterday”. Patient’s relatives were similarly seen as useful sources of information, depending on the patient’s clinical state:

Because of the patient’s poor clinical state, the best source of information was the son. We talked with the son; the genesis of the whole problem, how it has evolved, and all that and he had to keep coming around. That is the strategy we actually employed. (Dr. H. Atagwu)

you ask one or two questions from a patient’s relatives to clarify especially if you think the patient has something to hide or he is not in the right frame of mind to give you accurate information”. (Dr. R. Eweka)

However, the participants emphasized that in cases where the patient was stable and well enough to provide reliable information, they preferred to get information directly from the patient.

7.3 Information strategies

The CPT team was not an arbitrary structure. Depending on the member’s position on the team, the team members employed different information strategies to seek information from social sites.
7.3.1 Discussions, talking, and listening

The CPT team members used discussions as a strategy to situate themselves in work activities. This feature was prominent throughout the study. Discussions were either between the physicians and patients, or amongst the physicians themselves. Dr. C. Chukwuezek emphasized that patients had the right to information. Dr. C. Chukwuezek saw it as bad practice for any physician to manage patients within communicating well with them. He expressed surprise that he had seen instances where people had been coming to the hospital for ten years and had been taking anti-hypertensive medication during that time. But when asked why, they did not know that they had hypertension.

*I see it and teach it that discussing with patients is very important...as much of what we will achieve will depend on patient’s co-operation. And you are not going to expect somebody who does not understand what you are up to cooperate with you.* (Dr. C. Chukwuezek)

Discussions amongst the CPT team members were prominent and pervasive and ranged from discussions on a one-on-one basis to group meetings (one-to-two, one-to-many, and many-to-many). The one-on-one mode of discussion was of both informal and informal nature. It prevailed all through the CPT team’s work activities and even went beyond the work activity setting in the form of face-to-face meetings. Dr. H. Aghogho talked about how a Registrar informed him one-on-one that the electrolyte, urea, and creatinine (EUC) investigative test done for patient was deranged after the Registrar went to the laboratory to check on the test results. Discussions also took place on a peer-to-peer basis. Dr. H. Aghogho also talked about how his colleague informed him that a patient that was prepared for surgery by the CPT team on the day that I interviewed him had blood in the blood bank. This was after the initial report that the patient could not be transfused because his PCV was very low.

Discussions on one-on-one basis were also done over the telephone. This type of discussion prevailed amongst members even outside of official work hours. I observed that from time to time, the participants received calls and also made phone calls while attending to patients. Dr. S. Idegbe explained that the phone calls were “*actually geared towards patients’ management...and it makes things faster in terms of patients’ management*”. The participants proffered several reasons why they made phone calls, and these reasons fell into the following categories: 1) to find out about laboratory test results; 2) to communicate with patients’ relatives to gain information; 3) to inform other team members and even members of the wider
community about patients’ cases; 4) to more easily facilitate tasks, including the verification of patients’ cases; 5) to provide feedback to relevant parties; 5) to clarify issues pertaining to patients; and 6) to facilitate access when a physician’s attention was urgently required. For the reasons enumerated, Dr. H. Ayidu said that there was an implicit rule in UBTH that the ‘mobile numbers’ of all the physicians in the teaching hospital should be in circulation.

*It is a clinical crime for a doctor’s phone to be switched off because the patient’s life may just depend on your phone being switched on or your battery being charged.* (Dr. H. Ayidu)

Dr. H. Aghogho talked about how his senior colleagues sometimes called him on the phone to find out about the status of a patient, even during weekends. He claimed that he often told them:

*Okay, I saw the patient few minutes ago, and this was what was happening to the patient as at the time I saw him.* (Dr. H. Aghogho)

Another media for discussions included group meetings on a one-to-many or many-to-many basis. The participants saw them as important not only for correlating findings about patients, but particularly because they provided forums for enhanced learning, the exchange of new ideas, and brainstorming about making decisions. Dr. S. Olowo explained that if he thought that a patient had cardiac failure and another said it was not full-blown cardiac failure but hypertensive heart disease, “the question then becomes why this, why not that, what evidence then proves what the patient really has”. Thus, discussions were a valuable information strategy that helped to fill in the gaps in knowledge in patient diagnosis. Exemplifying further, Dr. S. Olowo indicated that the treatment of a particular disease may be outdated, and that there may be more recent alternatives known to some members, but not others. So in the process of discussions, they may come across, “Oh, there is something new”. Somebody may say, “Okay, if there is something new, how do you know that it is new?” and then, they may say “Okay, let’s try this, if it works fine” (Dr. S. Olowo). The discussions provided a common ground for individual members to share knowledge about diverse topics during activities. Dr. R. Mgbekeder argued that no one works solo in a teaching hospital, but “you are bound to practice on quackery...you need people to discuss and correct you”. Moreover, Dr. H. Ebi saw discussions within the frame of the interactive teacher-student relationship between the core and peripheral members where everyone “just have something to offer”.

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Group meetings took place at different levels of operations (e.g. ward rounds and Consultants’ clinics). To the participants, group meetings led to a sense of belonging in the team’s activity process.

We go in groups so that we can have a meaningful discussion about the patient, and everybody would be aware of the patient. (Dr. S. Olowo)

We go in group because we walk as a team. If we are doing team work, we must be seen to do team work and the fastest way to pass across information in the team is for everybody to be on ground. (Dr. C. Chukwuezeke)

Going to patients’ bedsides individually would bring chaos into patients’ care, and the whole essence of establishing a teaching hospital would be lost. So what is usually done is that at agreed time, every member of the team would gather at different locations. All of us come and put our heads together, and get things done as a team rather than if we come as individuals. (Dr. S. Idegbe)

Group meetings are undertaken with the aim that both the patients and physicians benefit. The team would loss man hours and members would waste more time making them not to have the learning and benefits of each other expertise and skills. (Dr. S. Igweh)

No man is an island, no man knows it all. It is an academic environment and every academic environment strives by cross-pollination of ideas. So our meeting in groups not only served us as arena for interactions, but also enables us to discuss and rub minds together so as to optimize the care given to patients. (Dr. H. Ayidu)

Even a question that is asked during a group meeting will make you think about something else; little issues that will be raised will actually benefit you...What you saw when you examined the patient as an individual may not be what the patient is having. It is good to have everybody around from time to time and we discuss about our patients. (Dr. H. Atagwu)

There are questions to and from, follow-on questions and all that. So that is the only place where you can get that properly at no cost...If after commencing treatment and patient is not improving, we go back as a group to the first point again. We now ask ourselves questions,
what we missed out? What did we not see before? So these are the things we call them challenges, we rub minds with and give ourselves assignments so that we can come back again and help the patient. (Dr. C. Chukwuka)

The frequency of group meetings in the different operational levels led to the feeling of inclusion in the team. Dr. R. Iyamah believes that everybody has something to contribute as “two heads are better than one; it doesn’t matter whether one is junior or senior”. This feeling of inclusiveness was also highlighted by Dr. R. Efangwu and Dr. S. Olowo:

Sometimes group meetings gives you boldness to be able to talk with the patient and the boldness to be able to talk with your highly placed senior colleagues because initially, there would be that timidity, but as you engage in group meetings more and more often, you can talk anywhere. (Dr. R. Efangwu)

So you won’t come back here and say ‘Oh! This was what they said; no, everybody was there, we all heard what was said. (Dr. S. Olowo)

Group meetings also had other communicative benefits:

When no. 9 is playing, he should be able to look at where no. 10 is to pass information to him. In the same way, when no.9 is saying something, he should be able to let others know why he is doing what he is doing. (Dr. H. Atagwu)

So when we come together in groups like that...Like the House Officers and Registrars, we ask our senior colleagues that something like this happened; why then did this person present like this; this patient presented like this or why are we using this drugs for this or why not that. Then our senior colleagues will be there to answer us. They give us answers; they explain to us why they took certain decisions if they thought that we were not following them...So in general, the benefit that I think that we get from group interactions would be enhanced information dissemination and learning. We get to know more when we are all in groups, because each and every person has something to contribute, even we the junior ones. We tell our senior colleagues about the patients because we are closest to them. (Dr. R. Kehinde)
The participants contended that discussions were two-way processes, whereas talking was a one-way process. When I asked Dr. S. Idegbe about talking while leading the CPT team during ward rounds and in Consultants’ clinics, he gave two reasons. He saw talking as part of the medical profession, especially when “you have to deal with younger colleagues, when you have to deal with nurses, when you have to deal with different care givers”. Because it is a teaching hospital, Dr. S. Idegbe saw talking also as part of the training of residents:

*You talk, you learn how to talk so that as a Consultant, which you aim to be in the future, you would have acquired the art of talking.* (Dr. S. Idegbe)

Dr. S. Idegbe averred that, as a Senior Registrar, talking allowed him to pass down knowledge to the peripheral members.

*So I have to talk, it is my duty to talk; to train people you have to talk, you have to ask questions to find out what they don’t know. You have to talk to let them know. You also need to talk because it is a teaching hospital like I said. You also need to express what you think so that you can allow other people make their own contributions.* (Dr. S. Idegbe)

Along with talking, discussions and observations, the CPT team members viewed listening as a valuable information strategy.

*There is a path where we have to examine the patient, and then you observe. Then there is a path when we take our hands off the patient and talk and discuss. Then, you listen, so you are both observing and listening.* (Dr. H. Ayidu)

Listening was a way for the CPT team members to connect to the team’s communal repository of knowledge and to broaden their knowledge. It also enabled them to grapple with difficult situations. They all affirmed that listening supported their medical knowledge, though the reasons they gave differed, depending on their position on the team. For example, Dr. S. Idegbe, who is one of the core members, explained that listening to the peripheral members enabled him to get an idea of what they did or did not already know, and where needed to focus more. For the peripheral members, listening enhanced their learning. Dr. H. Aghogho explained that people could have different interpretations of diseases and therapies. In such cases, the core members needed to guide the peripheral members on how to carry on with difficulties.
Dr. H. Ayidu and Dr. H. Ossai talked about how listening helped them to learn new things and to review what had been learnt before. By listening, the peripheral members believed that they were able to get a better understanding of the views and the logic behind the decisions of the core members:

_You see how they are thinking, and then your thought process is actually a combination of the facts you have and theirs._ (Dr. R. Iyamah)

In this way, listening triggered some cognitive responses. Dr. R. Mgbeke saw it more like an exercise for the brain, which helped to make one’s reaction time faster. Dr. R. Mgbeke then talked about how useful listening was to him:

_So most times, we pick new things while listening to our senior colleagues talk. I now remember that: ah, there is this thing that I noticed in this patient that I did not give particular attention to._ (Dr. R. Mgbeke)

Dr R. Iyamah summed it up by saying that

_Then you tend to see and you try to tread in the right direction and correct just by listening and observing people discuss._ (Dr. R. Iyamah)

### 7.3.2 Questioning

The CPT team members used questioning to elicit information, depending on their position on the team. For example, the cadre of House Officers was the first point of contact with patient, and they saw the patient more often than the other members of the team. Dr. H. Ossai explained that he expects questions to be posed to him all the time by his senior colleagues. According to Dr. H. Ossai, the core members of the team might have to find out from the peripheral members if the patient had been febrile, and what the likely cause of the febrile illness might have been. On the other hand, the peripheral members might have wanted to know why the core members made certain decisions regarding the treatment plan for the patient. Dr. H. Ossai further explained that he could ask his senior colleagues: _“Why did you take this position? We want to know the reason for taking this decision?”_ Dr. H. Ebi buttressed Dr. H. Ossai’s view, while Dr. H. Kehinde admitted that asking the core
members questions about issues he did not understand initially was a device he used to build up some confidence about his expertise.

Questioning happened both formally and informally. However, the Registrars, who were midway between the Consultants/Senior Registrars and the House Officers, claimed they were not formal about questioning in the absence of the latter. Dr. R. Mgbeke expressed:

*If our senior colleagues are not around sincerely speaking, we are not as formal as that because we try to ask our questions at barest minimum level where we think everybody can communicate at that level.* (Dr. R. Mgbeke)

The participants also used questioning to share information while engaged in activities. Dr. R. Mgbeke described it in this way:

*As I am asking those questions, it helps me to remember those things that I forgot that I wanted to do for the patients. Maybe the patient has an ulcer or the patient has sceptics, I now ask, how do you investigate sceptics? I know the investigations but as the other team members are listing to the investigations, they may list one that I may have forgotten. As they list it, “ah” I recollect. Yes, “Oh” this one was not there, and I tell the person writing to put it, add it to the investigation. So I have actually helped my other colleagues by that interaction; I have also helped myself, too. Next time, if I ask any other person, I won’t forget that one that I forgot before. So it is a two-way thing. The colleagues under you benefit, you on your own also benefit. It is a two-way thing, and it improves your information bank, and also improves the health care that you are going to pass on to the patient.* (Dr. R. Mgbeke)

Dr H. Kehinde believed that questions were necessary because “they help me to see the areas I never knew before or maybe areas that I have heard of but I did not have enough understanding”. Stressing further, Dr. H. Kehinde explained that a question was sometimes taken as a teaser, “*If I find out that I did not know it, I could jot it down, go home and find out the answer*”. Dr. H. Kehinde explained that he found out that from this act of jotting down questions he always learnt something new that would be useful later on. Dr. H. Ayidu explained,

*That is the only way our senior colleagues can ascertain that they are communicating with us, or whether we are gaining information by*
asking questions and getting feedbacks. If they get the positive feedbacks, then they will be satisfied that they have communicated. If they get negative feedbacks, it is either we are not listening or they have not communicated effectively. (Dr. H. Ayidu)

For the core members, questioning served different purposes. When I asked Dr. S. Idegbe during the interview why he asked other members of the team questions, he responded that he asked questions to clarify and be certain: 1) about issues pertaining to the patients; and 2) some decisions that his colleagues may have made on his behalf. In some cases, Dr. S. Idegbe noted, the questions were about some missing gaps in the history-taking. From the way some of the questions were asked, I imagined that the core members wanted to know if the peripheral members were conversant with emerging problematic issues such as, “Why a patient is having this kind of complaints following this other kind of treatment?” Dr. C. Chukwuezeke explained that he did not assume that somebody knew something only because they had attained a certain level of certification. He firmly believed that questioning enabled him to assess the person’s level of knowledge:

I need to reassure myself that at each level, the people that I have been working with have the requisite knowledge, skills and abilities that they should have. That is why I ask questions, and that is why I don’t just ask straight forward questions, but ask questions that challenge them to think in the context of the real work situations that we face. (Dr. C. Chukwuezeke)

From the analysis of the interviews, the core members proffered several reasons for questioning: 1) to identify the peripheral members’ knowledge gaps and thereby fill those areas of deficiencies; 2) to guide the peripheral members towards appropriate directions; 3) to identify gaps in the information gathered; 4) to clarify uncertainties about the patients; and 5) to clarify issues about decisions made. Dr. R. Iyamah expressed the general view that questioning was part of the discourse around the patient and served to stimulate the team members’ thoughts. This may also prompt them to think in a particular way that they had originally not considered. It may even be used to find out how the team members synthesized facts and arrived at conclusions.

7.3.3 Instruction

Instruction was another important strategy of the CPT team. The core members gave instructions to the peripheral members to ensure that plans were implemented,
investigations were carried out, and drugs were prescribed accordingly. Instructions might also have been given to alert the CPT team peripheral members about what to do and how to do it. For Dr. S. Idegbe, a core member, instruction implied a top-down relationship:

I am the most senior resident in the unit so the instructions with regards to patient care will have to come from me, whether through the Consultants or instructions that are originating from me. It has to come from me as the most senior resident...It is my responsibility as the most senior resident to give instructions to other team members. So, I have to pass instructions, the final instructions as to what should be done for the patient. (Dr. S. Idegbe)

Instructions were given to the peripheral members by the core members due to “the need to enhance patient care and ensure that the patient gets better” (Dr. H. Ossai). Along similar lines, Dr. R. Mgbeke reasoned that instructions were given to make sure that plans were carried out accordingly. According to him, instructions alerted team members to know how activities in the unit were to be undertaken. Hence, he described it this way:

We don’t just write it and tell them to read what is written. We have to direct them because it is not everything that is written that is self-explanatory despite the fact that they are doctors, they are still in training just like us we are still in training. (Dr. R. Mgbeke)

Dr. H. Aghogho explained that when the senior members wrote down their plans, the write-up was like a set of instructions because it detailed what needed to be done.

7.3.4 Consult

The consult was an effective strategy for one-to-one or many-to-many types of communication used by the CPT team members. The Consult was a standard referral form within the hospital setting; it was used to communicate with other units/departments for patient referrals. For example, when a patient attended to by the CPT Unit had gynaecological problem, the patient is referred to the Obstetrics/Gynecology Department by the CPT Unit. A referral, which served as a consult, was written by any member of the CPT Unit. The referral stated the patient’s health profile in concise terms. The information detailed what the unit wanted the department/unit to do, and why the CPT team thought the department or unit was
the best/right unit to do the assessment and review the patient’s case. The consult was usually sent according to how it was generated across the levels of hierarchy, but most often it was done either by a Senior Registrar or a Registrar. The House Officer could also be authorized to send it. Dr. H. Ossai talked about how the CPT team gave information to other units/department through consults.

What we write in the consult is what is already documented in the case note. We may not write everything in the consult. It is just a summary. When they come, they look at the case note, look at what was done for the patient, flip through and that will help them. If we want to write everything in the case note to them, that means we are writing a different book entirely you know. We may probably write five pages of consult and I am sure that you would not want to read that kind of consult. It is a summary so that by the time they come, they would be able to look through the case note to know more about the patient. (Dr. H. Ossai)

The CPT team sent out consults as frequently as the specialty of other units/departments were needed in their management of patients. Dr. H. Aghogho and Dr. H. Atagwu similarly recounted an instance of a consult that was sent out by the CPT team with respect to a diabetic-mellitus patient who was admitted. The patient had cardiomyopathy and an endocrine problem that required the attention of specialists from other units. The team then sent out consults inviting the cardiology unit and endocrine unit to review the patient for cardiomyopathy and endocrine problems respectively, while the CPT Unit managed the patient for diabetic mellitus. On the other hand, the CPT Unit could also receive consults from other units particularly when there were cases of adverse drug reactions, uncontrolled hypertension, and diabetes. The feedback mechanism was into the case notes.

7.4 Determining the authority of information sources and strategies

The results so far presented in this chapter reveal that information was available from a variety of sources through a variety of strategies. During the interviews, I tried to find out which of the sources or strategies were more valuable, credible, or reliable. The intent was to determine the cognitive authorities of the information sources and strategies in patient care. The responses of the team members indicated that issues of reliability and credibility depended on the condition of the patient as the object of activity. The participants generally agreed that they did not rely solely on any one source and ignored all other sources. The sources depended on the
patient, the circumstances of the patient’s ailment, and the learning activity in focus at that point in time. It was not unusual to see the CPT team members flipping through patients’ case notes, reading over laboratory test results, looking at radiological imaging scans, and even referencing handbooks. According to the participants, everything and everybody came into play in making a diagnosis and determining a treatment. However, Dr. C. Chukwuka affirmed that some sources or strategies could assume greater prominence in the process:

Some sources may be more valuable in one case than another, it depends on what you have playing out really, and then you are able to define how to go about it. (Dr. C. Chukwuka)

To buttress his explanation, Dr. C. Chukwuka explained: “When you see a physician taking up an x-ray to look at it, the physician is not just looking at the heart, but the whole chest”. Dr. H. Igweh shared a similar line of reasoning and emphasized that every source of information was valuable, such as direct interactions with the patient, interactions with colleagues, textual documents, test results from laboratories, radiographic imaging, patient’s relatives, and eye witnesses. However, the different strategies in the study context revealed that they were intermixed with each other in activity.

By observing, I watch him, the way he does the examination of different systems, then by listening to what he talks, I open my ears also to get information, new information, let’s say...dynamic information. These are essentially it. Then, at other times, there are things I may need to write if I find out the diseases, there are things that I am not likely to find in textbooks. So, I just write it down. I may go home and consult other textbooks or even the net. (Dr. H. Atagwu)

Even the drugs prescribed for a patient, as Dr. H. Atagwu explained, could open “a door to knowing actually what the patient is being managed for”. This could happen in cases where there was a language barrier, and the patient and the physician were not able to communicate with each other. Dr. H. Ayidu expressed that he could just ask for the drugs that the patient is taking, and simply by looking at them, he could get a clue as to what emergency care to render to keep the patient alive. Dr. H. Kehinde explained that drugs were disease-specific, and as such, were useful as an information source in finding out what the patient was being treated for. For example, anti-hypertensive drugs indicated that the patient was being managed for hypertension. A hypoglycaemic agents implied that the patient was being managed for diabetes. Also, the combination of clarithromycin, metronidazole, amoxicilin, and pantoprazole was for the treatment of peptic ulcer
disease. The pertinent question was, according to Dr. S. Igweh, to “tie them up, and look at it if it has any link to what the patient is presenting with”. Dr. R. Mgbeke noted that the emphasis of the team is that “after every ward rounds, after every clinic, after every lecture, you go back to your books and reinforce and confirm what you have learnt”. To Dr. R. Mgbeke, it sticks better “so you have seen how it is done, you have read, you go back and read”.

It was also, in this respect that I tried to find out about instances of problematic issues or contradictory information, and specifically who or what the participants consulted in such cases. The general view was that nobody was infallible. Also, many of the participants agreed that credibility and reliability depended on the problem at hand and its circumstances. Thus, for the CPT team members, credibility and reliability were not fixed. In most cases, the opinions of the Consultants, who were the most senior and experienced members, were indicated as a high standard of credibility and reliability; “at a glance they know how the information from different sources can be synchronized to make a diagnosis” (Dr. R. Mgbeke). Along the same lines, Dr. H. Ossai reasoned, “what we may write down or what we may open in our books to cross check, they already know it”. Some participants argued, “the gold standard is to check the books. What the book says will be the final issue” (Dr. R. Efangwu). Dr. H. Aghogho had yet another view: “I will hold on to my laboratory results, because no matter the years of experience, laboratory result is laboratory result”. Dr. H. Ebi and Dr H. Kehinde summed it up in this way:

Medicine is both a theoretical thing and a skill. You learn on the job. It is like an apprenticeship thing. So what happens is this...well, I read literary materials, I read on the Internet, I read textbooks, then I ask questions from my colleagues, especially my senior colleagues. Then in work activity such as during Consultants’ clinics, morning reviews, ward rounds...we ask questions. I also examine the patient myself physically. If there is anything that I don’t really understand, I ask questions, and it can be anybody, and when the questions are answered, my knowledge is enhanced. (Dr. H. Ebi)

For example, we see a case during a ward round, probably a case of pulmonary tuberculosis. Now having presented the case, we have seen the history, after the history we have seen the various examinations and then the various questions asked, I would then go back home, and read more, open my books and read more about that particular case so that I can get more information about it. Interacting with our senior colleagues could be a source of information and learning, because sometimes we do ask questions. I mean the Registrars and the Senior Registrars: Sir, why is this like this or why is it not like this? How could
it be done? Why are we using this drug? So in such instances especially when the time allows, there are some degrees of interactions, and as such information is shared and I gain more. And then on going back home, I read more about such a case. So I get to gain more also. (Dr. H. Kehinde)

7.5 Concluding remarks on information access

This chapter describes in detail the nature of information access inherent in the CPT team’s work activity. The study provides empirical knowledge about various information sources and strategies in everyday work context, and the ways the participants gain access to information through them. The findings highlight that the wide range of information sources and information strategies enable the participants to mediate the information environment both subjectively and inter-subjectively in pursuit of a common shared goal of restoring the patients’ health. It was revealed that authority relating to information sources and strategies concentrate on the extent to which a particular source of information or strategy may be relevant at a specific point in time.
8 The role of tools and artefacts in work activity

This chapter describes the role of tools and artefacts in work practice. The focus on the role of tools and artefacts in work practice has been largely disregarded in library and information science (LIS) research. Subsequently, there is limited understanding as to how tools and artefacts influence information practices in activities in the workplace. When considering the role of tools and artefacts in activity, it is worth noting that members of the CPT team used them as information aids towards accomplishing the goal of the team’s work activity. At a general level, this study demonstrates that tools and artefacts enhance the performance of the entire activity system, though they may appear in different ways. ‘Tools’ in this study refer to objects that are of practical significance for engaging in activities. These objects may be used intentionally or unintentionally to accomplish an activity. In this respect, tools are seen as valuable for finding facts or as heuristics for problem-solving. ‘Artefacts’ on the other hand, are regarded as something produced by man in goal-oriented activities. Thus, in this study, tools and artefacts are seen as intermediaries in work activities. The aim of this chapter is to consider how tools and artefacts function in activity in order to gain further understanding of the relationship between the subject and object of activity from a LIS perspective. Accordingly, the underlying research question for this chapter is: “What role do tools and artefacts play in work activity?”

8.1 Physical tools

The activities of the CPT team took place or revolved around patients as objects of activity. It became apparent in the study that a number of physical tools were crucial in the CPT team’s everyday ongoing activities. As previously mentioned, the patients primarily managed by the CPT team included patients with diseases such as of diabetics or geriatrics, those who were hypertensive or were prone to hypertension, and those with various forms of cardiovascular disease. The team members used different tools to enable them to restore a patient’s health back to normalcy; the tool and the way the tools were used depended on: 1) the specific disease; 2) the condition of the patient; and 3) the knowledge and procedures required to restore the patient’s health. While some of the tools were used to elicit essential signs for a single purpose, many tools were used for several purposes. Dr S. Igweh used the analogy of using a farmer’s tool to explain the importance of tools in work activities:

*Just as the cutlass is to the farmer, every tool you see a doctor carrying is important to him. That is how we are, if you see a doctor there are*
some things that he takes along with him. He takes his stethoscope along; he takes his sphygmomanometer along with him, he takes the wrist-watch along with him... also, not just because he doesn’t have anything to take. These are the tools to aid him in picking out vital signs, to marry these signs with the information he has gotten from the history to make a proper diagnosis. (Dr. S. Igweh)

The physical tools used for accomplishing activities on an average day during the CPT team’s encounters with patients can be categorized in many ways. For instance, the tools can be categorized by the physical presence and visibility; that is, whether they are ‘in-sight’ or ‘off-sight’ during activity. In some cases, the off-sight tools are used in conjunction with the other units of the internal medicine departments. There are also tools that are common household items, which may seem trivial to discuss. In the discussion that follows, before I discuss the role of tools and how they were appropriated from this research perspective, I will briefly highlight the different physical tools that were identified in the CPT team’s work activities.

One of the most visible and indispensable tools in this research setting was the sphygmomanometer or blood pressure meter, which nearly always was the starting point during any encounter with a patient. It is a device used by the participants to assess the cardiovascular system with the aim to determine or monitor abnormalities such as fluctuating blood pressure, the fragility of blood vessels, doubling of heart sounds (pulsus paradoxus), and the calcium content of the body. The sphygmomanometer’s inflatable arm-cuff, which is attached to a column of mercury, is wrapped around the patient’s upper arm. The mercurial mechanical manometer is used to measure the systolic and diastolic pressures. The sphygmomanometer, although a conspicuous tool in the CPT team’s work activities, functions in conjunction with other physical tools such as the acoustic stethoscope and wrist watch.

You notice that in every of our ward rounds, there are three things that must be there; first of all the sphygmomanometer, the stethoscope and a wrist watch, and not just a wrist watch but a wrist watch with a second hand. (Dr. H. Ossai).

Apart from being personal items, the wrist watch and stethoscope were thus visible in the CPT team’s work activities. This seemed more of an implicit norm imbibed from the medical training than an explicit rule with no formal written procedure for it. In the beginning of the study observation, it seemed to me that the wrist watch was a rather trivial object that was of no importance for investigation. Over time,
however, and from the interviews, it became clear that the wrist watch had a crucial role in the team’s work activities. During the general examination of patients, one of the first things that were done by the team members was use their wrist watches to check the pulse rates of patients (e.g. radial, peripheral, and carotid pulses). The physician did this by putting his fingers on the targeted artery on the patient’s wrist to feel the pulsations of the blood vessels, and with the aid of the wrist watch, he then counted the pulse rates in beats per minutes. In conjunction with the sphygmomanometer and stethoscope, the wrist watch was also essential to examining other body parts and organs. Dr. H. Ossai opined that the absence of the wrist watch during an encounter with a patient implies that:

*Otherwise you would not have taken a complete history, not complete per se; you have not examined that patient properly.* (Dr. H. Ossai)

The acoustic stethoscope seemed to be the most versatile of the visible tools used by the CPT team. It is a medical device used for listening to the internal sounds of the human anatomy. Regarded as a trademark of the physician’s profession, it operates on the transmission of sound from the chest piece through air-filled tubes, to the listener’s ears. The chest piece consists of two sides that can be placed against the patient for sensing sound: a diaphragm (plastic disc) or bell (hollow cup). When the diaphragm is placed on the patient’s body, sounds vibrate the diaphragm, creating acoustic pressure waves. The stethoscope has multi-purpose functions. Apart from being used with the sphygmomanometer and wrist watch for measuring blood pressure, it is primarily useful in eliciting essential information from the various physiological or pathological conditions that are manifested as sounds. A prominent sight all through the study was seeing the CPT team members listening to sounds in the chest, abdomen, and even the blood flow in the arteries and veins.

*So you want to hear sounds from wherever, from chest which tells you about the conditions of the lungs, you want to hear sounds from the heart, heart sounds which tells you about the conditions and the functions of the heart, even from the abdomen, you want to hear noise from the intestine that you will be able to tell, have an idea about the state of the functioning. In fact all other organs produce some forms of sounds whether in a physiological state or a pathological state; the kidneys, the arteries. You use the stethoscope to listen, and then from your experience you are able to characterize the sounds you are hearing, and you are able to tell whether this is the sound you ought to hear or not. And it gives you valuable information in terms of patient’s management.* (Dr. S. Idegbe)
There were other tools that were less visible, but still important, in the CPT team’s work activities. These were located either within or outside the activity setting itself. For example, the calibrated thermometer, which was used to measure the body temperature, was a typical example of a tool that was not constantly visible, yet was made available whenever it was needed. Since nurses mainly used calibrated thermometers to measure patient’s temperatures on an hourly or daily basis, it was usually located at the nurse’s bay of the different inpatients wards. The thermometer has a mercury column that can measure the temperature of three locations on the body (mouth, rectum, and armpit). I observed the participants asking for calibrated thermometers several times during the team’s interactions with patients. I asked Dr. R. Mgbeke why the physicians took the patients’ temperature, given that the nurses performed this same task on a daily or even hourly basis and documented it in the treatment chart. He answered that physicians used the calibrated thermometer to measure the patient’s body temperature and calculate “the expected values”. Dr. R. Mgbeke explained that calculating expected values in patients’ temperature was beyond the sphere of dispensation of the nurses, whose duty it was to take the patients’ temperatures.

It tells us whether the patient is feverish or not. So if he is, there are values that you expect, then after taking the reading, you try to see if it is within the normal limit of less than 37.2 above 37.5, or the abnormal range of more than 37.5..., so if it is within the normal limit, it is okay. Less than 37.2 above 36.5 it is okay. Well, if it is more than 37.5 and above and less than 36.5 then there is problem, and we start thinking of why the patient has those problems. So the one below is hypothermia, the one above is hyperthermia otherwise simply called fever. (Dr. R. Mgbeke).

Dr. H. Ayidu explained that temperature fluctuates, and when temperatures fluctuate greatly, it is usually due to inconsistencies in some other extraneous factors that must be identified. He claimed that with regular checking, the patient’s health was always monitored.

There were a number of other off-sight physical tools that were invaluable to the activities of the team. One example was the glucometer, which was used to approximate the concentration of glucose in the blood in order to determine the glycaemic state of patients with diabetic mellitus. Dr. H. Kehinde explained that sometimes it was not very feasible to take samples of venous blood to the laboratory for quick results: “so we quickly check to find out if the blood glucose level is low or is very high...we use it to check the patient’s glucose level to get a value” (Dr. H. Kehinde). The glucometer is a machine that reads blood sugar level. It is used in conjunction with strips that are read by the machine. After the patient’s
thumb is pricked, a drop of blood is collected, and the blood seeps into the strip by capillary motion. The strip is then inserted into the machine, which automatically reads the blood sugar level in the blood. I observed that the glucometer was continually used to measure the blood sugar levels of diabetic patients, to check for either a hyperglycaemia (high blood sugar) or the hypoglycaemia (low blood sugar) state.

The ophthalmoscope, which is a single monocular eyepiece, was another basic off-sight tool used in the team’s activities, which was made visible when examining a patient’s eyes. The ophthalmoscope is used to perform funduscopy, which is an examination of the interior of the eyes, including lens, retina, and optic nerve. The physician checks for any abnormalities in the frontal glands or any optical changes, especially in cases with known hypertension in diabetic patients. It is equipped with a rotating disc of lenses to permit the eye to be examined at different depths and magnifications. It also consists of a concave mirror and a battery-powered light. It was mostly the core members of the team that I observed using the ophthalmoscope to examine patients’ retinas. With the relative ease that they used the ophthalmoscope, I had thought that it was the same for all members of the team. However, the peripheral members, like the House Officers, admitted that they sometimes had difficulties using the ophthalmoscope, and often relied on the core members to learn its proper application (see example in 7.1.3).

Although not very visible in the activity setting, the patellar hammer was an additional basic physical tool used by the CPT team members. The patellar hammer has many functions. Amongst others, the patellar hammer is used for chest percussions and neurological testing for detecting abnormalities in the central or peripheral nervous system. It was common to see any of the CPT members holding the patellar hammer during physical examination. This instrument was used to check the patient’s reflexes by eliciting knee jerks, ankle jerks, bicep jerks, and triceps jerks. The physician utilized it by swinging the hammer in an arc-like motion and striking deeply into the tendon. Yet another tool was the tuning fork, which is an acoustic resonator in the form of a two-pronged fork. The prong is formed from a U-shaped bar of elastic metal, such as steel, that produces some form of vibration when in use. The turning fork had varied functions in the CPT team’s activities, including: 1) hearing tests; 2) checking for the patient’s sense of vibration; and 3) checking the joint position sense as part of the examination of the peripheral nervous system. The participants used turning forks to produce vibrations while assessing the patient’s ability to respond to various sound frequencies. The physician performed this by holding the tuning fork next to, but not touching the ear, so as to cause vibrations in the air next to the ear. The patient was then asked to determine which sound was louder, the sound heard through the ear, or the sound heard through the bone. The participants claimed that when set by
striking the tuning fork against a surface or with an object emitting a pure musical tone, the fork will resonates at a specific constant pitch for minutes after the high overtones die out.

There are also common everyday tools outside of the medical setting that are used frequently by the participants, albeit, not quite so visible in the overall work activity setting. Examples of such tools are: cotton wool, ruler, weighing scale, tapes, and markers. In the beginning of the study, I regarded them, like the wrist watch, as trivial objects because of their commonality as household items. Over time, however, it became clear to me that these tools had specific functions, sometimes different from the original purposes for which there were designed. This polysemy was exemplified in various ways. For example, cotton wool was useful for assessing body sensations, doing neurological testing of the central nervous system, and also for checking colour-blindness. The metre ruler was useful for measuring jugular venous pressure, and in conjunction with the weighing scale, was used to measure the body mass index (BMI). The weighing scale was useful for assessing obesity, particularly when patients were moribund and could not stand. The tape measure was used to measure different parts of the body (e.g., the circumference of abdominal girth; limbs in assessing swelling or inflammation). Markers were useful in putting distinct marks on parts of the body and delineating borders. A pen touch was used to examine the eyes and the mouth. The pin (hypodermic needles) was also used to check for peripheral neuropathy. These tools were used individually for specific purposes or together with other tools. For example, the cotton wool and pins were used to examine patients for peripheral neuropathy and identify impairment across distributions. I observed the CPT team members assess the central nervous system (CNS) of a diabetic mellitus (DM) patient with cotton wool and pins. When the pin was used to touch and prick the extremities, the patient was unresponsive to pain. This was indicative that there was impairment of sensitivity to pains.

8.1.1 The role of physical tools in work activity

In this sub-section, I analyze and discuss the role that physical tools played in supporting the activity of the CPT team. The purposes for which they were used in activity were neither ambiguous nor cumbersome, and all the participants stressed their importance in patient care. I asked Dr. C. Chukwuka why it was necessary that on each and every encounter with patients, physical tools were employed to elicit essential signs. He proffered two reasons: 1) to be able to arrive at a base-line for making a diagnosis and clinical decisions. As a science, medicine entails having objective measurements, and this requires the assessment of many parameters; 2) to determine the stability or severity of the illness by knowing the deviations of
abnormality from the normal values.

Physical tools were regarded as the *sine qua non* of the CPT team’s work activity. Dr. H. Ossai explained that he was not able to imagine a situation where a physician would do a physical examination for a patient without using the required physical tools. Dr. C. Chukwuka noted that they “*all have significance, which I don’t think we can go into to talk about... the significance of all these*”. I then specifically asked him about a specific tool, and his response linked the tools to the patient as the object of activity.

*Stethoscope...every doctor’s trademark...use to listen to heart sounds, to the breathe sounds, if there are sounds in the abdomen or not...Because like the heart sounds if there is any abnormality, you would know whether these valves are giving some problems and you will be able to appreciate them that these valves are giving some problems. There is a murmur here, okay, where is it referable, you will be able to pick up all that. There is the problem with the covering of the heart; you would be able to know that. And then, for the respiratory system, you will find that when you listen to the breathe sound, you want to know if the air is entering the lung properly or are there abnormalities of the lungs?* (Dr. C. Chukwuka)

Physical tools were used for finding, checking, and cross checking facts, and for making a holistic assessment and evaluation of a patient. Typically, the complaints or features of a patient triggered the use of the physical tools to elicit essential signs. This was done repeatedly and aimed at verifying and confirming earlier findings. It also involved checking whether other essential signs had been missed. Dr. H. Ossai described it as follows:

*The last patient we saw up-stairs had a pulse rate of above 120 per minutes. That is a case of tachycardia and as such there are other things that may cause that. It is either the patient is having anaemia or the patient is having fever. Now when we had this pulse rate, we were worried and we began to find out what must have caused this. We looked at the PCV to see if it was still within the normal range, and because this patient PCV was within the normal range, we now had to look at the fever. We check the fever, we used the thermometer...the patient was not having fever. So now we are trying to find out why the patient pulse rate was high.* (Dr. H. Ossai)

The physical tools were tied to actions performed in work activity, and were seen
as affordances in the process, rather than the end product. The same physician may not attend to the same patient at a future date, and these tools stood as intermediaries between the CPT team members and the patients. The participants agreed that physical tools enabled them to know patients’ problems and to arrive at orderly representations of those problems: “if it is the CNS\textsuperscript{112}, I need to have all the entire instruments for the CNS to examine the patient” (Dr. S. Igweh). The reliance on physical tools in work activity was clear and definitive. Dr. R. Efangwu explained that it would be problematic eliciting essential signs such as eye disease until “you look into the eyes with the ophthalmoscope, you can have a diagnosis and then make up your mind properly as to the treatment plan” (Dr. R. Efangwu). The information obtained through the aid of physical tool(s) was then documented, making the information available to other members of the team or even the wider community directly involved in patient care (see Chapter 9 on documentation). In this way, members of the team were able to share information from their intrapersonal experiences in an inter-subjective way.

The physical tools were available for repeated usage, and as such, were able to guide the array of the CPT team’s activities. The tools were also useful for monitoring and keeping track of the patient’s ailment trajectory on the continuum of the past, present, and future. Information about the patient was continually updated, and the team used this information to ascertain and make proactive decisions. Dr. C. Chukwuka explained that essential signs triggered off chain reactions. He further explained that new findings could lead to (re)adjustments of the patient’s drug dosages or to further assessment and re-evaluation. Requests for consultations might be sent to specialists’ physicians from other units. Dr. R. Iyamah exemplified this with a stethoscope in the examination of the chest and the heart.

\textit{There are things that you hear on auscultations and then the diagnosis is changed. You hear, for example, a heart strain in an adult then you think of cardiac failure, probably the patient is a diabetic patient. So you start looking for the cause or to say the least, a fluid overloaded space. It is useful if you hear palpitation in the chest, you have to find whether it is an infectious disease fluid.} (Dr. R. Iyamah)

The challenging aspect of employing physical tools in patient care pertained to the procedures involved in the team’s work activities, particularly with regards to considering minute details. Dr. H. Aghogho explained it as follows:

\footnotesize{\textsuperscript{112} C.N.S is the acronym for central nervous system}
If we measure the blood pressure with the sphygmomanometer, we see that the blood pressure is like 180/120, that tells us that the patient is hypertensive, and we know the drugs to prescribe for the patient. In the mornings, we are expected to come to the patient beside to take blood pressure. If the blood pressure is very high, the sphygmomanometer tells us the blood pressure is very high, low or normal. If the blood pressure is very high, and the patient is on anti-hypertensive, then we know that the dose that we are giving the patient is either insufficient or under-dosed. So we have to step up the patient dose for it to march with the blood pressure of the patient. So in the morning when we come to the patient’s bedside, we take the blood pressure and the blood pressure is normal, then we equally know that the dose we have put on the patient is enough for the patient. We may also need to monitor his blood sugar. When we come in the morning, we prick him with a needle, and then we put the blood on a clinical test strip. This would help us as the glucometer machine reads the fasting blood sugar. Any figure that is above 126 is abnormal. And if we do that every morning and we see that the blood sugar is above 126, you know that the patient blood sugar is not well controlled, so we try to step up the level of insulin. (Dr. H. Aghogho)

One major challenge facing Nigerian physicians is the lack of state-of-the-art facilities and equipment. To overcome this, the CPT team members improvised with the available physical tools and used them in ways for which they were not designed. For example, because of a shortage on the instruments used for measuring intracranial pressure, Dr. C. Chukwuezeke explained how by using a centimetre ruler, he elicited the essential signs of the jugular venous pressure by measuring the vertical distance between the sternal angle and the highest level of the jugular vein pulsation. Dr. H. Aghogho explained how the patellar hammer was improvised to measure superficial reflexes, abdominal reflexes and cremasteric reflexes. Dr. H. Aghogho further explained how the sphygmomanometer was improvised to determine pulsus paradoxus by checking for the ankle brachial index of the peripheral vessel.

