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Progressing towards effective record-keeping in Multidisciplinary Team Meetings

Possibilities of achieving structured, standardized, electronic records

Information Systems
Master's Thesis, 30 ECTS credits

Date: 2020-12-01
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Abstract

Multidisciplinary team meetings in cancer care have received world-wide adoption due to the positive benefits that they bring to healthcare. Multidisciplinary team meetings (MDTMs) ensure that many specialties jointly discuss and assess a patient's case; thus, each case can benefit from different skills and experiences that the various health professionals bring. The purpose of multidisciplinary team meetings is to find the most accurate diagnosis and appropriate treatment for the patient. It is essential, then, that the proceedings of multidisciplinary team meetings are correctly documented as the recommendations that result from the discussions need to guide the treatment of the patient thereafter.

This qualitative study uses a survey questionnaire to find out more information about the MDTM record-keeping practices, their effectiveness, and the usability of currently employed record-keeping systems. Results show that, in Sweden, multidisciplinary team meeting records are mostly electronic, and healthcare professionals perceive them to be of satisfactory quality, but there seems to be a lack of standardization and uniformity, and responsibilities for record-keeping are blurred. This study demonstrates that further studies of this nature are warranted and can provide good support to the implementation of improved record-keeping. Additionally, several opportunities for further research are identified.

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Chapter 1 – Introduction

1.1. Introduction

The multidisciplinary approach to cancer patients' treatment and care is widely adopted following years of research and implementation, proving there is much to be gained from this approach. A multidisciplinary team (MDT) consists of various healthcare professionals working collaboratively in trying to find an accurate diagnosis, correct staging, and to reach a decision on the most appropriate treatment for a patient case (Li, Mansfield & Hansen, 2008; Lamb, Brown, Nagpal, et al., 2011; Shao, Rodrigues, Corter, et al., 2019; Ottevanger, Hilbink, Weenk, et al., 2013). Multidisciplinary teams collaborate for this purpose by holding regular meetings which are referred to as Multidisciplinary team meetings (MDTMs) or cancer conferences, where clinicians participate in the discussions and give input based on clinical information, investigative procedures, clinical guidelines, and their expertise (Borras, Albreht, Audisio, et al., 2014; Kane & Luz, 2006; Lamb, Sevdalis, Benn, et al., 2013). Although multidisciplinary team meetings may also convene for other complex non-cancer cases, they are predominant in discussing known and suspected cancer cases. Sweden is one of several European countries that follow the MDTM approach to cancer care (Rosell, Alexandersson, Hagberg, et al., 2018; Ekendahl, 2019).

The collaboration between many specialties in the MDTMs requires information sharing. Several activities occur before the meetings, including ensuring that all relevant information is available about a patient's case listed for discussion. Clinical findings from the consultations and the results from investigative work done beforehand are discussed at the meetings to establish a diagnosis, find disease stage, and then provide recommendations for treatment (Kane & Luz, 2009). Therefore, the outcomes of the MDTM regarding a patient case (and options that are taken into consideration) are of importance to the patient's treatment and care and should be documented appropriately. The decision record from the interactions in meetings would be a reference and basis for future individual clinical decisions and, potentially, a key information item in the patient record (Kane & Luz, 2009).

1.2. Problem statement

Multidisciplinary team meetings have become an essential part of cancer care, and as such, are extensively researched. The adoption of the multidisciplinary care model continues to grow and is becoming the standard requirement in cancer care in various countries. The positive contributions that MDTs bring to the cancer care pathway include improving the accuracy of diagnosis and staging, shortening the patient's time to treatment, better access to care, and adherence to guidelines (Rosell, Alexandersson, Hagberg, et al., 2018; Brar, Hong, Wright, et al., 2014), hence the inference to better patient outcomes. Healthcare professionals cite better support for patient management as a benefit of including patient cases for discussion in an MDTM (Rosell, Alexandersson, Hagberg, et al., 2018). Other benefits accrue to the medical professionals, such as learning, information sharing, exchange of ideas, better teamwork, and coordination (Look Hong, Gagliardi, Bronskill, et al., 2010). However, previous research on MDTMs has focused more on the MDTM composition, the discussions and decision-making, and the value of MDTM in the patient care process.

Information is a valuable resource in healthcare. Multidisciplinary care calls for information sharing, and despite the value multidisciplinary team meetings add, information sharing and keeping comprehensive MDTM records are still under-researched. The MDTM record seems to be raised only in a few cases that highlight a *need for a record* and, in some cases, the challenges of *lacking information* in records, but few have embarked on studies that take a broader look into record-keeping. There is still room to explore further how the records are produced, how they are used, and how they can be designed to aid the multidisciplinary care process. Careful records of decisions made during the multidisciplinary team meetings are essential, and so is communication to all team members, even virtual attendees (Fennell, Das, Clauser, et al., 2010). Speedy access to reliable health information is essential to ensure good patient outcomes (Finchman, Kohli & Krishnan, 2011). Important patient information guides the discussions and decision-making process in MDTMs, and important information results from those discussions and decisions and guides the patient's treatment and management plan. Therefore, MDTM records should not be overlooked.

Kane and Luz have put in considerable work that has set precedence in this area of MDTM record-keeping. In one study, Kane & Luz (2011) explored the record-keeping issue in a single tertiary institution and discussed the most pertinent data for inclusion in the MDTM records and the need to include the MDTM record as part of the electronic patient record. Though research is scant, record-keeping is in place, regardless of the form it takes. Some studies make references to successful MDTM record-keeping. De Ieso, Coward, Letsa, et al. (2013), for instance, in their patient record review study to review costs and decision outcomes, also display that well-documented MDTM records can make a useful reference for future inquiries. Komatsu, Nakayama, Togari, et al. (2011), also, in their Japanese study of patient's perceptions of multidisciplinary cancer care in relation to paper-based and electronic MDTM records, highlight the impressions of using both forms of record-keeping.

However, it would be good to take a more in-depth look into the practices that institutions follow, how MDTM records can be structured and documented for effectiveness, and how technology can aid MDTM record-keeping. Whether electronic or paper-based, good clinical record-keeping is essential for good quality healthcare (Mathioudakis, Rousalova, Gagnat, et al., 2016). Good quality clinical records aid communication, coordination, transparency, and auditing functions, while poor clinical records can have life-long effects on a patient's health (Mathioudakis, Rousalova, Gagnat, et al., 2016; Zegers, de Bruijne, Spreeuwenberg, et al., 2011). For MDTMs, too, there is a need for a consistent, reproducible, information-rich record that provides the safeguards not currently embodied within the written record (Kane & Luz, 2009).

In the context of the study, record-keeping is concerned with the documentation of all efforts during multidisciplinary care. Three crucial considerations arise from existing literature, giving rise to the questions investigated by this study:

a) Missing clinical information and unavailability of imaging data at MDTMs hinder the ability to make effective decisions (Demiris, Afrin, Speedie, et al., 2008).

b) The decisions that are taken at an MDTM guide the continuance of work rhythms post-MDTM (Kane & Luz, 2006).

c) Health experts acknowledge communication failures are known as one of the leading causes of medical error (Kane, Toussaint & Luz, 2013).

The three statements above can be aligned to MDTM inputs, outputs, and consequences, respectively. Many factors come into play for each of these points; however, we look at them only in relation to our topic of record-keeping. *a)* is concerned with information that is necessary to facilitate the MDTM. MDTM discussions and the decision-making rely on previously collected clinical information: examination and prognosis, pathological and radiology investigations, and findings, as well as clinical guidelines and patient health status, history, and preferences. All of which are part of a record or several records. Often missing or inadequate information hinders the decision-making process (Lamb, Brown, Nagpal, et al., 2011). Good quality records could aid completeness and quicker retrieval of information (Tsai & Bond, 2008) and aid MDTM discussions and decision-making. *b)* The outcomes of MDTMs are recommendations for patient treatment and care based on each patient case's discussion. The recommendations guide the follow-on processes after the MDTM; therefore, a good record of the proceedings is essential. Kane & Luz (2011) and Borras, Albreht, Audisio, et al. (2014) highlight the importance of noting the discussions, various treatment options considered, decisions, and rationale. *c)* There are consequences to poor record-keeping. Poor record-keeping leads to miscommunication, which could result in poor coordination, deviations from MDTM recommendations, unaccounted for actions, delays in treatment, and other adverse effects. Rajan, Foreman, Wallis, et al. (2013) found that a small number of cases suffer error during the MDT discussion or documentation. In a multidisciplinary setting, the quality of the record is directly proportional to the quality of information communicated between team members, which is why good quality records can be linked to improved care (Lewis, 2002). Inadequate record-keeping would, therefore, undermine MDT work.

We believe that the concerns raised here, to a large extent, can be facilitated by good quality electronic record-keeping. Many hospitals in developed countries have indeed adopted an electronic patient record (EPR), but little is said in literature about whether institutions have adopted a similar style of record-keeping in MDTMs, how well it integrates with the processes of consolidating information prior to MDTMs, and how it supports the activities that should happen after the MDTM. A complete record would add confidence in its accuracy and help co-ordinate later work tasks (Kane & Luz, 2009). In 2014, the EPR models did not encompass an MDTM record that fully captures the decisions, the rationale for the decisions, and what options had been explored (Kane & Groth, 2014). The question therefore is, is good quality MDTM record-keeping in place now, 6 years later?

Janssen, Robinson, Brunner et. al (2018) highlight that integration of Information and Communication Technology (ICT) systems has been slow and uneven in cancer services. According to Groves, Kayyali, Knott, et al. (2013) cited in Janssen, Robinson, Brunner et. al (2018) the perception that newer systems such as electronic medical records and databases offer no significant improvement over existing approaches such as paper-based notes is highlighted as a significant barrier to the successful implementation of ICT. Nevertheless, the study by Janssen et. al (2018) also shows that study participants believe data collection is important and MDTMs are said to present a unique opportunity for improving data collection, and can be aided by health information systems to be of high quality, if implementation challenges are overcome. MDTs, however, do not seem to be making optimal use of ICT as yet.

1.3. Background and need

It is usual for meeting discussions to be recorded in minutes. However, multidisciplinary team meetings result in decisions that influence people's lives due to the decisions' bearing on what next step health professionals will take regarding the patient's health. The weight of the information MDTM record is the reason the MDTM record deserves careful planning. The need for good quality patient records is driven by the fact that the records positively influence patient care quality. Ideally, the MDTM record, i.e., the record of the discussions, considerations, decisions, and recommendations regarding a patient case, should also form part of the patient record (Kane & Luz, 2011).

Medical errors may lead to adverse effects on patients (Crane & Crane, 2008). Some errors are due to incorrect information or the lack of information. MDTMs give recommendations for treatment and care for each concluded discussion on a patient's case. Recommendations need to be documented for future reference. The reference may be to guide follow-on processes and management plans and for the future if a patient has complications or a suspected or subsequent cancer-related illness. The recommendations also guide the caring doctor and can prevent unnecessary or ill-advised treatment. Therefore, accurate, reliable medical records are necessary for patient care and form part of the patient's medical history. Disparate or missing information may mean that some required tasks fall through the cracks

Pillay, Wootten, Crowe, et al. (2016) are amongst authors who have raised the issue of the cost of MDTMs. MDTMs require time, and in some instances, travel (Lamprell, Arnolda, Delaney, et al., 2019). The time needed means they cannot continue with their usual work tasks during meeting times, and those meetings are often not compensated (Ekendahl, 2019; Denton & Conron, 2016). If healthcare workers make an effort to attend and make a valuable contribution to the management of a patient's case, then that information should not be lost due to poor record-keeping. The decisions taken need to be accurately documented to ensure they are carried through during the patient's treatment.

Research work seeking to find out the effectiveness of MDTMs also needs quality records as reference. Similarly, the collection of information for the formation of guidelines (related research) needs medical records. According to the SocialStyrelsen (2015), Sweden, the purpose of the guidelines is to ensure that people have access to good health and medical care; the guidelines contain recommendations about which interventions should be implemented for a particular condition. MDTMs contribute to developing treatment protocols (Wright, Vito, Langer, et al., 2007). Although candidates for clinical trials are identifiable in the actual MDTMs, other cases may require investigating patient records. MDTM records would also aid other audit functions.

Amongst the challenges experienced by MDTs that affect decision-making is lack of information: pathological information (Rosell, Alexandersson, Hagberg, et al., 2018), information about patient comorbidities, and information on patient preferences (Lamb, Brown, Nagpal, et al., 2011). This information is not generated during the MDTM but is instead on record(s) that are vital inputs to the discussions. If this information is collected, integrated electronic departmental systems will ensure ease of access to the records for MDT discussions, and vice versa for the access to MDTM records by the relevant departments.

With the increase in the discussions of patient-centered care, a patient's involvement during the discussion of their case is advocated for. Patients can use the opportunity to get informed and present their wishes and provide other comorbid information as needed. The final decision is made once the recommendations have been discussed with the patients (Devitt, Philip & McLachlan, 2010). Nevertheless, there are issues with the idea of involving the patient. The majority of cancer patients want to know as much information as possible about their condition, but health professionals do not support patient attendance at meetings as they fear it would bring about increased patient distress and impact on the group decision-making process (Devitt, Philip & McLachlan, 2010). Therefore, "should the need arise, the patients themselves should have access to their records to be able to see what has been done and what has been considered" (Mathioudakis, Rousalova, Gagnat, et al., 2016, p. 371). Access to an MDTM record in the electronic patient record would provide patients with the information they need. In some countries, such as Sweden, patients can view their health records online, but there is no clarity whether cancer patients who have been discussed can view MDTM related information as well.

Patient cases are unique, and doctors, based on expertise and experience, may have different opinions to what the guidelines suggest. Perhaps guidelines in other instances may not sufficiently address the uniqueness of a case. Sometimes the patient is not in agreement with the recommendations. Records capturing all the information surrounding such cases should contribute towards increased accountability both for the decisions and recommendations taken and those that have not been implemented.

The issues raised in this section suggest the importance of a comprehensive medical record that encompasses MDTM information. Komatsu, Nakayama, Togari, et al. (2011) highlight that the adoption of electronic record systems has been slow and paper-based records are still in use. The challenges MDTMs face also pose a threat to record-keeping practices. In the case of lack of time, essential parts of the documentation may be left out or poorly done. Lack of attendance (Lamprell, Arnolda, Delaney, et al., 2019) may result in the incompleteness of the MDTM discussion and record as crucial parts may be dependent on a particular specialist's input; while early meeting leavers (Kane & Groth, 2014) may result in misconceptions arising from documentation pointing to the presence of someone who may have left. Too many cases to be discussed may result in rushed discussions (Lamb, Brown, Nagpal, et al., 2011), thus impacting the documentation quality. The mentioned and other potential threats can be explored further through research.

1.4. Purpose of the study

Several health information systems are used within hospitals and other institutions that provide cancer care. These health information systems often keep related data in a disparate manner. Radiology and pathology results from the radiologists and pathologist respectively, along with clinical data from the examining physician (Kane & Luz, 2009) and patient circumstances and preferences from the contact nurse or other representative (Lamprell, Arnolda, Delaney, et al., 2019), are often required inputs to the MDTM. These inputs have to be collected during the preparation stage of the MDTM and may have to be coming from different clinics or institutions. According to Rosell, Alexandersson, Hagberg, et al. (2018), in south Sweden, insufficient pathology and the need for supplementary investigations were identified by healthcare professionals who attend MDTMs, as barriers to reaching treatment recommendations.

Additionally, several professionals may still take personal notes during the meetings on findings, treatment to consider, and to formulate their to-do lists. Information from individual notes, however, would then be decentralized and hard to track. Inadequate MDTM records would also make it harder to execute follow-on tasks after the meetings. Therefore, the aim is to find more information on how records are captured, the kind of information that is needed by each stakeholder, what influences the way records are stored, and whether the records are adequate. Though paper records have their shortcomings, such as illegibility, inaccuracy, incompleteness, format issues, and problems with retrieval and accessibility (Institute of Medicine, 1997), electronic records are also not immune to problems. Deficiencies in electronic health records (EHR) result in less efficiency and hinder physicians' routine work (Kaipio, Lääveri, Hyppönen, et al., 2017). Sweden might be an interesting case to investigate, as ordinary medical record-keeping is quite digital. Sweden is counted amongst the top European leaders in national electronic health record (NEHR) systems (Fragidis & Chatzoglou, 2017), and it would be quite interesting to know how Sweden fairs with regards to MDTM records.

Technology can resolve the record-keeping needs when successfully implemented. The completeness and accuracy of records will positively influence patient care, provide a means to ascertain if MDTM decisions are followed, and potentially give a better picture of whether deviations to recommendations are warranted and acceptable. Accurate documentation also ensures subsequent written reports are in accord with the opinions expressed during the meetings (Douek & Taylor, 2003), which means fewer misunderstandings between professionals and uniformity in the feedback the patient receives from various healthcare workers handling their case. Good records facilitate quality research and, potentially, the application of advanced technologies, such as machine learning/AI applications. Therefore, our interest would be to establish if appropriate record-keeping solutions are in place, taking advantage of technology to aid the usefulness of records in the various situational needs of healthcare workers.

1.5. Research questions

The study explores the following three questions regarding MDTMs and record-keeping:

1. To what extent has electronic record-keeping been adopted in Swedish hospitals for use in MDT meetings?
2. How effective are the records captured in MDT meetings in aiding the patient care after the decisions have been taken?
3. If there are people who do not attend MDT meetings but use the meeting record during the treatment of the patient, do they find the MDTM record easy to access and use?

1.6. Significance to the field

Addressing issues surrounding the MDTM record will have an impact on clinicians' considerations on keeping a comprehensive electronic record of all MDTMs. The clarity on the information the MDTM documentation should encompass, and the effectiveness or lack thereof of MDTM records will inform what is to be considered further for future MDTM documentation proposals. Increasing knowledge on how electronic MDTM records can be implemented, the benefits that may be derived from it, allowing exploration of how MDT discussions and outcomes can be clearly integrated with pre-MDTM and post-MDTM activities, and possibility and benefits of easy access to consolidated information, therefore, strengthens the body of knowledge and may lead to better records and adoption of electronic record-keeping in MDTMs. In the long run, we hope for this and any future studies on this topic that will yield information on the best practices in MDTM record-keeping and that proposed solutions will aid better patient care, more transparency between clinicians and other healthcare workers (Zegers, de Bruijne, Spreeuwenberg, et al., 2011), accountability (Tsai & Bond, 2008), and increased alignment of treatment to guidelines (Institute of Medicine, 1997).

This research would significantly contribute to health institutions because accurate, complete, and reliable records would mean more adherence to recommendations and ease of access for delivering care and building a knowledge base for research and development of guidelines. Literature may benefit from the models of record-keeping that may arise from this study and subsequent studies, which may be applicable even outside of the health sector. Furthermore, the patient may benefit from accessing MDTM information about their case through their record, which would also address the growing concern that the patient may desire to attend an MDTM in which their case is discussed. However, the great benefit would be finding a means through which an MDTM record can be so enriching to the healthcare user's work processes and the implementation of MDTM recommendations. Patients whose treatment is concordant to recommendations, for instance, have significantly shorter wait times to starting treatment (Osarogiagbon, Phelps, McFarlane & Bankole, 2011).

The clinicians' perceptions will yield better information allowing us to evaluate how much adoption and acceptance there is on the use of electronic records and whether the contents are appropriate to the needs of oncology healthcare processes that follow. According to Mathioudakis, Rousalova, Gagnat, et al. (2016), just a few years ago, at a European level, the implemented electronic record systems still varied greatly regarding the content of clinical records and means to address the variations later followed. In the same breath, MDTM records could vary. Even where electronic record-keeping is in place, shortfalls can exist, and these shortfalls can be missed if the users of the records have other means of getting by. Those who attend MDTMs may find it easier to work around MDTM records even if they are incomplete because of personal notes and possibly the ability to recall discussions, while those who do not have a similar advantage (i.e., did not attend) may find it harder to follow or easier to misinterpret the recorded information.

Nevertheless, the lack of electronic record-keeping may not necessarily translate to a perceived higher number of errors, nor does the presence of electronic record-keeping guarantee a lower number of errors. The design and implementation of effective electronic MDTM record-keeping rely on several factors that must be addressed adequately, but the potential gains are expected to encourage adoption. Additionally, literature shows that lack of acceptance and underuse of technology may result from many factors, thus holding back progression towards effectively using an electronic record-keeping method.

1.7. Definitions

Multidisciplinary care implies that professionals from multiple disciplines are involved and give concurrent input in the examination, treatment, and care of a patient. The team is known as a multidisciplinary team (MDT) or a multidisciplinary (MD) team. In the UK, an MDT is defined as a "group of people of different healthcare disciplines, which meets together at a given time (whether physically in one place or by video or teleconferencing) to discuss a given patient and who are each able to contribute independently to the diagnostic and treatment decisions about the patient" (National Cancer Action Team, 2013, p. 71). The meetings, known as multidisciplinary team meetings (abbreviated MDTM or MTM), also synonymous with tumor boards (TB), multidisciplinary tumor boards (MDT), decision meetings (DM), multidisciplinary meetings (MDM), multidisciplinary conferences (MCConf), and multidisciplinary cancer conferences (MCC) or just MDT meetings, are a gathering for different healthcare professionals from medical and allied disciplines, either physically or virtually, to discuss listed patient cases and recommend appropriate personalized treatment plans (Devitt, Philip & McLachlan, 2010). Fennell, Das, Clauser, et al. (2010) distinguish between a multidisciplinary team meeting and a tumor board, but many authors refer to them as interchangeable terms. In this document, the terms MDT meetings or MDTM are used. The acronym of the Swedish version of the term multidisciplinary conference (MDK) may appear in this document.

Another example of formalized multidisciplinary care is multidisciplinary clinics (MCClinics), where multiple consultations with the multidisciplinary team are conducted in a single patient visit, with or without a meeting (Brar, Hong, Wright, et al., 2014). The study's main interest, however, is in the meetings and related documentation. Record-keeping is concerned with the formal documentation of an exchange that happens between two or more entities. Record-keeping practices refer to the different activities concerning how or forms in which documentation is done. According to Rafter, Hickey, Condell, et al. (2014) and Carnes, Mars, Mullinger, et al. (2010), variations occur in literature with regards to the definition of adverse event (AE). Additional classification and defining it within context becomes necessary (Carnes, Mars, Mullinger, et al., 2010). However, for the purpose of this study, we consider a simplistic definition of adverse events being an unintended or unexpected incident (injury) to a patient resulting from medical treatment or management (Rafter, Hickey, Condell, et al., 2015). Medical records, patient records, and health records all refer to the information recorded about a patient during a consultation and includes personal information, medical history, current condition and diagnosis, and treatment to be given. EMR, EPR, and EHR would, therefore, be acronyms for the electronic version of each of these records, respectively.

