

# Patterns of Communication at Interdisciplinary Patient Care Meetings: Implications for the Use of Information Technology

*Vanessa Vogwill BA, BEd, MBA, PhD(cand)*  
*University of Toronto, Toronto, Canada*  
[vvogwill@mie.utoronto.ca](mailto:vvogwill@mie.utoronto.ca)

## Abstract

Interdisciplinary collaborative team approaches to patient care are increasingly encouraged and mandated. With a parallel emphasis on the use of information technology to support such collaboration, the nature of verbal communication in interdisciplinary team meetings is examined as a means to suggest criteria for the use of information technology.

**Key words:** interprofessional collaboration, information technology

## 1. Background

There continues to be great emphasis placed on the enhancement of interprofessional education and collaboration in the healthcare field, because it is seen as a way to address the unacceptably high rate of errors in patient care [Corrigan (2000)].

Research in the area of collaborative practice is a key goal of funding agencies in Canada. In May 2005 the Canadian Health Services Research Foundation (CHSRF) commissioned a team of researchers at the U of T, Ottawa and Montreal to develop a synthesis report on the status of healthcare teamwork in Canada.[Ondasan, Lemieux-Charles et al (2005)] One of the conclusions was that future studies could “investigate the communication processes and information flow between providers “(pg 28).

The understanding of these processes and flows is crucial to the effective implementation of information technology in healthcare settings. Information technology has been identified as a potential means to aid collaboration, but successful implementation of technology requires a proper assessment of user requirements and context [Haynes (1995), Reeder (1999)]. This the context of the present study, with reference to Bullet Rounds.

Bullet Rounds are multi/interdisciplinary group meetings of health care personnel engaged in General Internal Medicine (GIM) at a major teaching hospital in Toronto, Canada. They take place four mornings a week and are attended by all or a subset of physicians (staff doctor, residents, and medical students), nurse managers (in charge of administration, ensuring staffing levels are appropriate, general management of wards), charge nurse(s), emergency nurse (occasional), Occupational Therapists, Physical Therapists, Dietician (occasional), Social Workers, Pharmacist, and Speech/Language Therapist (occasional). The purpose of the meetings is to establish a treatment program and discharge plan for the patients in GIM, with a focus on quality of care and efficiency. This is achieved through a process of decision-making using the collaborative sharing of information, knowledge and insight within the group to identify the currently appropriate pathway.

## **2. Literature Review**

The synthesis report commissioned by the CHRFS in 2005 is informative of the available evidence regarding the status of healthcare teamwork in Canada and other jurisdictions. In all jurisdictions reviewed a team approach to the delivery of healthcare is promoted, although it is practised to varying degrees. The objectives of the report were to understand what interventions promote and sustain affective teamwork and to propose recommendations for policy and practice to effectively implement teamwork within the Canadian health care system.

One of the areas the team looked at was the characteristics and consequences of team effectiveness and how to measure team effectiveness through outcomes. The report defines a team as the “who” (page 13), while teamwork is defined as collaborative behaviours – i.e. the relationships and interactions that take place between co-workers. Positive collaborative practice allows shared communication and decision making to positively influence patient care.

One of the findings of the Report was that at the micro or team level in multidisciplinary teams, information sharing on patient status is the norm, and supports the goal of making informed decisions about patient care. It is this process that the present study purports to examine. Although the report does not address the issue of information technology, the issues and recommendation raised are relevant to the improved understanding of how information technology should be used to assist collaboration in interdisciplinary teams.

A review of the research in this area shows that the use of information technology is regarded as useful, and necessary for information exchange between healthcare professionals [Weiner (2005) Reeder (1999)] especially as healthcare professionals are increasingly called upon to work in interprofessional teams [Miller (1998)]. IT spending in the healthcare field in general is predicted to increase in both the US [(eMarketer (January 2005))] and Canada (IDC Report 2005) although precisely which approach should be used is not clear, and further research is needed in this area [Johnson (2000), Wiecha (2004), Currell/Urquhart (2005)]. While the necessity for the use of collaborative information technology is asserted, it is acknowledged that the precise form it should take requires further study, and will depend on the context of implementation.

