Clinical communication in a Trauma Intensive Care Unit (ICU): a case study

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In 2006, JCAHO defined the second of its National Patient Safety goals as to "Improve the effectiveness of communication among caregivers". The SBAR protocol gives practical guidelines for person-to-person communication but may not be appropriate in its current form for more complex contexts. This paper presents a case study showing communication processes in one ICU and illustrates important principles of complex clinical communication. The case study is based on observational and interview data from a bedside nurse, a charge nurse, a resident and a fellow over 12 hours each in a major trauma ICU. Artefacts were also collected and annotated. Five types of interconnected communication events are described in the sequence in which they occur. Each communication event is described in terms of its purpose, participants, process, and support tools. Four principles are defined.

INTRODUCTION

In 2006, the Joint Commission on the Accreditation of Healthcare Organizations (JCAHO) defined the second of its National Patient Safety goals as to "Improve the effectiveness of communication among caregivers"; 2A of this goal outlines a basic process for communication. Arora and Johnson (2006) have further refined this process although outcomes focus on the detailed representation of communication processes than on practical guidelines. The SBAR protocol developed by Leonard et al (2004) and inspired by similar protocols in aviation emphasizes practical guidelines and is arguably the most widely known protocol (Knapp, 2006; Guise & Lowe, 2006), although recent initiatives within the US Veterans Affairs provide similar a framework for improving professional interpersonal communication. Haig et al (2006) defines common understanding (Endsley et al 2003) between two or more people about what the patient situation is as one of SBAR's purposes.

SBAR guidelines and the JCAHO goal emphasize one-to-one communication. Haig et al (2004) maintain that the SBAR protocol helps to overcome hierarchical, interdisciplinary, age, gender and cultural barriers to communication. A junior physician, for example, may be concerned that a patient's condition is deteriorating and wants the advice of a senior physician. SBAR provides a framework that allows junior staff members to present their concerns precisely, concisely and in ways that promote an effective response. Similarly, SBAR guidelines may effectively guide one-to-one communication when patients are transferred across organisational boundaries, for example, between the operating room and intensive care unit (ICU) or between the ICU and a general hospital unit. These however are isolated events. Clinical communication involves communication within a team comprising physicians, nurses, allied health workers and patients over extended periods of time. The continuity of team communication over time does not appear to be accommodated within the SBAR framework.

Like many other institutions, Vanderbilt University Medical Centre (VUMC) aims to improve clinical communication. However, very little research is available to guide the implementation of team communication and continuity of patient care strategies. Studies associated with ward rounds (Harris et al, 2006; Moroney & Knowles, 2006; Dodek & Raboud, 2003; Pronovost et al 2003; Manias & Street, 2001) and formal shift handovers (Patterson et al 2003; Sexton et al 2004) as well as more general studies about clinical communication and multidisciplinary teams (Alvarez & Coiera 2006; Albolino et al 2007; Fliessig,et al 2006) have been undertaken and provide an important but fragmented basis for understanding complex clinical communication. Studies that integrate broader clinical communication processes, roles and tools are rare.

The case study reported in this paper shows that while effective one-to-one communication may be necessary it is not a sufficient approach to clinical communication in an ICU. This paper also illustrates important principles that may guide the development of strategies for more effective team communication. This case study was collected within a broader research project designed to describe continuity of care processes in ICUs, but on its own offers valuable insights into clinical communication in a complex multidisciplinary team environment.

METHOD

Participants

The larger project, of which this case study is a part, was undertaken with ethics committee approval. In the Trauma ICU, the overall multidisciplinary team was made of the day and nightshift medical and nursing sub-teams together with allied professionals, such as pharmacists, dieticians, respiratory therapists, physical therapists, case managers and social workers as well as patients and/or their relatives. The medical sub-teams included a trauma attending, a trauma fellow, a senior resident and one or two junior residents. The nursing sub-team included a nurse manager, at least one charge nurse, and bedside nurses to care for patients on a 2 patient to 1 nurse ratio with support from care partners.

