Team situational awareness, competing priorities, and organisational hierarchy influence the patient discharge process in intensive care

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Abstract

Background: Patient flow from intensive care to acute care units is often problematic and many discharges from intensive care to acute care are unsuccessful on the first attempt. Objectives: The aim of this study was to explore the factors that influence intensive care patient discharge.

Design, setting, and participants: This ethnographic study was undertaken in an Australian metropolitan tertiary hospital that had a 14-bed level 3 intensive care unit. Intensive care and acute care unit medical and nursing staff, and other hospital staff who were involved in the intensive care patient discharge process participated in this study. A total of 28 discharges were observed, and 56 one on one interviews were conducted.

Methods: Data collection techniques including direct observations, semi-structured interviews, and collection of existing documents were used. Activity theory was the theoretical framework that underpinned this study.

Findings: Three patient activity systems were identified: intensive care patient discharge activity, acute care unit accepting patient activity, and hospital bed management activity. Analysis of the interactions among these activity systems revealed conflicting objects (goals), communication breakdowns, and teamwork issues.

Conclusion: Discharge delay was found to be a significant problem, which was associated with limited acute care unit bed availability. Strategies to improve acute care unit bed availability are needed. Routine after-hours ICU discharge could raise patient safety concerns which need to be considered. All team members’ input in discharge decision making should be encouraged. Problems identified in clinical handover call for actions to change the handover practice. Activity theory successfully guided the study by providing a practical and descriptive framework for the study, facilitating the understanding of the interrelationships among the activity systems.
What is already known about the topic

- After-hours intensive care unit (ICU) discharge has been associated with increased mortality.
- ICU resources are limited and demand constantly outstrips supply.
- Admissions, discharges and transfers (ADTs) are high workload tasks. Patients exposed to nursing shifts with high ADTs and high nursing workload are associated with increased risk of mortality and morbidity.

What this paper adds

- The process of safely discharging patients from ICU to acute care units is a complex activity requiring integrated teamwork not just between the disciplines in ICU but also between the ICU and acute care unit staff.
- The handover and other communication tools used to facilitate ICU patient discharge can be misused if staff from different care areas, for example, ICU and acute care unit, have different goals.
- Sometimes ICU patients’ discharges are delayed and subsequently occur after-hours. These patients may be at increased risk of adverse events if not addressed.
- Activity theory is a suitable theoretical framework to understand and improve clinical practice in healthcare organisations.

1. Introduction

Recent large sample research has shown that hospital inpatients exposed to shifts with high numbers of admissions, discharges and transfers (ADTs) are at increased risk of mortality and morbidity (Needleman et al., 2011). The same study also confirmed that patients exposed to shifts with high nurse workload were also at risk of increased mortality and morbidity. ADTs are among the most labour intensive of nursing activities (Aiken et al., 2002; Unruh, 2003; Unruh and Fottler, 2006). However, very little research has been undertaken to understand ADTs and nursing work. In particular, little is known about the factors beyond patient characteristics that influence transfers of care from intensive to acute care units (Lin et al., 2009).

A patient’s stay in ICU is only part of their hospital journey. After ICU, most patients are discharged to acute care units before being discharged home. Such transfers involve the progressive de-escalation of care as patients recover from critical and acute illness episodes. Deescalation processes are complex. Transfer from the ICU, for example involves ICU and acute care unit medical staff and nurses, hospital bed managers, unit clerks, and other hospital staff. Patient safety may be compromised as a consequence of discontinuities in communication and the coordination of care. In addition, patients may be at further risk
during transitions from relatively well-resourced ICUs to acute care units where nurse staffing is typically lower (Drennan et al., 2008). Although the risks associated with ADTs are well understood, the factors and the potential risks associated with de-escalating care are not as well defined. The purpose of this study was to identify factors that may increase risk to patients during de-escalation transitions of care, and focuses on the activities staff undertook associated with patient discharge from ICU to acute care units.

2. Theoretical Framework

Activity theory was the theoretical framework that underpinned this study. Emerged in the 1920s and 1940s, activity theory was developed in the Russian cultural historical school of psychology (Engestrom, 1987; Engestrom et al., 2006; Vygotsky, 1978). In activity theory, it suggests that many local activity systems are interconnected in large organisations. The current activity theory model, which consists of two interacting activity triangles (Fig. 1), has been used in western countries in the past two decades to study cognitive work systems in a variety of settings, such as computer-supported learning (Barab et al., 2004; Zurita and Nussbaum, 2007), group work analysis in education (Choi and Kang, 2009), and analysing medical practice (Engestrom, 2000).