Electronic medical records (EMRs) have been shown to improve communication among medical staff, although they do not yet adequately support the collaboration and information exchange processes that persist in hospital environments. The use of electronic spaces that function as meeting rooms facilitate asynchronous exchange and serve as a repository of historical records, and extension of electronic medical records to include some function of information repositories may have a positive effect on communication among in-hospital staff [Jovicic (2005)]. The Electronic Health Record (EHR) has been suggested as a means for making healthcare more efficient and reducing costs, although the results from studies undertaken regarding the efficacy of the EHR have been inconclusive [Neergaard (2005)].

Team interaction classification systems exist to analyse team verbal exchanges, including Interaction Process Analysis (IPA), SYMLOG, TEMPO [Marks (2001)]. The Team Observation Protocol (TOP) has been used to analyse conversations that take place in multidisciplinary team meetings in the Health Care Field. These conversations were the

evidence used to examine the team processes occurring in a team conference in a stroke unit [Gibbon (1999)]. As noted by Gibbon, the TOP is designed for the categorization of statements made by team members and for attribution to a particular professional, which allows the analyst to identify how decisions are made by the group. Understanding the information and collaboration needs of healthcare professionals working in interdisciplinary teams is necessary as input into the design of effective electronic systems to support this collaborative decision-making.

Both prior and subsequent to this study, there are few empirical studies exploring the processes that take place in multidisciplinary patient care meetings or documenting instances of collaboration and teamwork [Gibbon (1999), CHSRF Report (2005)].

### 3. Objectives

The objective of the Bullet Rounds study was to extend previous work done on the study of verbal exchanges in interdisciplinary team meetings using the TOP. It describes the team approach to the challenges of patient care as practised by groups of health care professionals on the General Internal Medicine Clinical Teaching Units in a major Toronto teaching hospital, by using the TOP categorisation method and a modified version of the TOP in conjunction with a verbal protocol analysis software package. It extends the previous study by applying the analysis tool to broader multidisciplinary teams and by refining the analysis toolset.

### 4. Assumptions

The basic categories of the TOP were used in the study. There are 7 categories of statement in TOP, and interactions at Bullet Rounds were coded into one of them. The categories and definitions to be used are as follows:

Category	Description	Assumptions
1. Client	All affective statements regarding the client: i.e. joking/hostile references indicating emotional reaction	Applied as per the TOP definition
2. Team	All affective statements about the team or team member. Includes joking, laughing or hostile remarks	<b>Included in this category were statements providing background, commenting on the physical environment, anything personal about team members, and team dynamics</b>
3. Questions	All statements asking for information, suggestions, or opinions or requesting reports	Applied as per the TOP definition
4. Information	All statements giving factual information, dealing only what is observed without interpretation	<b>Included in this category were requests or instructions, and comments</b>
5. Interpretation	All statements that give an opinion or interpretation, going beyond empirical data to make inferences about what has been observed	Applied as per the TOP definition
6. Alternatives	All statements that suggest alternatives, explore or compare possible courses of action	Applied as per the TOP definition
7. Decisions	All statements which deal directly with the final decision –expressing, clarifying, or elaborating the decision reached.	Applied as per the TOP definition

*Table 1: TOP Categories*

## 5. Methodology

### 5.1. Qualitative Data Capture

The goal of the initial phase of the Study was the documentation of qualitative data. The methodology adopted was an ethnographic study, and consisted of unobtrusive unstructured non-participant observation of Bullet Rounds, which were not taped. We attended a total of 20

meetings over the course of 3 months in 2005. The wards and patients in question were in GIM, and over 400 patient discussions were documented. We attended the full meetings which generally took between 1 and 1.5 hours in the morning, for an approximate total of 30 hours. During that time extensive notes were taken by hand by the observer who did not participate in any way in Bullet Rounds; these notes transcribed the conversations that took place at Bullet Rounds and identified the role of the speaker (doctor, nurse etc). This body of data has been transcribed into Field Notes, and is referred to as the Baseline Data. The notes are as faithful a representation of the conversations that took place as was possible with the time and resources available. The observer did not come to Bullet Rounds with any prior knowledge of them or predetermined hypothesis or bias with respect to them, but simply to describe, without inference, what was seen and heard.