Materials

Materials included notebooks used by the researcher to document communication flows and participant responses to the researcher's exploratory questions. Copies of de-identified artefacts including forms and checklists were also collected.

Procedure

The researcher 'shadowed' a bedside and a charge nurse, a fellow and a junior resident for 12 hours each over

one week in September, 2007. The researcher also attended sub-team and multidisciplinary team meetings related to patient care over that time. While shadowing each participant, the researcher noted all communication events including the time of the communication, the roles of sender(s) and receiver(s), and summaries of the substantive content of the communication.

Copies of any tools used to support communication were also collected and annotated these to reflect the tool's purpose and use. At convenient times, participants were questioned about aspects of the observed communications and about use of the tools. Examples of questions about communication events included: Would you commonly speak to 'A' about that and who else might you talk to? Would you document the outcome of that and if so where? Would that information be useful to other people, how would they find out about it if you didn't tell them?

Questions related to tools included: How long have you used this tool? Do other tools capture this information? Is it kept permanently or do you discard it at the end of the shift? Who else might use it or the information it captures? This procedure was undertaken in eight other ICUs who participated in the larger study and results of the broader study will be reported elsewhere. As a result of initial observations made with the resident, a further follow-up interview was conducted with the medical director and a charge nurse about the history of the communication process and its support tools.

RESULTS & DISCUSSION

The following communication events are summaries of the researcher's process and tool use observations and the participants' rationales and reasons given during interview. Interpretative comments are the views of the authors. The following five communication events are presented, as possible, in the sequence in which they were observed:

1. The medical pre-round

In academic teaching hospitals conversations on rounds, intended to provide direction about patient care, are often interspersed with conversations aimed at educating junior physicians. However, these conversations can become irrelevant to the issues at hand and can unreasonably extend the length of a round. The medical team in the Trauma ICU have chosen to separate direct patient management conversations from educational conversations. Thus, all physicians (attending, fellows, senior and junior residents and medical students) attend an informal pre-round meeting at 0700hrs in a small conference room away from the main body of the ICU.

The pre-round meeting begins at 0700hrs with the night team resident providing an overview of events that have occurred during the night focussing on new patients or patients whose condition may have improved or deteriorated. Led by the attending, the team engages in detailed discussion, which may take several forms. Discussion may involve the detailed analysis of difficult, rare or novel patient situations (e.g., a patient's unusual radiology report). At other times, a theme (e.g., the management of acid-base balance) affecting several patients is food for compare and contrast discussion, or a medical student who may have been allocated this task yesterday informally presents research findings on a topic of general interest. Depending on time availability, the attending offers challenging hypothetical scenarios or quizzes the team about aspects of the theme or the patients' care. The discussion ends promptly at 0800hrs.

The medical pre-round meeting is important for several reasons. It provides opportunity for detailed medical discussion about complex problems, which may be irrelevant to other healthcare team members. It allows physicians to express knowledge deficits or uncertainties in a supportive, peer-oriented environment away from others whose scrutiny may intimidate physicians who are in training. Away from the patient, it gives physicians time to consider solutions to often-difficult patient problems. It gives privacy to discussions that represent conflicting professional views and provides a group-space for these to be aired and resolved. The meeting also allows the night team members to go home at a reasonable hour. The pre-round meeting is rigorously scheduled which limits side-issue discussions. In these ways, the pre-round meeting provides all medical team members with an opportunity to engage in highly technical, problem-centred discussion that is also educative.

2. The morning multi-disciplinary (MD) round

The morning multi-disciplinary (MD) round begins at 0800, and progresses from bed-to-bed around the unit. The MD round includes at minimum all scheduled physicians, each patient's bedside nurse, the charge nurse, the respiratory therapist, a pharmacist, a dietician, and social and case management workers. The patient's relatives are expected to be present. Two of each patient's family members act as patient surrogates because patients are often unable to actively participate. Consistent with privacy regulations, a Trauma ICU liaison person escorts the each patient's family members to the patient's bedside.