As shown in Fig. 1, each activity system consists of six interactive components in an activity system: subjects, object, tools, rules, community, and division of labour. The subject can be one person or a group of people who share the same object. Subjects can be involved in many activities, each with different objects, forming many different activity systems. The subjects’ activities are directed towards the object (goal). Thus the objects of various subjects involved in a process should overlap or be shared to some degree to achieve a common outcome. Tools are the artefacts that are used by the subjects to carry out the activity towards an object. They can be physical tools such as pen and paper and computer software; they can also be cognitive properties, such as language and ways of communicating. Rules refer to the explicit or implicit routines, policies, guidelines and rituals that determine and govern the activity within the community. Division of labour refers to how the tasks and work are divided among members of the community. Community includes all subjects who espouse similar values, beliefs and rituals in an activity. Rules mediate subjects and the community and influence how the community functions as a whole, while division of labour determines how the community functions towards the shared object (Engestrom, 2000). Using Engestrom’s triangle we formulated the following research questions as a starting point for studying ICU discharge processes (see Fig. 2).
Figure 1 Third generation of Activity Theory – the interacting activity systems Adapted from Engestrom (2000)

What tools were used by the subjects? How did the tools influence the discharge process? Were there problems identified while the tools were being used?

Figure 2 The use of activity theory to guide the data collection

What were the routines, discharge guidelines, policies and criteria, and other formal or informal rules that influenced the discharge process?

What professional groups were involved in the discharge process?

Who were the other staff members that the subjects worked with in the discharge activity?

What were the roles and responsibilities of each professional group? Was there any gap or waste in the division of labour?
Table 1 Consented participants and interview status

<table>
<thead>
<tr>
<th>Staff position classification</th>
<th>Consented</th>
<th>Percentage of total consented</th>
<th>Interviewed</th>
</tr>
</thead>
<tbody>
<tr>
<td>ICU RN Level I</td>
<td>41</td>
<td>48.2</td>
<td>12</td>
</tr>
<tr>
<td>ICU RN Level II</td>
<td>10</td>
<td>11.8</td>
<td>5</td>
</tr>
<tr>
<td>ICU RN Level IV</td>
<td>1</td>
<td>1.2</td>
<td>1</td>
</tr>
<tr>
<td><strong>Total ICU RN</strong></td>
<td><strong>52</strong></td>
<td><strong>61.2</strong></td>
<td><strong>18</strong></td>
</tr>
<tr>
<td>Ward RN Level I</td>
<td>5</td>
<td>5.9</td>
<td>5</td>
</tr>
<tr>
<td>Ward RN Level II</td>
<td>3</td>
<td>3.5</td>
<td>3</td>
</tr>
<tr>
<td>Ward RN Level IV</td>
<td>5</td>
<td>5.9</td>
<td>5</td>
</tr>
<tr>
<td><strong>Total Ward RN</strong></td>
<td><strong>13</strong></td>
<td><strong>15.3</strong></td>
<td><strong>13</strong></td>
</tr>
<tr>
<td>ICU Intern</td>
<td>3</td>
<td>3.5</td>
<td>3</td>
</tr>
<tr>
<td>ICU Resident</td>
<td>2</td>
<td>2.4</td>
<td>2</td>
</tr>
<tr>
<td>ICU Registrar</td>
<td>8</td>
<td>9.4</td>
<td>4</td>
</tr>
<tr>
<td>ICU Consultant</td>
<td>3</td>
<td>3.5</td>
<td>2</td>
</tr>
<tr>
<td><strong>Total ICU Doctors</strong></td>
<td><strong>16</strong></td>
<td><strong>18.8</strong></td>
<td><strong>11</strong></td>
</tr>
<tr>
<td>Ward Intern</td>
<td>1</td>
<td>1.2</td>
<td>1</td>
</tr>
<tr>
<td>Ward Resident</td>
<td>1</td>
<td>1.2</td>
<td>1</td>
</tr>
<tr>
<td><strong>Total Ward Doctors</strong></td>
<td><strong>2</strong></td>
<td><strong>2.4</strong></td>
<td><strong>2</strong></td>
</tr>
<tr>
<td>Others</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>ICU Ward Clerk</td>
<td>1</td>
<td>1.2</td>
<td>1</td>
</tr>
<tr>
<td>Bed Manager</td>
<td>1</td>
<td>1.2</td>
<td>1</td>
</tr>
<tr>
<td><strong>Total Others</strong></td>
<td><strong>2</strong></td>
<td><strong>2.4</strong></td>
<td><strong>2</strong></td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>85</strong></td>
<td><strong>100.0</strong></td>
<td><strong>46 (54%)</strong></td>
</tr>
</tbody>
</table>

3. The study

3.1 Aim

The aim of this study was to explore the factors influencing the ICU patient discharge process. This study was the first phase of a three-phase quality improvement study. The second phase of the larger study was to design and implement a new discharge process based on the findings of the first phase. The last phase of the project was to evaluate the outcome of the study by using discharge delays and mortality as main outcome measures (published but author masked to allow blinded review of this paper). This paper provides a description of the first phase.

3.2 Method

In this ethnographic study, we used participant observation, semi-structured interviews, and examining documents as data collection techniques which are considered common data collection methods for ethnographic study (Hammersley and Atkinson, 2007). For the purpose of describing the data collection process, we identify the data collection researcher as FL in this paper.

3.2.1. Research setting
This research was carried out in a 580-bed Australian tertiary teaching hospital. It is a major metropolitan/regional tertiary referral centre for medical and surgery specialties including thoracic surgery, neurosurgery, general surgery, and surgical and medical oncology. The hospital has a 14-bed, level 3 ICU. A level 3 ICU category is a comprehensive intensive care that provides highest level of critical care support services (JFICM, 2003). The ICU admits approximately 1500 patients per year with an average patient length of stay (LOS) of 3.2 days. This hospital has an ICU Liaison nurse, who works from 7:00 am to 3:30 pm during weekdays, to follow up and provide support to the patients on the acute care units after ICU discharge.

