Interruptive communication patterns in the intensive care unit ward round

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KEYWORDS
Interruptive communication; Intensive care unit; Communication observation method

Summary
Objective: An exploratory study to examine interruptive communication patterns of healthcare staff within an intensive care unit (ICU) during ward rounds.
Methods: The study was conducted in a tertiary hospital in Sydney, Australia. Nine participants were observed individually, for a total of 24 h, using the communication observation method (COM). The amount of time spent in conversation, the number of conversation initiating and number of turn-taking interruptions were recorded.
Results: Participants averaged 75% [95% confidence interval 72.8—77.2] of their time in conversation events during ward rounds. There were 345 conversation initiating interruptions (C.I.I.) and 492 turn-taking interruptions (T.T.I.). C.I.I. accounted for 37% [95% CI 33.9—40.1] of total communication event time (5h: 53min). T.T.I. accounted for 5.3% of total communication event time (56min).
Conclusion: This is the first study to specifically examine turn-taking interruptions in a clinical setting. Staff in this intensive care unit spent the majority of their time in communication. Turn taking interruptions within conversations occurred at about the same frequency as conversation initiating interruptions, which have been the subject of earlier studies. These results suggest that the overall burden of interruptions in some settings may be significantly higher than previously suspected.

1. Introduction

Several studies have highlighted that poor communication between healthcare workers contributes significantly as a latent source of medical error [1–3]. Furthermore, evidence exists that patients have better outcomes when nurses and doctors communicate effectively [4–6]. Past research has illustrated that interruptive communication seems to dominate in high stress medical environments. Chisholm et al. studied emergency department physicians and showed that per 180-min observation, there were a mean of 30.9 ± 9.7 interruptions [7]. An Australian study showed that doctors and nurses spent 80% of their time communicating and that 30% was considered interruptive [8].

The intensive care unit (ICU) is an area of the hospital where the sickest patients reside. Poor communication is perceived as a significant root cause of error in ICU [9,10]. However, little
observational data regarding communication in the ICU exists. This study explores the patterns of communication between healthcare workers during intensive care ward rounds and focuses on interruptions, which may disrupt working memory and as a consequence cause clinical errors [30].

2. Method

The study was conducted at the intensive care unit of a large metropolitan teaching hospital located in Sydney, NSW, Australia. The hospital is a trauma center with over 500 hospital beds and 12 intensive care beds (ICU). All observations occurred during the daily morning or evening ward rounds. This is typically the busiest times of the day when all patients are examined and many management decisions are made. The observations occurred between June 2002 and February 2003. Prior to recruitment of clinical staff, formal presentations were made to ICU staff to explain the rationale for the study, answer questions and discuss any potential concerns regarding the methodology. Reminder posters on notice boards asking for volunteers to contact the researcher followed these presentations. Ethics committee approval was obtained for the study.

Nine participants (three senior registrars, three junior registrar, three nurses) were observed for a total of 24h. All nurses were female and all the registrars were male.

Subjects were studied using a modified version of the communication observation method (COM) [11]. During the observation, the researcher "shadowed" each subject by following them as they carried out their daily rounds. The researcher followed at a distance to avoid direct interference with normal work, but remained sufficiently close to observe what was occurring. Participants wore a lapel microphone and carried a radio transmitter, through which conversations with patients and other staff members were transmitted to a recording device carried by the researcher. Because the subject's microphone would record conversations with other staff members and with patients, the subjects were asked to obtain verbal consent, informing them that their conversation would be recorded. Subjects or their conversational partners could request the suspension of the recording at any time, or retrospectively exclude recorded material. Conversations and field notes were transcribed verbatim to produce a text record of the audio data.

Individual communication events were then identified from the transcripts. A communication event consists of the passing of a message(s) between a sending agent and one or more receiving agents, for a purpose, and via a communication channel [11]. Communication events can thus be a face-to-face discussion, telephone conversations or entry of text into a medical record. Communication events may thus involve a series of utterances and can be thought of as individual conversations bounded by a common channel, actors and purpose.