8.1.2 Adopting physical tools in activity

There were no explicitly written documents or manuals to show how the physical tools were used. The participants averred that they had been given adequate training during their undergraduate medical training. More so, the complexity of using the tools to obtain information from patients was in knowing and understanding in detail the anatomy and pathology of a given body area, as defined by the domain-specificity of medical knowledge. This did not, however, mean that
the use of these tools was only linked to explicit knowledge any more than the tacit or procedural use of it. The participants emphasized that the use of the tools were guided by the mix of 1) the esoteric domain-specific explicit knowledge, which was acquired through their medical education, and 2) the procedures proffered by tacit knowledge. One of the participants used the wrist watch to exemplify the intersection between domain knowledge and procedural knowledge in assessing the respiratory rate of a patient:

*The normal respiratory rate for adults is between 12 to 16 as well as 20; once it is 30 and above, we know that it is acute dyspnoea, and acute dyspnoea occurs in different respiratory diseases or heart failure.*

(Dr. H. Ossai)

It took the undergraduate clinical posting period of two years to learn the basic techniques of using the tools to elicit essential signs from patients; this even went on further to the one-year internship period after graduation. There were fixed ways and techniques to handle the different tools during encounters with patients, depending on the essential signs to be elicited. The CPT team members, who were already qualified as physicians and were to a large extent fully integrated into the culture of medical practice, saw it as their responsibility to pass on techniques to the students. The everyday work activities of the team provided the opportunity for the core members to demonstrate the different techniques in using the tools. Usually, one or two students were called upon to repeat the same technique in the presence of other members of the team. Dr. R. Iyamah described it as follows.

*That also brings us back to bedside teaching. You use a stethoscope and you listen to the chest and you hear something abnormal. What we usually do if the patient has a sign, we call the students to listen and we also ensure that they appreciate the abnormality so that they can understand it. Once in a while, to know how much or how proficient they are, we call them to examine for example the chest. Then we ask them, do you notice anything? And then, they will give you a reply. If they didn’t notice, you call them back and let them see, let them know what to look out for with the aid of the tools and then let them know how to find the difference between normal and abnormal whenever they used any of the tools. It is a learning process and usually overtime, they tend to start grasping the essence of abnormality and normal.* (Dr. H. Iyamah)

In addition, the physical tools had cultural significance to the medical professional practice. Dr. R. Eweka explained that “...their uses have been tested over time as the basis of medical practice is based on physics and not guess work”. My
impression was that the involvement of the medical students in asymmetrical side-by-side participation with core members of the team, some of whom happened to be their professors and lecturers, implied that they were being prepared for medical practice after graduation. The core members of the team were present during the team’s encounters with patients. Thus, it was easy to make corrections of wrong applications of tools and interpretations of essential signs. Dr. R. Efangwu explained that:

This is why we do demonstrations in the ward rounds or outpatients clinics in order to teach them how to use the equipments and put them through. (Dr. R. Efangwu)

Dr. H. Ossai explained that a particular student’s level of motivation could determine how much skill he was able to acquire in using the various tools during the periods of clinical postings. Apart from the formal mode of appropriation, the students were supposed to bring in their individualized learning, such as visiting the wards to clerk and examining patients individually during their free time. In order to meet one of the requirements for medical certification, Dr. C. Chukwuka explained that the students had to be tested on their ability to apply the tools and elicit and interpret the essential signs of physical examinations.

During the study, I observed how the CPT team members assisted and guided medical students in adopting the tools. I identified how the CPT team members demonstrated with the tools and instructed students in their use. I observed how the guidance provided by the CPT team members enabled the students to use the various tools. This also enabled the students to develop sufficient ability to independently elicit the desired essential signs. Furthermore, I observed the emulation of techniques on the part of the students as they participated in the CPT team’s work activities. I observed in many ways how the CPT team members tried to pass on the techniques of applying these tools to the students in different clinical activities. It seemed to me that the core members were practically reaching over to the students’ learning space as they interacted with them in their shared endeavours of patient care.

One of the peripheral members explained how he was in the habit of asking questions as a student: “it was better to ask question when you are with experts than to make mistake when you start practicing” (Dr. H. Kehinde). It seemed that the students became familiar with the tools during subsequent engagements in work activities. By graduation, a student needs to have grasped the details of handling the different tools for various specified purposes. Dr. H. Aghogho and Dr. S. Idegbe
We have already been taught when we were in school. You see those students now... there is a session that our senior colleagues create time for to teach them how to use the tools like the sphygmomanometer and the glucose machine. So we have been taught and we have been supervised a lot of time. (Dr. H Aghogho)

In fact, we were actually taught how to use these instruments effectively as medical students because that is what a very large part of our medical practice is going to be dependent on. So right from medical students days, and then as a house officer, and eventually as a resident, you are expected to learn how to master the use of these tools very well, very effectively. (Dr. S. Idegbe)

According to Dr. H. Ayidu, any physician who has gone through appropriate medical training anywhere in the world ought to be able to use the physical tools without assistance or guidance. He exemplified this with the patellar hammer.

The patellar hammer is a basic, very basic tool. I cannot think of any manoeuvre in performance when using a patellar hammer...that will require my calling my senior colleague or even my peers. Moreover, if I have to call on my senior colleagues to assist me with a patellar hammer, in fact he would frown at it very much. (Dr. H. Ayidu)

Dr. S. Idegbe highlighted some underlying problems that physicians faced when using physical tools. These include: 1) the physician has not learnt the skill of how to use the various tools well enough as a student; 2) there is the problem of interpreting the essential signs elicited with the tools; 3) there are essential signs such as sounds or pulsations that differ; 4) the tools themselves malfunction; 5) there are advanced tools that require assistance.

The peripheral members saw direct guidance as important, especially in cases when their own independent efforts were inadequate in addressing problems at that point in time. For example, they admitted that they sometimes had difficulties in using the ophthalmoscope to elicit essential signs in the eyes because it was a complicated tool. In such cases, they claimed that they always relied on the core members or specialist ophthalmologist (i.e. wider community) to interpret and verify the essential signs.
Yes, there is one, especially the ophthalmoscope that is used in examining the eyes of patients; the inner part (retina) of the eye...not the external part (the iris or pupil). The retina of the eye is a very small compartment that is not very visible and not so easily comprehensible...the ophthalmoscope is mainly used by the ophthalmologist. As students actually, I did not really get a good mastery of that. It was quite expensive to afford as a student. Since I did not actually have it as a student not until I become a medical doctor. When I have problems using the ophthalmoscope, I just call on my senior colleagues...and they tell me what to do, this is how to handle it; this is how to put it on; this is how to put on the lens...So I am still perfecting my skills in its usage. (Dr. H. Atagwu)

It takes someone with experience of doing that on a consistent basis to be able to tell you that. Okay, this is what is there, and this is what it means. I can look into the eyes, but I may also need some assistance to interpret what I am seeing. (Dr. R. Eweka)

In recounting his experience, Dr. H. Ayidu explained how he had to rely on the guidance and assistance of one of the core members and his peer when he was looking into a patient’s eyes for hypertensive retinopathy:

I did not see anything. I called my peer; my peer did not see anything. First, my eyes at that stage were untrained; my peer’s eyes also at that stage were untrained. But we called our senior colleague whose eyes were trained, and better experienced, and he saw Grade 1 hypertensive retinopathy. (Dr. H. Ayidu)

One of the clearest outcomes of using tools continuously in patient care was the advantage of pressing the learner into a higher order of competence. However, Dr. R. Mgbeke envisaged pitfalls in adopting some of the tools. He reasoned that with adherence to the standards in the text-books and effective supervision from senior colleagues, procedural problems with the use of the tools hardly occurred. For Dr. H. Aghogho, one started appreciating subtle differences in their improvement as they practiced regularly with the physical tools under the guidance of the core members.

They will tell you that you didn’t really pick exactly this signs with this tool, but what I am saying is that we have learnt over time how to apply the various tools...we have been taught and we have been supervised a lot of times as how to use them...we can now know the differences between now and when we started working as House Officers... so it
was then that our senior colleagues came and supervised us, but they now know that we are capable of taking patients’ blood pressure and glucose level, so they just leave us to work on our own. (Dr. H. Aghogho)

Direct guidance and support of the team members was seen as a constant feature. There were different reasons that necessitated such guidance and assistance. Dr. S. Idegbe explained that he saw it as a call of duty to provide scaffolds to the peripheral members as a way of integrating them into the culture of medical practice.

Well, first it is always the duty of the more experienced doctor to tell a younger colleague where he or she is going wrong. If the tools are not being applied well the way they should be applied, it is my duty to tell them when they should be applied and how they should be applied. And if in the course of use, there are something, may be lack of experience they haven’t learnt after they use the tools, it is my duty to use the tools, and then explain to them what they missed if they had missed anything, and explain to them why they missed it as well, how they didn’t apply the tools well. So it is my duty to teach them how to use these tools and how to apply the tools. (Dr. S. Idegbe)

Dr. S. Igweh noted that physicians in Nigeria did not have state-of-the-art facilities. He then reasoned that it was important that they correlated their findings as a team. Hence, he stressed that he would call on other members of the team in cases of uncertainty to verify if he was on the right track regarding the essential sign that he picked:

What we do is that we call each other, come and listen to whether you can hear what I am hearing. This is what I heard. Is it the same thing you are hearing? Now, if he is hearing something different, we call another person to come and listen. It is a team and your colleagues should be able to confirm what you are hearing. (Dr. S. Igweh)

The case was quite different for Dr. R. Iyamah, who explained that direct guidance and assistance regarding physical tools was necessary in setting the clinical procedures right. He exemplified it BY using the blood pressure measurement of obese patients:

You explain to them the ideal way of these things being done because errors in measurement can occur at any interaction point with patient.
There is the approximate level of the systolic pressure, and if you under inflate the sphygmomanometer, the patient may have an ascultatory gap as pressure is reduced and reappears at a lower level...you don’t have blood pressure of up to 200, you may miss palpitary estimation. There is also the problem of the diastolic dilemma where the blood pressure measurement is uncertain about the diastolic endpoints. And then you inadvertently give the wrong B.P reading. So you would actually ask them to do this, and you will show them that there are little things they have to look out for. (Dr R. Iyamah)

Dr. R. Efangwu recounted his experience as a House Officer in using the sphygmomanometer for checking blood pressure. He explained that there was a procedure for taking blood pressure accurately, which he learnt when he was a House Officer from one of the core members:

The couch of the bladder, the bladder in the couch of the sphygmomanometer has to be above the arteries direct, there is a specific location with an arrow that has to be above the artery. Most times, I wasn’t doing that, but my senior colleagues put me through the way it must be done properly, and it gives you an accurate reading when you do it that way. So now, I take time to teach the younger ones if they have such problem. (Dr R. Efangwu)

8.2 Language as a tool in activity

In this sub-section, I examine the crucial role of spoken language in the form of utterances as a practical tool for interactions in work activity. The utterances were part of social interactions as the CPT team members ‘lived’ through their work activity. If we considered the team’s interactions with the patient without anybody talking or making any form of utterance, it would be a waste of time, leading the team members to make irrelevant probabilities. When a physician speaks to a patient, he does so with the aim to obtain information towards directing the course of activity. The following extract exemplifies the interaction between the team and a hypertensive patient who had been previously managed by the team, and who had come to the Consultant’s clinic for a follow-up (see Data Extract 1).

Data Extract 1

1) Dr. S. Idegbe: How do you feel? How are you doing today?
2) Patient: I have pains all over my body

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3) Dr. S. Idegbe flipped through the case notes: *Pains all over your body? When last did I see you? Flipped again: On the 6th of May*

4) Patient: *I have bad eye sight now*

5) Dr. S. Idegbe: *Is that why your B.P. has been difficult to control?*

6) Medical student: *Yes, what she is saying is that she could not recognize you.*

7) Dr. S. Idegbe still flipping through the case notes: *Your B.P is becoming uncontrollable...Apart from the pains that you are complaining of now, do you have any other problem?*

8) Patient: *So many, so many, so many problems all over my body, so many.*

The above extract shows that Dr. S. Idegbe started the consultation by initiating a straightforward request for any information with the propositional content of such questions as: “*How do you feel?*” Dr. S. Idegbe wanted to have information about the patient’s present condition, which is why he asked the patient questions that encouraged her to talk about her illness in whatever way or manner. This enabled him to pinpoint the problem(s) to be solved and to make further clarifications about the patient’s health status. The patient’s response in no. 2 not only informed the physician that she was feeling unwell and conveyed the current state of her illness, but indicated a possible reason for seeking medical attention that day. It also positioned her within the context of the team’s work activity. Dr. S. Idegbe’s utterances in no. 5 and 7 sought to disambiguate the patient’s response in no. 4 (indicating some element of familiarity) and resolved unanswered issues by keeping the focus on the problem at hand by repeatedly saying in no. 7 “*Your B.P. pressure is becoming uncontrolled?*”. Sensing that Dr. S. Idegbe did not understand what the patient said in no. 4 about not recognizing him, one of the medical students chipped in: “*Yes, what she is saying is that she could not recognize you*”.

Dr. S. Idegbe’s utterances were in a language that the patient could comprehend. The dialogue that followed (Data extract 2, nos. 1-12) focused extensively on different aspects of the patient’s health condition, and fell within the range of a strict biomedical definition. The way the dialogue went reflected the active role that the patient played throughout the consultation, either to provide information about her prevailing health condition (nos. 2, 4, 6, 8), to refute questions (no. 4, 6, 12), or to supplement facts (no. 8).

Data Extract 2

1) Dr. S. Idegbe checked the blood pressure and flipped through the laboratory results attached to the case notes: *You know that controlling your B.P. is*
very important; how long have you been experiencing pains?

2) Patient: Since a week now, but my heart is beating, I feel cool, feverish and sometimes I feel hot inside me; I have been having headaches for some time now, but my heart is beating.

3) Dr. S. Idegbe: Heart should beat... Is it beating very fast? When was the last time you had malaria?

4) Patient: No, not very fast... but up and down. I had malaria six months ago (brought out some drugs from her bag).

5) Dr. S. Idegbe: Are these the drugs you are currently taking? Do you have any drug allergy? How have you been taking your drugs?

6) Patient: I don’t have any drug allergy, and I take Hiprill... the last time I came it was one tablet of glucophage.

7) Dr. S. Idegbe: I will be increasing some of your drugs; the Hiprill-5mg to 2 a day... This is 5mg... but when next you buy it again, buys the one that is 10mg... As from now on the glucophage is going to be two in the morning, afternoon, evening (3 times a day). Let’s watch it like that and see how your blood sugar and blood pressure is controlled. You will have to do some tests again so that we know what the problem is really.

8) Patient: (Pointing at the eyes) My eyes, I was referred to the eye clinic.

9) Dr. S. Idegbe: Eye clinic? What is wrong with your eyes? Have you been using glasses before? Then you should see an eye specialist who will tell you whether you need glasses or not (refers patient to ophthalmologist and then ask the patient if she has any other problem).

10) Patient: When do you think that I will be completely off the drugs.

11) Dr. S. Idegbe: Be completely off your drugs... We have two diseases here that we are contending with; we are trying to treat you for both hypertension and diabetes... and both of them require long life treatment. The problem with these kinds of diseases is that as long as you take your drugs, both your blood pressure and blood sugar would be controlled. But once you go off them then you start having problems. It is life-long... (and then asked the patient again) Do you have any other question?

12) Patient: No... thank you.

The Data extracts above (1 & 2) distinguish Dr. S. Idegbe and the patient as conversational partners. Dr. S. Idegbe led the dialogue with his expertise and skills as a physician, asking almost all the questions. The questions asked involved straight-forward requests for information, and not just for the sake of conversation. Some of the questions were an expansion of the patient’s past medical history such as in Data Extract 2 (no. 5), “…do you have any drug allergy? How have you been taking your drugs?” The essence was to make the patient focus on the relevant features of the problem. On the other hand, it was clear that the patient had now
assumed the position of an information giver and a speaking subject; “I don’t have any drug allergy, and I take Hiprill...the last time it was one tablet of glucophage”. The patient only asked one question (Data extract 2, no.10) in order to gain access to prognostic information as to when she could stop taking her drugs.

The findings in the two Data extracts relate to Frankel’s (1984, p. 135) findings that during consultations with patients, physicians’ utterances almost always took the form of questions, whereas patients’ utterances routinely consisted of answers. The analytic point is that utterances in the dialogue between the subject and the object of activity involve some sort of asymmetrical relationship. Dr. S. Idegbe’s utterances were followed by the patient’s response though each of Dr. S. Idegbe’s questions created space for an open-ended exchange in which the patient was able to talk freely about the different dimensions of her health condition.

Dr. S. Idegbe’s response to the patient’s utterances, especially the partial repetition of the patient’s answers, was a characteristic way to confirm that a piece of information had been understood. However, the interaction between Dr. S. Idegbe and the medical students during the consultation with the same patient took a different form. The major difference between Data extracts 2 and 3 is the language that falls within the range of strict biomedical definitions in the latter case. The language in Data extract 3 is more specialised. For example, the student’s use of the term “...ectopic heartbeat” in no. 3 (Data extract 3) to describe the irregularity of the heart rate and heart rhythm involving extra or skipped heart-beats, instead of the patient’s complaints in nos. 2 & 4 (Data extract 2) “...my heart is beating...not very fast...but up and down...”. Note also no. 5 (Data extract 3), “...instead of adding drugs to revise the cardiomegally”. It is worth noting the conspicuous use of biomedical definitions by Dr. S. Idegbe, rather than the use of ordinary language, in explaining to the medical student why he increased the patient’s drug dosage (see no. 4, Data extract 3).

Data extract 3

1) Student: Sir, why did you have to increase the dosage?
2) Dr. S. Idegbe: Why do you think I will increase it?
3) Student: Is it because of the ectopic heartbeat?
4) Dr. S. Idegbe: When a patient comes presenting complaints, after listening then you sit down and try to figure out by looking at other probabilities to see if they would fit in...they are some symptoms that are secondary...fleural pneumonia,...If you know what the ECG is, you would be able to read the cardiomegally...you try to see if the patient has increased heart entropy or
even cardiomyopathy...You even have to consider the degree of pain, is it intermittent, constant or otherwise. For example, constant pain is suggestive of myocardial infarction...You can also consider dyspnoea, which at times is suggestive of congestive heart failure secondary to acute myocardial or pulmonary embolism,...and the pulmonary embolism you all know could lead to pericardium. Don’t forget what you know about pulmonary oedema too...So there are a lot of probabilities for a physician to consider...We are now looking for the cause...the differential diagnosis...before we can start thinking about the prognosis.

5) Student: Instead of adding additional drugs to reverse cardiomegally, can we try other alternatives?

6) Dr. S. Idegbe: Yes, hypertension is not all about drugs. We can try non drug measure. If it is not working well, then we can apply more drugs.

I found that spoken language or utterances by the CPT team fell into two types. The first type was the medical jargon, which the team members used for interactions amongst themselves. Medical jargon portends a powerful language for the CPT team member and is imbued with special words, phrases, and gestures that had specific meanings for the team members. To an outsider such as myself, it was, to a large extent incomprehensible. The second type of language was that used for interacting with ‘ordinary’ or ‘lay people’ like the patients and myself. It was agreed by many of the participants that it would be absurd to use the ‘medical jargon’ when interacting with a patient, as the language of communication during consultations depended on the literacy level of the listener(s). Nigeria is a country that has high linguistic diversity of over 510 languages, mixed social class backgrounds, and a high level of illiteracy. The essence of communication is in understanding what is being communicated, and the language used in activity is determined not only by the purpose that it is intended to serve, but to whom it is directed. When I asked some of the participants to compare these two types of languages, they all agreed that there were striking differences.

So like the jargon that we use amongst ourselves as doctors, we ought not to use such jargon when we talk with our patients...They must understand our language and comprehend us well. So, we use simple layperson’s language when we are talking to a patient. We assume that the patient is not a medically-trained person or so...When the patient is not literate and cannot understand simple English; we resort to using our vernacular or local dialects; sometimes and more often...we use pigeon English. (Dr. H. Atagwu)

Most times, it depends on how learned the patient is. Patient that belongs to a very high class, patient that is educated, we speak simple and correct English. If a patient is not educated at all, and is a stark illiterate, and you
happen to speak the same language with the patient, then you speak your local dialect with the patient. If the patient does not speak the same dialect with you, then you speak the normal vernacular English that the patient understands that is common pigeon English that we all speak here in Nigeria. You will not speak high classed English to a patient that is illiterate rather we go down to our local dialects or pigeon English as the case may be. (Dr. H. Aghogho)

Sometimes in discussing amongst ourselves, it may be okay that is my own personal opinion to use these words. But when you want to communicate to your patient, on what your discourse has been, you can now come down and use non jargon words. (Dr. R. Iyamah)

The use of the medical jargon was prominent throughout the study in a way that indicated Wenger’s (1998, p. 104) assertion that the nuances and the jargon of a professional group, in practice could be a glass ceiling, as much as certification or official policy. For example, during a ward round, I observed Dr. S. Idegbe tell Dr. R. Efangwu to position a diabetic mellitus patient to check for the jugular venous pressure (JVP). The participants gave various reasons for the use of medical jargon in their interactions: 1) to facilitate a realistic degree and use of biomedical knowledge and understanding in practice; 2) it puts the physician’s flow of thought into a distinct form; 3) to enhance free communication amongst physicians in the team activities; 4) to embody a cultural practice indicating both a particular trade, craft, or professional group, and the jargon spoken by that group. I will further use the example in the following paragraph to illustrate the pervasiveness of medical jargons as a language of communication amongst the CPT team’s members.

The case history of a hypertensive patient with renal impairment presented by Dr. H. Atagwu to the team members portrays well the jargon of a specialized knowledge community.

I present patient X, a middle age chronically pale ill-looking woman in respiratory distress...aricteria, case history is five years;...bilateral pitting oedema-hypopigmental patch in the anterior chest wall;...associated drenching; known hypertensive with finger clubbing and claudification...acute dyspnoea and sinuses; chest x-ray shows cardiomegally with upper lobe division, but no evidence of hypertrophic cardiomyopathy...multiple ulcers at lower limbs measuring 20 to 30 c.m...pulse rate 150...respiratory rate 42 circles per minutes; JVP...5 cm (distended neck veins); Apex beat: 6LICS lateral displacement...; heart sound, S1S2S3 radiating to the axilla; trachea deviated to the right; PN...resonant; BS vesicular with creps in...fine basal
erepitations...Abdomen...full moves with...liver span 8 c.m \( K^0 \); .B.P. 190/130mmHg (supine),...conscious and alert, well oriented in TPP, neck supple but tender...urinalysis shows PH of 7.5”

Assessment:...acute hypertension, heart disease and renal impairment. (Dr. H. Atagwu)

All the participants possessed a strong command of the vocabulary of the biomedical language when communicating with each other. Dr. C. Chukwuezek argued that he did not believe that the medical jargon was intended to confuse people or to mystify things, but the opposite.

_I believe that our language, the language that we speak or what we call language is intended to capture many things, and convey much in few words._ (Dr. C. Chukwuezek)

The participants were at consensus and believed that the use of medical jargon not only allowed for effective communication amongst themselves, but was also useful in providing short, clean, clear, and precise information. Dr. C. Chukwuezek explained that, when speaking to his medical colleagues, instead of saying that a patient was ‘vomiting blood’, he preferred to say that the patient had “haematosis and anybody who is trained in medicine will know what I have just said”. Dr. C. Chukwuezek enumerated two advantages of using medical jargon when interacting with other physicians: 1) to ensure confidentiality of the information in treatment; 2) to protect the patient from information that the patient cannot handle at that point in time.

_For example, I think if somebody has malignant disease, cancer, I should not stand beside the patient’s bedside and tell the other physicians that this patient has cancer of the throat. I could say that the patient has a malignant disease of so so and so and they know what I am talking about. Eventually, the patient will get to know, but it will be at a time when he is able to handle that information. And I may still tell him that he has cancer without using the word cancer. I could tell him for example that he has growth somewhere, and it is not normal for him to have that kind of growth, and that the growth could be curtailed with a capsule. If I am talking to my students, I will say the growth could be benign or malignant. There is no gainsaying that we have a language, we must use the language, and the more proficient we are at using the language the better it is for us all._ (Dr. C. Chukwuezek)

The above excerpt illustrates the way meaning is made in the team’s activity. This
further proffers a basis for the discussion of the role of language. First, it illustrates
the manoeuvring in the use of utterances by the participants. This allowed me to
probe further into the way meaning was made between two different kinds of
‘listeners’ (i.e. subjects and objects of activity). Medicine abounds with examples
of careful naming, and Dr. R. Iyamah explained that “there are different medical
languages for almost everything, and one word can say a lot”. He explained that
one could say, for example, that a patient was anaemic rather that saying that “the
patient has a low PCV of this, this, this, and it says a lot about the patient”.

Meaning-making thus requires attention to be paid to both denotative and
connotative meanings. For example, the denotative meaning of telling the cancer
patient, as in the above excerpt: “that he has a growth somewhere, and it is not
normal for him to have that kind of growth...” (Dr. C. Chukwuezeke). Dr. C.
Chukwuezeke said that he could also tell his colleagues at the patient’s bedside that
the patient had a “malignant disease of so so and so and they know what I am
talking about”, and tell the medical students that “the growth could be benign or
malignant”. Eventually, the patient would get to know that “he has cancer of the
throat”, with its connotations of painful chemotherapy treatments and eventual
death. But the utterances used in informing the patient has held painful reactions at
bay. Sometimes as Dr. R. Iyamah explained, instead of using the connotative word
such as cerebral malaria, symptoms or complications such as ‘fainting’ and ‘being
unconscious’ could even be used to explain the disease to the patient.

However, it was found that the utterances by patients sometimes connoted some
forms of ambiguity and vagueness due to their being subject to multiple
interpretations and meanings. Clarifying the ambiguities therefore required the
expertise of the physician. Dr. R. Iyamah explained the ambiguities in utterances
with two examples: “...my eyes are turning me” for dizziness and “I have problem
with urination” for explaining the problems associated with painful or increased
excretion of urine. Dr. R. Iyamah further explained that it was important for the
physician to clarify the ambiguities.

If a patient says ‘my eyes are turning me’, is it that when I stand up, I
feel drained which is more like postprandial hypotension. When I stand
up, I feel drained or is it that the ground is turning as if I have turned
round and stopped, which more is like vertigo. Postprandial
hypotension may be because he has less blood, but vertigo may be
because he has an ENT\textsuperscript{113} problem. (Dr. R. Iyamah)

\textsuperscript{113} ENT is the acronym for ear, nose and throat.
If a patient says ‘I have problem with urination’ that is, ‘I have urinary problems’ is vague. Does he have pains when he is urinating? Dysurea, when you say dysurea I think…does he have frequency that he is urinating every now and then, the bladder is irritable, does he have polyurea and he goes and urinate, small quantity of urine. So these are summary things and ways of expressing yourself, bringing out possible meanings; because causes of polyurea, something that will cause excessive urination, excess urine volume may not cause pain in urinating. So if a person says ‘I have problems when I urinate’ it is vague. So you want to specify what the problem is in terms of medical language. (Dr. R. Iyamah)

The participants agreed that it required both expertise and experience to deduce and make meaning out of patients’ utterances. I observed when a House Officer told Dr. C. Chukwuezeke that a patient who had hypokelamaelya complained of dizziness. To get the facts right, Dr. C. Chukwuezeke responded;

We must know what the meaning of dizziness means in this regard. What does the patient mean by dizziness? In Nigeria, some people...when they are hungry say that they are dizzy. (Dr. C. Chukwuezeke)

The case was the same with interpreting the commonly used Nigerian local parlance of ‘pigeon English’. I observed a fragile and pale-looking elderly woman walk into one of the consulting rooms at the Consultants’ clinic and announce, “I dey wello, wello; my bodi dey kampe” (meaning I am very well; my body is very healthy). In actuality, the patient meant that she was really sick and needed medical attention. I was surprised when the attending physician asked the patient “na where your bodi dey pain you?” “How e dey worri you?” (i.e. where do you have pains, what are your problems?). The patient used her hands to gesture to all the parts of her body where she felt pain. Her action thus implied that she was not well, like she had claimed earlier.

The language itself that is used in the CPT team members’ interactions is interesting to explore and becomes clearer when one takes into account the use of medical jargon in everyday work activity.

Well, I think it is a gradual thing. There is really no demarcating line...But you learn, you learn everyday...and I have to now pick it up so it is a continuous thing. There is no demarcating line but to some extent, we expect you to improve. But if you are a 600 level student, you
should talk like a doctor. When you talk outside, then you talk and I say okay you must be a doctor. There are ways you talk and I can say no, this is not a doctor. (Dr. R. Iyamah)

Language modification as occasion demands. I think it is long, I will say that did not actually only happen only in medical school, but language is interaction, social interaction, something I see. Something that has been happening since birth as far as you live among human beings, you interact with them. One has been developing this communication skills or interaction for long, but by the time we now came to medicine, the professional aspect now comes to play. So, it has been an age long thing. (Dr. R. Iyamah)

There seemed to be a culture regarding the appropriation of language by the CPT team members. Although many of the participants averred that they were already used to the terminology of the medical jargon before graduating from medical school, some of them voiced concerns that their proficiency needed to be further established.

Talking about proficiency regarding our medical jargons, I won’t say as at now that I am proficient because there is still much to learn. I am still a long way getting to the top. I come to better use of medical terms by daily associations with them because I am just coming across some of these terms. As I read the case note, I see new things, as I read my textbooks I read new things and when I come to the ward I hear new things. So when I hear them, they stick, I read about them, I take note of them because I would need them to communicate, so with more associations you find out that it becomes part of you, in no time you are better at using them. (Dr. H. Kehinde)

I have not finished learning the medical jargon, as you go ahead you keep learning, you keep hearing new things. But I have gone far from when I started...by you reading books, coming to clinics, going for conferences, working hand-in-hand with your seniors, you gradually change, drop some things, pick up medical things and you already fall in into the system. So it is not something that you pick up once. Nobody can do that ones. But it is something that we tell each person because not having the medical language or using it can actually fail you in exams. They expect your words to be that of a doctor. Even your patients will appreciate you when you speak medical language; they ask you: “oga” what do you mean by that? Then you start explaining. But when you talk like a market person, they will even say that this one is not a doctor. So I think that it even helps your profession. It helps
your perception in the public. (Dr. S. Igweh)

I am still learning. We still learn the language, the learning continues. It is like learning your native language, and which is a gradual process. It comes with confidence, it comes with time, and it comes with the more you listen the more you know. I actually learn more of it by listening. You listen to your senior colleagues talk before really it becomes part of you. I think, I became more confident in final year as a medical student, and then as a practicing physician. All the same, we are still learning the medical language and that is what actually distinguishes you from other health professionals. (Dr. H. Ossai)

Medicine is practiced in a way that makes emulation possible. Dr. H. Kehinde explained that by participating in the everyday work activities over time, his vocabulary of medical jargon was built up and became a way of life. Dr. C. Chukwuezeke believed that living by example was one way of ensuring that other members of the team abided by the norm of using medical jargon. He reasoned that you could not expect other people to do what you yourself were not already doing, so he spoke the medical jargon as often as was necessary. He also believed that the peripheral members learned how to improve on what they already knew by emulating the core members. Dr. C. Chukwuezeke claimed that sometimes, when he noticed that the peripheral members were not really up-to-date with the development of their medical jargon, he gave them assignments that would require them to get acquainted with the terminology that they were not fluent with.

Sometimes when we notice that some of our younger colleagues are not really up-to-date the way we expect from them we give them assignments. And that is why you may notice that I pick on some people more than others. We get them to talk so that by practice, they begin to acquire the language skills. (Dr. C. Chukwuezeke)

To assist the students in getting acquainted with the medical jargon, the core members of the team constructed mnemonics. During a ward round at the bedside of a diabetic patient, Dr. S. Idegbe checked whether a patient had sensory feeling or neuropathic pain, and gave the students the mnemonic for checking the signs of autonomous neuropathy. The mnemonic was MRS V.C. ABEHCA, meaning

1. M- mitral myxoma
2. R- raised intraaranial
3. S- six sinus syndrome
4  V- vasomotor syncopy
5  C- coupled ectopic beat
6  A- abial fibrillation
7  B- bitter bockers
8  E- elderly point
9  E- Excess use of digitals
10 H- hypothermia or heart block
11 H- hypothyrodism
12 C- cholestatic jaundice
13 A- Athletic fitness

It is important to note here that MRS V.C. ABCHA is a Nigerian name. The use of such mnemonic by the CPT team members was pervasive. By using the mnemonic of MRS V.C. ABEHCA, Dr. S. Idegbe was able to ensure a level of commonality in checking for neuropathic pains amongst the students.

8.3 The case notes

The research question to be addressed in this section is an aspect of the fifth research question and deals with the crucial and integral role of artefacts in the CPT team’s work activity. Some of the participants argued that without their own professional expertise and skills as physicians, the case notes would have meant little. At this point, it becomes trivial to discuss in detail the representative quality of the case notes or how they mirror the patient’s trajectory. This section looks at how artefacts support and mediate the plethora of the CPT team’s work activity.

Glancing through the loose-leaf papers of the case notes (as in the practice of reading and writing in the case notes so aptly described in Chapter 9) enabled the participants to go back and forth through the patient’s history and observe closely the severity and stability of patient’s current situation. At the same time, the case notes were useful in the documentation of relevant issues in the patient’s history and in identifying what needed to be addressed. For example, I had followed the case of a diabetic patient that needed medical attention due to a bilateral foot ulcer. I observed the participants continually flipping through the patient’s case notes, attentively writing and (re)writing in it in light of further deliberations and actions taken with the patient. I observed the continual review and re-evaluation each time the team either collectively or individually had an encounter with the patient. I also
observed the participants (re)turning to the case notes in a way that seemed to imply that the case notes actually shaped and modified the team’s activity or so it seemed from the viewpoint of a lay person. Many of the participants, particularly the core members, did not agree with my view that the case notes actually shaped the way the team activity was performed. To them, it was more of a collective responsibility influenced by their own personal histories as physicians who were adequately qualified for the job with specialized training of varying sorts, experiences, exposures, and commitments to their duties that they considered when engaged in the team’s work activity.

Though there were many artefacts in the study context, I chose to look at the patient’s case notes as the main mediating artefact in activity. Focusing on only one artefact did not change the overall picture of importance of the other artefacts that were not investigated in this study. It is the significance and specificity of the case notes, in occupying a central niche as an informative and communicative artefact that is the focus of the research interest here. During the study, I was allowed to access the case notes. I examined some of the case notes and made extrapolations relevant to the research. Throughout this section, I will be using a broad definition of the ‘case notes’, which is the physicians’ written record of each patient’s medical course, observed in one or more visits within the hospital setting, and stored for future use. This definition implies that the case notes were not a single item, but the whole assemblage of interactions of physicians with patients including the patients’ first visit to the Accident and Emergency Unit (A & E), the Consultant’s clinics, inpatient wards. It is impossible to separate the mediating artefact from the activity itself, but the discussion in this section will address emerging issues and affordances that were revealed in the use of the case notes as a mediating artefact.

8.3.1 Case notes as a mediating artefact

Obviously, none of the participants described the patient’s case notes as a ‘mediating artefact’. All the participants saw the case notes as standard documentation of the physicians’ interactions with patients and all activities concerning patients, which the physicians were expected to document according to the culture of the medical profession. Thus, rather than describing it as a ‘completed’ document, the participants’ descriptions alluded to the case notes as a working document. This document-in-progress evolved over the trajectory of the patient’s health history and care. The case notes were seen as a necessary document, because unless the patient’s trajectory was documented, it would be impossible to follow the patient’s health profile.
Typical case notes were handwritten. The document consisted of loose sheets of A4 paper with numerous entries chronologically arranged, indicating successive, continuous, and iterative interactions and events. Dr. C. Chukwuka admitted that there could be misinterpretations, and to guard against them, as well as to facilitate for the multiple authors, the structure was fixed and spacious to permit physicians to write down their observations, and to note investigations and therapeutic interventions in full detail. The CPT team members saw the case notes as the team’s repository, accessible only to those who were involved in the patient’s management.

Each entry entailed details of historical information starting with the biographical data that introduced the patient and was comprised of such information as age, sex, tribe, occupation, and religion. This was followed by the physician’s detailed description of the patient’s reason for seeking medical attention. The information also pointed to the patient’s past medical history. The next section of the case notes entailed the following: findings of the physical examinations (general and systemic); investigative test results; assessments; list of problems in rank order; the projected therapeutic interventions; and summary of the encounter. The entries were brief or extended. The case notes had to be signed by its author with the accompanying date and time, signifying that the CPT team member, as the subject of activity, acted upon the patient as the object of activity. Because of the legal liability of medical practice, as well as the need to reconstruct the patient’s past medical history, information was continuously recorded and updated in the case notes by the different physicians (both within and outside of the unit) that interacted with the patient.

The participants saw the case notes as the embodiment of where the team’s activities began and ended pertaining to a patient. It would thus seem meaningless to analyze the case notes outside of the work activities of the team. Dr. H. Atagwu exemplified it with the case of a hypertensive patient who had been visiting the unit for medical attention for over ten years. He then reasoned that the case notes indicated the continuum of the patient’s ailment trajectory over the years. The case notes were also seen as a resource for comparing the past with the present, which proved useful in making decisions regarding new investigations to be done and therapeutic dosages to be either (re)adjusted or discontinued. This cycle continued until the activity was accomplished and the patient was discharged.

During the interviews, many of the participants spoke about and stressed the need to identify missing gaps in earlier findings. To some of the participants, it was those missing gaps that a good physician should really strive to identify, rather than falling back on the past to reconstruct the present. In the discussions that follow, I
will present some of the emerging issues that sprung up in the study when looking at the case notes as a mediating artefact.

8.3.2 Case notes for engaging in activity

Once a patient was registered, new case notes were opened. If a patient sought renewed medical attention, then the old case notes were retrieved from the medical records department. At this stage, the case notes became not only a resource for the CPT team members, but also a link to the wider community. Dr. C. Chukwuka saw the case note in this light, and referred to it as ‘record linkage’.

*You have this linkage of record, you will be able to find out some things, which exceed the background noise telling you something might be happening there, and we are able to trace so many issues.* (Dr. C. Chukwuka)

The case notes represented the patient *per se* and supported the actions and activities of the A&E unit or the outpatient department of the teaching hospital. The participants saw the case notes as the representation of the different encounters with a patient; the temporal assemblage of people and events were involved in those interactions to accomplish the goal of restoring the patient’s health to normalcy. However, the case note did not determine work processes (which were drawn upon to undertake any activity), but were instead seen as one important resource among others. The outcomes of the use of case notes depended on the team member’s own expertise and mastery of the procedures involved in patient care. It was thus subject to the team members’ interpretations and reconstructions based on the progression of the patient’s condition. In this sense, the role of the case notes was defined by the team members as they could not tell the team what course of action to take, organize, or plan.

*The case note does not tell us what to write or the action to take. We just read to know what was written for the patient previously, and for us to know what the patient is being managed for. But for us to write on a very fresh case, we have to examine the patient, see the patient, and know what to write.* (Dr. H. Aghogho)

The case notes were, first and foremost, for keeping track of the patient’s ailment trajectory. The participants believed that case notes also helped them to individually keep track of what was happening to a patient at any point in time. For
example, in the A&E unit, a House Officer attending to a patient had to consult the case notes for the patient’s past medical history. With the case notes, he claimed that he was able to make his assessment of the patient’s present situation and establish a link between the present and past situations. The case notes were passed on to the attending Registrar for further consultation and assessment. The contents of the case notes were updated to reflect the Registrar’s assessments, the investigations he had ordered, and the therapy that was prescribed. The patient was admitted and transferred to the inpatient ward where the case notes followed. The case notes were first received by the nurses, who used them for the purpose of locating a place for the patient, and administering the treatment plan as ordered by the A&E unit. In the morning, another Registrar took the case notes to the morning review to present the patient’s case. The Registrar’s presentation made it possible for members of the wider community to be informed about the patient and to provide their input on the patient’s care. The Consultants and Senior Registrars acted as experts, who shared detailed knowledge within their respective specialties. The case notes were, thereafter, taken back to the bedside of the patient where it remained throughout the duration of the patient’s admission. After the patient was discharged, then the case notes were returned to the medical records department.

The activities undertaken and actions performed by the team throughout the duration of the patient’s stay on admission were, to a large extent, facilitated within the spatial-temporal confines of the case notes. The case notes were also seen as an aide-mémoire in work activities and enabled the participants to engage in activities synchronously or asynchronously while monitoring the patient.

*I don’t think that human memory can contain everything just like that. We tend to forget some things…memories can be short and the case note always helps us to remember a lot.* (Dr. H. Ebi)

*We can’t keep everything in our head…there are a number of patients we have to see…if we just put everything in our head, the tendency to forget is there.* (Dr. H. Kehinde)

*You are able to remind yourself what happened in the past so that you don’t forget the trend of the management of the patient.* (Dr. S. Idegbe)

For example, between the periods of two ward rounds, the team members individually attended to patients. The House Officers attended to patients in the early morning hours as part of their routine and the case notes were used for clerkship. The other team members used the case notes to review or re-evaluate
patients’ cases. Even the medical students on clinical posting used the case notes to do clerkship as part of their medical training. During ward rounds, it was the norm for one of the House Officers to present the case notes to the other members of the team. This provided the opportunity for other members of the team, who had not had contact with the patient, to gain insight regarding the patient’s health status. It also provided the opportunity for the team members to discuss and deliberate amongst themselves, compare the progression of the patient’s condition, and subsequently make decisions. Questions regarding relevant issues were usually put forth either to the presenter or to any other members of the team.

The entries in the case notes were evidence of the participative presence of the team members during work activities.

*So it also helps as evidence that that person was actually seen or attended to. For example, if I come across a patient in the morning, I discuss with him, do some examinations and then document my findings in the case note. Later in the day when any other member of the unit comes across the patient, he sees my documentation, and it would tells him or her that I have been there earlier on, and my findings would be clearly seen and he can carry on from there.* (Dr. H. Kehinde)

The case notes were seen as a viable tool for not only monitoring and keeping track of patients, but also for making prognoses, which called for numerous pre-emptive and proactive actions in determining the eventual outcome of the activity. For example, Dr. H. Ayidu explained that if a patient had a good medical record, it was possible to know whether the patient had a terminal illness or not, and to work proactively to prevent a disastrous event.

*You can foresee from the patient’s case note; you can foresee a disaster event. There are medical disasters, things like stroke...So from the medical record, you can see that this patient has had previous episodes of transient systemic attacks, and is so prone to a disaster event of a cardiovascular accident or a stroke in the near future.* (Dr. H. Ayidu)

However, Dr. H. Ayidu complained that in some cases, the patients themselves were not compliant with their medication. He then saw this non-compliance as a mitigating factor against the participative status of the case notes, as the case notes could not control the patient.

In addition to the two roles of the case notes as both an information source and as
evidence, the participants saw the case notes as part of their arguments when justifying current actions, especially in cases of diagnostic dilemmas, where there were two or more options for a diagnosis. The case notes were then used to arrive at a consensus. Dr. H. Ayidu recounted how a patient was once diagnosed with primary liver cell carcinoma, but the team members felt that the ailment was a carcinoma of some other parts of the body with some metastasis of the liver. The team members then needed to find out if carcinoma was primarily from the liver or “somewhere around the liver such as the cervix, breast, or cancer of any of those areas that had travelled and found its ways to the liver” (Dr. H. Ayidu). The prognosis at the initial diagnosis was that the illness was supposed to retrogress, but this turned out not to be so. The team had to revisit the patient’s case notes to re-evaluate the situation. The documentation in the case notes revealed an initial diagnostic dilemma, and this provided the catalyst for looking at other possible alternative options to follow. Further investigations by the team later proved it to be carcinoma of some parts of the body with distant metastases of the liver, and not liver carcinoma. Suffice it to say, the case notes were fundamental to ensuring the continuity of the patient’s management trajectory.

