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Embedding continuous quality improvement processes in multidisciplinary teams in cancer care: exploring the boundaries between quality and implementation science

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Abstract

Objective. The aim of the present study was to identify key enabling factors for engaging multidisciplinary teams (MDTs) in cancer care across the spectrum of translational research and quality improvement (QI) projects.

Methods. The study was conducted in two large Sydney metropolitan hospitals. Qualitative methods, including structured observations of MDT meetings and semi-structured interviews with MDT leaders and champions, were used to identify how teams interact with and generate research and implementation initiatives. Enabling factors for and barriers to the engagement of MDTs in translational research and QI were identified.

Results. Four key enabling factors emerged from the analysis of data generated from observing 43 MDT meetings and 18 semi-structured interviews: (1) access to high-quality data around individual and team performance; (2) research-active team leaders; (3) having experts, such as implementation scientists, embedded into teams; and (4) having dedicated research or QI-focused meetings. Barriers included a lack of time, administrative support, research expertise and access to real-time data.

Conclusions. The identification of enabling factors for and barriers to translational research and QI provides evidence for how multidisciplinary cancer care teams may best be engaged in research and QI that aims to improve service and care outcomes.

What is known about the topic? MDTs are key to the delivery of cancer care in Australia, but there is scant research into how teams can best be engaged in translating research from basic science through to implementation science and QI.
What does this paper add? This paper provides new evidence from an immersive study of cancer care MDTs in two large metropolitan hospitals in Sydney (NSW, Australia), regarding the key enabling factors for and barriers to successful engagement in translational research and QI in cancer care.
What are the implications for practitioners? Cancer care professionals in MDTs are presented with an opportunity to embed translational research and QI into cancer care. MDTs can operate as an ideal vehicle to look beyond individual patient outcomes to broader trends and population health outcomes.

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Introduction

The benefits of multidisciplinary teams (MDTs) in healthcare and service delivery are frequently reported in the literature. In cancer care, MDTs can improve communication, coordination and decision making, and reduce the time between diagnosis and the commencement of treatment.[1–3] MDTs in cancer care can also improve adherence to clinical guidelines and recruitment into clinical trials.[2,4] However, there is only a very small body of evidence linking MDTs to improved clinical outcomes. A Scottish study,[5] for example, found an association between MDT care and improved breast cancer survival.

MDTs underpin the delivery of cancer services across the Western Sydney Local Health District (WSLHD) and Nepean Blue Mountains Local Health District (NBMLHD) in Australia. Twenty tumour programs are supported across two metropolitan hospitals at Westmead and Nepean hospitals. In 2011, the Sydney West Translational Cancer Research Centre (SWTCRC) was established and funded by the Cancer Institute NSW to build the capacity of its members to conduct research across the translational spectrum including T1 research (basic science and discovery), T2 research (clinical trials, guideline development, systematic reviews etc.) and T3 research (dissemination and implementation). This is consistent with a model for translational research developed by Westfall *et al*.[6] A key focus of the SWTCRC has been on how to identify and promote high-performance MDT cancer care. Key performance indicators for MDTs have previously been developed in Australia and include core membership, leadership, administration support, access to data and research and training.[7] New cancer treatment approaches are rapidly emerging and it is crucial to have processes in place for evaluating their effectiveness and building the research evidence around their use.

Studies have shown that information giving and education are less effective at achieving behaviour change in clinical practice.[8–12] To ensure the translation of new research findings, it is important to identify how quality improvement (QI) projects and implementation science can inform each other. Although not synonymous, there is considerable overlap in the objectives of QI and implementation science, especially in terms of translating evidence into practice and improving patient outcomes. Both implementation science and QI are concerned with understanding contexts, assessing performance and supporting the scale-up of interventions.[13] Whereas QI activities typically focus on securing change to address a well-defined, local problem,[14] implementation science often has a broader focus and aims to promote the systematic uptake of research.[15] It is important to identify how QI projects and implementation research can inform each other but, to date, few studies have explored how QI and implementation science can support each other and how they could interact in an MDT program of cancer care. Furthermore, few studies have examined the association between MDT cancer care and the quality of that care.[16,17]