3.2.2. Participants

Staff members working in ICU and on the acute care units involved in the ICU discharge process were informed of the study and invited to participate. The term ward was used by participants in the interviews, which means acute care units. Position classification of consultants refers to the medical specialists/physicians. Medical staff classification included consultants, Registrars, Residents and Interns. Nursing classification included level 1 nurses (bedside nurses), level 2 nurses (often in charge of the shift), and level 4 nurses (educators, unit managers/head nurse). Some of the nursing participants were easily identifiable because there were only a small number of participants with these position classifications within this hospital. To maintain the anonymity of the participants, in this paper, the nurses were grouped into two broad categories: Nursing Clinical Leaders that included nurse educators, the ICU liaison nurse and the nurse unit managers (head nurses); and bedside nurses who worked at the bedside. To maintain the acute care units’ anonymity, each acute care unit was given an alphabetical label.

Some ICU participants were recruited before data collection. Other participants were recruited on the day of data collection, including ICU participants who were involved in discharge cases but not yet consented, and all acute care unit participants who were involved in receiving the ICU patients. As shown in Table 1, 85 participants, including 52 ICU nurses, 16 ICU medical staff, 13 acute area nurses two acute care medical staff, and 2 ICU support and hospital management staff gave written consent to participate in this research. This study was approved by Griffith University and the hospital’s ethics committees. If any staff member did not return the consent form on the first invitation, a reminder was sent a few days later. However, if a discharge case involved a staff member who did not wish to participate after the reminder, the discharge process was not observed. Only one ICU staff member declined to participate. The patients involved were asked to give verbal consent to their discharge process being observed. All patients agreed to allow FL to observe the discharge processes.

Multiple staff members and multiple activities were involved in each patient’s discharge process. A discharge process was considered complete if the case was observed from the morning when preliminary discharge decisions were made to when the patient was discharged to the acute care unit, or the patient was eventually discharged home because there were no acute care beds.

3.2.3. Data collection
Demographic data about participants including age, gender, position classification, employment status, and years of experience was collected using a questionnaire. The ICU and acute care unit activities and processes related to ICU patient discharge were observed. Unplanned discharges, such as after-hours discharges occurred as a result of demand for beds were not observed. Observation focused on the activities that occurred during the discharge process such as interactions and communication among team members, decision making processes, and documentation. Weekdays from Monday to Friday were chosen as the main observation days, although some data were collected on weekends/holidays for comparative purposes. Observations were conducted over two to three days a week. On each data collection day, FL started the discharge observations at 6:30 am before the nursing and medical morning handover when preliminary discharge decisions were made, and concluded when last patient was discharged to acute care units, or when FL was informed that there would be no beds available for the patients who were to be discharged to the acute care units. In addition, acute care unit activities and the hospital bed management process were observed to gather information about how acute care beds were allocated and how staff on the acute care units planned to accept ICU patients.

One on one semi-structured interviews were conducted with all consenting ICU participants who were involved in the observed discharge cases. The interviews with bedside ICU nurses often occurred after a patient was discharged to the acute care units, and interviews with ICU medical staff and Nurses Clinical Leaders usually happened at a time that was suitable for them. Interviews with all acute care unit staff who were involved in receiving the patients discharged from ICU were often conducted after the patients arrived on the acute care units. All interviews lasted about 10–15 min which were audio-recorded. A total of 56 one-on-one interviews were conducted with 18 ICU nurses, 11 ICU medical staff, 13 nurses 2 medical staff from acute care units, and 2 other hospital staff. Some of these participants were interviewed more than once because they were involved in multiple discharge cases. Field notes were taken during observations, and daily contact summaries (Miles and Huberman, 1994) were used to summarise the main points of the field work every day and to capture FL’s momentary reflections and observations. Once observations for a discharge case were completed, a discharge case summary was made. When a discharge tool or form was identified, blank and de-identified used forms were collected. If preliminary analysis revealed any issues with the tools, this was further explored in later observations and interviews. Although the longer the time the researcher spends in the field, the richer and more complete the data might be, in organisational research, often with financial and time constraints, field work ceases when there is a belief that the collected data accurately describe the patterns of the setting and show significant characteristics about the study field (Fetterman, 1998). The total number of observations was ultimately dictated by the richness of the data collected in the field. Data collection concluded when ongoing data analysis during data collection indicated that collected data provided a thick description of the discharge process, and no new information was emerging.