The case notes indicated activities in progress as it was found that they triggered actions and activities. For instance, I observed how a Registrar’s order for various tests was implemented; as documented in the case notes, the tests that were ordered for a diabetic patient with renal impairment included fasting, blood sugar test, potassium test, liver function test, renal function test, pulmonary function test, urinalysis, blood culture, and an x-ray. Dr. H. Ayidu took the samples and delivered them to the laboratories. He also made arrangements with the ward attendants on duty to carry the patient to the radiology department for radiologic imaging (x-ray). The investigative result slips were later sent back from the laboratories and were attached to the loose-leaf papers of the case notes. In fact, the activity remained largely coordinated and manageable based on the information in the case notes, and the investigative result slips acted as visual cues to the case notes. This led to further actions, including refining the diagnosis, adjusting therapeutic dosages, and ordering (discontinuing) drugs.

The total assemblage of the data was seen as beneficial to the team’s activities and aided the team in 1) building a composite picture of the problem at hand, and 2) deciding what was to be done. Although Dr. H. Ebi complained that once in a while, as a newly trained physician, he found it difficult to read and interpret the handwriting, especially the abbreviations written by the specialists’ physicians from other units/departments; it took some time for him to get used to their handwriting. He hoped that by the time he completed his internship, he would be used to interpreting the illegible writing and abbreviations. However, he did not find it as an impediment to his work-flow since other team members were able to interpret
the illegible handwriting for him.

The case notes also showed some commonality of purpose. Entries were recorded any time there was an encounter with the patient. The information was elaborated on over and over again, amplified with test results, interpreted by all parties of interest, summarized after each encounter, and made available at any time. This relates to Wenger’s (1998, p. 76) assertion of artefact on the level of mutual engagement. According to Wenger, mutual engagement does not entail homogeneity, but it does create relationships and diversity among people in doing things together. Dr. H. Ossai recounted how he retrieved the liver function test results for a particular patient on the morning of the day that I interviewed him. After retrieving the results, he wrote down the result findings and the conclusions in the patient’s case notes. At the time Dr. H. Ossai was recounting his experience during my interview with him, we were geographically distant from the patient and the case notes:

_I am here right now; a member of my unit could walk up there. Looking at the case note would tell him that the results have been retrieved, and this is the conclusion. I don’t have to be there but he already knows that I made notes. He doesn’t need to see me face-to-face, but looking at the case note will tell him what has been done._ (Dr. H. Ossai)

With the passage of time, the case notes took on a physical presence and representational life of their own as “artefacts that mediate social engagement” (Engeström, 1990). It was found that together with other resources, the case notes became the basis for future evaluation and decisions about treatment. In this vein, the case notes served as a means of communication for the team and provided the continuum of the patient’s management trajectory.

_We did a ward round yesterday, consultant ward round: we made certain decisions and plans, and in the next ward rounds, we want to know whether those decisions have been carried out. Of course, looking at the case note, we would be able to know that. The person who, for example, was asked to take a particular sample for investigations, the person should be able to document appropriately, so when the result comes out another person will also have to document. So the next ward round, even though the persons who documented are not there, the medical record would be able to inform the team that so, so, thing has been done for the patient._ (Dr. H. Ossai)

_Probably when I have gone, the Consultant may decide to come in the_
afternoon to do a ward round on her own, personal rounds or on his
own. He just goes through the case note to see what has been done and
continues from there. He doesn’t really need me at that point in time;
everything he needs is in the case note. (Dr. R. Mgbeke)

8.3.2.1 Resistance, credibility, and reliability

Many of the participants talked about the primacy of the medical record:

_Because it can make the difference between life and death...It could
determine whether the patient lives or die. We work with what is
documented, and if what we document is false, then it might end up
harming the patient. If it is documented that a patient reacts to
sulphonamides, and you overlook it, and still go ahead and give the
drug, you are a bad doctor as the case note can actually guide us. (Dr.
S. Olowo)_

From the perspective of activity theory, the subject of activity cannot resist the
artefact. The participants accepted the purpose of the case notes as a working
document in accordance with the knowledge generated according to the medical
culture of practice. Hence, resistance was very unusual, or so it seemed, as the
participants were not supposed to resist the mediating artefact. But according to
Wertsch (1998), there is something definitely resistant about mediating artefact as
the link between the mediated actions and means of mediation is the understanding
that it always involves resistance of some sort. There were hints of some small acts
of subtle resistance, as some of the participants believed that the power of the case
notes is relative. While disagreeing with the interview question that it was possible
to resist occasional contents in the case notes, Dr. C. Chukwuka agreed that the
case notes _per se_ could not be granted the status of absolute authority. This implied
that there were occasional, subtle, and almost silent acts of resistance by some
members in trying to authenticate facts. Dr. R. Iyamah and Dr. H. Kehinde
described this type of resistance as follows:

_If I don’t want to be biased by somebody else’s thinking because I don’t
know the circumstances the history was taken or there may be some
aberrations and all that, which needs to be corrected, I may want to
look at the patient, take a history, and examine the patient first, before I
now go into details looking at what others have done before especially
for the first-timers. But for secondary patients who have been coming
often and often, I don’t think I have had course to shut the case note
down. I will listen to the patient. But I will still have to look at the_
patient’s medical record. (Dr. R. Iyamah)

Sometimes, I chose not to look at the case note because I want to have my own straightforward information base different from whatever was initially documented, even though later on I may now choose to go to the case note, but I would have finished all my clerkship then without consulting the case note. (Dr. H. Kehinde)

The resistance may be the team members’ desire not only to put the existing practices under scrutiny, by striving for authenticated facts, but to assert themselves as active actors in work activity. It was acknowledged by the participants that medical hierarchy governed the choice of opinions and consequent actions that they took. For example, Dr. H. Ossai explained that the consultants would more likely rely on what a Senior Registrar had written than what a House officer had written. Along the same line of reasoning, Dr. H. Ayidu explained that even within the same case notes, one had to filter and be selective about the information, and know where the information was coming from. Stressing this further, Dr. H. Ayidu explained that it was important for him to know how trained the person who entered the information was, how qualified, and how experienced the person was in the first place to work on the information in the case note:

*The more qualified the person, the more trustworthy the record. There are levels of qualifications in the medical field...the higher the qualification of the person, the more credible and reliable.* (Dr. H. Ayidu)

There were also some extraneous factors that drew attention to potential sources of resistance. For example, issues of reliability and credibility were considered as factors that mitigated or or enhanced resistance. Dr. C. Chukwuka, who had been a member of the unit from its inception, had a standard and clear-cut view of the issue of reliability:

*In fact what we have to do is to ensure that it is factual, what is being documented is consistent with facts on the ground? If it is factual let it be so reflected...it goes on to the record. There is no question of resistance or no resistance?* (Dr. C. Chukwuka)

Dr. C. Chukwuka thought it was dangerous for members to even conceive of the idea of resisting the case notes, which were firmly regarded as indispensable in patient care. Above all, he argued that the essence of clerkship in clinical training
was to ensure that the case notes captured the circumspect and pervasive needs of the patient in a way that the information contained in it was not fabricated, but reliable at any point in time. The issue of reliability and credibility further reinforced the fact that resistance did not arise when there was the conviction that certain parameters had been met when entering data into the case notes. For instance, Dr. C. Chukwuezeke once told the other members of the team during a ward round about the need for caution in accepting information from human sources without question. He exemplified this with a patient who claimed not to smoke cigarettes, although the patient had probably been smoking two packs of cigarettes a day for over thirty years, and had stopped only six months before when he started feeling ill. Dr. S. Idegbe explained that he would rely much more on the laboratory test results as documented in the case notes, as opposed to the information from human sources. Similarly, Dr. H. Ossai explained that information from human sources in the case notes should be adjudged only when the informant “is oriented in time, place, and person”. Dr. S. Olowo reasoned that the person giving the information on the patient’s behalf must have maintained a first-degree kind of relationship with the patient.

Dr R. Iyamah’s response implied two ways of looking at the issue of reliability in the case notes. Firstly, the patient must know what he is saying; and secondly, what should be entered into the case notes is the physician’s prerogative. However, Dr. H. Ebi believed that being detailed and ensuring that the examination findings and investigative results tallied with the history-taking was a way of ensuring that the data entered into the case notes was reliable. Dr. H. Ebi said that he did not have any reason to subtly resist the case notes; instead he claimed that every time he had cause to consult the case notes was seen as an opportunity for learning. When I asked why, he said that because: 1) it was a team work; and 2) there was information entered into the case notes by very senior colleagues who were experts recognized both nationally and internationally. Rather, instead of seeing the case notes as something to be resisted, he saw it as a vast intellectual bazaar that provided the opportunity for ample inquiry. He averred that he saw reading through the case notes as aggrandisement, something of a self-fulfilment particularly seeing the handwritings of his senior colleagues who were once his lecturers in medical school.

Despite this, the issue of resistance does not lead to any type of disturbances or contradictions in the CPT Unit. Rather, it was seen as a way of maintaining coherencies and consistencies within the activity system. In this regard, the optimal value of the case notes was seen as a matter of a profound sense of commitment and sense of responsibility.
Because if I write information that is not right in the case note, my other colleagues would obviously do the right thing, and then I will feel very foolish and incompetent for not getting that information right. (Dr. R. Mgbeke)

Because we are dealing with lives here, and whatever information we have is supposed to be credible, it is supposed to be dependable...because decisions will be taken with it and as such if it is not credible, a wrong decision may be taken which may not be to the patient’s benefit. (Dr. H. Kehinde)

8.3.3.2 Power relationships

The issue of mediating artefact becomes extremely intriguing in exploring sociocultural phenomena in diversified ramifications in work activity. This is especially relevant as I discuss here the heavy appeal of power relations that surfaced in the study. Power relations refer to the unequal influence of participating actors. The relationship between issues of power in mediating artefacts receives very little attention in research employing activity theory, as mediation tends to be the primary focus in activity. The case notes are seen in this study as one way in which issues of power relationships were addressed both within the team and the wider community.

Within the team, the case notes underscored the hierarchical relationships in activities. It was obvious that on occasion, when there were two mutually-exclusive entries, the issue of power tended to play out as accomplished inter-subjectively in work activity. This finding relates to Prus’s (1999, p. 272) assertion that power is not to be seen as an ‘objective phenomenon’ but a “social, meaningful enacted essence”. The ward rounds and clinical meetings provided avenues for the team members to reconcile differences in the case notes. However, it was found that it was the medical hierarchy that governed how the differences were reconciled and whose views prevailed. Within the CPT team there was a strictly observed order of work and responsibilities, implying that the views of the core members prevailed over those of the peripheral members. Hence, although there was room for consensual agreements in case notes, the participants turned to their senior colleagues as the medical tradition demanded. Differences reflected in the case notes such as the need for new investigations or (re)adjustments of therapy, were also urgently addressed, and the entries were quickly updated to reflect the new decisions.
Power relations determined the authority in the interpretation of the information in the case notes. The Consultants were the absolute authorities in matters that related to the entries in the case notes. The participants proffered various reasons for it: 1) the Consultants were at the head of the team’s hierarchy; 2) the imperative of their medical training; and 3) the Consultants were the most knowledgeable and so whatever they said and documented in the case notes became a reference for the other team members. However, the participants also consulted other resources regarding absolute authority as explained by Dr H. Ebi explained: “I may also want to do some research on my own to find out why there is differences and how it goes”.

The issue of power relations, as they related to the case notes, were prevalent in the case study and became as important as the issue of mediation itself. The landscape of mediating artefacts gave rise to passive acceptances of power and powerlessness, and was prominent when I examined the team’s relationship with the wider community. Some of the participants from the wider community who were interviewed affirmed that they were only able to read from the case notes to extract information for their work activities. This included the nurses and staff from various departments, e.g. pharmacy, account sections, haematology, gas operating, and account sections. Nurses could not make entries into the case notes even though 1) they were physically and geographically positioned nearest to the patients; 2) they spent far more time with the patients; and 3) they were, in actuality, the custodians of the case notes per se when patients were admitted. They could only read the information that related more to the chores and administration of the physician’s management plan, as expressed by one of the nurses:

_We don’t make any entry in the case note. When patients come, we have our charts that we use...we don’t write on the case note. Only doctors write, so most times we read from doctors...their findings, and all that in the case note and we enter in our charts._ (W. Ejiro)

The above excerpt illustrates the symmetrical/ asymmetrical relationship regarding patient care between the CPT team members and members of the wider community, as depicted in the access and use of the case notes. It also implies the control and authority that each participating group has over the case notes. The fact remained that effective power in the use of the case notes belonged to the CPT team members. However, the potential power of the interacting peripheralities of some members of the wider community ought not to be disregarded. This explained why specialist physicians from other units had access to the case notes in the same way the CPT team members did, even though they were geographically distant from the patients. They were statutorily authorized to enter information without any
restrictions. Even though Dr. W. Dalahatu, a consultant physician from the neurology department belonged to the wider community, he was both empowered and statutorily authorized to have unlimited and unrestricted access to the case notes. He explained that after his evaluation of a patient, he would definitely have to go back to the case notes and enter the documentation:

"I have to make my own documentation and instructions on what to do, because if the CPT team members now come, they will ask to open the case note to see what I have done. Not only for the team, but for posterity, people will now look at that... this is what we did, and everything, so I must write now this is what I want you people to do for this patient. So that is how it is done." (Dr. W. Dalahatu)

Dr. W. Dalahatu’s explanation bespeaks of some form of authority and control over the mediating artefact per se. Thus, it was seen that the case notes reflected the hegemonic order in UBTH, and reflected chains of delegations and authority that rendered the physicians as the representatives of the entire heterogeneous assembly in the activity system. It also affirmed their position as the ‘central actors’ and ‘core decision makers’ in the structuring of the patient’s trajectory, while reducing the role of others to the execution and administrations of the physicians management plans.

The case notes were seen in this case study as the central locus where the CPT team’s work activity began and ended. It was also seen that the case notes underscored the hierarchical relationships in the entire teaching hospital. It was on these handwritten loose-leaf papers that the authority and sphere of dispensation of ‘who is who’ in the teaching hospital was portrayed. It was also on these handwritten loose-leaf papers that ‘what’ actions and ‘activities’ were to be undertaken, and ‘how’ they were to be carried out, and those responsible for carrying them out, were reflected. In so doing, the case notes fed into the organization of the entire hospital environment. For example, the unstructured entries of patients’ medical histories reflected the central position of the participants as physicians caring for patients. The highly structured space, where the various investigative tests results were entered, depicted a to-do-list of actions taken by different participating actors in patient care (i.e. the CPT team and the wider community).

The case notes indicated how actions were performed. For example, intravenous drugs were supposed to be given by physicians while sublingual oral medication was administered by the nurses. This demarcation reflected how the case notes created bridges between the different actors. They thus depicted the physicians at
the top of the ladder as they wrote unrestrictedly on the case notes. In so doing, they defined how to accomplish the goal of the activity, putting the patient’s profile into the perspective of the activity trajectory in a way that tended to direct how the activity would be accomplished. Hence, the access and constraints on the case notes by the various actors in the activity system provided the leeway to claim ownership of it. Dr. C. Chukwuka averred: “the case note is for the team, it is for the unit, so every member of the team has access to it”. Emphasizing this claim to ownership of the case notes, he said:

\[
\text{The point is this; I would not allow anybody take my patients’ case note. There is a confidentiality clause concerning my interactions with my patients. So, I don’t think my patients’ case note should be release without getting my consent... case notes of my patients should not be released without my giving consent, without my being asked.} \quad (\text{Dr. C. Chukwuka})
\]

During the interviews with the participants, I noted the nuances made in the participants’ descriptions and allusions of the role played by the case notes. After the initial run-through in analyzing the transcripts of interviews, I was able to figure out the case notes as mediating artefacts that promoted a range of associated activities, which could also be seen as empowering the activity system itself. It was these activities that emerged as particular affordances around which social practices were focused. The concept of affordance “allows for a material thing identified by its material attributes to exist as more than one social object, each identified by its role in a narrative” (Harré, 2002, p. 27). The same material thing can be suggestive of many different or alternative modes of activities or actions, and each per se is an affordance. For example, the case notes were working documents, but the same case notes also afforded individualized and collective learning. That meant that they had the potential to be meaning-producing and practice-generating, thereby creating subject-object dissociation (Knorr Cetina, 2001). The case notes in this study had different affordances depending on their purpose. I will show in the following two sections that the case notes can play the role of a ‘bundle’ for the team’s information activities and as a ‘boundary object’ for linking to the wider community. Subsequently, I will also show how the case notes afforded learning in the work place. The information practice category showed that it was possible to further divide into two: information practices within the team and information practices linked to the wider community.

8.3.4 The role of case notes in information practices

This section is about how the case notes informed the team’s information activities.
The participants saw the case notes as written text that made information available to them whenever it was needed in their work activities. Medicine is a science that depends on facts and figures, and as such, requires intensive verification and scientific analysis to arrive at certain deductions. This influenced how the case notes were used to produce and collect information. The material, or rather the physical format of the case notes implied that they were designed to provide information on different sub-areas. This fits into what Gorman et al. (2000, p. 266), referred to as ‘bundles’ in examining the role of the case notes in information practices. Gorman defined ‘bundles’ as “organized, highly selective collections of information to help solve problems and maintain situational awareness” (p. 266).

In their identification of bundle properties Gorman et al. (2000) summarized which properties bundles must always have, sometimes have, and do not have. A bundle is always: actively created by an expert, a physical collection, selective, multi-granular, context-specific, task-oriented, and redundant (Gorman et al. 2000, pp. 280-281). The case notes had the same properties as ‘bundles’. The case notes were actively created by expert physicians in order to document their everyday actions and decisions pertaining to the object of activity. The case notes were physical as previously discussed; they consisted of multiple loose-leaf papers in a variety of forms. Of note is that in describing the case notes, they were seen in different ways such as documents (medical, historical, legal), textbooks, reference texts, a compendium, and a diary. Significantly, the case notes in their physical representation, were referred to mostly as documents, but the allusion to them as a ‘textbook’ was most intriguing. By textbook here, I mean a manual of instruction on any branch of study. Dr. H. Atagwu explained that whenever he had an encounter with a patient, he saw the case notes as a manual of instruction that guided him to modify or change the way the patient was managed.

Because by virtue of that information in the case note, there are some drugs that you should never give to the patient, and there are some things you now advise the patient never to do by virtue of that information on his or her case note. So you can find out now this as a way now guides you to modify the patient health care for his or her betterment. (Dr. H. Atagwu)

Given its physical representation, the case notes thus became an integral part of the participants’ information practices in the care of patients. Dr. H. Ayidu talked about the case notes as a “guide or road map” that “gives the picture of a patient’s from the time the very first physician attended to the patient to the time I am being privileged to read the case note” (Dr. H. Ayidu). In a very obvious sense, beyond patients, Dr. H. Atagwu highlighted the representational quality in the case notes.
and likened them to a “mirror; when you dress while going out, you look at the mirror to look at the way you look” (Dr. H. Atagwu).

The interviewed participants averred that the case notes supported their engagement in information practices in two ways: 2) in their interactions amongst themselves and 2) around and through the patient as the object of activity. As Berg (1996, p. 514) argued, there is a continuous back-and-forth between the different parties about the very same record that structured their communications. How much information was required from the case notes depended on the problem at hand. The case notes were seen as a physical entity that was not distinct from the object of activity, the patient:

As a patient/doctors relationship even while going through it. I have no special attachment to the case note; that is the truth. What I am looking out for is information that will make me help patients. (Dr. R. Mgbeke)

When I specifically asked about the physical quality of the case notes, Dr. R. Efangwu upheld the primacy of patients over the case notes, and downplayed seeing the case notes as a physical entity.

I don’t really see it as a document or as a text. I see it as the patient himself because the life history of that patient is there. And what can make or mar that patient is there...in subsequent years to come, what can save that patient live is there. So I see it as a patient life and not just record nor a physical entity. (Dr. R. Efangwu)

The case notes were a collection that involved grouping items according to related principles, “it has a lot of you know, ties to it” (Dr. C. Chukwuka) (emphasis mine). This property of the case notes enabled all the items related to the patient to be collected and vaulted, thus providing the starting point for the information to be obtained. Dr. R. Eweka described it as follows:

You may probably be seeing a patient for the first time, and he can’t tell you much about his history, but the record can. So, if I am not satisfied with the amount of information the patient gives to me, from his case note, I go back, even as far back as twenty years. I see what was done with the patient. I see how the illness has progressed. I can see the history taking, the various investigative results, the team’s various assessments and all that. I can tell everything about the patient without him telling me everything...to know how his illness started, and
how it has progressed even if it is over fifty years as far as the records are there. (Dr. R. Eweka)

The case notes were multi-granular in that they contained information on various levels. On one level, the information was comprised of bits and pieces of data from a single patient’s biographical data (surname, first name, middle name, sex, religion, age, tribe, occupation, residential address). On another level, the handwritten documentation of the physicians, which was in specific formats on the contiguous and multiple loose-leaf sheets, reflected a series of well-defined and sequential narrative structures. The multi-granular property of the case notes was exemplified in the case notes of a diabetic patient that I looked through during the study. It was found that the patient was diagnosed with “recurrent history of bilateral leg swelling and superficial ulcer which developed as a result of small blisters on the left foot” (Data extract), as depicted in the physician’s analysis of the bits and pieces of data contained in the case notes. The case notes were selective and separated the relevant and important data from the non-relevant and unimportant. The purpose of being selective was to disambiguate the flow of thoughts of whoever was using the case notes. Dr H. Ayidu explained that:

The primary concern is to save patient’s life...So to me any information that will not contribute to the patient’s well-being and care is extraneous material at that point in time. Any information that will contribute to the well being of the patient is important material. (Dr. H. Ayidu)

However, the content was not exhaustive as it was seen as a working artefact in progress that did not interfere with other activities. The information within the case notes was context-specific. It was specific to a particular encounter with patient at a particular time. with either a particular physician or the team at the collective level. However, the spatial-temporal specificity of the entries did not limit their usefulness to other moments in time. Suffice it to say that what was important and relevant at one moment in time could be unimportant and non-relevant at another moment: “I would only want to refer to all of the information in the case note relevant to that particular instance” (Dr. H. Kehinde). During the interview, I asked the participants to explain why previous entries were seen to be useful at a later date or by other members of the team, considering the fact that the patient was always physically present during any encounter and was still going to be examined anyway. Their responses underscored the case notes as a point of reference:

Well, most of the time, within the unit, the case note is actually of utmost importance in that whatever you put there, whatever you write
there, the other members of the team could come out any time and look through, being that the patient belongs to everybody even if they are assigned to particular persons, they still belongs to everybody because at any time, you could be called upon to go and sort out a particular patient if the person in charge is not at hand. (Dr. H. Ebi)

You can’t remember everything you saw in the patient before, because you meet a patient today, and you see him in the next six months. So, it is a way of going back to what you did before and reminding yourself about the patient, and knowing where to go next. The next time you see this patient, you don’t need to be asking all the questions all over again. They are already in the case note; you can now make reference to your write-up. It also helps you to remember the cases you have managed very well and treated very well and see what you did for those people, and you can apply the same experience to other people. (Dr. R. Eweka)

The case notes were multi-purpose. They served as the residual memory of the team, while playing out in different scenarios such as: “medical scenario, teaching and all that and I have also talked about the legal angle” (Dr. C. Chukwuka). Dr. C. Chukwuezeke said that he used the case notes for auditing at different levels, including at the departmental level and the individual levels. He also recalled when he analysed the case notes for two years in order to provide the departments with patterns of morbidities and mortalities in the Department of Internal Medicine. Dr. S. Idegbe saw the case notes as a good source of information for the individualized learning of the residents who were preparing for examinations:

When I was preparing for exams in my part 1, I needed to read through many patients’ case notes to have an idea of how they came and what management was instituted for them. (Dr. S. Idegbe)

The case notes were assembled to be task-oriented, facilitating and supporting the performance of specific tasks (Gorman et al., 2000). Clearly, no single physician could keep all the patient information in his/her head, and with the case notes as the data cache for the residual memory of the team’s activities, there was no need to:

You cannot just go to the patient’s bedside and ask the patient everything. When we come in the morning, we flip through the case note, because we are not expected to put everything in the brain or around the patient. (Dr. H. Ebi)
Dr. S. Igweh recounted his experience with a hypertensive patient who had regularly visited the Consultants’ clinics and was compliant with his medication, but for some reason stopped. Though the anti-hypertensive drugs were correcting the patient’s blood pressure, the period of his temporary withdrawal led to further hypertensive complications that brought him back to the hospital.

Now you ask the patient; what drugs are you taking? He doesn’t even know the drugs that he was taking. He doesn’t even know the drugs that he has been placed on. But he knows that he has been attending clinics. So the wise thing a doctor should do is to pursue that case note, and look at those anti-hypertensive drugs that they gave to this patient before. But when you go through the case note, you see those drugs documented, the time they were given, and all that. So it is very important we go through the records of patients, what he used previously in guiding what you are going to prescribe. (Dr. S. Igweh)

Imagine a situation where a patient is unconscious and unable to recount his past medical history, as I severally observed. Dr. C. Chukwuka explained that what was done at that stage was to “to pull out the patient’s case note, even older records dating back may be five, six, ten or even twenty years”. The case notes in this regard, informed the team on how to proceed: “that is what had been done for the patient in the past, and what had been written down to be done at a later date, so that we can know exactly where to carry on from” (Dr. C. Chukwuka).

The case notes played a crucial role for understanding and accomplishing work activity. For example, the participants recalled that the case notes helped to limit mere guesses or problematic situations in task-oriented activities. They claimed that they often turned to the case notes when interacting with patients or even discussing amongst themselves. Dr. H. Ayidu highlighted the problematic situations usually created in circumstances of missing case notes that occasionally occurred: “if a case note gets lost...you are stocked, you are handicapped” (Dr. H. Ayidu). Dr. H. Ayidu then reasoned that it was easier for him, and actually made the activity easier, if the patient he was attending to had updated case notes at any point in time. However, some of the participants firmly believed that anything that not included in the case notes contributed nothing to the patient “because it is not written in the case note, it is sort of regarded as baseless...it becomes difficult to depend on” (Dr. H. Aghogho).

The case notes supported communication in work activity, though Gorman’s notion of ‘bundle’ fell short of addressing communication. Communication within the different operations, such as ward rounds and Consultants’, were different. It was
then necessary to establish the link between communication and the case notes. The use of any form of exchange helped to introduce features of communication, though it depended on where the encounter was taking place, with whom the patient was interacting with, and the condition of the patient at that moment in time. The core members explained that they first interacted with the patient before checking the case notes. This included engaging in some courteous ‘small talk’ and listening to the patients: “courtesy demands that you should at least have some chats with the patient...especially cases were the patient is able to talk, and you ask the patient questions” (Dr. S. Idegbe). However, the peripheral members preferred to first get acquainted with the case notes, especially when the patient was not their primary patient. Whatever approach the participant adopted, the communication was always asymmetrical between the physician and the patient.

Bundles can trigger searching for additional details in task-oriented activities. They also facilitate the development of the individual’s situations awareness, which according to Gorman (2001), implied the need to get the facts straight and think the problem through. There was no rule that limited how much the participants could reference the case notes. However, the participants claimed that they always took advantage of them as they guided and assisted them in their diagnoses and in instituting the patients’ management plans. At other times, the referencing was not far-reaching, particularly if the patient was not seriously ill: “you may just need to go back into his last two or three visits and see what he is being treated for at the time” (Dr. R. Eweka). The participants saw the situation differently when a patient had a recurrent illness that required the overall picture of the ailment trajectory. Sometimes, rather than referencing to the case note the participants looked out for the morbidity and co-morbidity factor in making a diagnosis: anything, just things that will make us pin down on the disease that touched on the ailment itself (Dr. R. Ebi). Some of the core members did explain that limited referencing of the case notes as the past memory was only important as far as the present circumstances demanded.

Supposing what the patient was having then was a medical thing, now it is a surgical thing. So we can’t say that because it was a medical thing that this one must still be medical. (Dr. S. Igweh)

The case notes were redundant in that almost every item of information within the case notes were found somewhere else in other documents, collections, or locations. In Nigeria, the case note are strictly confidential documents, but according to Gorman (2000, 278), unwritten and socially-negotiated rule of “ownership” allowed for some objects to be shared or removed for use in task-specific purposes. The case notes originated with the team and contained...
information specific to the team’s activities. However, all of the following were attached to it: nurses’ charts, copies of the reports on the radiographic imaging from the radiography department; slips with different investigative laboratory results; duplicated copies of consults to specialist colleagues; account slips from the account departments; and medication request forms from the pharmacy department. The only exception to this was the Kardex; because it was specific to the nurses as a physical form of administrative control for patient-management, the Kardex was not included in the medical record. The Kardex contained information about the current happenings of the patient: ‘patient had a fair night’; ‘this patient had a temperature rise’; and ‘the patient went to the radiological department for x-ray’. When I asked one of the nurses why the Kardex was not included in the medical record, the response was that it was because the information contained in the Kardex was highly sensitive. However, physicians were statutorily authorized to assess it. Of note is that, the kardex was discarded once the patient was discharged from the hospital since it was considered that it had outlived its usefulness.

Bundles are sometimes organized, dynamic, temporary, diverse, complex, multi-authored, shared, multi-purpose, uncertain and visual (Gorman et al.2000, p.281-282). The case notes were organized along the lines determined by the team members as medical professionals; hence, they embodied the template for clerkship. In this way, the case notes synchronized and tailored the relationships of the participating actors in a meaningful way that allowed room for the coordination of activities. Dr. R. Eweka saw meaningfulness in terms of the ailments, the risk factors, what predisposed patients’ ailments, and the investigations and interventions by the physicians. The content and arrangement of the case notes were flexible enough to contain information that represented ‘what is going on’ with the patient in the present, what had been done in the past, and what needed to be done in the future.

The case notes were more or less ‘exhaustive’; they started small from when the patient was first attended to or admitted, and due to frequent updating in subsequent visits, it became ‘bulky’. In this sense, the case notes were considered dynamic when active and in use, but dormant when stored in the medical records department. The case notes were also not temporary in the sense that their use was continuous, i.e. they were used whenever the patient was presented to the team or the team had an encounter with the patient. The contents of the case notes were diverse because they were derived from multiple sources including: the patient, physicians, nurses, specialists from other units, radiographic images from radiographic department, various laboratories, and professional colleagues. Different slips were attached to the loose-leaf pages that made up the bulk of the case notes. Like cues, they existed side-by-side with the case notes and were regarded as addenda.
One example of case notes that I examined revealed two sets of documents: 1) the haematology report slip, which indicated the specimen results received from the haematology department (Blood Mp- Negative (...), PCV-26%, RBS-10-4 mmol/l”); and 2) the chest radiograph slips, which showed the radiological imaging used to capture the disease conditions that affected the chest and nearby structures. There were also different symbols and shorthand abbreviations used in the recording of standard clinical parameters. The annotations included un-labelled numeric or text data such as: ‘CVS’ (cardiovascular system) and ‘CNS’ (central nervous system). Each symbol had specific meanings that were attached to other data, for example:

- CVS: PR: 886pm, reg (iv) vol
- BP: 110/70mmHg
- HS: S1 S2
- Chest: RP: 36 cpm
- Trachaea central
- AN: Resonent
- BS: Vascular
- Fine basal erepitations
- ABS: Full, 50 ft, moves with resp. (Data Extract)

These addenda were significant to the extent that, without them, the case notes were incomplete. Dr. H. Ossai explained how he preferred to go through the nurses’ Kardex before consulting the case notes.

_I look out for information in the Kardex first before I open the case note to ensure that the drugs were administered properly. For example, I look out for what drugs was given this morning? How many drugs were given this morning? When was the patient given the drugs? If I feel that the patient’s blood sugar was 200 this morning instead of 150 yesterday, I look at the Kardex to see if, when, and how the insulin was administered. I can then go back to the treatment plan in the case note to see if the patient is treated appropriately as planned._ (Dr. H. Ossai)

The data in the case notes was complex and well-understood by the CPT team members and the members of the wider community, whose work activities had bearing on the patients. The multiple data types, such as numbers, text, annotations,
and abbreviations, were represented so that their meanings were properly understood by the participating actors.

8.3.5 Connecting to the wider community

In this sub-section, I focus on the role of the mediating artefact as a ‘boundary object’ in the activity system in understanding the potential of the CPT team’s interactions with the wider community. Initially, it seemed that the case notes were localized to the CPT team’s activities. But as the study progressed, it was obvious that the case notes had a “more stable and communal aspect” (Engeström, 1990, p. 198). It was found that members of the wider community severally took advantage of the case notes as an information source. The case notes were useful for interactions and communication between the CPT team members and members of the different units/departments, particularly amongst specialist physicians, who were always invited to review and re-evaluate patients in areas of their specialties. In response to a consult from the CPT Unit, Dr. W. Dalahatu who was a Consultant neurologist from the neurology department consulted the case notes in reviewing the cases of patients with neurological complications who were admitted by the CPT Unit. W. Ejiro, a nurse, consulted the case notes to obtain information regarding the administration of the management plans instituted by the CPT team members. W. Otega, a physiotherapist from the Physiotherapy Department, consulted the case notes in relation to issues that dealt with musculoskeletal and neuromuscular disorders. W. Okon, the anaesthetist, consulted the case notes regarding matters pertaining to surgery patients. W. Bala, an account officer, consulted the case notes to do billings for the hospital. W. Ayodele, a gas technician consulted the case notes to obtain information about the appropriate specifications of oxygen supplies. Archibong, who is from the Medical Records Department, claimed that the Medical Record Department was the ‘custodian’ of the case notes. Students, as I severally observed, consulted the case notes both for clinical clerkship and research.

The members of the wider community gave different reasons for consulting the case notes. This indicates that the case notes served as an intermediary object that cut across boundaries and addressed multiple perspectives.

When we write consults about outpatient to other units, we use the case note as the template for the information we detail to them; in the same way when we receive information from other units about our patients, we hope that they have also assessed the information in the patient’s case note which is the centre, and likewise document their findings. With the case note, we should be able to relate...
whatever findings they have come out with, and make our own impressions and interpretations from there. (Dr. C. Chukwuka)

In fact when the patients are managed, sometimes we don’t see together. Sometimes a team may see and another team sees. But communication is written down, anything that is seen, their impression and their plan is written and their thinking is written for the team to see. (Dr. R. Iyamah)

The inherent features of the case notes supported interactions and collaborations that dismantled and broached boundaries in the diverse and complex setting of the teaching hospital. For beyond patient care, and in part through it, the case notes were seen as a viable information resource that enabled sharing of information across boundaries, similar to what Wenger (1998, p. 108) refers to as “nexus of perspectives”. For example, there were patients that were managed by three or four units/departments, depending on their morbidity. Dr. C. Chukwuka explained it as follows:

*The present medical problem of a patient might not be unrelated to the initial problem. The presentation of a disease to one unit or department one day might follow up, get complicated and results in its presentation in another unit or department the next day or within a sub-time frame...and if the relevant parties do not have the existing documentation of what has been happening they may lose entirely the patients profile or what the sequence of the history is all about.* (Dr. C. Chukwuka)

The case notes occupied a position between members of the team, the wider community, and patients. At the ‘nexus’ of these perspectives, over time, the case notes became a meeting point for consensus amongst the different participating actors. This gave coherence to the medley of activities linked to patient care. Dr. S. Idegbe explained that if a patient being managed by the CPT team had to be re-evaluated and managed for some other pathological conditions in some other units, it is through the case notes, as a record of the CPT team, that the other unit was able to understand what had already been done for the patient; the case notes documented the relationships between the past and the present. They also served to indicate what other drugs the patient had been taking. Indeed, the members of the wider community merely assumed that the case notes were ‘detailed enough’ for performing their own activities. However, the contents in the case notes were not the only information sources used by the specialists from other units/departments; they also obtained information from different sources specific to their own
The important point is that the specialist physicians from the other units/departments possessed their own expertise and gave their own specialist input. It was clear that the case notes served as a coordinating mechanism between the participating actors. There was no indication of overlap in activity or blind acceptance by the actors. Though the case notes served multiple units/departments, control of the case note depended on the participating actor’s involvement in the patients care. Some were directly involved with patients such as the specialist physicians from other units/departments, nurses, and physiotherapists; others were not directly involved, such as the accounting staff, gas operators, and laboratory technicians. Presumably, representation in the content of the case notes was the same for all the participating actors. Yet, the interpretations and meanings changed according to the different actors. In this way, the contents of the case notes were incorporated to fit into the activities of other units/departments. W. Bala from the accounting department incorporated the facts in the case notes and assigned monetary values in order to do the billings. He then quantified the contents of the case notes in terms of the services rendered by the hospital and computed them at pre-determined costs associated with such services. Hence, he averred that, “it is that thing that has to do with money that is my concern in the case note”. W. Otega, the physiotherapist, interpreted the contents of the case notes in terms of procedural purposes in patient care and the discourse for assessing the patient’s ‘level of cooperation’ in physiotherapy:

*During physiotherapy sessions, I assess the case note by looking at the patient’s medical history and therapeutic interventions to relate to the patient’s level of cooperation in physiotherapy… it made me know the reason why the patient has not been cooperating. For example, if the patient had been given diazephram, diazephram has made him calm and relaxed, and he became restless after some time. If I have not looked through that case note I wouldn’t have know that he has been given that drugs. And I wanted him to do this exercises, he was not cooperating, he was just lying there relaxed. If I didn’t have enough information, I would have thought that something else was wrong with him. But looking at the case note gave me total information, total feedback of that patient, and I was able to handle the patient better.*

(W. Otega)

Even with this kind of flexibility in perspective, the case notes did not ‘lose’ their significance. Instead, the case notes were integrated and assigned a different significance as a tool that enabled and supported the participants in their respective units/departments. In essence, the case notes helped to forge a shared understanding
towards a common goal. Dr. W. Dalahatu explained how the case notes served as the mechanism through which he integrated his own neurological specialist input in response to a consult by the CPT Unit. Dr. H. Atagwu, a member of the CPT Unit gave his own version confirming Dr. W. Dalahatu’s explanation.

_I would go through the case note immediately and study it to see what has been done for the patient by the team. If from my own specialist expertise, I think there is something that needs to be done for the patient, ... some missing gaps ... I would then review and evaluate the case again. After my evaluation of the patient I would definitely go and make documentation and instructions as to what to do in the case note, because if the team now comes, they will ask to open the case note to see what I have done._ (Dr. W. Dalahatu)

_They will from time to time make reference to our own and compare their record with our own because we are referring to them. Because we saw the patient first, it is the assumption there are some information that we have about the patient that they may not be able to see because of our initial management. There are some things we would have seen in the patient that we managed that are resolved now before we transferred that they may not be able to see again because the patient has improved. So our record now will serve as a very good mirror for them to see the actual picture of the patient sometime ago, before, now. But that does not mean that they may not have their own different opinion about the patient’s case. That is why we have invited them._ (Dr. H. Atagwu)

It was clear in this case study that the members of the wider community maintained direct relationships with the CPT team members through the case notes. The role of the case notes was, in this regard, that of a tool that helped both parties to communicate well with each other.

_So when they come, they make their own notes, and their opinions well stated... We don’t have to go and ask them whether they have seen the patient. It is the case note that will tell us whether they have been to our unit and seen the patient. From there, we can make our own impressions and interpretation of their findings pertinent to the patient’s condition._ (Dr. H. Ossai)

The flexibility in the case notes had major implications in supporting the CPT team’s work activity. Indeed, as I have mentioned earlier, the entries were largely standardized and categorized. Its purpose was to impose standards of sameness and
differences so that information would be recognized, even in the midst of a flow of activity. At the same time, the case notes reflected the expertise and limitations of the respective participating actors. For W. Ejiro, nurses could interpret relevant information entered by the physicians because nurses’ training was oriented towards healing, which is the domain of practice of physicians. However, he reasoned that some of the newly trained nurses would not be able to interpret all relevant information, and in such circumstances, would have had to request assistance from the older nurses:

*We have ward managers and different forms of ward managers; we have older colleagues who will be able to interpret.* (W. Ejiro)

### 8.3.6 The mediating artefact affording workplace learning

The case notes were seen as an empowering tool for enhancing workplace learning, and in most cases co-evolved with the CPT team’s work activity. The case notes were a useful learning resource though there were characteristic differences between the way the medical students adopted the case notes and the way the CPT team members gained mastery of it. I observed that students were habitually picking up and reading through case notes. One evening, I found the opportunity to observe six students as they clerked in pairs at the bedsides of patients in the ward. It was very interesting observing them looking through the case notes, asking the patients questions, and discussing amongst themselves. The students claimed that they developed their skills in clerkship in this manner. Some of them claimed that it helped them to confirm whether their history-taking conformed to the standards of practice; hence, they looked at the entries of qualified physicians who were already in practice.

*If in the process of history-taking, I find out that the history is not that kind of straightforward and I am a bit confused, or maybe I get to a stage where maybe I can’t, I don’t know much, and I don’t know what other questions to ask, I have asked all the questions that I think are relevant, and as such I need to know exactly what more questions I need to ask, I will just go to the case notes and find out what other questions my lecturers have asked, so that could aid me to now know the kind of question to ask the patient.* (a Medical student)

Remembering his student days, Dr. H. Ebi said that he took an interest in reading patients’ case notes whenever he found the opportunity to do so, and claimed that he learnt by so doing. He explained that it was necessary for him to know both the
basic principles and the practical approach in patient care, and asked questions such as: “What is the management protocol is?” or “How do you manage patients with this problem?” He then recounted the case of a patient with diabetic foot syndrome who was admitted to the inpatient ward. He claimed that as a medical student then, he was able to learn much about the diagnosis and therapeutic management of diabetic foot syndrome by reading through that patient’s case notes. Thus, he read the past and present history and saw both the outline of the therapeutic management and the investigative results.

For qualified physicians, the usefulness of the case notes was in its ability, in a very profound way, to consolidate their knowledgebase while engaging in work activity. The participants saw procedural knowledge as equally important to factual knowledge.

**Because it is something that has to do with practice, though it was written down, so it further consolidates my knowledge as a doctor. So when I go through it, I say oh, this is okay when you see diabetes foot ulcer grade 4. This man has diabetic foot ulcer grade 4, I read it in the case note of the patient-grade 4. Now I know that grade 4 is localized gangrene...when I go to the ward, I will go back because sometimes when you read the case note of the patient, you need to go back to the patient and see, when you see you come and read. You know, so I go back to the patient...oh this is localized gangrene. So I actually realized localized gangrene is grade 4 diabetic foot ulcer, spreading gangrene is grade 5...But if I read it on the case note and the patient is still in the ward, I will go and see the patient. So you can see that it further consolidate my knowledge on what I know about diabetic foot ulcer. So it is very instrumental to learning. (Dr. H. Atagwu)**

The participants saw the case notes as a template for learning. Dr. R. Eweka explained that the best way to practically learn, for example, what congestive heart failure or chronic kidney disease was about was to read through the case notes. Dr. H. Ossai equated the case notes to ten textbooks. When I asked him to explain what he meant, he gave his response giving an example of a diabetics mellitus patient. According to him, the assemblage of the following in the case notes - the extensive history-taking, physical examinations, investigative results, and the patient’s treatment management - consolidated his knowledge in the disease management and far outweighed what he had learnt in ten textbooks.

