Create a Safe Night

An Interdisciplinary Approach to Risk Identification and Mitigation for Hospitalized Patients

Doron Schneider*, MD,
Danielle Meyer†, RN,
Mary C. Naglak‡, PhD,
and Annmarie Chavarria§, RN

*Corresponding author
‡Abington Hospital – Jefferson Health

Disclosure: The authors declare that they have no relevant or material financial interests.
Background: The ultimate goal and purpose of healthcare is to improve health while preventing morbidity and mortality. The optimal approach to this is through teamwork using a reliability framework. Upon review of our institution's 2012 patient safety culture survey data, we noted that the teamwork domain of the Agency for Healthcare Research and Quality (AHRQ) assessment was in the lowest decile. Our institution implemented the Crimson Analytics tool in 2013, and an analysis of inpatient mortality data revealed higher than expected mortality statistics.

Objective: Hospital systems and team-based care are more developed during daytime hours, leaving patients more vulnerable to adverse events (mortality and morbidity) during the overnight period. Our objective was to develop optimal transitions of care and proactive risk identification/mitigation through an interprofessional team-based approach, with resultant decrease in patient harm and improvement in safety culture.

Methods: In a community hospital, standardize transitions to identify “at risk” patients for nurses, physicians, and respiratory therapists with subsequent interprofessional review of care plans/patient status in a centralized midevening standup briefing, subsequent proactive rounding on “at risk” patients, use of error prevention behaviors aimed to mitigate cognitive bias, and end-of-shift reflection process.

Results: Inpatient mortality rates fell from a baseline level of 2.08% in April 2013–March 2015 to 1.56% during the intervention period from April 2015–March 2018. The observed/expected mortality ratio fell from 1.04 to 0.76. AHRQ safety culture data improved in the team domain from 61% to 83%. A custom survey for this intervention was developed and found significant improvements in risk awareness and mitigation response, teamwork, efficiency, and—potentially—joy at work.

Conclusion: An interprofessional approach to high-quality transitions in care, risk identification, and mitigation, along with structured huddles and proactive rounding, can improve patient safety at night while simultaneously improving staff satisfaction, joy, and safety culture.

Keywords: high reliability, transitions in care, night-time, teamwork, proactive risk mitigation, interdisciplinary

Introduction

The ultimate goal and purpose of healthcare is to improve health while preventing morbidity and mortality. The optimal approach to this is through teamwork using a reliability framework. Upon review of our institution’s 2012 Surveys on Patient Safety Culture (SOPS) data, we noted that the teamwork domain of the Agency for Healthcare Research and Quality (AHRQ) assessment was in the lowest decile. Our institution implemented the Crimson Analytics tool in 2013 and an analysis of inpatient mortality data revealed higher than expected mortality statistics. Baseline inpatient mortality rates (April 2013–March 2015) were 2.08% (compared to the Crimson national cohort average of 1.79%) and top quartile of 1.65%. Our baseline observed/expected mortality ratio was 1.04.

Expected mortality rates were determined from Crimson comparator of risk-adjusted “bad cases” in the database of over 1000 hospitals. Increased mortality occurred despite Rapid Response Team (RRT) data (Figure 1) that revealed continued month-over-month growth in activations since its inception in 2009 and during our baseline period for the Create a Safe Night Program (CSNP) intervention (April 2013–March 2015). Additionally, multiple published articles of early warning scoring tools such as the Modified Early Warning Score (MEWS) demonstrated relatively low sensitivity and specificity for ability to identify patients at risk for clinical decline. Finally we increasingly became aware of the tenets of high reliability. Becoming “highly reliable” will require organizations to move towards higher functioning interprofessional teams that are situationally aware of risk and are able to anticipate and mitigate potential harm before it occurs.

With this as context, we set out to create an approach to impact interprofessional team dynamics and performance with an ultimate goal of reduction of inpatient mortality—with a particular focus on the unmet need of patient safety and risk during the overnight period.