3.2.4. Data analysis
Data analysis occurred concurrently with data collection. Other research team members and FL met regularly during and after data collection to analyse collected data. All original transcribed data including interviews, contact summaries, case summaries, and field notes were copied into qualitative data management software (NVIVO 8) to assist with coding management. The data analysis process consisted of three steps: initial reading and coding, systematic revision of coding, and synthesising for patterns. The six components of activity theory including subjects, objects, community, tools, rules, and division of labour were used as main codes. However, additional main codes were added for the data that did not seem to fit into any of activity theory components. In the initial reading and coding step, sub-codes were added under each component according to the preliminary data analysis. For example, under the code subject, there were sub-codes of ICU medical staff, ICU nurses and so on. Further codes were discovered and added to the initial framework as more data were analysed. This analysis was iterative. That is, when new codes were identified, previously analysed data was reassessed. Coding revision, as a progressive data analysis process, is an important process to ensure the coding system is appropriate (Bogdan and Biklen, 1992; Miles and Huberman, 1994). Through this revision process, it was identified that some of the “additional main codes” were merged into the six main codes under activity theory, while some did not fit into the activity theory framework. For example, the code “discharge lounge” contents did not seem to fit into any of the main codes under activity theory. These codes were further analysed in a further step of data analysis, which is described in another paper (currently under review, author masked to allow blinded review of this paper).

Systematic revision of coding was carried out once all data was coded. This step informed the final step of data analysis, synthesising for patterns.

3.2.5. Rigour

Intensive observation and data triangulation were important techniques used to increase the credibility of this ethnographic research (Lincoln and Guba, 1985; Sandelowski, 1986). The field work of this study ensured there was a thick description of the discharge process. Data triangulation techniques such as verifying findings from different sources including observations, interviews, and examination of existing documents were used. Although the discharge processes in this research setting might not represent all discharge processes in other ICUs, the findings of this research might be relevant to the ICU discharge processes in other hospitals that have similar characteristics in terms of the hospital size, level of ICU, patient characteristics, and resource availability. The research findings have been presented to different international audiences which received positive feedback. This verified the fittingness. Methods to ensure auditability include a clear documentation of data collection, methods and decisions in the study process. The contact summaries and case summaries reflected FL’s understandings of events and also documented the rationale for further exploration of significant events.

Regular group meetings among all researchers were held to review the coding results and discuss the data analysis progress. The discussions and decisions made during these meetings were documented. The process of data analysis was clearly documented including stages such as coding, sorting and synthesising for patterns. Once credibility, fittingness, and auditability
are established, confirmability is achieved (Guba and Lincoln, 1994; Lincoln and Guba, 1985; Sandelowski, 1986). To prevent the Hawthorne effect (Lewis-Beck et al., 2004), FL held a number of meetings with the participants to emphasise that the aim of the data collection was to observe their usual work patterns. FL also spent a few days in the hospital prior formal observations commenced, so that the participants were used to having FL around.

Fig. 3. The ICU patient discharge process map.

4. Findings

A total of 28 discharges were observed within a five month period. In relation to discharge destination, 16 patients (57%) were discharged to surgical acute care units (five to general
surgical units, two to a urology surgical unit, and nine to the neurosurgical unit) while seven patients (25%) were discharged to medical units (one to infectious disease medicine, five to renal medicine, and one to respiratory medicine); four patients (14%) were discharged home directly from ICU; and one patient (4%), who was to be discharged to an acute care unit for palliative care, died in ICU while waiting for an acute care bed. In relation to the timing of the discharge after the discharge decisions were made, only 57% (n = 16) patients were discharged to the acute care units on the same day; 11% were discharged the next day (n = 2 acute care unit, n = 1 home); while 32% waited for 2–3 days (n = 4 acute care unit, n = 3 home, n = 1 died in ICU).

Observations showed that the typical discharge process started when patients were admitted into ICU and finished when patients were discharged from ICU, and then arrived on the acute care units. A process map was developed from this data (Fig. 3). It should be noted that, first, this figure does not include those unplanned discharge process such as after-hours discharges that occurred under bed demand pressures when patients were discharged to acute care units quickly. Second, there were occasions when the discharge process did not follow this exact process. For example, on one occasion, the ICU nurses contacted the ward nurses to book a bed, instead of going through the hospital bed manager as illustrated in step 5 of Fig. 3.

Three main interacting activity systems in the ICU patient discharge process were identified: the ICU patient discharge activity (such as discharge decision making, preparing patients for discharge, and collaborating with acute care staff); the acute care unit accepting the ICU patient activity (such as preparation of acute care bed, bed allocation, and staffing); and hospital bed management activity (such as bed allocation, collaboration between ICU and acute care units). Within each activity, the subjects, objects, tools, rules, community, and division of labour of each of the activity system were identified. Table 2 shows the six components of each activity system.

### 4.1. Subjects

As shown in Table 2, there were many participants in the discharge process. ICU consultants were the main decision makers who often initiated the discharge decisions, while ICU Registrars, ICU Nursing Clinical Leaders and bedside nurses, acute care unit treating consultants, and acute care unit Nursing Clinical Leaders contributed in the discharge decision making. As these participants stated,

> We don’t really make any decisions on discharge . . . only tell the doctors how the patient was doing. (Participant #38, ICU Bedside Nurse)

> I can give my recommendation about whether I think the patient is safe for discharge or not according to my assessment, but ultimately the decision is made by the [ICU] Consultant. (Participant #83, ICU Registrar)

Some participants were not involved in the discharge decision making process but undertook tasks in the discharge process. Although patients were not observed in this study, it was noted that the patients’ input was not routinely sought in the discharge decision making process. Patients were often informed of the discharge decisions by the ICU nurses or the acute care unit treating doctors.
Table 2 Summary of activity theory components within multiple activity systems