1.8. Search terms

Related literature was retrieved using the keywords Multidisciplinary Team, Tumor/Tumour Boards, Multidisciplinary care, Multidisciplinary/Case Conferences, Record-Keeping, Electronic Health Record, Cancer Care, and Quality of life. The initial focus was on systematic reviews followed by other articles. Some literature was identified through references of interest found in other read papers.

Chapter 2 – Literature Review

2.1. Multidisciplinary care approach and Multidisciplinary Team Meetings

In essence, cancer care has always needed intervention from various disciplines, i.e., the need for a physician, oncologist, pathology, radiology, nursing, and sometimes surgery. However, these professionals tended not to work collaboratively. Thus, there was less coordination in the tasks they carried out; the diagnosis, staging, and treatment recommendation was limited to the perspective of one doctor handling the case (or a few if colleagues are consulted). Multidisciplinary care (MDC) is defined as “an integrated team approach to health care in which medical and allied health care professionals consider all relevant treatment options and develop, collaboratively, an individual treatment plan for each patient” (National Breast Cancer Centre, 2005). Meetings are held weekly, fortnightly, monthly, and in some cases quarterly. The usual frequency is weekly, and in some instances, there is more than one meeting in a week.

The multidisciplinary team meetings brought about the opportunity to jointly review patient cases by taking into account the expertise of several professionals working together, with a common purpose, and thus allowing for the exploration of different opinions and possibilities before coming to an agreement on the diagnosis and best way for treating or managing the condition. MDTMs are the only place where clinical, pathology, and radiology findings are jointly considered, which presents an opportunity to revise and reinterpret results and resolve inconsistencies (Kane & Luz, 2009). Teamwork is fundamental to the multidisciplinary model, and regular meetings are essential in aiding the needed collaboration (Lamprell, Arnolda, Delaney, et al., 2019). It is also necessary for MDTMs to have an agreed protocol or standard operating procedure that clearly defines the objectives, composition and roles, operational methodology, and includes means of data capture and clinical governance (Ashton, 2008).

Multidisciplinary teams have slight variations in composition depending on cancer type, institution, region, or country, but it is generally accepted that surgeons, oncologists, physicians, nurses, radiologists, pathologists, and other allied health workers such as nutritionists, physiotherapists, as well as palliative care workers, form part of the multidisciplinary team (El Saghir, Keating, Carlson, et al., 2014; Lamb, Sevdalis, Benn, et al., 2013). The presence of qualified professionals, good preparation and case selection, meeting format and structure, expertise, efficient leadership, and good interaction among meeting participants are key to positive meeting outcomes, whereas dysfunctional MDTs may not always arrive at clear decisions (El Saghir, Keating, Carlson, et al., 2014).

The strength in a multidisciplinary approach lies in that many specialties have the opportunity to review all of the clinical information together, share their expert opinions and contribute towards the best way to manage the case, in line with guidelines. Constraints such as lack of resources in smaller, especially rural, institutions led to institutions participating in MDTs remotely, video-linked with another institution.

2.2. How MDTMs work

The Multidisciplinary Team Meeting is not a stand-alone event. Several work activities occur before, during, and after the meeting, which altogether forms a complete unit. Understanding how the MDTM works will help us to understand the information needs of MDTMs and the information that emanates from MDTMs that need to be in the MDTM record.

2.2.1. Pre-MDTM activities

Before the multidisciplinary meetings, several activities take place in preparation for the meeting. Preparation involves listing patient cases for discussion, circulating patient lists and questions to be discussed, to MDT members, creating an agenda, ensuring a venue and required professionals are available, ensuring the necessary clinical examinations are done and that clinical information including pathology and radiology results are available, and preparation for presentations by the representative professions (Ottevanger, Hilbink, Weenk, et al., 2013). The responsibility of the processes relating to ensuring information availability may fall on different people; in some cases, coordinators, in others, administrators (Kane & Groth, 2014). The process of gathering information about a patient’s case may be a long and tedious process. Clear processes are needed for information gathering and the development of criteria for placing patient cases onto the MDTM list (De Ieso, Coward, Letsa, et al., 2013).

2.2.2. During the MDTMs

Multidisciplinary team meetings typically include the presentation of the patient case by a physician who shares the current condition, patient history, and prognosis; the radiologist contributes by showing radiology images or artifacts to attendees and presenting the interpretation; the pathologist presents pathological findings and implication of such findings (Kane & Luz, 2009). Nurses are responsible for providing patient preferences and psychosocial information; Comorbidities essentially should also be included in the discussion of a patient case as well (Kidger, Murdoch, Donovan, et al., 2009). The attendees then discuss the case in light of the present information and applying their knowledge, attempt to reach consensus on the most appropriate diagnosis and disease stage, and in line with guidelines (and sometimes taking into consideration patient preferences and comorbid information) propose suitable treatment and management options. However, Ottevanger, Hilbink, Weenk, et al. (2013), Lamb, Brown, Nagpal, et al. (2011), and Devitt, Philip & McLachlan (2010) draw attention to the fact that not all attendees contribute equally at MDTMs. In the event of insufficient information, further investigative work or other retrievals of information may be ordered, meaning the case being discussed cannot be concluded at that meeting. Kane (2008) discusses meeting events as a four-stage process, where the stages are as follows: 1) presentation of findings from the investigative work done beforehand, 2) discussion of pathology, radiology, and clinical information together, 3) weighing treatment options and deciding on recommendations for the patient management plan, and 4) summary of disease staging and next step in patient management. See the figures in Appendix A. At the meetings, the chairman is responsible for handling the order and flow of the meeting (Ottevanger, Hilbink, Weenk, et al., 2013).

2.2.3. Post-MDTM activities

For concluded discussions, recommendations for treatment and care are then communicated to the patient, who would then decide (along with their doctor) on whether they will follow the recommended course of treatment. The patient's choice of treatment should be considered even during the discussions as it would aid better decision-making (Fleissig, Jenkins, Catt, et al., 2006). Some cases, however, may require further investigative procedures or referrals to other clinics (Pillay, Wootten, Crowe, et al., 2016). Regardless of what needs to happen next, communication of such should reflect in an MDTM record. GPs have ongoing involvement in the care of the patient (Lamprell, Arnolda, Delaney, et al., 2019) and therefore need to understand the patient status, diagnosis, and recommended treatment of the patient to offer continuing support. As GPs cannot always attend MDTMs, communication of the treatment plan is essential between the MDT and the GP, but "information mechanisms to advise GPs of recommendations arising from MDTMs vary widely and are not assured" (Lamprell, Arnolda, Delaney, et al., 2019, p. 200). The responsibility is left for the coordinator of the meeting (Borras, Albreht, Audisio, et al., 2014). Other activities may be required following an MDTM, such as further investigative tests, referrals, and communicating with the patient.

2.3. Benefits and challenges of MDTMs

2.3.1. Benefits of MDTMs

Several benefits of MDTMs are identified in the literature. Table 2.1 below shows a combined list of benefits discussed by Kane (2008), Denton & Conron (2016), Lamb, Jalil, Sevdalis, et al. (2014), Devitt, Philip & McLachlan (2010), El Saghir, Keating, Carlson, et al. (2014) Pillay, Wootten, Crowe, et al. (2016), Rosell, Alexandersson, Hagberg, et al. (2018), and Wright, Vito, Langer, et al. (2007).

Benefits of MDTMs
1. Improved coordination between various disciplines involved in the health care plan
2. More reliable diagnosis and disease staging
3. Better treatment decisions
4. Reduces variation in care
5. Development of other staff/sharpening of skills
6. Better patient experience – more access to oncological services, multiple opinions
7. Research
8. Training
9. Development of treatment protocols
10. Shorter wait time to treatment
11. Increased adherence to guidelines

12.	Contributes to linkages among regions that facilitate appropriate referrals
13.	Identification of cases fit for clinical trials

Table 2.1: Benefits of multidisciplinary team meetings

Multidisciplinary teams have become highly valued for contributing to the increase in accuracy of diagnosis and disease staging, and improvements on the agreement of the most suitable and better-coordinated treatment plan for a given patient case (Denton & Conron, 2016; Kane & Luz, 2006). In lung cancer, patients whose cases are discussed in MDTM had a higher likelihood of optimal treatment (Denton & Conron, 2016). Following a 20-year literature review, Pillay, Wootten, Crowe, et al. (2016) also highlighted that more than 50% of the studies found that discussing patient cases at MDTMs resulted in changes in diagnostic findings and management plans and increased likelihood to get more appropriate staging and neoadjuvant/adjuvant treatment for 10% of the patient cases. MDTMs also play a key role in training, research, and development of treatment protocol (Kane & Luz, 2006). According to Look Hong, Gagliardi, Bronskill, et al. (2010) professional benefits such as improved collaboration with colleagues, protection from the risk of malpractice, and an auditing mechanism of hospital practices have been seen. In multidisciplinary clinics, the exchange of ideas and information about the patient's disease and treatment is said to be rewarding, giving caregivers a richer view of the nature of a patient's condition and the risks and benefits of the various treatment options recommended (Hammond, 2010). Ruhstaller, Roeb, Thurlimann (2006) add that the benefit of increased communication between MDT specialists tends to be overlooked. Several of the MDT benefits can be further supported by MDTM records.

2.3.2. The challenges MDTs face

Many challenges still face multidisciplinary teams with regards to the meetings they must hold. There are issues of time, unavailability of key members, cost, record-keeping, lack of information prior to meetings, and shortfalls in follow-on activities (Denton & Conron, 2016; Kane & Luz, 2006; El Saghir, Keating, Carlson, et al., 2014). There are also issues surrounding meeting dynamics, such as the flow of the meeting depending on who is in attendance and whether there is equal opportunity for contribution by all attendees (Lamprell, Arnolda, Delaney, et al., 2019; Lamb 2010).

Though studies are reaching different conclusions on whether MDTMs improve quality of care and patient survival (Krauss, Angermaier & Helm, 2016), these studies also suggest that many cancer care professionals continue to support the multidisciplinary approach to health care, even if they acknowledge that there are barriers that still exist, and Sweden is no different (Rosell, Alexandersson, Hagberg, et al., 2018). Krauss, Angermaier & Helm (2016) cited that various studies found lack of preparation or lack of time to prepare, lack of information needed for the discussion and decision-making, lack of data standardization, lack of availability of participants, inconsistencies in patient data, issues around attendance or non-attendance by the patient, issues around adherence to guidelines, and technical problems, as issues that affect MDTMs. In an interim report by Inera written by Ekendahl (2019) on the feasibility study on support for multidisciplinary conferences in

Sweden, it is reported that there is a lack of guidance on how MDTMs should be managed, there is no agreement on how compensation should work, there are time agreement issues, venue availability issues, technical problems and "a paper-based and time-consuming preparation phase where journal information is searched in several places simultaneously, printed, copied and faxed between participants" (#Ekendahl, 2019, p. 4). MDTMs link clinical information from various sources (Rosell, Alexandersson, Hagberg, et al., 2018). So currently, the process of bringing information together during preparation is inefficient. They further report that the outcome must be recorded by the delegated participants. The documentation process is usually done after the MDTM in various medical record systems.

Additionally, a high number of cases started to overwhelm MDTMs leading to proposals to limit the number and type of cases to be discussed at a sitting. Requirements in various countries to include all patient cases in MDTM discussions may be responsible for this rise in numbers. Lamb, Jalil, Sevdalis, et al. (2014) point out that clinicians at MDTMs do not have enough time to have more in-depth discussions on cases and that it may be necessary to exclude less complicated cases from MDTMs and issue treatment following existing protocol. Their suggestion highlights the importance of guidelines and that data collected from the MDTMs ultimately informs the research that guides how other new, non-complex cases are handled, even if the more recent cases are not discussed at the MDTM.

Quoted from a translated version of original documented

2.4. The MDTM record as a formal record

2.4.1. Information needs in MDTMs

MDTM discussions are aided by certain clinical information, including pathology and radiology results. In addition, comorbidities and patient views are to be taken into consideration when a treatment plan is decided. Lack of information on comorbidities and patient preferences prevent the decision-making process from completing successfully (De Ieso, Coward, Letsa, et al., 2013; Stairmand, Signal, Sarfati, et al., 2014; Fleissig, Jenkins, Catt, et al., 2006) or results in decisions not being implemented but needing to be altered following re-discussion (Rajan, Foreman, Wallis, et al., 2013). Information is also often sourced from different places, a tedious process prone to delays, so clear processes for information gathering should be put in place. Electronic records offer completeness because data from multiple sources can be integrated (Thomas & Peterson, 2003). "The ability of an MDT to reach a clinical decision is associated with improved information quality—specifically, improved information from case history, radiological, and pathological investigations" (Lamb, Sevdalis, Benn, et al., 2013, p. 719). The presence of such quality information is, however, still ineffective if there lacks a person who has the expertise to interpret that information so it can be incorporated into the decision-making (Lamb, Sevdalis, Benn, et al., 2013) so even electronic records need the healthcare professionals to be able to use technology effectively. Figure 2.1 below is Soukup's and colleagues' (2016) depiction of the MDTM decision-making process. The anatomy they use, however, is high-level and lacks the detail seen in the 4 D-Stage explanation by Kane (2008) and, therefore, does not give clarity on how the decision is made. Nonetheless, it serves a purpose in highlighting the information needs of an MDTM that aid the discussion and decision-making process.

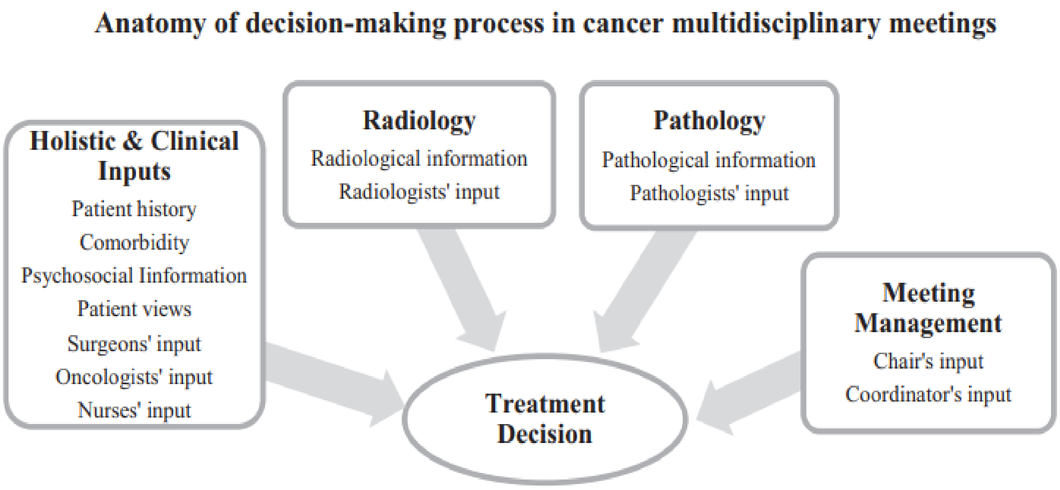

Figure 2.1: Diagram depicting the underlying components of decision-making processes in cancer multidisciplinary team meetings (Soukup, Petrides, Lamb, et al., 2016, p. 6)

The above-mentioned input data into the decision-making process also signifies the potential for the integration of record-keeping systems.

2.4.2. Information produced at MDTMs aid follow on processes

When a discussion is underway about a patient's case, it is essential that it is documented, not as a mere note, but as a formal record because they inform the treatment plans that will follow. A discussion, in addition to the presentation of clinical findings, will typically include various considerations to diagnosis and staging, and the agreement will be based on some rationale. Then different possible treatment options will be discussed, and again justification should guide the ultimate decision. It is vital that the consideration and the final decisions with their rationale be recorded for future reference (Borras, Albreht, Audisio, et al., 2014). The considerations and justification would enlighten the caregiver as to why specific options have been regarded or disregarded, or secondary possibilities in case of changing patient health situation. Similarly, treatment options will aid patient choice or the clinicians' options based on later knowledge, such as other medical reasons for having to change treatment methods.

The recommendations that are given at MDTMs take into consideration clinical information, the patient-specific case, expertise and experience, and guidelines. The purpose of providing such a recommendation is to provide an evidence-based guide to the processes that will follow regarding the patient's treatment and management plan (Devitt, Philip & McLachlan, 2010). The follow-on processes, therefore, depend on the decisions taken in the MDTM and require a record that communicates the decisions effectively. It is also known that deviations from MDT recommendations sometimes happen. Deviations may be due to complications with patient health, new information not considered in the MDTM, patient choice, and consultant's final decision (De Ieso, Coward, Letsa, et al., 2013). Deviation from recommendations may lead to delays in treatment and, thus, poorer outcomes (Osarogiagbon, Phelps, McFarlane & Bankole, 2011). Documenting the deviations also could assist in understanding the effectiveness of MDTM decisions.

2.4.3. Correct records provide good guidance

The MDTs' degree of organization and type of communication directly impacts the quality of patient care (Ruhstaller, Roe, Thurlimann, et al., 2006). "Communication of decisions is crucial to ensure a smooth transition across health services and to avoid omission of any aspect of care" (Denton & Conron, 2016, p. 141). The documentation of the MDT decisions increases transparency (Ruhstaller, Roe, Thurlimann, et al., 2006). However, without a formal record, there is no certainty that communication is getting across, especially where the decisions taken at MDTMs should guide processes that must happen after the meeting. Devitt, Philip, and McLachlan (2010) assessed perceptions of healthcare professionals on multidisciplinary care, decision-making processes, and team dynamics, and one of their findings was that there were deficiencies in the communication of the treatment plan because documentation insufficiently captured details of the discussion, which do not correctly guide follow-on processes. An example they quote is from one oncologist who responded:

> *In some instances... there's been a lot of debate about whether they should have chemotherapy or radiotherapy... You don't get any of that in the summary... it just says 'to see medical oncologists.' (Devitt, Philip & McLachlan, 2010, p.18)*

Meetings minutes in their nature, are not guaranteed to appear in every patient record or to encompass all the needed information. In many institutions, personal note-taking is in place, and though note-taking is not discouraged, it may contribute to a disparate way of keeping information and lack of shared accessibility and verification, possibly missed information; unless there is clarity that all relevant information is in the formal MDTM record as well. Note-taking mainly aims at creating a personal record of vital issues and helping the note-taker to remember what was discussed; it usually emanates from important events and tends to differ from public notes or meeting minutes (Bothin & Clough, 2012). Personal notes will likely vary from person to person at the MDTM based on what is relevant to that person, though similarities may be expected in other areas. However, the notes taken can be a great guide to the information that is relevant and should appear on the MDTM record. While other people may want a detailed description of meeting proceedings, others may be confident enough that, as experts in a particular area, for example, they will not forget (Bothin & Clough, 2012), which may affect how notes are taken. Healthcare staff who reported findings to the meeting said individual notes might not truly represent what was said; that communication may have been misunderstood, and may also result in the person making the utterance being misquoted in the future (Kane, Toussaint & Luz, 2013). There is a need for a formal record. A medical record contains written proof of a patient's medical life over time and can further aid future treatment and decisions taken around that patient's health (Tsai & Bond, 2008).

One of the recommended measures of MDT effectiveness, according to the Intercollegiate Cancer Committee in the UK, is the implementability of the MDT decisions (Lamb, Brown, Nagpal, et al., 2011), which also calls for adequate documentation. El Saghir, Keating, Carlson, et al. (2014) note that anxiety exists that MDT decisions are either not implemented or are sub-optimal due to either not being well documented or lack of attendance in meetings. Amongst the responsibilities of effective leadership in MDTMs is the need to ensure that the discussion is recorded and that the final decision is clear and unambiguous for each individual patient (De Ieso, Coward, Letsa, et al., 2013). The study by Ottevanger, Hilbink, Weenk, et al. (2013) revealed that documentation of the recommendations is being carried out in various ways by different institutions: documentation is either digital, handwritten, both digital, and handwritten or by dictaphone. In 26.7% of the meetings, the documentation was done on a specific MDTM form. A disadvantage Ottevanger, Hilbink, Weenk, et al. (2013) highlight is that not using a specific format may mean that some details can be missed or inadequately reported. Arising from the finding of multiple ways of documentation being combined, is the question of uniformity, completeness, and synchronicity.

Figure 2.2 below, constructed by Kane, Toussaint & Luz (2013), shows several pieces of information that the healthcare workers would like included in the MDTM record. The lists and priorities are likely to vary between tumor types.

Priorities for the Specific Information to be Included in a Record of a Patient's Case Discussion

(*In order of frequency expressed importance*)

Consensus treatment or management plan agreed
Recommendation to patient
Agreed Disease staging
Summary of Patient presenting details
Choice of chemotherapy / radiation therapy clearly indicated
Lesion type, grade, stage, margin status noted
Background history summarised
The underlying basis for decision agreed
The referring consultant
Past medical history
Patient findings on Examination
Cancer molecular diagnostics
Family history
Investigation dates
Accurate smoking history

Figure 2.2. Priorities of specific information to be included in Patient Case Discussion (PCD) record (Kane, Toussaint & Luz, 2013, p. 82)

Ideally, according to the framework for MDTM records (Kane & Luz, 2013), meeting information must be captured; attendance is of particular importance. Additionally, the content that forms part of the patient record, i.e., the patient case discussion information and decisions, followed by the work tasks to be actioned by each role post-MDTM. And then the data that needs to be captured for national repositories.

2.4.4. Likeness to clinical records

The type of information that is required of an MDTM record highlights the kind of formality it must follow. If the MDT record is considered a formal clinical record, a lot can be learned from other clinical records in order to design the MDTM record appropriately. Good quality clinical records facilitate communication, coordination, and continuity of care (Mathioudakis, Rousalova, Gagnat, et al., 2016). Moreover, they can be used as means to auditing quality of care, help in the event of lawsuits, disgruntled patients, or other investigations that might arise (Mathioudakis, Rousalova, Gagnat, et al., 2016). Up-to-date, complete, and accurate clinical records facilitate the work and decision-making of all health care workers and avert unnecessary repeat investigations and inappropriate diagnosis and treatments (Mathioudakis, Rousalova, Gagnat, et al., 2016). Good records aid better decision-making and scientific research, quality assurance, and transparency of delivered care (Zegers, de Bruijne, Spreeuwenberg, et al., 2011). Bad records can achieve the opposite, but more importantly, place the patient at risk. Such qualities apply to MDTM records. Table 2.2. below is shared by Mathioudakis, Rousalova, Gagnat, et al. (2016) as a guide contrasting good and poor clinical records.