Each communication event was then coded for the presence of interruptions. Two types of interruption were identified:

1. A conversation-initiating interruption (CII) is a communication event that is not initiated by the observed subject, and occurs using a synchronous communication channel such as face-to-face conversation or the telephone. In contrast, non-interruptive or asynchronous channels include email, voice-mail or a paper note [8].

2. A turn-taking interruption (TTI) occurs within an individual communication event, when one individual begins speaking before the other finishes. Two criteria need to be met for a turn-taking interruption (Box 1):
   - (a) The interrupter does not allow the other speaker to finish his/her utterance;
   - (b) The interrupter was able to finish or continue his/her utterance.

Turn-taking interruptions can thus be viewed as "intra" event or intra-conversational interruptions because they can only exist within the scope of an established conversation. In contrast, conversation-initiating interruptions begin new events or conversations, i.e. are "inter" conversational interruptions.

Box 1: Example of a turn-taking interruption.

In utterance 3, the nurse prevents the senior registrar completing his statement, and successfully makes a new utterance.

1. Nurse Can you come over here and look at Mrs. "Y", she dropped her blood pressure and I'm not sure why? (Calling across the unit)
2. Senior registrar OK, just give me a second while I finish here. (Pause, talking across the room) Have you given her any albumin because she ... 
3. Nurse ... already gave her 500ml but she hasn't responded!
4. Senior registrar Let me go look at her CT to make sure we haven't missed anything and start some Noradrenaline.
3. Results

Subjects were observed for a total of twenty-four hours, and communication events accounted for 17.5h of the total time observed.

3.1. Communications patterns

Participants spent an average of 75% [95% CI 72.6–77.0] of their ward round time in communication events. Time in communication varied significantly by role (Fig. 1). Nurses spent 62% [95% CI 58.1–66.5] of their time in communication, senior registrars 77% [95% CI 73.6–80.6] and junior registrars 85% [95% CI 81.4–88.8]. Eighty-eight percent (821 of 933) of all communication events involved the use of a synchronous channel. There were only two synchronous channels used by participants in this study, face-to-face and the telephone. Face-to-face was responsible for 97% [95% CI 95.8–98.2] of the synchronous communication events (Fig. 2).

3.2. Interruptions

There were 345 conversation-initiating interruptions (C.I.I.) and 492 turn-taking interruptions (T.T.I.). C.I.I. occurred at a rate of 14 CII per hour and accounted for 37% [95% CI 33.9–40.1] of total communication event time (=5h:53min, see Fig. 1). T.T.I. accounted for 5.3% of total communication event time (=56min). Doctors were responsible for 58% [95% CI 53.1–63.5] of all C.I.I., nurses accounted for the remaining 42% [95% CI 36.5–46.9].

T.T.I. and C.I.I. were not evenly distributed across clinical roles. Junior and senior registrars had roughly twice the number of T.T.I. compared to C.I.I. (see Table 1). The junior registrars had 155 [45%; 95% CI 40.2–50.8] T.T.I. versus 72 [21%; 95% CI 16.7–25.3] C.I.I. The senior registrars had 301 [45% 95% CI 41.3–48.9] T.T.I. compared to 128 [19%; 95% CI 16.0–22.0] C.I.I. This is sharp contrast to the nurses where C.I.I. were four times as many compared to T.T.I., 145 [35%; 95% CI 30.4–39.6] versus 36 [9%; 95% CI 5.9–11.1], respectively.

Figs. 3 and 4 show that the doctors in this ICU were responsible for the majority of turn-taking interruptions. Of all initiated T.T.I. by the observed doctors and nurses, 71% [n = 192, 95% CI 65.3–76.0] were by physicians. Similarly, doctors committed 72% [n = 160; 95% CI 66.5–78.3] of all received T.T.I. The senior registrar is expected to coordinate most of the patient care. It is therefore not surprising that the senior registrar’s T.T.I. represented 61% (n = 301; 95% CI 56.9–65.5] of all turn-taking interruptions.