Dr. C. Chukwuka explained that there were some patients that he had seen in the past who had complicated problems such as kidney transplants or chronic
pyelonephritis. If the physician currently seeing the patient did not have much knowledge on managing such a patient, it would be improper for the person to say that he was not competent enough in that particular area. Before referring the matter to senior colleagues, the proper thing to do was to look at the case notes. Thus, the case notes became the blueprint for sustaining the shared practices of the community in a way that reduced dysfunctional practices.

The forward and backward mode of looking at the case note makes it relatively easy to relate the ‘facts’ to patients. Some of the participants claimed that such modes helped them to improve their expertise in patient care. Dr. H. Kehinde explained that the detailed entries in the case notes served as a useful learning instrument for him.

It enabled me to have oversight of a pattern of management regarding different ailments: that should I see a case like that elsewhere…I would have a good idea of how to clerk the case, how to investigate as well as how to treat that disease…in fact it entailed the art of good history taking, good summary writing…that in just few sentences with good summarization, I am able to capture the essence of a bulky case note…the next person reading the case note does not have to start reading through the case note from the beginning to the end. (Dr. H. Kehinde)

Moreover, the case notes facilitated the ‘practice makes perfect’ habit that was deemed so central to work activity: “the more we practice with the case note as a guide, the better we become” (Dr. H. Atagwu). This had many obvious implications such as:

Enhancing faster learning than when discussing with the patient. (Dr. R. Efangwu)

Everything will be available to them there. And that would definitely bring about a sense of being organized and in one way direct the newly trained. (Dr. S. Olowo)

It helps in terms of the assistance and guidance that we give to them….they get the old case note, we look through, we find out what has been done and then it helps us assist and guide the newly trained and making referencing to appropriate referencing if need be. (Dr. S. Idegbe)
It helps to organize the activity, it makes it easier, and it makes it more scientific, maybe orderliness and things like that. (Dr. C. Chukwuezeke)

Finally, the case notes culminated in a sense of identity in such a way that the self was recognized in the past:

I saw case notes of patients that I managed over 30 years ago, I saw my handwriting there as a House Officer, and in another one, I saw my clerking when I was a junior Registrar, all these were very interesting moments seeing all that. I was very excited and happy about it. (Dr. C. Chukwuka)

Moreover, the case notes shed light both on other areas for further investigations and new areas of inquiry. These helped to bridge the information gap. On the other hand, the case notes resulted in more controversies. One challenge the team members faced was the need to reconcile differences in entries in the case notes. The participants believed that reconciling differences and resolving controversies helped them in their continual development. I observed a patient in a ward who was attended to by different team members. The participants explained the importance of reconciling differences as follows:

If what I have documented is different from what you have, we have to reconcile our differences, it helps to teach the junior ones, we call each other and examine the patient again... especially when somebody picks out something that another person missed out in patient’s care and other members of the team have the opportunity of going through it in the case note. (Dr. S. Igweh)

When you solve these controversies...you have learnt...for example, if there is a controversy regarding the outcome of a therapeutic interventions, the usefulness of the case note in identifying the pitfall and peculiarities of the interventions go a long way in enhancing learning. (Dr. R. Iyamah)

In principle, the case notes were a tool for collective learning. Some of the participants reasoned that one of the attributes of a good physician was the realization that nobody was all-knowing. Therefore every cadre was expected to provide input in the case notes:
So that everybody sees or goes round each and every one’s input...we get to know more because what I was thinking may not be conclusive and what somebody else had added as his own opinion becomes an addition to mine. (Dr. H. Kehinde)

The benefits to the team on a collective level were more precise and definitive. The case notes helped the members make timely diagnoses and institute proper management plans that ensured that the patient’s health improved in a timely manner.

Yes, because that information would put my team on a very strong footing in knowing what is wrong with this patient, may be now or some years ago, and what was done for the patient some years ago, so that you know where to start from now. (Dr. H. Atagwu)

Also in a case like this, what investigations would be relevant? I may have an idea but in a bid to know more about the patient, I could consult the case note to find out what investigations were ordered and how to treat the patient. (Dr. H. Kehinde)

One particular advantage of the case notes as a learning tool was that the learning outcome was neither arbitrary nor fixed. On the one hand, the core members used the case notes to teach other members of the team. On the other hand, the peripheral members saw it as a learning template, particularly with the documented entries of the core members. The participants also used the case notes for different learning purposes and subsequently had different outcomes. Dr. R. Iyamah explained how it affected his subjective pattern of prescribing drugs to patients. Dr. H. Kehinde believed that using the case notes helped him learn more about different kinds of unfamiliar drugs, how they were used, their usefulness, and side effects. Dr. H. Kehinde averred that, “I will be able to say that this particular line of treatment is very useful in the management of this kind of case”. Dr. H. Ebi claimed he continually found the case notes to be useful in clerkship, seeing how the team members clerked patients, how they systematically asked questions, how they arrived at their diagnoses, and how they instituted their management plans. He then claimed that this enhanced his proficiency in clerkship. Because the case notes reflected different perspectives of the patient, they tended to perpetuate the practice of the unit beyond the circumstances that shaped them in the first place.

As a tool for learning, I have used patient records in making research;
I have used patients’ records in presentations of seminars; I have used patients’ records to prepare for exams; I have also used patient record to learn how patients who have certain conditions have been practically managed as against what is written in text. So it has been of very good essence to me. (Dr. S. Idegbe)

We can have interesting cases that we just decide to summarize, and capture certain details for the purpose of teaching whether at undergraduate or even postgraduate level. We don’t have database cases here. If facilities were available, then the case note would have formed the framework from which to extract data. But we don’t have database from which we extract data. (Dr. C. Chukwuezeke)

However, the participants also searched for meaningfulness beyond the boundaries of the case notes. Dr H. Ebi put it in this way: “I may also want to do some research on my own to find out what it is and how it goes”.
9. Information practices in activity

In this chapter, I continue to discuss the information processes of the CPT team’s work activity, and focus on examining specific information practices pertaining to patient care. The information practices to be described in this chapter are context-bound social practices dealing with a wide range of information-seeking activities such as gathering, meaning-making, sharing, use, and documentation. At the same time, this chapter is used to highlight the influence of learning on information practices. Another aspect that I try to draw attention to is the significant role of patients, as they are not only integral to all of the aforementioned information practices, but also provide the focal point for understanding such practices.

The aforementioned information practices are so named, but no single one is exclusive to the CPT team or even to the medical professional practice. Rather, what are possibly unique to the medical profession are the characteristics of each of the information practices. The specific information practices described in this chapter were first identified during the preliminary study in 2008. However, the empirical data gathered proved to be limited. This shortcoming was overcome during the main study in 2010 through observations and subsequent interviews, which focused on the CPT team’s actual information practices. The two research questions addressed in this chapter are:

- Research question 3: What characterizes information practices related to physicians’ work activity?
- Research question 4: How does workplace learning relate to physicians’ information practices?

The tools and artefacts that interplay between the information sources/strategies and the information practices in the team’s work activity have been discussed in Chapter 8.

9.1 Information gathering

For the CPT team members, information-gathering was seen as the selective assemblage of information; that is, the team members gathered information in the course of their interactions with patients and during the events surrounding those interactions. There were three types of information-gathering identified during the study: history-taking, physical examinations, and investigations.
9.1.1 History-taking

History-taking is the first step in the information-gathering used by the CPT team members. Information seeking through this step entailed a process of dialogic interactions that involved a fairly structured method called ‘clerkship’ through which patients were queried with direct and open-ended questions. The team members used patients’ answers to establish their subjective assessments of the problems to be solved.

We do not in any way play around with clerkship or history taking. You don’t just go asking questions blindly; the questions that you ask a patient must be spelt out in an orderly way because you can never tell what the patient's problem is by just looking at the symptoms the patient presented with or the co-morbidity that is the other coexisting conditions. (Dr. C. Chukwuezeke)

Information in history-taking entailed the following details: demographics of the patient, the complaint, the history of the complaint, past medical history, the possible etiological factors, drug history and history of complications, history of consultations, the social and family history, and any other useful information. However, history-taking was not all encompassing, and as Dr. C. Chukwuka noted that:

There is nothing that we ask in history-taking that is really superfluous. There is nothing that is there just for completeness. (Dr. C. Chukwuka)

Drawing an analogy from his everyday life experience, Dr. C. Chukwuka explained as follows:

You can only solve someone’s problem if he tells you what the problems are; and you find that the problems are more than 50% solved if the person to solve the problem know and can identify them. From my own experience as a physician of many years, I can state emphatically that with a good history, a diagnosis can be made up to 70%; because if you get the history wrong from the onset, you are not going to do the right thing. With our knowledge and background, we should be able to synthesize what the possible diagnosis is and the probable course of actions to follow. (Dr. C. Chukwuka)

The procedure involved in history-taking was the same for both the core and
peripheral members. However, the most influencing factor and significant determinant in understanding how history-taking was an information gathering technique in the CPT team’s work activities was by examining the roles of the team members.

*That the information that A, B, C, D gets at the different levels, by the time you collate them and read through them, at least you have a very good idea of what is happening to the patient.* (Dr. H. Atagwu)

The House Officers were the first to take the history of patients, as they were the first point of contact. They took the history that was deemed important and potentially helpful to other team members. This history was also seen as the meeting point for other members to share their input.

*When our senior colleagues come they will read through the history that we have taken and this will inform them about the patient’s condition. If there is anything that we did not take into consideration, they will ask and find out what we have done so far. They will try to find out questions that we may have actually ignored to ask the patients. Of course, they will always bring in their own input that is to say fill up the blank spaces and so augment our history; they will be able to pick up those things. But that does not mean that we are not doing it properly, and that is why we actually do individual clerkship, go there, clerk your patients, and your superior colleagues go through it, so that whatever was excluded or left out inadvertently, your senior colleagues may pick it, and the things you could not really probe into, your senior colleagues probe into it and tell you the right thing to do. So, it makes the whole exercise holistic.* (Dr. H. Ebi)

The Registrar’s role was to obtain the details in the history-taking process. However, Registrars still had to repeat the entire process even with the House Officers’ elaborate history-taking. Dr R. Mgbeke expressed this point as follows:

*When the House Officers finish their own history taking, we as Registrars go through the entire process again and do our own history-taking...We don’t start it mid-way or do it half way; we start all over again and do it completely.* (Dr. R. Mgbeke)

I asked Dr. R. Mgbeke why it was so, and he responded that as Registrars, they aimed to synchronize the concurrences or discrepancies related to the symptoms
and signs in patients that were earlier identified by the House Officers. At this stage, the questions became more directed, more focused, and more goal-oriented, sometimes requiring that the Registrars consult other sources of information.

_They tell me the patient came in with cough, leg swelling and difficulty in breathing. I am thinking of heart failure…. I may now think: ‘ah’, what could explain this symptom, even if it has to do with my going to check up some things before interacting with patients, I will go and do it. I will go and ask my senior colleagues or even check my books. (Dr. R. Mgbeke)_

At the core level, the history taken by the Consultants and Senior Registrars was for the purpose of reviewing and assessing the history taken by the peripheral members. At this stage, the history-taking process did not necessarily have to be detailed, but instead entailed filling in the missing gaps.

_I find out whether they have asked the relevant questions with regards to certain areas. If they haven’t, I make them go back to ask those questions so that they fill in the gap. (Dr. S. Idegbe)_

_You are able to pick up certain gaps, maybe oversights and all that deficiencies in the history, you are now able to polish it to make them realize that that was an important mission which they should have pursued to logical end and all that so as to improve their history-taking ability. (Dr. C. Chukwuka)_

Some of the core members emphasized that the history-taking process was not linear. They even claimed that sometimes they deemed it necessary to repeat the entire history-taking process. Dr. C. Chukwuezeke succinctly put it this way: “I must not leave anything to chance”. Dr. C. Chukwuka explained that he sometimes still had to have:

_...a chat with the patient to confirm what has already been obtained...this may require doing the history taking all over again so that I can synthesize the necessary data before arriving at a conclusion and taking the necessary decisions. (Dr. C. Chukwuka)_

Dr. S. Olowo believed that there were things that could remain subtle to the peripheral members, hence “I read theirs and sometimes I take mine”. However, Dr. S. Olowo explained that he would not have had to repeat the process if another
Senior Registrar with the same ranking had already seen the patient and reviewed the history:

In that case, I may say, 'okay'. I may just go by the review made by my colleague. I may not bother to go through the whole process again.
(Dr. S. Olowo)

The history-taking process ensured consensual agreement regarding decisions. Dr. S. Igweh explained:

It is a teamwork, we rub minds together. No one person has all the knowledge. That is the good thing about tertiary hospitals with team of doctors...If there is anything that cannot be ironed out in the history taking, we have to go back to look at the references, to sort out other information that are not available to us then. We postpone the implementations of anything we want to do, and then we come back again to revisit the situation of the patient. (Dr S. Igweh)

The history-taking has obvious implications for learning. Medicine is a dynamic profession, and the participants believed that the art of history-taking required that they engaged in the continuous practice of clerkship to enhance their proficiency and to extract information properly. In this regard, the core members assisted the peripheral members and tailored their communication skills towards ensuring uniformity and consistency. According to Dr. S. Olowo: “this in a way ... would help them to know how to ask some certain delicate questions”. Dr. H. Atagwu supported Dr. S. Olowo’s reasoning from the viewpoint of a peripheral member. He explained that if two persons took the history from the same patient, there could be differences in terms of quality of the information extracted. Dr. H. Atagwu then reinforced the need for continual practice; “history-taking is something that you still need to perfect on. You learn and learn and learn, the more you learn the better you become”. Ideally, Dr. C. Chukwuka argued that nobody should interfere with or disrupt the face-to-face interaction between a patient and physician. Sometimes disruption was necessary for teaching purposes or when there was a need to have a conference with a patient.

The history-taking process entailed establishing rapport and trust during interactions with patients. Dr. H. Ossai and Dr. C. Chukwuezke narrated how they handled difficult cases:

I was seriously concerned, I was showing empathy, I was always
coming around him, dutifulness I should say. So that now gave him an air of “oh” kind of freeness to talk with me. If you don’t have good relation with your patients, if they don’t see you as their friends, they cannot talk to you freely and may not feel obliged to proffer all the necessary information. (Dr. H. Ossai)

The patient should be able to trust me. Trust me enough to tell me that he or she feels what others might disapprove of: like being able to tell me; I went to the native doctor; I took some herbal concoctions; I stopped taking the drugs prescribed for me because I was taking some native medicine; I went to the witch doctor; ... because those things, the complications of those interventions may even account for the presentations that we are getting. The more details I am able to get from a patient, the more trust we have established, the more likely it is that we are going to get better outcomes for very many reasons. (Dr. C. Chukwuezeke)

The history-taking was only one method of the information-gathering process, and relying solely on it would have resulted in getting incomplete information about a patient. There were two other techniques involved in the information-gathering process: general examinations and investigations. Dr C. Chukwuezeke noted that these two techniques were directed by the information obtained from history-taking.

9.1.2 The general examination

The general examination is an aspect of the information-gathering process involved in the physical examination of patients. As a follow-up to the history-taking, it involved obtaining information through the examination of the human body. The different parts of the patient’s body were examined through different means (e.g. auscultation, palpation, and inspection). For example, the participants inspected the patient’s nails, palms, and skin when they wanted to check if the patient was anaemic or jaundiced. They also checked the conjunctival membrane for conjunctival reactions (e.g allergy and serious infection), oedema (severe inflammation), discharge (acute viral infection or severe bacterial infection), and for the presence of follicles or papillae. Dr. C. Chukwuka explained that the goal was to discern and determine not only the abnormalities in the human body, but also to ascertain the level of progression of the therapy proffered thus far.

The information gathered through the general examination was integrated into the physical assessment of the patient. The information process involved the systematic
observation and examination of the physical characteristics of the patient, particularly because different diseases and ailments exhibit their own symptoms. The general examination presented opportunities to ask spontaneous questions and even provided a forum for the team members to discuss the patients. The general examination was a significant parameter for diagnostic activity, and the information obtained through it was useful in confirming the findings of the history-taking.

*General examination gives us pointers to the patient’s condition; pointing to the areas that are really more affected despite the patient’s complains. ...a patient might be complaining of one thing but it could be another thing. Hence, after a general examination have been thoroughly conducted, then we can say, oh no, this patient has primary cardiac problem rather than an abdominal problem. (Dr. S. Olowo)*

There are standardized procedures for doing the general examinations. Dr. C. Chukwuezeke noted that: “you don’t just go jumping from one part of the body to the other”. In the case study, the general examination was seen as a purposeful and directed mode of information-gathering that proffered insights into how specific organ systems inside the human body functioned. Dr. S. Idegbe and Dr. C. Chukwuezeke described it as follows:

*You want to access certain parameters, you want to look at the patient’s eyes, you want to access whether the patient is pale or not, you want to check whether the patient is jaundiced, you want to look at the patient’s general state”. You look at the whole skins; you look at whether there are any swellings that are obvious on the body. Then you look at the fingers, you look at; all will help you, at least give you an idea of what is the problem with the patient. (Dr. S. Idegbe)*

*If you are doing a general examination, you are looking out for pallor, jaundice, sinuses, the level of hydration, the overall form of the patient, is it ischemic or right size, is overweighted, like how much the person is overweighted, which will also mean that we have to take the height of the patient in order to calculate the body mass index. Then you are looking at the fingers, the hands, the knees, is there finger clubbing? Then again, you can tell again whether there is sinuses, finger clubbing, a lot of things that you can do. You can give a whole one hour lecture on general examination in length, the pedal oedema and so on and so forth. (Dr. C. Chukwuezeke)*

Science requires extensive verification (of opinions). In the case study, obtaining
information through the general examination depended on role-positioning. Like in history-taking, the House Officers were the first to have contact with patients. Unlike history-taking, Dr. H. Ossai explained that the role played by House Officers was about the same as the team members at the other levels; “because we are all doctors, but the frequency may not be the same” (Dr. H. Ossai). While the House Officers needed to examine the patient everyday during the patient’s stay, the other more senior colleagues did not. Dr. H. Ayidu explained that the reason for this difference in frequency was the fact that the House Officers, as the most novice cadre, were supposed to practice as much as possible since “practice makes perfect”. He explained:

*I am expected to be the first person to examine a patient. Ideally, it is the rule that the Registrar and Senior Registrar should not examine the patient before me. Then, I make my findings and I present it to the Registrar. More often than not, the Registrar adds some information to my own findings. Sometimes, I am not able to pick up one or two vital signs, which the Registrar may have picked and this is not unexpected at my level as nobody is 100%, so when I don’t pick up one or two things, the Registrar might just pick them.* (Dr. H. Ayidu)

However, the Registrars also examined patients almost as often as the House Officers. Dr. R. Mgbeke explained that the Registrars, in most cases, had to go through the whole examination process just as the House Officers had:

*We don’t say because the House Officers have checked for whether the patient is pale or not, that we won’t check for it again. We start all over, we check everything.* (Dr. R. Mgbeke)

At this stage, the role of the Registrars was to identify the concurrences or discrepancies in the House Officers’ findings. Dr. R. Mgbeke noted that if his findings concurred with that of the House Officers, then “fine”. But if they did not, then the House Officers findings were relegated. In such instances, it was the general examination of the Registrar that prevailed over that of the House Officer. Even within the same cadre, the role played by the Registrars went beyond obtaining information from patients in the general examination. It also included the supervisory role of overseeing the House Officers and medical students. Dr. R. Efangwu, claimed that he normally stayed around to supervise and point out the missing gaps.

*If the students checking for pedal oedema do not put their fingers rightly; they are supposed to wait for some time before they roll the*
finger over the pitting, so I correct them. (Dr. R. Efangwu)

The general examination by the core members was not different from that of the peripheral members, though the supervisory role of the former was more prominent. At this stage, it was not always necessary to do a complete general examination, and the role of the core members was mostly to identify the missing gaps and areas of controversy in the findings of the peripheral members. Dr. S. Olowo exemplified it in this way:

We try to add flesh to the findings of our younger colleagues...this patient has finger clubbing, and in the process of searching for what was causing it, we discover that the patient has a cardiac problem; you know...in addition I could find out that the patient was having yellowness of the eyes, jaundice and I say oh, nobody noticed this. (Dr. S. Olowo)

Although, the core members were not expected to go through the entire general examination process, at times it was expedient for them to repeat the entire process, particularly in cases where clarity was sought:

Sometimes, I just have to do another general examination for a patient even after my junior colleagues have done theirs...to start all over again...this entailed relating the signs and symptoms earlier elicited to the flow of thought of whoever was reviewing the examination. It also entailed using other sources of information to tie up the findings together. For example, finger clubbing in a patient could be found in a plethora of diseases, and in cases of diagnostic dilemma, there may the need to consult some other sources. (Dr. S. Olowo)

Experience accounted for how the core members participated in general examinations. Dr. C. Chukwuezeke averred that he did not have to be in close proximity to a patient to begin the examination process since his examination began “from the moment the patient is within my view”, when the person walked in the door of the clinic room. Dr. C. Chukwuezeke then described the general examination from multiple perspectives.

Let say one third of our examination is done without touching the patient. It involves observations...I am talking about seeing and observing, hearing, swellings, before we go ahead to touch. So from my observations, you are looking at a man or woman. Is the person ill-looking or not? Is the person acutely or chronically ill-looking? You
heard the discussion that day about acute or chronic ill-looking. Is the person in respiratory distress? Is the person comfortable? Is the person looking well-kept or looking rather unkempt. (Dr. C. Chukwuezeke)

The general examination at this stage went beyond information-gathering, and entailed the core members’ involvement in participatory learning in the form of guidance to other team members. Dr. C. Chukwuka and Dr. S. Idegbe explained how they observed the methodology of the peripheral members, especially the students, to ensure that they were using the standard techniques to elicit vital signs:

If the liver is enlarged, there is a standard way to examine it. How is the heart functioning? There are standard ways to examine whether the heart is large, whether the values are troubling too large. (Dr. C. Chukwuka)

As they are doing it, I am observing them. If they are not doing well, I teach them how to do it well. And then when they have done it well, and the information they get is not the right information, I also teach them how to interpret what they have done well. So it is my duty to teach them, and it is my duty to confirm what they have gotten from the general examination. (Dr. S. Idegbe)

The two information activities -the history-taking and the general examination - pertain to the CPT team members’ gathering first-hand information from the patient. The next information-gathering activity involved gathering second-hand information.

9.1.3 Investigations

The investigation or systemic examination, was an aspect of the physical examination that dealt with the system or specific organs of the body, such as the heart for the cardiovascular system, the lungs for respiratory system, the nerves for nervous system, the reflexes for the neurological system, the muscles for the muscular system, and the abdomen for the abdominal system.

The investigation was an aspect of the CPT team’s information-gathering activity. However, it differed from the other two discussed thus far in that it was heavily influenced by the activities of the wider community in the teaching hospital. The procedures involved in investigations were either simplified or advanced. The
simplified procedure entailed investigations that were done at the patient’s bedside by the nurses or the House Officers. Examples of such investigations included urinary investigations and the random assessment of blood glucose levels. Investigations that required more advanced procedures were carried out by various laboratories and radiographic units. Several reasons were proffered by the participants as to why investigations were carried out: 1) for confirming or refuting presumptive diagnoses in order to pinpoint the expected normal values from the deviations in the values of abnormality; 2) to monitor the patient and ascertain the progression of the patient’s health; 3) to exclude other diagnoses; and 4) to exclude complications related to the disease’s progress.

In the case study, the investigation involved actively seeking or scanning for information that was purposefully directed towards specific goals, “you see a patient that is pale, and you do a PCV” (Dr. H. Ebi). It also required specific goal-oriented baselines necessary for confirming or refuting diagnoses:

*Finding out what the hematocrit levels in the patient’s blood is in order to determine the complete blood counts of a patient along with the haemoglobin concentration, platelet count, and white blood cell count.* (Dr. C. Chukwuezek)

*Knowing how a patient’s kidney is functioning by testing for the electrolytes, urea and creatinine.* (Dr. R. Mgbeke)

*Doing a fasting blood sugar for suspected cases of diabetes or to monitor the blood sugar level.* (Dr. R. Iyamah)

Investigations were selective and restricted. For example, “an endoscopy test cannot be done for everybody but for a patient who has an upper gastro-intestinal (GI) bleeding” (Dr. H. Ayidu). Neither could “an electrocardiogram (ECG) test be done for any suspected case of hypertension unless for patients with suspected cases of heart disease or failure” (Dr R. Kehinde). I observed that the investigations were not undertaken in isolation. Ordering an investigation was intricately linked to the other two aspects of information-gathering (history-taking and the general examination). Because of the unique characteristics of each patient’s case, investigations were specific to the individual patient and the intended goals of caring for that patient. No one investigation was all-encompassing, and different investigations were carried out for different purposes as required. The investigations also entailed following-up on earlier investigations to reflect the progression or retrogression of the patient’s conditions. Investigative
results were interpreted by the CPT team members and specialist physicians from other units/departments.

Like history-taking and the general examination, the investigations, as an information activity, also depended on role-positioning. The role of the House Officers in the investigations was limited to the administrative execution of the decisions made by the core members and even the Registrars. The House Officers maintained contact with members of the larger community in various units/departments for different investigations such as chest x-rays, abdominal ultra scans, and MRI scans. While this may be the case for the inpatients admitted to the wards, the investigations carried out for the outpatients did not require involvement of the House Officers, as patients made such contacts themselves. I asked some of the House Officers why they had a limited and restricted role in the investigations. Dr. H. Kehinde responded that:

\begin{quote}
You don’t, as a House Officer, take your own initiative to institute an investigation, but you can write out the investigations that can be done for the patient. It is tentative...but it is not for you to take such decision per se. (Dr. H. Kehinde)
\end{quote}

Generally, the investigations were recommended and endorsed by the other team members. But the House Officers claimed that there were some basic investigations that they were able to initiate on their own. I observed one such instance when Dr. H. Ebi initiated a simple urine investigation for a febrile patient to find out the cause of the fever. Dr. H. Ebi later told me that, “if you do that, nobody will ask questions about it or say that you have done something wrong”. There was also another instance that I observed. It was an emergency situation and Dr H. Atagwu initiated the investigation first before informing the Registrar. Dr H. Atagwu later told me during my interview with him why he initiated the investigation.

\begin{quote}
Sometimes when my senior colleagues are not around, and I examine a patient, and I say, ah, this patient is jaundiced; oh, this patient has jaundice; and I look through the case note of the patient, the liver functions test, serum protein test has not been done, and I know it is very important, I can then order for an investigation. I take the sample to the laboratory, and then I will now report to my senior colleagues that the patient was jaundiced, and I felt that it was important to do
\end{quote}

\footnote{During the study, I observed what the House Officers did in investigations, including \textit{inter alia} filling out the investigative forms, doing a venous puncture on a patient, collecting samples from patients, sending specimens to various laboratories, and ensuring that the investigative results were retrieved and made available as soon as possible.}
some investigations. In that way, at least your senior colleagues will pat you on the back. (Dr. H. Atagwu)

The administrative execution of an investigation by the House Officers also entailed that they kept track of their patients’ laboratory results. Dr. H. Ebi explained that other members of the team could ask him at any point in time about the laboratory results of his primary patients and he was expected to provide such information at request.

So at my level, the others would require me to have first-hand information regarding the investigations, and how and what has so far been executed. They want to know how far; if there is any that have been done; what the results are. And I am expected to inform them as soon as I get the result of any investigation. In case I am not able to inform them before the next day, they could call on me at any time and ask “Have we done this?” or “Has the patient done this?” And if the answer is yes, I would be the one to give the information. So they ask or they come to ask me first following such kind of investigations. (Dr. H. Ebi)

It was common for the House Officers to encounter some difficulties while executing their investigative plans, which necessitated the guidance and assistance of the other team members, particularly the Registrars. Dr. H. Ossai talked about the challenge he once faced in doing a venous puncture as a newly-trained physician. He explained that the Registrar assisted him and told him what to do and exactly how to do it. In support of Dr. H. Ossai’s explanation, Dr. R. Mgbeke explained how he sometimes asked the House Officers about the significance of the investigations pertaining to their patients. Dr R. Mgbeke claimed that he even criticized the House Officers if he was not satisfied with their answers.

The Registrar’s role in the investigation entailed ordering specific investigations. Their role was akin to the role played by the core members. Registrars also intervened when there were delays in collecting the investigative results from the laboratories. This ensured that there were no disruptions in the information flow.

Occasionally, the results coming out from the laboratory may be a bit delayed; I can then go there to find out what the problem really is. I will not say that because I am a Registrar then we should all start waiting for the House Officer to collect the result. No, I have a responsibility to ensure that patients that we are managing have the best of care; a patient’s life may depend on that very laboratory result,
and delay you know they say is dangerous. Since I have done it before as a House Officer, and I am already more experienced so when they have difficulties I should be able to use my own wealth of experience and contacts above theirs to solve the problem. (Dr. R. Efangwu)

The core member’s role entailed endorsing and making decisions about the investigative plans. However, at this level, the investigations went beyond instituting or endorsing the investigative plans. Dr. C. Chukwuezeke explained that it also entailed looking at the case scenarios, whereby further investigative tests could be suggested and the appropriateness of such tests determined. Because the research setting was a teaching hospital, the investigations by the core members also connoted acts of learning. Dr. S. Idegbe saw it as his duty to interpret the investigative results for his colleagues and to tell them what they can learn from the process. At the same time, he explained to them why those investigations were relevant to that particular patient’s case. Dr. S. Idegbe’s explanation affirmed my observation that the core members, particularly the Consultants, were in the habit of asking the peripheral members (i.e. the House Officers and the students) to interpret the laboratory results as they related to the patient’s condition and to explain the content to others during ward rounds.

The investigation also implied recognition of cognitive authorities in the activity system. I asked some of the participants who or what they turned to in cases of problematic situations in the interpretation of investigative results. Their responses pointed to different authorities such as textual, social, and physical information:

*We turn to reference prints, but if the problem was probably because of some other diseases that the patient has, then we can look for more experienced hands like the Consultants to help in the interpretation.*

(Dr. S. Idegbe)

*We may even require calling for our sub-specialists colleagues from other units to help in the interpretation of those investigations...or even linking up with the head of the relevant laboratories for clarifications.*

(Dr. S. Olowo)

*We may not rule out calling for further investigations and collecting more samples from the patient....but if something is not clear, the laboratory attendants have to be told, the scientists have to be told, the nurses have to be told, you go back to your books or you repeat the investigation.*

(Dr. S. Igweh)
9.2 Meaning-making

Meaning-making was an important aspect of the CPT team members’ information practices. Understanding this practice was based on how the participants constructed meaning through participation with significant others, as opposed to solely on their own. This relates to Kaptelinin’s (1996, p.56) assertion that “human beings actively create the meaning of the objects in the process of interactions with the environment”. The meaning-making in the study context also relate to Dewey’s (1933, p.19) assertion that events and activities pertaining to human beings have meaning. This signifies that there may be consequences because of the deliberate control that human beings have over such events and activities.

In the case study, I focus on interpretation as a mechanism for meaning-making. Interpretation entailed an active information-seeking process that purposefully aimed to differentiate between normal and abnormal values. The participants claimed that the skill required for interpretations was passed on to them during their training in medical school. Interpretations served several purposes in the CPT team’s work activity and were not left to either intuition or guesswork. Rather, Dr. R. Eweka averred that interpretations were aimed at creating reliability and credibility in information. In this regard, he saw interpretation as more or less like a puzzle:

*If you put one, two and four together, it is most likely to be this. If you put three, five, and seven together, it is most likely to be that.* (Dr. R. Eweka)

The massive amount of information involved in patient care implied that interpretations could result in many possible courses of action.

*You now begin to ask those questions to see if that puzzle would match with your own picture. In putting one, you take out another...These are types of questions you ask and when it gives you a positive one you have added another block. It gives you a negative one, you remove another block, and you add another block until you get that perfect picture then you can put your puzzle together, and say okay this is congestive cardiac failure or that is a chronic kidney disease, or this is something else.* (Dr. R. Eweka)
Interpretations by the CPT team members entailed role-positioning. Dr. H. Atagwu explained that when he gathered crucial information from a patient on a day-to-day basis, being a House Officer implied that the information must not end with him.

As a House Office, any information that I obtain from patient must not end on my table...So I have to take it to the next level, which is the level of the Registrar promptly; this is what the patient I saw at so and so ward and in on so and so bed just told me that he or she experienced last night. So the Registrar will come and review the patient to find out any discrepancy, after which he will take the information to the next level again, which is Senior Registrar, who will come also and review the patient. You find out that it is a chain of information, which actually in the end, will lead to a conclusive diagnosis and appropriate treatment for the patient, which actually started from my own level. (Dr. H. Atagwu)

Dr. H. Ayidu gave an example of a diagnostic dilemma regarding a patient that he was managing at the time of this study. He explained that the team members were considering two diagnoses; either disseminated tuberculosis or cor pulmonale. According to Dr. H. Ayidu, there were symptoms and signs that favoured disseminated tuberculosis. But there were also symptoms and signs that favoured cor pulmonale. As a House Officer, Dr. H. Ayidu said that he could not have resolved the puzzle surrounding the patient’s ailment. However, he claimed that one of the Consultants was available to help resolve the dilemma by offering it up first to the open forum.

Interpretations at the peripheral level implied guidance and assistance by the core members in difficult cases.

Most times, if we come down with problems in interpreting our results, we call on our Senior Registrars or Registrars. We call them; they come and put us through, and by so doing we have equally learnt, and that means that we will never call on them again any other day. I think I learn a lot by so doing in differentiate between normality and abnormality. (Dr. H. Aghogho)

We can find out from more senior colleagues in the units who will come and express their ideas what they think about that issue. They come, they put us through, interpret the relevant information and they teach us as well. So that when next a similar thing occurs, you would not call
them. (Dr. H. Ossai)

My senior colleagues may even want to know my own flow of thought and level of understanding about the information to be interpreted. They would ask me what do you think is wrong with the patient, how would you manage the patient if you were left to manage the patient alone. Then I will tell them what I had in mind, and what I think would be appropriate for the patient. (Dr. H. Kehinde)

They show you how applicable the interpreted result is to the problem at hand, and where the problem lies, and how it came about, the physiology behind the problem, or rather the sequence that lead to the problem. It gives you a better understanding of the problem, and how you can move on with the problem at hand, and since you have seen it being done, it becomes easier for you to do next time. (Dr. R. Mgbeke)

Some of the peripheral members explained that the process of interpretation was sometimes fraught with uncertainties, which usually increased or decreased in the course of a patient’s treatment. I had then tried to find out from them how instances of conflicts and contradictions that arose from interpretations were handled. I also tried to find out from them who or what they turned to in such circumstances. Dr. H. Atagwu explained that when there were discrepancies in the interpreted information, new information was usually gathered. Though “you may not necessarily discard the old one...it could be cross-checked in the future”. Dr. R. Eweka described how one of his peers once checked and examined a patient and found that the patient’s liver was enlarged. Dr. R. Eweka later checked and found that the liver was not enlarged. Dr. R. Eweka explained that he documented his findings in the case notes but did not counteract the findings of the other team member.

Nobody is supposed to castigate or cancel what another person documented. You make your own impression, it is an impression. I too, somebody else can come and say that this is what he found. I am supposed to make my impression and be confident of my impression and say; this is why I wrote what I wrote... This is what I thought, and this is why I thought how I thought...definitely some form of agreement; this is what I got, and we both do it there and confirm. If he is right, we take his right, and if I am right, we take it, it is a team. (Dr. R. Eweka)

Dr. R. Iyamah also explained discrepancies in interpretations in an example of the therapy prescribed to a patient with transient ischemic attack (stroke). Dr. R.
Iyamah explained that the question was whether or not to give the person aspirin. This was because while there had been trials that showed that aspirin was useful for the secondary prevention of stroke, the patient had a bleeding problem, and that made the prescription of aspirin unacceptable.

There are thus bound to be differences in interpreting the information we elicit from patients; hence when we come together as a team, whatever each cadre missed will be picked out and handled together by all of us in unison... there are bound to be differences in opinion, but we have to rub minds together with the superior arguments gaining grounds...so if you bring out your opinion, you argue for your case and justify it more or less, and then the other person looks at it, and evaluate your points, you also evaluate the other person’s point, and when the points have been marshalled out, the pros and cons of every action, and then we see whether it carries enough weight, and we can come to a consensus which is usually the most appropriate step to take. (Dr. R. Iyamah)

In instances where there were uncertainties in interpretation, the participants claimed that they relied on or turned to anything that could proffer a solution:

Did the patient give the wrong information? Did the questioner get the correct message? Or was there a language barrier? (Dr. H. Ayidu)

Is the laboratory result deranged? (Dr. H. Aghogho)

You cross-check the history with some other person that is very reliable and close to the patient. (Dr. H. Atagwu)

It could happen, it could happen, but at that point in time there is always room for discussion between team members and we usually come to a logical conclusion based on facts in the textbooks. (Dr. R. Mgbeke)

I can take further steps to find out where and why things went wrong such as making contacts with the nurses, patient’s relatives, going to various laboratories to ascertain or confirm the information we have obtained. (Dr. S. Idegbe)

I asked some of the peripheral members if they were in a position to accept or reject
any interpreted information. Dr. H. Aghogho responded:

Whether we have to leave some information or take some information is not within my jurisdiction. As I told you as House Officers, we are at the lowest cadre of doctors. So if information is supposed to be taken up or left out, it is from the Registrars’ level, and not for our level. Secondly, our Senior Registrars and Registrars, they actually interpret information. But we can interpret information, but it is not at our level to interpret they actually do that at their own level. (Dr. H. Aghogho)

Interpretations at the level of the core members were different from that of the peripheral members, in that they required more expertise and skills. Hence, Dr. C. Chukwuka, saw himself as a facilitator in the process of interpretation. He explained that depending on the source of information, his role was to analyze the information and find the strengths and weaknesses by differentiating the superior arguments from the weaker ones.

You want to look at it and you want to inquire if there is need for more information, you do that. By the time you see the opinions, the views expressed by others members of the team, and then you have to make references to other materials. Ideally, these days of evidence-based medicine, decisions tend to be based on evidence and trials, work that has been done by research either by meta-analysis or some form of randomized trials that would have looked into that area and have come up with what they think is acceptable evidence. You look at the evidences, you look at the trails, you look at the rationality of the drugs you will now be able to act as a facilitator and strike a consensus. So that at the end of the day, you find that the conclusion or outcome will be further investigations to exclude certain things that came up during your discussions, and then you have to look at that; the initiation of certain treatment especially if the patient is at risk. If nothing is done, all those are things you reach in the form of consensus. But as the leader, the most experienced, most times, you should with modesty know what you are trying to arrive at, so that at the end of it, it will be in the interest of the patient. (Dr. C. Chukwuka)

The above excerpt underscores the fact that the process of interpretation at this level entailed some form of consensus. Some of the core members agreed that consensual agreement was mostly by superior argument. When I asked Dr. C. Chukwuka if there were any type of negotiations or bargaining, he responded in the negative:
I won’t call it negotiation. I won’t say we negotiate. There is nothing to be bargained. We try to reach a consensus from our wealth or pool of information. (Dr. C. Chukwuka).

Interpretations also signified an element of control and respect amongst members of the team. Dr. S. Idegbe explained how the other members of the team respected his opinion because:

At the end of the day, even when we meet and discuss like that, the onus still lies on me to take the final decisions for the patient. I have to say whether the result is correct or not, whether the findings are appropriate or not… and all that. (Dr. S. Idegbe)

However, the core members believed that there was no absolute authority in the process of interpretation. Dr. S. Idegbe was quick to put forth that:

No man is a citadel of knowledge, and a good physician is actually one who knows his limit. When you have done what you feel you should do, when you have differentiated the normal values from the abnormal, you call in others to attend to their own beat. (Dr. S. Idegbe)

Interpretations at the level of the core members also entailed some conflicts or contradictions, but Dr. C. Chukwuka averred that such conflicts were resolved on a collective basis within the parameters or acceptable standards of health care. These included: 1) evidence-based medicine as a synthesis of a large volume of information concerning any issue (the crystallization of such information was regarded as the truth for the area); and 2) the acknowledgement of and knowledge that the patient being managed was an ‘entity’ of its own to be handled accordingly to its own unique characteristics.

9.3 Case presentations as an aspect of information sharing

The case presentation was the narrative re-enactment of a medical encounter with a patient. The attending physician presented the case presentation to a wider audience at unit/departmental conferences (e.g. ward rounds and morning reviews). According to Hunter (1996, p. 56), case presentations are central to the discourse of medicine. For the CPT team, it entailed an episode or setting where one or more persons did the initial gathering of the patient’s information on behalf of the team. The information gathered was then later presented to others. It also provided the
audience with an overview of cases that were being managed by the unit/department. Dr. R. Eweka and Dr. H. Ebi talked about the significance of the case presentation.

*The presenter tell everybody about the patient’s health profile, so everybody gets to be aware, you don’t just gather information and keep it to yourself. You should be able to tell others that this is what you found out in this patient or this is what I think, this is how far I have gone, and this is what I hope to do next. Whatever you discover, you take it up, you tell the other team members... Then, the team members will get to know more about patients when cases are presented...because when we are working as a team, everybody is together. So we are all aware of what we are doing for the patient or what we have done for the patient. We rub minds together and come to a compromise or consensus, deliberate on important issues and decisions are taken collectively based on what has been presented.* (Dr. H. Ebi)

_We can’t tell everybody to read the case note at the same time. So, we tell somebody to read out especially the person who interacted with the patient and obtained the information. Tell us about this patient. We present cases so that everybody can hear, we present cases because it is part of our training to learn how to speak out, because when you are presenting a case, you are like a lawyer in a court who is presenting a case and trying to convince everybody about things. So you present a case to others in a format that is acceptable and meaningful to them; whoever wants to hear you hears and can follow the nitty-gritty of your presentation; why your diagnosis is that way; so, it is part of the training to learn how to present, to learn how to talk, to learn how to be convincing._ (Dr. R. Eweka)

The format of the case presentations that I observed was based on tradition. The presenter retold the medical history of the patient in this specific format: brief biographical data; current complaint of the patient; the history of the current complaint; physical examinations; investigations ordered; and the laboratory results. Other templates included: past medical history; drug history; and family and social history. The presenter also informed the listening audience about his/her own impressions or assessment of the patient. This entailed the initial diagnosis, preliminary management, difficulties encountered, and the case summary. Dr. R. Efangwu summed it up as follows:

*This is the information that I obtained when I had encounter with*
Case presentations were usually interactive in nature and provided a forum for feedback and scorecards (i.e. for evaluation) in the work activity of patient care. Dr. C. Chukwuezeke emphasized his role as listener, which gave him the opportunity to oversee and contribute to the initial care that patients received. Stressing further, Dr. C. Chukwuezeke noted that a whole team could be misled if the person who initially admitted the patient made a wrong assessment. Moreover, that no member of the team had the opportunity to re-evaluate the patient in detail. The goal of case presentations was to enable the other team members engaged in patient care to gain insights into the patient’s health profile and contribute accordingly. Dr. C. Chukwuezeke summed this up as a refining process that aimed to ensure that the team was on the right path.

