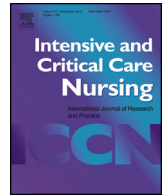




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Clinical research article

# Impact of surgical intensive care unit interdisciplinary rounds on interprofessional collaboration and quality of care: Mixed qualitative–quantitative study

Tatiana Urisman<sup>a,\*</sup>, Alberto Garcia<sup>a</sup>, Hobart W. Harris<sup>b</sup>

<sup>a</sup> Department of Nursing, University of California San Francisco, San Francisco, CA, USA

<sup>b</sup> Department of Surgery, University of California San Francisco, San Francisco, CA, USA

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### ABSTRACT

**Background:** Interprofessional collaboration is a key requirement for safe and effective care delivery in the critical care setting. To promote collaboration between care providers, intensive care unit interdisciplinary rounds have been introduced by multiple institutions and subsequent subjective improvements in interprofessional collaboration have been reported. However, only limited data are currently available regarding the impact of these rounds on objective patient care outcomes.

**Objectives:** The study had two main goals: (i) to evaluate the impact of introducing an interdisciplinary rounding format that formalised the participation of nurses in rounds on the effectiveness of interprofessional collaboration, specifically between nurses and physicians; and (ii) to evaluate a possible impact of adopting these rounds on measurable patient care outcomes.

**Methods:** General surgery rounds were introduced in our 32-bed medical–surgical intensive care unit. The impact of the rounds on the quality of collaboration was measured using anonymous web-based surveys of nurses and surgeons. Rates of falls and self-extubations (adverse events) were compared during five month pre- and post-intervention periods (August 2014–Jun 2015).

**Results:** Both nurses and physicians reported subjective improvement in collaboration following the introduction of interdisciplinary rounds. Additionally, a decline in both rates of falls and self-extubations was observed in the post-intervention period; however, due to the rarity of these events, neither trend reached statistical significance.

**Conclusions:** Interdisciplinary rounds provide an attractive model for improving interprofessional collaboration in critical care. Our findings add support to the growing evidence that interdisciplinary rounds improve collaboration and have a positive impact on the quality of patient care delivery.

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### Introduction

Interprofessional collaboration (IPC) is a cornerstone of effective health care delivery in today's dynamic environment of inpatient hospital care. It plays an even greater role in the Intensive Care Unit (ICU) setting, where nurses, physicians and other health care professionals work more closely together than in other inpatient areas. Numerous reports in the medical literature suggest that collaborative practice in intensive care units is essential to reducing patient morbidity/mortality and improving patient outcomes (Baggs et al., 1999; Boyle and Kochinda, 2004; Costa et al., 2014). Moreover, col-

laborative practice has the additional benefits of reducing health care costs as well as improving job satisfaction for all members of the interprofessional team (Zwarenstein and Reeves, 2000).

Traditionally, collaborative practice and team work within interprofessional teams in the ICU is primarily related to sharing of responsibility. Little emphasis is placed upon coordinating decisions based on input from team members. As a result, most team practitioners work in parallel with little direct communication, instead of involving all team members in shared decision making as desired by interprofessional collaboration (Kydonas et al., 2010).

The critical role of IPC within teams of surgical specialty providers, particularly in the ICU setting, has also been recently highlighted (Davenport et al., 2007). Indeed, surgical specialty teams favour a rigid hierarchical structure and are typically led by the highest-ranking team member. This approach to care often leads to members of interprofessional team working independently

\* Corresponding author at: Department of Nursing, 505 Parnassus Ave, Box 0210, San Francisco, CA 94143, USA.

E-mail address: [tatiana.urisman@ucsf.edu](mailto:tatiana.urisman@ucsf.edu) (T. Urisman).

in assessing patients, setting goals and making care recommendations. Therefore, critical care providers end up working in parallel to each other, with the medical record serving as a vehicle to share information. Moreover, due to their busy operating room schedules, surgical teams' fragmented availability in ICUs makes it especially challenging to have timely effective discussions with various members of the ICU team (Visser et al., 2014).

To foster IPC in the ICU setting, interdisciplinary rounds (IDR) have been introduced by many institutions. Among 13 published reports devoted to the topic of ICU IDR, the majority examined the attitudes of health care providers regarding communication effectiveness and perceived communication barriers during IDR (Geary et al., 2009; O'Leary et al., 2010; Vazirani et al., 2005). Together, these studies show consistent improvements in provider satisfaction with teamwork climate as a result of IDR and provide evidence that IDR facilitate ICU provider collaboration. In contrast, we found only two reports that examined objective patient care outcomes following introduction of ICU IDR. Johnson et al. (2009) reported that implementation of IDR significantly decreased the incidence of ventilator-associated pneumonia (VAP) at their institution. Similarly, Arora et al. (2014) reported that IDR can have an impact on reducing catheter days and catheter-associated infections.