The round is highly structured. At the patient's bedside, the junior resident begins with the patient's history and any major results or events over the last 24 hours. The bedside nurse follows and gives the patient's current state in terms of vital signs, drugs and management or routine care protocols. The respiratory therapist gives an update if the patient is receiving ventilatory support and the resident finishes this part of the report by giving the results of the patient's physical examination.

The senior resident supported by the fellow and attending, leads an analysis of the patient's condition and treatment according to the standard physiological systems reporting taught during their training (e.g. neurological, cardiovascular). Treatment options are discussed and other team members clarify or offer suggestions about management changes. The pharmacist, dietician and any other participants (e.g. social worker, case manager, family members) contribute to this discussion. Following this analysis, the attending physician summarizes goals and the overall action plan. The senior resident, fellow or attending physician then gives the family a 'plain English' summary of the discussion and actively solicits their questions and comments.

This process is supported by three main paper-based tools: computer printouts of the 'ICU patient list' which is updated each day; the patients' recent 'results and medications'; and the 'nurses' rounding sheet'. The patient list is simply a list of each patient's name, identity number, admission diagnosis and the main treating physician, separated by one to two inches of blank space that is used by physicians to write notes; residents tend to construct 'to do' lists. The patient's 'results and medication report' is a useful reference in the round but quickly becomes obsolete as new results are added. The nurses' rounding sheet guides the nurses' report. It includes space for writing vital signs, drugs and other treatments, the patient's status with respect to routine protocols (e.g. Deep Vein Thrombosis protocol, Ventilator Acquired Pneumonia protocol) and allows nurses to document the care goals, reportable limits and actions specified by physicians. The evolution of this tool and its effect on communication processes was significant.

Two factors drove the development of the nurses' rounding sheet. First, senior medical and nursing staff wanted to move towards MD morning rounds that were more inclusive of family members and non-medical disciplines. However nurses, who were not used to presenting information in rounds, were reported as feeling uncomfortable and thought that a sheet that they could prepare in advance would help them to structure their report. Concurrently, physicians expressed frustration that nurses did not provide a consistent set of information in rounds. As a consequence, the charge nurses were asked to consider ways to improve this situation. One charge nurse led a collaborative design process involving other senior nurses that resulted in a 'draft rounding' sheet. Bedside nurses used the draft during the rounds on a trial basis and feedback was used to make further modifications.

Physicians in the Trauma ICU do not use a generic rounding sheet. However in another ICU, nurse practitioners have developed a rounding sheet that has been adopted by residents to structure round reports, to document goals and to construct activity 'to do' lists. This rounding sheet was based on information that clinicians typically write on the 'patient list' and includes history, recent events, and laboratory and examination results. Information is arranged in columns that summarize one day of a patient's data. Seven days are presented on the two-sided sheet. Another ICU uses the patient's permanent daily medical report to structure information presentation and note taking.

Implementing the nurses' rounding sheet had two additional effects. The rounding sheet explicitly allocates the reporting of certain information to nurses and to residents in ways that reflect their roles in the healthcare team. Nurses are responsible for monitoring patient vital signs and for administering and monitoring the effects of treatments, but previously, residents were expected to collect this data and present it on rounds. This information is included on the rounding sheet and is now presented but the nurses. As a result, residents' are better able to focus on information that reflects their responsibility. From an observer's point of view (e.g., family members) role distinctions become clearer.

Residents are responsible for assessing the patient's medical condition, for prescribing therapy and for executing medical procedures under the fellow's or attending's supervision. As previously, residents' report the patient's past, admission and recent history including major events and significant results and the results of physical examinations. Senior residents and fellows are responsible for diagnosing patient pathologies, for devising and for supervising medical care plans and the junior residents' practice. Thus, the senior residents and fellows present the more detailed systems analysis supported by the contributions of expert allied health professionals. The attending physician, who has ultimate responsibility for the patient's medical management, supervises and contributes to the analysis and presents the definitive plan.