<table>
<thead>
<tr>
<th>Activity theory components</th>
<th>Activity theory systems</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>ICU discharge activity</td>
</tr>
<tr>
<td>Subject</td>
<td>Discharge decision makers</td>
</tr>
<tr>
<td></td>
<td>ICU Consultants</td>
</tr>
<tr>
<td></td>
<td>ICU Registrars</td>
</tr>
<tr>
<td></td>
<td>ICU Nursing Clinical Leaders</td>
</tr>
<tr>
<td></td>
<td>ICU Bedside Nurses</td>
</tr>
<tr>
<td></td>
<td>ICU Interns</td>
</tr>
<tr>
<td></td>
<td>ICU Ward Clerks</td>
</tr>
<tr>
<td>Object</td>
<td>To discharge patient to wards as soon as possible</td>
</tr>
<tr>
<td>Tools</td>
<td>ICU morning medical handover</td>
</tr>
<tr>
<td></td>
<td>Medical progress notes</td>
</tr>
<tr>
<td></td>
<td>ICU medical discharge summary</td>
</tr>
<tr>
<td></td>
<td>ICU to ward nursing handover</td>
</tr>
<tr>
<td></td>
<td>ICU nursing discharge summary</td>
</tr>
<tr>
<td>Rules</td>
<td>ICU discharge guidelines, and ICU discharge criteria</td>
</tr>
<tr>
<td>Division of labor</td>
<td>ICU subjects’ roles and responsibilities in patient discharge</td>
</tr>
<tr>
<td>Community (staff from other departments)</td>
<td>Ward doctors, nurses and ward clerks</td>
</tr>
<tr>
<td></td>
<td>Bed cleaners</td>
</tr>
<tr>
<td></td>
<td>Wardsmen [sic]</td>
</tr>
<tr>
<td></td>
<td>Hospital Bed Managers</td>
</tr>
</tbody>
</table>

*HBCIS: Hospital Based Clinical Information System
4.2. **Objects (goals)**

Data showed that ICU team members often aimed to discharge patients to the acute care unit as soon as possible. They usually gave consideration to acute care nurses’ preferences and negotiated with them on the timing of the discharge, and used acute care beds whenever they became available, as this nurse stated,

> I was told [that] there was a bed on ward C, so I rang immediately to find out what sort of timeframe they would be ready so that I could get my paperwork in order and get the patient prepared to go to ward. I made two more phone calls to find out exactly what the problem was because time was passing. (Participant # 11, ICU Bedside Nurse)

Accepting ICU patients was only one of the acute care nurses’ goals and ICU patient discharge was often not considered a priority because of their competing priorities for bed demands, staffing, other patients care needs, and physical resource availability, as this interview revealed,

> The other consideration is that we have six-bed bays. I need to consider the needs of five other patients and the workload of the nurses. If I put a patient with heavy dependencies from intensive care into a six-bed bay, because they are still requiring some care, one nurse can’t be everywhere. It is not uncommon for one nurse to have six patients in the same bed bay. (Participant #31, Ward Nursing Clinical Leader)