4. Discussion

To our knowledge, no previous study has examined the communication patterns of the intensive care ward round, nor analysed for turn-taking interruptions. Our results support previous findings of high interruptive communication patterns in the clinical domain. Over a third of communication events
Table 1 Distribution of communication events and interruptions amongst study subjects

<table>
<thead>
<tr>
<th></th>
<th>Nurses</th>
<th>Junior registrar</th>
<th>Senior registrar</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Observation time</td>
<td>8:40:10</td>
<td>6:03:10</td>
<td>9:16:08</td>
<td>23:59:28</td>
</tr>
<tr>
<td>Communication event time</td>
<td>5:23:24</td>
<td>5:03:19</td>
<td>7:04:26</td>
<td>17:31:09</td>
</tr>
<tr>
<td>Percentage time in communication</td>
<td>62.3%</td>
<td>85.1%</td>
<td>77.1%</td>
<td></td>
</tr>
<tr>
<td>N communication events</td>
<td>381</td>
<td>186</td>
<td>366</td>
<td>933</td>
</tr>
<tr>
<td>N conversation-initiated interruptions</td>
<td>145 (381)</td>
<td>72 (186)</td>
<td>128 (366)</td>
<td>345 (933)</td>
</tr>
<tr>
<td>N turn-taking interruptions</td>
<td>36</td>
<td>155</td>
<td>301</td>
<td>492</td>
</tr>
</tbody>
</table>

Fig. 3 Turn-taking interruptions initiated by observed clinician towards a second party.

in this study were classified as communication-initiating interruptions, similar to the 30.6% interruption rate reported in a previous study of two Australian emergency departments [8]. A separate study of US emergency physicians [7] reported an average of 14 interruptions per hour, identical to the rate of 14 CII per hour found in the current study.

However, we identify a significant and previously unanticipated additional source of interruptions through turn-taking disruption of conversational flow. Our data shows that T.T.I. occurred more frequently than C.I.I. Conversation-initiating interruptions have been of interest because of their potential to disrupt working memory and generate error [30] and T.T.I. may have a similar effect on cognitive processes.

Turn taking is a basic construct of communication and is a ubiquitous part of our lives. Through no formal training, we learn the "rules of engagement" as we encounter a conversation. As such, turn-taking can be compared to an economy

Fig. 4 Turn-taking Interruptions received by observed clinician from a second party. (*) Includes bedside nurses, charge nurse and nurse unit manager. (**) Includes consultants, junior/senior registrars and residents. (***) Includes patient’s family, students, social worker, physiotherapy, ward-clerk, pharmacist, porter and X-ray service.
Interruptive communication in intensive care unit

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Many authors are concerned that a high burden of interruptions may be an important ergonomic factor contributing to inefficiency and stress [27—29]. This study and others cited [7,8] all involved acute settings, i.e., intensive care and emergency settings. The extent to which these results might be replicated in less acute settings is unknown. There is evidence that out of hospital clinicians may experience less interruption [26]. It is also entirely possible that if non-clinical domains were studied, a similar pattern of communication would be observed.

Because doctors and nurses have their patients' best interests at heart, they want management issues dealt with quickly. Therefore, it is perhaps not surprising that clinicians favor this face-to-face communication and often interrupt each other. This has a way of letting people unburden their working (short-term) memory by mentally "checking off" tasks concerning their patients [34]. Workplace interruptions may be an important ergonomic factor contributing to inefficiency and stress [27—29].

Many authors are concerned that a high burden on short-term memory through interruption may threaten to disrupt items stored in working memory [8,30,31]. This apprehension is justified because working memory is limited in its capabilities [32] and is also limited in duration—evidenceshowsthe powerful negative effects of both interference and diversion of attention on working memory [33].

It is therefore conceivable that a workplace peppered with interruptions could cause the workforce to forget to do important tasks. In the intensive care unit where patients are critically ill, small mistakes may have dire consequences.

5. Conclusion

These results suggest that intensive care personnel spend the majority of their time in the ward round communicating and that interruptions are prevalent. Turn-taking interruptions are well documented in other arenas, but this study highlights that they are a significant and previously unanticipated additional source of disruption to clinical activity. Clearly some types of interruption are necessary, and further research is required to understand the specific consequences of different interruption forms on clinical activity and error generation. The development of interventions to improve communication patterns hinges on developing such an understanding, and the armamentarium ranges from education to raise clinician awareness of the consequences of their communication choices, through to the development of new mechanisms and technologies that minimise the need to generate interruptions in the first instance.

References


