
Collaboration and Multimedia: Identifying Equilibrium in the MDT Information Ecosystem

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Abstract

This study of collaboration among a multidisciplinary team of healthcare workers demonstrates that elements intrinsic to the interaction constitute a delicate ecosystem. As the balance between actors, digital media and paper artefacts fluctuates, so too the nature of the interaction and collaboration changes. Intrinsic to the multidisciplinary team (MDT) ecosystem is specialist knowledge, radiological images, pathology samples, together with the interpretation of the patient's findings, as well as the roles and responsibilities of the active participants and observer collaborators.

Author Keywords

Teamwork; Medical Team Meetings; MDTMs;
Collaboration; Medical Work

ACM Classification Keywords

H.5.3 [Group and Organization Interfaces]:
Computer-supported cooperative work.

General Terms

Human Factors, Theory, Performance

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CSCW'12, February 11–15, 2012, Seattle, Washington, USA.
ACM 978-1-4503-1051-2/12/02.

We thank the multidisciplinary teams members at St. James's Hospital, Dublin for their on-going co-operation in this study.

Introduction

We examine the main developments in a large teaching hospital in St. James's Hospital, Dublin, Ireland, and identify changes in MDT collaboration as the work volume increased. Our study provides insights into the nature of medical teamwork, meetings and the use of technology. Changes are shown in the dynamics of the interaction among the MDT members, and their choice of medium for communication at MDTMs, as a result of the introduction of an Electronic Patient Record (EPR) system and a consequent increase in the numbers of patients being processed. Deeper understanding of the nature of the collaboration and coordination involved in MDT work may reveal insights that can be usefully applied in other CSCW settings.

Background

Multidisciplinary medical team meetings (MDTMs) are an example of synchronous collaboration, with asynchronous components, among medical specialties for a specific purpose. MDTMs were introduced over 25 years ago as a mechanism of collaborative diagnosis and patient management. Intuitively they are good practice because all of the professional groups are involved in the clinical decisions affecting individual patients [3, 1]. However, the system is increasingly under pressure from technological developments, legislative requirements and economic challenges.

Methodology

Long-term study, since 2001, provides the data for this paper. Unobtrusive data gathering through observation of several MDTs at work, their MDTMs and the artefacts they each use, provide the main material for analysis.

Interviews, questionnaires and group exercises were also used to probe specific research questions that arose, and to clarify findings. We have been privileged to have had the opportunity to observe several MDTs at work over an extended period of time. Each MDT meets weekly, differs in workload and has been affected in different ways by external factors such as Clinical Practice Guidelines (CPGs) and health service restructuring. The hospital is a specialist referral centre for prostate, lung, breast, head and neck and oesophagus cancer. Some of these designations were awarded since 2005.

Our approach in this study borrows concepts from different theoretical perspectives, adapting them to our needs as the research evolved. The initial stages of the work were strongly influenced by ethnomethodological approaches [2], motivated by the need to being as unobtrusive as possible, given the sensitive nature of the work situation being studied, as well as by the goals of capturing a sense of the context surrounding the activities of the MDT and producing (as far as possible) unbiased accounts of the different perspectives of the specialisms involved.

Results

A significant increase in workload has been recorded across all specialisms, but particularly for those for whom new CPGs were introduced, namely breast and cervical cancers. The number of MDTMs, the patients discussed and the increase this represents over 2005 figures are given in Table 1. Overall there is an increase of almost 100% which ranges from > 20% for the Head and Neck MDT to 261% for the Urology MDT.

The changes observed in the nature of the interactions at MDTMs as a result of an increase in volume of work have

Bridget Kane is an IRCSET Fellow, funded through the Irish Research Council for Science Engineering and Technology (IRCSET) Enterprise Partnership Scheme with St. James's Hospital.