From the study observation, it was obvious that physicians who were listening to the same case presentation either agreed or had different impressions about the case. I asked the participants what they looked for during case presentations. Dr. H. Ossai explained:

_We all look out for about the same thing...What we will look out seems to border around a common realm either to rule facts in or to rule them out; is this presenter presenting it well? Has he or she taken appropriate history, has he done the examination as he should have done it? The diagnosis he made, is it actually the right diagnosis looking at the history and examination he has done? The plan that he has instituted, is that actually the right plan? You want to know why he has instituted the plan. Does he know the reason why he is instituting the plan?_ (Dr. H. Ossai)

Dr. H. Atagwu averred that it was not difficult for team members to comprehend the details in cases presented because of their medical training.

_There is really nothing that could keep any qualified physician at sea when a case is presented. Every terminology, whatever thing that is being discussed during case presentations, in your capacity as a doctor, you should be able to understand them._ (Dr. H. Atagwu)

However, the difference in what the participants looked for was just a matter of emphasis. In some instances, it depended on one’s social position in the medical
hierarchy, and in other instances, it depended on role-positioning as either a presenter or listener during the presentation. The peripheral members believed that case presentations created room for enhancing their information-gathering skills; hence, they claimed that they looked for clarity and facts in the cases presented.

*Generally the presentation has to be clear...looking for conciseness, simplicity; the presentation has to be easy to understand.* (Dr. H. Ayidu)

*When somebody is presenting and I am listening, what I will look out for is that; is this Registrar presenting it well? Has he or she taken appropriate history, has he done the examination as he should have done it? The diagnosis he made, is it actually the right diagnosis looking at the history and examination he has done? The plan that he has instituted, is that actually the right plan? I may want to know why he has instituted the plan. Does he know the reason why he is instituting the plan? I will look out for the investigations the presenter has requested. So from that I am learning. So just in case I come across such cases elsewhere, I could recall that a number of cases like this were presented which I listened to, and this diagnosis was arrived at, this investigations were ordered, and this were the line of management instituted.* (Dr. H. Ossai)

*You get to listen; you get to hear, you know, see how this person was thinking and while the person made certain diagnosis. Like I said, also you hear your senior colleagues criticize presentations. You can learn from that. So you don’t repeat the mistakes somebody else has repeated. Also opportunities are given for questions to be asked, and based on those questions, accurate answers are also given. And the questions that are usually asked are standard questions. So, just coming to morning review, there is a whole lot that you can learn. So, I try as much as possible, not just to be around, but to be early so I can benefit from morning review.* (Dr. R. Eweka)

Some of the other peripheral members claimed that they listened for specific issues such as:

*...the frequency of certain kinds of ailments admitted into the wards with the different complications arising from such ailments to enable me have sufficient insights into the prevalence of such ailments in Nigeria.* (Dr R. Kehinde)
Some of them saw case presentations as a way of setting things right and getting things done:

*They tell you that what you did was not the right thing to do at that particular time. Then, if what was done for the patient was not well done, our senior colleagues tell us, ‘you did not do this well, right now go back there, do this for the patient, do that for the patient’...so what you thought was correct, you will now know that it is not the right line of management for this patient.* (Dr. H. Aghogho)

*They tell you what they think after hearing your case.* (Dr. H. Ebi)

*They will tell you that this is how to do this thing.* (Dr. H. Ayidu)

So they criticize your history, they criticize your examination especially in those examinations that were omitted or were not done because of lack of knowledge that there should be done, they criticize that and they make you know why you should do that. Then in your management, they can criticize the drugs you prescribed, probably because you were unaware that they have side effects, or that you were unaware that there is a better alternative to what you prescribed for the patient. They analyzed what you have done, and in so doing they help you in getting a better history from the patient. They help you in analyzing the signs of the patients; they help in your drug management of the patient. Then you remember and note those things and next time when you are clerking another patient, you are more informed, so you ask those questions. (Dr. R. Mgbeke)

The core members believed that the case presentations permitted analyses and criticism of step taken by the presenter. They also highlighted discrepancies. Dr. C. Chukwuka said that his role was to gravitate the presenter towards a central point acknowledged by the majority of the audience by pointing out discrepancies in the cases presented.

*I would look out to see that the fellow who is presenting the case has a message to deliver, he presents it with all confidence, good flow, proper delivery of the case, and then gives an adequate review of that case and delivers a message so that at the end of the day, there is a take home message from the case that was presented.* (Dr. C. Chukwuka)
Core members differed as to what extent they criticized presentations. For others, case presentations availed them the opportunity to get first-hand information from the presenter. They were then able to criticize the presentations in-depth so that the presenters could make corrections. For some, the onus implied identifying loopholes in the presentation;

*Fill in those gaps and correct errors that have been made...and suggest the way forward.* (Dr. S. Idegbe)

*Hear straight from the horse’s mouth how individual patients presented and be able to correct the presenter as much as I can* (Dr. C. Chukwuezeke)

*Okay, we probe in, we investigate, we want to look how sharp our younger ones are during case presentations...and the knowledge they have, because if they don’t know what they are looking for, they will not see anything... So case presentations enable us to see how grounded our younger ones are, and see how well-built they are, how well they have developed in the training. Okay, that is what we look out for when one is presenting. The lapses, those are what we call lapses in presentations, which you can tell them to go back and add flesh to it. Okay, that is what we look out for.* (Dr. S. Igweh)

Yet, others were particularly interested in seeing whether the protocols for clerkship had been appropriately followed;

*If there is anything that I cannot get quite straight in the presentation, something that I cannot really figure out, it is my duty to find out from the person his/her sequence of thought even the usage of medical terminologies.* (Dr. S. Igweh)

To sum up, Dr S. Olowo wanted to see the presenter’s progression of thought:

*How did he move on from point A to point B to point C in making a diagnosis? Is it logical? Then also your examination, does it go with the known form; the known pattern of the disease which I think the patient has, then when you make a diagnosis, is it in a proper formulation. There are ways you formulate diagnosis. And then the treatment is it in line with what is the acceptable treatment for that condition or not? That is my role as a Senior Registrar, go through all*
the processes and see if it is informed and in line with already known format. (Dr. S. Olowo)

Case presentations were more than just a way to find ways of sharing information amongst team members in activity. They also had obvious learning implications for both the core and peripheral members. Presenting each patient’s case provided avenues for obtaining detailed information about health care.

Essential details may emerge or prop up during encounters with a patient. Then you may learn a new thing even if you don’t contribute, even if you don’t go up to talk and you don’t go out there to present cases. But you are listening to what other people are saying, and they are saying that this is what they did for their patients when they were on call. The patients came like this, they did like this, by the time they did this, this result was obtained, and all that. Then, you are telling yourself, yes, right, this is what is supposed to happen. This is what the response is supposed to be. This is what it is not, and then you are just learning. (Dr. H. Ebi)

We are building on those first principles that are the foundation. So during case presentations that is what we are listening to in any medical gathering, morning reviews, handover rounds, and presentations during ward rounds, or even conferences; we are working from first principles, and we expect that whatever the person is saying should be in line with the first principles so that we are familiar with it; so that we can catch up easily…but sometimes, we see new things propping up that we really have to pay attention to. (Dr. H. Ayidu)

Dr. R. Iyamah illustrated this with an example of a presenter who could have made the right diagnosis that the patient X actually had a stroke. However, in the course of the presentation, he/she did not convince the listeners that he/she actually went through the required thought processes to arrive at that diagnosis. It was not only the listeners that could question the case presented. The presenter could also ask questions about uncertainties and that could lead to new lines of inquiry. This could also account for why Dr. H. Ayidu saw case presentations as the avenue for cross-pollinating ideas at a high frequency. Basically, cases were presented in accordance with given principles and were seen as avenues for promoting a professional identity.

Now the Consultants and the Senior Registrars want to train us to think like specialists, to think like a doctor, to think like themselves. So there
is a thought process required: this plus this plus this should be equal to that. So the Consultant ask basic questions to direct you to their own line of thoughts, so that those of us who as House Officers, who are still learning would be able to think like specialist, will be able to think like doctors, will be able to have a peep into the specialist’s mind and imagine what could be going on in the mind of the specialist. (Dr. H. Ayidu)

We look out for the inputs of our senior colleagues in cases presented. They are helping to make us better doctors as they are more experienced in the field. So their inputs during presentations are useful to us because we are learning and tapping from their wealth of experience such that without their presence or in their absence tomorrow, we can then stand on our own, and recall what contributions they made in our career and even act like them. (Dr. H. Kehinde)

In sum, the case presentations can be seen as a way of making a useful assessment of the subject of activity. Dr. H. Atagwu opined that:

*It is what you put in or take away from there that actually determines the kind of doctor that you will be in future.* (Dr. H. Atagwu)

### 9.4 Reading

In this study, reading is an information practice through which documents, specifically, the patient’s medical records, are turned to, leafed through and (re)read. Along with the practice of writing, the participants believed that reading was constitutive of their thought flow in their relationships with patients and amongst themselves. The discussion in this section will focus on the silent reading by an individual (as reading aloud have been discussed in the preceding section on case presentations). The act of silent reading was prominent throughout the study as the participants were always seen flipping and reading intermittently during their interactions with patients. Dr. C. Chukwuka, Dr. H. Ebi, and Dr. H. Atagwu reasoned that silent reading was necessary because the medical trajectory entailed a continuum of patient care:

*It is therefore necessary to see the last documentation; what or how the parameters ...for the patient? What was the blood pressure? What was the fasting blood sugar? What has so far been done for this patient?*
The patient may have been seen at the Consultants’ outpatients clinic by one of the team members and other team members are to attend to the patient at the inpatient ward while on admission. The patient may also have been attended to by specialist physicians in other units/departments. (Dr. H. Atagwu)

There are some things that make you flip through the note, too. So there are many reasons why you flip through the case note while managing the patient, not just to start writing yourself...but to know where others stopped, what they have do so far and how to continue from there. (Dr. H. Ebi)

It is good to look at the past medical history by reading the patient’s medical record, you compare the past by looking at what the different persons involved in managing the patient have done, reading through the patient’s past documented results, history, findings, and all that. You may want to see if there, say the liver is diseased, you may want to read and see where for instance this was picked up. Is it receding, is it improving and all that? Those are issues you want to resolve in the present by the practice of reading. (Dr. C. Chukwuka)

The act of reading was seen as a purposeful information practice and the essence of reading was intentionally and intricately tied to the patient.

In the absence of reading previous documentations about a patient, you will just go there and do what is far from what is actually wrong with the patient and that can sever patient’s life. (Dr. H. Aghogho)

Dr. S. Idegbe noted that they were some things that could spring up in the course of managing the patient. The patient could make reference to what had happened in the past and that would have required flipping through to confirm the patient’s information. Because different people notice different things, Dr. S. Igweh noted that it was necessary to look at all of the case notes and to know how to provide your own input. For example, Dr. S. Igweh reasoned that the symptoms of a sickle cell patient could be missed because nobody made the effort to read the information about the patient’s health profile, and you just think that this is not a sickle cell patient and you just treat”. (Dr. S. Igweh)

Reading meant that various analytical objectives took place at the same time. To the participants, reading meant that: 1) they could get more informed about the patient’s health profile; and 2) they could compare the actions taken by the team
members and other health care providers.

Reading is useful to us as a team in comparing the present investigative test results and the past; probably when some new results come, you want to look at previous results so that you can compare. (Dr. S. Idegbe)

Reading also acknowledged the activities of members of the wider community, particularly the nurses’ contributions to patient care. I noticed that in any medical record, there were normally two folders: the first folder contained the case notes which were the exclusive domain and the prerogative of the CPT team members as physicians (extensively discussed in Chapter 8), while the second folder comprised of addenda such as the nursing process chart and drug chart used by the nurses. Dr. C. Chukwuezeke explained:

Unless I look into the nurses’ process chart for example, I am not able to tell what the pattern of the patient’s temperature yesterday was like, and what the fluid intake-output was like. (Dr. C. Chukwuezeke)

Dr. C. Chukwuezeke expressed that just by flipping through and reading the nurse’s chart, he was able to “see another side of the patient’s progress outside what we found when we come and examine”. Stressing further, Dr. C. Chukwuezeke explained that as a physician, he was not responsible for administering prescribed drugs to patients.

So even if I had written a prescription in the case note, the only way to be assured that the patient was actually administered the drug by the nurses is to go to the drug chart, and see what and what were given, how much of it was given, and when it was given. (Dr. C. Chukwuezeke)

The analytical objectives of flipping or reading through documents in work activity focused on the pragmatic. Sequential and intermittent reading by the CPT team members was done to satisfy different analytical needs. This influenced what the participants looked for or paid attention to whenever they flipped or read through the medical record. The analysis of the interviews revealed that reading depended on the participants social positioning. That is to say reading analytically for core members was different from reading analytically for peripheral members.
Reading was a characteristic feature of the peripheral members’ activities whenever they encountered patients. They engaged in the practice of reading for several purposes: to view the patient’s past history; to obtain insights on all the interactions and events surrounding that patient’s care; to view the patient’s health care progression; to problem-solve; to keep track of the patient’s trajectory; and to make associations between the things that were occurring with the patient.

*When I am reading a patient’s case note, I am looking for the patient’s presenting complaints, and the cause of the presenting complaints, the progression of the events, the treatment that the patient has sought for in the past, the complications that has resulted as a result of the patient’s current illness. I am also looking out for the examination findings of the patient, then the investigations that have been done for the patient, and then the diagnosis that has been made. Now, if alternate diagnosis has been made, I am also looking at the alternate diagnosis, and I want to know the reason why there is more than one diagnosis for the patient. And I am looking at the progression so far between the time the patient was first seen and the time I am seeing, what level of progress has the patient made.* (Dr. H. Ayidu)

*If I go to the patient’s bedside now, I will read the patient’s medical record to look out for whether the patient has been taking his drugs regularly, whether the nurses have been charting his temperature, vital signs, temperature, respiratory, breathing pattern, the blood pressure... You know whether the patient has any complaints. In the absence of any complaint whether there are new things that the patient will like to tell us. So what I am looking out for is actually the diagnosis, what investigations have been done for the patient, and what drugs the patient has been on. Then some of the signs that were in the patient prior to now, we want to know whether they had been resolved. That is the basic thing that we look at for, and above all the number of days that the patient has spent in the hospital, we equally look out for that one too.* (Dr. H. Aghogho)

*Reading provides such information that will solve the problem now, and when you read case notes, you become familiar with the problems that were at hand during the encounter and the solutions that were provided; that would as well also help you to subsequently manage other patients that will come with similar problems better because you are afresh with the data.* (Dr. R. Efangwu)

*So it gives you an association. You can associate things from records. You look through; you look through how the patient is taking his drug*
and the vital signs. Is the drug having an effect? You look through: is the patient gaining weight? Is the patient doing well? You can assess the progress of the patient, those many things that you may not be able to remember all. The patient’s blood pressure when he came in, the patient’s PCV when he came in; are we doing well or are we doing badly? The patient’s subjective feeling, the patient does he feel getting better? So these are things you look through and then see where you are in the time scale. (Dr. H. Iyamah)

The core members read through medical records to make references to salient points in the documentation.

*Look at the patient’s state, new treatment, is my diagnosis correct? Am I giving the wrong or the right treatment, am I on course with the patient.* (Dr. S. Olowo)

Dr. S. Olowo seemed to be describing how reading provided him the opportunity to evaluate a patient’s treatment. As a physician, he was familiar with the actions to take; but he wanted to see if his diagnosis was correct, and also to decipher whether he had taken the right path in treating the patient. Reading was also seen by the core members as an instrumental tool to get work done.

*I want to know whether the instructions that have been given are being carried out in the way they should be. If they are not, whoever is at fault is called to order. Then I also want to know if the younger colleagues under me are learning well. If there is any error they are making, if for example drugs that are supposed to be administered to the patient are not administered, if things that are supposed to be done are not done or documented. Generally, you are looking out for any loopholes in the case notes such that they can be corrected.* (Dr. S. Idegbe)

*We try to ensure that things are done the way they should be done...we do find out that there are discrepancies between what we expected our junior colleagues to do and what was actually done...and that is why you see us go through the medical records as much as we can. It becomes critically important for us to direct or instruct our junior colleagues after reading.* (Dr. C. Chukwuezek)

*An embodiment of experience, especially when we are looking at the past medical record, it actually helps us. That is why we take time to*
look at what has been documented. Yes that is what experience does. We have seen cases whereby you did not take time to read and look at patient’s past history, and you want to do something and it backfires. So, an experience doctor takes time to look at previous documentation before going ahead; you start and you read through the patient’s history; you go back and move forward; you stop, ask questions, and even begin again. (Dr. S. Igweh)

Reading had obvious learning implications for both the core and peripheral members. The participants explained that sometimes, novel things came up and reading the documentation helped them to enhance their expertise and continually cultivate their professional development.

So we also read to keep abreast with current events pertaining to patients; you have to be on top of new therapy, novel things, and even experimental things. (Dr. S. Olowo)

Reading was beneficial to the CPT team members, both at the individual and collective levels. At the individual level, Dr. R. Mgbeke recounted the benefits he personally derived from reading.

I have benefited a lot by flipping and reading through various documentations on our patients. I have gotten some knowledge about the patients’ problems and some knowledge of the patients’ previous follow-ups; previous clinic attendances. So it helps me in continuing patients’ management and even for my own professional development as sometimes reading may even be done to ensure that I have not written rubbish. (Dr. R. Mgbeke)

On the collective level, Dr. R. Efangwu noted how reading had been beneficial to the team:

Each and every one of us also gains from the reading...as well in our own individual ways update ourselves from the knowledge gained from the patient and that collectively helps the team to become better. (Dr. R. Efangwu)
9.5 Documentation

Documentation is a basic principle in medicine and a significant aspect of the day-to-day clinical routine in medical practice. It entails writing the details surrounding a patient’s health trajectory. Dr. C. Chukwuka explained:

Documentations during interactions with patients give us a good summary of the deliberations or discussions we had with them so that whatever decisions we take are appropriately reflected. (Dr. C. Chukwuka)

In the case study, documentation was visibly prominent and seen as an integral aspect of the CPT team members’ information practice. Whenever the CPT team members arrived at a patient’s bedside, or during consultations at the Consultants’ clinics, it was typical to see them documenting their encounters with patients. To the participants, documentation seemed to be the only way that all the information pertaining to the team members’ interactions with patients, and the events surrounding those interactions, could be holistically gathered in one place. They also reasoned that the person who initially or previously attended to a patient may not be the one to see the patient the next time the patient sought medical attention.

Others would know what have been done for the patient… It helps us remember where we stopped in case somebody need to follow up... But if even I am the one that earlier documented, because we see such a high number of patients, I can’t remember all their case histories; I can’t remember all their stories. So that is why we write to keep ourselves in the know about our patients. (Dr. S. Olowo)

Any other person that picks your documentation can continue from where you stopped...it will be magical to know where the last person stopped without documentation. (Dr. R. Mgbeke)

We will know where the last person that attended to the patient stopped and what to follow...we can see the patient’s progress, can follow the flow of thoughts of the physicians who earlier documented and follow the peculiarities of these patient’s ailment. (Dr. R. Iyamah)

You want to know what information is on ground, how it would assist you in reaching your diagnosis, as well as for follow-up... That in future, the fellow might have a problem, and then the team can have
recourse to the information already documented by the people who saw him by then. This can also be very useful to whoever is seeing the fellow at a future time. (Dr. C. Chukwuka)

It helped the team to know what had been done so far for the patient, how the patient was responding, whether the team was succeeding, whether the team was doing well or not, whether there was need to revise the treatment. (Dr. H. Atagwu)

So that tomorrow, should the patient be improving clinically, we can now refer to our earlier documentation following the first contact with the patient, perhaps at the emergency room that when he was there, these were his clinical states, or this was his clinical states evidenced by these findings as documented. Now, he is now in the ward, having spent about a week and seen that he is much better, how do we tell that he is much better, but compared with what we wrote initially about his clinical states, we now find that certain features that were present initially are no more there. So we can say that clinically he is now more stable. (Dr. H. Ebi)

In this way, documentation ensured continuity of care, particularly as the output of what was documented in the case notes (discussed extensively in Chapter 8). For the most part, documentation in this study refers to the actual writing into the case notes based on the team’s interactions with patients and the events in work activity. Though the content of what was documented varied, there was order in the documentation as the pattern and structure of what was documented was fixed and the participants followed a particular format. Dr. C. Chukwuka and Dr. H. Ossai noted that any fact worth documenting was documented, including unusual circumstances surrounding the ailment’s trajectory.

We also document if the patient’s not cooperating with us. We may ask a diabetic patient to abstain from certain foods because of his/her blood sugar level, we note it down. When we ask the patient to take so and so drug, and we notice that the blood sugar level is okay at this time, we also note it down. We may ask a patient to buy drugs and he does not buy the drugs, we document it. A patient who is eating from outside, a diabetic patient who is not suppose to eat food from outside because we want to control the blood sugar, and he eats indiscriminately, we document it. This is not a good act. But if a patient is compliant to therapy, we document it. That is a good image. So everything that happens, anything that we are able to pick up from the patient we document it. So that someone else who comes to look at the case note, and is worried about the lack of improvement will be able to
tell that this is the reason why the patient is not improving because this patient is not compliant to therapy. (Dr. H. Ossai)

…and what you are trying to do, there are certain things you want to follow up on. Now what is the patient’s state of health? It is important to determine that as at that point in time. What of the medication, is the patient being adherent to therapy? Is he taking his medicine? You have to document that. Is the medicine beneficial or is it harmful? You have to get that? Is there information the patients want to tell you as regards his social and family history? You have to document that. So these are some of the things which you ask, and which you document. And then you want to know any new event that has happened in the management of the patient, and what you examined, and then you write it down in a systematic manner. So it depends on your own flow whether you want to do it intermittently or whether you want to do it at the end of the interactions. (Dr. C. Chukwuka)

Documentation was ongoing in the CPT team’s activities and was primarily focused on the patient. Dr. R. Iyamah noted that:

The documented text is like a movie… and every day there are things that are happening to the patient; the patient has new experiences that will need to be addressed for optimal patient’s care, and such experiences must be documented. (Dr. R. Iyamah)

The participants explained that they were expected to document any interaction with patients and to summarize their findings at that point in time. Dr. R. Iyamah and Dr. S. Olowo described it as follows:

We document our clinical encounters with the patient, we document our actions, we document our interactions, and we document our thoughts. In fact, every time we see a patient, we document both the subjective assessment and objective analysis. Are we making assessment, what are our assessments, and then are we instituting any plan? What could it be? And we are documenting whatever and whenever. (Dr. R. Iyamah)

You want to follow up a patient, you want to remember the therapies you have used, you want to remember the drugs that have been prescribed, you want to remember the investigations that have been done, you want to know the results and you want to see how they have
progressed. Is the patient improving? Is the patient deteriorating? Only what we have documented will give you that information. (Dr. S. Olowo)

Dr Iyamah highlighted the protective attributes of documentation, noting that it was important for the patient’s protection. Documentation also saved time and energy in eliminating the need to repeatedly ask the patient the same questions.

The patient may forget some facts about his/her health. For example, a patient reacts to certain drugs you document it so that in ten years time if the patient want to take such drugs someone can flip through and see that the patient once reacted to such drugs even if the patient may have forgotten or the patient is not even in a state to remember. (Dr. R. Iyamah)

The participants emphasized that documentation had to clearly written, signed and marked with date and time. Dr. H. Ebi explained that following this rule verified the content of the documentation at that moment in time. I had observed that documentation was either done solo by an individual team member who was having encounters with patients, or collectively during the team’s joint interactions with patients. Hence, the discussions that follow will focus on the individual/collective levels rather than the social positioning of the participants.

I asked the participants during the interviews for the reasons why it was important for them to document the interactions and subsequent events pertaining to the patients. Dr. H. Ossai illustrated with a situation where a physician went to a patient’s bedside, and proceeded to have:

...just talks with the patient, asks some questions, even examine him/her, tells the nurse to give him/her drugs, and then walks away.
(Dr. H. Ossai)

Dr. H. Ossai could not see such an instance happening in a teaching hospital since he assumed that documentation was part of medical training. Documentation was suggestive of the participative status of physicians, which implied a patient has been attended to either individually or collectively. Thus, the participants agreed that the only evidence that something was done or said was in what was written down. Some of the participants viewed it as an act of negligence for any physician to see a patient and not document it. They reasoned:
That which was not documented was not done, if it is not written, it wasn’t said. (Dr. H. Ossai)

Any time you see a patient, you are supposed to document, so that any time anything happens, that documentation must be there....that will stand for you when you are not there... You must document, if you do not document that means that you never saw the patient. (Dr. H. Aghogho)

The essence to ensure that the conversation or interactions have been orderly documented...so that the patient doesn’t come back and say, ‘no, this is what I said, or this is what I did’. I would say ‘no, this is what you said, this is what you did, and this is what was written, and this is how we documented it’. I could also not document and the patient comes and says ‘I did this’, and there is no backing for me. (Dr. S. Olowo)

Nobody would start looking for me or trying to reach me or call or do anything to get information from me because the information is right there as documented. (Dr. H. Ebi)

You may ask a patient to do investigations or to buy a particular drug and the patient says he does not have money to buy it; you document it, so that tomorrow the patient will not say that he brought his drugs and did not get treatments. (Dr. R. Iyamah)

Especially during this era of litigation in Nigeria, the participants saw documentation not only as evidence of their participative status, but also as a self-protective measure.

...comes to your aid in the case of litigation.. as the case note may attest that a patient had actually been seen and treated. (Dr. R. Iyamah)

The only thing that can speak for you in a malpractice suit is that you have documented what you did with the patient and the challenges thereof (Dr. R. Iyamah)

What will save you then is the documentation that you made, not the one that you forgot to write or the one that you said verbally (Dr. R.
Dr. H. Aghogho explained further why it was necessary to document all the time. In addition to being an indication of the physician’s participative status, he reasoned that documentation helped to avoid doing the same thing for the patient over and over again. He gave the example of when one of the Registrars had ordered for an electrolyte, urea and creatinine (EUC) test to be done for a patient, who was primarily his patient. Because he was attending to some other duties, Dr. H. Aghogho said that his colleague, another House Officer, collected the sample from the patient on his behalf, and sent it to the laboratory. His colleague then documented his action. Dr. H. Aghogho said that when he got back to the ward, he read through the Registrar’s plan and saw that his colleague had taken action on his behalf. He then reasoned that if his colleague had collected the blood sample without documentation, then he would have gone back and repeated the same action.

In the same way Dr. C. Chukwuezeke reiterated that:

*Any interaction with patients that is done without documentation is I mean not valid as it were...is null and void. And I keep telling people that anything that can be said without proof can be denied without proof.* (Dr. C. Chukwuezeke)

Information sharing is a characteristic feature of documentation, particularly as most patients could not provide all their previous medical history:

*Because nobody is perfect, when I come back tomorrow, I need to know where I was the previous day, so that I can update, I can go higher from there.* (Dr. R. Efangwu)

Dr. R. Efangwu viewed documentation like mathematics; that is, what was documented provided the framework upon which to analyze the patient holistically.

*You tend to itemize the current problems; then what problem you are trying to solve? The obstacle you are encountering, and how you intend to solve them?* (Dr. R. Efangwu)

The participants also saw documentation as a means for effective communication. Dr. H. Ayidu explained it as follows:
Documentation is for proper understanding. Yes, when I am writing, I write to be understood. To me, writing is like talking. Writing is communication obviously, and I write to be understood. I write such that if you take whatever I have written, anywhere in the world, any doctor or person in the medical field who sees it, will be able to have a picture of the patient just by reading what I am writing. So my writing is like a picture of the patient so that I can send my writing to a medical colleagues or peers anywhere in the world and just by reading what I have written, it is assumed that the patient is sitting right before the person and they can picture the patient and really capture the essence of what is going on with the patient. So I write for clarity. I write to be understood. (Dr. H. Ayidu)

The main reason for documentation in patient care was to capture the accuracy and representativeness of what had transpired in a clinical encounter between the team members and the patient.

We cannot capture everything like you are capturing this now (referring to the tape recorder which I was using for the interview) when we are with patients. You are going to draw out things but we are not able to do that. So, the best we can do is a summary of interactions and the decision captured in prose. (Dr. C. Chukwuezeke)

Similarly, Dr. S. Idegbe noted that:

The faintest text tends to be better than the best memory... The faintest pencil is sharper than the brightest and sharpest mind. (Dr. S. Idegbe)

Dr. H. Ayidu estimated that:

Any information that you listen to, that you hear, you can only capture like 30% of the information you hear. But you can capture about 70% of the information you put down in writing. So if in our everyday interactions, if we just rely on hearing only, we would be getting just 30% of the required information. If we rely just on hearing and observing we will be getting just like 60% of the information required. By the time we add writing to it, we will be getting like 90%, nobody really gets up to 100% but we would be getting up to 90% of the information required. For these reasons, proper documentation is essential if we must capture maximum information. (Dr. H. Ayidu)
Documentation *per se* has obvious learning implications at the individual level. For example, the House Officers claimed that their expertise and skills had been enhanced, which encouraged them to further engage in the team’s participatory practices. By documenting continuously at every contact point with a patient, Dr. H. Atagwu believed that he was learning. He claimed that it actually enhanced his mastery of factual medical knowledge and the procedural skills involved in patient care. Dr. H. Ebi talked about how as a House Officer, documentation helped him to get accustomed to writing and allowed him to get better acquainted with his patients. Dr. H. Kehinde explained that continuous writing made him more organized in activities as there were certain pieces of information that needed to come first before others. Dr. H. Kehinde exemplified it with the case of managing a patient, who primarily had a cardiovascular problem. He explained that he was expected to start with the cardiovascular findings when documenting his examination findings, and not the findings of the central nervous system (CNS) or the gastro-intestinal system. Dr. H. Kehinde also noted that once in a while, one made mistakes, but the next time, “*I will get it corrected and it just becomes like a routine*”. Dr. H. Kehinde claimed that writing made it seem as though he was coming across the information the second time and made him more organized in patient care. In this way, he acknowledged that documentation helped him to retain the information because:

> As I am writing it is like I am reading it by myself…and I can easily recall it when I am no more there. (Dr. R. Kehinde)

Dr. H. Ossai claimed that documentation helped him to remember what he had documented in the past, and that whenever he saw what he had documented, even without looking at the write-up, he could remember and say:

> Oh, this was what I wrote that time… So they become part of me. (Dr. H. Ossai)

Documentation at the collective level is different from that at the individual level. Traditionally, the norm for documentation at the collective level was that a more senior person on the team dictated and a younger person documented. Either the House Officer, who primarily managed the patient, or any other person did the actual writing. The participants believed that this method made documentation faster as the same person questioning the patient, talking to colleagues, and examining the patient, did not have to also be writing at the same time. Dr. R. Eweka explained:
It is easier for me to dictate because it helps my thought processes, it helps to make my mental processes mature, instead of thinking and writing at the same time. (Dr. R. Eweka)

However, some of the participants expressed that they preferred writing for themselves. Documentation also had implications for learning at the collective level. For example, Dr. H. Aghogho noted that:

*It makes us to learn new things everyday especially as our senior colleagues put us through to ensure that the job is properly done.* (Dr. H. Aghogho)

Dr. H. Aghogho went on to explain that if a Consultant did the documentation, then the House Officer was expected to go there and read through what the Consultant had written and interpret it on his own. I asked Dr. H. Aghogho why this was so and the reason that he gave lent credence to the evidence of co-participation in practice, which created power relations. To Dr. H. Aghogho, the Consultant’s documentation was regarded as the highest documentation, “it makes you to learn how things are done in step wise manner and treat the patient according to standard”. In the same way, Dr. H. Ayidu expressed that if the Consultants documented anything in the case notes “it is to my best interest to read it. It is a learning aid”. Dr. R. Iyamah expressed that reading a peer’s documentation gave him a window into his colleague’s mind.

*It is like I have his mind on the paper, then I evaluate the thought processes of my fellow colleagues, even if the person is not around. I see what they have done about this patient and I see either to agree with him or to disagree with him. It makes you think, it gives you a broader picture. It is like the commerce of peoples’ mind. So, somebody comes and makes an impression and you come and make your own impression.* (Dr. R. Iyamah)

Dr. H. Atagwu further highlighted the outcome of documentation:

*And also sometimes in the clinic, Dr. X sees a patient, and prescribes a drug; he then dictates to me and gives me the case note to write. I pick up the prescription sheet and write down the prescription as dictated by Dr. X. From that time, I now find out that they are some drugs now*
that I don’t need to ask and I don’t need to consult the BNF\textsuperscript{115} or other pharmacological physicians’ guide to know their doses. So there are some drugs that confidently I can prescribe very well, accurately they are doses. This is consequent upon the fact that I have been actively involved in the prescription writing of those drugs in the clinic just as we do in the ward rounds during documentation. So is a passive way of learning. (Dr. H. Atagwu)

9.6 Information use

Information use was one of the core elements of information practices in the case study. Information use was found not to be distinct from the other cognates of information practices that were identified. Rather, information use was found to occur simultaneously alongside the other cognates of information practices. Hence, rather than examining single episodes of information use, I focused and explored information use by addressing the question: What was the information used for? I was also interested in the indications of how the core members guided and assisted the peripheral members in the use of information.

In the study context, information use arose from problematic situations and was tied to the goal of restoring patients’ health to normalcy. The participants explained how they used information first and primarily for problem solving.

The information we obtain from patient is primarily used to make preliminary and proper diagnosis to ensure that patients are treated appropriately. We make sure that we not only gather the information, we use it rationally by making sure that the information is used to treat patient well. (Dr. C. Chukwuka)

Review your data or your bank to see what information you have gathered and how such information can help you to manage future patients. (Dr. S. Idegbe)

It was found that information use was not time-bound. Information gathered in one occasion could be used at any point in time or as the entry point in another occasion.

\textsuperscript{115} BNF is the acronym for The British National Formulary
We use information gathered and obtained at anytime, and whenever the patient comes to the hospital...we will use information instantly as long as the patient is there, we use information throughout. (Dr. C. Chukwuka)

It was also found that information use in the CPT team’s work activity did not only depend on graphic representations found in documented text. Rather, it was largely influenced by communicative interactions and events that had functional significance to the activity.

We interact, as I told you... And when there are grey areas, members of the team may be asked to do a research work or to look up some issues, and then share with others, or bring some presentations of the issues to clarify the areas. So you have in-depth research into areas, which are not clear, and you discuss it further. (Dr. C. Chukwuka)

What influenced information use in the CPT team’s work activity depended on a number of parameters. Dr C. Chukwuka enumerated some of these parameters as: 1) the symptoms manifested by ailment; and 2) how the information would be used to treat the patient rationally. At this stage, the information served purely as data or the data itself could become useful to aid in interpreting the findings. However, the data itself was never fixed or completed; the participants reasoned that any information for use was taken as fluid data-in-progress, as explained by Dr. H. Atagwu:

Information clues can be provided by using information obtained from patients...getting connected to the information obtained from a patient would enable you to know how the patient is feeling; how the patient is responding to treatment; everything that surrounds the patient; whether the patient is actually okay; in fact, it would go a long way to consolidate or rather modify a diagnosis toward attaining the desired goals of better treatment for the patient, you know. (Dr. H. Atagwu)

Investigating information use indicated the possibility that there were still issues that needed further probing. It even led to narrowing down the probable options to follow as explained by Dr. H. Ossai:

When we get information from patient, we look out for the areas of convergence and divergence, and that leads you to many options that further help to create and make better care for the patient. The
information from the preliminary diagnosis and the rational treatment is used to input data. (Dr. H. Ossai)

However, the information-seeking process implied that only competent persons were involved in its information use.

The information obtained is put up the ladder to be scrutinized by different cadres to ensure that they are factual and also that the level of competence is acceptable. (Dr. C. Chukwuka)

The CPT team members used information in purposeful, intentional, and cyclical activities; e.g. when monitoring a disease, they continually used information to determine whether there was improvement or regression. For example, Dr. H. Ossai explained that the reason why an investigation was done was to take a baseline to determine exactly what the patient’s status was at that point in time. Dr. H. Ossai then exemplified this point with the electrolyte, urea and creatinine (EUC) investigative test, the results of which was used to assess kidney function.

I should be able to make a conclusion whether it is chronic kidney disease or not at the end of the day and inform my superior. You know because by the help of this, it will help you know. The way it will help you is that investigations will help me support the diagnosis that I have already made and again I will now know that next time when I have history and examination like this, it is most likely that this is what it is. Because my past experience taking investigation will help you to make that diagnosis. (Dr. H. Ossai)

The CPT team members gainfully used information as the basis for making decisions on the next line of action to take. This allowed for refinement and updating of previously gathered information. Moreover, it allowed the participants to gain a broader perspective of the patient and see what Dr Ebi referred to as the “big picture”. Decision-making regarding information use took place at the different levels of cadres but the decisions of the core members superseded that of the peripheral members.

The Registrar’s decisions supersede that of the House Officer, the Senior Registrar supersedes that of the Registrar, the Consultants that of the Senior Registrar. Because the higher the cadre, the more knowledgeable they are expected to be, and we expect that their decisions are wiser than that of the junior colleagues. Even though they
may not know it all, but they are sometimes that the junior will need to suggest a decision. He is not putting it as his own decision, but he is suggesting it. And also we would be able to arrive as a team on a particular decision. But when there is a contrary decision, the higher person's decision would supersede in this instance. (Dr. H. Ossai)

Apart from patient care, it was found that the CPT team members used information for other purposes such as research and learning. Thus, all aspects of information use happened simultaneously, even if the main purpose of patient care was just one aspect.

You know we are in a teaching hospital; we also use the information as you have noticed during the seminars; we also use this information to teach ourselves because as a doctor, we are bound to keep learning, and even consultants come to this seminar. The unit that has managed the patient and gathered information pass on something they think is important in the management of that patient to others. Some new knowledge that has been acquired from the management of that patient is passed on to everybody. So that everybody hears and learn from your wealth of experience. So apart from patient’s management, it is also an opportunity to learn from the management of that patient. (Dr. S. Idegbe)

The core members did a lot of research, and Dr. S. Idegbe explained that their use of information was geared towards further probing of unusual or rare cases. Dr. S. Idegbe explained that sometimes, the information use would also entail presenting a mini-research that prompted a larger project at a future time. However, the peripheral members explained that they were not involved in research. For them, they used information for learning purposes.

I use it to boast my knowledge and to pass it on to improve the patient’s care. Because the more knowledge I have, the more positive input I can pass on to the patient. Then I also derive pleasure in passing information to other colleagues, the reason being that I believe that if all of us are good, the profession will be better appreciated. (Dr. R. Mgbeke)

So information we gather, it is our responsibilities to go back to our rooms, to our homes and read up those information. You read around them, and you add some flesh, put some icing on the cake and get more rounded perspective as far as information is concerned. (Dr. H. Ayidu)
9.7 Learning outcomes

Gerber and Oaklief (2000, p.191) state: “acts of learning do not occur in a vacuum, they occur within a workplace that espouses particular values, has a declared mission, involves workers of varying levels of experience in and related types of work and promotes the idea of a learning organization”. Learning in the study context was found to be integrated and embedded in work activity. I asked the participants explicitly about their learning experiences. That is, what they felt they had gained from participating in patient care, and what they felt the other team members benefitted from participating in the team’s work activity. The participants agreed that the benefit of engaging in activity was always learning, and they were specific about the differences between institutional learning and actual learning by practice. For example, Dr. C. Chukwuezeko believed that engagement by practice brought about ownership of something and thus, led to better outcomes.

If I believe that the right thing to do is to pick the brains of everybody in the team and put it together like this since two heads are better than one, then I should be seen to do that. (Dr. C. Chukwuezeko)

Outcomes in the study context were examined through the combination of Billet’s (1999, p.155) three planes of engagement in activity: every day work activities; the close guidance of peers and experts; and the indirect ongoing guidance provided by the work environment. The analysis of the interviews revealed that the participants inevitably spoke of outcomes as the ongoing guidance provided by the work environment.

Well as a doctor, here in Clinical Pharmacology and Therapeutic, actually, virtually all patients are ours. Diabetic patients, hypertensive patients, patients with various forms of cardiovascular diseases, sometimes patients with respiratory diseases, we manage, sometimes if they have complications we refer to the respiratory unit. If it is mild or moderate we just manage. So over time, I have been in the unit and I have been practically involved in managing them. If there are drugs to be given, to be administered, I administer the drugs. If there are drugs to be prescribed, I prescribe the drugs. Then if there are investigations to be carried out I do the investigations. I retrieve the results of the reports. Then we analyze the results or reports together. If there are any interventions to be done based on those results, then there are done, and most of them are carried out by us. They just give the orders.
They give the instructions and then we carry them out. I think that I have learnt and benefited a lot in this way by being actively involved in the unit’s activities. (Dr. H. Ebi)

I would say that I have gained clinically in terms of knowing more of drugs. Clinical Pharmacology and Therapeutics is more or less almost a unit that talks about drugs in its entity, so we learn more about drugs, the specific dosage and the side effects of drugs for various ailments. (Dr. H. Ebi)

To the participants, every encounter with a patient was experiential, and each encounter presented an avenue to teach and learn via the available information sources and strategies.

So definitely we learn. For example, like from the ward round, it is an avenue to teach. We always learn from there. Then sometimes our senior colleagues can give you materials or books, literary materials to read. They can just challenge you one on one, ask you questions, and then you talk and if you don’t know it so much, then they teach you and information is transferred. So definitely, we learn and I appreciate the fact that we learn in this unit. (Dr. H. Ebi)

In more specific terms, Dr. S. Idegbe explained learning outcomes by saying that “the same disease condition can manifest in different ways”. Dr. S. Idegbe believed that afforded a vast wealth of experience that cannot be quantified. Dr. H. Kehinde explained learning outcomes in terms of the ideal standard of practice of what and how the processes involved in gathering information ought to be. In this regard, he believed that he had gained much by engaging in the CPT team’s work activities by being directly involved in patient management. This helped him to be more objective in terms of assessing patients and more detailed in the various ways of gathering information.

