Identifying work system components and constraints of cancer multidisciplinary team meetings

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ABSTRACT

Multidisciplinary teams have been introduced into cancer care to improve quality of care and are now considered the gold standard for the management of cancer patients in the UK. Meetings of these teams provide an opportunity for experts to discuss the best possible treatment options for the patient. Trends show that referral numbers to these meetings are increasing, placing strain on the capacity of meetings to function optimally. This in turn has cognitive and workload implications for staff involved. Promoting MDT Excellence is a project that aims to examine the variation in practice of these meetings across one NHS Trust and to understand the challenges they are currently facing. In the first phase of this project, a systems analysis of cancer multidisciplinary teams was conducted for the purpose of identifying system constraints and resource issues. A total of twelve meetings were observed, and 42 staff from four specialties were interviewed. Using the SEIPS 2.0 model, key work system components and constraints for multidisciplinary team meetings were identified for the people involved, the tasks, tools and technology, organisation of work, internal environment and external environment. Furthermore, aspects that promoted efficient ways of working and positive outcomes were captured. Examples identified included adopting a more structured agenda, real time digital notetaking and different work organisation techniques, such as distribution of responsibilities and the scheduling of patient groups to be discussed during the meeting. These results provide the basis for a multifaceted approach for system improvement for this work process.

KEYWORDS

Multidisciplinary teams, Systems Analysis, SEIPS 2.0

Introduction

Multidisciplinary teams (MDTs) are widely used in healthcare as they provide a means to bring together expertise and different opinions from multiple disciplines to improve patient care (Oeppen et al., 2019). MDTs were introduced into cancer care in the UK in the 1990s to improve quality of care and survival rates, and since have been used to assist in the management and diagnosis of cancer (Hoinville et al., 2019). They are now considered the gold standard for the management of cancer patients in the UK (Independent Cancer Task Force, 2015).

MDTs usually take the physical form of regular meetings and serve as a platform (Hoinville et al., 2019) to bring together healthcare professionals from different disciplines to reach a consensus on the diagnosis and best possible treatment for the patient based on available scientific evidence

(Horlait et al., 2019). The structure of these meetings aims to improve communication, coordination and decision making (El Saghir et al., 2014). These meetings form part of clinical duties, link clinical information from different sources and are a pivotal point in the patient's cancer pathway (Rosell et al., 2018). A secondary objective of these meetings is to provide a teaching and competence development opportunity for healthcare professionals (Prades et al., 2015; Rosell et al., 2018). In addition to this, they serve a governance role in that they monitor the impact of treatment decisions of individual clinicians (National Cancer Action Team, 2010).

Trends show the duration of MDT meetings are increasing across healthcare specialities, possibly due to increasingly advanced diagnostics, complex cases and sophisticated treatments (Oeppen et al., 2019). Furthermore, currently it is mandatory in the UK for all suspected or new cancer cases to be discussed at an MDT meeting (Hoinville et al., 2019). However, to meet these growing demands, in some cases, the duration of MDT meetings has increased, which has cognitive and workload implications on staff involved in these meetings, and possible quality implications for the patient cases discussed at the end of meetings (Oeppen et al., 2019).

Given that with the introduction of the Faster Diagnostic Standards from 2020, patients will need to have a confirmed cancer diagnosis within 28 days of referral (NHS England, 2016); the demands on MDTs will increase and all aspects of these pathways will need to be optimised. Promoting MDT Excellence is a project that was commenced in October 2017 to examine the variation in practice of MDT meetings across one large acute teaching hospital NHS Trust and to understand the challenges these MDTs are currently facing. This component of the project conducted a systems analysis of cancer MDTs for the purpose of identifying the system constraints and resource issues currently affecting MDT meetings.

Method

A unique aspect of this project is that it applied a multifaceted approach combining theory and methods from the fields of quality improvement, organisational development and human factors. Each field provides a unique perspective and a wide range of methods and tools for understanding and assisting in making alterations to this complex process. By aligning all three disciplines in this project, a more thorough understanding of how MDTs currently operate, the constraints placed on them, what key tasks need to be achieved and what supporting resources, processes and personnel are required to achieve optimum results for patients could be identified. This phase of the project aimed to identify the system constraints and areas that would benefit from a combined intervention approach to improve the efficiency and work system of MDT meetings.