In the past, patient safety and quality has largely focused on error detection and management rather than success factors.[18] It has been argued that this focus has not resulted in expected gains in patient safety and quality, and that it may be more effective to focus on successful practices (or positive deviance).[18] This requires a realignment of services from a focus on problems to a focus on how to disseminate success factors.[18] Implementation science can inform how to sustain and scale-up evidence-based interventions[19] and evaluate the effects of successful practices on patient care. This is important because typically QI initiatives are not always subject to rigorous evaluation. However, identifying processes and generating data to demonstrate patient safety and quality, which can be embedded in organisational systems, remains a challenge.[18] Nevertheless, by collecting clearly defined patient outcome data, QI programs are well placed to inform the identification of gaps in care and to generate implementation studies.

There is little published research on how MDTs in cancer care can be the drivers of translational research and QI. The present study was initiated to explore the engagement of MDTs in the WSLHD and NBMLHD in the use and generation of translational research and QI programs, and to develop strategies to improve this engagement. We hypothesised that a high-performing program of MDT cancer care has several interconnected activities, including business meetings, clinics and embedded processes for QI. In particular, the present study focused on how MDTs use and generate T3 or implementation science studies to enhance patient care outcomes.

Methods

The study comprised two phases, the first of which is described and reported here. Phase 2 of the study includes a review of the governance structures that can be implemented to support the engagement of MDTs in translational research and QI. Phase 1 commenced in 2013 and used an ethnographic approach to identifying enabling factors for research engagement in MDT tumour programs in the WSLHD and NBMLHD, and factors that stimulate their high research performance. The rationale was that enabling factors identified could be used to support the generation of both QI projects and at least one implementation study with a specific MDT program of cancer care. Key characteristics of ethnography include embedding the researcher as an active participant in the population under study to obtain detailed and rich insights into people's views and actions.[20]

Structured observations of MDT meetings and semi-structured interviews with key stakeholders and MDT champions at two metropolitan hospitals in Sydney (NSW, Australia) were conducted by three researchers (TR, AJ, KM). This included observing breast, upper gastrointestinal tract, lower gastrointestinal tract, lung, melanoma, gynaecological oncology and metastatic breast tumour team meetings. The research focused broadly on identifying the use and generation of translational research within MDT meetings, any reference to prospective data collection and enabling factors for implementation science and QI projects. Semi-structured interviews were conducted with MDT leaders, champions and team members from diverse discipline backgrounds. Interviews focused on identifying current research activities, practice gaps, barriers and enabling factors for research and QI.

Transcripts of observations and interviews were de-identified then subjected to thematic analysis. Broad themes were identified, which subsequently informed a feedback and priority-setting workshop held with clinicians, who were asked to rank potential implementation initiatives that emerged from observations and

interviews according to their significance, feasibility and acceptability. In this way, the significance and feasibility of enabling factors for the use and generation of implementation research were determined. Permission to conduct this study was granted by human research ethics committees of the WSLHD and the NBMLHD.

Results

A total of 43 MDT meetings were observed and 18 semi-structured interviews were conducted with medical and nursing clinicians from a range of disciplines, including in medical and radiation oncology, pathology and surgery, as well as clinical trial coordinators, research fellows, MDT coordinators and policy makers from the Cancer Institute NSW. Scrutiny of observation notes identified considerable variation between teams in their use and generation of research, but most MDTs made good use of clinical guidelines and regularly discussed available clinical trials (T2 research or translation to patients). As one oncologist noted:

> The vast majority of what we do is T1 and T2, but both those dimensions get a very balanced airing at the MDT or the dedicated research meetings.

A small number of teams were observed to generate basic science research (T1) and this was particularly the case in one team that included an embedded scientist in its membership. As the scientist noted:

> My main role there is to listen to the deliberations that the clinicians go through for particular cases and that really helps us to form our research questions.

Although embedding a scientist in MDTs is not common, it was identified as a significant enabling factor for translational research. As the scientist stated:

> What other groups try to do is to get the clinicians to come to research meetings but that fizzles out. . .There aren't very many who have got the paradigm of researchers being really engaged in the MDT.