Good clinical records	Poor clinical records
Aid the sharing of relevant information and multidisciplinary team communication	Misinform healthcare professionals and patients
Aid coordination of care	Increase medico-legal risks
Aid continuity of care	Lead to unnecessary repetition of tests or other investigations
Aid informed decision making for patient management	Prolong hospital admission
Improve availability of data for risk assessment	Jeopardise patient care
Improve availability of data for route cause analysis in the investigation of serious incidents	Lead to serious incidents
Improve audit capabilities	
Provide informative evidence in a court of law	
Aid targeting of diagnostics and treatment plans without unnecessary repetition	
Improve time management	

Table 2.2: Advantages of keeping good clinical records and the disadvantages of poor clinical records (Mathioudakis, Rousalova, Gagnat, et al., 2016, p. 374)

Medical error is defined by America's Institute of Medicine (IoM) as failure to complete a planned action as intended or the use of the wrong plan to achieve an aim (Crane & Crane, 2008). There may be several causes of preventable medical error, and poor record-keeping is one as it can lead to such failures, as mentioned in the definition above. According to Zegers, de Bruijne, Spreeuwenberg, et al. (2011), poor record-keeping can be a cause or consequence of the low quality of care and may be associated with higher rates of adverse events in hospitals. It has been highlighted in the literature that in cases where a multidisciplinary approach is used, misunderstandings, lack of clarity, and incorrect or missing information can affect both the decision-making process as well as patient care. In Zegers, de Bruijne, Spreeuwenberg, et al. (2011), patient records provided a means through which adverse events (AE) occurring during hospitalization can be assessed and found that missing record components (nursing records, physician orders, laboratory test results) may lead to underassessment of AEs in record-review studies while diligently recording information may heighten the visibility of AEs. Zegers, de Bruijne, Spreeuwenberg, et al. (2011) also found 23% of medical records inadequate (incomplete/illegible) and not signed by the physician, 10% of patient records physician orders were insufficient – unclear and disorderly, and in 14% of medication lists inadequate – handwritten. In 12% of the patient records, admission and patient history were insufficient, and records with low-quality information were associated with more adverse events. Though a majority of AEs are not necessarily attributed to actual records, the records are essential in the event that the records need to be reviewed in case of adverse incidents (Pirie, 2010; Neale, Woloshynowych, &Vincent, 2001). The dependency on patient charts or records when investigating AEs, on the other hand, is somewhat flawed if the records are incomplete, ineligible, or inaccurate (O'Neil, 1993 as cited by Thomas & Petersen, 2003).

Table 2.3 below is an adaptation of a table by Pirkle, Dumont, Zunzunegui (2012) on how poor records can threaten the quality of care. From these fallacies, MDTs can learn and adapt accordingly:

The aspect of quality affected	Examples from the field	Explanation of Threats
Coordination and continuity of care	Health personnel argued that incomplete patient obstetrical charts are acceptable because recording case notes is time consuming, and they are able to remember all pertinent medical information anyway	Medical charts are a written means of sharing information. Multiple personnel and shifts of personnel attending a patient require some form of information transmission. Verbal transmission of case notes is not reliable and does not reach all staff
	When a patient with postpartum complications returns to the same hospital for additional treatment, a new chart is created. Hospital staff do not append new notes to the patient's old chart.	Archiving is often so poor that time-constrained personnel cannot reasonably retrieve a patient's previous chart. This limits the understanding of the aetiology of many conditions, if previous treatments had been administered, and if other conditions had previously presented
Decision-making	Partographs were often jokingly referred to as postographs. This is because they are frequently and inaccurately completed after childbirth. They are often used as learning tools for interns and almost	Medical charts are decision-making tools. They help professionals synthesize divergent clinical information to make informed decisions. When charts are incomplete or

	never completed by more experienced staff	inaccurate, they negatively affect decision-making capacities
Health personnel accountability	Three different sources of medical records all recorded different complications and survival outcomes for the same patient	When charts are incomplete or unreliable, so are any recommendations based on them, including what staff could have done better
	An unexpectedly low number of maternal deaths at one hospital suggested that the files of a substantial number of maternal deaths were misplaced.	When the files of adverse events go missing, then health personnel cannot be held accountable for their actions vis a` vis those missing cases. It is impossible to know if care was suboptimal and in cases where it may have been, to make necessary changes
Accurate statistics	Postpartum haemorrhage was almost never identified in patient medical charts during the immediate post-partum period, although detailed inspection of the case notes often revealed unmentioned cases of postpartum haemorrhage	By not explicitly recording occurrences of postpartum haemorrhage, trends cannot be assessed that would be useful for widespread quality improvements (e.g., improvements in medical education and patient follow-up)
	Medical records were missing from archives. In our study, we deemed these records to be missing at random, but this may not always be the case	Missing data are a form of selection bias and even with advanced forms of statistical adjustment, statistical correction for bias is almost impossible for levels of missing data >10%. Any statistics based on archival research will risk bias with high numbers of missing records. Trends in the quality of care and health outcomes cannot easily be assessed based on such data

Table 2.3. Examples from the field of how poor charting and archiving can threaten the quality of care and why these examples are important - Adapted (Pirkle, Dumont, Zunzunegui, et al., 2012, pp. 565-566)

2.4.5. Advocating for an electronic record

The feasibility and viability of electronic patient records (EPR) and electronic medical records (EMR) have been proven over time. Electronic records are promising as they eliminate the need to find physical space to store medical records, improve the legibility of entered data, facilitate the retrieval of previous patients' records, and validity checks can be programmed into electronic record-keeping systems to assure that vital patient information that must be recorded is not forgotten (Pirkle, Dumont, Zunzunegui, 2012). Electronic medical records (EMR) result in improved patient safety and reduction in medical errors through the ease of access to the patient's record providing medical history and clinical data and contributes to better coordination between clinicians (Crane & Crane, 2008). Similarly, we envisage that electronic documentation of MDTM discussions and decisions can lead to better implementation of decisions, easy to track data, and possibly contributing to the ease with which effectiveness of MDTs can be measured.

An additional area where proper record-keeping is becoming essential is for the eligibility of billing codes to be effected; for example, in Australia, where MDTM attendance is now a billed activity, proper record-keeping is one of the requirements (Denton & Conron, 2016). In this view, a double positive is seen. The attention to the quality of records produced is an advantage to healthcare, and the record itself is advantageous to the billing process and thus the compensation.

The use of paper records by hospitals have their advantages, such as familiarity, portability, flexibility with which recording can be done, and no downtime; they also have several shortfalls such as illegibility, inaccuracy, incompleteness, format issues, and problems with retrieval and accessibility (Institute of Medicine, 1997). Zegers, de Bruijne, Spreeuwenberg, et al. (2011) envisaged that electronic record-keeping would contribute to the ease of recording, standardization, completeness, accessibility, availability, and exchange of patient information. Laboratories and radiology departments predominantly have an electronic way of record-keeping in many countries, and because these departments provide key input to the MDTM process, integrating with electronic MDTM records would be advantageous to the information flow. The MDTM record-keeping, in electronic format, would by-pass many of the known disadvantages of handwritten records. MDTM records would aid such affordances as having a summary of discussions available in the electronic patient record (EPR), making a summary available for referring doctors, and enable the gathering of audit information, worklists, and data for national repositories (Kane & Luz, 2011).

The implementation of electronic record-keeping systems in MDTMs is not unheard of. Electronic health records, though not explicitly implemented for the purpose of MDTMs, have in cases such as the study by De Ieso, Coward, Letsa, et al. (2013), demonstrated a capability to accurately storing the decision information from multidisciplinary team meetings as well as guiding the processes that follow. Other examples of electronic MDTM record-keeping are seen in Kane & Groth (2014) and Lamprell, Arnolda, Delaney, et al. (2019). In Queensland, Australia, significant advances have been made through the creation of "meeting management software which efficiently provides the information required and records the decisions taken without inordinate time losses" (Lamprell, Arnolda, Delaney, et al., 2019, p. 205) and which "is able to draw data from disparate oncology management information systems, making it comparable across administrative regions and facilitating standard post-meeting communication and broadly track patient coverage, time to treatment and adherence to protocols" (Lamprell, Arnolda, Delaney, et al., 2019, p. 205). In other instances, electronic record-keeping during the MDTM does not always prove viable, resulting in reservations regarding the time that may be consumed by the process of data entry during already time-constrained MDTMs (Kane and Luz, 2011). In some cases, the electronic system gets too slow for live note-taking (Carman, Miles, Gregory, et al., 2020). If functioning optimally, a real-time electronic record-keeping system at MDTMs can be projected for all MDTM participants to see and allow for a joint review of the data entries, thus adding to data correctness and accuracy. Since MDTM record-keeping has not been explored enough in literature, establishing the level of success achieved by electronic MDTM record-keeping systems and assessing the best practices they follow, would be useful to the body of knowledge.

The successfulness of electronic record-keeping, in the case of the reviewed patient records, can be attributed to the follow-up communication with those responsible for record-keeping and a strict review of the electronic patient record by secretarial staff and coordinators following MDTMs, while poor documentation was due to poor handwriting or ambiguous annotations which gave no clear account of the decisions taken (De Ieso, Coward, Letsa, et al., 2013).

2.4.6. Additional considerations that influence the MDTM record

Amongst the discussions around records arises the need to have a standardized structure. Structuring records may improve patient outcomes and doctors' performance (Mann & Williams, 2003). The importance of structure is also highlighted by Pirkle, Dumont, Zunzunegui, et al. (2012), who found that record-keeping (charting) where no standardized forms are used tends to be haphazard and missing information, whereas enforcing standardization would improve record quality and vital statistics derived from routine medical data. However, standardization and structure should not be so rigid that it takes away from the richness of the free text which medical professionals use (Lewis, 2002).

Another issue that needs to be addressed in the structure aspect is the terminology used in the records. As per Parvaiz, Subramanian, and Kendall (2008), abbreviations in medical records used by MDTs may cause misunderstanding: in their study, though surgeons are the highest to give the meanings of the abbreviations correctly, they still could only interpret 57.2 % correctly. Abbreviations can be ambiguous and, therefore, should be avoided or their use approached with care (Mathioudakis, Rousalova, Gagnat, et al., 2016; Pirie, 2010). Symbol use in documentation can be equally ambiguous. According to Galliers, Wilson, Randell, et al. (2011), the use of symbols in medical documentation is a safety issue, more so in MDTs. Symbols were found to be used for reinforcement of important information or a shorthand version, thus avoid writing long directions. However, the symbols were unclear at times, misunderstood, misinterpreted, or sometimes assumed to be unimportant (Galliers, Wilson, Randell, et al., 2011).

It is commendable that work has started that guides the information is expected from an MDTM record; however, the issue of format and use of technology still requires exploring. The MDTM record-keeping is of multi-dimensional nature, complicated by the number of stakeholders whose needs it must support, as well as the medico-legal and ethical concerns that must be considered (Kane & Luz, 2011). A key question to be kept in mind, therefore, is to know whom the record is intended for, which will facilitate further how to ensure that it encompasses the needs of each intended use and all necessary information sources are integrated. Organizing information, increasingly enabled by electronic systems, improves the consistency and quality of communication, whereas with insufficient organization, essential information can be lost, and the risk of error increases (Lewis, 2002). For the different specialist areas, an accurate record also ensures compliance and protects against unaccounted for deviations. Accurate electronic record-keeping is, therefore, not only crucial to the continuity of care and coordination but also is key to decision-making and accountability (Pirkle, Dumont, Zunzunegui, et al., 2012).

Several countries, in addition to other Clinical Practice Guidelines (CPGs), have guidelines in place that guide the processes of MDTMs. Likewise, policies are necessary too that govern how record-keeping is done within and in relation to MDTMs. Electronic record-keeping is not a magical fix to record related issues. Deficiencies may exist as well in electronic record-keeping, with some detrimental effects. Therefore, it is essential that the necessary research work is done.

Chapter 3 – Research Design

3.1. Research approach

A research approach refers to how the researcher chooses to proceed with the research process (Wagner, Kawulich & Garner, 2012). A qualitative approach is used to explore and gain an understanding of the record-keeping practices followed in MDTMs. Opinions and beliefs are gathered from involved medical professionals in hospitals with oncology departments about their experiences regarding the documentation; provided before, used during, and resulting from MDTMs. This approach is befitting because we attempt to understand the record-keeping process. There can be many truths arising from the different medical professionals concerning how they perceive current forms of documentation regarding their needs. Qualitative research focuses on understanding the processes and social and cultural contexts that shape various behavioral patterns (Nieuwenhuis & Smit, 2012). By doing qualitative research, one can explore and identify patterns, themes, and models that provide an initial understanding of the researched phenomenon. Following which one can then find ways to accurately convey the participants' experience by producing a meaningful interpretation of events and phenomena in a particular context (Center of Research Quality, 2015). As seen previously, the research questions addressed are:

1. To what extent has electronic record-keeping been adopted in Swedish hospitals for use in MDT meetings?
2. How effective are the records captured in MDT meetings in aiding the patient care after the decisions have been taken?
3. If there are people who do not attend MDT meetings but use the meeting record during the treatment of the patient, do they find the MDTM record easy to access and use?

The study, therefore, has an interest in the type of documentation used. The documentation is essential because of the different advantages known to be brought about by electronic record-keeping. Effectiveness in the second question considers whether the data that goes into the MDTM record is in line with what literature proposes to be the ideal contents of an MDTM record and whether the medical staff has a positive attitude towards the production of the MDTM record and the value its contents add to their work rhythms. To ascertain whether records are effective calls for a better understanding of the MDTM process as well. Finally, we look at the accessibility and usability of the MDTM record. Data is collected using a survey on a sample size of 29. Qualitative studies use smaller sample sizes because they are not concerned with inference, predictions, and even generalizability (Laher & Botha, 2012).

*** The use of the term MDTM record in this section is synonymous with MDTM documentation with all its components. It does not refer only to the audio recordings sometimes done by doctors for later transcription. Therefore, we use the word record in similar terms as in the phrases medical record or patient record.*

3.2. Population

A population is the total collection of all units of analysis in which a research study is interested (Welman, Kruger & Mitchell, 2005). The population of this study comprises medical professionals who work in or closely with hospital oncology departments and are involved in patients' multidisciplinary care. The clinics/departments hold meetings, either physically or virtually. Various medical professionals attend the MDTMs to discuss patient cases, decide on diagnosis and staging, and recommend the appropriate treatment. The study is also interested in staff that does not attend the meetings but needs to use the documentation produced in or following the MDTM to execute their work tasks.

3.3. Participants

Surgeons, oncologists, physicians, nurses, radiologists, pathologists, medical secretaries, administrators, coordinators, and allied health workers are suitable participants for this study. The identification of participants is based on literature by authors such as Kane & Luz (2009), Lamb, Wong, Vincent, et al. (2011), Chang, Vines, Bertsch, et al. (2001), and Look Hong, Gagliardi, Bronskill, et al. (2010), who in their respective studies mention the expected attendees of MDTMs. No segregation is made on seniority or qualification status within each group of professionals, meaning all of the mentioned professionals can participate, without selecting seasoned doctors instead of newly qualified doctors, or qualified nurses instead of trainee nurses, for example. By so doing, we limit the possibility of data being skewed and increase the likelihood that the results will be generalizable across the different levels. For example, highly experienced doctors who are used to working together in a particular way may use shorthand forms of writing and, therefore, may find such writing in a patient record easy to follow and understand, while a newly appointed doctor may not. This satisfies the principle of initial equivalence applied in experimental research, which reduces sampling error (Graziano & Raulin, 2013).

The targeted participants all play a role in the patient care pathway and thus are involved either in pre-MDTM, during, or post-MDTM activities and therefore utilize or somehow influence the MDTM documentation. Table 3.1 below shows the relevance of each participant to the study as a justification for inclusion. The roles each of the health professionals play are drawn mainly from the works cited on the headers. In cases where other sources are used, citations are alongside the roles in specific rows. The third column shows the inputs (orange) to the MDTM in the form of documentation, images, investigative results, guidelines, and intellectual and verbal contributions that should form part of the MDTM record, as well as outputs (green) from the MDTM, i.e., how the resultant MDTM record is of importance to their work tasks.

Profession	Work scope in relevance to MDTs and patient case (American Cancer Association, 2019)	Relevance to the study (Kane & Luz, 2009; Lamb et al., 2011)
Surgeons	Perform surgical procedures relating to investigation or treatment of cancer conditions	Participate in the discussions and contribute to possible treatment recommendations Findings, complications, recommendations that result from surgeries need to be recorded and discussed at an MDTM Access to MDTM documentation guides both the investigative and treatment processes for known or suspected conditions
Physicians	The first doctor that the patient sees when symptoms or problems come up. Examines the patient during consultation and refers them for further examination with radiologists, pathologists, and oncologists; lists the patient case for MDTM discussion and may also manage the patient	Physician notes (clinical findings) and prognosis are an essential input to the discussion as a basis for the patient case to be discussed MDTM decisions and recommendations to be communicated back to the physician
Oncologist (medical)	Specializes in diagnosing and treating cancer	Provides input to the MDTM based on patient case information, experience with, and guidelines for the treatment of similar cases Need to access the MDTM record post-MDTM to provide care

Nurses	Assess, educate, and treat patients Collect information about patient preferences/co-morbidities Take care of the patients Communicate with patients and schedule follow-on appointments	Patient preferences and co-morbidities information are an essential input that may influence the decision-making process and thus must form part of the record Need to access the MDTM record post-MDTM to communicate and to provide care
Radiologists	Uses radiography to investigate medical conditions and interpret findings Provide radiotherapy when recommended for patient case	Present images and discusses interpretation at the MDTM. Need access to the MDTM record post-MDTM to provide treatment and care
Pathologists	Investigate work on body tissues and cells, provides diagnosis, and classification of diseases Pathologists play an important role in the diagnosis, pathologic staging, management, and prognosis of patients with cancer	Present findings and discusses interpretation at the MDTM May need to access records post MDTM if further pathology information is required
Allied health workers	May be involved in physiotherapy or speech therapy sessions needed for a patient May provide the dietary requirements of the patient May deal with psychological aspects of patient health	Suggest needed therapy Consult records to provide necessary sessions and support

Administrators	Said to be equivalent to/ handle the same responsibilities as coordinators (Soukup et al., 2016; Lamb et al., 2013; Kane & Groth, 2014)	Provide patient lists Source/avail patient files Document meeting proceedings Update patient record
Coordinators	Coordinate organization of MDTMs and ensure availability of staff, patient files, maintain order and flow during the meeting and ensure documentation is done (Fleissig et al., 2006)	Ensures patient lists are updated and patient records are made available as input Notes attendees Summarizes discussions, decisions, and recommendations
Medical secretaries	Perform clerical duties for health professionals, receive patients, access patient files, and assist in the documentation process (Career explorer, n.d.)	Ensure the patient file is received/prepared before MDTM Transcribe audio recordings and document doctor notes

Table 3.1. The relevance of chosen participants to the study

Inputs Outputs

3.4. Sampling

Non-probability sampling is used. The method used combined purposive and snowball sampling. Purposive sampling uses the researcher's ingenuity, experience, or previous research to identify participants that represent the population, whereas snowball sampling is one where a small number of the population is approached and then asked to extend to other individuals, thus allowing for the sample size to grow (Laher & Botha, 2012). In purposeful sampling, the selection of individuals and sites for a study because they deliberately inform central phenomenon in the study and understanding of the research problem (Creswell, 2013). Participants are approached by sending emails to personal contacts, other referred contacts, and contacts found online on various Swedish regional healthcare websites. The contacted persons are further requested to disseminate the survey to other contacts/colleagues that may be of interest to the study, resulting in the snowball effect. Snowball sampling allows for identifying cases of interest from people who know which cases are information-rich (Creswell, 2013). One can also use snowball sampling in cases where members of a population are difficult to locate (Laher & Botha, 2012). The people contacted combined those who could participate in the study and those who are needed to grant permission and distribute the survey further without taking the survey themselves. The Swedish Nurses Association and the Swedish Medical Association were approached and asked that they disseminate the survey to their members on whichever platform they deemed fit (their websites, via email, or even their social network platforms) to get the link to the potential participants. There had been no response at the time of the report. No incentives are offered for participation and referring contacts.

3.5. Research method

The study is cross-sectional because it only focused on getting data at a single point in time, i.e., from March 2020 to September 2020. In-depth interviews or observations with a few institutions could have been more appropriate, but such data collection methods need much time and ability to gain entry into the respective organizations. The ability to gain entry is affected more because Covid-19 resulted in restrictions of time, access, comfort, and people's availability for interviewing. Additionally, the possibility of observations is reduced by ethical considerations towards the exposure of patient data to a non-medical person not affiliated with the institution and not involved in patient care. As an alternative method, survey research is embarked on, using a web-based questionnaire. A self-administered questionnaire and a structured interview are similar research methods, except that the questionnaire is self-completed (Bryman, 2016). The study targets a wide variety of participants and needs to reach more people in a broader area over a short period; therefore, an online survey is used for data collection.

Surveys are used to ask participants about their experiences, attitudes, and knowledge (Graziano & Raulin, 2013). Online surveys have advantages such as allowing for comprehensive geographical coverage, save time and money, speed up data processing, provide an environmentally friendly approach to conducting research, and provide a way of getting 'real-world' data as the participants often speak from their own experience; however, surveys can be susceptible to low response rate which may introduce non-response bias (Denscombe, 2017), they are also restricted to online populations and require motivation to participate (Bryman, 2016). Despite the challenges known relating to low response rates in surveys, Krosnick (1999) points out that surveys with a low response rate can be more accurate than those with a high response rate, meaning that a low response does not necessarily imply that the study suffers from a large amount of non-response error. Though surveys are traditionally known as a quantitative means of data collection, they can also be used qualitatively. In the case of our study, the participants can respond to both closed and open-ended questions. The use of open-ended questions is great for exploring topics in-depth and allowing respondents to qualify and clarify their response; in contrast, closed questions may be quicker and easier to answer, and answers allow comparison that may help explain further the issues in question (Mentz, 2012).