Working with the CPT team members has made me confident enough to stick to my findings, and say or write what I found down that this is what I found with this patient... It has thus challenged me to have an answer to whatever puzzles that I come across when patients presents...and not to allow any lapses in anyway. (Dr. H. Kehinde)

The participants acknowledged that in engaging in activity, they developed their skills and improved their acumen.
I have clerked patients, I have participated in the management of patients, I have followed them up to the point of discharge. Even after discharge, I have kept in touch with these patients still, and I have worked under strict supervision. By so doing, I have developed my skills and learnt considerably. (Dr. H. Ossai)

Yes, it has, it has really enriched my skill. It has made me to read about his condition. It has made me to read more about the patient’s condition. So I now know a lot of things about diabetic’s mellitus, because of this patient. Prior to this patient’s coming, I just knew few things. I know peripheral things about DM. But now, I now know a lot of things about diabetic’s mellitus. I have gone on my own, to make researches about the patient’s ailment, and I have already read about the ailment so it has helped me a lot. (Dr. H. Aghogho)

Yes now, my participation would be useful by several ways. For instance, I read up cases, I am expected to read up cases that I come across. And any case I read up, I have a contribution to make. And by making contributions, you are participating actively. I am able to contribute to the patient’s care and the team benefits from a contributor who has read about the case. (Dr. H. Ayidu)

Well, I have improved my clinical skills definitely, and then the seemingly mundane things, I learn to take them more seriously because in Clinical Pharmacology and Therapeutics, evidence is king. So you have to base everything on evidence; well, there is a little bit of room for expert opinion, but preferably it has to be evidence-based, more of evidence, evidence, evidence, and evidence. Basically, in the department I have learnt to seek first the evidence, what are the recommendations? What is the level of evidence, regarding this case and how do we treat this case and if there is need to go reference, and then we go reference. We go to check the books; that is one. (Dr. S. Olowo)

The learning outcomes in patient care were seen in the light of everyday work activities, particularly when a patient in serious health distress sought medical attention and was eventually restored back to normalcy. Dr. H. Aghogho and Dr. H. Atagwu explained:

The benefit to me is that when a doctor treats a patient, and the patient gets well, the doctor is happy. That is the first thing. I am very happy
that the patient is doing well. Because the way that diabetic amputee patient came the patient came in a very bad shape, but now we can see that the patient has been progressing. The patient has improved remarkably. It is my joy. This is my primary patient, and I am doing well for the patient. So, I thank God. (Dr. H. Aghogho)

And another benefit is that I feel happy that I am participating actively in patient’s care on a daily basis, and these patients many times are getting better. To me that is a great achievement. I am really fulfilled. (Dr. H. Atagwu)

I also analyzed the outcomes in terms of everyday participation in activity. Dr. C. Chukwuka noted that the work itself is a substrate for learning. Dr. H. Ayidu explained that actively participating in all of the team’s activities helped him tremendously as a newly trained physician. The participants were of the consensus that the regular challenges that one faced in work activities provided an obvious advantage for enhancing learning. Dr. R. Efangwu reasoned that information could fade without practice:

When you practice what you have read or what you have learnt, it sticks better and becomes part of you and easy for you to reproduce than when you have never practiced it. (Dr. R. Efangwu)

Understanding the learning outcomes implied examining the guidance and assistance of experts and peers. Dr. H. Atagwu noted that:

I learn everyday on the job with the information and challenges thereof, and by virtue of interacting with my senior colleagues and peers; I learn a lot of things. (Dr. H. Atagwu)

Similarly, Dr. R. Iyamah explained the learning outcomes by noting the difference between a newly trained House Officer who had just graduated from medical school and the other members of the team who had some years of experience.

Of course there are a lot of things he or she would not know. Well, definitely if you are in a setting like this, you will learn every day. If you have spent more time in the unit, you have written more exams; you are more exposed and have acquired more experience so it is actually a learning thing. We share information, and you learn from the older persons, the experience the older ones have. And also, supervision is
important because you do not let somebody who is just doing internship for example to do anything unsupervised because you are dealing with human lives here. (Dr. R. Iyamah)

The learning outcomes were not seen as passive accomplishments or actions. Rather, they were understood in relation to the mutuality of engagement that entailed how the participants interacted, how they treated each other, and how they worked. It also had bearing on the issue of professional identity. Dr. S. Idegbe commented on mutuality of engagement as a core member, while Dr. R. Efangwu, Dr. H. Ayidu, Dr. H. Ebi, and Dr. H. Atagwu discussed it as peripheral members.

They tell you that they have learnt something new from you. That tells you that you have passed across relevant information which they have collectively taken. (Dr. S. Idegbe)

You do the one you know, and when you come around what is beyond you, you have your senior colleagues to fall on to. (Dr. R. Efangwu)

Working under close supervision, working under strict supervision, has helped me, so I have learnt a lot. (Dr. H. Ayidu)

Yes, actually as I said, medicine is an apprenticeship thing. So definitely I learn, and then it makes me fulfilled as a doctor than I have ever felt. I see the way my senior colleagues talk, what they do, how they do it. There is something to learn, so you have to pick up a lot from that. The patient having DM, you want to institute a particular management protocol for the patient, and it is not working. Then you call the Registrar on call and the Senior Registrar who says Okay, this is what is done in this case. Then you do it, results are gotten. Then it enhances your knowledge. You now know that in situations like this even if such a person is not around, this is what I am expected to do, and I expect to see positive results. (Dr. H. Ebi)

Yes, because I have been taught too by the consultants, most of the time they come to the ward rounds, they teach, they ask us questions, the House Officer and if you don’t know they teach you. When they are teaching the Registrars and students, we watch too. So in such cases we have learnt, we have really learnt a lot. Then from the message that you are to carry out, maybe investigations and all those things... write prescriptions and the rest I would say in a nutshell that having gone through the Clinical Pharmacology Unit, I am a transformed, a better.
Both Dr. H. Ebi’s and Dr. H. Atagwu’s excerpts signify a transformation in the individual. This was further exemplified during my last interview with Dr. H. Atagwu, a day prior to his disengagement from the CPT Unit. Dr H. Atagwu then talked about the remarkable transformation that he experienced during his stay in the CPT Unit:

*I look back to what I was before I joined this unit and what I am now, and I think the difference is very much. It is wide apart. I have learnt a lot, it has made me a better doctor and more experienced doctor.* (Dr. H. Atagwu)

Similarly, Dr. H. Ossai also claimed that he had made clear improvements since joining the team.

*I am now more proficient in obtaining information from a patient, learning better and being more concerned for the patient.* (Dr. H. Ossai)

While Dr. H. Atagwu and Dr. H. Ossai expressed their views from the viewpoint of peripheral members, Dr. C. Chukwuka and Dr. S. Igweh had different views as core members. For them, the learning outcomes in mutual engagement suggested sustaining a practice where members: became invested in what they did, valued their relationships with significant others, and felt a sense of belonging in their shared history.

*Yes, I have actually learnt. It is like a carpenter; a man who want to learn carpentry. Initially he gets confused, but as he stays with his master, over time he is able to develop some skills. That is what has really happened to some of us here. Initially, when we came into the unit, one was really naïve to do the job. And as time went on, one has developed and one really now known one’s job specification.* (Dr S. Igweh)

*The point is this, by the time you become Consultant, you have spent many years within the setting, you know. So the other team members - the Senior Registrars, most of the Registrars, the House Officers and all might have been your students at one time or the other. So you find that they appreciate, they know your own perception of clinical issues,*
management, and all...and you ensure the management of patients in your own ways according to the standard of medical care. That in itself is something they all know that this is how it should be or what it should be, even when I am out because of administrative responsibilities, the other consultant fall in immediately and take over the responsibilities. So there is no vacuum because that is what might happen because of some administrative demands. (Dr. C. Chukwuka)

Well, definitely there is a saying that you cannot purchase experience. And I can tell you, over the years, we have seen patients admitted, managed, and discharged. We have seen residents come into the units, admitted, and managed patients and so on with their own style. Ordinarily over the years, we found that every day is a learning experience and we also found out that no two patients are the same. That is what you have to appreciate. No two patients are the same; there must be some peculiarities that distinguish them. So you find that by being there, by participating you are learning everyday more. You tend to appreciate the peculiarities of patients you know, at least from the physician’s perspective. It can be quite interesting. So definitely, you find out that as you move up the ladder, you have other distractions no doubt, because some are administrative distractions and all, which we have to contend with. So you may not even be there all the day, all the time you know, but as much as possible you try to be there. (Dr. C. Chukwuka)

9.8 Discussions

This chapter describes information practices as social practices in the context of everyday work activity. Information-gathering was the first major information practice undertaken by CPT team members as they focused their attention on the patients. Information-gathering refers to the act of collecting information. Three types of information-gathering were identified during the study: history-taking, the general examinations, and investigations. Meaning-making was seen through participation with significant others, and this implied useful information practice in activity. The focus was on interpretation as the mechanism for exploring meaning-making. Information shared entails examining how information was shared through different media of interactions in varying circumstances, particularly the case presentations. Reading was seen in this case study as information practices that were intermittent as the participants engaged in activities. Documentation was also ongoing and depicted the actual writing into the case notes. Information use was seen as not distinct and occurred simultaneously alongside other cognates of information practices. Among the CPT team members, learning, as a component of
social practice, was seen as ongoing with potential benefits and outcomes for the goal of restoring patients’ health to normalcy.
10 Discussion

This chapter highlights the most significant results of the study. This research was never intended to be a traditional information needs, seeking and use (INSU) study on preferred information sources and their use. Rather, the intention was to explore the information practices of a professional group in the workplace by focusing on the interactions between the actors in work activity through the use of mediating tools and artefacts. The gradual formulation of the research problem was based on a sociocultural perspective and combined with relevant theoretical approaches, such as activity theory and practice theory, and came to focus on physicians’ information practices in patient care. The previous theoretical research showed that the phenomenon should be studied while embedded in context. The research questions aimed to broaden the understanding of the contextual factors at play in information practices. Therefore, the objective of this chapter is to discuss the results in light of the intended contributions, as well as the themes and elements addressed in earlier research. I intend to articulate a middle level approach of bringing abstract theories and the literature on early research to explicate the empirical data. Toward this end, an argument is made for investigating information practices from a participatory perspective.

10.1 Research on information practices in Nigeria

The issues addressed in this study have not been studied in either developing countries or in Africa. Most studies on information-seeking in context have been mostly in the developed world, such as Sweden, Finland, Canada, U.S.A., the United Kingdom, and Australia. From the literature search, it was obvious that there was a dearth in the field of study in Nigeria and other African countries. Therefore, I was particularly interested in seeing how theories and concepts from the developed world could fit into exploring phenomena of INSU in the context of a developing country. Generally, I was interested in studying context as something that enacts and shapes information practices in workplaces. I was specifically interested in the roles of actors and those of tools and artefacts.

The overall aim of this thesis was to gain an in-depth understanding of the information practices of a professional group in the workplace as exemplified in the Nigerian context. The study also contributes to the field of information practice research by providing a rich empirical study on the information practices as well as on the tools and artefacts used. This thesis has focused on medical professionals. I chose physicians at a University Teaching Hospital in Nigeria with the explicit aim
of contributing empirically to research on workplace-learning in an occupational setting in relation to information practices in work activity. In my view, the understanding of the socio-cultural context of work activity is significant in the development of information systems, practices, and services in workplaces.

Since most research on information practices has been on the developed world, a study of a professional group in a developing country contributes to the understanding of information practices with different prerequisites. However, it is difficult to infer how much the results of this study can be generalized to similar settings. I believe that the results of this study provide valuable insights into the variance of information practices.

It is worthwhile at this point to recall the physician’s role in the context of the historical background of the study. Physicians have occupied important economic, social, and political positions all through the developmental stages of the health care system in Nigeria. Both during the colonial and post-colonial eras, physicians in Nigeria have been seen as a powerful group because of their “monopoly over an important skill such as doctoring” (Freidson, 1970, cited in Ityavyar, 1987, p. 488). This provides a picture of professionals, who are not only engaged in medical care, but also have strong social and political roles in society and hence, are looked up to by the populace Where there is ailment, they have an obligation to use their esoteric scientific knowledge and restore human life to normalcy. They are involved in the training of medical students. They maintain positions as administrators in workplaces and are politically active in society. Hence, they are held in high esteem not only within the health sector but also within society-at-large, and as such, constitute what Case (2002, p. 242) refers to as “the most high profile community in the health care system”.

Although the medical curriculum and training seemed to tow the same path, the circumstances under which Nigerians were trained as physicians were not the same in the colonial and post-colonial eras. The colonial era laid the foundation for the development of modern health services in Nigeria. The most important aspects of this development were the medical education and training of health professionals and the establishment of health facilities all over Nigeria. The provision of health facilities was seen as a necessity for the dispensation and sustainability of societal growth. By establishing educational institutions and training centres, the colonialists and missionaries laid a foundation for the current Nigerian health care system.

10.2 Revisiting the research questions
In the quest to learn more about the information practices of the Nigerian physicians, I presented the following research questions to guide this research:

1) **What distinguishing attributes in physicians’ work activity frame information practices?** This question was the basis of Chapter 6 and described the context of the research in detail.

2) **How and in what ways do physicians gain access to information in work activities?** This question was addressed in Chapter 7 and described access to information in work activity.

3) **What characterizes information practices related to physicians’ work activity in the study’s context?** This research question was addressed in Chapter 9 and was used to describe the various information practices in work activity.

4) **How does workplace-learning relate to physicians’ information practices?** The issues addressed in this research question pertain to the case study, participatory modes of engagements, and learning outcomes. They cut across Chapters 7, 8, and 9.

5) **How do tools and artefacts materialize and frame physicians’ work activities?** The mediating role of tools and artefacts was discussed in detail in Chapter 8.

This chapter will be devoted to summarizing the results of the empirical study and making extrapolations that are relevant to the research questions. First, though, it is worthwhile to reflect on the contextual elements that frame information practices in work activity.

### 10.3 Factors influencing information practices in work activity

The first research question addressed issues pertaining to contextual elements. The results were based on the field study observations. Nine contextual elements, which had sufficiently different aspects that reflected the activity system or the hierarchical structure of activity, formed distinct attributes that framed information practices. Though context was not articulated during the interviews, it was obvious that numerous contextual elements were at play during the empirical study and, to a large extent, determined the way activities were pursued. They also influenced and legitimized information sources, strategies, and practices. The different contextual factors of the previous research will be discussed below.
10.3.1 Cultural-historical setting

The teaching hospital unit studied constituted the cultural-historical setting and influenced what kind of activity system framed the information practices in that context. The CPT Unit provided a wide range of health care activities, where were organized and centred on patients. The features of the CPT Unit were examined as a community of practice through the activities of its members. I also identified the CPT Unit as a community where members acted in accordance to commonly shared practices pertaining to patient health care through what Wenger (1990, p. 179) refers to as a “nexus of membership and trajectories of participation across landscape”. According to Wenger (1990, p. 156), “because communities of practice are organized around a practice, they have to organize themselves in such a way that their members can proceed with that practice, and proceeding with the practice both requires and results in an existentially coherent form of membership”.

10.3.2 Object of activity

Patients were identified as the motivating attributes for engaging in activity. According to activity theory, human activity is directed towards objects, and the object in this case study was the patient. Restoring patients’ health to normalcy was the focal point of the studied actions and activities. This significantly influenced and determined information practices in activity. The theoretical implications suggest that the patient can therefore be seen as “the initial physical carrier and embodiment of the object, in whatever way the object is subsequently delineated and conceptualized” (Engeström, 1990, p.109).

Patients were viewed in two ways. First and foremost, the patient was seen as the raw material and ‘problem space’ in which clinical activities were undertaken. Engeström (1990) referred to this as a ‘perceptual-concrete’ and immediate appearance of the object that is transformed during the medical encounters into a meaningful pattern of clinical activities. A patient was also seen as an information source that was useful when engaging in activities such as problem-solving and keeping track of the ailment since the patient was continuously evaluated and re-evaluated for clarification. As an information source, a patient was “read like a book”. In conclusion, the consequence is that the patient was seen per se as a valuable informational entity for engaging in work activity towards accomplishing the goal of the activity system.
10.3.3 Human actors in the activity system

In addition to the patients, other human actors played a key position in the activity system. The human actors of particular interest in this study were the subjects of activity as represented by the group of physicians in the CPT Unit. However, the system was not comprised only of this team of physicians. To a large extent, it was also comprised of the wider community that included staff members from other units/departments in the teaching hospital who all worked towards the common goal of attaining optimal health care for patients.

The distinction between the two groups was clear and necessary. The team of physicians in the CPT Unit was analytically further categorized in various ways. Physicians belonged to different cadres as a specific feature of the teaching hospital; this depended on their qualifications, sub-specialist experiences, and rank within the medical hierarchy. A defining characteristic of this team was that membership was determined by the uniform medical qualification, which is compulsory for entry into medical practice in Nigeria. The participants were then categorized according to their professional nomenclatures as Consultants, Senior Registrars, Registrars, House Officers, Nurses, Students, etc. This categorization of the participants as subjects of activity fit into Engeström’s (1987) definition where the subject is defined as something “which acts upon an object” (Engeström, 1987).

The CPT team members participated in many activities and their roles in these activities were significant to understanding their information practices. Their categorization was not fixed as the participants were also categorized according to their participatory modes of engagement in an apprenticeship system, as defined by Lave and Wenger (1991) as ‘legitimate peripheral participation’ (LPP), and hence reflected the CPT team as a dynamic social site of learning. Participation in work activities implied that members in the different levels or cadres were either learners or experts. For example, the peripheral group comprising of the Registrars and House Officers had the first point of contact with the patient. This group provided the main access point to the information relating to the object of activity. However, the participants at this level worked in the unit for a specific time-frame of about three months. Therefore, there was a significant level of mobility within the group. However, the extent to which such mobility affected information practices in the work activity was not the focus of this study.

Apart from attending to the patients, the core members acted in the role of experts in the enculturation of the peripheral members. For example, the Consultants were seen as embodied knowledge within the unit. Hence, the Consultants were seen
mainly as teachers and mediators, rather than mere colleagues of the peripheral members. The Consultants were core members that held a key role in drawing boundaries and maintaining conformity to the rules and practices of medical practice in the team’s work activity. Senior Registrars, Registrars, and House Officers, who were undergoing various forms of residency training, were categorized as learners. Though the Senior Registrars were said to be undergoing some form of apprenticeship, like the Consultants, they were granted core membership with full participation. Thus, they also held a key role in ensuring conformity to the rules and practices within the unit. Wenger (1998, p. 229) notes that communities of practice are defined by the living experience of the participating actors, and as such, they cannot be legislated into existence.

The other group in this study consisted of the members of the various units/departments of the teaching hospital. In terms of activity theory, this group is referred to as ‘the wider community’. Within the social context, the subjects of activity interact with the society at large and share the same general object (Engeström, 1987). The categorization of the participants in the wider community were mostly done according to their professional nomenclature such as specialist physicians, nurses, pharmacist, etc. The members of the wider community were not identified as experts and learners though they fit well into Lave and Wenger’s (1991) categorization of ‘marginalized participants’. Obviously, students were categorized as learners, and they made up a sizeable number of the wider community. Though they participated as marginalized members, to some extent, they fell into Lave and Wenger’s (1991) categorization of ‘peripheral participants’ due to different forms of apprenticeship. However, Lave and Wenger’s categorization of the wider community was too broad to show any significant characterization of what membership in the wider community entailed. Moreover, Lave and Wenger’s categorization did not capture the specific variations of the different cadres or individuals in this study.

I have argued that the role of human actors in activity differed depending on whether they were subjects or participants of the wider community. This influenced how they engaged in information practices. The role of the participating actors depended on their relationship with the object of activity, the patients. This relationship was emphasized because it determined when and how the participating actors engaged in information practices. It also determined what information was enacted, used, and documented. The members had a direct relationship with patients through various types of clinical activities, including diagnostic, therapeutic, administrative, decision-making, and follow-ups to previous activities. In this way, these members enacted information, which they and the wider community used, except when stored for future use.
Even the members of the wider community had occasional contact with the object of activity, as reflected in their information input. Sometimes, the CPT Unit invited the specialist physicians from other units and departments. They then accessed and generated information, either from the object of activity or their interactions with the subject of activity, and made entries into the case notes. Nurses with direct contact with the object of activity had unrestricted access to information but limited rights to generate information. Hence, their information input remained at the level of addenda to the case notes. The physiotherapists had access and the right to generate information, but only in their specific area of physiotherapy. However, a number of members of the wider community, e.g. the accounting department, did not have any direct contact with the object of activity. There were obvious restrictions to interactions with the object of activity by some members of the wider community, and this consequently determined their level of engagement in information practices related to the CPT team.

The orientation above focused on understanding how the different entities in the work place environment organized their work practice through interactions amongst themselves and with the society at large. Both categories of the subject and wider community were, to a large degree, dependent on the goals of the activity system and the various activities undertaken. In an environment with a large interconnected network, the CPT team, as the subject of activity was the most predominant category in need of information about the patients in everyday activities. In other activity systems within the same environment, the subjects in this case study may form a part of the wider community for information practices of other communities of practice.

10.3.4 Division of labour

Another element that influenced information practices in work activity was the division of labour that ascribed job roles according to hierarchical cadres. There was no doubt that all CPT team members participated in all the activities both on a collective and individual basis. The team, either at the core/peripheral level or as a whole, was an important indicator for understanding the division of labour. Moreover, there was a formal division of labour that played a decisive role in the information practices. As such, the team, as a community of practice, was a central focus, and the division of labour reflected a “cadre kind of relationship” that depicted a hierarchical chain pointing to the upward or downward direction of information. Each participating team member was well aware of this system and flowed with this “cadre kind of relationship” as it was relevant to his or her role in
the activity system.

There were interdependencies of tasks in all the activities undertaken by the CPT team. These tasks had their own profiles that were built over time. Leckie, Pettigrew, and Sylvain (1996) discuss a model of information seeking by professionals, which is based on the idea that “the roles and related tasks undertaken by professionals in the course of daily practice prompt particular information needs, which in turn give rise to an information seeking process”. This model comes closest to reflecting the influence of the division of labour in the CPT team’s activity system, particularly as Leckie et al. used social roles to explain professional information-seeking behaviour. However, my characterization of information practices in activity differs from that of Leckie et al. (1996). Their professional information-seeking model does not address the object of activity, which in my study, plays a significant role in processes of information generation.

It was deduced in this case study that the division of labour entailed a form of participatory management, where “everybody knows what to do at what point in time” (Dr. C. Chukwuka). In this regard, the subject of activity individually or collectively undertook his/her activity and carried out a particular set of actions. Again, any subject in an activity system can take on a number of different activities within the activity system or any number of interwoven activity systems, but this differed significantly from the social roles discussed by Leckie’s et al. (1996). In Engeström’s revised mediational triangle (cf. Chapter 4, Figure 4.3), the emphasis is on division of labour rather than the variety of roles that an individual in an activity system may have. In the setting of this study, the division of labour was well-defined and clear-cut to prevent *ad hoc* assignments. The physicians’ roles were built upon by the existing rules of the medical culture of practice. They were determined by the norms taken for granted by the hierarchical structure of the unit. For example, the Consultants and the Senior Registrars had a supervisory role and were the ones mostly engaged in decision-making in patient care. The Consultants and Senior Registrars also held a key role in drawing the boundaries and maintaining conformity to rules and practices of the medical profession. The Registrars supervised and coordinated the routine duties of the House Officers, i.e. executing the decisions taken by the other members of the team. This underscored Lave and Wenger’s (1991) assertion that peripheral members are left to do lesser duties and physical tasks as they gradually get enculturated into the community of practice where the core members do the most specialized tasks.

In this case study, I focused on the integration of the individual within the social milieu. The CPT team-work’s activity entailed not only the individual’s actions but ‘collectiveness’ in activity that ensured a balance and cohesion within the dynamics
of the unit. ‘Collectiveness’ was understood as historical events anchored in the real environment of time and space. It was analyzed by examining the dialectical relationships of the team members at the various levels. However, it had considerable relevance to the understanding of the team’s immediate environment. It was found that differentiations were reached through extensive discussions, feedback, and consensus. This limited tensions and contradictions in the activity system.

The division of labour in the CPT team’s work activity enabled members to adhere to the formality where roles were specified and actions and activities were undertaken accordingly. The decision-making involved mostly a top-down approach, and information emanated from the top echelons of the team and was passed down to the bottom. Occasional flexibility allowed for a bottom-up approach where hierarchies were put aside if there was an immediate knowledge gap that put patients in danger. Each role was seen as important and necessary. For example, the House Officers, who had the lowest cadre of the CPT Unit hierarchy, saw their role as invaluable in the information processes through their first contacts with the patients. The division of labour clarified the intermediary roles in the information process. For example, House Officers saw themselves as the intermediaries between the patients and other team members in gathering information. The Consultants saw themselves as facilitators of learning. Besides participating in the work activity relating to patient care, they claimed they imparted medical knowledge to other members and supported the team’s collective and individual learning activities. However, the analysis revealed an unequal distribution of opportunities and possibilities amongst the CPT team members as relationships or ties for entering and forming relationships differed significantly. The unequal relationships or ties amongst the team members influenced the roles they played when making contacts with other cadres in the team’s hierarchy or with members of the wider community.

The discussions on division of labour include that of rules and norms. In the study context, both are discussed together even though in activity theory the two are separated. It was necessary for the team to show accountability, i.e. compliance with the rules in the activity system. From Engeström’s activity theory perspective, it is the rule that concretizes the underlying practice in the activity system. In this case study, rules were identified as one important attribute that framed work activity, and subsequently, information practices. The analysis of the empirical data showed that rules entailed both explicit regulations and implicit norms. Like in Chatman’s (1996, p. 204) “theory of information poverty”, these rules and norms were seen as a form of social control. It was found that many rules in the Code of Medical Ethics influenced how the CPT team members engaged in work activity, and as a result, in their information practices. These rules seemed to maintain not
only conformity to medical practice, but also the continuity of the medical profession in Nigeria. These were seen as explicit regulations and were applicable all through the team’s work activity supporting Wagenaar’s (2004, p. 644) view on “actors who are engaged in a particular activity together produce the proper activity through their emerging understanding of what is right or fitting in that particular situation”.

However, norms emanate from values, which are an institutional goal-setting mechanism. Values lack precision because of their abstract nature. Like the explicit rules, norms also influenced the information processes in the case study by setting parameters around interactions and communications. Many norms were identified, and the goal or value of total patient care encapsulated all the other norms. In the analysis, it was found that explicit rules and norms worked in tandem and largely determined how the participants interacted with patients and communicated amongst themselves. For example, the explicit rule in the Code of Medical Ethics stipulates that patient care should be handled at different levels of specialty. However, the explicit rule of “respect to colleagues” reflected the norm of hegemonic orderliness that defined the associations and structures between the core and peripheral members in ensuring patient care. The CPT members displayed a pragmatic approach in applying rules and norms using their background medical knowledge and their experience on the job in their communications and interactions with the object of activity in obtaining information.

10.4 Levels of work activity

As was established in Chapter 4, the fundamental principle for analyzing activity depended on its hierarchical structure, which Leont’ev (1978, p. 1981) schematized into three-levels: activities, actions, and operations. These levels have particular value for investigating information practices as social practices in historically and socially-situated activity context. What the analytical levels represent is dependent on the goal of the activity system as a whole: whether it concerns what activities must be undertaken, what actions must be performed, or the operational configuration or routine within the activity system. Activities as such could be realized using different actions, depending on the situation. Single or multiple goal-directed action(s) may depend on different activities, in which case the different motives will cause the action to have different meanings and interpretations. Operations can provide the adjustment of actions in current situations, and can also be part of several actions. For example, different actions were undertaken in the diagnosis of a patient ailment’s, and their relevance and meaning depended on the activity taken, e.g. the activity of therapeutics. However, the CPT team’s
information practices were identifiable on each analytical level and described as part of the work activity relating to patient care, i.e. subordinated to a more durable high-level formation that made possible the restoration of patient’s health to normalcy. The focus of this analysis is on the actual processes of information practices. Thus, the overall hierarchical activity system is described only to the extent as to how they influenced information practices. The relationship between the hierarchical level of activity and the processes of information practices are significant for understanding the latter.

The first stratum of activity identified in the CPT team’s work activity that influenced the members’ information practices was the level of ‘activities’. Activities were seen in this case study as patterns or series of conscious goal-directed actions or chains of actions that the team members undertook while interacting with the patient. As presented in Chapter 6.6, four activities were identified in the activity system of patient care. These included diagnostic, therapeutic, monitoring and follow-ups, and discharge. These activities were either synchronous or asynchronous. It was found that apart from diagnostic activity, the extent to which other activities came into play varied from patient to patient depending on their health status as inpatient or outpatient. It can be argued that the clinical activities that the physicians were engaged in constituted the medical practice itself. In addition to the identified clinical activities, the study also identifies various goal-directed actions that were used to achieve the goals of the different activities.

Diagnostic activity consisted of identifying the problem to be solved and indicated that information actions were involved. The underlying principles of diagnosis were beyond the scope of this study in terms of information practices. Diagnosis involved interactions with patients to collect information and reconcile deviations from normalcy. This implied collecting information based on a subjective assessment (the information proffered by the patient) and an objective assessment (the information obtained as a result of the physicians’ own assessment of the patient’s condition). The subjective assessment entailed physicians’ interactions with the patients, while the objective assessment involved three different aspects of diagnostic activity. These included: 1) initial diagnosis; 2) differential diagnosis; and 3) investigative or definitive diagnosis. The CPT team members mostly undertook the first two categories, but the definitive diagnosis involved input from the wider community, such as laboratory investigations and radiographic examinations, and was done mostly to reconcile the two former types of diagnoses.

Therapeutic activity focused on solving the problem. It was clearly goal-oriented and targeted on the object of activity rather than on the collation of information.
The findings revealed three objectives involved in therapeutic activity: 1) finding a cure; 2) controlling the parameters of normality; and 3) alleviating the patient’s pain. The procedure taken was appropriated to set a successful therapeutic trajectory. This entailed a step-by-step procedure that included different alternative actions such as the prescription of drugs, observing the patient, monitoring the patient’s progression, reassessing and re-evaluating the treatment, as well as interventing to rectify intended and harmful effects of the therapy. Although the CPT team members mostly undertook therapeutic activity, specialist physicians from the other units/departments also prescribed drugs and were involved in the reassessment and re-evaluation of the treatments.

Monitoring and follow-ups involved checking and keeping track of the object of activity. It involved the collation of information based on re-evaluations. The actions also enabled and ensured re-adjustments in the earlier two activities (i.e. diagnostic and therapeutic). Through this kind of activity, it was possible to ensure the progression of the object of activity. Moreover, it was possible to verify test results and discover other diseases or adverse drug reactions. Monitoring opened up activities to include members of the wider community; specialist physicians from other units/departments were thus involved in patient care, as were the nurses who were in-charge of administering the management plans of the CPT team members.

Discharge activity meant disengagement from ward management at a particular point in time. In contrast, cases of repeated episodes of the patient’s ailment trajectory meant often further control and monitoring. The level of activity can be viewed from either the individual or the collective activity of the team.

The second stratum of activity consisted of the various actions performed by the CPT team members in the activity of patient care. Because actions were goal-directed by definition, they required that the participants paid conscious attention. In this study, actions entailed considering events for achieving the goals of the activity. They were organized around the information strategies discussed in Chapter 7. Modalities for actions included: discussions, talking, questioning, demonstrations, observations, feelings and sensations, listening and giving instructions. These modalities provided the organizing structure for patient care events, and were also useful as a means for achieving the goals of the activity in terms of planning, decision-making, and evaluation.

The third stratum of the activity hierarchy was the level of operations, which focused on the focus was on the particular means that the CPT team members used to achieve the goal of restoring patients’ health to normalcy. According to activity
theory, the level of operations was identified as significant indices for analyzing the situated nature of communicative events in work activity. Operations are the most basic level of activity. They have no goals of their own and they play an equally important role as that of actions in the team’s work activity. They depend on the actual prevailing conditions or circumstances of the overall activity (Leont’ev, 1978, p. 65). Five different operations (routine actions) that enabled the CPT team’s interactions were identified in this study. Two of them (i.e. ward rounds and Consultants’ clinics) were put in place by the team for their own internal working mechanism (Chapters 6.7.1 & 6.7.2). The remaining three (i.e. morning reviews, clinical meetings, and Accident and Emergency clinics) took into account the team’s linkage with the wider community consisting of the other units/departments of the teaching hospital (Chapter 6.7.3 & 6.7.4). The operational levels proved to be positive for communicating varying ways. Also, at a general level, operations provided the conditions or forums through which the team’s activities were undertaken and attained.

These operations initially encountered as the means of achieving shared goals in the course of the team members’ interactions with others. Over time, they became well-practiced routines and the resources for meaning-making in work activity. A corollary was that the identified operations - ward rounds, morning reviews, Consultants’ clinics - had become so routinized to the extent that much of the communication and information sharing in work activity took place through them. They became the systematic means to keep members of the activity system (both within the team and other units/departments) informed about the activities of the team. Most prominent communicative events that were enabled and sustained through these operations comprised of group meetings (e.g. face-to-face, one-to-many, many-to-many). It was found that group meetings had several functions and were stressed by the entire team as valuable for sharing information. They were also found to be useful in preventing tensions and contradictions as they enabled the participants to discuss, brainstorm together, and identify challenges for optimal patient care. More so, the participants acknowledged them as efficient for learning and enhancing each other’s expertise and skills. Hence, group meetings were: 1) used for learning within a socialization process; 2) led to feelings of inclusion; and 3) legitimized membership regardless of the team member’s social positioning.

In sum, patient care was understood within the frame of various ‘activities’, which were performed through various ‘actions’ that were structurally organized, and realized through a series of operations by which the activity goals were attained. However, the various activities and actions in patient care were not linear. Rather, they seemed to be dynamic and simultaneous in the participants’ interactions with the patients. For example, diagnosis and treatment could take place simultaneously, as was the case with talking, observations, and feelings and sensations. Also, the
activities and actions did not follow the same pattern of operationalization in different occasions. None of the activities and actions took place in isolation; they were in several ways affected by other contextual factors such as the input of the subject of activity, the use of available tools, or the mediating artefact as guided by the rules and norms of the activity system. Also, some extraneous factors, such as learning, took place during any activity, and information per se was the eventual outcome of such activity.

10.5 Access to information

The second research question asked how and in what ways physicians gained access to information in work activity. The answer to this research question was obtained by examining the different information sources and strategies in work activity. Ideally, information sources and strategies ought to contribute to the overarching goal of restoring patients’ health to normalcy, and at the same time, enable actions to be performed and activities to be undertaken. Information sources and strategies generally have a pragmatic purpose and the analytical focus for understanding them entailed understanding how they facilitated access to information situated in work activity. At the level of information sources, the analysis showed that the process of engaging in information practices required engaging with a range of physical, social, and textual sources, which Lloyd (2007) asserted were recognized and sanctioned as legitimate by experienced practitioners. In the same way, at the analytical level of information strategies, the analysis showed that the different strategies employed were characterized by the culture of medical practice and even showed the role of the CPT team as a community of practice in employing these strategies. It seemed that information sources and strategies constituted two aspects of how access to information was gained. Interestingly, the analysis also indicated that both information sources and strategies were always directly related to the object of activity. The complementary nature of these two aspects of information processing will unfold in the discussion that follows.

10.5.1 Information sources

It was found that access to information in work activity was gained through different kinds of information sources such as textual, physical, and social. The activities were organized around them while attending to the object of activity. For example, textual sources of information derived mostly from the medical domain, were accessed when the participants needed conceptual knowledge. Explicit knowledge was made accessible through printed and digital sources. According to
Lloyd (2007), textual sources such as books and journals are in the form of facts, propositions, or concepts, and were rarely questioned. In the study context, access to textual sources of information provided the participants with information that related to ‘know what’ and ‘know why’ types of knowledge. Mastering of medical conceptual knowledge was imperative to participation in medical practice. Textual sources contributed immensely to how the CPT team members, as the subject of activity, became enculturated and active in the professional discourse. It was observed that participants had specific and recurrent needs to consult textual sources in their work activity. It assisted the peripheral members in constructing a sense of individual subjectivity - a sense of self, and an understanding of their relationship to the work practice (cf. Lloyd, 2007, p. 188). However, the core members only fleetingly accessed textual sources and found them especially useful in resolving contentions. This is likely due to the core members’ experience and knowledge.

Textual sources of information were often connected to other two types of sources of information. Perhaps the physical and social sources emphasized more of the situated and experiential nature of knowledge than the textual sources, which could focus on general and specific aspects of a medical case (cf. Chapters 7.3.2 & 7.3.3). The analysis showed that physical and social sources of information were mostly addressed to enable the ‘know how’ knowledge related day-to-day activities. This finding supports Lloyd’s (2010, p. 253) assertion that information drawn from activities constructed the practical intelligibility to coexist within a community of practice. For example, information was accessed through the physical body of patients. The body as source of information, was found as critical to the construction of meaningful practice in patient care. This corresponds to Lloyd’s (2010, p. 254) supposition that the awareness of the body as a source of information is central.

Information was also accessed through social sources. Significant others were seen as points of reference about medical conceptual knowledge, the medical professional practice, and the procedures of the work practice. To emphasize the importance of these sources, access to them was made available through many communicative events. For example, information was accessed at one-to-one, one-to-many, and many-to-many meetings between the team members during ward rounds, morning reviews, clinical meetings, Consultants’ clinics and at the Accident and Emergency (A&E) Unit. Information was also accessed through communication with members of the wider community. In this way, social sources of information enabled members to become inter-subjectively embodied in the team’s community of practice. Social sources also served as forums for the kind of learning that thrived on the evolving forms of membership and depended on opportunities to contribute actively to the practices of the team. The core members
guided and assisted the peripheral members into the culture of medical professional practice. It was mostly through this connection that the core members engaged the peripheral members with explicit and implicit information, and enabled them to have an inter-subjectively shared understanding of a meaningful collective practice.

A general significant observation was the wide contrast between how the CPT team, as the subject of activity, and members of the wider community made use of the different information sources. For example, the patient’s body was seen as raw material comparable to what Lloyd (2010) refers as “a performative information site, through which information about our situated experiences and material practices is enabled and enacted”. The CPT team members accessed and made use of such information as soon as patients sought medical attention. On the other hand, with the exception of specialists’ physicians from the various unit/departments, other members of the wider community only made use of the information in the mediating artifact – the case notes (cf. Chapter 8.3.3.2). This was more so as the case notes served as the information repository of the team.

10.5.2 Information strategies

A significant finding in the case study was the reliance on different information strategies. The identified strategies were mostly linked to tacit and social sources of information. As we will see in the discussion that follows, these strategies, which are linked to information sources, highlight the importance of situated information. Strategies linked to the tacit sources of information were exemplified by observations, demonstrations, and feelings and sensations. In contrast, the socially oriented strategies included discussions, direct questioning, instructions, and listening. Through these strategies they were able to obtain information that was necessary for arriving at patients’ diagnoses, patients’ management plans, and for monitoring and follow-ups. Thus, the identified strategies were useful for problem-solving. In the same way, they were able to identify missing gaps in the information already obtained. With the exception of feelings and sensations, which did not require collectiveness, they were also able to interact and communicate with significant others on the team about issues pertaining to patients’ health.

The same prominence of specified strategies could not be deduced regarding the explicit sources of information. Use of these sources were more at the level of individual engagement and made it possible for the participants to develop a sense of self, and an understanding of the agreed-upon medical culture of practice. The physicians had to have a grounding in the domain of medical conceptual knowledge to be able to practice medicine. They gradually became enculturated and integrated
into the professional discourse of medical practice in the activity system.

As a result, information processing in work activity cannot involve a choice between information sources and strategies when we talk about how actors in activity gain access to information. One cannot assume that information sources were unproblematic and that they were sufficient in accessing information. The different information sources were related to the different activities undertaken by the team. Employment of the strategies ensured access to information. This assumption makes sense as the relationship between information sources and strategies often took place through the ongoing activities of the team. In this sense, information sources were always present in activity, whereas information strategies tended to be emergent and highly resilient, reconstituting themselves during interactions with the object of activity. The emergent nature of information strategies implied that access to information was pervasive and dynamic. Information strategies enabled representations of the object of activity by giving structured access to the patient.

Information practices involved decisions about what information source was useful in solving a problem. This implied that information sources or modalities were given. Thus, information sources were constitutive of information strategies. By contrast, information strategies were seen as a response to the specific information modalities –how, when, and where specific information was accessed. The modes of engagement by the participating actors always influenced how the strategies were employed. For instance, the peripheral members relied on guidance and assistance from the core members in problematic situations. They employed these strategies even though they already possessed the prerequisite basic explicit and procedural knowledge from their medical undergraduate training. In general, the employment of strategies significantly impacted how the CPT team members engaged in information practices. It also influenced their learning activities as information strategies put in place by the team implied support of participatory modes of engagement in work activity.

To conclude, it was obvious that the information sources employed and the strategies applied depended on a number of contextual factors as part of the restoration of the patients’ health to normalcy. The findings showed that the information sources and strategies employed were related to the problem at hand.

Issues of how to determine the authority of an information source and strategy were prominent throughout the study. Two notable indices for assessing the authority of an information source or strategy were credibility and reliability. The credibility
and reliability of an information source or strategy depended on the patient’s health problem. This implied that the object of activity was subject to decision and interpretation by the subject of activity. In making a decision or interpretation, all the team members were involved to accomplish the goal of activity. The findings revealed that every information source or strategy was valuable depending on the situation. It was found that measures of the authority of information sources or strategies were not fixed. In some cases, the opinions of the core members were indicated as a measure of credibility and reliability. In other cases, the explicit instance of authority was the gold standard.

10.6 Information and information practices

This section addresses the third and fourth research questions. The third research question was about what characterizes information practices as related to physicians’ work activity. It was assumed that there were different aspects of information practices in work activity. The fourth research question was about how workplace learning relates to physicians’ information practices.

Information practices were regarded as social practices in the study context. Byström and Lloyd (2012) argue that practices are shaped by the ‘sayings’ and ‘doings’ of the context as reflected in the discourses and language games that drive the performance of work activities. Furthermore, practices are viewed as constructed, shaped and reshaped over time with the outcomes of reflecting the history and tradition which embodies the social and historical conditions of a setting (e.g. Schatzki, 2002; Byström & Lloyd, 2012). Viewing practices in these regards enable the understanding of the empirical reality of how participating actors in work activity engage in information practices. It also enables the understanding of how information emerges, is constructed and co-constructed by those participating actors. The empirical data revealed six different aspects of information practices (cf. Chapter 9). These were information gathering, meaning-making, information sharing, information use, reading, and documentation. These information practices were prominent throughout the study; they made up and covered a vital spectrum of the information processing in work activity.

As social practices, all information practices entailed standardized procedures intricately intertwined with the problem-solving purpose of restoring patients’ health to normalcy. Information practices, in this regard, were purposive. For example, general examinations were intended to proffer insights into how specific organs of the body functioned. Meaning-making in activity entailed the active process of interpretation in order to create reliable and credible estimations from
the available information. Information practices in work activity were directed and purposeful. Information practices also entailed information being obtained by proxy; the participants provided information to each other or to members of other units/departments.