The success of this strategy was further highlighted in the scientist's comment that:

> Every single meeting, I can come away. . .with three research projects.

In addition, the physical proximity to 'wet laboratories' facilitated the exchange and flow of ideas between the clinic and the laboratory.

Although some teams identified a willingness to engage in T3 implementation research and QI projects, very few were active in or had high awareness of what this kind of research would entail. Furthermore, a low awareness of implementation research and QI was a common theme across MDTs and across disciplines. As one oncologist noted:

> I have been here for nearly 2 years and I would have had no idea as a clinician what implementation science was, even though I was a member of the translational research [centre], I just had no idea.

This was also reflected in the comment from a nurse who said:

> Implementation research – I guess it's still in its infancy in terms of it being widely understood in that group about what an implementation project might be.

Similarly, as a research fellow noted:

> I'm still a little bit struggling with the actual concept [T3]; I know what it is sort of, theoretically, but how you do that and I guess I'm struggling with what are the measurements.

This was in contrast with T1 (basic science) and T2 (clinical trials) research, which participants reported using and generating on a regular basis.

Not all disciplines attending MDT meetings were found to be similarly research active. As one surgeon observed:

> . . .we don't promote research in all disciplines. I think that's the biggest thing to figure out right now, how to do that.

Nurses were considerably less involved in research and no team-based studies were identified. Hence, the relationship between MDTs and individuals in research was unclear. As one MDT leader noted:

> . . .we have collaborators who happen to be other members of the MDT but we don't view it as this is the research by the MDT.

Hence, the unstructured observations of several tumour streams identified some generation of T1 and T2 research and considerable use of T2 clinical trials. However, there was scant use or generation of T3 research in any of the MDT meetings observed.

The findings from semi-structured interviews identified four broad enabling factors for MDT engagement with translational research and QI (data collection, leadership, research meetings and embedded researchers). The absence of any of these factors represents a significant barrier to research. The issue of real-time data collection was the most common theme to emerge. Participants identified that a range of data, including on treatment responses, quality of life measures for rarer cancers (such as pancreatic cancer) and hospital length of stay would be valuable. As one medical oncologist noted:

> There should be rates of infection after chemotherapy, central lines, rates of failure. . .the other important thing for us should be the time from last chemotherapy to death.

However, as one surgeon stated:

> . . .the information is often not there or there is not enough information going in about outcomes for it to be a proper quality assurance process.

Nonetheless, although data collection ranked highly as an enabling factor for translational research, as a medical oncologist noted:

> Just collecting data doesn't achieve anything because you need to have the right questions to ask the data.

Another key enabling factor for translational research identified was leadership:

> . . .it all revolves around leadership and who's there at the time.

This is leadership in research application rather than the more generic skills often referred to in literature on MDTs. One surgeon noted that:

> If you don't have one [a leader] involved who has understanding of the research process or sees themselves as doing clinical research then I think you're pushing it uphill.

In particular, the need for leadership in implementation science was noted:

> I don't think they fully understand or are aware of T3.

The absence of this leadership means that most research is weighted towards clinical trials:

> . . .we have clinical trial nurses present. . .they're there to remind us this could be a good study for them [patients].

The importance of leadership was further emphasised in comments from one MDT leader (a surgeon):

> You just have these lucky drivers through people with very serious research expertise. . .they set the tone for the MDT over the long run.

Other significant enabling factors for MDT engagement across the spectrum of translational research were regular business and/or research meetings and support for research fellowships, including T3 research fellowships. There was considerable comment that the workflow within regular MDT meetings made it difficult to consider engaging with translational research and QI. For this reason, several MDTs used extraordinary meetings to foster potential research projects, although this posed a challenge in terms of 'losing' clinical team members who did not feel able to prioritise research activities. In teams with extraordinary meetings that successfully engaged with translational research, leadership played a pivotal role. Despite wide support for research fellowships as enabling factors, one oncologist noted that their role is often subsumed by clinical work:

> . . .they're not supposed to be clinical fellows, they're supposed to be research jobs but they've become clinical fellows.