MDT	Mean No. Patients per Hour MDTM		No. of Patients Discussed/MDTM		% Increase in MDTM Time over 5 Years	% Increase in Patient Cases over 5 Years
	Nov. '05	Nov. '10	Nov. '05	Nov. '10		
Urology	6	16	4.5	16	33	261
Breast	14	27	14	47	75	237
Gynaecology	9	14	9	28	100	211
Skin cancer	47	57	47	86	50	82
Lymphoma	7.3	9	5.5	9	33	64
Gastro-Intestinal (GI)	20	24	15	24	33	58
Respiratory	11.5	19.4	23	34	-12.5	50
Head & Neck	23	28	11.5 [‡]	14 [‡]	0	>20
Total	465	630	129.5	258	35.5	99.2%

Table 1: Profile of number of patients discussed, and MDTM activity, in November 2005 and 2010

forced change in the system. Some limited additional staff resources has been allocated because of funding limitations. Physical space and time are significant constraining factors. Of all of the constraints observed, *time and timing* are associated with the greatest observable effects on the MDTM.

Time is limited; schedules are tight. MDT members continually complain that they have not enough time, either to attend meetings, or for an individual case discussion.

Function shifts: Instead of incorporating teaching, social support and audit as well as patient management, the prime purpose of the MDTM has become Patient Management. Audit is a secondary function. The education function and socio-emotional support is now minimal.

Participation: There are fewer active participants in a single discussion since the number of patients to be discussed has increased. Questions are more rare

than previously.

Role: Senior people tend to dominate discussion nowadays. Junior members of the team occupy an observer status.

Discourse: Participants are less discursive when narrating patient history. Information is synopsised in collaboration as workload increases.

The Agenda is reorganised so that the most medically serious cases are discussed. When workload was lighter, cases were prioritised in order of their data and time of being submitted for the agenda.

Use of Images: As the number of patients increase the amount of imaging reviewed becomes less. Furthermore, there a hierarchy of radiological imaging studies can be identified with PET-CT scans prioritised, if available, and plain x-rays examined only if result is particularly unusual, and other imaging is not available. Review of pathology images becomes infrequent as the number of

Good Practice Guidelines for Collaboration at MDTMs

Preparation:

Team members should review the agenda beforehand and review any information they may have with respect to patients on the agenda.

Materials:

All data pertaining to patients being discussed should be available at the MDTM.

Process:

Be on time.
Do not engage in side-bar conversation. Pay attention.
Participate when appropriate.

Images & Test Results:

Are all investigation results available for discussion if needed?

Record:

Who is designated to take notes of the discussion? Is the note validated?

patients being discussed increases.

Text: Reading a text report, rather than describing the image findings, becomes more prevalent as the number increases.

Pre-MDTM preparation is critical for effective discussion, particularly as the number of cases increases.

Record-keeping becomes critically important as the MDTM is relied on, more and more, for patient management.

Record-keeping

Audio-visual /multimedia recordings of MDTMs are not considered to be acceptable to participants. However, having a record of the discussion that will be available in the patient's EPR is an articulated priority. Figure 1 proposes a framework for such records, that will incorporate i) process information about the MDTM, ii) an individual record of each patient case discussed, that will be available in that patient's EPR, together with iii) facility to relay notifiable diseases to national data repositories.

Conclusion

Recording appropriate electronic records of the collaboration that medical staff engage in while managing their patients is becoming more critical as medical care becomes increasingly specialised, centralised and more intense. More research is needed to identify the critical information necessary for collaboration and medical decision-making.

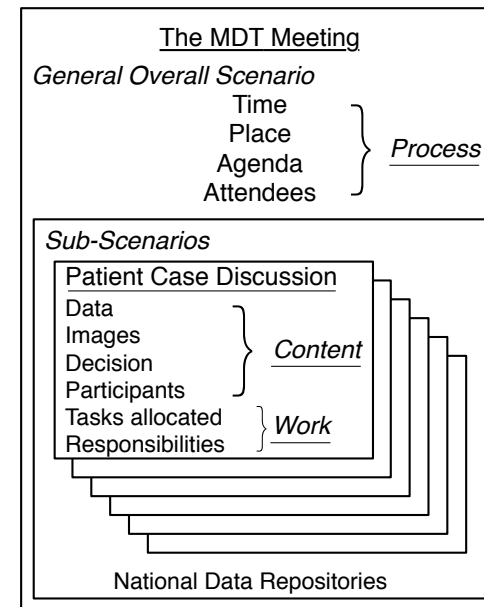


Figure 1: Framework for MDTM Records

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