## 5.2. Quantitative Data Capture

The Field Notes were organized to enable coding. There were two approaches used for the coding process:

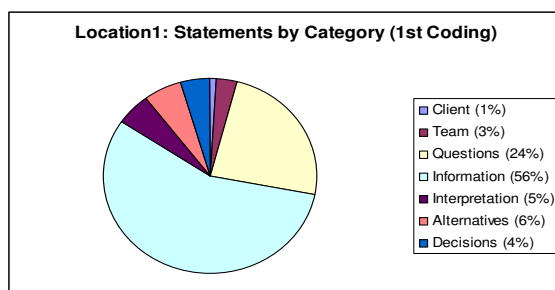
- Coding was done using the categories from TOP without modification.

The data processing of the first stage of analysis involved the summation of statements according to category and participant through the use of a spreadsheet tool. The coding was done by the observer only, but on two separate occasions. No other individuals were asked to code since only one person had actually been present to observe and it was felt that non-present individuals, in the absence of recorded transcripts, would not be able to assess the notes appropriately.

- Coding was done using a custom software tool called Verbal Protocol Analyzer (VPA) VPA has been designed to assist in categorizing statements made in the context of software testing for usability. As an analysis tool however, it can be applied to other contexts where verbal protocols need to be categorized and allows the user to input their own analysis scheme and create subcategories as well. A modified version of the TOP Categories was used in this case: a subcategory “Comments and Collaborative Behaviour” was added to the category “Team” which enabled the documentation of non-verbal and non content-bearing communication which were indicators of team functioning. The category Information was refined to separate out “Requests and Instructions” to add detail.

## 6. Findings

### 6.1. Manual TOP Coding



**Figure 1: Statements by Category**

Figure one above shows the results of the TOP coding exercise and are summarised below by category.

**Category 1: Client (1%):** There is only occasional discussion of social situation or personality as it relates to issues that may affect ongoing treatment.

**Category 2: Team (3%):** There are some comments on team functioning and processes, including other teams, but very few overt comments about individuals. Side conversations occur at times that preclude effective full group functioning.

**Category 3: Questions (24%):** Questioners are mainly doctors asking nurses, and nurses asking doctors.

**Category 4: Information (56%):** This is the largest category of verbal exchanges, and involves all team members.

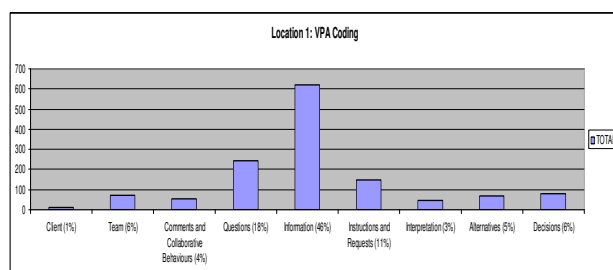
**Category 5: Interpretation (5%):** This category represents a small proportion of the total verbal communication, includes expressions of opinion or uncertainty on the part of team members, and can relate to process or clinical issues.

**Category 6: Alternatives (6%):** The teams discuss possible alternatives in cases where the required information is available, but the percentage of verbal communication in this category is low because to do so the team generally requires outside information that is unavailable.

**Category 7: Decisions (4%):** The decision-making component of the meetings is very small and represents only 4% of verbal exchanges. On any given day there are few discharges, and where a discharge is to take place, discussions around it are generally very brief. The group quickly move on to another patient unless the discharge is conditional upon further action being taken, because at patient discharge they have reached their collective goal, and need to move on to the “active” or “unsolved” cases.

## 6.2. Coding using VPA software

A second round of coding using the same baseline data was undertaken to further refine the categories of Team and Information.