MDTM attendees are requested to complete an online questionnaire, which would help us investigate the current record-keeping practices and the gains and shortfalls they present to ascertain if they are sufficient for MDTM data recording. The survey is also used to assess the perceptions and understanding of how (if at all) electronic record-keeping is employed for MDTM data documentation. Healthcare workers in oncology that do not attend the meetings but are involved in the patient treatment and care following MDTM decisions are also invited to participate. Their participation is considered essential to ascertain the clarity and usability of the produced MDTM records and their ability to aid follow-on activities without supplementary notes.

An online survey is selected because online surveys are far-reaching, which means more participants can be reached easily, quicker, and more cost-effectively (Bryman, 2016). Availing of the survey online makes it convenient to participate from anywhere at a convenient time. The ability for participants to complete the survey independently also gives them the freedom to express themselves freely and without biases that could be introduced by external pressures and impressions of a researcher being present. Bryman (2016) highlights that the presence of the researcher (interviewer in the case of interviews) may lead to social desirability bias and also that characteristics of the researcher (such as ethnicity, gender, and social background) may affect the answers people give. The tool Survey & Report was used for creating the questionnaire.

3.6. Survey design

The survey was made first in English and then translated to Swedish. Participants are given both versions and can take the questionnaire in the language with which they are most comfortable. The application used to prepare the questionnaire also allowed for both the desktop view and the mobile view for participants' convenience.

The survey is salient because record-keeping is essential in aiding good quality care, ease of reference, and better coordination between medical professionals during the patient care journey. It can be expected that good quality record-keeping is an important topic to medical professionals and expect the survey to be of interest. Also, the assurance of reliable records would play an important part in developing guidelines and future research that requires assessing patient records.

The questionnaire has mainly continuous questions using a 5-point answer system drawn according to the Likert scale, a few category type questions for demographics, and free-text response questions. The five points allow participants to indicate the extent of their agreement, the frequency of certain events, or even intrinsic values such as levels of importance (Bryman, 2016). Allowing participants who attend MDT meetings and those who do not attend provides a way of strengthening the validity of results.

The questionnaire consists of 30 questions. Of the 30 questions, 3 are tabular, requesting the participant to select their responses on a 5-point Likert scale. Response options are *Strongly disagree* (1), *Disagree* (2), *Neither agree nor disagree* (3), *Agree* (4), and *Strongly agree* (5) to indicate their level of agreement. The options are *Not at all* (1), *To a lesser extent* (2), *Somewhat* (3), *To a great extent* (4), and *Completely* (5) to indicate the extent to which they believe an item applies. The latter also gave the participant an option to indicate if they ‘don’t know’ (0). The Likert scale provides a linear way to measure attitudes by allowing people to indicate their agreement level with a series of statements on a given topic (McLeod, 2008). Each response on the 5-point Likert scale is assigned a numerical value (each associated with the strength or intensity of one’s opinion). The use of numerical values increases the ease of analyzing the data and applying statistical tools in analysis.

Therefore, the survey has a total of 60 questions, 5 of which are for demographic purposes. The survey had three main parts. The first section has contingency questions requiring information about the participant’s profession, whether they attend MDTs, the frequency of attendance, and their role in the MDT process. The second section focuses more on the record-keeping practices during MDTMs, i.e., what goes into the record, who is responsible, when the record is captured, and how it is verified. The third section is concerned with the accessibility and usability of the MDTM records.

The survey was reviewed by a senior lecturer and a professor of nursing at Karlstad University (KAU), translated to Swedish, and piloted with two licensed nurses. “A Pilot study is a version of the main study that is run in miniature to test whether the components of the main study can all work together” (Arain, Campbell, Cooper, et al., 2010, p. 5). A pilot helps to ascertain if there are any potential problems, misunderstandings, and misinterpretations. During a pilot, one can assess if the sampling technique is sufficient and whether the study, on a larger scale, will be feasible. Through a pilot survey, a researcher can get an idea of the variation in a population and thus carefully calculate the correct sample size (Denscombe, 2017). If potential shortfalls are identified, they can then be corrected. The questionnaire was agreed to be clear, sensible, and capable of yielding the expected results.

Following the two pilots of the survey, the questions were adjusted based on recommendations and concerns raised during the pilot. These included clarification of some questions and inclusion of other professions in the items that relate to the profession. We also included the estimated completion time, which was already in the introduction, to the consent form as well. The time estimated to complete the survey is 5 to 20 minutes. Variations in time depend on participants’ responses, and based on their answers, questions that do not apply are hidden. Due to the survey’s length and the anticipation that participants would usually be busy, the survey can be saved and completed later. The consent form communicates that participants can save the survey and finish it later. The logic the questionnaire follows is customized for different response combinations, as is shown in Figure 3.1. The logic allows participants to respond to relevant questions and avoid spending time on questions that are not applicable; for example, a person who does not attend MDT meetings should not be going through items relating to the processes that happen at an MDT meeting.

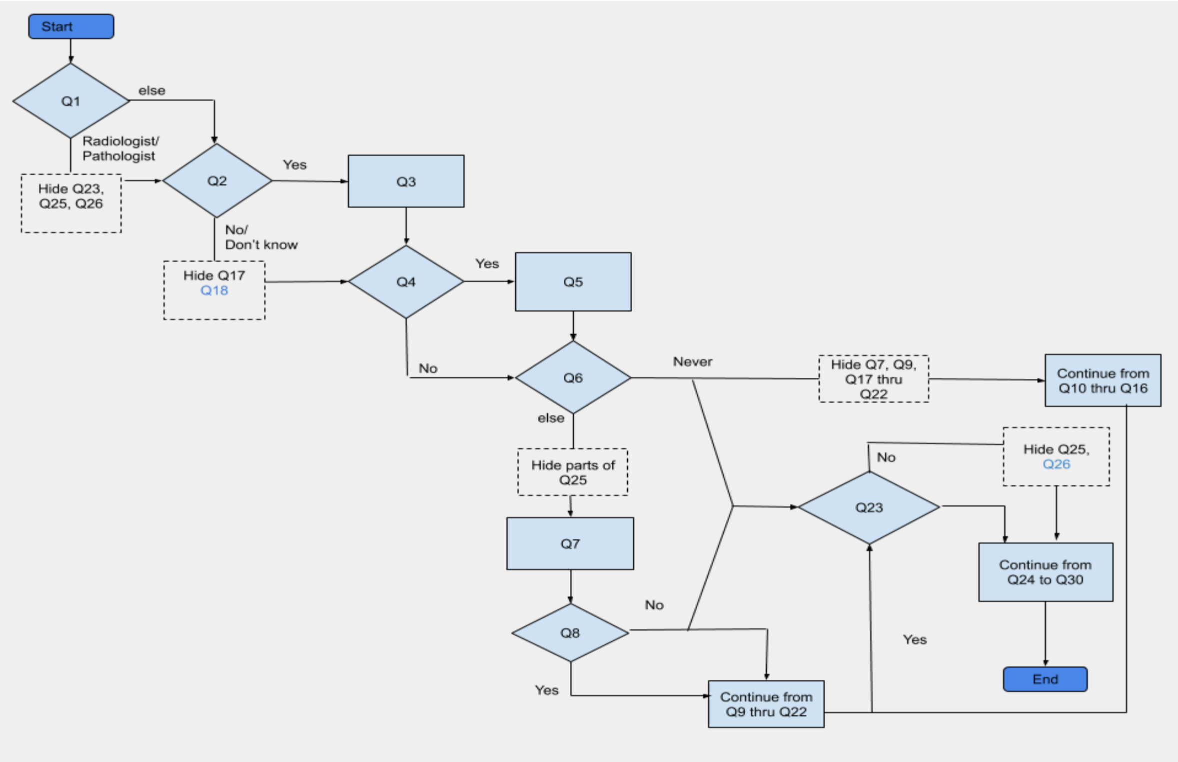

Figure 3.1: Flow of logic for survey questions

3.7. Reliability and validity

Though some researchers have sought to apply the concepts of reliability and validity in qualitative research, other researchers argue that they are inapplicable to or inappropriate for qualitative studies, and others have adapted the terms to be more fitting to qualitative research (Bryman & Bell, 2016). 'Reliability and validity are conceptualized as trustworthiness, rigor, and quality in qualitative paradigm' (Golafshani, 2003, p. 604). Triangulation strengthens the validity of results by combining methods and facilitates cross-checking of results.

3.8. Trustworthiness

Trustworthiness is concerned with a set of criteria (credibility, dependability, transferability, and confirmability) that are used to assess the quality of a qualitative study (Bryman & Bell, 2016). These criteria address issues such as accuracy and appropriateness of collected data, demonstrating that the research reflects reputable procedures and decisions that other researchers can see and evaluate, the extent to which findings could be transferred to other instances, and the level of objectivity displayed – the level of freedom from the influence of the researcher conducting the inquiry (Denscombe, 2017).

The identification and inclusion of various professions in this study intended to show a holistic view by ensuring that the views of all those who play a role in multidisciplinary care are represented. Each stakeholder may have differing needs from the MDTM records, and certain aspects may be more prominently addressed than others. Those who do not attend MDTMs but rely on the MDT decisions and recommendations may require specific formats, the inclusion of certain information, or clarification in the event of insufficiency or arising ambiguity. Their inclusion, therefore, strengthens the reliability of results arising from participants of MDTMs. The use of a survey also means that its reuse would mean participants would understand the questions the same way, and analysis would follow the same path. The inclusion of various institutions and regions also allows us to assess the level of transferability.

However, the reliability depends also on the number of respondents, the quota they represent, and the similarities in circumstances of their predispositions, e.g., same professions in different health institutions may be following different procedures and practices to address a similar problem, and these factors can introduce non-response bias (discussed in the next section: research bias). Krosnick (1999) also discuss dwindling respondent motivation to participate in interviews and surveys over the years and the notion of satisficing, where respondents expand the minimum amount of effort needed to generate a satisfactory response. Respondents need to interpret each question carefully, search memories extensively for relevant information, carefully integrate the information into summary judgments, and respond in ways that convey those judgments as precisely as possible, and compromising one or more of the steps constitutes satisficing (Krosnick, 1999). Satisficing may result in getting less than accurate responses. We have made an effort to address the regulators of satisficing Krosnick (1999) refers to, i.e., the difficulty of the task, the responder's ability to perform the required task, and motivation to perform the task. The latter is done through a thorough introduction of the research, highlighting relevance to the participants and the reasons for requesting their participation beforehand. The former two regulators are addressed by ensuring that a thorough review of the survey questions was done with those knowledgeable in the field, piloted twice, and two language options are given to participants.

3.9. Transferability

Repeatability, also known as replicability, refers to the likelihood that repeating a study by following the exact procedures will lead to similar findings (Bryman & Bell, 2015). Qualitative studies often do not claim repeatability/replicability but refer to the notion of transferability, which is concerned with whether findings hold in other contexts (Bryman & Bell, 2015). A study like this one is transferable in that healthcare bodies in a country often follow the same prescribed standards, and therefore the likelihood that processes that one institution follow are likely to apply to another. The study may also be repeated to involve more respondents, more hospitals, regions, and even countries, and thus is expected to apply in different contexts. The patient record, as well as the guidelines to its contents, how it is produced, stored, and accessed, is undoubtedly important, both to the patient and the healthcare provider. MDTM records likewise are essential and relevant in every institution, region, or country. The use of a survey questionnaire heightens the possibility of being able to repeat the study successfully. Repeating the study would help with determining if results can be generalized to a broader population, and being a survey, it would do better than observations or interviews because of the advantage of being consistent and without researcher influence such as ‘lack of objectivity or intrusion of researcher’s values’ (Bryman & Bell, 2015) in the study.

3.10. Research bias

Having used snowball sampling and forwarding the survey through other contacts presents a possibility of bias in cases where the initial contact is a manager or supervisor of the participant. Co-worker influence could increase or decrease response rates. “Opinions could also be influenced significantly if there existed informal groups with strong norms to either participate or not.” (Buchanan & Bryman, 2011, p 457). Another aspect of bias may arise from the under-representation of certain professions in the responses received. Non-response bias is an expected mistake in estimating a population character based on survey data in which certain types of respondents are under-represented (Berg, 2005). A sample becomes biased when the population from which the sample is taken is not well represented, and though bias should be eliminated as far as possible, it is incredibly difficult to remove it altogether and achieve a truly representative sample (Bryman, 2016). The use of non-probability sampling already introduces some form of bias in that human judgment will likely affect the selection process.

Additionally, inadequate sampling frame and non-response may also add to bias (Bryman, 2016). Acquiescence also presents possible bias when research is in the form of a survey. Acquiescence is when a respondent tends to agree or disagree with a set of questions or items on the questionnaire regardless of what is being asked (Bryman & Bell, 2015). Social desirability bias is, however, not a big concern in an online self-administered questionnaire.

3.11. Ethical considerations

Ethics are an integral part of research work. The codes of ethics are in place to protect human subjects, animals, the environment, and the public perception of research (Pauwels, 2007). This project is registered by my supervisor, Dr. Bridget Kane Ph.D., with the Research Ethics Unit at Karlstad University. The title of the project is “Survey of multidisciplinary team meeting practices”. In accordance with the university policy, the data will be preserved for 10 years and then deleted. This research does not require the involvement of patients nor any of their data. The anonymity of all participants is preserved.

Data protection refers to the steps to be taken to guarantee that all personal data is protected, and the privacy of participants is guaranteed (Pauwels, 2007). Protection of personal data requires that the utmost care be taken regarding both the access and conversation of research data (Pauwels, 2007). The participants’ demographic data, such as profession, department, hospital, region, and country, are requested. No other personally identifiable information is requested. Demographic data is asked for analysis purposes and is not mandatory except for the profession.

Participants are presented first with a consent form informing them of how data would be handled and how to get further information if they need to. The consent form also advises participants that data such as hospital name, region, and the department will not be included in the published results to protect their confidentiality. Participation is voluntary, and the participants can proceed with the survey only if they give consent. The participant can consent by ticking a checkbox to agree and then confirming by clicking the '*I agree'* button. At this point, the participant can also select '*I refuse'* - in which case they are thanked and exit the survey. Informed consent ensures that participants are fully aware that their participation is voluntary (Pauwels, 2007). Participants further have the option to withdraw their participation at any point, even after giving consent. The research student and supervisor details are also provided to ensure that participants have contacts if they have questions or require access to the results after the study is complete. The purpose of the study, the group of targeted participants, and their time commitment are also outlined in the consent form and introductory text of the questionnaire. For participants to consent meaningfully to participation, the consent should be transparent about the research and its goals, possible adverse effects, and or withdraw from the study without facing any consequences (Pauwels, 2007).

3.12. Challenges with access to participants

Creswell (2013) discusses issues of access and building rapport to facilitate data collection, and though his discussion concerns mostly studies that would require gaining physical access to sites, it has proven to apply in the case of our study. With regards to ethnography, which closely relates to this study, he discusses that access starts with a "gatekeeper" who is the initial contact of the researcher and is an individual who is a member of or has insider status to a cultural group, and leads the researcher to other participants (Hammersly & Atkinson, 1995 as quoted in Creswell, 2013). Despite having no requirement to do observations or physically meet the intended participant, several challenges still arise from doing research relating to the medical industry. Rapport, which means quickly establishing a relationship with the respondents, encourages them to participate (Bryman, 2016) in a study. Building trust with study participants results in getting richer data (Kane & Groth, 2014).

Clinicians are hard to access and have time constraints as they have to tend to their daily routines, meaning, as an unknown person and not within the industry, one encounters hardship with making contact with them and grasping their attention. There is little that can be done towards getting contact details of the relevant people without a gatekeeper, and emails provided on websites sometimes led to incorrect contacts, unanswered emails, or a select few that would lead to granted permission or forwarding of the permission request to a relevant party.

Early on, phone calls were made using contact details provided on websites, but the phone calls led to being forwarded from one place to another, only to end up dropped, with no response, or with no help. An additional challenge to not having inside information is that it is difficult to understand the organizational structure, who should be contacted first, and how they can be reached, and institutions differ.

Clinicians do not have time. Even when the communication reaches the right people, there is an issue with when the participant can participate in the study. One response requested more information regarding ethical issues and after sending a reply to accordingly. Having received the answer, she raised the question, “On whose time will this be done?”. The clinicians cannot be asked to put the study on employers’ time; from an ethical perspective doing so would be questionable as the clinicians' primary concern is patient care, which cannot be made to compete with time taking a survey. Similarly, clinicians may be protective of their personal time, where the study concerns work-related practices.

Different institutions require approvals of various kinds. Ethical issues were carefully considered relating to participants’ data protection and anonymity, and with reference to any patient-specific information. Ethical considerations are communicated to participants in the email, inviting them to participate and in the consent form that each must sign before taking the survey. Some participants found the process followed adequate, and others not. Several email responses displayed an interest, but some required that permission be sought with clinic heads of the individual cancer clinics, and some required regional/hospital approval before they could consider giving consent within their respective clinics.

Summer holidays, through which the study extended, also proved a difficult time to consult different professionals, and work emails would most likely accumulate during their vacation, resulting in the invitation to participate in the study taking lower priority upon their return to work. On the other hand, those who are not on vacation would then most likely have more work to handle due to a reduced number of available employees, thus lower the chances of getting responses. The issue of summer holidays was also raised by one of the nurses who piloted the study as a potential challenge.

The Covid-19 pandemic also altered how cancer care is handled, in that fewer cancer cases are handled, virtual consultations are embarked on, patients could not get some types of treatment, deferred screening appointments (Broom, Kenny, Page, et al., 2020), and fewer cancer cases plus reducing contact must have an impact on frequency or capacity in MDTMs. In turn, this could result in less attendance and thus less keenness to participate in an MDTM study. Another concern raised during a pilot, resulting from a question that refers to a participant’s recently attended meetings, ‘what if I have not attended recently?’. The concern highlights the point on how keenness to participate can be dampened in this case.

Another area of skepticism with regards to the forwarding of the invitation to participate is that if people sent emails from their region’s email addresses (which the health professionals use), it might give others a false sense that the request is coming through and has been approved by the region, possibly arising from insecurity and need to feel protected from being found to be at fault should an inquiry arise with regards to participation in the study. Following up on emails can be tricky as a lack of response could be due to not having received/seen an email or the participant's choice not to participate.

3.13. Data analysis

Data analysis is the process of making sense of the data collected during a research study to answer the research question (Wagner, Kawulich & Garner, 2012). The survey questionnaire consists of both closed and open-ended questions, and a qualitative view to analysis is taken. According to Bernard and Ryan, cited in Kuckartz (2014), the type of data does not necessarily determine the type of analysis; quantitative data could be analyzed qualitatively and vice versa. Quantitative methods of analysis/tools can be applied to qualitative data gathered using Likert scales. The analysis is done inductively, as opposed to deductively, as the research seeks to understand how, where, and when MDTM records are produced and what goes into MDTM records. There are no hypotheses to work from and hence no specific variables of interest, as would be the case in the deductive analysis. An interpretive epistemology is taken as opposed to the positivist stance, which focuses on facts and figures relating to the causes and consequences of phenomena (Denscombe, 2017). Interpretivism, as a paradigm, is primarily concerned with using qualitative data to develop insights into people's beliefs and their experiences (Denscombe, 2017).

The tool Survey & Report was used for designing, piloting, also in reporting the findings. Survey & Report is a multilingual online survey tool, accessed for this study through Karlstad University. The results are reported in three ways: the number of respondents, percentages, and bar graphs for each Likert item or Likert-type item by Survey & Report, then reviewed and analyzed one-by-one.

'Raw data' was exported to Microsoft Excel. The analysis included assessing the frequencies as given by Survey & Report. Frequencies refer to how many respondents selected a particular response (Denscombe, 2017), e.g., *Strongly agree*. Further analysis was done in Excel and SPSS, considering the Mean, Mode, Median, and Standard Deviation for various questions, and looking out for relations between certain variables, and then presenting the data descriptively. SPSS was used to check for statistically significant relationships between professional roles and other variables.

For open-ended questions, thematic analysis was done. Many participants opted to give their text-based responses in Swedish, and those responses had to undergo translation and verification before coding could happen. Grammatic errors and incorrect punctuation is purposefully not corrected to avoid tampering with the data. However, in a few cases, it was necessary to reorder as required in each of the language's sentence construction rules. For ethical reasons, institution names and regions mentioned in the free text were masked before sending the file out for translation verification.

Thematic analysis, whereby themes or patterns are identified and then used to understand a phenomenon by looking at how participants experience it (Kawulich & Holland, 2012), was suitable for the text-based responses. Themes are broad units of information consisting of several codes (from the coding process) that are aggregated to form a common idea (Creswell, 2013). Responses to open-ended questions in the survey were put in tables with three columns. The first column held the item number, the second column had the participant's response, and the third column had the translated version of the participant's response. Each table was numbered and given a heading to match the question on the survey, and each participant's responses were tabulated in rows. From the text, coding was done bearing in mind concepts, perspectives, characteristics, context, and relationships. The codes were then grouped into themes or categories. Color-coded stick-it notes were used to write down text-based responses, which were later categorized and aggregated.

Coding allows us to label and group data into meaningful chunks (Bui, 2014). During the coding process, the researcher scrutinizes the data, finds the common elements between them, and assigns the small bits of 'raw data' into categories, where each category may be concerned with a specific issue, attitude, or even emotion (Denscombe, 2017).

3.14. Limitations

The following limitations are noted:

- Participating hospitals are limited to those who could give a response within a specified time. The requirement of the institution- and region-specific approvals also require time to process, thus resulting in non-participation.
- The current COVID-19 pandemic changed the dynamics around access to healthcare institutions, working patterns, and the availability of cancer staff.
- Given the difficulty of reaching healthcare professionals, and because the composition of MDTs differs between clinics and institutions, all specialties may not be sufficiently represented.
- It is likely that each hospital will have its own version of an electronic record-keeping system, with some systems superior to others, which may make it harder to understand whether positive or negative perceptions are influenced by version differences or the use of an electronic record-keeping system in general.
- Reviewed literature is limited to English literature. A few Swedish articles were read to get an understanding of MDT organization in Sweden; however, the electronic translation applications are not always accurate; therefore, scientific papers in Swedish are not included.