Clinicians believe that the most significant effect of this process is on the patients' family members. With the detailed pre-round discussion, MD round discussions are short (10 minutes or less per patient) and focussed. Thus, family members are less likely to get lost in technical detail and are not exposed to the more academic medical debates. The roles of team members and the relationships among the roles become clearer to families so that they can better target questions and requests to appropriate role-holders. With all roles present during rounds, the team including the family, receives the same information at the same time, thus opportunities for confusion are reduced. The openness of the round may also present the healthcare team as highly professional and cohesive thereby promoting confidence among family members.

3. The morning nurses' handover

The development of the nurses rounding sheet also affected the nurses' morning shift handover, which takes place at about 0640hrs. The night-shift nurse provides a report to the day-shift nurse and answers any questions. The beginning of a shift is one of the busiest times, as day nurses complete safety and equipment checks, get up to speed on their patients' progress and the day's plans as well as dealing with interruptions from other caregivers who are also trying to organise their day. Collating information for the round would be a further imposition on the day nurses' at this time, thus, the night nurse completes the rounding sheet for the day nurse.

This was reported as having several advantages: a) at the end of the night shift the night nurse can check changes in the patient situation against the rounding sheet left by the previous day nurse; b) the night nurse, having cared for the patient overnight, is more familiar with the patient and so can more accurately complete the rounding sheet; c) the rounding sheet provides a concise, comprehensive and efficient checklist which can help tired nurses to focus on important information while increasing the likelihood they can leave on time; d) using the rounding sheet to guide the handover allowed the day nurse to vicariously rehearse the round report and e) summarised on paper, both nurses focussed on the same information at the same time thereby increasing the likelihood of both nurses developing a common understanding of the

patient's situation. Information category headings also acted as prompts for nurses to clarify issues that may otherwise be forgotten.

Thus in addition to other benefits, the rounding sheet supports the flow of information from the night nurse to the day nurse and from the nursing team to the overall care team in the MD round. This tool, like the rounding tool used by residents and nurse practitioners in the other ICU, promotes continuity of care because it enhances continuity of information.

4. Informal communication

The communication events that have been described above are designed to achieve common understandings among the participants about what the patients' situations are and what needs to be done. However, these communications do not address logistical issues such as who will do what, how or when. Communications between physicians after the round are geared towards work allocation. Notes and 'to do' lists support these discussions. In what is called 'the huddle', residents meet usually with the fellow, at a central work desk. They work through their patient lists comparing noted activities to ensure that all residents have the same task list and that they understand what is required. During the round one resident may begin entering orders and treatment changes into a mobile computer; these entries are also checked. Once they have established a common task list, the residents and fellow negotiate who will complete what tasks in what priority. Various factors determine work allocation; one resident, for example, may assigned to perform a particular procedure, another may have developed a good rapport with a difficult family and so on. Throughout this process, the fellow identifies potential task difficulties or hazards.

Once the workload has been distributed residents set about executing their allocated tasks. Examples of tasks include report writing, following up test results and ordering new tests, consulting with specialist physicians or other allied professionals such as case managers, and performing procedures such as inserting or removing tubes. The timing of procedural tasks often needs to be negotiated with others such as respiratory therapists or nurses who may have competing priorities yet may need to assist in the procedure. Hence many conversations between nurses and residents involve negotiating, prioritizing and coordinating the timing of patient care tasks.

The activities that nurses note on their rounding sheets also act as prompts, so that if anticipated activities appear to be overlooked, nurses contact residents to confirm when or if the task will be completed. Nurses also attend to reportable range limits for important patient parameters using these criteria to notify residents when patient variables are outside acceptable levels. Leaving nurses to monitor patients against reportable limits frees residents from this activity so that they can focus on executing the medical plan. Throughout the day, residents and the fellow interact for status updates, to reprioritise or check off tasks, solve problems and clarify issues. These informal conversations allow the physicians to maintain an awareness of their performance as a team and of the overall state of patients in the ICU. The patient lists are constantly updated by checking off tasks and adding comments and thus represents a record of each physician's activities.