4.3. **Tools**

A number of tools related to the ICU patient discharge which were used by participants in ICU, on the acute care units, and by the hospital management team, were identified. Among these tools, the clinical handovers (as cognitive tools as shown in Table 3) appeared to be most problematic. There were variations in the length of morning medical handover, which was often influenced by the ICU consultants’ preferences. The purpose of the ICU to acute care nursing phone handover, which occurred right after the discharge decision was made and long before the actual patient transfer, was often understood differently by ICU and acute care staff. The acute care unit staff needed some basic information in order to allocate the patients beds and staff at this stage, whilst ICU staff considered this as the time to give the most comprehensive handover during discharge. The face-to-face handover between ICU and acute care unit bedside nurses often did not happen when the patients arrived on the acute care units due to the unavailability of acute care unit staff. Acute care nurses claimed that they often received limited or no information about the patients. A form used by acute care staff in some units to document ICU nursing phone handover from ICU was found to be helpful in improving patient information transfer between departments.
<table>
<thead>
<tr>
<th>Type of handover</th>
<th>Purpose and description</th>
<th>Findings</th>
<th>Verbatim / Field notes</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>ICU morning medical handover</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>From Night duty ICU Registrar</td>
<td>Purpose: To report an overview and update of the patients’ conditions.</td>
<td>1. The morning medical handover usually took longer on Thursday mornings because it was the first day of the consultant on duty for the week-long rotation.</td>
<td>1. The morning medical handover…the consultants, some like it short and brief, some like it to be more in detail. As Registrars we must consider who we are reporting to. (Participant # 83, ICU Registrar)</td>
</tr>
<tr>
<td>To Day shift ICU doctors, Nursing Clinical Leaders, other allied health professionals</td>
<td>Description: It took place at 8:00 am in the x-ray viewing room.</td>
<td>2. Length of the handovers varied greatly when different ICU Consultants were on duty.</td>
<td>2. I had no idea about this patient…didn’t get much info from the morning handover. (Participant # 49, ICU Intern)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>ICU to ward nursing phone handover</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>From ICU Bedside Nurses</td>
<td>Purpose: To transfer patient information from ICU nurses to ward nurses.</td>
<td>1. This was the most comprehensive ICU to ward nursing handover in the discharge process.</td>
<td>1. Nursing Clinical Leaders normally take the phone handovers from ICU…because we have to decide where to put that patient, if we have got to move beds around… and who is going to be looking after the patient. (Participant # 53, ward Nursing Clinical Leader, on case 7)</td>
</tr>
<tr>
<td>To Ward Nursing Clinical Leaders</td>
<td>Description: Once the hospital Bed Manager informed the ICU of ward bed availability, the ICU Bedside Nurses usually immediately contacted the ward’s nursing staff and gave phone handover.</td>
<td>2. The handover giver and receiver understood the purpose of the phone handover differently. ICU nurses perceived this handover was for the ward staff to plan the patients’ care on the wards; ward nurses thought this provides basic information for them to allocate beds and staffing.</td>
<td>2. Today the handover was really good…it doesn’t always happen that way…we often had to prompt and ask questions. (Participant # 81, ward Nursing Clinical Leader, on case 28)</td>
</tr>
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<td>3. Some ward staff complained that ICU nurses did not provide enough information.</td>
<td>3. I’ve had complaints from the ward staff when I’ve gone up there “we’ve just received this patient the [ICU] staff member that brought her up told us absolutely nothing.” …(Participant # 4, ICU Nursing Clinical Leader)</td>
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<td>4. A large amount of information was lost during transition in most of the cases because of the different understanding of the purpose of the handovers. The loss of information contributed conflicts between ICU and ward nurses.</td>
<td>4. I would tell them to ring the nurse who took handover from me from previous shift to get handover [if that person had already gone home]. I sometimes refuse to do it again, especially if I was having a bad day. (Participant # 70, ICU Bedside Nurse)</td>
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4.4 Rules

Written ICU discharge guidelines were available but few ICU participants were aware of their existence.

Discharge guidelines and protocols . . . I don’t think we have it, not as like on a documented piece of paper. I know it’s really up to the doctors. (Participant # 44, ICU Nursing Clinical Leader)

In addition, there were variations in discharge decision making among the ICU consultants,

. . . Yes, there are variances among the consultants. Say a particular patient, some [ICU Consultants] might discharge the patient while others might like to hang on to the patient for one more day just to make sure the patient is going to be okay.

(Participant # 83, ICU Senior Registrar)

ICU medical staff often reviewed the patients on the acute care units if they were discharged to the acute care units after-hours (and often sooner than usual) due to ICU bed demand. However, patients who waited for acute care beds and consequently were discharged to acute care unit after-hours were often not reviewed by any medical staff until the next morning. This late night discharges occurred on a few occasions during observation, as this interview shows,

There’s no time limit [on how late a patient can be discharged to the wards]. If a bed became available in the middle of the night, and the patient was booked for discharge then we should utilise that bed definitely. (Participant # 44, ICU Nursing Clinical Leader)

4.5 Division of labour

The majority of the participants seemed clear about their roles and responsibilities in the discharge process. In most of the observed discharge cases, ICU patients were ready to be discharged hours before the acute care beds were ready. Observations showed that one reason for this wait was waiting for acute care unit patients to be discharged home to vacate the acute care unit beds. However, acute care unit medical staff members’ competing priorities, such as having to attend surgeries and outpatient clinics, appeared to prevent them from completing acute care unit discharge process, such as following up reviews and writing discharge prescriptions, promptly. This consequently contributed to acute care unit discharge delays, and reduced acute care unit bed availability.

4.6 Community

Problems with some rules, including discharge routines, and issues within division of labour seemed to influence teamwork the discharge process. First, routine communication patterns appeared to impede the discharge process. There was limited communication among staff from different departments on how each department and each team made decisions and prioritised. Staff in different positions and departments had different knowledge about the discharge process. Not knowing the rationale for decisions made by other staff did seem to contribute to the distrust among some staff.
In contrast to the above, there was practice of supporting other community members which contributed to a smoother discharge, as the following interviews revealed,

The Liaison Nurse role initially is to help with the transition of patients and their relatives going from ICU to the ward . . . also helping ward nurses up-skill a bit if the patients have anything special such as a drain the ward nurses hadn’t seen for a while. (Participant #4, ICU Nursing Clinical Leader)

Furthermore, there was a culture of supporting inexperienced team members, which helped to ensure the efficiency of discharge process, as this interview showed,

The ward secretary advised me to update the discharge summaries regularly and to get on top of them so when a patient is ready to go it all will kind of be ready.

(Participant #82, ICU Intern)

On some acute care units, nursing and medical teams worked collaboratively to forward plan their patients’ care. For example, on acute care unit C, which consisted of two sub-specialties, consultants and Nursing Clinical Leaders from both specialties held regular meetings to discuss bed demands and patient management plans. Because the consultants reviewed their patients regularly when their patients were in ICU, they could predict when the patients might return to their acute care units and this prediction was communicated back to the nursing team at these meetings, as stated by the following acute care unit nurse,

We have a meeting here in the ward Monday and Fridays with the specialists. We talk about our inpatients and if we’re aware of someone in the ICU, when those patients might come back. So we do talk among ourselves as a network trouble-shooting strategy to discuss any particular clients so obviously smooth things out a bit.