The identified limitations prompt the direction and design of potential future studies.

Chapter 4 – Results

The first questions in the questionnaire seek to understand the roles of the participants and their involvement in MDTMs. In the results and analysis, the logic the questionnaire followed must be kept in mind as it is customized for different response combinations, as shown in Figure 3.1. No statistically significant relationships are identified between professional roles and other variables.

4.1. Respondents

A total of 29 participants completed the survey questionnaire. The majority of the participants are a part of 8 Swedish regions and 14 Swedish hospitals. 89.7% of the participants (26) provided the country, 28 (96.5%) supplied the region, and 20 (69%) supplied the department. The participants are comprised of 8nurses (27.6%), 7 physicians (24.1%), 4 surgeons (13.8%), 3 oncologists (10.3%), 2 radiologists (6.9%), 2 administrators (6.9%), 2 medical secretaries (6.9%), and 1 pathologist (3.4%).

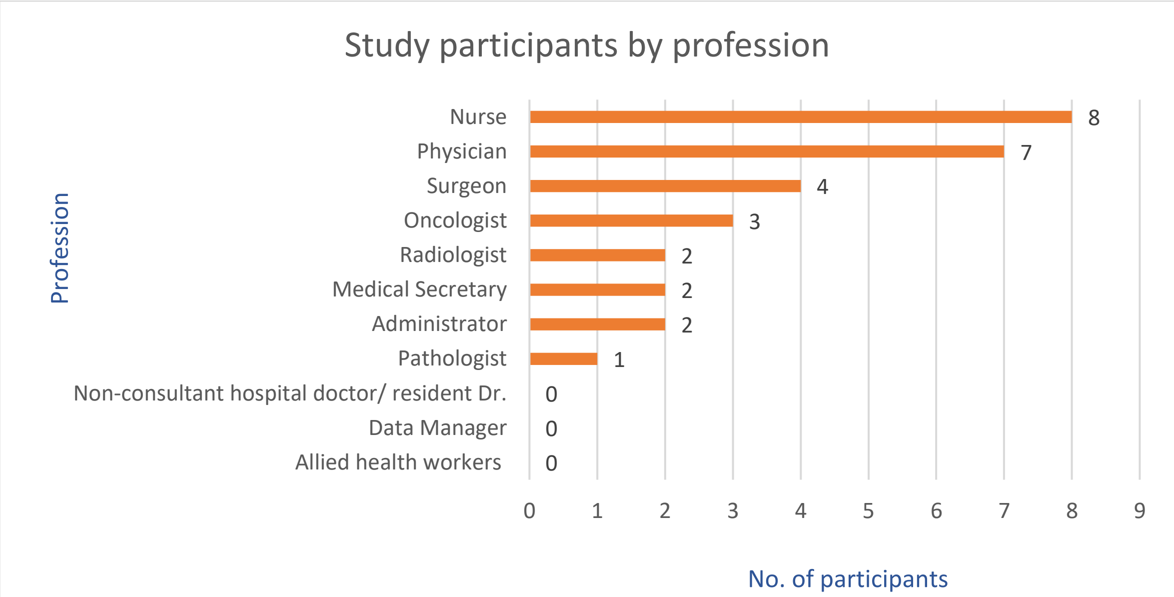

Figure 4.1: Survey respondents by profession

4.2. Institution and team involvement in MDTMs

Of the 29 participants, 28 (96.6%) work in teams that attend MDTMs, while the remaining 1 (3.4%) does not. The one participant whose team does not attend MDTMs does not personally attend MDTMs anywhere else and does not know if their institution takes part in MDTMs remotely is a nurse. If this is true, then it highlights a different picture, that some institutions do not as yet use a multidisciplinary approach to healthcare in Sweden. Teams that attend MDTMs constitute 17 (63%) who have meetings weekly, and 10 (37%) attend an

MDTM more than once a week, with one participant revealing that they attend as many as 14 times in a week, another highlighting that attendance happens at four different frequencies, and yet another pointing out that they have been exempt from usual attendance requirements due to the Covid19 pandemic. In addition, 21 participants (72.4%) confirm that their institutions take part in MDT meetings that take place over a video link, either weekly – 13 (61.9%), more than once a week – 6 (28.6%), twice in a month – 1 (4.8%), and monthly – 1 (4.8%). The other 7 participants (24.1%) only have meetings that take place and are attended at physical locations, while 1 (3.4%) does not know if their institution takes part in video-linked meetings.

4.3. Individual involvement

17 participants (58.6%) attend meetings weekly, 6 (20.7%) attend every other week, 3 (10.3%) attend more than once a week, 1 (3.4%) does not attend, 1 (3.4%) seldom attends, and 1 (3.4%) attends once a month. There is a positive but weak correlation (r = 0.4) between the frequency of team meetings and the participants' attendance. Though the Mode and Median both = 5 (weekly), participants generally attend less frequently than teams hold meetings.

It is expected that a single person may attend MDT meetings for various reasons, either on separate occasions or on one occasion, and the results reflect as such. One question in the questionnaire enquires about reasons for attendance, and expected responses are given in the questionnaire, but participants are also at liberty to provide additional information in free text in the comment section. According to the options that are given in the questionnaire, the results are as follows ('Other' option = 0% not reflected on the chart):

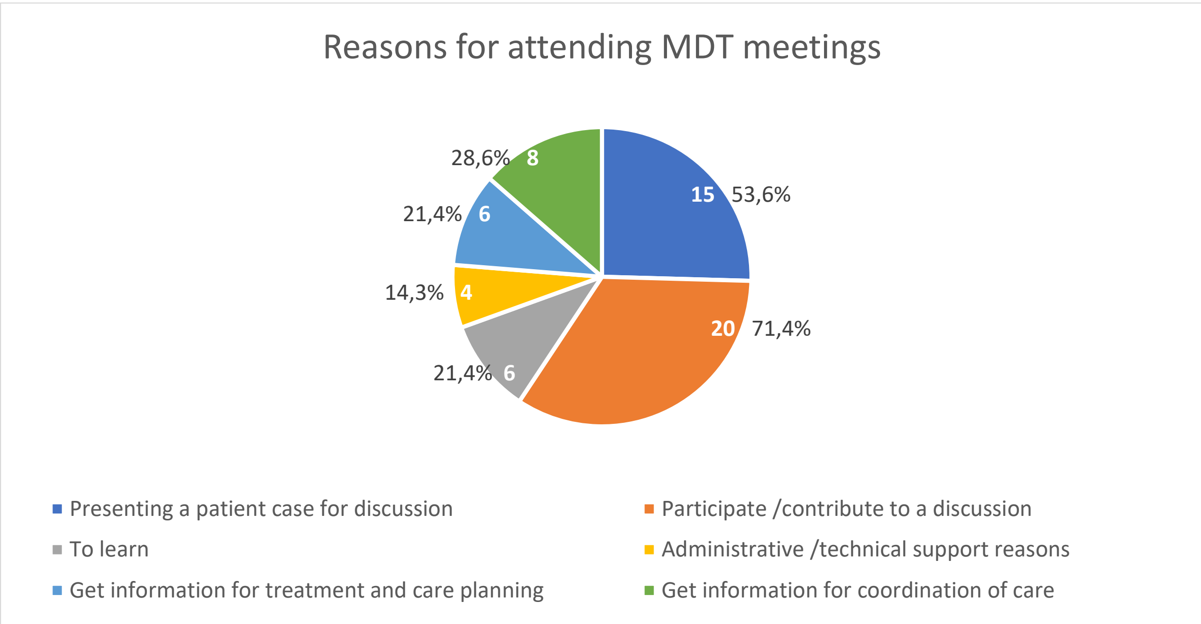

Figure 4.2: Reasons why participants attend MDTMs

4.4. Roles

The questionnaire further enquires about the participants' tasks/roles in preparation for the meetings, during the meetings (tasks/roles beyond just verbal participation in discussions), as well as after the meetings. 65.5% (19/29) of the participants are involved in the organization of the MDTM. See tables 4.1, 4.2, and 4.3 below for the aggregated list of tasks/roles that take place prior to, during, and after the MDTM, respectively. Some tasks overlap between themes. Examples such as operating some equipment, data capturing, and co-ordinating the meeting, were given for roles during the meetings that are additional to or besides verbally engaging in discussions. More than half (57.1%) of attendees at the MDTM say that they have a role during the MDTM that goes beyond the need to participate in the discussion, such as coordinating the meeting, data capturing, or operating equipment. Out of 27 respondents, 25 report having a role after the MDTM that follows from the MDTM decisions. The tasks/roles are listed in table 4.3.

Communication & Scheduling	Information for discussions	Pre-MDTM procedures & exams	Preparation for discussions
Receive registration of cases to be discussed Prepare patient list (cases to be discussed) Schedule cases to be discussed Compiling MDTM sign-ups and any additions Plan dates for MDTMs Announce cancellation in the event that MDTMs will not take place Distribute a list of patient cases to participants Mark out contact nurses for each patient and distribute copies to contact nurse colleagues	Make sure all necessary information is available Make a summary of medical history Notify patient that case will be discussed at MDTM and ask about preferences	Ensure patients are listed for and fully examined, including pathology, x-rays, PET-CT & Scintigraphy Ensure test results, x-ray answers, and PAD answers are ready	Read up on cases to be discussed Define clear question that should be covered in MDTM and ensure it is available in the medical record Prepare patient case Prepare demonstrations/ radiology Choose PAD to develop on the patient that the surgeon has set up

Table 4.1: Highlighted tasks/roles that participants handle before the MDTM

Meeting order and setup	Presentations & outcomes	Rescheduling	Follow-up
Starting up equipment Take attendance list Keeping meeting order Facilitator Chairman	Presentation of patient cases Use existing equipment for demonstrations Note if bookings should be made for surgery Ensure that steps such as formal staging are completed adequately Present how the patient feels	Take possible rebooking requests and make bookings	Note which examinations need to be ordered Note referrals that need to be sent Gather information to be able to coordinate care Follow up decisions and dictate decisions

Table 4.2: Highlighted Tasks/roles that participants handle during MDTMs in addition to general verbal discussions

There is an allotment for general comments with regards to the organization of MDTMs within the participants' departments/hospitals. These comments were organized in categories and themes, and the following two main themes were evident: praise (3 participants) – 'works well', and challenges (6 participants) – lack of needed professionals, technical issues, missing information on patient wishes, lack of standardized form of documentation, length of meetings. Comments with responses '*No*', '-', '.', and those that were informative without much relevance to a specific theme are not considered. Some participants attend at the regional level and may attend at national level MDTMs also; therefore, a similar question is asked with regards to regional/national MDTMs, and from 4 responses, similarities to the local meetings are seen: lack of resources, *attendance, and a call for improved quality of technology. Comments with '*No*', '*Not applicable*', '-', or '.' were again not considered.

** A note on lack of attendance by nurses in national MDTM is unclear. It could be informative, meaning the question cannot be answered because nurses do not attend, or it could be drawing our attention to the suggestion that nurses are not invited to attend nationally.*

Documentation of proceedings	Book planned procedures	Handle referrals	Patient update	Schedule appointments	Follow up
Send out attendance lists Dictate Record notes Ensure there are notes for all admitted patients Documentation of cases I have presented Document suggestions and discussions in the medical record Write demonstration statement for current cases Plan treatment – administer or excuse conclusions from MDTM Make sure different measuring points for SVF are entered in the journal Code in the medical record that MDTM has been completed	Order/ Schedule surgery times Schedule additional X-Rays Order additional examinations such as Mutation analysis	Ensure referrals are written and sent	Communicate with patient Communicate with contact nurse Discuss decisions and present the proposed treatment plan to the patient. Document the patient's receipt of the proposal	Schedule return visits	**Chairman follows up the decisions

Table 4.3: Highlighted tasks/roles that participants handle after MDTMs

*** This is unclear as it could be interpreted as follow up on the progress of the matter post-meeting (bearing in mind that chairpersons are often medical professionals too) or meaning summarises and finalizes the discussion by verifying/re-iterating what has been discussed and decided upon in conclusion of the discussion during the meeting.*

The second section of the survey investigates how the documentation is done, the information that goes into the documentation, who is responsible, and when the documentation happens.

4.5. Documentation

To answer to how documentation is done in the meetings, the participants who attend MDTMs highlight that the following are in use: audio recordings - 2 (7.4%), audiovisual recordings - 1 (3.7%), taking of personal notes - 17 (63%), documentation is done electronically - 14 (51.9%), forms and other paper records completed during the discussion - 3 (11.1%), forms and paper records during the discussion which is later captured into electronic form – 4 (14.8%), and 1 (3.7%) indicated to the use of forms or other paper records completed after the discussion. From these results, an indication is made that the majority of the documentation is electronic. Table 4.4. below shows the distribution of results.

Form of documentation	Responses	Percentage
Audio recordings	2	7.4%
Audiovisual recordings	1	3.7%
Taking personal notes	17	63%
Forms and other paper records completed during the discussion	3	11.1%
Forms or other paper records completed after the discussion	1	3.7%
Forms and paper records during the discussion which are later captured into electronic form	4	14.8%
Documentation is done electronically	14	51.9%
I attend from a remote site, and our institution keeps its own documentation	2	7.4%
I attend from a remote site, and documentation is kept by the main institution	2	7.4%
I attend from a remote site, and documentation is kept by the main institution but communicated to us	1	3.7%
I attend from a remote site and have access to an electronic meeting updated during the meeting	0	0%

Table 4.4: Forms of documentation

Some institutions do not have the resources or the availability of certain specialists in their own institutions; therefore, these institutions may remotely participate in MDTMs and collaborate with specialists in alternative institutions to discuss patient cases (Delaney, Jacob, Iedema, et al., 2004; Li, Mansfield & Hansen, 2008; Fennell, Das, Clauser, et al., 2010). Other issues of geographical location result from different care providers being based in different locations, which requires time to be spent in traveling for the meetings (Hammond, 2010). Of those attending from remote sites, 2 (7.4%) indicated that their institutions keep their own documentation, 2 (7.4%) indicated that the documentation is kept at the main institution where the meeting is held, 1 (3.7%) said the main institution keeps documentation but provides documentation (or rather a copy) to them after the meeting, but neither indicated having direct access to an electronic record updated at the meeting. Different combinations may apply in a single meeting, department, or institution so that the participants could select all applicable answers. Some participants (n=8) substantiated further, indicating that documentation into the medical record is done after the meeting with either the doctor responsible for the patient or the chairman dictating the notes to be entered into the medical record. Medical secretaries, contact nurses, and radiologists are also involved in the documentation process through the writing of notes or data entry into the medical record.

Though 13 participants (50%) indicated that the referring physician is responsible for documenting the meeting proceedings and decisions, various other professionals (in differing combinations) take this responsibility too. Participants highlight coordinators (11.5%), the designated data manager (19.2%), nurses (11.5%), each person who will treat the patient taking personal notes (15.4%), medical secretaries (23.1%), and other (15.4%) document during the MDTM. Note-taking and later dictation is often left for the responsible doctors and the chairman, but some participants indicate that the process differs in different situations. Sometimes the responsible doctors or the chairman dictate to someone else to enter the data into the medical record, typically a medical secretary, but in other instances, they may delegate a person who will be responsible for documentation. Taking of personal notes by participants may also be done for the note owners' benefit. Contact nurses are also said to have the responsibility of documenting. An indication is made by one participant that the quality of documentation varies based on the person handling the documentation.

Some documentation takes place during the meeting (7.4%), but most documentation is done as soon as the meeting is over (81.5%) and up to 72 hours post-meeting (11.1%). One participant pointed out that based on experience, the benefits of documentation during the meeting can be appreciated, but it takes long as different specialties have different interests with regards to what goes into the record in relation to the role they play in the patient care process. Instead, a summary of the recommendation is given by the chairman at the end to ensure that every attendee is clear.

4.6. Attendance

Participants' responses show that the lists of meeting attendees are usually taken in local meetings. 22 participants (78.6%) attest to meeting attendees being noted in the MDTM documentation, while 5 participants (17.9%) disagree with this, and 1 (3.6%) do not know. Two participants' added that though attendees are often noted at local MDTMs, this is not the case in MDTMs at the national level; another two participants highlighted that the specifying of meeting attendees happens only sometimes, while another participant added that the list contains doctor names, show contact nurses sometimes and refer to coordinators only with function.

4.7. Meeting proceedings

Lamb, Sevdalis & Taylor (2012) discuss several concerns that need to be considered that enrich the discussions and decision-making process in MDTMs. Understanding these key inputs into the discussions and decisions is essential in consideration of the appropriate contents of the documentation, what barriers could exist, how various types of documentation are interlinked, and how record-keeping practices affect or are affected by these inputs.

4.7.1. Inputs

MDTMs are characterized by presentations, demonstrations, and discussions that are aided by information emanating from previous examinations such as the clinical information, radiology contribution, pathology contribution, information on co-morbidities, and information on patient preferences (Soukup, Petrides, Lamb, et al., 2016). These inputs play an important role in concluding the discussion on a patient case. Participants selected their responses from 'strongly disagree' (1) to 'strongly agree' (5) to indicate their level of agreement to whether the above inputs were sufficient in the MDTMs they attend and whether consensus and agreements are reached. The Median and Mode were calculated on each item, and the Median is used to depict the participants' views in Figure 4.3 below. Participants are also asked to indicate the extent to which guidelines, clinical data, patient preferences, and co-morbidities affect discussions and management/treatment recommendations. See Figure 4.4. Median = 4, Mode = 4 for all charted items. The chart shows items according to the number of responses.

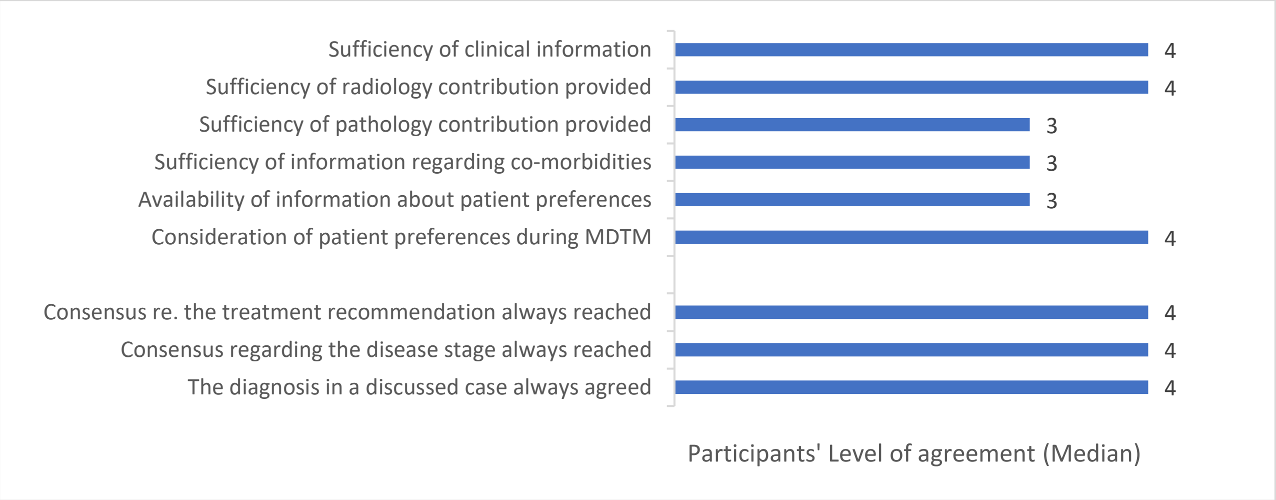

Figure 4.3. Participants' views on the contributions/inputs into MDTM and discussion results

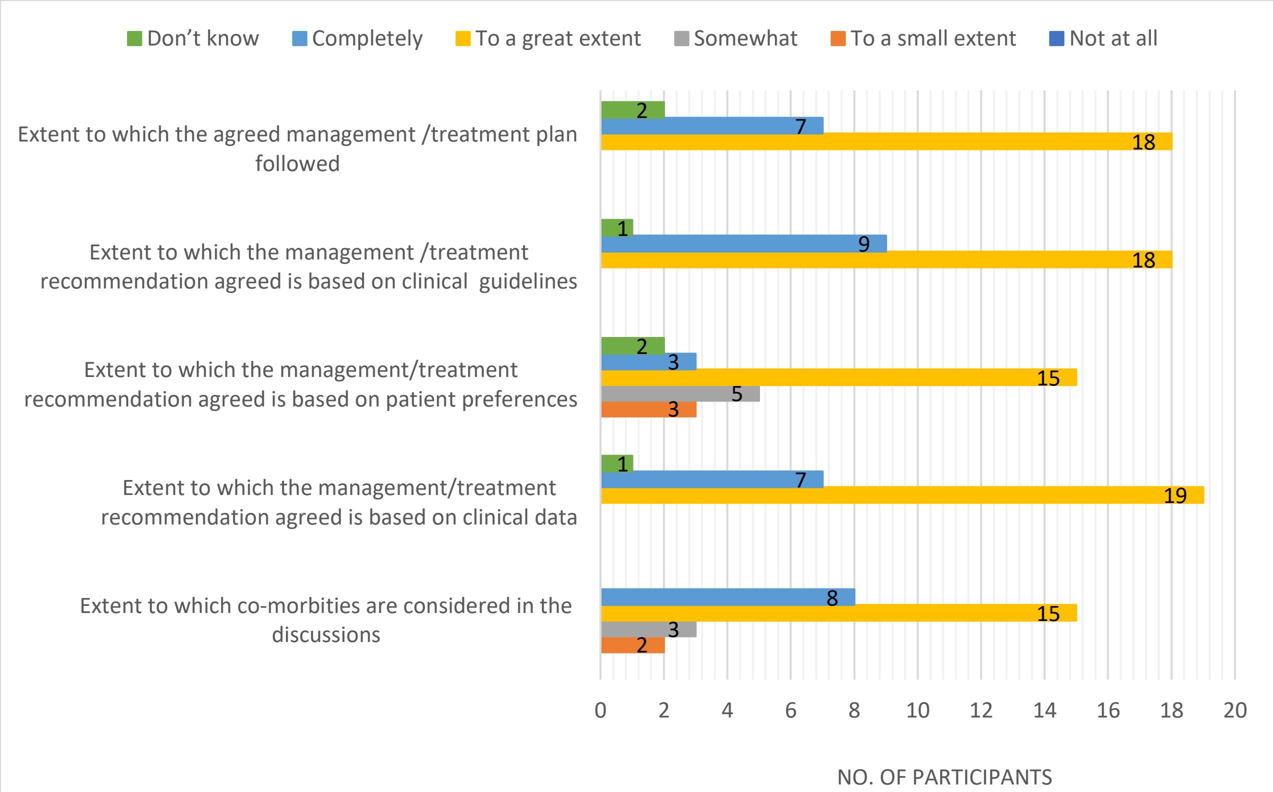

Figure 4.4. Participants’ views on the extent to which specific contributions are considered in the discussion & results

4.7.2. What gets documented?

The MDTM documentation may contain various elements. The participants are asked to indicate their level of agreement with whether four elements (see Figure 4.5) that should ideally form part of the MDTM record (Kane & Luz, 2011) are always clearly recorded. The responses were coded with values 1 to 5 where ‘1’ = ‘Strongly disagree’ and ‘5’ = ‘Strongly Agree’. Mean scores were as follows: the decisions taken at an MDTM are always clearly documented (Mean = 4.1, SD = 0.94, Median = 4), the rationale behind the decisions taken is always clearly documented (Mean = 3.5, SD = 0.79, Median = 4), the discussions leading to the decisions are always clearly documented (Mean = 3.3, SD = 0.89, Median = 3), the various treatment options considered are always clearly documented (Mean = 3.3, SD = 0.89, Median = 3). The chart below shows the spread of their responses.