Four MDTs participated in this phase of the project that incorporated clinical specialties from the main divisional structures of the Trust, including urology (cancer and associated specialties), lung (medicine), hepato-pancreato-biliary (HPB) (surgery) and gynaecology (family health). The data for this phase of the project were collected through interviews with staff that participated in MDTs from these specialties and the observation of MDT meetings. The interviews captured information regarding the different roles; the purpose of the MDT; the main and supporting activities; the resources available and constraints; the aspects that work well and those that do not work well; the referral process and the other sites that may link with the MDT. A template was used to assist with standardising the note taking for the interviews with MDT staff. The observation of the MDT meetings aimed to capture information regarding the system components and constraints on this specific aspect of cancer MDTs. Similarly, a template was used to assist with standardising the observation of these meetings; whether other Trusts or sites were involved (by attendance or remote videoconferencing); the technology used; the role of different staff in the meeting; the tasks done; and the environment in which meetings were conducted.

The notes from the interviews and observations were analysed together with NVivo 11 (QSR International, 2015) using initially a deductive coding approach with the work system element of the Systems Engineering Initiative in Patient Safety (SEIPS) 2.0 model (Holden et al., 2013). Common themes were then identified across the different MDT specialties for the six SEIPS 2.0 work system components (Carayon et al., 2014) namely the person, tasks, tools and technologies, the organisation of work, and the internal and external environment (Carayon et al., 2014) using thematic analysis (Braun and Clarke, 2006). The SEIPS 2.0 model was selected as the framework for the analysis as it depicts the relationships of various elements that occur in healthcare (Carayon et al., 2006) and is based on a frequently used quality improvement healthcare model (Mitchell et al., 1998), namely the Donabedian (1978) Structure-Process-Outcome model of healthcare quality (Carayon et al., 2014). A hierarchical task analysis (HTA) (Shepherd, 2001) was conducted using the interview and observation data for the main task of discussing the patient's case during the MDT discussion meetings. This was then overlaid with the work system components to highlight the interaction of these with the sub-goals of the task.

This research project was defined as a service improvement project. As no patient-identifiable information or personal data was captured, only organisational approval was required. The necessary organisational approval was obtained prior to data capturing.

Results

Participant characteristics

A total of twelve MDT meetings were observed, and 42 staff from the four MDT specialties were interviewed. Staff interviewed included consultants which consisted of medical and clinical oncologists, histopathologists, palliative care consultants, respiratory physicians, surgical consultants and radiologists; nursing staff including oncology specialist nurses and clinical nurse specialists; heads of service and MDT specific roles including MDT leads, chairs and co-ordinators. The number of observations and interviews per speciality and the staff roles of the interviewees is presented in Table 1.

		Gynaecology	HPB	Lung	Urology
MDT Meetings Observed		3	3	4	2
Staff Interviewed (Total)		7	9	17	9
	Consultants	2	5	8	2
	Nursing staff	3	2	5	3
	Cancer Lead/Head of Service				2
	MDT Lead/Chair	1	1		1
	MDT Co-ordinator	1	1	4	1

Table 1: Number of MDT meetings observed and interviews conducted for the system analysis.

MDTs require multiple interactions between people, environments and systems. Patient cases are referred to MDTs, although the patient does not physically encounter the MDT. Additionally, the referrer may also not be part of the MDT. The staff that form the MDTs will come from numerous different departments, often with the only opportunity for these staff to meet being the MDT meetings, which usually occur weekly. Due to the extent of this work system, this paper will focus on the work system components specifically relating to MDT meetings where patients are discussed. This type of meeting is a common feature across the four specialities that participated.

MDT meeting format and characteristics

The interview results highlighted that staff felt the purpose of MDTs was to promote a collective expert team approach for determining holistic treatment and diagnostic options for cancer patients, usually achieved during MDT meetings. These meetings were considered as crucial due to the decision-making component in the treatment plan for the patient and also to meet national targets. Several types of meetings were identified, each with different purposes, and included triage meetings to select the patients referred to the MDT, pre-MDT meetings to prepare and the MDT discussion meetings to discuss the patients requiring MDT input. The MDT discussion meetings for these specialties, which are the main focus of this paper, are usually approximately 1.5-3 hours in duration, during which time about 30 to 50 patients are discussed. Some MDTs have an upper threshold cutoff for the number of patients discussed per meeting; others reportedly adapt the meeting to suit the numbers, in essence shortening the time on each case.