5. The afternoon round

Afternoon rounds are functionally different from the morning MD round. Where the morning round focuses on patient assessment and the revision of care plans and goals, the afternoon round tends to focus on what has been achieved or what has changed since the morning round; the morning round is the reference. Participation in the afternoon round is more relaxed; the day and night attendings do a snapshot round at a central desk at 1600hrs that focuses on major patient issues. The day and night residents round at 1800. They continue to update and check off their patient list items and also liase with the night respiratory therapist to ensure that ventilatory weaning continues over night. Nurses' involvement in the afternoon round is less formal and family members may be involved, but their presence is not expected. Other than an updated 'results and medications' printout, no new support tools are used. Only if a patient's situation is substantially different from that anticipated during the morning round are goals or directions fundamentally changed.

CONCLUSIONS

The communication events described in the previous sections highlight the temporal, functional and organisational complexity of communication in the Trauma ICU. The case study shows that clinical communication events are often not discrete events but are part of ongoing dialogues and information flows.

From a temporal perspective, the outcomes of one event, the nurses' shift handover and the pre-round meeting, flow into subsequent events, such as the morning MD round. Information also flows occur across different levels of organisation; for example, whole care team communication during the MD round; intra-disciplinary team communication during the pre-round meeting and the nurses shift handover, and informally between individuals such as residents and nurses. Information also flows over different timescales; the daily cycle from morning round to morning round, the morning to afternoon cycles and hourly feedback cycles that occur between nurses and physicians depending on patient acuity and stability.

Over a 24-hour period, communication events have different functions; the afternoon round is not a simple repetition of the morning round. Where the morning round is used to comprehensively analyse the patient situation and the overall care plan, the afternoon round is used to assess the day's progress against directions set in the morning round.

Different communication events involve different role-holders and thus different perspectives, priorities and information content. The 'resident's huddle' involves residents and fellows in a discussion focussed on the logistics of getting the work done, whereas the pre-round meeting involves all physicians and discussion can become academically abstract and highly technical. In contrast, informal conversations between nurses and residents involve negotiating task

dependencies and managing patient's physiological disturbances.

This profile suggests that protocols such as SBAR need to be implemented and assessed with a greater understanding of the broader communication context in which these protocols are to be embedded. The case study also suggests the following four principles that may be used when considering or evaluating communication protocols.

Principle 1. Each communication event has a primary purpose: Each communication event in the case study had a primary purpose. The primary purpose of the pre-round meeting was to provide an opportunity for physicians to engage in free and open discussion about difficult medical problems. The pre-round meeting is inherently educative because peers are able to present and discuss differing views, resolve professional conflicts and expose knowledge deficits in a safe environment. The primary purpose of the morning MD round was to ensure that all stakeholders (physicians, nurses, allied health professionals and the patients' family) share a common understanding about each patient's situation and about the daily care plan.

Principle 2. Communication events are not isolated in time. Communication events are informed by inputs from the past and will inform outputs that flow into the future. In the Trauma ICU, communication events represented a number of specific phases. The pre-round meeting and the nurses' morning shift handover can be understood as preparatory communications; neither event involved formal decision making but both were essential to subsequent decision making in the MD round. The residents' huddle and informal conversations between nurses and physicians throughout the day reflect the details of plan implementation, while the afternoon round was used to assess the overall team's progress against directions established in the MD round. This temporal pattern may differ in other ICUs and in other care delivery settings.

Principle 3. Communication events reflect the information content, perspectives, and concerns of the involved role-holders: Endsley et al (2003) represents team knowledge as a Venn diagram. In a Venn diagram some types or categories of information are specific to particular roles. Thus, the information content of the nurses' handover and the pre-round meeting is specific to those role-holders; some information types or categories are shared between some role-holders but not others. The timing of patient procedures, for example, is negotiated between the bedside nurse, the resident and possibly the patient or family and may not involve the charge nurse or fellow. Other information such as patient vital signs, shared in the MD round involves all role-holders. The involvement of different individuals affects the content, the language and the level of structure needed to ensure clear and effective communication.