( Participant #43, ward Nursing Clinical Leader)

This in turn, gave the nursing staff the opportunity to plan bed availability and staffing for the patients that were returning to this acute care unit which appeared to facilitate a smooth transition for their patients’ return from ICU. Observation showed that there were fewer issues when ICU patients returned to this acute care unit.

5. Discussion

The findings of this study add further evidence to current literature on discharge delays. This study found that a significant number of discharges (33%) were unsuccessful at the first attempt due to the lack of acute care beds, with 11% waited for one day, and 32% waited for two or more days. This supports the findings from other studies, such as, because of a lack of available acute care unit beds, 16% of planned ICU discharges in an Israel hospital were unsuccessful at the first attempt (Levin et al., 2003), and 81% of discharges were delayed in an Australian hospital ICU (Williams and Leslie, 2004). We found that competing priorities was a factor that contributed to the acute care bed shortage which was a consequence of acute care unit discharge delays. Ideally, the objects of staff members involved in this process should overlap or be shared to some degree to achieve the best collective outcome. However, the competing priorities of staff members working in different roles made it difficult for them
to align their objects, which might have consequently contributed to suboptimal patient flows and patient discharge delays within the hospital.

Further, tools and artefacts should be designed to facilitate the discharge process. A key concept in activity theory is the artefacts’ mediating function (Engestrom, 1987). In this study, clinical handovers were cognitive tools which did not support the discharge process effectively. This raises patient safety concerns if acute care nurses could not recall vital patient information in emergency situations during the transitional period. In addition, in this study, there was a lack of standard protocol and structure in both medical and nursing clinical handovers; bedside acute care unit nurses received limited information; and face to face handover was underutilised in ICU to acute care unit nursing handovers. These findings supports previous studies that found that lack of standard handover structure and not giving enough information were common problems in ICU to acute care unit handovers (Håggström et al., 2009; McFetridge et al., 2007). Many researchers suggested that face to face handovers have many advantages over other non-face to face methods including using visual cues to facilitate a good understanding of information being transferred (Baron and Byrne, 2004; McFetridge et al., 2007; New South Wales Health, 2009). Poor handovers have been found to contribute to 34% of medical errors (Singh et al., 2007). There has been growing recognition on standardising handover process by using communication principles such as situation, background, assessment, recommendation (SBAR) handover strategy (Haig et al., 2006). Thus adopting evidence based strategies including standardising handover process to improve clinical handover is crucial.

The ICU nurses coordinated the discharge process, especially during the period from when ICU patients were ready for discharge to patient arrival on the acute care unit, by initiating and maintaining communication with acute care unit nurses, and pushing the discharge process forward. The ‘‘push and pull strategy’’, a concept that originated from supply chain businesses, emphasises the importance of both the push (manufacturers providing products or information to the consumers) and pull (consumers demand product or information) power to mobilise and utilise resources efficiently (Brown and Hagel, 2005). However, ICU nurses’ pushing effort was often not met with the pulling power from the acute care nurses. The information on ICU and hospital discharge delays was not transparent or readily available to the acute care unit nurses; therefore the acute care unit nurses could not see the incentive and need to pull the discharge process.

In this research, it was evident that better coordination on some acute care units improved resource efficiency and appeared to shorten ICU discharge delays. This supports the earlier findings that coordinated teamwork and open communication among team members were the major factors contributing to better patient care (Shortell et al., 1994). Similarly, it has been found that daily patient flow meetings attended by all unit managers has been found to support better coordinated care, which might have shortened ICU LOS and reduced costs (Jain et al., 2006).

This study found that the discharge decisions were primarily made by the ICU consultants, and junior staff would ‘‘never challenge the consultant’s decisions’’. This supports the findings of many teamwork studies which found that junior staff members often reluctant to
speak up in front of staff in higher positions (Brand, 2006; Edmondson, 2003; Mills et al., 2008). Current literature suggests that hierarchical order could adversely impact on team performance if the person with higher position is given too much power or dominates decision making process (Manion et al., 1996). In addition, team members’ confidence, feedback and input during decision making increases team decision making accuracy (Bonaccio and Dalal, 2006). Other staff members need to be encouraged to speak up and voice their concerns when they have different opinions, and learn skills on how to influence discharge decision making to ensure vital information is communicated.

Further, in this study, the ICU patients had minimal input in discharge decision making. Patient centred care has been high on worldwide healthcare improvement agenda in recent years (Kovacs et al., 2006), and shared decision making model, where patients and/or their family members are active participants in the decision making process, has been recommended as a preferable approach in clinical decision making (Edwards and Elwyn, 2009; Vranceanu et al., 2009). Although limited literature available, it is reasonable to suggest that ICU discharge decision making is a much more complex process than discharge on the acute care units due to the high acuity of the ICU patients, therefore patient involvement in this discharge decision making needs to be explored.