The identified information practices have bearing on the different aspects of information seeking identified in INSU studies (McKenzie, 2003; Johannisson & Sundin, 2007; Savolainen, 2008). Most of the different practices that emerged from the empirical study were useful in understanding contextual phenomena. There were some underlying differences in approach as some of the studies adopted monological approaches. For example, McKenzie labeled her approach of information seeking as ‘discursive’, focusing on the individual with a primary emphasis on language. McKenzie’s study does not readily accommodate stable and durable structures that persist over time and across different activities and situations; the practices in her study appear more short-term and ad hoc. What is considered important is the action orientation of information seeking accounts. However, the identified information practices in this study were bound to the work context. It was context depicted by the CPT activity system that was seen as enacting, entangling, and shaping the phenomenon and entities within it. The analysis revealed that the cultural-historical setting of the CPT Unit formed the basis for information practices to take place. The information use was triggered by contextual factors, and it was context that determined, shaped, and influenced information practices, how they were engaged in, and which information practice - inclusive sources and strategies were seen legitimate.

The different information practices were enacted in work activity and took place at the different cadre levels of the CPT team. The social positioning of the participants in the team as a community of practice significantly influenced what happened at each cadre level. These cadre levels could be used to examine the apprenticeship system. The participants themselves played a decisive role in what they did at each level, including information-gathering, meaning-making, information sharing, and reading. For example, the information gathering of the House Officers and Registrars took place at the peripheral level, but the information obtained was significant as a meeting point for all the team members. On the other hand, information gathered at the core level by the Consultants and Senior Registrars ensured consistency by pinpointing and filling in the missing gaps. However, this was not the case with documentation, as its analysis was more concerned with the participative status of the team members rather than their social positioning in work activity. Hence, the emphasis on documentation in this study was at the individual or collective levels. This illustrates Wenger’s (1998) community of practice and Lave and Wenger’s (1991) legitimate peripheral participation (cf. Chapters 4.5.1 & 4.5.2), which both emphasize participation among colleagues with different
experiences and different access to everyday practice.

Having noted the varying cadre levels through which information practices were enacted, I will further explicate what they represent. Information practices were social practices that reflected how the CPT team members engaged in activity at a meta-level. The information practices, individually or collectively, did not account for the entire CPT team’s work activity. The team members did more than just gather information, make meaning out of the encounter, read, document, share information, or even learn.

An important aspect of information practice is communication. Telephones were an increasingly popular medium of communication for the team members and members of other units/departments in the teaching hospital (cf. Chapter 6.10). Consultative reports/evaluations/statements, which were written and sent across units/departments, were analyzed as one of the most efficient and effective tools of communication across units/departments. They were particularly useful in sharing information with specialist physicians in other units. Of note is that email was not a popular means of communication in the case study during work activity.

Given the complexity of human interactions, it was expected that there would be instances of contradictions and tensions influenced by internal inconsistencies and discrepancies within the team. It was also expected that there would be discrepancies in the collaborations between the CPT team members with other units/department. The efficient forms of communication and the structured division of labour (with the rules and norms to guide team’s work activity) ensured that primary contradictions were, to a large extent, minimized. In turn, medical professionalism was ensured. Primary contradiction implied discrepancies that arose from the same action executed by different people for different reasons or by the same person as part of two different activities. The same degree of minimal contradictions was deduced in the CPT team’s members’ collaborations with other units/departments. Everybody seemed to know where to be, what to do, and how to do it at every point in time. In the emergence of discrepancies, they were quickly resolved through communal efforts and consensual agreements, with the Consultants’ decisions being final. Contradictions and tensions are a significant component of activity theory (Engeström, 1987). In this study, issues of contradictions and tensions were not prominent.

Information practices also reflect the explicit, tacit, and situational knowledge in work activity. For example, information gathering, documentation, reading, and information use are information practices that are procedural by nature. They fall
mostly within the realm of practical knowledge that is the ‘know-how’ involved in activity. They also fall within the realm of the ‘know-where’ type of knowledge, and as such, can be constituted by ‘situational’ knowledge that cuts across different circumstances in the workplace. Along with meaning-making by interpretation, information practices also imply the factual or propositional ‘know-what’ knowledge available for the CPT team’s activity to construct and make meaning of their activities.

The discussion in the preceding paragraph depicts how I tried to link information practices to knowledge in activity. In this regard, information practices are at a meta-level of the activity involved in encountering patients and restoring their health to normalcy. Information gathering, documentation, and even reading, for example, transcend the CPT team’s work activity. They are all information practices that are common and occur in many workplace settings, even amongst the different professions. However, there is an underlying difference in the way these information practices occur in the CPT team’s work activity and their ultimate focus on the patients as the object of activity. More so, the various information practices were enacted and wielded by persons with esoteric specialized medical knowledge and membership in a community of practice. From the activity theory viewpoint, the specific mechanics of the activity structure – actions, activity and operations – are seen as central to shaping information practices.

It was even found in the case study that information practices were interconnected. For example, general examinations were useful in confirming that the information that had been obtained through history-taking from the patient was a significant parameter for problem-solving (i.e. patient’s diagnosis). Case presentations provided an opportunity to re-evaluate a patient’s case where more information could be gathered. The act of reading was linked to previous documentation, and was also seen as a way of information gathering. Again, information gathering activities (history-taking, general examinations and investigations) were done through an interconnected procedure (Chapter 8).

The team members acted individually and collectively at different operational levels during the ward rounds and Consultants’ clinics. Information practices at these operational levels were more definite and pronounced and entailed direct contact with the object of activity. The same direct contact with the object of activity was maintained at the Accident and Emergency (A&E) clinics -though in collaboration with members of other units/departments. However, at the other operational levels such as clinical meetings and morning reviews, the object of activity was not physically present but was represented by the mediating artefact of the case notes (cf. Chapter 9). However, the outcomes of the whole activity were
mediated by the interconnections of the different components of the activity system, which included: the patients, the team members and their collaboration with other units and departments, the available tools and mediating artefact, the division of labour with its rules and norms guiding the team’s actions.

The information processes also entailed learning in the form of what Billet (2001; 2005) referred to as participatory practices. For the CPT team members, learning was seen as an eventual outcome of participation in work activity. As a consequence, to engage in information practices was not only to support activities in the work place, but also to offer a possibility for transformation. A workplace curriculum, which Billet (2006; 2002) referred to as a “pathway of learning activities”, was identified and consisted of three interdependent levels. They included: 1) the team members’ engagements in everyday work activities; 2) the direct guidance offered by the core members (Consultants and Senior Registrars); 3) peer-to-peer assistance rendered by the peripheral members (Registrars and House Officers); and 4) indirect guidance as influenced by the environment (teaching hospital).

The initial step in gathering information was seldom a specific item, even if it mostly turned out that the participants had a specific demand and often a clear view of what they wanted. The information the participants elicited from the object of activity was often quite clear or comprehensive to start with; they looked for ‘everything’ about the problem to be solved. If someone encountered problems in obtaining information, they turned to other members of the team. Most of the participants preferred to seek guidance from colleagues at the next level of hierarchy. They saw this as the most efficient way of handling problematic situations. The social relationships and interactions in work activity thus offered different alternatives to engage in information practices, as steered by a seemingly obvious division of labour in activity.

Information practices as social practice were ever-present in the CPT team’s work activity. This finding relates to Johannisson and Sundin’s (2007, p. 200) assertion that information practices are regarded as “social practices, actively engaged in by people in relation to social context of which they are a part of”. In this thesis, information practices are defined as “social practices involving the interactive processes of participating actors; enabled and sustained through the use of tools and artefacts”. However, in this study, information in work activity is open to varying interpretation, and I shall start by explaining it in terms of Bateson’s conception of information as any difference that makes a difference to a conscious human mind (Bateson, 1972, p. 453). Case (2002, p. 40) interpreted Bateson’s definition of information as whatever appears significant to a human being, whether originating
from an external environment or a (psychologically) internal world. But this in itself begs the question of what the difference entailed. What if information is so indiscernible as to make it incomprehensible enough to be understood? -That is to say, is information ‘everything about’ a certain issue? For example, the patients presenting complaints could be vague and incomprehensible or the House Officer’s history of presenting complaints could be seen as inadequately described (at least from the viewpoint of the other members of the team). What then defines information in work activity? For example, can merely talking with a patient be seen as making a difference? What about the interactions and brainstorming between the participants themselves? What about the clinical meetings with specialist physicians from the various units/departments? What about an informal conversation between two team members? Lloyd (2006, p. 578) reasoned that information is conceived as the building block used in the construction of a meaningful reality and also issues pertaining to knowledge of it.

In the study context, Bateson’s definition of information as anything that makes a difference has bearing on Buckland’s (1991) conception of information. Buckland described three categories of information; information-as-knowledge; information-as-thing, and information-as-process. Information-as-knowledge concerns the intention to communicate knowledge and refers to the content of tangible information. It pertains to opinions, belief, and knowledge, and cannot be touched or measured directly. It is also personal and subjective. Information-as-thing is tangible, and it concerns information that can be measured or described. Examples of information-as-thing include laboratory results and textual sources such as print documents and digital materials. Information-as-process is the transformation of information-as-thing into information-as-knowledge. This thesis focuses on Buckland’s three categories of information. The major consideration is the extent to which information is seen as a useful tool in accomplishing a goal in work activity. It is in work activity that the participants use information for various purposes such as physical tools and language. It is also in work activity that information is processed during interactions. It is information that supports the opinions, beliefs, and knowledge of the participating subjects in work activity. Information is the thing that is read and interpreted as information such as the case notes, manual handbooks, and articles in journals. It is in work activity that the body becomes a vital source of information. The concept of information in library and information science was mostly associated with textual and social information while physical information was considered less. In the present study, information was considered within the realms of the three sources so than it can be textual, social, and physical.

Information can also be explained in terms of Wilson’s (1983) concept of knowledge as first-hand or second-hand knowledge. First hand-knowledge refers to the individual’s experience of knowledge that depends on the stock of ideas people
bring to the interpretation and understanding of their encounters with the world. In this study, such knowledge implies information acquired through participation in work activity that constitute the life-world of the individual and the meanings that are constructed in the course of participation in the succession of events that make up his or her life trajectory. Well (1999, p. 84) sees it as “these events that are constructed in terms of the individual’s existing model of the world”. Second-hand knowledge implies how people depend primarily on others for ideas as well as for information outside the range of direct experience. In the study context, information derived from such knowledge implies the meaning that people make through participating with significant others such as through interactive dialogue, conversations, and artefacts like the case notes.

Since the distinction between knowledge and information is not really useful in this thesis, I will not discuss it. However, information may be used interchangeably with knowledge in examining how information is assessed, evaluated, used, shared, and produced in the activity system. In this regard, the term ‘information’ will be used to refer to instantiations, details, and materialization of knowledge in activity. Again, the emphasis in this thesis is on information as “a sociocultural tool whose meaning and relevance are created in those practices where people use it” (Sundin & Johannisson, 2005, p. 37; see also Cappurro & Hjorland, 2003). Hence, Talja’s (1999, p. 77) assertion that information ought to be regarded as messages that are produced within specific historical, cultural context and specific interest. From Talja’s assertion, it becomes clear that what makes information a symbolic tool and what makes it empowering is, according to Wenger (1998, p. 220), “…the way in which it can be integrated within an identity of participation”.

Identity of participation implies that information that is not useful in solving a problem at one moment in time may be valuable or not valuable at another moment in time. The participating actors in activity can thus narrow the mass volume of information down to meaningfulness. In this regard, the information is assumed as accumulated, not in the abstract as an end in itself, but as a means of undertaking activities. It is in undertaking these activities that information becomes appropriated as a tool for social practices. But on the other hand, it may even be that the information may be disconnected from other pieces of relevant information. To Wenger (1998, p. 220), such information therefore fails to translate into a way of being in the world coherently enough to be enacted in practice.

10.7 Learning

The fourth research question was about how workplace learning relates to
physicians’ information practices. This question was addressed by examining the CPT team through Lave and Wenger’s (1991) idea of a learning community through a complex apprenticeship system they had termed *legitimate peripheral participation* (LLP). Through this process, newly trained physicians moved from the periphery towards the core of full participation in order to become experts. The point of analysis is that learning is practice oriented and therefore cannot be judged to be either successful or unsuccessful. It is not seen as a single period in history, but rather as constantly on-going in the core of the work activity. Learning took place simultaneously with work activity itself. It was found that through the process of LLP, the participants engaged in several activities and communicative events. The main advantage was the enhanced accessibility in the broader information context of the entire team’s activities rather than the singular tasks of each member.

Just as much as participation in work activity depended on the participants’ social positioning (i.e. core or peripheral members), in the same way information practices were influenced by it. For example, peripheral members engaged in history-taking (i.e. Registrars and House Officers) that in turn, enhanced proficiency in information gathering. The core members (i.e. Consultants and Senior Registrars) had supervisory roles in information practices and they mediated the proficiency skills of the peripheral members. There was thus the prominence of what Billet (2002; 2004) and Rogoff (1995) regarded as guidance and assistance by the core members as the peripheral members engaged in information practices. The mutuality derived from such assistance and guidance in work activity implied a community of practice, which in turn, entailed communication. The CPT team as a community of practice was then viewed as the node for dissemination, interpretation, and use of information. Consequently, information was readily passed amongst members.

The findings revealed how different aspects of the empirical realities of workplace learning significantly influenced information processing in work activity. The CPT team had a history of mutual engagement and shared practice centred on the restoration of patients’ health. This shared goal was the collective focus on the object of activity, and according to Davies (2007, p. 113), it comprised of the understanding of the object and the carrying out of short-term and goal-directed actions toward the object. The analysis revealed that the team accomplished its shared goal through continual interactions at the different communicative events that made up the operational level of the activity structure. For example, ward rounds and Consultants’ clinics provided fertile ground for learning. There were also various forms of collaborations that extended to other units/departments, such as clinical meetings and morning reviews. These continual interactions and collaborations sustained the existing practices of the team and also brought about new experiences.
The CPT team was viewed as a social learning site that enabled effective access to information. The team members were able to gain practical insights from explicit information regarding patient care. Both learning and information sharing took place through continual interactions. Even learning that the participants did entirely on their own was related to their involvement in these interactions. The transformation of the individual team members into specialist physicians may be seen as a result of this continuity in learning and information sharing. They assumed a greater professional identity through medical language as encounters with manners and material arrangement of the social world (Holt, 2008, p. 55). This made it easy for the individual participants to identify themselves at a collective level in the actions and activities they undertook. This relates to Sundin and Hedman’s (2005, p. 295) assertion that professional discourse exerts a disciplinary logic that influences the individual practitioner’s information practices.

### 10.8 Tools and artefacts

The fifth research question on how tools and artefacts materialize and frame physicians’ work activity has been elaborated on in Chapter 8. Decortis, Noirfalise and Saudelii (2000, p. 12) note that the tools and artefacts “shape the way the activity is performed, and are themselves changed by the activity”. In this study, it was found that they served as mediational means between the subject and object of activity, and even amongst the participating actors themselves. The first part relates to the role of tools in work activity. The tools considered in this study were physical tools and language, both of which, metaphorically speaking, stood between the individual and the world (Sundin and Johannisson, 2005). It was found that tools served as mediational means in the information practices in work activity. The second part described the mediating role of a central artefact of the case notes. Case notes are an example of artefacts that are produced intentionally for the purpose of successful production and reproduction of the means of existence.

The theoretical framework utilized in this study emphasizes the central role of tools and artefacts, and this was supported by the empirical findings. The tools and artefacts were crucial elements in almost all communicative events and activities. From the analysis in Chapter 8, it was clear that tools and artefacts had convergent and divergent functions towards accomplishing the goals of activity. They were seen as meditational means connecting the actors in activity to the wider community. They were also found useful in providing and obtaining information. The information was used for diagnoses, for management plans of patients’ treatment trajectories, for decisions, to reconstruct past actions and events, to verify
previous and present findings, and for follow-up activities.

The use of tools and artefacts depend on the problem to be solved. Some tools have specific functions while others have broader functions that cut across contexts in accomplishing activity. For example, the mediating artefact of a case notes were found to provide information about all the activities undertaken in relation to the patient, while the stethoscope was useful in obtaining specific bodily information.

10.8.1 Physical tools

There were many physical tools identified in this study, and they were categorized according to their visibility in terms of being in-sight or off-sight during work activity. The tools categorized as in-sight were present in work activity and included the sphygmomanometer, stethoscope, and second hand wrist watch. The off-sight tools were not constantly present, but were of utmost importance in patient care. They included the calibrated thermometer, ophthalmoscope, patellar hammer, and tuning fork. Other in-sight and off-sight tools included common household items such as: cotton wool, ruler, weighing scales, tape and markers. Thus, the participants improvised and used some tools for purposes other than their original design. This relates to Engeström’s (1990, p. 174) assertion that the “presence of a tool in an activity does not mechanically determine the way it is actually used and conceived of by the subjects”.

Each tool has its own functions or co-functions for various purposes. The importance of any physical tool was adjudged by its relevance to the particular problem and to the actions necessary to obtain the desired information and attain the desired goal. For example, the CPT team members used physical tools such as the stethoscope and sphygmomanometer to intentionally elicit information from patients. The findings relate to Wertsch’s (1991, p. 102) assertions that “some tools are more powerful and efficacious for certain activities of life, others are more powerful and efficacious for others”.

Physical tools were seen as affordances in the process of activity. They exerted influence on the continuum for the activity in the past, present, and future. In this way, it transformed the intrapersonal experiences of the individual physicians into inter-subjective interactions. Also, the information elicited through the use of any single tool was in itself incomplete in attaining the goal of the entire activity system; it was necessary to combine it with other sources of information.
The physical tools appeared as indispensable and completely integrated into the team’s work activity. Physical tools did not act on their own but were manipulated by the subject of activity with the basic training and experience to act upon the object of activity. The participants were familiar with the techniques of using the tools to elicit information. The initial knowledge on how to use them was often already acquired during the participants’ undergraduate training. However, peripheral members did not completely master the tools, and had to be assisted and guided by core members. This entailed their everyday engagement (Billet, 2002) through processes of appropriation (cf. Chapters 4.5.3 & 9.3.2) that were effectively done through different strategies (cf. Chapter 7). Appropriation of tools was practically procedural as the participant wanted to ensure that they were either acting correctly or performing a task correctly. This implied an understanding of the ‘know-how’ knowledge as situated and Vygotsky’s (1978) zone of proximal development.

10.8.2 Language

The participants saw language as a crucial and versatile tool used for practical purposes in all situations where activities were undertaken. It was used for purposes of coordinating work activities; as a problem-solving device for interactions; for communicating with the patient or other participating actors in rendering their world intelligible; as a representational device for mirroring the external world and representing actions and activities; and for mediating learning (cf. Section 4.4.3.3.1). Language in work activity was, in this study seen either in the form of written text or as verbal utterances of speech. Speech was suited to collaborative activities and actions undertaken by the CPT team members together. In contrast, whereas written language was superior for historical and evidential purposes. Language in work activity was further categorized according to the social activity setting; 1) “general speech genre” tied to speech situations; and 2) “social language” tied to the classes of speakers or jargon. This categorization relates to Wenger’s (1998, p. 104) assertion that “the nuances and the jargon of a professional group distinguish the inside from the outside”. Bakhtin’s (2000) notion of the primacy of dialogic utterances was useful in understanding language as a tool used by different speaking subjects in the diversity of a social activity setting. The essence of utterances is communication and understanding what is being communicated.

Language was related to the two kinds of ‘listeners’ (i.e. the subject and object of activity), and a distinction was made between the two kinds of meaning identified: denotative and connotative meaning. The connotative meaning in this study relates to the social language within a medical culture, i.e. the medical jargon. The
denotative meaning of utterances adequately fit into the layman’s common language was linked to the patients as listeners. It was not unusual that ambiguities and vagueness emerged in the interpretation of denotative utterances due to the multiplicity of meanings in Nigeria; even more so, since it is a country with multiple languages. Clarifying the ambiguities required the expertise of an experienced physician to know and communicate accurately. Medical jargon was further subject to Vygotsky’s (1987) distinction between ‘everyday’ and ‘scientific’ concepts. The understanding of scientific concepts of the medical domain was seen as “systematic and for most part, encountered in educational contexts”. ‘Everyday’ concept in this case study implied understanding language as constructed in the contexts of actions and interactions by the participating actors.

However, there was no demarcating line between ‘scientific’ and ‘everyday’ concepts in the present setting. The culture of medical practice seemed to acknowledge the language acquired during the undergraduate medical training with proficiency of the medical jargon being further consolidated through everyday engagement in work activity. Many of the participants expressed how utterances of medical jargon were consciously mastered or unconsciously assimilated. Thus, the findings of this case study underscored Vygotsky’s (1987, p.220) assertion that the two concepts were never completely separate but intermingled with each other: “the scientific concept grows down ward through everyday concept and the everyday concept moves upward through the scientific”.

10.8.3 The mediating artefact

This section focuses on the intermediary role of the case notes as an artefact. From the activity theory perspective, mediation was a focal point and was seen in this case study as a constitutive feature for the achievement of collective and individual goals in activity. The significance and specificity of the case notes in occupying a central niche as an informative and communicative source in work activity made it an item for study as a mediating artefact. It was also possible to analyze how it influenced the information practices of physicians in this case study particularly as it functions as what Gorman (2000) termed ‘bundles’ (cf. Chapter 9.5.4). Many of the participants reasoned that they could not possibly have all of the patients’ past history in their memories. The case notes were useful in making connections with ongoing treatment pertaining to the object of activity. I would claim that the case notes so construed as a mediating artefact was central to the work activity of the CPT team members. Any activity system has mediational means as one of its features, and the role of the case notes in the CPT team’s work activity exemplifies this very well. The case notes help to understand the relationship between the subjects and object of activity, and between the individual participants and the
social processes of the activity system. Thus, I have used the concept of mediating artefact in this case study in a much broader sense than conceived by Engeström (1987) to explicate how the case notes place the activity of the CPT team in perspective, connecting the participants to the present situation as well as to the wider world.

The analysis of this case study showed that the case notes were primarily seen as a necessary artefact-in-progress that evolved over the trajectory of a patient’s health to normalcy. Considering the culture of medical practice governing physician-patient interactions, the case notes can also be equated as the official documentation on the treatment of patients and seen as a *sine qua non* for engaging in any work activity. As an official document, the case notes possessed certain inherent qualities that made them valid as evidence to authenticate activity. As emphasized by Berg (1996, p. 510), the case notes are seen as a “structured distributing and collective device, where all tasks concerning a patient’s trajectory must begin and end…” In light of activity theory, Kaptelinin (1996, p. 62) notes that tools and artefacts do not only mediate the activity but often empower the individual even when the tool is no longer in use.

The case notes contained a set of pre-defined data on a patient’s health profile. Their format supported certain uniformity. The case notes were problem-oriented rather than domain-oriented sources. Several functions emerged when the case notes were seen as an artefact-in-progress. For example, the case notes functioned as a repository, and in this study, were seen as embodying where the team’s activity began and ended. The case notes were unique to a particular patient and could not be replaced by other documents or textual sources. Their evidential value was seen as a parameter for assessing participation. Moreover, they provided evidence that participants had attended to specific activities. The case notes were used as the basis for a plethora of activities, it shaped and modified activity, and was used to keep track of and to control activities that were undertaken by other physicians. They functioned as resource for comparing actions and activities in the bid to identify missing gaps and discrepancies. The case notes were also useful for administrative purposes such as registration and the administration of drugs. These purposes were work-related, and the assumption thereof was that the case notes were generated by work activity itself, by the more elaborate actions or input during communicative events such as the ward rounds, Consultant’s clinics, and morning reviews. Thus, the case notes were seen in relation to the participants’ engagement in different information practices.

In studying the case notes as mediating objects in the activity system, other issues that were not discussed in the theoretical framework, such as power relations and
the fleetingly mentioned issue of resistance, surfaced up in the study. Resistance can be realized pragmatically through the use of the case notes as a mediating artefact. In some of the participants’ responses, their subtle rejection (push something or someone away) of the mediating artefact and their capacity to strive against or oppose the use of it was subtle and only partial, but still apparent. Resistance was seen as having the obvious advantage of affording the participants the opportunity to learn or even enhance their information activities (making their own judgment before consulting the case notes). More importantly, this subtle resistance served the subjects’ desire of being active actors in the activity system, particularly in putting the existing practices under scrutiny. However, resistance in this sense may not be recognized as it operates below the level of goal-oriented action and operational standards of the activity system. To understand the issue of resistance in the use of the mediating artefact, I suggest that a researcher must look beyond the structure of the activity *per se*, and shift attention from the group’s actions and activities to the isolated actions and activities of the individual.

The study of case notes revealed the prominence of power relations through the use of the case notes and how their understanding can be incorporated into the analysis of the mediating artefact in an activity system. Activity theory highlights the influence of multiple voices on the object of activity, but ignores the role and influence of power in determining the use of the mediating artefact. The aspect of power is more clearly illuminated through Lave and Wenger’s situated learning perspective that incorporates the power relations in respect to “the social organization of and control over resources” (Lave & Wenger, 1991, p.37). Maintaining or modifying power relations is seen as a central issue in practice (Wenger, 1990, p. 173). The power relations resonate with work activity and were embedded in workplace learning processes in the CPT Unit through the use of the case notes.

The power relations were indicative of a community, which promotes learning not only for explicit and implicit purposes. The focus was on the interacting peripheralities of related communities of practice. The case notes reflected the power relations of the CPT team as a community of practice linked to other communities of practice, where the relationships were suggestive of a hegemonic order in the activity system. Hegemony was demonstrated through the predominant influence that actors had over the mediating artefact and their access to it. For example, it was clearly determined who was required to fill in different information in the case notes, who was allowed to read it, and in the case of problems, whose information prevailed. Even though they were more distanced from the object of activity, physicians of the wider community had greater influence compared to non-physicians. At the same time, other members of the wider community exercised little influence over the case notes even though they were nearer to the object of
activity than the physicians. It appears that the power relations were not accidental or marginal but intricately intertwined in the social practices inherent in the entire work activity. This conclusion emphasizes Lave and Wenger’s (1991, p. 42) view on learning that incorporates an appreciation of the “hegemony over resources for learning” within “unequal relations of power”. As with the case notes, depending on the role of the actor, power relations either facilitated or impeded access to the information in the mediating artefact.

The case notes provided different affordances around which social practices were focused. For example, the case notes were seen as a bundle for the team’s information processes, as a boundary object for linking the CPT team with the wider community in the activity system, and as a mean for workplace learning. The need to coordinate practice through the mediating artefacts allowed other perspectives across boundaries and time, and to visit the “object of activity” through the same prism or lens as the subjects. For example, the members of the wider community, had access to the case notes, namely: specialist physicians, nurses, laboratory attendants, pharmacists, and accountants. In analyzing the case notes in Chapter 8, I claimed that it may also function as a boundary object between communities of practice, articulating the relationships in them. I also illustrated the features of flexibility inherent in the case notes to allow different types of connections across boundaries. In this regard, as a boundary object, the case notes maintained the coherence of information that spanned multiple contexts within the teaching hospital. This included physicians and other medical professionals, non-medical professionals, and amateur, lay and academic representatives. In the same vein, the case notes enabled various perspectives in the information process that enhanced coordination between the participating actors in activity. Sometimes, the case notes were used as a boundary object to explain troublesome phenomena by identifying missing gaps (Engeström, 1990, p. 191). In this way, it became a nest for series of modifications made on the object of activity.

Thus, the case notes assumed the position of a boundary object where different perspectives were able to converge in the attempt to align them for the same purpose or in the same object. This indicated Star and Griesemer’s (1989) assertion of boundary objects as artefacts that are flexible enough to accommodate different interpretations emanating from the various social groups, yet robust enough to maintain a common identity across sites (contexts and boundaries). Moreover, the case notes appeared as an extraordinary boundary object since it embodied activities made in one unit about the status of the object of activity to be involved in activities of another unit. The collective recognition of the case notes became crucial in determining the relationship between the subjects and the wider community. In Engeström’s activity system diagram (Figure 4.3), artefacts are
placed at the apex of the triangle alongside with physical tools to indicate their position between the subject and the object and maintaining a farther distance to the wider community.

The concept of reification was introduced by Wenger (1998, p. 58) to refer to “the process of giving forms to our experiences by producing objects that congeal this experience into “thingness””. The case notes portrayed the activity per se, and travelled through the different units/departments in the teaching hospital supporting the varying practices of respective members. According to Wenger (1990, p. 176), such self-reflection can hardly be distinguished from practice as “there is no practice without an image of itself; and more importantly, that image is part of the practice…it functions inside of it”. Viewing the mediating artefact from outside may only become useful inside if “it can result in a co-practice, in a process of mutual legitimate peripheral participation that extends…transparency through…participation” (Wenger, 1990, p. 176). According to Wenger (1998, p. 59), “having a tool to perform an activity changes the nature of that activity”. Certainly for the CPT team members, encounters with the object of activity without case notes were unimaginable. In fact, none of the other tools (physical tools and language) captured the CPT team members’ work activity like the case notes in its reified form.

The case notes also had widely established learning implications. It was useful in integrating newcomers, and also in perpetuating practice. In socio-cultural theory, learning is seen as a continuous activity whereby appropriation of artefacts is phenomenal in engaging in everyday activities. This entailed not only adopting the artefact but according to Wells (1999, p. 155), gaining mastery of the artefact in the course of engaging in activity. According to Wenger (1998, p. 99), practice is fundamentally a social process of shared learning that cuts across generational discontinuities.

In sum, the case notes were an eminent carrier of information, and useful in several information practices. The case notes were a material representation that constituted its significance as evidence of activity pertaining to an object. The physical format of the case notes provided access to information about a patient’s past history. This property was integrated and inherent in any set of case notes and enabled not only basic-fact-finding, but also making interpretations from previous entries to fit into the present situation. Activity per se incorporates a past and a future sometimes involving processes not originally intended by the mediating artefact. The patient’s past history and how the patient had previously been managed is important in attending to the patient at the present. The peripheral members systematically used the case notes as the search path to obtain information
about past actions and activities towards the present situation. In this way, the case notes were used as an entry point to the patient’s history. Perhaps the most recurring motive for using case notes by the participants was “to see what had been done for the patient” or “to read what we discussed during our previous encounters with the patient” or “to verify that what was said to be the patient status or the disease that was diagnosed was collectively agreed upon”. The case notes were useful in strengthening the information processes in two related ways:

1. By incorporating patients’ past medical history into the decision-making process; that is, to find out what had so far been diagnosed and how the patient had so far been treated or managed.

2. By opening trajectories of continuity and consistency of actions and decisions that allowed the case notes to be used for subsequent follow-ups.

The normative structures of the case notes enabled a configuration of reification that enclosed the activities undertaken on the object of activity by the participants. The case notes also provided representations that could trigger new interpretations thus offering a broad picture of the object of activity. This, in turn, implied that the case notes could provide an ‘information space’ for brainstorming as well as for consensual agreements. This in itself enabled participation and supported information practices beyond the actual work activity, as members were able to learn from the input of others.
In this final chapter, the theoretical implications are highlighted. The case study is evaluated and the main limitations are identified. The study’s contribution to the overarching aims and its relevance for different research areas are discussed accordingly. A third and last section points out and identifies areas where further research is needed.

### 11.1 Theoretical implications for information practices

This section presents the theoretical implications of the results of the case study for information practices in work activity. This is achieved through the integration of the key points of the theoretical framework (cf. Chapter 4) and the main empirical findings (Chapters 6, 7, 8 and 9) in this case study. The ideas proposed here reflect a sociocultural viewpoint that takes into consideration the situatedness of the studied case and places the emphasis on the mediating role of tools and artefacts. In this regard, knowledge is seen as extending beyond the individual cognitive processes, including not only the explicit and procedural knowledge, but also the conditional genesis that considers the situatedness of the phenomena of study.

The theoretical implications are developed and evaluated in terms of contextual elements that can be used to analyze work activity and related information practices. Activity theory is a theory about work and is significant for understanding and analyzing human activities in the workplace. The framework itself is not very detailed and in the strictest interpretation of the term, cannot mean what is usually referred to as a ‘theory’ within research. Rather, it consists of a set of basic principles, which constitutes a general conceptual system as a foundation for understanding more specific theories. According to Bannon (1997), activity theory does not provide any clear methods as to how activities are to be recognized, delineated, and scrutinized. There are also no guidelines to help researchers confirm that what they are observing is indeed an activity system (Davies, 2007, p. 255). Davies (2007) notes that with "the often-shifting elements of the activity system, it can be difficult to identify when something is a mediating artefact or an object, or when something is a part of a wider community or overlapping activity system, for example. It is a theory somewhat at odds with its origins in that it has become generic when it started as very individualistic, concerned as it was with learning and children’s developmental psychology".

I chose activity theory for this study because of its conceptual framework through
which other theories can be developed. It also illuminates and elaborates on the interrelated elements identified in this case study as useful in understanding information practices. According to Wilson (2006), the use of activity theory in library and information science can help us consider the “wide range of contextual issues that influence information behavior and information exchange”. In this regard, a socio-cultural viewpoint can benefit from activity theory as the starting point. The essential elements originally adopted from Engeström’s (1987) model are used to examine an activity. The activity may be understood through two other levels: the activity system and the hierarchical structure of activity. The activity system in Engeström’s model is made of different components: the object of activity; human actors comprising of homogenous and heterogeneous entities that make up the subject that act upon the object and the wider community respectively; the rules and norms; division of labour; tools and artefacts; and the goal of the activity system. The structure of activity is comprised of three levels: activity, actions, and operations.

My assumption was that the activity of physicians takes place within the cultural-historical setting and is inseparable from workplace learning. The team of physicians (subject) acts on the patients (object) as part of the cultural-historical setting and as related to other units/departments in the teaching hospital (wider community). There are explicit rules and implicit norms that govern the practices of medical professionals. The division of labour determines both the horizontal division of tasks between the members of the community and the vertical division of power and status. The expertise of the team members is mirrored in the interactions and reflected in the engagement in information practices, which are aimed to supporting the treatment of patients. Tools and artefacts mediate the interactions between the physicians and the patients in the process of attaining the ultimate goal of restoring patients’ health to normalcy. Two of the inseparable outcomes from acting upon patients are learning and the transformation as members of the medical profession.

There are some areas of interest associated with activity that need further elaboration. These include: the range of interactions and communications within activity, situations, participatory practices, modes of engagement, affordances, and curriculum pathways. Activity theory has not yet offered guidance into these details. I found this guidance from theories on situated learning and communities of practice, which belong to the field of practice theories on learning. To me, they seemed to be compatible with activity theory and its contextual orientation. Activity theory proposes a specific notion of context in that the activity system itself is the context. The different levels of the activity system, to some extent, constitute the context. However, conscious or unconscious learning emerges from activity and hence, it can be said that activity is a precursor for learning or that
learning occurs in the context of a meaningful activity. However, a pertinent question that could be considered is how to categorize and synchronize relevant and specific terms such as who the participating actors are in activity. While in activity theory, participating actors could be categorized according to their relationships to the object of activity (either as subject or the wider community), participatory actors in communities of practice are categorized according to their social positioning on the peripherality (peripheral, core and marginalized membership).

Situated learning is a practice theory that explains how learners become involved in ‘communities of practice’, which embody the culture of practice to be acquired. Situated learning and communities of practice are mid-level social learning theories that emphasize learning as social participation. This entails a more encompassing process of being active participants in the practices of social communities, becoming enculturated, and becoming part of such communities. Mid-level implies that both theories are caught in the middle of many other theories such as: theories of social structures (the primacy of institutions, norms and rules, and emphasis on cultural systems and discourse); theories of situated experience (people’s interactive relationships with their environments); theories of social practice (everyday activities and real-life settings with an emphasis on social systems by which groups organize their activities); and theories of identities (the social formation of persons and the cultural interpretation of the body) (Wenger 1988, pp. 12-13).

Consequently, both situated learning and communities of practice theories are more granular than activity theory and perhaps, lend themselves better to being applied small groups in research. These theories are in their first generation of application and conceptualization. Activity theory has evolved over three generations of research, stretching back to the 1920s (Engeström, 2001, p. 133). However, all three theories challenge the Cartesian mind-body dualism, and assume that mind and body are interrelated. All three theories can also be seen as variations of what Wenger (1998, p. 47) called “doing in a socio historical and social context that gives meaning and structure to what we do”. It is therefore difficult to view them outside of their socio-cultural context. Concern with issues of practice and activity go all the way back to Karl Marx’s (1844) use of the notion of ‘praxis’ as the socio-historical context for a materialist account of consciousness, and can even be traced back to Plato’s argument on the nature of a republic (Cited in Wenger, 1998, pp. 280). The Marxist philosophy seems to be the greatest influence on activity theory and the pragmatic philosophy seems to be the greatest influence on situated learning and communities of practice.

Recently, there has been a focus on how understanding information practices from
the perspective of practice can enable a practice to emerge. However, there is a lack of theoretical frameworks for analyzing information practices. Within the LIS field, there is no unified approach or definition of practice as “the term ‘practice’ appears to be accepted at face value and applied at definitional levels” (Lloyd, 2010, p. 246). The same problem also applies to the definition of information behavior. Lloyd also notes that the term lacks any of the deep and complex theorizing that has been accorded the concept in other fields, in particular, those with a rich sociological tradition such as education.

The three theories that I have considered are valuable for understanding information practices in the complex real-world information environments of a workplace. Information practices are then viewed as socio-cultural practices that occur inside other practices. Investigating phenomena of information practices thus entails a focus on a range of practices that are continuously ongoing in the diverse meaning-making activities of the participating actors. The consideration is on the nuanced contextualized understanding of the interplay between the participating actors in activity, the activity per se, and the intermediary roles of tools and artefacts. Information practices that pertain to work activity are seen as inherently social, because what enacts or enables an information practice, how it is understood, and how it is sustained over time, occur within the social realm of work activity. It also entails viewing information as: 1) constituted through a constellation of information-related activities (Lloyd, 2010, p. 251); and 2) revealed in the activities by finding, using, and sharing information to do their work and sustain their identities (Choo, 2008). In patient care, these activities included diagnostic, therapeutic, monitoring, and discharging activities. This then implied focusing on contextual factors that take into account other social phenomena that are extant to information practices (e.g. other practices and actions).

Information practices are not only viewed as social, but also as holistic processes, which according to Schatzki (2005, p. 471), are composed of material arrangements. Lloyd (2010, p. 249) notes how such arrangements hang together and overlap, thereby forming a mesh of practices. In this study, the material arrangement included tools, artefacts, and information sources that were textual, physical, and social. However, various emergent strategies were employed depending on the source in use, including observations, demonstrations, etc. Information practices were then constituted through multiple information sources and strategies in several ways. First, information practices enabled access to information through information sources and strategies. Second, information practices related to these sources and strategies were significant for facilitating problem-solving. And third, an understanding of these sources and strategies enhanced learning.
All three theories that I have considered for this study can be conflated by their nature of being bound and made visible through their situatedness, suggesting that they are tied to context. It also suggests the supremacy of activity theory in providing a base to understanding the contextual phenomena. In combination with the two practice theories, the focus was on the collective work activity, rather than on individuals, where mediation through tools and artefacts seems to be a focal point. It was the emphasis on mediating artefacts in activity theory that made activity theory stand out as a valuable framework for examining information practices in the present study. However, the level of analysis of the information processes cannot be adequately addressed at the activity level and I argue here that it requires other levels of analyses incorporated from practice theories and INSU models. Thus, I suggest that activity theory provides a bridge to combine the activity level of analysis and the other contextual determinants.

One great advantage of using activity theory is its emphasis on the history of an activity. However, I noted that analysis of the actual activity as well as the history of the activity could be discounted and impossible to understand if the historical background is ignored. I was unable to link my analysis to the historical trajectory of the activity system as strongly as I had expected. The historical analysis of this case study through the activity theory perspective could have been stronger. However, this was augmented by the background history of Nigeria. In addition to the historical aspect, another deficiency of activity theory is that it can be identified as being on the social level of analysis. In Engestrom’s model, the emphasis is on the social at a general level, whereas in this thesis, the distinctive feature of the social level is emphasized by the participatory modes of engagement.

The issues raised in the discussion above constitute implications for how to consider information practices in work activity. The descriptions therein implied the understanding of information practices as phenomena that were more deeply concerned with complex contextualized practice, processes and interactions. This means that the activity system is no longer a triangle, but subsumed within a cultural-historical setting, and thus could assume a ‘circular’ shape. The re-conceptualization presented implies focusing holistically with all the contextual elements on equal footing with each other. The assumption thereof is that the several contextual elements existing in work activity influence information practices and need to be acknowledged as such in research on information practices.

My main findings relating to theoretical or methodological contributions are:
The activity system (object, subject, community, rules, division of labour, tools and artefacts, and goal) and its hierarchical structure (activities, actions, and operations). In this step, the basic components of the activity system are defined in the following questions: who are the subjects? What is the object? And, what is the goal of the activity system? This is the first stage, and it aims to identify the contextual elements in the study. The first stage can, however, continue throughout the study.

The participatory modes of engagements that sustain situated learning in the community of practice: These consist of the core and peripheral members and the marginalized outsiders. This step is linked to the first stage as it pertains to the subject of activity and members of the wider community.

The curriculum pathways that implies knowing the navigation of the curriculum activities depicting three interdependent levels: everyday engagements; direct guidance by experts and peers; and indirect guidance as influenced by the environment.

Information processing: This step entailed information practices along with information sources and strategies. The information-processing step examines the available information sources and strategies, and what information practices can be identified. These stages could be analyzed at the onset as well and ought to be ongoing throughout the study.

11.2 Evaluation of the study

This research is practice-oriented. One great challenge of a study of this kind is that the major key concepts used in doing the investigations of the phenomenon being studied manifest themselves in a number of ways. For example, practice is a concept that has many faces, and those seeking an unambiguous definition are likely to be disappointed. The same applies to the concept of context, which has also remained ill-defined, amorphous, and elusive. The elusive nature of such key concepts may lead to the question of whether practices are able to be researched at all.

The overall research problem was to find out how people in workplaces were aware of information that was embedded, intricately intertwined, and tightly bound to the
ongoing routines of their everyday work activities. Participating actors are more concerned with the actual work *per se* than practices that relate to information. In this case study, information practices were seen within the framework of people interacting in situated work activity as influenced by tools and artefacts. Access to information was fruitfully gained through information sources and strategies. The ideas for understanding information practices, as outlined in the preceding section, need to be evaluated and commented on by other researchers for further elaboration. I am convinced that the ideas can be applied as an analytical tool in other settings and thus contribute to further research. They may serve as a methodological tool to assess and examine contextual phenomena and current practices in work activity.

From the supposition in the preceding paragraphs, it is thus reasonable to evaluate how much, or how well the empirical findings answered the research questions of this thesis. The research questions were concerned with identifying contextual elements in work activity, how access was gained to information through different information sources and strategies, different aspects of information practices that could be identified in work activity, and the role of tools and artefacts. These issues have neither been explored nor studied in research on INSU in Nigeria, or even Africa. It was pertinent to use previous literature and underlying theoretical principles and concepts that cut across different disciplines to explicate the phenomena of the case study context. In this regard, apart from the fact that underlying socio-cultural theoretical principles immensely guided the empirical field study, the principles were also useful in making extrapolations and illustrations in the analysis supported by the previous research literature. For example, activity theory provided a good viewpoint for examining and evaluating contextual phenomena. When I relate the case study to the literature and theoretical framework, I can summarize that the results support the theoretical framework. The results indicated that information practices could be adequately explicated by concepts from developed countries.