In this study, we sought to more directly examine the link between IPC and measurable markers of patient care quality as a result of introducing ICU IDR. For this purpose, we evaluated the impact of ICU IDR on IPC, as measured by the attitudes of participating nurses and physicians and simultaneously tracked objective patient care outcomes. Specifically, we quantified the rates of two preventable adverse outcomes, falls and self-extubations, during the pre- and post-intervention periods. These adverse events occur most often in the setting of inadequate sedation or delayed planned extubations (Hofso and Coyer, 2007; White and Del Rey, 2009). Sedation adequacy, readiness for extubation and risk for falls were specifically discussed during IDR. Therefore, we hypothesized that improved communication regarding these components of patient care management would result in decreased rates of accidental falls and self-extubations.

## Setting

The study was conducted in a 32-bed Medical/Surgical ICU at the University of California San Francisco Moffitt-Long Hospital, United States. The unit is an open ICU where the General Surgery Service has the primary responsibility for their patients, and ICU/Critical Care Medicine service is responsible for pain control, sedation and ventilator support. The General Surgery Service includes three different subspecialty teams, with attending surgeons and surgical residents rotating every month. Patients on the General Surgery Service requiring ICU care are placed in a multi-specialty Medical-Surgical ICU, where a surgical team assumes primary responsibility for managing surgical patients with the exception of sedation and ventilator support, which are managed by the ICU medical team. The surgical team, consisting of an attending surgeon, surgical fellow, general surgery residents and a nurse practitioner, start their ICU rounds at 06:00 and must finish them by 06:30 in order to prepare for the day's operating room schedule by 07:00. Due to these time constraints and the need for adequate resident teaching, multidisciplinary discussions are generally avoided for the sake of efficiency. Therefore, in many cases patient management decisions are made without effective multidisciplinary input. As a result, patient status presented by the surgical resident at rounds may lack the latest information from a bedside nurse, or issues related to over- or under-sedation, pain management and ventilator support are not addressed since they are in the domain of the ICU medicine team. Focus on big-picture items only during morning rounds leads

to unaddressed issues and redundant or unnecessary orders that must be clarified through follow-up phone calls and pages.

## Participants

The entire ICU nursing staff of approximately 130 registered nurses as well as 25 surgeons on the General Surgery Service (including attending physicians and trainees) were asked to participate in the study. Surgeons were briefed on the expectations and format at their weekly clinical conference using a slide presentation followed by a question-and-answer session. Nurses were given written email instructions regarding the format and expectations followed by an initial 15-min oral presentation plus a question-and-answer session. Additional education and reminders were provided in subsequent bimonthly staff meetings.

## Intervention

Daily IDR were introduced on January 5, 2015 on all General Surgery teams. The first five months following IDR introduction (ending June 5, 2015) were defined as the post-intervention period and the preceding five months (starting August 4, 2014) as the pre-intervention period. The IDR were conducted daily, at 06:00 on weekdays and at 07:30 on weekends. Participants in the IDR included a surgery team (typically an attending surgeon, surgical subspecialty fellow, surgery residents, and a surgical nurse practitioner), ICU charge nurse, bedside nurse, and unit secretary. Respiratory therapists and ICU team members also occasionally joined the IDR upon availability. A standardized IDR format was developed to encourage open yet time-efficient multidisciplinary discussion. The format for individual presentations included an initial patient presentation by a surgery resident, followed by input from a bedside nurse, and when available from a respiratory therapist and the ICU team. Specific attention was given to issues related to patients' sedation, ventilator support, level of activity, and family concerns. Approximately 10 min on average were spent discussing each patient.

## Measures and data analysis

### Provider participation

Aggregated anonymous data on provider participation in ICU IDR were logged daily by the ICU charge nurses into a Microsoft Excel spreadsheet. Percent participation by nurses was calculated on a per-patient basis (e.g., if nurses participated in IDR on 3 of 5 total surgical patients in the ICU on a given day, participation would be 60%). Average weekly percent participation was visualized using a run chart. Mean percent participation and standard deviation were calculated from daily percent participation values over the entire intervention period.

### Attitudes of nurses regarding IPC before and after the introduction of IDR

Nurses' attitudes regarding effectiveness of IPC were assessed twice using an identical web-based, anonymous, six-question survey administered via SurveyMonkey® (SurveyMonkey.com), first as a baseline evaluation prior to and then six months after the introduction of IDR. To avoid possible bias, the questions were deliberately designed to measure general attitudes of nurses regarding their experience communicating with the General Surgery Service, without any specific references to IDR. The response rates, as percent of responders, in each question category before and after the intervention were tabulated and visualised as

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