The usefulness of the ICU discharge guidelines was unclear. The ICU discharge guidelines were one of the cognitive artefacts available for ICU staff to aid their discharge decision making as recommended by intensive care professional organisations (JFICM, 2003; SCCM, 1999). However, there is limited literature on discharge guideline use in the ICU discharge process and patient outcomes (Lin et al., 2009). This research showed that ICU discharge decision making was in line with the current discharge guidelines recommended by SCCM (1999). However, not all discharge decision makers refer to the discharge guidelines explicitly for discharge decision making. There has been a consensus that because of the complexity of ICU patients’ illnesses, discharge decisions should be clinically driven and made on a case-by-case basis according to the consultants’ clinical judgement, in combination with the use of guidelines (Judson and Fisher, 2006). Therefore discharge decisions might vary among different decision makers. Thus further research is needed to explore the usefulness of guidelines for ICU discharge decision making.

In addition, this research found that there was no discharge protocol related to the timing of discharge. Some patients had to wait for an acute care unit bed to become available, and were subsequently discharged to the acute care units after-hours. We call these delayed after-hours discharges, which should be differentiated from other afterhours discharges. Many researchers found that after-hours discharge was associated with increased mortality (Laupland et al., 2008; Priestap and Martin, 2006; Tobin and Santamaria, 2006). However, there is still a gap in clinical research related to after-hours ICU discharge. Most of the empirical studies failed to differentiate the delayed afterhours discharges from the discharges that occurred as a result of bed pressures after-hours, which may have been classified as premature discharges (Duke et al., 2004). Whether delayed after-hours discharge increases patient mortality is unknown. Some hospitals have protocols in place to ensure that transfers between units can only happen during 9:00 am and 8:00 pm because of safety concerns.
Furthermore, although there has been mounting evidence that after-hours discharge increases mortality, whether delayed after-hours discharge still exists in practice is unknown. The late discharges from ICU could potentially put the patients at risk because of the increased workload for the nurses working on after-hour shifts when staffing is low (Needleman et al., 2011). Therefore further research is needed to guide clinical discharge decision making to ensure patient safety after ICU discharge.

In this research setting, there was a culture of senior ICU staff supporting others in the ICU and on the acute care units. Williams and Leslie (2004) showed that acute care unit nurses’ skill mix was associated with discharge delays. ICU outreach services, in which staff visit patients on the acute care units after ICU discharge, has been found to improve patient outcomes (Ball et al., 2003; Priestley et al., 2004). Outreach services and ICU liaison nurse may empower acute care unit nurses by assisting them to develop the knowledge and decision making skills needed to provide care to patients with complex needs (Chaboyer et al., 2005). It has been suggested that the culture of supporting others, as an element of team structure, influences team communication and coordination, which is essential for effective teamwork and optimal teamwork performance (Flin et al., 2008). The culture of supporting others might be patient focused, or might be team focused. Regardless of the reasons, in this research, the culture of supporting others contributed to better coordinated teamwork and therefore might have contributed to better patient outcomes.

Activity theory provided a framework for data collection and data analysis. Using activity theory, the current state of the local discharge activity was uncovered. Viewing people as drivers of the activity, with the focus of researching the mediating factors such as tools, rules, and division of labour, offered the researcher the structure to observe and analyse the current state of the activity at the local level. By applying this theoretical framework, many activities within the complex work system were observed and analysed separately, but then the interactions among the activities became evident. The gaps, conflicts, and breakdowns in the interactive activity systems were identified. However, it is important that the researcher must keep an open mind when collecting and analysing data using a priori framework such as activity theory. Many data may not fit into the activity theory framework. It is crucial that careful planning for data collection and revision of data analysis are undertaken.

6. Conclusion, recommendations, and limitations

This study supports current evidence which suggested that many ICU discharges are unsuccessful at the first attempt due to limited number of available acute care beds. Strategies to improve acute care beds efficiency needs to be explored to overcome this worldwide problem. The discharge process needs to be supported by effective tools to ensure optimal communication and patient safety. In particular, this study suggests that acute care bedside nurses often received limited information about the ICU patients was a patient safety concern, and clinical handover need to follow best evidence principles. Junior staff members need to be educated to speak up during discharge decision making to ensure patient safety. Patient/family involvement in ICU discharge decision making needs to be explored and
literature is needed to promote patient centered care. The role of discharge guidelines was unclear which needs to be explored. In regards to discharge timing, patients’ safety should be considered when they are discharged to acute care units after-hours due to discharge delays. Consistent with current literature, coordinated care and supporting other team members are effective strategies to improve teamwork and resource efficiency.

This research was carried out in a single setting. The results might not be able to be generalised to other public hospitals in Australia. However, the research method might be replicated in organisations to study similar processes in the future. Additionally, the findings and recommendations may be applicable to other similarly sized hospitals that meet these similar standards. The second limitation to the study was the researcher (FL) as instrument. FL had been a critical care nurse for many years and might be insensitive to some issues and cues with which she was familiar, although every attempt was made to prevent this, such as, having research group meetings and discussions. The last limitation was that patients’ involvement in the discharge process was not observed as the purpose of this research was to identify the clinical practices that can be improved. Further research on patients’ involvement in discharge process may be needed.

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