Another challenge related to the time-limited nature of research fellowships that could be addressed by supporting 'rolling fellowships', where research projects are handed on to subsequent fellows in order to generate more longitudinal and sustainable research programs. There was also wide support for embedding scientists in MDT programs, even though participants acknowledged the resource issues this would entail:

> If we had a similar person they'd make a huge difference.

Overall, participants were keen to enhance their skills in implementation research (T3) and QI, but both were seen as requiring special skills and supporting systems and processes, including the feedback of patient data to help inform gap analysis and engagement with QI. MDT participants were keen to improve their engagement with QI, regularly audit MDT outcomes and receive feedback on issues such as treatment responses. However, several participants noted that their current workloads mitigated against compiling this data themselves:

> . . .in terms of trying to implement T3 research, I don't think we can do that until the basics of our MDT are improved.

Conversely, an academic researcher noted:

> Most of these things are just people. Most of the T3 stuff actually isn't expensive.

There was unanimity that regular feedback of patient outcome data and the identification of indicators to inform QI approaches would be highly significant for generating more T3 research. The enabling factors identified by participants in this study operate across the translational research 'pipeline' and appear in Fig. 1.

Discussion

The present study has identified, for the first time, a range of enabling factors that can be applied to a program of MDT cancer care to support the generation and use of translational research and processes for embedding QI approaches. This included the identification of factors that support research across the spectrum of translation, including access to real-time data, leadership, regular research forums and embedded fellowships. Other enabling factors were specific to the domains of T2 and T3. Specific factors required for T3 research include regular cycles of audit and feedback of patient outcomes and processes for embedding QI and implementation science in MDT tumour programs. Overall, we propose that future models of MDT engagement with T2 and T3 research should include collaboration with QI services to identify key metrics and data that can be collected and presented on a regular basis (perhaps biannually) at MDT meetings.

Ideally, this will be broader than process measures (such as hospital lengths of stay) and will include data that better demonstrates quality, such as leadership and quality of life. Such a process would assist MDTs to conduct gap analyses and generate both QI initiatives and implementation research questions. Although the study of improvement interventions is an emerging field that is characterised by diverse approaches and debate,[14] QI studies that are typically small scale can inform the development of more rigorous research evidence. Furthermore, the focus of QI on improving quality of care and reducing unwarranted variations in patient outcomes remains a high priority.[21] The present study seeks to use implementation science to inform approaches to QI that will enable the links between changes and outcomes to be understood and demonstrated. To our knowledge, this proactive engagement with health care quality and safety or clinical governance to inform the identification of practice gaps and to develop improvement indicators is a novel approach to generating implementation questions and is worthy of further investigation.

Despite the largely common ground identified on enabling factors, the present ethnographic study also identified considerable variation in the use and generation of research within MDTs across the translational 'pipeline'. There was wide agreement that MDTs need to be engaged in translational research and QI, but