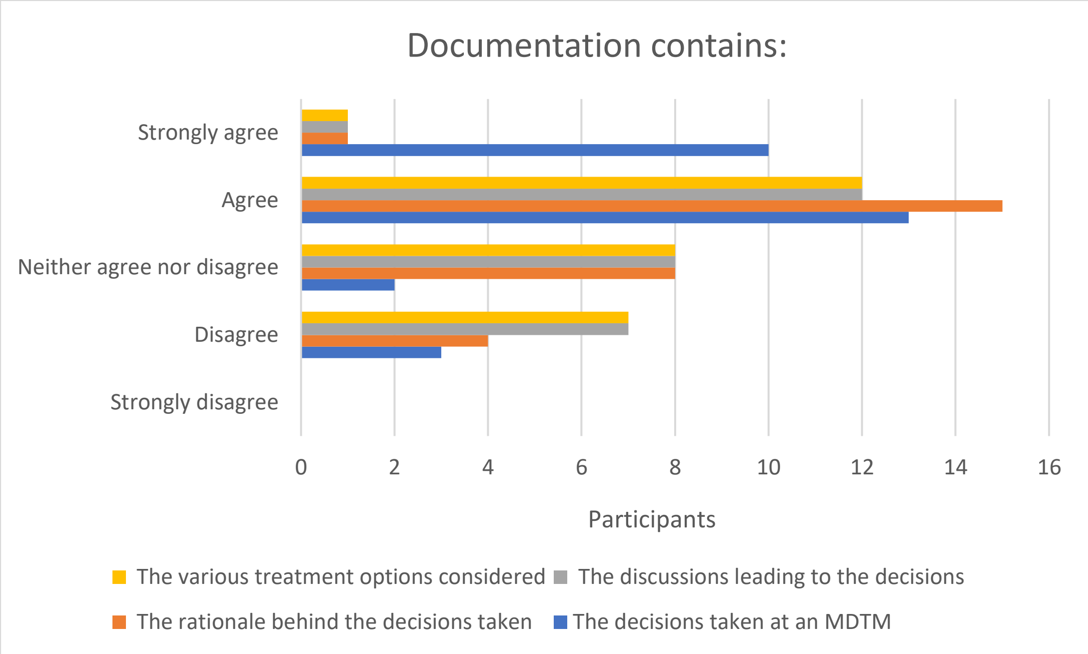

Figure 4.5. Participants' views on the elements that go into documentation at the MDTM

4.7.3. Verification

9/24 participants (37.5%) agree, and 2/24 participants (8.3%) strongly agree that the documented information gets verified for accuracy during the meeting. 1 participant (4.2%) strongly disagrees, 6 (25%) disagree, and another 6 participants (25%) neither agree nor disagree. The Mode is 4, and the Median is 3.

7/27 participants (25.9%) agree, and 1/27 (3.7%) strongly agree that verification is done after the meeting. 11/27 participants (40.7%), however, are undecided, while a further 8 (29.6%) disagree that verification happens after the meeting. Both Median and Mode equal to 3.

The questionnaire also enquires on the possibility of verification happening on a different occasion to the two mentioned above, i.e., only if ambiguity or misunderstanding arises during the course of the treatment. 2/27 participants (7.4%) strongly disagree, 6/27 participants (22.2%) disagree, 10/27 (37.0%) neither agree nor disagree, 7/27 (25.9%) agree and 2 participants (7.4%) strongly agree. Both Median and Mode equal to 3.

Sometimes a patient case is discussed in more than one MDTM (Osarogiagbon, Phelps, McFarlane, et al., 2011; Kane & Groth, 2014). Participants noted the following reasons for multiple discussions on a single patient case: Missing /inadequate information (64.3%), new complications arising in patient condition (60.7%), patient not in agreement with proposed care plan (10.7%), it is a protocol to have a follow-up review (10.7%), all patient cases are discussed at different stages in the care pathway (50%), and other reasons (3.6%). Additional information given by 2 participants included the need for more examinations, the need to seek a second opinion, and the changes during treatment that might warrant more investigation, change of regimen, or required surgery.

Looking at the overall picture on the discussions and decisions taken at the MDTMs, 8 participants make some interesting observations: that conversations tend to be dominated by certain individuals, thus blurring the aspect of being multidisciplinary, MDTMs often confirm at least 95% of originally intended action plan, that the discussions work better where guidelines are in place and or there is good leadership, and that the consideration of patient preferences is overestimated regarding the outcome of the MDTM. A suggestion of two specialists being present per discipline is made, and that there is a need for the person presenting the patient to know the patient personally, or at least should be represented by the contact nurse's notes.

Another requirement on the questionnaire is for the participants to give a rating on four aspects of healthcare (clinical practice guidelines, clinician's judgment, co-morbidities, and patient preference) in relation to their influence on treatment/management plan outcomes in order of importance. The Median of the responses was calculated, and a comparison was made between the different professionals according to the roles they play. 11/25 participants (44%) gave 'clinical practice guidelines' a rating of 5 (very important), 8 (32%) gave a rating of 4 (important), 3(12%) gave a rating of 3 (average), and 3(12%) gave a rating of 1 (not at all important). On the importance of 'clinical judgment' 2 participants (8%) gave a rating of 2, 1 participant (4%) gave a rating of 3, 15 participants (60%) gave a rating of 4, and 7 participants (28%) rated it 5. 'Patient co-morbidities' is rated as follows: 6 participants (24%) gave a rating of 3, 16 participants (64%) gave a rating of 4, and 3 participants (12%) gave a rating of 5. 'Patient preferences' are given a rating of 1 by 2 participants (8%), 2 participants (8%) gave a rating of 2, 5 participants (20%) gave a rating of 3, 10 participants (40%) gave a rating of 4, and 6 participants (24%) gave a rating of 5.

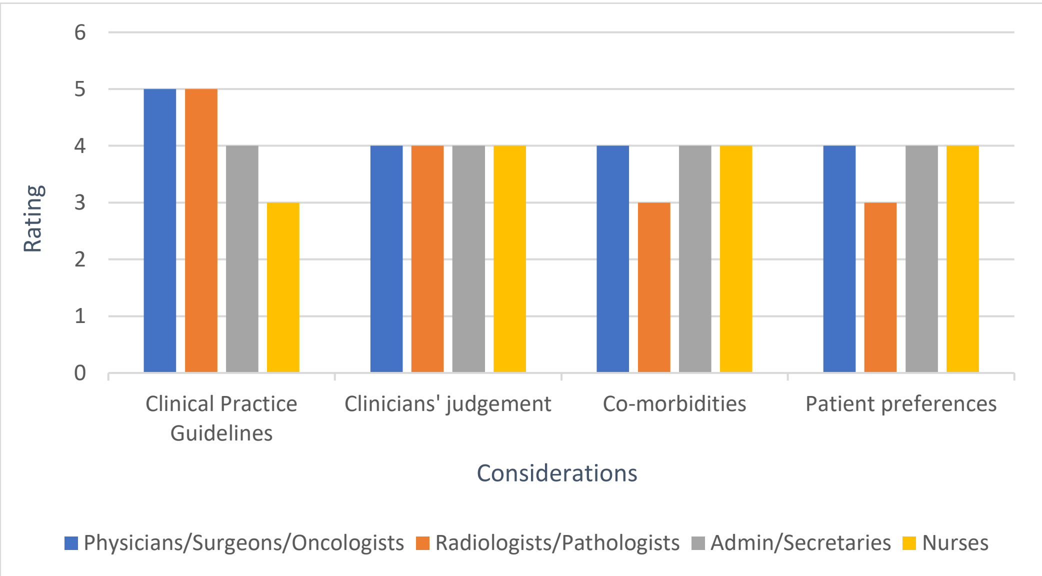

Figure 4.6: Considerations that influence the treatment/management plan

The final section of the questionnaire enquires about the usability of the MDTM records.

4.8. The need for MDTM records

The majority of the participants (80.8%) need to use the MDTM records as reference for work that needs to be done during patient care, while 5 (19.2%) do not. 5 participants point out that there are circumstances in which they find having the MDTM record useful, such as when they could not attend or are not personally involved in a meeting but need to treat/care for the patient, when national/international recommendations cannot be followed, and as confirmation for the treatment that had been intended. One of the 5 participants makes a note that regardless of MDTM recommendation, the doctor and the patient can still agree to follow a different treatment path.

4.9. Availability

A small percentage of participants (13.8%) do not know whether the MDTM record is available on the individual patient record, but 25 participants (86.2%) confirmed it to be so. One participant added that having an MDTM record in the patient record is standardized; another pointed out that the MDTM record will be available in the cancer overview and in the oncology journal if they have dictated on MDTM. Another participant, however, expressed uncertainty with the question, whether the question related to the journal which is available to the patient through 1177.se or if the question referred to the medical record. They further explained that the latter is always the case, while the former is not in their region, but a copy can be requested.

4.10. Use of MDTM records

A total of 20 participants responded to the questions that follow that relate to the use of the MDTM record; 2 participants (10%) neither agree nor disagree with whether they rely on the MDTM records to get their work done; 10 participants (50%) agree, and 8 (40.0%) strongly agree. Looking at both the Median and the Mode, participants generally 'agree' (4) that records are legible/audible, that they are always complete and accurate, that they have enough information to adequately guide follow-on processes, that decisions are followed during patient treatment, and that should there be a reason to deviate from MDTM decisions, the deviation is justified and reported on the MDTM record.

4.11. Sufficiency and quality of MDTM records

Figure 4.7 below shows the participants' views mentioned above in aggregated form. The questionnaire also asks whether it is documented sufficiently on the MDTM record if a decision could not be taken on a patient case due to missing information. 1 participant (5.0%) disagrees, 4 participants (20.0%) neither agree nor disagree, 12 participants (60%) agree, and 3 participants (15%) strongly agree. Two interesting observations are that majority of nurses' responses are generally positive, with legibility/audibility of records scoring higher than other professionals and with a Median of 5, and also 28.5% of physicians claiming they do not need to use the MDTM record as a reference during patient care.

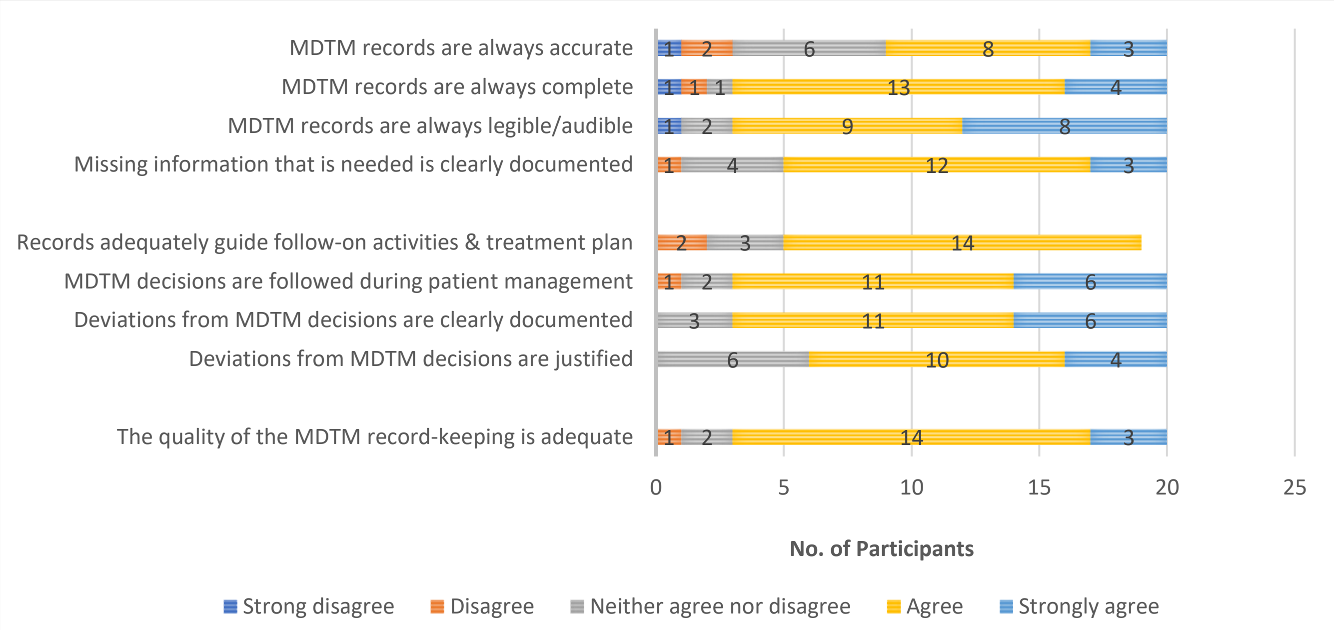

Figure 4.7: Participants' views towards MDTM records based on the level of agreement

The general quality of record-keeping in the participants' institutions received a Median of 4, Mode of 4, Mean of 4 with a Standard Deviation of 0.7.

The majority of the participants gave positive responses (55% agree and 35% strongly agree) to that they know whom to consult in case ambiguities or misunderstandings arise from the MDTM record. 1 participant (5%) disagrees, and another 1 participant neither agrees nor disagrees to having the knowledge of whom to contact. 4 participants (20%) disagree, 9 participants (45%) neither agree nor disagree, and 7 (35%) agree that patients are always in agreement with the decision that has been taken at the MDTM. The spread in response selections is relatively similar with regards to whether feedback about treatment outcomes is sent back to the MDTM: 4 (20%) strongly disagree, 3 (15%) disagree, 4 (20%) neither agree nor disagree, 5 (25%) agree, and 4 (20%) strongly agree.

Chapter 5 – Discussion

Bearing in mind what is learned from literature, that MDT composition and organization may differ slightly depending on location, institution, or tumor type, contingency questions are included that pertain to MDTMs in Sweden to give an understanding of the process in the Swedish context better. Below is the discussion of the results, and, where applicable, we discuss reflections on how electronic record-keeping systems could be of aid.

5.1. Participation

The adoption of a multidisciplinary way of working and the various professionals' involvement in MDTMs is confirmed by the results regarding attendance and diversity in the profession. 28 out of 29 participants (nurses, physicians, oncologists, pathologists, administrators, medical secretaries, and radiologists) confirmed participation in MDTMs, where the majority attend meetings weekly. The weekly attendance highlights that Sweden follows the general world standard, where the frequency of most meetings is weekly (Pillay, Wootten, Crowe, et al., 2016). The positive correlation between the frequency of team meetings and the individual attendance (though low) signifies that the participants attend most of the MDTMs prescribed for their teams. Other professionals attend more frequently, e.g., four different frequencies, which means they participate in meetings in various departments or levels (i.e., local, regional, and national). The one oncologist's report, whose team attends approximately 14 MDTMs a week, was particularly alarming, and this frequency signals a possible overburdening of the team by meetings. Worthy of further research is whether this much attendance impedes on regular work routine or not. Already, Lamb, Payne, Vincent, et al. (2011) allude to such overburdening and highlight that the need for much attendance impacts upon the oncologists' time for preparation, attendance, and post-MDTM actions, thus affecting the ability to commit to extra MDT responsibilities. On the other hand, this finding also stresses the demand for oncologists' availability at MDTMs. Oncologists are likely to be attending meetings with several different departments dealing with varying types of tumors, as per the example in Kane & Groth (2014).

The reasons for attendance are similar to those given by Carman, Miles, Gregory, et al. (2020). Presenting the patient case and contributing to the case discussions are highlighted as the main reasons for attendance. Nurses and those in administrative roles are the only ones whose reasons included getting treatment and care planning information and care coordination information. The reason "to learn" ranked lower. While Carman, Miles, Gregory, et al. (2020) highlight that using the MDTM as a learning experience relates more to junior staff, Devitt, Philip & McLachlan (2010) and Kane (2008) purport that through MDTMs mutual learning can be achieved across professions in an organization. This study shows a mix of nurses, physicians, surgeons, and oncologists value the educational aspect of MDTMs.

72.4% of institutions also regularly participate in video-linked meetings, indicating that institutions that do not have all resources are also included in MDTMs in Sweden. The collaboration between institutions confirms that information-sharing and record-keeping need to cross organizational boundaries. Documentation of outcomes and decisions is a crucial tool and technological component in video-linked MDTMs (Carman, Miles, Gregory, et al., 2020). Initially, logistical issues propelled the need for video-conferencing in multidisciplinary team meetings. Lately, it can be expected that the Covid-19 pandemic will heighten the use of video-conferencing as institutions attempt to maintain social distancing.

The participants' tasks before MDTMs highlight mostly manual processes that are grouped into the themes: *communication and scheduling, information requirements, pre-MDTM procedures and exams*, and *preparation for discussion*. Though some of these tasks overlap between categories, they are grouped in the categories believed to be most pertinent to the functions. The category *'communication and scheduling'* includes receiving registration of cases, scheduling the patient cases to be discussed, preparing and distributing patient lists to MDTM participants, listing contact nurses for each patient and distributing copies to colleagues, and planning and communicating meeting dates. Our findings show that administrators and medical secretaries fulfil the tasks in this category. Wright, De Vito, Langer, et al. (2007) also assert that similar roles and responsibilities are to be fulfilled by the coordinator or other delegated member.

The tasks highlighted under '*information requirements'* pertain to individual involvement in ensuring information needs of the MDTM are met for the scheduled cases, notifying the patient that their case will be discussed and asking about their preferences, making a summary of the medical history, and ensuring that all required information is provided. The tasks listed show that getting a patient case listed already requires several steps that in literature are often just grouped as 'pre-MDTM' tasks. The '*information requirements'* depend on the category '*pre-MDTM procedures and exams',* and it includes ensuring that full patient examinations including pathology, x-rays, PET-CT scans, and scintigraphy are done, and then ensuring that results are ready on time. Our study shows that nurses are responsible for ensuring that information about a patient's case is ready and available. On the contrary, Ashton (2008) highlight many of the pre-MDTM tasks are the responsibility of the coordinator

The final category is the '*preparation for discussions'* representing doctors' pre-MDTM tasks and activities (responses by physicians, oncologists, radiologists, and pathologists). The activities include reading up on the patient cases to be discussed, preparing for demonstrations and presentations, defining clear questions to be addressed for each patient case, and ensuring that those questions are detailed in the medical record. The radiologists also decide on what PAD (pathological and anatomic diagnosis) to develop on the patient that the surgeon has set up. Prades, Remue, van Hoof, et al. (2015) discover in their systematic review that various studies highlight activities similar to those listed in the category '*preparation for discussion*s'. The pre-MDTM tasks require time and are concerned with ensuring that information is available (whether physically or cognitively) to aid the upcoming discussions. Consolidating information collected through the pre-MDTM activities may be more challenging if it comes from different organizations. The shared electronic patient record used in Sweden has proven it is possible to share patient data. Still, organizational/regional factors come into play, and the challenges around the patient's consent to their medical record. De Ieso, Coward, Letsa, et al. (2013) discuss that similar challenges, especially where transfer of patient information, pathology and radiology imaging between institutions is concerned.

Human involvement is necessary for many of the pre-MDTM tasks. Our study's participants give no clarity about the methods used to accomplish the pre-MDTM tasks, but according to the Inera interim report on the need for support for MDTMs in Sweden, the pre-MDTM process is time-consuming and paper-based, requiring retrieving, printing, and faxing documents (Ekendahl, 2019), which presents an opportunity for an information system that can securely share information inter-organizationally and intra-organizationally. Information systems can improve handling several of the tasks and present an opportunity to integrate several information sources. The registration and scheduling of cases and distribution of lists along with responsible contact nurses can be done in a system that integrates with the medical record, which would have the medical history, patient preferences, pathology, and radiology results, identifiable to each patient and accessible to all MDTM members. An example is seen already in Lamprell, Arnolda, Delaney, et al. (2019). However, additional complexity would result from the fact that the sources may be different institutions with no interlinked systems.

During the meetings, tasks identified formed the categories: *meeting order and setup, presentations and outcomes, rescheduling,* and *follow-up activities*. In '*meeting order and setup'* are activities such as starting up equipment, taking attendance lists, maintaining meeting order and other facilitation, and meeting chairing activities. The '*presentations and outcomes'* category encompasses tasks like presenting patient cases, performing demonstrations, ensuring disease staging is completed adequately, presenting patient views/preferences, and taking note of patient cases that must be booked for surgery. '*Rescheduling'* tasks include taking rebooking requests and making actual bookings. In the '*follow-up'* category are tasks such as making referrals, ordering further examinations, gathering information that will enable coordination of care, following up on decisions, and dictating decisions. The follow-up and rescheduling activities would satisfy the discussion of the framework of MDTM records on the discussion resulting in a list of follow-on tasks and responsibilities from each role (Kane & Luz, 2013).