As a result of the duration and workload, the MDTs reported time as a considerable constraint in this work system. Due to this constraint several of the specialties have resulted in splitting MDT discussion meetings so that they have more than one a week. Furthermore, due to the number of patients to be discussed and time limitations of the meetings, staff felt that patients towards the end of the list did not receive the same time for discussion as patients at the beginning. In addition to this, most of the MDTs felt the number of referrals to them was increasing, with some not requiring the input of an MDT meeting (for example straightforward decisions that could have been made by individual specialists). Staff felt that this may be due to a 'risk averse' culture among healthcare staff. Furthermore, they felt the general workload during the MDT discussion meetings was already near capacity but still increasing and often the meetings would run over time.

Work system components, constraints and strengths

Based on the SEIPS 2.0 model, key work system components, constraints and strengths for MDT discussion meetings were identified for the six components, namely the people involved, tasks, tools and technology, organisation of work, internal environment and external environment. As the name suggests, staff involved in MDT discussion meetings come from a range of disciplines each with individual goals and differing degrees of participation during these meetings. Staff involved include specialty consultants, oncologists, histopathologists, radiologists, clinical nurse specialists, support nurses, palliative care nurses, research nurses and administrative staff. Agreement on the purpose of the meeting (ensuring quality care) does not prescribe identical goals and the goals for different staff included presenting patient cases, contributing to the discussion, obtaining a decision on a patient's treatment plan, hearing an update for one's own patients, advocating for the patient and using the meeting as a learning experience from more junior staff.

In addition to conventional staff roles, several MDT specific roles have developed more recently. These include the MDT lead, MDT chair, and the MDT co-ordinator. In the MDTs where the chair role was present, some staff felt that the chair was responsible for time keeping and managing the meeting. In some specialties, this role was filled by one staff member, in some this role was not present, and in some this role was rotated among staff. The activities of the MDT co-ordinator role, which in some MDTs was a full-time role and in others a part-time role, includes but is not limited to preparing the agenda for the MDT meetings, ensuring the necessary information is available so clinicians can make clinical recommendations, and transmitting the necessary information to the right staff. Furthermore, staff mentioned that this role is frequently filled by someone who does not have a clinical background. Constraints identified by staff included not all participants contributing to the discussion in the meetings, availability of staff during holiday periods, part-time roles relative to workload (for example MDT co-ordinator) and that roles and responsibilities for these groups were not well defined, (for example who should be responsible for time keeping in these meetings,

the chair or the co-ordinator). However, staff suggested the reason MDT meetings worked well despite the workload was due to individual's efforts to ensure things "kept going". Further strengths highlighted by staff that ensured the MDT meetings went well included a good working relationship between the MDT chair and co-ordinator and good teamwork among all staff involved in the MDT discussion meeting.

Staff mentioned numerous tasks that occur prior to the meeting upon which the success of the MDT discussion meetings are dependent. These included the referral process, the preparation of the agenda, collation of the necessary clinical information, and preparation of the diagnostic information by radiologists and histopathologists. Delays in pathology results and clinical information could result in patients being deferred and delay in the patient receiving treatment. The main task involved in MDT discussion meetings, based on the identified purpose of the meeting, was the review and discussion of new or recurrent patient cases to determine the most suitable means of proceeding for these cases. Depicted in Figure 1 is a high-level HTA of this task highlighting the interaction of the different work system components with this task. The tools and technology components are depicted in blue and the staff and tertiary sites (external environment component) are depicted in green. The constraints associated with this task that staff identified included missing information (Figure 1 - HTA step 1.3, 2.1 or 2.2) affecting the discussion and decision-making process (HTA step 2 and 3), a lack of clarity regarding the outcome (HTA step 3.1 or 3.2) and problems associated with the duplication of work with regards to data entry (HTA step 3.3). Strengths highlighted by staff that ensured the MDT discussion meetings went well included preparing thoroughly before the meeting, pre-MDT triage meetings and processes, as well as diagnostic MDT meetings.



Figure 1: High-level HTA of the patient case discussions that occur during MDT discussion meetings highlighting the interaction of the influencing work system components on the sub-goals.