Principle 4. Effective communication requires support. Continuity of communication was supported by two main tools: The residents depended on their annotated patient lists to organize their work and to verify that medical tasks had been completed. Nurses depended on their rounding sheet to organize information that needed to be presented during the round and to document planned patient activities and reportable limits. Both residents and nurses updated and annotated their respective worksheets throughout the day so that at any time, including at the completion of their shifts, team members had a tool that reflected current patient states and what had been accomplished or still needed to be done.

In conclusion, JCAHO requires health care organizations to "improve the effectiveness of communication among care givers". Protocols such as SBAR are important in improving interpersonal communication between people who may not share a prior understanding of the patient situation or the team's plans. However, as illustrated in this case study, these communications may represent a limited subset of communication events. Thus protocols such as SBAR may not be sufficient to improving communication more broadly. The principles proposed from this case study may provide a basis for more broad-based protocols.

ACKNOWLEDGEMENTS

The researchers gratefully acknowledge the enthusiastic participation of all medical, nursing and allied healthcare professionals of the VUMC Trauma ICU in this study. Dr Miller's time on this project was supported by a VUMC School of Nursing fellowship.

REFERENCES

Albolino S, Cook R, O'Connor M. (2007). Sensemaking, safety and cooperative work in the intensive care unit. *Cogn Tech Work*. 9:131-137

Alvarez G, Coiera E. (2006). Interdisciplinary communication: An uncharted source of medical error. *J Crit Care*. 221:236-242.

Arora V, Johnson J. (2006) A model for building a standardized hand-off protocol. *Jt Comm J Qual Patient Saf*. 32(11) 646-655

Dodek PM, Raboud J. (2003) Explicit approach to rounds in an ICU improves communication and satisfaction of providers. *Inten Care Med*. (29: 1584-1588.

Endsley MR, Bolte B, Jones DG. (2003) Designing for situation awareness: An approach to user-centered design. New York, NY: Taylor & Francis.

Fliessig A, Jenkins V, Catt S, Fallowfield L. (2006) Multidisciplinary teams in cancer care: Are they effective the UK. *Lancet Oncol*. 7:935-43.

Guise J, Lowe NK. (2006). Do you speak SBAR? *J Obs Gynecol Neon Nurs*. 35(3). 313-442

Haig KM, Sutton S, Whittington J. (2006). SBAR: A shared mental model for improving communication between clinicians. *Jt Comm J Patient Saf*. 32(3):167-175

Harris KT, Treanor CM, Salisbury ML. (2006). Improving patient safety with team coordination: Challenges and strategies of implementation. *J Obs Gynec Neon Nurs*. 35: 557-566

JCAHO. (2006) National Patient Safety Goals, Number 2. www.jointcommission.org Accessed 23rd January, 2008.

Knapp C. (2006) Bronson Methodist Hospital: journey to excellence in quality and safety. *Jt Comm J Qual Patient Saf*. 32(10) 556-563

Leonard M, Graham S, Bonacum D. (2004) The human factor: the critical importance of effective team work and communication in providing safe care. *Qual Saf Health Care* (Suppl 1, Oct) i85-i90

Manias E, Street A. (2001) Nurse-doctor interactions during critical care ward rounds. *J Clinic Nurs*. 10:442-450

Moroney N, Knowles C. (2006) Innovation and teamwork: introducing multidisciplinary team ward rounds. *J Nurs Manag*. 13(1):28-31

Patterson ES, Roth EM, Woods DD, Chow R, Gomes JO. (2003). Handoff strategies in settings with high consequences for failure: Lessons for health care operations. *Int J Qual Health Care*. 16(2):125-132.

Pronovost P, Berenholtz S, Dorman T, Lipsett PA, Simmonds T, Haraden C. (2003) Improving communication in the ICU using daily rounds. *J Crit Care*. 18(2):71-75

Sexton A., Chan C, Elliott M, Stuart J, Jayasuriya R, Crookes P. (2004). Nursing handovers: do we *really* need them? *J Nurs Manag*. 12:37-42