After the meetings, the majority of the activities performed relate to '*documentation of the meeting proceedings',* such as sending out attendance lists, recording notes (individual notes and forms), ensuring notes are recorded for all admitted patients, documenting suggestions and discussions in the medical record, writing demonstration statement for current cases, enter different points for SVF in the journal, plan treatment, i.e., administer or excuse conclusions from MDTM, and code in the medical record when the MDTMs are complete. Participants in administrative roles note documentation tasks. In some cases, physicians and radiologists handle documentation too but focus only on information relating only to the presentations they had given. The category '*patient update'* consists of establishing communication with the contact nurse and with the patient to discuss decisions, present the proposed treatment plan, and document the patient's receipt of the proposal. A physician usually handles this category's activities unless otherwise delegated (Wright, De Vito, Langer, et al., 2007). In the '*book planned procedures'* category, healthcare professionals are involved in scheduling or ordering additional exams like mutation analysis, additional x-rays, and surgery times, and also '*handle referrals'* – writing and sending of referrals, '*scheduling appointments'* – return visits, and finally, chairman's '*follow-up'* (on) the decisions. Nurses handle the scheduling of follow-on procedures. Both nurses and physicians/oncologists handle communication with the patient. However, doctors emphasize 'meeting' the patient, and nurses use the terms 'communicate' or 'inform' the patient or 'meet the patient *with the oncologist*'.

Because there is no further clarification on the chairman's 'following up' on decisions, a possibility of two scenarios is seen. The chairman (sometimes coordinator) summarizes the discussions and re-emphasizes the decisions made and recommendations given at the end of the meeting. On another note, follow-up, in this instance, may also refer to the chairman doing a follow-up, later on, to see if the MDTM decisions have been or are being implemented. Both have an essential role. The former ensures that there is clarity for everyone involved in the decisions taken and what needs to happen next. The latter is necessary to understand issues such as the patient's agreement or disagreement with the proposed treatment, the status of referrals, or the progress of the patient's case in general, concerning a given decision. Prades, Remue, van Hoof, et al., (2015) system review found that many have called for the support of clerical and general administration tasks. In agreement with Lamprell, Arnolda, Delaney, et al. (2019), we also believe that reduction of resource requirements for pre-MDTM, during MDTM, and post-MDTM activities can be accomplished by employing an information system that efficiently provides the required information and records the decisions taken without inordinate time losses.

5.2. Documentation

The questionnaire enquired about how documentation is done, by whom and when, and what information gets documented. According to our findings, the documentation process is not standard. Many different methods are in use, but personal note-taking and electronic documentation are the highest in number. Therefore, electronic record-keeping is in place. The knowledge that the majority (92.6%) of the record-keeping is done after the meeting implies that the personal note-taking, form-filling, and audio records taken during the meeting are not considered the final form of record-keeping, but rather, information that is used during the actual record-keeping process. Additional explanations also support this finding, pointing out that MDTM information is later dictated to other staff, typically a medical secretary, to enter into the medical record. Individuals keep personal notes for their own benefit. However, it is crucial that all relevant information is captured in the MDTM record and not held only in personal notes. As discussed earlier in Chapter 2, individual notes are likely to contain pertinent information (Bothin & Clough, 2012).

There is a lack of uniformity and clarity regarding the person with whom the responsibility of documentation lies; different institutions or teams take different approaches. Half of the participants indicate that the referring physician is responsible for documenting the meeting proceedings and decisions. However, data managers, medical secretaries, nurses, coordinators, chairman, and others sometimes handle this responsibility. In some instances, the chairman delegates beforehand who will be responsible for documentation. The variety points to a lack of standardization and no guarantee that all responsible members record all necessary data. One MDTM member points out that the quality of documentation varies based on the person who is given the responsibility for documentation. "It makes sense to investigate the logic of a record: the specific way it mediates the work that depends on it" (Berg, 1996, p. 22). A logical record will ensure that all necessary information is present, resulting in the record's meaningful use by all who need it.

Other professionals also do their own documentation after the MDTM. An example of this is the writing of the radiologist's demonstration statement and the implication that surgeons and oncologists may also have some way of keeping a record for themselves, in an account from a participant stating, *"I am not familiar with how surgeons and oncologists document"*. A small percentage also reflects on documentation or part thereof being paper-based, even after the MDTM. Wright, De Vito, Langer, et al. (2007) highlight that the physician is expected to enter the MDTM recommendations in the medical record and document the feedback discussion with the patient and final decision taken. The issue of documenting the recommendation is interesting because there is no clarity as to when the documenting happens; before or after meeting the patient. Secondly, it signifies blurred roles as in other cases, documentation will have been done during or soon after the MDTM, by dictation and recording of the recommendation along with other MDTM information by the coordinator or chairman and the medical secretary, data manager, or another delegate respectively.

Some good practices highlighted by this study include that meeting attendance is taken in most local meetings (sadly, the same good practices are not evident at national level MDTMs.), and records are updated as soon as the meeting is over and no longer than 72 hours post-meeting. The advantage of keeping attendance lists is that one could easily identify someone who can enlighten a situation if clarification is later required. The attendance list may also play a role in identifying responsible persons who are accountable for making specific decisions. A similar notion in medical records is that a doctor signs the record of the actions he/she has taken. In some instances, attendance lists are taken only sometimes, and special attention is given to doctors' names, while other attendees are either rarely mentioned or mentioned only by role, which shows that there is no consistency; and adding this to the process of standardizing record-keeping practices may be helpful. Medicolegal implications (in the Australian context), when attending MDTMs, are briefly touched on by Denton and Conron (2016). Possible medicolegal issues and the knowledge that one appears in the attendance list could be a positive motivator against indifference at multidisciplinary team meetings. Additionally, the use of a well-documented MDTM record also protects healthcare workers should complaints and accusations occur.

There are still challenges with doing record-keeping in real-time at MDTMs. The real-time documentation may be time-consuming (Carman, Miles, Gregory, et al., 2020) and distracting in that, as expressed by Kane & Luz (2011), concerns are that it threatens to turn the meeting into a 'form-filling exercise'. Understandably, various professions have different types of information that they would like to capture, and the structure each record-keeping form must take is different, using specific medical codes. The big takeaway of this setup (where the captured record is projected on the screen) is that it presents an opportunity for verification to be done by all meeting participants, thus reducing discrepancies. A participant attests that having taken part in meetings with this setup, and their experience was that it took too long. However, that challenge still may not signify impossibility. Information Systems may indeed be ineffective if not prior researched, well designed, and well-implemented (Berg, 1999).

Given that the responsibility of documentation mostly goes to the responsible physicians and chairman (sometimes coordinators are said to play the same role), it can be understood that it would be an onerous task for them to maintain order, participate in the discussion, critically appraise different given options and ensure all appropriate information is documented precisely correctly while the meeting is in progress. Exploring the possibility of permanently assigning the record-keeping task to someone else, who can document the discussions during the meeting, would help ensure that information is not forgotten or misinterpreted. Further research would enlighten this supposition, but as per Bothin and Clough (2012), cognitively, it can be challenging to accomplish all of the above tasks simultaneously thoroughly.

Few participants confirm that they attend from remote sites, and their view of where the responsibility of the documentation lies differs. In one case, the primary institution and remote institution have separate documentation, but the primary institution sends a copy of their documentation to the remote institution. The other two cases show that the primary institution keeps the records, and the remote institution keeps its own records, respectively. The two last cases also raise a concern on whether the two records are in sync. Centralizing this data and making it accessible to all concerned members would reduce the need for manual exchange of records. As a minimum, it would be ideal to have a set guideline as to where the responsibility lies and how other parties gain access.

5.3. Documentation influencers and contents

The contents of the documentation are of utmost importance. The four key information areas thought to be essential elements of the MDTM record assessed are: the discussions leading to the decisions, the decisions taken at the MDTM, the rationale behind the decisions taken, and the various treatment options under consideration. There is a higher likelihood of the records containing decisions taken and the justification for it than to have the whole discussion or different treatment options. It is possible that the recommended treatment plan is documented but not the various options that are taken into consideration. In their proposed guideline, Ottevanger, Hilbink Weenk, et al. (2013), for instance, focus on the documentation of recommendations and discrepancies between recommendations and final treatment but not the various options under consideration and the rationale for the decision. An area of interest would be to know whether a standardized structure of recording the information areas information is in place.

There are no strong agreements amongst the participants regarding the verification of documented information. The lack of verification may result from the fact that most documentation happens after the MDTM, via dictation between two people and not the entire MDT team, which would make it harder to tell how verification takes place. The verification referred to as being done during the meeting may refer to the chairman's confirmation.

> "*…when each patient has been discussed through, the chairman should make a short summary of the recommendation to see that everyone has perceived it equally"* – [participant: ID14]

It can be expected that it would be possible to verify record contents later if ambiguity or misunderstanding arises during the patient treatment and care, even if verification is lacking during documentation, for example, on the occasion that the record is not clear or not complete. Another cause of ambiguity highlighted in literature is the use of abbreviations (De Ieso, Coward, Letsa, et al., 2013; Mathioudakis, Rousalova, Gagnat, et al., 2016; Pirie, 2010). The results show a very balanced outlook where the majority are neutral, and the spread on either side, positive (agree & strongly agree) or negative (disagree & strongly disagree), are almost equal. Therefore, the results could mean one of two things: either the records are relatively accurate, and the participants have had minimal exposure to such scenarios, or participants have had an equal exposure to verification happening due to misunderstandings and verification happening at other times and not only due to misunderstandings. It appears to be clear to most healthcare workers whom to consult in case of ambiguities or misunderstandings in the MDTM record. It would be good to ascertain whether there is a relationship between this finding and the taking of attendance lists at meetings, or this finding and the presence of an authoritative body the health workers know to consult under these circumstances. Communication of whom to contact must then filter through to the few who remain unclear. On the other hand, a well-designed electronic system should eliminate such challenges (De Ieso, Coward, Letsa, et al., 2013).

The quality of the information that informs the MDTM decision-making process is key to effective multidisciplinary team meetings and, ultimately, the resultant MDTM record. Moreover, the information required for the MDTMs is also a record (or multiple records) about the patient whose case will be up for discussion. The study seeks the participants' perspectives on the adequacy of information regarding clinical assessment, radiology and pathology contributions, comorbidities, and patient preferences. This study also explores the extent to which the given factors influence recommendations. Clarity on information adequacy informs the integration needs between various forms of data and the sources from which they come. Clinical information and radiology contributions are generally agreed upon as sufficient, while information on patient preferences, comorbidities, and pathology contributions are not always enough.

The information that lacks accounts for over 60% of the cases are not concluded and needs to be re-discussed. Lamb, Sevdalis, Benn, et al. (2013) and Rosell, Alexandersson, Hagberg, et al. (2018), among others, have also found patient preferences, comorbidities, and pathology to be lacking. When deciding on management and treatment recommendations, consideration is given more to clinical guidelines and clinical data. However, comorbidities and patient preferences are not too far behind. Physicians, surgeons, oncologists, radiologists, and pathologists, rate clinical guidelines as the most important when considering the appropriate treatment for a patient. It would make sense for doctors to prioritize guidelines as they are an evidence-based guide to the decisions around patient treatment, but this also may signify that it is not apparent to nurses the weight clinical practice guidelines have on decision making despite their regular attendance. Clinical judgment, comorbidities, and patient preferences are viewed as reasonably equal in importance. Patient preferences are considered when available, but this is not always the case. It would also be worth exploring further the statement of one participant whose views seem to indicate differences between some practices in Sweden:

> "*The point about the patient's preferences is overestimated regarding the outcome of MDK (MDTM). As a rule, the patient may not have preferences that influence the decision on treatment. If the patient has views, it is usually that he or she does not want treatment at all.*" - [participant ID18]

Rajan, Foreman, Wallis, et al. (2013) and Fleissig, Jenkins, Catt, et al. (2006) stress the importance of patient preferences. Borras, Albreht, Audisio, et al. (2014) note that patients should be included in decision-making where appropriate so that recommendations take their views into consideration. Other participants' comments also seem to support the notion of considering patient preferences. One used the example of missing information on patient preferences as one reason for consensus not being reached. Consensus is achieved at most discussions on the diagnosis, stage, and treatment recommendation. In addition, MDTM records are seen as accurate, complete, and legible. On the 'rare' occasions that consensus is not reached, several steps can be taken: proposed options are discussed with the patient, the case is re-discussed at the meeting once the holdback has been resolved, the issue is re-discussed in the next meeting, a second option is sought, and going back to re-examine the patient is possible but very unusual.

The participants indicate that treatment recommendations are followed, and if deviated from, the deviations are justified and documented. A physician claims that MDTM recommendations confirm the physician's intended management plan about 95% of the time. Another participant states that the patient and the doctor can also agree on a different treatment path that differs from the MDTM recommendations. Ruhstaller, Roeb, Thurlimann (2006) discuss two ways to categorize the decisions made in MDTM. First, the MDTM decision is a recommendation and is non-binding to the caring doctor. Second, the MDTM decision is final, and a good reason is necessary for deviating from the decision.

The healthcare workers perceive the overall quality of record-keeping as adequate, and the MDTM record forms part of the patient's medical record. Patient medical records in Sweden are electronic for many years now and the country has progressed in different systems integration, both at the county and national level (Jerlvall & Phersson, 2012, as cited by Fragidis & Chatzoglou, 2017). It would be possible then for MDTM records to, in some way, inherit a similar means of record-keeping. Additional information given draws attention to the fact that, as opposed to the medical record, the MDTM record forms part of the Cancer Overview and Oncology Journal. A future inquiry could look into how to ensure uniformity regarding where the MDTM record can be found or even centralizing access for various recipients. Some health professionals confirm that they refer to the MDTM record during patient care. Others, however, refer to the MDTM records on occasion, such as missing a meeting. Still, others highlight consulting MDTM records to check if recommendations agree with their intended plans and the need for records arising from the fact that they work with multiple clinics. The conditional use indicates that the doctors are drawing information from other sources, perhaps the personal notes or some other form of record-keeping. After all, Ekendahl (2019) reports that MDTM participants often have different journals.

Pathologists and radiologists do not need to utilize MDTM records after meetings. Arguably the pathologist may not be involved further in patient care following the MDTM. But they admit to having some record-keeping function – which most likely is done on a separate system. The concern with this is whether the different information sources are indeed in sync with MDTM recommendations. Another grey area is whether the medical record and the patient record are the same, and if not, whether the MDTM record reflects on both.

Conclusion

The response numbers might be considered low and a potential limitation to this study; however, each profession is represented, and their participation facilitates reasonable analysis. Despite the low participation, this study highlights that the topic of record-keeping in multidisciplinary team meetings is worth researching further. The data collected enables us to answer two of the three research questions asked. The first two questions addressed are whether the MDTM records are in electronic form and whether the MDTM records effectively aid the post-MDTM work processes. This study established that, to a large extent, MDTM record-keeping is electronic in Sweden. Paper forms and personal notes are still in use, but the information appears to be later entered into an electronic format. The majority of participants who use the MDTM record during patient treatment and care confirm the effectiveness of the MDTM records, and on average, give high ratings on the accuracy, completeness, and quality.

However, some evidence exists that suggests that there are still shortcomings in record-keeping in MDTMs. Even though most healthcare professionals who participated in the study indicate that they find the quality of record-keeping acceptable, there is still evidence that standardization is lacking, and uniformity is questionable. There is no clarity on the entities responsible for record-keeping; therefore, we agree with Ekendahl (2019) that it must be clear who is responsible for documentation. From literature, a deduction can be made that there is little coordination with regards to bringing patient-related data together and ready for the case discussion before the MDTM. The activities listed by participants also point in the same direction, but further exploration is warranted. It also appears that different disciplines are keeping their own records following MDTM discussions; what is unclear is whether the information that appears in the various records is in sync with the information that appears on the MDTM record and if not, one can wonder if the MDTM record can be said to be complete and accurate as our participants have indicated.

Further studies may also address issues of verification of the MDTM record. A record-review study or observation study would provide greater clarity and means to elaborate on the findings produced by this study. It appears that the dynamics of MDTMs have not been explored thoroughly in the implementation and use of MDTM records.

The third question asked is: “If there are people who do not attend MDT meetings but use the meeting record during the patient’s treatment, do they find the MDTM record easy to access and use?”. The third question has not been answered because only one respondent met the criteria that satisfy this group of people, and that respondent kept answers neutral regarding the quality and contents of the MDTM record. Further investigation may provide more detailed results in this regard.

Given this study’s outcome, it will be interesting to see if future studies will yield confirmatory or different results from what we have found. Some regions appear to be performing better than others, and this study has shown that in many ways, multidisciplinary team meetings in Sweden are similar to other countries in composition, procedure, and the challenges they face. Further investigations could use different data collection techniques, such as semi-structured interviews and observations. Getting the necessary ethical approvals from the different regions will allow for more participation, which will give us the big picture of the state of record-keeping in MDTMs.

Questions regarding the organization and process of MDTMs confirm findings of prior studies, so it may be worthwhile reducing the number of questions around those topics and focussing future surveys on more specific questions about record-keeping practices. Driving this consideration is the notion that lengthy survey questionnaires may lead to survey fatigue and thus impact response rates (Jepson, Asch, Hershey, et al., 2005). The questions asked in the current survey appear to be clear to participants, but one question may need further clarification and investigation. That question related to the use of the term ‘patient record’ - which seemed to confuse one participant who claimed not to understand if the question referred to the record the patient has access to (Sweden’s Journalen) or the medical record that the institution maintains. This highlighted difference raises the curiosity into why these are two separate records. This study has also given leads on institutions and regions which may be approached for approval to do more in-depth studies. Overall, the design of the current study yields expected results.

Future research areas that are identified include:

- how information systems can streamline pre-MDTM activities and bring together the information required at MDTMs
- research regarding the use of ICT in MDTMs for documenting proceedings
- guidelines that can improve record-keeping by informing the team on the responsible persons, what data to capture, and the most relevant formats to use
- verification of record contents
- the integration of information sources to aid better discussions and coordination
- and how to provide easy access to the MDTM record for all responsible healthcare members and whether caregivers need access to MDTM records
- issues around availing MDTM records to the patient through the electronic patient record.

These future research areas are all promising for in-depth investigation. The diversity of the multidisciplinary team does, however, makes this task a little more complicated, as healthcare needs a balance between orderly routines and yet sensitivity to variations in local conditions (Fichman, Kohli & Krishnan, 2011). Nonetheless, continued research in this area may yield many positive outcomes to patients, healthcare workers, and sustainability – and the involvement of technology is vital in this process. Because of its potential in aiding follow-on processes, informing the patient medical history, and guiding the patient's treatment and care, the MDTM record should be seen as far more than just meeting minutes. Therefore, the MDTM record must follow strict guidelines, capturing all relevant information as in the medical record.

Acknowledgments

My sincere gratitude goes to my supervisor Dr. Bridget Kane Ph.D., for the outstanding support and guidance through the course of this thesis. I could not have asked for a better supervisor. I have learnt so much from you about this field and about research in general. You have taught me to look deeply and more critically, and even polished my writing skills. You gave of your time even beyond expectation. I really cannot thank you enough. Many thanks to Eivind Nordby for the support, the patience, and the time you committed during the translation process. To Foutula Wohlin, the information and the talks we had were very enlightening, not to mention the much-needed clarification when the medical terms got confusing. Thank you. Additionally, I thank Linn Rosell, Katarina Karlsson, Cecilia Olsson, and Maria Linn; your input and assistance have been invaluable. To my family, your support and understanding during the stressful times and times when I seemed awfully unavailable for you, you have been my strength. I appreciate it all.