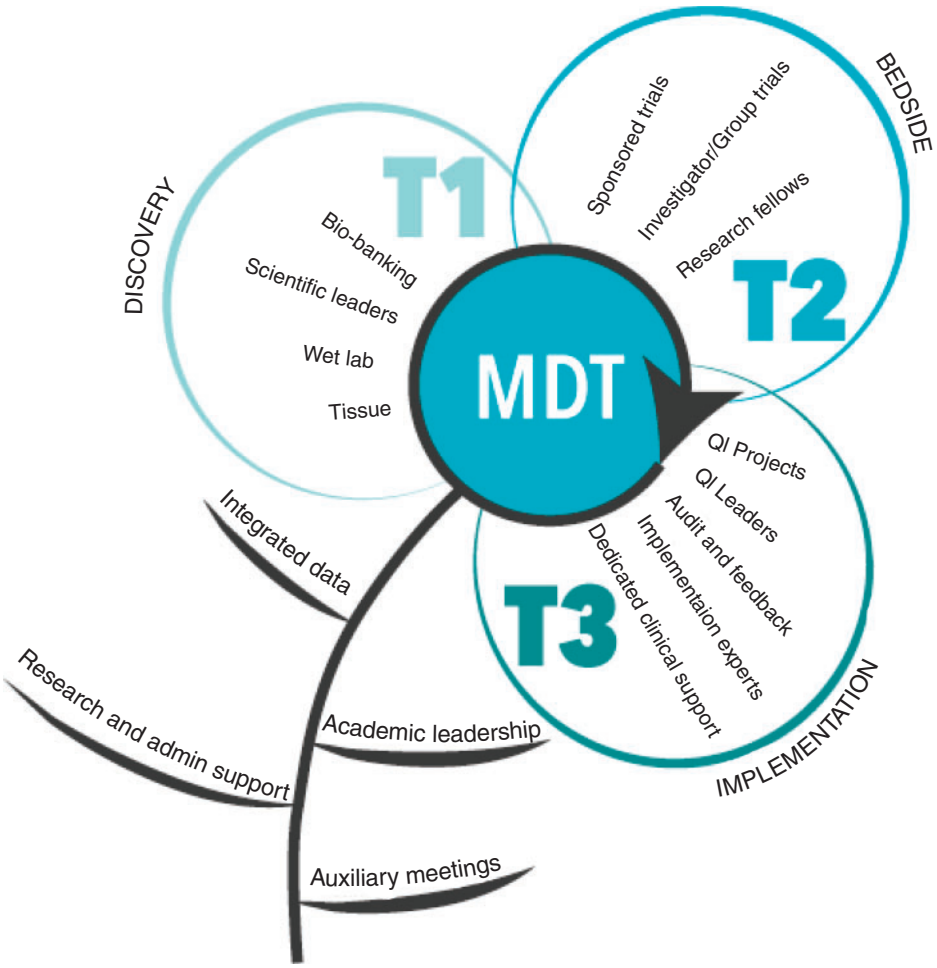

Fig. 1. Enabling factors for translational research.

identified barriers inhibiting this engagement included deficits in available time, administrative support, research expertise and access to real-time data. The observations of the 43 MDT meetings confirmed that these barriers existed in varying degrees across teams in terms of T1 and T2 research, but across all teams there was limited engagement of MDTs in T3 implementation research and QI initiatives. For example, those MDTs that had an embedded scientist exhibited higher capacity to generate T1 and T2 research. However, there was less awareness or knowledge within teams about how to use or generate T3 research and QI programs. Given that MDT meetings are one of the few occasions when clinicians regularly meet within the clinical environment, these findings suggest that there is currently a missed opportunity to engage MDT teams in translational research and, in particular, implementation research and QI activities.

There are some inherent limitations in the use of ethnographic approaches that must be acknowledged. Given that MDT members were aware that they were being observed, it is possible that they were vulnerable to the Hawthorn effect, wherein some members may have modified their interactions. For this reason, the observers attended no less and sometimes more than three meetings for each tumour stream. At the same time, observational methods are likely to have more veracity than self-report or other surveys because clinicians tend to over-rate aspects of their own performance, even though self-report measures have been used to reliably assess their team performance.[23] Another limitation is that no psycho-oncologists attended the observed MDT meetings and their absence means that processes for measuring distress or clinicians' confidence with end-of-life discussions did not emerge as possible QI or implementation studies. Distress and quality of life measures are crucial for informing patient treatment choices and are significant outcome measures for future collection. Nevertheless, the large number of MDT tumour streams and meetings observed, and the breadth of semi-structured interviews that were conducted across disciplines, are significant strengths of the study.

Conclusion

Although considerable variation in the generation and use of translational research in a program of MDT cancer care was identified, the most significant and feasible factors for enabling T3 research reported by study participants are regular data audit

and feedback and processes for gap identification. The present study identified that factors for active engagement with quality and safety can help refine data collection and embed processes for regular audit and feedback of patient outcomes and quality of care. In this regard, MDTs can operate as an ideal vehicle for teams to look beyond individual patient outcomes to broader trends and population health outcomes. We propose that the identification of enabling factors for translational research and processes for engaging with QI have wider applications and a high potential for scaling up across other tumour programs and illnesses that are currently supported by MDT models of care.

Competing interests

None declared.

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