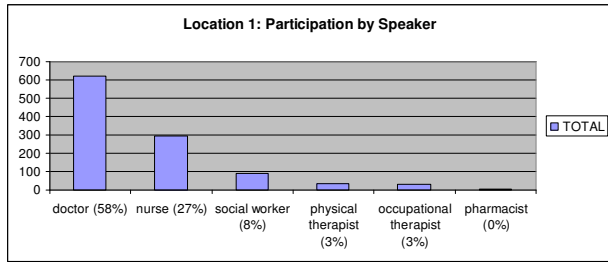


**Figure 2: Location 1: VPA Coding Using Subcategories**

Figure 2 above shows the results of the VPA coding exercise. More team interaction has been captured using the subcategory of comments and collaborative behaviours (4%) raising “Team” to 10% overall. Previously, using the original TOP categories, these behaviours were not recorded. While information remains the highest category of types of statements at 48%, the additional subcategory of “Instructions and Requests” is 11% and provides additional description of the interactions in the teams. Combined, the two results would provide a rating of 59% for information overall, similar to previous results. Questions are reduced to 18% of the total, because where they represent requests for action they are coded under the new information subcategory.

## 6.3. Participation by Speaker

The coder also considered the role of the person participating, and analysed the statements by speaker using the spreadsheet tool, as seen in Figure 3.



**Figure 3: Location 1: Participation by Speaker**

Doctors and nurses have the largest amount of verbal participation at Bullet Rounds with 58% and 27% respectively, followed by social workers at 8%.

## 7. Discussion

The results of the coding exercise show that the dominant form of communication in Bullet Rounds is the exchange of information, with the questioning component linked to this insofar as it seeks further information that has not been made available or is unknown. This suggests that any protocol or technology that could facilitate the provision or exchange of information may improve efficiency and possibly overall patient care, and an effort to extend current applications of EMR's could be beneficial

By further breaking down the information exchange at Bullet Rounds, as per Table 2 below, it is clear that doctors at Bullet Rounds depend a great deal on sources outside the meetings to provide additional information. In addition, nurses frequently do not have the information requested of them and must therefore go outside of Bullet Rounds to obtain it.

Information Category	Dr	N	SW	PT	OT	Pharm
Instructions	19%	5%	3%	5%	0%	20%
Process	16%	18%	50%	36%	0%	0%
Patient Status	27%	50%	12%	32%	67%	40%
Outside BR's	38%	27%	34%	27%	33%	40%

**Table 2: Information Categories**

Nurses and doctor are in constant exchange requesting updates from each other. Typically, questions regarding the clinical dimension are put to doctors. The information provided by doctors is: diagnosis, background, and treatment plan/status, including general statements about what needs to be done. At Bullet Rounds there are generally a range of physicians present, which may include Attendings, Residents, and Medical Students. They do not all have the same level of knowledge of process and team accountabilities, and this can prolong discussion.

Roles and responsibilities are not spelled out in any structured way, and the approach taken by the physician, as an example, may depend on their level of experience. Because processes are not spelled out but rather "understood" the less experienced physician has to assume or ask, while an experienced physician is familiar and able to direct more explicitly. Therefore it is not necessarily clear to the observer who will act on the instructions given, nor which, if any, team member is responsible or accountable for carrying out the instruction. This suggests the potential for greater efficiency by removing such handoff gaps. There is a significant amount of time spent on process issues. Provision of background information on roles and responsibilities may be a way to reduce this phenomenon.

Although physicians are responsible for the clinical diagnoses and the treatment protocol, other participants may get involved, or attempt to get involved, in clinical matters, especially the nurses. This is seen in the form of “leading” questions or outright questioning of diagnoses, information or instructions given. The doctors also use the meetings for discussions amongst themselves. Nurses at the meeting mainly provide updates based on what is in the notes (Shift Report from Nursing), although the information required to respond to questions (in particular from doctors) may not be in the notes, necessitating follow up. For both nurses and physicians, the information provided does not necessarily fulfill their information needs and requests: this results in delays of decisions as the questions have to be taken outside of the meeting to obtain answers.

The ability to anticipate required information would be a valuable tool in reducing the necessity for follow up outside of the Bullet Rounds meetings, and is another factor to consider when designing supportive information technology for this context.

There is relatively little discussion of alternatives, or interpretation. This may be a time issue or not be thought to be useful if the necessary information is not available. Means of making the missing information available may be useful in contributing to the discussion of known alternatives. Decision-making represents only 4% of all statements: since the goal of Bullet Rounds is to improve patient care and efficiency, it is reasonable to suggest that an increase in the number of exchanges dealing with discharge would represent an improvement in these measures, although with some caveats, such as re-admission rates for example.