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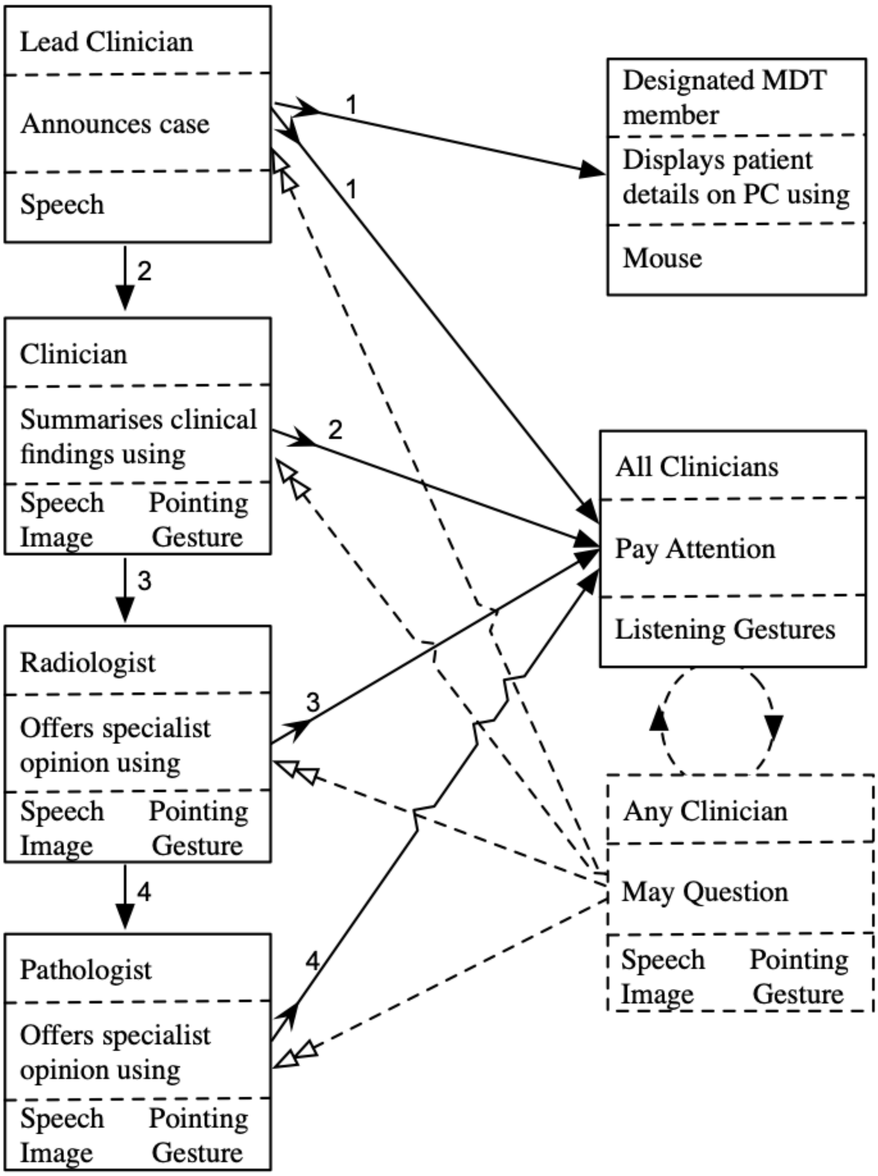
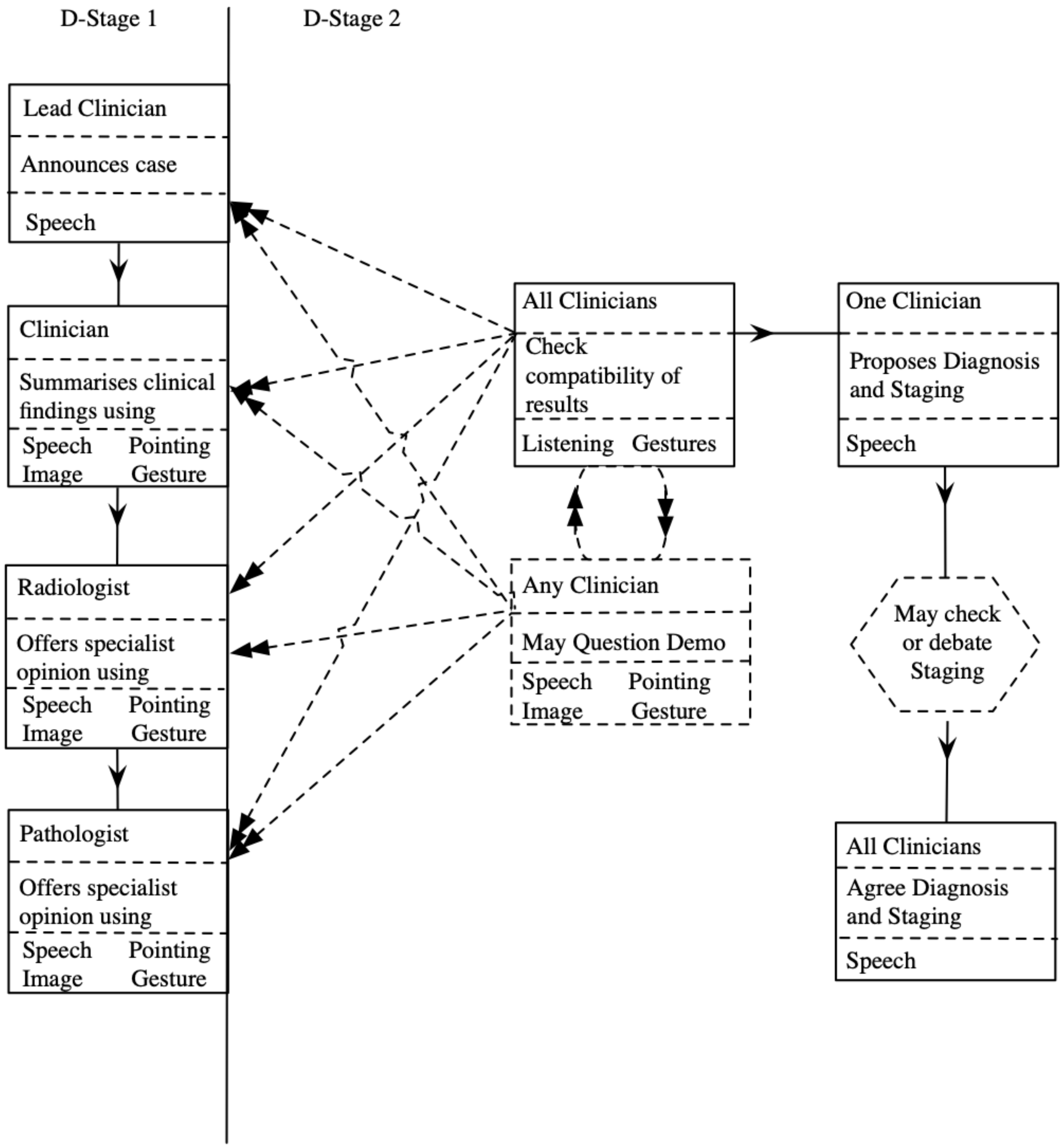
APPENDIX A – 4 D-Stage model of MDTM decision making

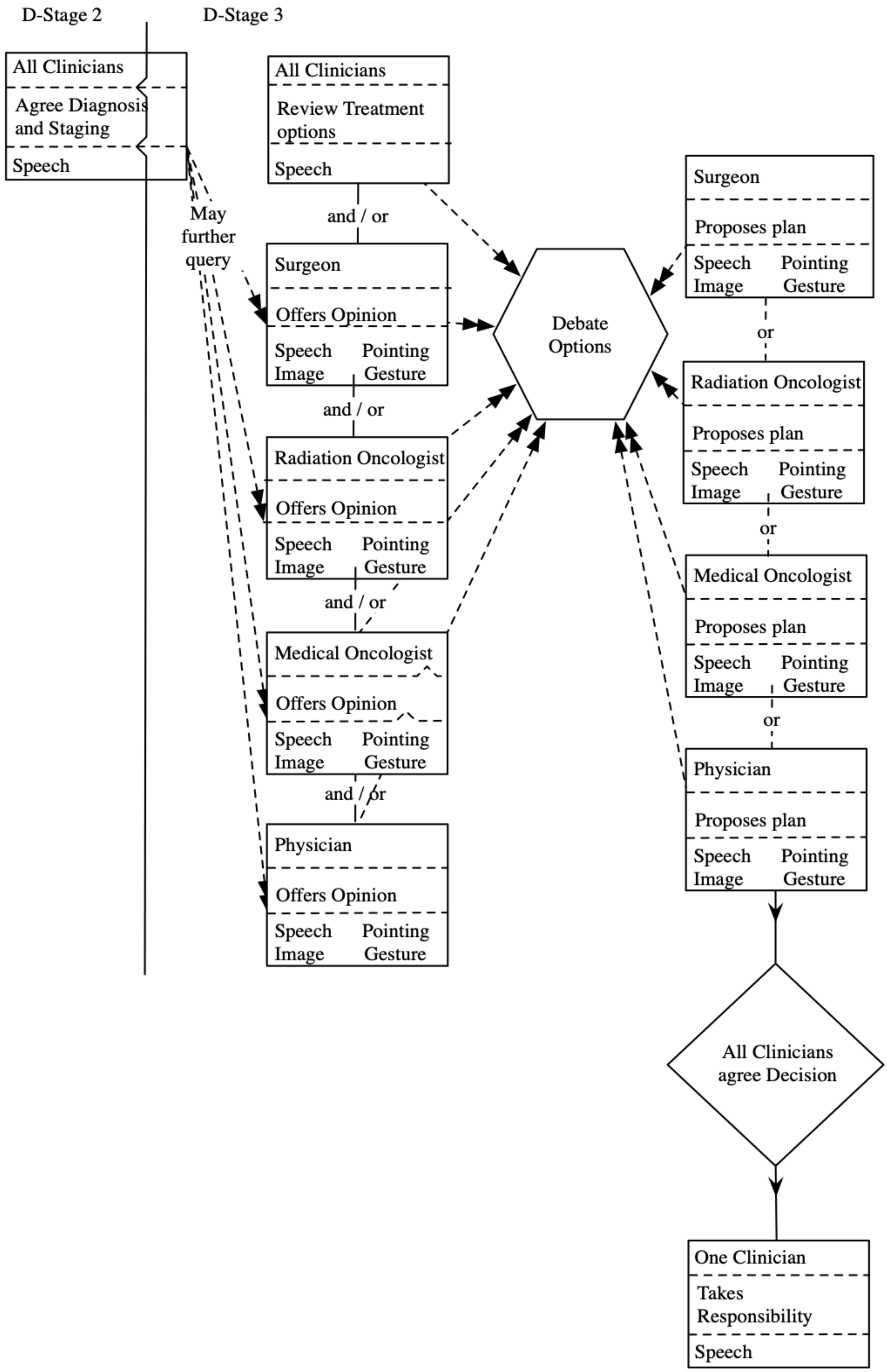
Source: Kane (2008)



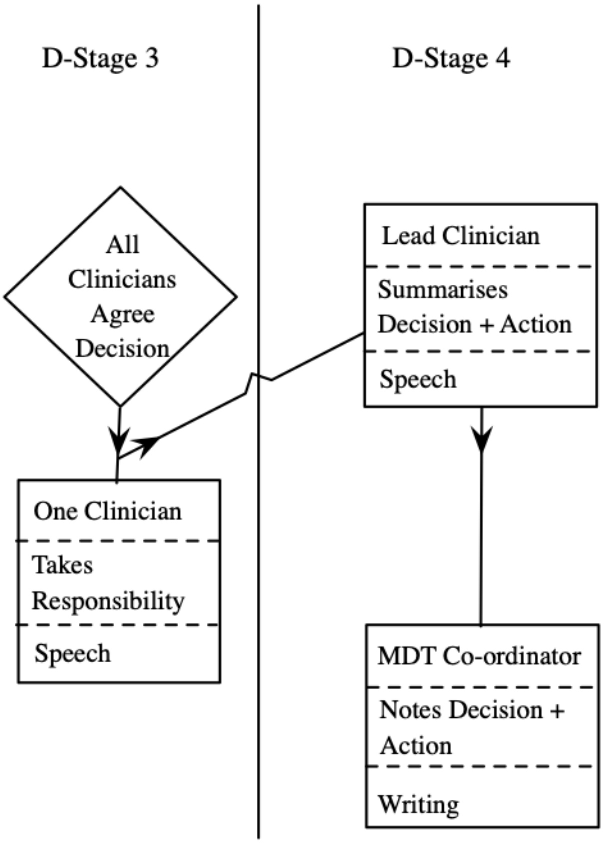
D-Stage 1 (Kane, 2008, p.79)



D-Stage 2 (Kane, 2008, p. 84)



D-Stage 3 (Kane, 2008, p. 88)



D-Stage 4 (Kane, 2008, p. 90)

APPENDIX B – Consent Form

This study is interested in the ways in which the records from multidisciplinary team meetings are produced and used, as well as how the records help some specialities in their work of caring for patients. Multidisciplinary care has become a central part of cancer care in many countries, and multidisciplinary team meetings (MDK /MDTM) provide the platform through which discussions can take place between health professionals, both locally and virtually. The intentions for such meetings are primarily the need to identify the best possible treatment and care for the patient, and record-keeping is important in such settings.

We invite you to please take a few minutes to answer the questions below. The survey is **fully anonymous**. Your personal data will not be collected. Your region, hospital name, department, and country are required for data analysis only and will not be disclosed in any of the published results. Hospitals and countries will be referred to as Hospital / Country A, B, C, etc.

The data collected from this study will be kept safe and used only for the purposes of this study. Your individual response will be processed according to your informed consent. Participating is completely voluntary and you can revoke your consent at any time without giving any reason, although it will not affect the data processing before your revoke. All the information we receive will be processed in such a way that no unauthorized person can access it.

Please give your personal consent before proceeding. Your participation is valuable to this study.

The survey will be answered in the web-based survey tool Survey & Report, a cloud service outside Karlstad University. Karlstad University is the controller for the personal data. According to the General Data Protection Regulation, GDPR, you have the right to request from the controller access to and rectification or erasure of personal data or restriction of processing regarding the data subject or object to processing. Any complaints about how Karlstad University is processing personal data may be directed to the Swedish Data Protection Authority, the Data Inspectorate. Contact details to the Data Protection Officer at Karlstad University are dpo@kau.se. For more information about how Karlstad University is processing personal data see https://www.kau.se/en/gdpr

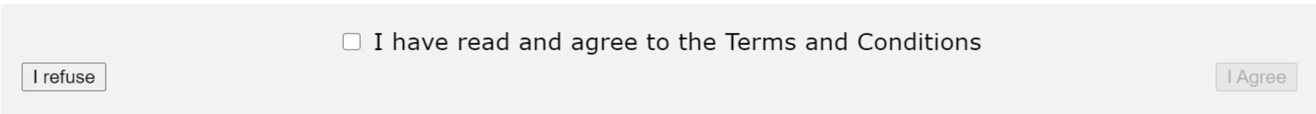
The people responsible for this survey may be contacted at akhokhum100@student.kau.se (MSc. student) and Bridget.Kane@kau.se (supervisor)
This survey will take between 5 and 20 minutes to complete depending on your role. The survey can be saved and completed later if necessary. Please note that some question numbers will be suppressed when they are not applicable.

Please mark the box to participate in the survey and approve that Karlstad University processes the data provided in accordance with the current data protection regulation and information provided. Then select the "I agree" button.

Thanking you in anticipation,

Akhona C. Khumalo, MSc. student

Dr. Bridget Kane Ph.D., research supervisor



APPENDIX C – Survey Questionnaire

This survey is intended for healthcare workers who are part of a team that takes part in Multidisciplinary Team Conferences (MDKs /MDTMs) and aims to determine if the existing means of record-keeping practices sufficiently capture the information needed to provide the best possible care for cancer patients. By MDK meeting (MDK /MDTM) we mean the discussion that happens between various healthcare specialties in an effort to decide on an accurate diagnosis and disease stage; and propose the best possible treatment plan for a patient. The importance of this survey lies in the fact that MDKs /MDTMs play an important role in the patient's care.

This survey will take between 5 and 20 minutes to complete depending on your role.The survey can be saved and completed later if necessary. Please note that some question numbers will be suppressed when they are not applicable

The questions in this section will help us to understand your circumstances better.

1. What is your profession?

- ☐ Nurse (Contact, Oncology, Surgical, or Other Nurse)
- ☐ Physician
- ☐ Oncologist
- ☐ Radiologist
- ☐ Surgeon
- ☐ Pathologist
- ☐ Non-consultant hospital doctor/resident doctor
- ☐ Data manager
- ☐ Allied health worker
- ☐ Administrator
- ☐ Medical Secretary
- ☐ Other

If you have selected **Other** or **Allied Healthworker**, please specify here:

2. Is your team involved in MDK /MDT meetings?

- ○ Yes
- ○ No

3. If yes, how often does your team attend MDK /MDT meetings?

- ◯ Monthly
- ◯ Every other week (Twice-monthly)
- ◯ Weekly
- ◯ More than once a week
- ◯ I don't know
- ◯ Does not apply
- ◯ Other

Comment

4. Does your institution take part in MDKs /MDTMs that take place over video link?

- ◯ Yes
- ◯ No
- ◯ Don't know

5. If yes, how often do video linked meetings take place?

- ◯ More than once a week
- ◯ Weekly
- ◯ Every other week (Twice-monthly)
- ◯ Monthly
- ◯ Less frequently than once per month
- ◯ Does not apply
- ◯ Don't know

6. How often do *you* attend MDK /MDT meetings (at local level)?

- ◯ Never
- ◯ Seldom
- ◯ Monthly
- ◯ Every other week (Twice-monthly)
- ◯ Weekly
- ◯ More than once a week

7. Why do *you* attend MDKs /MDTMs? (Select all that apply)

- ☐ To present a case for discussion
- ☐ To participate /contribute to a discussion
- ☐ To learn
- ☐ For administrative /technical support reasons
- ☐ To get information for treatment and care planning
- ☐ To get information for coordination of care
- ☐ Other

Other, please specify

8. Do you play a role in the *organization for* an MDK /MDTM? Examples are, but not limited to, getting patient cases listed, ensuring patient record availability, etc.

- ◯ Yes
- ◯ No

If yes, please specify

9. Do you play a role *during* an MDK /MDTM that goes beyond the need to participate in the discussions? Examples are, but not limited to, meeting co-ordinator, data capturing, operate certain equipment etc.

- ◯ Yes
- ◯ No

If yes, please specify

10. Do you play a role *after* an MDK /MDTM that follows from the MDK /MDTM decisions? Examples are, but not limited to, electronic entry of MDK /MDTM discussions and decisions, updating patient records, communicating with referring physician or patient etc.

- ◯ Yes
- ◯ No

If yes, please specify

11. Do you have any general comments to make on the *organization* of MDK /MDTM at your *hospital /department*?

12. Do you have any general comments to make on the *organization* of MDK /MDTM for your *regional /national meetings*?

The next set of questions aim at learning more about record-keeping (documentation) practices during MDK /MDT meetings. Please select the most appropriate answer(s) from the provided options

13. How do the proceedings of an MDK /MDT meeting get documented? Please select all the answers that apply

- ☐ Audio recordings
- ☐ Audio visual recordings
- ☐ Text is recorded electronically
- ☐ Taking personal notes
- ☐ Forms or other paper records completed during the discussion
- ☐ Forms or other paper records completed after the discussion
- ☐ Forms and paper records completed during the discussion and later captured into electronic form
- ☐ I attend from a remote site and our institution keeps its own documentation
- ☐ I attend from a remote site and the other institution keeps the documentation
- ☐ I attend from a remote site and documentation is provided to us after the meeting
- ☐ I attend from a remote site and I have direct access to the electronic record updated at the meeting
- ☐ Don't know

Comment

14. Who is responsible for documenting MDK /MDT meeting proceedings /decisions? Please select all the answers that apply

- ☐ Coordinator
- ☐ Designated data manager
- ☐ Nurses
- ☐ Referring physician
- ☐ Each person who will treat the patient takes independent notes for their own use
- ☐ Administrator
- ☐ Medical secretary
- ☐ Other

Other, please specify

15. When do MDK /MDT meeting notes on discussions or decisions get documented in the patient file?

- ○ During the meeting
- ○ As soon as the meeting is over
- ○ Within the first 72 hours
- ○ Within a week
- ○ With two weeks
- ○ The MDK/ MDT decisions are noted on the patient record when care is given by a clinician
- ○ Never

Comment

16. The MDK /MDTM attendees are noted in the documentation for each MDK /MDTM

○ Yes
○ No
○ Don't know

Comment

17. Reflecting on the meetings that you attend most regularly, please indicate your level of agreement with the following statements:

	Strongly Disagree	Disagree	Neither agree nor disagree	Agree	Strongly Agree
The clinical information required to facilitate the MDK /MDTM case discussion is always sufficient	○	○	○	○	○
The radiology contribution provided is always sufficient	○	○	○	○	○
The pathology contribution provided is always sufficient	○	○	○	○	○
Information about co-morbidities is always sufficient	○	○	○	○	○
Information about patient preferences is always made available	○	○	○	○	○
The patient preferences are always considered during the MDK /MDTM discussions	○	○	○	○	○
The diagnosis in a case discussed in the MDK /MDTM is always agreed	○	○	○	○	○
Consensus is always reached regarding the disease stage	○	○	○	○	○
Consensus is always reached regarding the management /treatment recommendation	○	○	○	○	○
The decisions taken at an MDK /MDTM are always clearly documented	○	○	○	○	○
The rationale behind the decisions taken is always clearly documented	○	○	○	○	○
The discussions leading to the decisions are always clearly documented	○	○	○	○	○
The various treatment options considered are always clearly documented	○	○	○	○	○
The documented information is verified for accuracy *during* the meeting	○	○	○	○	○
The documented information is verified for accuracy *after* the meeting	○	○	○	○	○

	Strongly Disagree	Disagree	Neither agree nor disagree	Agree	Strongly Agree
The documented information is reviewed for accuracy *only if ambiguity or misunderstanding arises during the course of treatment*	○	○	○	○	○

18. Reflecting on the meetings that you attend most regularly, to the best of your knowledge please indicate your understanding /belief:

	Not at all	To a lesser extent	Somewhat	To a great extent	Completely	Don't know
To what extent are co-morbities considered in the discussions during the MDK /MDTM	○	○	○	○	○	○
To what extent is the management /treatment recommendation agreed based on clinical data	○	○	○	○	○	○
To what extent is the management /treatment recommendation agreed based on patient preferences	○	○	○	○	○	○
To what extent is the the management /treatment recommendation agreed based on clinical guidelines	○	○	○	○	○	○
To what extent is the agreed management /treatment plan followed	○	○	○	○	○	○

19. A specific case is discussed at more than one MDK /MDTM because ... (Please select all that apply):

- ☐ Missing /inadequate information
- ☐ New complications arising in patient condition
- ☐ Patient was not in agreement with proposed care plan.
- ☐ It is protocol to have a follow up review
- ☐ All patient cases are discussed at different stages in the care pathway
- ☐ Other

Other, please specify

20. Do you have any general comments on the conduct of your discussions and/or around the decisions taken at the MDK /MDTM?

21. What happens when consensus is not reached at an MDK /MDTM?

22. How do you rate the following in their importance with respect to influencing the management /treatment plan:

Clinical Practice Guidelines (CPG)

Clinician's judgement

Patient co-morbidities

Patient preferences

Other

Comment

This section deals with the accessibility and usability of MDK/ MDTM documentation.

23. Do you need to use MDK /MDTM records as reference for what needs to be done during patient care?

- ◯ Yes
- ◯ No

Comment

24. MDK /MDTM case discussion record is available in the individual patient record

- ◯ Yes
- ◯ No
- ◯ Don't know

Comment

25.
Reflecting on the records you currently use, please indicate your level of agreement with the following

	Strongly Disagree	Disagree	Neither agree nor disagree	Agree	Strongly Agree
I rely on the MDK /MDTM records to get my work done	○	○	○	○	○
The MDK /MDTM records are legible /audible	○	○	○	○	○
The MDK /MDTM records are always accurate	○	○	○	○	○
The MDK /MDTM records are always complete	○	○	○	○	○
If missing information is required before the discussions can be concluded, this is clearly documented	○	○	○	○	○
The documented MDK /MDTM information always adequately guides the flow of follow-on activities and treatment plan	○	○	○	○	○
I know who to go to for help regarding an incomplete, unclear or ambiguous record	○	○	○	○	○
The MDK /MDTM gets feedback on the outcome of the treatment given	○	○	○	○	○
Patients are always in agreement with the decision taken at the MDK /MDTM	○	○	○	○	○
The MDK /MDTM decisions are followed during patient treatment	○	○	○	○	○
Deviations from MDK /MDTM decisions are clearly documented	○	○	○	○	○
Deviations from MDK /MDTM decisions are justified	○	○	○	○	○
The quality of the MDK /MDTM record-keeping at our institution is adequate	○	○	○	○	○

26. Do you have any further comments you would like to make regarding MDK /MDTM and its processes?

27. Region

Select an answer option

28. Hospital Name

Select an answer option

If not on list, please fill in here

29. Department

30. Country

Select an answer option

Other

APPENDIX D - Example Pictures from Thematic Analysis