Moreover, this thesis provides a practical framework to study information practices in work activity, and as such, serves as a useful complement to other INSU research on socio-cultural studies that place emphasis on the role of tools and artefacts in social interactions.

I have set forth the four different criteria proposed by Lincoln and Guba (1985) to determine the trustworthiness of this study and make a case as to why it warrants serious consideration as a valuable contribution to the body of research. I make no claims as to what extent the results of this study can be generalized throughout Nigeria or other African countries; this was not the purpose. The purpose of this
research has been to gain an in-depth understanding of a specific phenomenon, namely information practices of medical professionals in work activity. This hopefully contributes to the knowledge of information practices in general, and information practices in work activity in particular. I firmly believe that the results fit the larger context and can be evaluated in relation to other studies. For example, the numbers of contextual factors enumerated and described provide a good overview of the elements required for studying contextual phenomenon in work activity. The number of information sources and strategies identified in the case study context adds to the holistic understanding of information related phenomena within the medical domain.

The use of the qualitative method in conducting LIS research in Nigeria is unusual compared with the use of the more popular quantitative methods. My research is oriented to an empathetic understanding of the phenomena of study, which Weber (1981, p. 159) referred to as Verstehen. It aimed to understand the phenomena of the study context by grasping the meaning of the social realities. Information practices were studied as social practices in work activity, and the methods, techniques, and practices were used to examine and clarify relevant issues pertaining to this stance.

11.3 Contributions to body of knowledge

The overarching goal was to gain a deeper understanding of the information practices of professionals in occupational settings. Specific goals were identified in the thesis in order to indicate: how professionals interacted and made meaning in the context of a complex set of social activities in the work place; how professionals individually or collectively gathered, made meaning, produced, shared and used information; and how workplace learning influenced information practices. This thesis is the first of its kind in Nigeria, and the expectation was that the results of this thesis would support the development of information systems, practices, and services, particularly at the feasibility stage of information systems design and analysis (Isah & Owushi, 2006). The purpose was to first provide empirical knowledge about information practices of a specific target professional group in Nigeria, and accordingly, to see how the results could be generalized to other professional groups and perhaps result in making appropriate recommendations for improving the information environment.

This study contributes in a number of ways to our understanding of information practices in the workplace. The first contribution is undertaking this research as an empirical study in a developing country in response to the many proposals in the
INSU research field. It addresses Davenport and Cronin’s (1998) call that researchers ought to look at the world of work per se and not the isolated activities of individuals. This thesis answers Talja and McKenzie’s (2007, p. 101) proposal that attention ought to be shifted to communities of practice in understanding how groups organize their work practice through interacting with significant others and the available tools and artefacts.

The emphasis on the intermediary role of tools and artefacts in information practices was found to be fruitful when studying information practices. To this effect, I have provided descriptions of tools and artefacts in relation to mediations and mediational means, which allow the possibility of linking them with other concepts such as boundary objects. As for the functions of tools and artefacts, the spectrum of tools and artefacts in work activity was equally considered; the tools and artefacts were used, despite their original function, for their ability to help solve problems at any given point in time.

The combined theories and models cut across different disciplines representing a novel integration of ideas from different perspectives such as the cultural-historical activity perspective, learning-in-practice theories, and information seeking and use (INSU). All the issues included in the framework have been utilized in the analysis. This kind of framework ought to be particularly fruitful for investigating information seeking in workplaces, work practices, occupational settings, and even in educational institutional environments. The framework is broad enough to cover many aspects of the empirical realities and other relevant issues required. One of the assumptions in this case study was in line with the thoughts of researchers such as Billet (2004), Lave and Wenger (1991), and Rogoff (1995) that participation in social practice was analogous to learning. It was assumed and found that workplace learning had a profound influence on information practices.

The main methodological contribution is based on the use of the socio-cultural approach to INSU. The socio-cultural approach, as a tool, was the method of inquiry used to capture the dynamics of processes in diverse context. However, the methodological approach cannot be separated from the theoretical framework that frames the underlying principles used to examine the empirical data. I presented a methodology grounded on collaborative relationship with significant others and focused on three key issues –social components, cultural components, and context. However, activity theory was taken as the base for understanding the socio-cultural approach, which has work activity as it’s prototype and main ‘unit of analyses’. Good techniques for analyzing and representing work activity is needed in studying context, and one of the appeals of activity theory was that I felt it had the potential to direct attention to all the fuzzy aspects of context in work activity. Activity
theory was also useful as a method for understanding the role that tools and artefacts play in mediating perspectives in activity. Activity theory does not provide all the tools to study the peculiarities in a study context. In this respect, some other specific methods suitable for examining context were considered. For example, interpretative methodology was fruitful in understanding the socially meaningful actions of the participating actors. The theoretical framework for this study is explained in Chapter 4 and the way it is used for inquiry in the study is illustrated in Chapter 5. One could ascertain that the methodological contribution had two main aspects. Firstly, the suitability of the socio-cultural approach for INSU research was tested and proved. Secondly, the socio-cultural perspective was further elaborated on to make it more appropriate for undertaking INSU research.

Because the research is practice-based, it has practical implications that may be useful in understanding the day-to-day actions and interactions of participating actors in work activity, especially as related to learning. The details contained therein in the thesis are of practical significance and actually connote ‘doing’ in the social context of the workplace; that is to say, they mostly address the interactive relations of the actors with their environment. As indicated (cf Chapter 1.3), the study is intended to have a concrete impact on how work activity influences information practices and vice versa. When making projections and plans for new information systems, the study proposes that explicit and tacit issues should be addressed from the onset with the intended aim of establishing the links between information practices and the variants of the explicit and tacit. Explicit issues that can be addressed at the onset may include language, tools and artefacts, information sources and strategies, the clear-cut and well-defined division of labour and job roles, communications, work procedures, and rules. Tacit issues may include norms, embodied interactions and understandings, implicit relations between participating actors, and common world-views. The results of this thesis can therefore be generalized to other familiar and unfamiliar research settings, and the framework and methods used in the study are explicit enough that they can be applied to other settings in the first place. The findings are not restricted to research settings in the Nigerian or developing country context, but can be transferred to other countries and areas as well.

11.4 Limitation of the study

The present study has three important limitations as they pertain to the methodology used for the study. Firstly, this study intended to use multiple-case design in a two-case or three-case study in the research setting. According to Yin (2003, p. 53), it will be better to do a good case study through a ‘two-case’ case study rather than use a single-case design. Single-case designs are vulnerable as it
is assumed that the researcher has put “all your eggs in one basket” (Yin, 2003, p. 53). More importantly, there is the possibility of direct replication; the analytical conclusions arising from the two cases would be more powerful than those coming from a single case (p. 53). Also, the context of the two cases is likely to differ to some extent, and this would have immeasurably extended the external generalizability (i.e. the transferability) than with a single case alone. Furthermore, the criteria requiring sample size is not necessary in multiple case studies. However, conducting such a study was not possible due to time constraints and the extensive resources required beyond my means as a single independent research investigator. Thus, it was obvious that the decision not to undertake a multiple case study for this thesis was not made lightly.

Secondly, I envisaged using audio and video recording, as these would have allowed complementary modes of observation-based inquiry with the aim of capturing the accuracy in the physician-patient encounters and also the interactions amongst the participants. It could have also opened up discovering and exploring other sensory evidence such as the bodily-based activities in social processes in order to understand what fully transpired in the varied encounters and interactions. For example, video recordings can be used to capture the team’s demonstration technique of tools and artefacts. Both audio and video recording are seen to be reliable techniques as they allow for repeated examination of the data as in real-time. However, the sensitivity of patient care in Nigeria made the use of these data collection techniques impossible.

Thirdly, I had proposed in the research design for “team and member checking” (informant feedback or validation) as an aspect of winding up the data collection process. Lincoln and Guba (1985) see member checking as the most crucial technique for establishing credibility and thereby ensuring trustworthiness in qualitative research. I expected to give the CPT team members the interpretations and report (or a portion of it) after the study was completed to check the authenticity of the empirical results. The intentions were to allow the team to: critically analyze the empirical findings; assess the adequacy of the data; confirm whether or not the results reflected the reality on the ground in terms of the members’ experiences, activities and practices; and correct errors and challenge what they perceived were wrong interpretations. In addition, as a process for re-evaluation, it could have provided the opportunity to obtain additional information from the participants. In this way, member checking could have helped to improve the trustworthiness of the study as the team members’ feedback was intended to serve as a check on the viability, authenticity, and originality of the interpretations. However, this process was not achieved due to time constraints on my part and the extensive demands that it would have exacted on the participants’ time. Also, member checking relies on the assumption that there is a fixed truth of reality that
can be accounted for by a researcher and confirmed by a respondent (Angen, 2000). However, from an interpretive perspective, Angen notes that understanding is co-created and there is no objective truth or reality to which the results of a study can be compared.

11.5 Suggestions for further research

It would be a wasteful venture to undertake an INSU research of this magnitude, as I have conducted in a developing country, and then to just move on to some other life venture. This was not the purpose even as funding LIS research project is not a usual practice in Nigeria. This research is the first of its kind in Nigeria, and as new and fertile terrain, is a starting point for other studies in related areas in Nigeria. Therefore, my ambition is to ensure that this study serves as a springboard for INSU research pursuits in Nigeria. There are many interesting aspects to explore, the first being to conduct multiple case studies. While it is a worthwhile venture to consider conducting such research in familiar terrain such as workplaces, amongst professional groups, and occupational settings, there are also possibilities to undertake such research in unfamiliar terrain such as educational institutionalized settings (in classrooms and scientific laboratories), everyday life activity amongst non-professional groups, and in non-work environments.

The analysis of certain issues that have been initiated in this thesis ought to be of interest for further research. Two such issues relate to resistance and power relations that surfaced in the role of mediating artefacts. Resistance to the use of the mediating artefact is one way of understanding the case notes as a mediating artefact. From the perspective of activity theory, the subject of activity cannot resist the artefact, but there was some evidence of subtle resistance in this case study. Hence, future research may look micro-analytically, below the level of action and its goals. Also, there is the issue of power relations in mediating artifact, which is discounted in research employing activity theory. Issues of power may address the concerns of hierarchy and hegemony in the workplace. Of course, there are inherent power differentials in workplace relationships and understanding the realities of group dynamics in workplaces is important. Another area of interest that requires further attention is related to issues of affordances pertaining to the mediating artefacts around which social practices are focused. Future research should investigate affordances of immensely varied kinds not only as they pertain to case notes, but in different situations and events that affect information practices. It would be interesting to examine the potential implications that this may entail.

In addition to the above, there were issues that appeared fleetingly in the analysis or
that were briefly touched upon, each of which can form a viable topic of study on its own. One such topic is the issue of determining the authority of information sources and strategies. The use of Wilson’s (1983) cognitive authority was limited in the analysis of this case study, but ought to be found useful in concentrating on the many ways information sources and strategies may be recognized as reliable and trustworthy enough to be included among used information sources and strategies. The issue of professional identity that was fleetingly mentioned in this thesis is another such topic. According to Wenger (1998, pp. 145-146), identity serves as the pivot point between the social and the individual, and is continually negotiated as each can be discussed in terms of the other. Professional identity - how participating actors experience their work, how they interpret their position, what they understand about what they do, what they know explicitly or tacitly, or what they try to know - are neither individualistic nor the result of belonging to a social category. Additional issues include the tensions and contributions. Because tensions and contradictions provide the potential driving force for change in an activity system, they may also form a viable study topic of their own.

There are also other issues that were accorded attention in this study that may be of interest to investigate. For example, I did not examine the role of embodiment in the use of tools and artefacts. Embodiment is regarded as an important aspect of situational knowledge and plays an important role in work activity (Lloyd, 2010). I assume that the bodies, tools, and social interactions are dynamically and tightly interrelated. Their integration ought to be an important area of future research. Again, the relationship between physical and linguistic tools as mediating artefacts need to be examined and further explicated. They both have functional meanings, which cut across contexts and are seen to be mutually interrelated.

While I have examined the various aspects of information practices in general, the most important part for further research would be to examine the various aspects of information practices and their relationships to workplace learning. Workplaces as learning environments emphasize workplace participatory practices as conceptual foundations that have been studied widely and extensively (Billett, 2004). For example, most researchers found that there was no separation between engagement in thinking and acting at work, and learning (Billett, 2004; Rogoff, 1990, 1995; Lave, 1993). An alternative view is to examine how information practices affords participating learners. Another aspect is an in-depth examination of the influence of social learning communities on the entire information processes in the social construction of meaning-making in work activity. Such a study would complement previous research such as Lloyd (2007; 2006) within the INSU field. I have tried to map out a theoretical framework combining different theories. However, a complement to studies of information practices that may prove fruitful may be by adopting specific theories or concepts within the framework to analyze these
practices. For example, appropriation, which refers to how individuals adopt tools and artefacts through interactions with their environments (Sundin & Johannisson, 2005, p. 35), could be a potential concept to consider for their usefulness in work activity.

11.6 Concluding words

It can be concluded that information practices in work activity is ongoing, is in a state of flux during continuous and routine everyday work activities, and may thus differ from information practices in other contexts. The specific characteristics are obvious in the role-play in learning communities, how access is gained to information through different sources and strategies, and the availability of tools and artefacts that mediate perspectives in information practices. The findings of this study have shown that information practices are even more complex intricately embedded, and intertwined with work activity and workplace learning than previously assumed in the research literature. The socio-cultural perspective can enrich the understanding of information practices.

Now that we have been able to piece together different aspects of the puzzle of information practices pertaining to context, information access, the actual information practices, and available tools and artefacts, I acknowledge that the practice turn in information seeking is a perspective whose time has come, and this thesis is one of many such ventures. However, this is only the beginning, as future research will certainly reveal.
Denna avhandling är en användarstudie inom biblioteks- och informationsvetenskap och fokuserar på att förstå deltagande praktiker inom en yrkesgrupps arbetsrelaterade aktiviteter. Detta har bara till en mindre del undersöks i tidigare biblioteks- och informationsvetenskaplig forskning. Avhandlingens kvalitativa empiriska fokus pendlar mellan läkares engagemang i arbetspraktiker och lärande på arbetsplatsen inom patientvård. Det övergripande forskningsproblemet koncentrerar sig på fenomenet om hur människor på en arbetsplats hanterar information som är inbäddad i, sammanflätad med och tätt bunden till de pågående rutinerna i deras dagliga arbete.

**Syfte**


Följande fem forskningsfrågor har behandlas:

1. Vilka särskiljande egenskaper hos läkares arbete inramar deras informationspraktiker?
2. Hur får läkare tillgång till information?
3. Vad karakterisera de informationspraktiker som är relaterade till läkares arbetsrelaterade aktivitet?
4. Hur ser relationen ut mellan lärande på arbetsplatsen och läkares informationspraktiker?
5. Hur materialiseras redskap och artefakter och hur ramar de in läkares arbetsrelaterade aktiviteter?

**Teoretiskt ramverk**

Den epistemologiska utgångspunkten för denna avhandling utgörs av det sociokulturella perspektivet, vilket understryker det dynamiska och ömsesidiga beroendet mellan individer och social och kollektiv utveckling genom medierande redskap och artefakter i kulturella, institutionella och historiska situationer. Sociala praktiker som informationspraktiker utvecklas på en kollektiv nivå i arbetsrelaterade aktiviteter. De redskap och artefakter som är involverade i dessa aktiviteter representerar inte bara en social verklighet, utan de har en primärt medierande och konstitutiva roll när det gäller hur individer förstår och agerar i olika situationer. Detta angreppssätt användes för att fånga dynamiken i olika situationer i de patientvårdande processerna för ett läkarlag.

Kulturhistorisk aktivitetsteori (CHAT) och praktikteori var de två teorier som användes för studien. Den kulturhistoriska aktivitetsteorin användes för kontextuella frågor vilka påverkar informationspraktiker i arbetsrelaterade aktiviteter: objekt och subjekt för en aktivitet; arbetsdelning; regler och normer; gemenskap; redskap och artefakter; liksom aktivitetssystemet i sig och aktivitetens hierarkiska struktur. Fördelen med att använda aktivitetsteori i användarstudier är en medföljande förståelse av de praktiker som användarna är en del av. Teorier och begrepp från praktikperspektivet på lärande ansågs användbara för att uppnå en djup förståelse av olika former av deltagande aktiviteter på arbetsplatser, liksom de influenser som sociala lärandegemenskaper har på skilda informationspraktiker. Det antogs att lärande på arbetsplatsen har en djup påverkan på informationspraktiker.

**Metoder**

Avhandlingens empiriska material insamlades genom en kvalitativ fallstudie, vilken varade under en period av två år. För att fånga läkares informationspraktiker och erfarenheter användes direkt observation som den dominerande datainsamlingsmetoden i både den preliminära studien och huvudstudien.

Analysen och empiriska resultat

Avhandlingens empiriska resultat har indelats i fyra delar. I den första beskrivs kontextbundna element utifrån ett kulturhistoriskt aktivitetsperspektiv och här visas hur informationspraktiker hos en yrkesgrupp kan influerar av vissa särskiljande drag hos arbetssammanhanget. Dessa inkluderar i det studerade fallet: enhetens som en utvecklad akademisk hierarki; lagmedlemskap som både bygger på homogenitet i termer av professionell kvalifikation och heterogenitet vad gäller träning, specialiseringsnivå och erfarenhet; patienter som motivationsfaktor för kliniska aktiviteter; andra avdelningsverksamhet på universitetssjukhuset och läkarlagets plats inom ett nätverk av bredare gemenskap; samt en arbetsdelning som både bygger på deltagande och är hierarkiskt styrd genom explicita och implicita normer.

I den andra delen av det empiriska resultatet beskrivs informationstillgång på arbetsplatsen och huvudfokus här ligger på olika informationskällor och informationsstrategier för att mediera informationsmiljön antingen subjektivt eller intersubjektivt beskrivs. Studien identifierade tre typer av informationskällor och de var textuella, sociala respektive fysiska. Skilda informationsstrategier kunde sammankopplas med informationskällorna. Till exempel länkades känslor, förnimmelser, observationer och demonstrationer till fysisk information, medan diskussioner, tal, lyssnande, frågande instruktioner och rådgivning länkades till
sociala källor. Ett lika viktigt resultat var hur auktoritet relateras till informationskällor och -strategier.

I den tredje delen presenteras tillgängliga redskap och artefakter som informationshjälpmedel med en medierande roll. Redskapen indelades i fysiska redskap respektive språk. De olika fysiska redskapen kategoriserades med hänsyn tagen till om de var inom eller utom synhåll under de arbetsrelaterade aktiviteterna. Språkets roll för social interaktion beskrevs såväl med patienter som mellan läkare. Språk kategoriserades därför utifrån den sociala aktiviteten som 1) ”generell språkgenre” bun- den till talsituationer och 2) socialt språk, bundet till de talandes grupptillhörighet. I den sista sektionen blev patientjournalerna, ett exempel på skriven text, beskriven som en medierande artefakt som erbjuder vissa handlingsmöjligheter beroende av deras användning. Sammantaget fann studien att deltagarna var familjära med de fysiska redskapen, språk och patientjournalerna, och att de fick skicklighet i dessa redskap och artefakter genom sin arbetsaktivitet.


**Diskussion**

Läkares informationspraktiker kan ses som inbäddade i den kontext som utgörs av deras arbetsrelaterade aktiviteter. Det var denna kontext som formade, influerade och legitimerade informationspraktiker, liksom de sätt som medverkande aktörer engagerade sig i dem.

En ytterligare slutsats visar hur redskap och artefakter materialiserar och inramar läkares arbetsrelaterade aktivitet och därmed även information. Det teoretiska ramverket understryker redskapens och artefakternas medierande roll i arbetsrelaterad aktivitet och detta fick stöd av de empiriska resultaten. De redskap som undersöktes i denna studie var fysiska redskap respektive språk. Båda typerna av redskap var nödvändiga i den arbetsrelaterade aktiviteten och metaforsikt sett stod de mellan individen och världen (se Sundin och Johannisson 2005). Studien visade även implikationer av lärande i användning av fysiska redskap genom approprieringsprocesser (se Billet 2002). Dessa är beroende av de problem som skall lösas och vissa redskap hade specifika funktioner, medan andra hade bredare sådana. Studien fann att de fysiska redskapen, språk och patientjournalerna, ensamma var otillräckliga för att föra med den information som är nödvändig för att uppnå målet för hela aktivitetssystemet, varför de måste användas tillsammans.

Patientjournaler som medierande artefakt är en utomordentlig bärare av information med vida implikationer för lärande. På det viset innehar de en central plats som informationskälla i arbetsrelaterad aktivitet. Utöver att de är nödvändiga i patientvården, visade det sig att de även associerades med frågor om motstånd och maktrelationer. Bevarandet respektive modifierandet av dessa i en arbetsrelaterad


Sammantaget var de olika praktiker som urskiljdes i den empiriska studien användbara för förståelsen av kontextuella fenomen vilka är bundna till den kulturhistoriska inramningen av en arbetsplats. I denna kontext var information per se föremål för varierande tolkningar beroende på dess användbarhet för uppnåendet av målet för arbetsrelaterad aktivitet. Dessa inkluderade att se information som "vilken som helst skillnad som gör skillnad" (Bateson 1972, s. 453) respektive information som byggsten i konstruktionen av meningsfull verklighet (Lloyd 2006, s. 578


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Dualism (Philosophy of Mind).


Gunmen Kidnap UBTH Chief Medical Director. (2010, April 7). Nigerian Tribune.


Torchbooks.


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**Glossary**
Acute liver failure - an uncommon condition in which the rapid deterioration of liver function results in coagulopathy and the alteration in the mental status of a previously healthy individual.

AIDS (acquired immune deficiency syndrome) - is essentially a sexually transmitted disease, either homosexually or heterosexually that destroys the immune system. The other two routes of spread are through infected blood or blood products.

Amoxicillin - oral penicillin antibiotic. It is prescribed in the treatment of infections caused by susceptible gram-negative or gram-positive bacteria.

Anaemic - a decrease in haemoglobin in the blood to levels below the normal range of 12-16 g/dL for women and 12-16g/dL for men.

Angina - pain in the chest caused by inadequate supply of blood to the heart muscles, following exercise or eating because of narrowing of the arteries.

Ankle brachial index - the ratio of ankle systolic blood pressure to arm systolic blood pressure. It is calculated by dividing the higher of the left and right ankle pressures by the higher of the two brachial artery pressures.

Anorexia - lack or loss of appetite, resulting in the inability to eat.

Ascites - an abnormal intraperitoneal accumulation of a fluid containing large amounts of protein and electrolytes. Ascites may be detectable when more than 500ml of fluid has accumulated.

Ascitic fluid - a watery fluid containing albumin, glucose, and electrolytes that accumulates in the peritoneal cavity in association with certain diseases such as liver disease or congestive heart failure.

Asthma - a respiratory disorder characterized by recurring episodes of paroxysmal dyspnea, wheezing on expiration and/or inspiration caused by constriction of the bronchi, coughing, and viscous mucoid bronchial secretions.
Auscultation - the act of listening for sounds within the body to evaluate the condition of the heart, blood vessels, lungs, pleura, intestines, or other organs, or to detect fetal heart sound

Auscultatory gap - a silent period in the knocking sounds heard with a stethoscope over an artery, between the systolic and diastolic blood pressures, when the blood pressure is measured with a sphygmomanometer

Autonomous neuropathy - is a nerve disorder that affects involuntary body functions, including heart rate, blood pressure, perspiration, and digestion

B-lactam antibiotics (beta-lactam antibiotics) are a broad class of antibiotics consisting of all antibiotics agents that contain b-lactam nucleus in their molecular structures (e.g. carbapenems, penicillin, cephalosprins, monobactams)

Bacterial - unicellular prokaryotic microorganism that usually multiplies by cell division and has a cell wall that provides a constancy of form

Bacterial infection - infection caused by bacteria resulting in mild to life-threatening illnesses

Bilateral - occurring and appearing on two sides; having two layers

Bitter bockers - is known as Adenosine 5’Monophosphahate. When dissolved into a solution and dropped on the tongue, it is purported to prevent the tongue from tasting bitterness

Bladder training – involves following a strict schedule for voids to increase bladder control and independence, and also to reduce or eliminate incontinence

Blood pressure – the pressure of blood against the walls of the arteries. Pressure is highest during systole and lowest during diastole

Body mass index (B.M.I) – a formula for determining obesity. It is calculated by dividing a person’s weight in kilograms by the square of the person’s height in meters
Carbapenems - are a class of B-lactam antibiotics with a broad spectrum of antibacterial activity.

Carcinoma - a malignant epithelial neoplasm (cancer that arises in the epithelial) that tends to invade surrounding tissue and to metastasize to distant regions of the body.

Cardiac - of or pertaining to the heart; pertaining to a person with heart disease; of or pertaining to the proximal part of the stomach

Cardiovascular - of or pertaining to the heart and blood vessels

Cardiovascular disease - any one of the numerous abnormal conditions characterized by dysfunction of the heart and blood vessels.

Cardiovascular system - the network of structures, including the heart and the blood vessels, that pumps and conveys the blood throughout the body.

Cardiomegaly - enlargement of the heart.

Cardiomyopathy - disease of the muscular wall of the heart.

Catheter - a slender, usually flexible tube inserted into a body cavity to drain fluids or to introduce diagnostic or therapeutic agents.

Central nervous system (CNS) - the brain and spinal cord which link together all the nerves.

Cephalosporium Acremonium - is the fungus that produces the natural Cephalosporins antibiotics. Cephalosporins, a prescribed class of bacterial agents used to treat a wide variety of bacterial infections such as respiratory tract infections, pneumonia, strep throat, tonsillitis, skin infections, and urinary tract infection. They are also used for the prevention of bacterial infection before, during, and after surgery and have the same mode of action as penicillin. Like
penicillin, they kill bacteria by disrupting the synthesis of the peptidoglycan layer of the bacterial cell wall. This disruption causes the cell walls to breakdown and the bacteria to eventually dies

Cholestatic jaundice - hepatitis in which the signs of bile duct obstruction are more prominent than those of liver cell necrosis

Chronic - describing a disease of long duration, involving very slow changes, and often of gradual onset. The term does not imply anything about the severity of the disease

Clarithromycin - is a macrolide antibiotic used to treat pharyngitis, tonsillitis, acute maxillary sinusitis, acute bacterial exacerbation of chronic bronchitis, pneumonia, and both skin and skin structures infections

Claudification – limping

Clerk - to take a history of a patient’s illness and to do a clinical assessment

Clerkship - the entire process or stage of training that entails taking a history and assessing of the patient

Congestive cardiac failure - an abnormal condition that reflects impaired heart pumping.

Conjunctiva - the thin transparent mucous membrane lining the inner surface of the eye

Conjunctivitis - inflammation of the conjunctiva resulting from bacterial, viral, or allergic agents

Cor pulmonale - also known as pulmonary heart disease, is the enlargement of the right ventricle of the heart as a response to increased resistance or high blood pressure in the lungs (pulmonary hypertension)
Coronary arteries - arteries that supply blood to the heart muscles

Coronary heart disease - any disease affecting the coronary arteries, which can lead to strain on the heart or a heart attack

Creatine - an important nitrogenous compound produced by metabolic processes in the body

Creatinine - a substance formed from the metabolism of creatine, commonly found in blood, urine, and muscle-tissue

Cremasteric reflex - a superficial neural reflex elicited by stroking the skin of the upper inner thigh in a male. This action normally results in a brisk retraction of the testis on the side of the stimulus

Diabetes - a clinical condition characterized by the excessive excretion of urine

Diabetes mellitus - a complex disorder of carbohydrate, fat, and protein metabolism that is primarily the result of a deficiency or complete lack of insulin secretion by the beta cells of the pancreas or resistance to insulin

Diagnostic dilemma - when there are two or more disease conditions masquerading (e.g. a diagnostic dilemma between psychosis and post-traumatic stress)

Diastolic pressure - when the ventricles are relaxing and refilling

Dietician - a person trained in food and nutrition

Diffuse - becoming widely spread (e.g. diffuse apex)

Disseminated - dispersed or spread throughout, as in an organ or the whole body (e.g disseminated tuberculosis)

Dyspnoea - laboured or difficult breathing due to obstruction to the flow of air into and out of the lungs
Dysuria - difficult or painful urination usually associated with urgency and frequency of urination if due to cystitis or urethritis

Ectopic - located in, or arising from a place other than normal (e.g. heartbeats arising from other than the S-A node)

Encephalopathy - any abnormal condition of the structure or function of brain tissues, especially chronic, destructive, or degenerative conditions

Endocrine- pertaining to a process in which a group of cells secrete into the blood or lymph circulation a substance (for example, a hormone) that has a specific effect on tissues in another part of the body

Endoscope - an illuminated optic instrument for the visualization of the interior of a body cavity or organ

Endoscopy - the visualization of the interior of organs and cavities of the body with an endoscope

Fibrillation - the rapid contractions or quivering of muscular fibrils

Follicles - a) a somewhat spherical mass of cells usually containing a cavity; b) a small circumscribed body

Fulminant-hepatic failure - is used to describe the development of encephalopathy within 8 weeks of the onset of symptoms in a patient with a previously health liver

Gastroenteritis - inflammation of the stomach and intestines accompanying numerous GI disorders. Symptoms include anorexia, nausea, vomiting fever (depending on the causative factor), abnormal discomfort, and diarrhea.

Geriatrics - branch of medicine dealing with the physiologic characteristics of aging and the diagnosis and treatment of diseases affecting the aged
glycaemic state - referring to the sugar level in the body

Gynaecological - referring to the treatment of diseases of women


Heart block - an interference with the normal conduction of electrical impulses that control the activity of the heart muscle

Haematuria - abnormal presence of blood in the urine

Hematocrit - the volume percentage of red blood cells in whole blood (also called packed cell volume)

Haematology - the medical specialty concerned with the diagnosis and treatment of disorders of the blood and blood-forming tissues

Heparin - a drug usually administered by injection used for the prevention of blood coagulation both in patients with thrombosis and similar conditions. The most important side-effect is bleeding

Hepatic- relating to the liver

Hepatic encephalopathy - a condition in which brain function is impaired by the presence of toxic substances, absorbed from the colon, which are normally removed or detoxicated by the liver

Hepatitis - inflammation of the liver. Hepatitis C is caused by the hepatitis C virus, which often causes chronic hepatitis leading to cirrhosis
HIV (human immunodeficiency virus)- a retrovirus responsible for AIDS

Hypertension - a common disorder that is a known cardiovascular disease risk factor. Hypertension is characterized by elevated blood pressure over the normal values of 120/80mm Hg in an adult over 18 years of age.

Hypertensive encephalopathy - a set of symptoms including headache, convulsions, and coma associated with glomerulonephritis

Hypertensive retinopathy - disease of the blood vessels in the retina occurring as a complication of hypertension

Hypocalcaemia - the presence of low serum calcium levels in the blood, usually less than 2.1 mmol/L or 9mg/dl or an ionized calcium level of less than 1.1 mmol/L or 4.5 mg/dL. It is a type of electrolyte disturbance

Hypoglycaemia - a less than normal amount of glucose in the blood, usually caused by the administration of too much insulin, excessive secretion of insulin by the islet cells of the pancreas, or dietary deficiency

Hypoglycemic - pertaining to or resembling a state of low blood glucose levels

Hypoglycemic agent - any of the various synthetic drugs that lower the blood glucose and are used to treat type 2 diabetes mellitus

Hypokalemia - a condition in which inadequate amount of potassium is found in the circulating blood stream or the condition in which the concentration of potassium in the blood is low

Hypothermia - an abnormal and dangerous condition in which the oral temperature is below 95°F (35°C) or the rectal temperature is below 96°F (35.5°C) usually caused by prolonged exposure to cold and/or damp conditions

Hypothyroidism - a condition characterized by decreased activity of the thyroid gland
Intracranial pressure - the pressure inside the skull and thus in the brain tissue and cerebrospinal fluid

Finger clubbing - a thickening of the fingertips that gives an abnormal rounded appearance. It is a common symptom of respiratory disease, congenital heart disease, and gastrointestinal disorders

Jaundice - yellow-pigmentation of the skin and/or sclera caused by high levels of bilirubin in the blood

Jaundiced - marked by jaundice; yellowish

Jugular venous pressure (JVP) - the indirectly observed pressure over the venous system via visualization of the internal jugular vein

Lumber - relating to the loins (i.e. part of the back between the lowest rib and the pelvic bone on either side of the spine)

Lumber puncture - is a diagnostic and, at times, therapeutic procedure that is performed in order to collect a sample of the cerebrospinal fluid for biochemical, microbiological, and cytological analysis

Lymphoma - any of a group of malignant diseases originating in the lymphoreticular system, usually in the lymph nodes

Metastasis - the process by which cancerous cells form secondary tumours that are discontinuous from the primary tumour, in parts of the body that are distant from the original site

Metronidazole - a drug used to treat infections of the urinary, genital, and digestive systems, such as trichomoniasis, amoebiasis, giardiasis, and acute ulcerative gingivitis
Myocardial infarction - commonly known as a heart attack resulting from the interruption of the blood supply to a part of the heart, causing heart cells to die

Nephrologist - a specialist in nephrology

Nephrology - the study of the kidney and its diseases

Neurological testing - an assessment of the patient’s neurologic status and symptoms

Neurologist - a specialist in the nervous system and its diseases

Neurology - the branch of medicine concerned with the nervous system and its diseases

Neuropathy - any disease of the nervous system

NSAID (acronym for nonsteroidal anti-inflammatory drugs) - drugs that provide analgesic and antipyretic (fever-reducing) effects, and in higher doses, anti-inflammatory effects

Obstetrics - the branch of medicine concerned with the care of women during pregnancy, childbirth, and the period of about six weeks following the birth when the reproductive organs are recovering

Obstructive neuropathy - is a structural or functional hindrance of normal urine flow, sometimes leading to renal dysfunction (obstructive nephropathy)

Oedema - excessive accumulation of fluid in the body tissue

Ophthalmologist - a doctor who specializes in the diagnosis and treatment of eye diseases
Orthopaedists - the science or practice of correcting deformities caused by disease of or damage to the bones and joints of the skeleton

Orthopnoea - a condition that prevents the patient from lying down, so that he has to sleep propped up in bed or sitting in a chair

Palpitation - a sounding or racing of the heart

Pantoprazole - a group of drugs for the treatment of peptic ulcer disease

Pericardium - a fibroserous sac that surrounds the heart and the roots of the large vessels

Peripheral neuropathy - damage to the nerves of the peripheral nervous system, which may be caused either by diseases of or trauma to the nerve or the side-effects of systemic illness

Peripheral vascular disease - the obstruction of large arteries not within the coronary, aortic or brain vessels

Peripheral nervous system - all parts of the nervous system lying outside the central nervous system (brain and spinal cord)

Pharmacodynamics - the study of the effects of drugs on the body and the mechanism by which they act

Pharmacokinetics - the study of the passage of drugs through the body, including their absorption, distribution, localization in tissues, metabolism, and excretion

Pharmacovigilance - the pharmacological science relating to the detection, assessment, understanding and prevention of adverse effects, particularly long term and short-term side effects of medicines
Physiotherapist - a person who is licensed in the examination, evaluation, and treatment of physical impairments through the use of special exercise, application of heat and cold, and other physical modalities

Physiotherapy - a branch of treatment that employs physical methods to promote healing, including the use of light, infrared and ultraviolet rays, heat, electric current, massage, manipulation, and remedial exercise

Pleural pneumonia - an inflammatory condition of the lungs, especially affecting the microscopic air sacs (alveoli) associated with fever, chest symptoms, and a lack of air space on a chest x-ray

Pneumonia - inflammation of the lungs caused by bacteria, in which the air sacs become filled with inflammatory cells and the lung becomes solid

Polydipsia - extremely intense thirst, leading to the drinking of large quantities of fluids. This is a symptom typical of diabetes mellitus and diabetes insipidus
Poly uria - production of large volumes of urine, which is dilute and of a pale colour

Polyphagia - gluttonous excessive eating

Postural hypotension - abnormally low blood pressure that occurs when an individual suddenly assumes the standing posture

Postprandial hypotension - abnormally low blood pressure that occurs after eating

Psychiatrist - a medically quantified physician who specializes in the study and treatment of mental disorders

Pulmonary - relating to, associated with, or affecting the lungs

Pulmonary embolism - obstruction of the pulmonary artery (i.e. artery that conveys blood from the heart to the lungs for oxygenation) or one of its branches by an
embolus, usually a blood clot derived from phlebothrombosis of the leg veins

Pulmonary hypertension - a condition in which there is raised blood pressure within the blood vessels supplying the lungs

Pulmonary oedema - the accumulation of extravascular fluid in lung tissues and alveoli, caused most commonly by congestive heart failure

Pulse - a series of pressure waves within an artery caused by contractions of the left ventricle and corresponding with the heart rate (i.e. the number of times the heart beats per minute)

Pulsus paradoxus - a large fall in systolic blood pressure and pulse volume when the patient breathes in

Sputum - material coughed up from the lungs and expectorated through the mouth. It contains mucous, cellular debris, or microorganisms, and may also contain blood or pus

Reflex - an automatic or involuntary activity brought about by relatively simple nervous circuits, without consciousness being necessarily involved. Reflexes may be superficial (situated at or close to a surface) abdominal (denoting the abdomen); and cremasteric (elicited by stroking the skin)

Renal failure - the inability of the kidney to excrete waste, concentrate urine, and conserve electrolytes.

Rigor - rigidity; stiffness

Sickle cell disease - a hereditary blood disease that mainly affects people of African ancestry but also occurs in the Mediterranean region and reaches high frequencies in parts of Saudi Arabia and India

Sinus - an air cavity within a bone, especially any of the cavities within the bones
of the face or skull (e.g. paranasal sinus)

Sinusitis - an inflammation of one or more of the mucous-membrane-lined air spaces in the facial bones that communicate with the nose (paranasal sinuses).

Sprinolactone - a potassium-sparing diuretic (water pill) that prevents the body from absorbing too much salt and keeps the potassium level from getting too low

Sternal angle - relating to the sternum (breastbone)

Subfulminant heptic failure - is reserved for patients with liver disease for up to 26 weeks before the development of hepatic encephalopathy

Surgery - a branch of medicine concerned with diseases and trauma requiring operative procedures

Systolic pressure - when the ventricles are contracting

Tachycardia - refers to heart rate that exceeds the normal range. A heart rate over 100 beats per minutes is generally accepted as tachycardia

Transient ischemic attack - an episode of cerebrovascular insufficiency, usually associated with partial occlusion of a cerebral artery by an atherosclerotic plague or an embolus; (stroke)

Tuberculosis - a chronic granulomatous infection caused by an acid-fast bacillus

Urea - a normal metabolic waste product from protein metabolism

Urea, Electrolyte and Creatinine (UEC) - a renal function blood test; test of measure of kidney functions.
Urethra - a small tubular structure that drains urine from the bladder

Urethral - pertaining to the urethra

Urinary obstruction – a blockage of the flow of urine out of the body

Viral infection - any of the diseases caused by one of the approximately 200 viruses pathogenic to humans

Vasomotor - pertaining to the nerves and muscles that control the diameter of the blood vessels

Vertigo - a sensation of instability, giddiness, loss of equilibrium, or rotation caused by a disturbance in the semicircular canal of the inner ear or the vestibular nuclei of the brainstem

Appendix 1
UNIVERSITY OF BENIN TEACHING HOSPITAL
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PROTOCOL NUMBER: ADM/E.22 A/VOL. VII/84

PROJECT TITLE: INFORMATION PRACTICE OF PHYSICIAN IN CLINICAL

PRACTICE

PRINCIPAL INVESTIGATOR(S): ISAAC EBOLE ESTHER

DEPARTMENT/INSTITUTION: SWEDISH SCHOOL OF LIBRARY AND INFORMATION

SCIENCE, UNIVERSITY OF GOTEPRIG/UNIVERSITY

COLLEGE OF BORAS, SE-501 90, SWEDEN.


DECISION OF THE COMMITTEE: APPROVED

REMARK:


Supervisors:

DECLARATION BY INVESTIGATOR(S)

PROTOCOL NUMBER (Please quote in all enquiries)

To be completed in four and three copies returned to the Secretary, Ethics and Research Committee,
clinical Services and training division, University of Benin teaching hospital, Benin City.

I/We fully understand the conditions under which I am/we are authorized to conduct the above-
mentioned research and I/We undertake to resubmit the protocol to the Ethics and Research
Committee.

Appendix 2
CONSENT FORM FOR PARTICIPATING IN RESEARCH PROJECT

I am a doctoral student at the Swedish School of Library and Information Science (SSLIS) at Goteborg University and University of Borås. My main supervisor is Professor Katriina Byström. My dissertation research examines the information practices of professionals in workplace learning. The purpose of the study is to seek an enhanced understanding of the constitutive role of tools and artefacts in workplaces. The aim is to discover if these resources have the potential to provide workplace learning opportunities and how they work in enacting information practices.

The preliminary study started in the autumn of 2008 by observations of the work activities in the unit and will continue during the main study. I would highly appreciate if you can participate in the main study. Your participation in the study will be in the form of interview for about two times which is expected to last between 60-90 minutes. I will be asking you questions about your work task relating to workplace learning, your participation in the teams activities and your viewpoints about the role of tools and artefacts to collect as many perspectives and expressions as possible on information practices. The results of my thesis may turn out to be useful and contribute to better services in Nigerian health care sector in future.

If you have any further questions after this interview, please contact me as the main person responsible for the study:

Esther Ebol Isah, doctoral student, Swedish School of Library and Information Science (SSLIS), Goteborg University and University of Borås

E-mail: esther_ebole.isah@hb.se
Telephone: 0739290276
Address: Swedish School of Library and Information Science (SSLIS), University of Borås, Allégatan 1, 501 90 Borås

If you wish to receive additional information and references, you are welcome to contact my supervisors at the Swedish School of Library and Information Science:

Professor Katriina Byström, e-mail: katriina.bystrom@hb.se
Professor Gunnel Hessler, e-mail: gunnel.hessler@hb.se
This study follows the guidelines set up by the Swedish Research Council (Vetenskapsrodet), which means that you as a participant are assured the following rights:

- You are guaranteed total confidentiality with regard to anything you say as all data are treated confidentially
- Your participation is completely voluntary, and you have the right to end your participation without negative consequences at any point during the study. You may also refuse to answer any question you do not wish to answer
- You have the right to decide for yourself the conditions under which you participate
- The collected data will only be used for research purposes stated in this document, and other related documents.
- A process known as ‘member checking’ will allow you to see how the data you have provided is being used.

Thank you for participating in this study, your contribution is valuable.

Date and signature: .................................................................

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