Often the only opportunity for staff involved to physically meet is at the MDT discussion meetings. As a result of the spatial distribution of those involved in this work system, artefacts such as tools and technology play an important role. In several of the meetings observed, external organisations

(for example different Trusts and tertiary sites) video-linked into the MDT discussion meeting. Challenges associated with this included the reliability of the connection and the quality of sounds and images, which would affect the quality of the discussion the team could have. Another key tool and technological component of this work system is the documentation of outcomes and decisions. These were recorded either on paper or electronically, however if recorded electronically, this documentation was not visually displayed for the team during the meeting across all specialities which has implications for quality assurance. Additionally, in some MDTs, the electronic system was too slow for live notetaking and would result in a combination of electronic and physical notetaking. Similarly, both physical and electronic patient files would be used during the discussion of patient cases (HTA step 1 and 2). This combination of paper-based and electronic documents poses several challenges which can result in duplication of effort, confusion, and gaps in information. Additional technological constraints identified by staff included insufficient information and computer technology (ICT) support and equipment as well as the number of digital systems being used. The latter technological constraint may result in not only an increase in workload and time delays but may also result in staff questioning the reliability when these systems are linked. Some examples staff gave of tools and technology that resulted in more efficient working included implementing a structured agenda based on different diagnostic categories (for example radiology, radiology and histopathology, and only histopathology) so that staff from diagnostic departments are not required to attend the entire meeting, and technology that allows real time notetaking removing the duplication of documentation work.

Work organisation components of the MDT discussion meetings included the way the teams worked during and the interactions within the meeting. This varied even within specialties if they had more than one meeting and staff usually attributed this to the staff member leading the meetings. Furthermore, this was identified as impacting on whether staff felt they could speak up or not. Additional constraints related to the organisation of work included inflexible scheduling and availability of the rooms the meetings were held in (for example if they ran over time), and a lack of teamwork and negative work culture during the meetings (for example the climate during the meeting and the effect on the ability to voice one's opinions). Strengths associated with work organisation highlighted by staff that ensured the MDT meetings went well included distribution of responsibilities during the meetings and the scheduling of patient groups to be discussed at specific times during the meeting to maximise efficiency.

Internal environment aspects identified as challenging included room layout, as this can affect the quality of discussion, and ICT infrastructure within the room (for example access to power points for laptops), as this would affect the access to technological resources needed. Staff felt that the room layout not only affected the quality of the discussion due to the impact on audible quality, but where they sat in the room affected the degree of influence they had and their "ability to speak up". External environment aspects included tertiary sites dialling in to MDT discussion meetings to discuss the patients that had been referred to the specialty. This external environment component is strongly linked to the technology components of this work system.

Recommendations and conclusion

MDTs and their meetings appear to have evolved to fill a need in the healthcare system as cases and diagnostic and treatment decisions have become more complex. As a result, not all formal structures have yet developed and are in place. Examples of this include poorly defined roles and responsibilities, missing terms of reference, and variability in the necessary supportive services provided (for example administrative roles). Due to the spatial aspects of this work system, the work necessary for meetings to be successful may not always be visible to all team members. This includes preparation work for the presentation of patient cases and compiling the necessary and relevant diagnostic results required for the meeting. Furthermore, it is this spatial aspect that results

in communication and information transfer being an integral component in order to complete the tasks for this working group. This is due to the joint decision making that needs to occur during the MDT meetings but also due to the interaction of different systems (for example external trusts, referrers and patients) with this working group.

Based on these results, in collaboration with the MDTs, several streams of improvement work have been identified within this project. These will require combining human factors, organisational development and quality improvement approaches and techniques to ensure suitability and sustainability of these interventions. The proposed workstreams derived as a result of the findings above relative to the different approaches are depicted in Figure 2.



Figure 2: Combined human factors, organisational development and quality improvement approach for supporting and implementing the recommendations from this work.

The quality improvement aspect of this project includes identifying cohorts of patients who are currently being referred to the MDT and whose next step could be decided at a triage meeting with the aim to streamline MDT meetings and reduce unnecessary referrals. This aligns with the MDT streamlining guidelines that are due to be released by NHS England. The human factors aspect of this project will use a systems approach to address information flow to ensure the MDTs readily have access to the information they need and transmission of the relevant information following the meeting. Both a human factors and organisational development approach will be used to define the role of chairing for MDT meetings through the consensus of the staff involved in these meetings. With the aid of organisational development, an MDT co-ordinators' forum will be developed to empower this staff group as well as providing support for the development and promotion of culture and collective leadership. MDTs are complex work systems that interact with numerous other systems. It is aimed that by adopting a combined approach, effective and sustainable ways to support this complex work process will hopefully be developed.

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