Bullet Rounds are important for the ongoing direction and management of the treatment program, a function that is led by medicine on the clinical side, and equally shared amongst the team members on the implementation side, with nursing contributing in both areas. This places nursing at the intersection between clinical and implementation management, since they interact with all members of the team outside of Bullet Rounds on a regular basis, have consistent patient interaction and have broad knowledge of both clinical and process issues, unlike other team members who tend to have a narrower range of specialization. Nurses are the broadest of the group in terms of what they discuss and ask, and this central role played by nursing must be taken into account in the development of collaborative technology.

The “tone” of the Bullet Rounds meetings varies by group: there is a regular turnover of physicians and the extent to which the tone is collaborative or not is partly the result of which physicians are involved, but also the approach taken by the nursing teams. The use of subcategories in the TOP analysis (Figure 3) has enabled the identification of behaviours that relate to overt collaboration, although it still requires further definition to obtain a true picture.

## **8. Conclusion and Future Work**

The results of the analysis of the Bullet Rounds observations point to different levels of awareness of the evolving treatment program and discharge plan amongst group members. Given its synchronous and asynchronous communications capacity and information-gathering and sharing capacity the internet is a logical platform for supporting interdisciplinary clinical teamwork. Research is needed to better understand how interdisciplinary eHealth team members can work together in everyday practice to guide the development of effective and

efficient eHealth software applications to support greater clinical teamwork. [Wiecha (2004)]. Future work will focus on establishing measures that can be used to evaluate interventions in Bullet Rounds meetings designed to improve the provision and exchange of information in order to create a model to improve decision-making and ultimately patient care through the use of information technology

## References

1. Butler S: US Physicians: *Technology Usage and Trends*. Emarketer magazine, Jan, 2005
2. Chan J: *Integrated and Collaborative Computing in a Medical Workgroup Environment*, Proceedings of the World Conference on Medical Informatics, 1995
3. Corrigan JM, Kohn LT, Donaldson MS, Editors: *To Err is Human: Building a Safer Health System*. Committee on Quality of Health Care in America, Institute of Medicine 2000
4. Currell R et al: *Nursing Record Systems: Effects on Nursing Practice and Health Care Outcomes*. Cochrane database of Systematic reviews, Issue 3, 2005
5. Gibbon B: *An Investigation Of Interprofessional Collaboration In Stoke Rehabilitation Conferences*. Journal of Clinical Nursing, Vol 6, May 1999.
6. Haynes RB et al: *Bridges Between Health Care Research Evidence and Clinical Practice*. Journal of the American Medical Informatics Association, 1995
7. Johnson C: *A Guide To Choosing Technology To Support The Measurement Of Patient Outcomes*. Journal of Nursing Administration, Vol 30 (1), Jan 2000
8. Jovicic A: *Beyond the Paper Chart: Collaborative Discharge Planning and Electronic Health Record*. PhD proposal Sept 2005
9. Marks M: *A Temporally Based Framework And Taxonomy Of Team Processes*. The Academy of Management Review, Vol 26, July 2001
10. Miller P: *Technology as a Tool for Health Care Collaboration*. Computers in Nursing Feb 1998 pp 27-29
11. National Health Service (NHS): *National Program for Information Technology*, UK, 2003
12. Neergaard L: *Challenge of Electronic Medical Records*. Associated Press, September 2005
13. NHS Cancer Plan: *Service Improvement Guide*, UK, 2001
14. Oandasan I, Lemieux-Charles L et al: *Guide To Collaborative Team Practice*. Health Services Research Foundation (CHSRF) of Ontario Interim Report, July 2005
15. Reeder L: *Anatomy of a Disease Management Program*. Journal of Nursing Management, April 1999
16. Sharp J: *Business and Technology Priorities in Canadian Healthcare*. International Data Group Canada Report, 2005
17. Simpson RL: *Patient and Nurse Safety: How Information Technology Makes a Difference*. Nursing Administration Quarterly, Vol 29, 2005
18. Weiner S et al: *Processes for Effective Communication in Primary Care*. Annals of Internal Medicine, Vol 142, April 2005.
19. Wiecha J: *The Interdisciplinary Ehealth Team: Chronic Care For The Future*. Journal of Medical Internet Research, Vol 6, 2004