Methods

Our institution realized that the structures and processes for team-work and response to patient decline were significantly more advanced and developed during nighttime hours. A goal was set to bring additional order and structure to the evening/night hours with an ultimate goal of reduction of harm at night. Several focus groups and brainstorming sessions with night shift leadership were held to inform the development of the program. The CSNP was launched in April 2015 after a significant educational effort that included live, in-person didactic information sessions, memos, and distribution of PowerPoint presentations to all involved stakeholders and leaders (nursing, residents, attending physicians).

The CSNP has multiple components. Daily it begins with the identification of patients that are at risk for clinical decline in the overnight period. Borrowing from the Patient Safety Institute’s I-PASS program, we used the word “watcher” to identify these patients. Resident physicians were trained to identify watchers using clinical judgment by asking, “Which patients on my service are at most risk of having a clinical decline overnight?” Attending physicians were trained to supervise the process, and watchers were systematically signed out to covering night float intern/residents. Watcher patients were clearly noted in a column in the electronic medical record (EMR) that allowed transparency for all staff to see the identified patients. Similarly, nurses were trained to identify watcher patients on their units who they believed had risk for clinical decline.

A 9:30 p.m. huddle was implemented to bring covering intern night floats, nursing representatives from each floor, respiratory technicians, and the evening nurse coordinators together. During these 15–20 minute sessions, the status of each watcher was ascertained and shared, care plans were reviewed, and contingencies were developed for each patient. Critically, this function served as an opportunity for interdisciplinary collaboration in the development of optimal care plans.

Figure 1. Number of Rapid Response Team (RRT) calls per month from November 2009 to March 2015 at Abington Hospital

Blue line: Actual number of RRT calls
Dotted line: Trend line
Green line: Average (40.4)

DOI: 10.33940/culture/2020.3.5
Our institution has long had error prevention behaviors similar to those found in many other hospital systems.3,4 These have traditionally focused on optimizing team function by creating standardized language and expectations through the use of tools such as SBAR (Situation-Background-Assessment-Recommendation) and CBS (Communication-Based Safety Issue). As part of our evolution and in response to the Institute of Medicine’s report on diagnostic error, we developed and deployed new behaviors called “Talk Out” and “Watch Out.” After this brief huddle, nursing supervisors and had nursing unit leadership on a daily basis to enable rapid course correction and resetting of expectations as necessary.

In the morning, at the end of their shift, the night float teams were asked to reflect on the sign-out they received as well as the course of the events of the evening. They were asked to enter an end-of-shift electronic report form. The form of process completion and reflection allowed for the development of a feedback loop to the day teams with the intent of improving the sign-out process. As an example: if the night float encountered situations that had been evolving during the day but the patient was not identified as a watcher, they would note that in the form and discuss it with the daytime primary service team.

It was recognized that despite the above efforts, there were patients that had clinical declines in the overnight period that were not identified as watchers at end-of-day sign-out. In order to provide additional cycles of learning and reflection any non-watcher patient that had a critical event or an unplanned transfer to a higher level of care was identified and a “reflection form” was sent to the primary team to guide them through the process of learning and refining their approach to future watcher patient identification. The intent was to allow the day teams to ponder if there could have been different decisions made during the previous day that could have prevented the patient’s decline. The form used open-ended questions but also contained prompted options such as a proactive upgrade in level of care, the ordering of additional labs, obtaining specialty consultation, etc.

In order to better understand the impact of the CSNP, an electronic survey was developed and distributed via email on May 5, 2017, and remained open for completion until June 1, 2017. Observed/expected mortality ratios were obtained from the Advisory Board’s Crimson Continuum of Care national cohort and are based on All Patient Refined Diagnostic Related Groups (APR-DRG) methodology which uses age, severity of illness, and risk of mortality-based case matching.

**Results**

Baseline inpatient mortality rate from April 2013–March 2015 was 2.08% (compared to the Crimson national cohort average of 1.79%) and top quartile of 1.65% (Figure 2). Baseline observed/expected mortality ratio was 1.04. The CSNP was initiated in April 2014 and mortality rates from April 2015–March 2017 fell to 1.56% (compared to Crimson average of 1.72% and top quartile of 1.58%). The observed/expected mortality ratio fell to 0.76 during this same period.

AHRQ SOPS data improved in the teamwork domain from a pre-baseline (2012) level of 78% to baseline (2015) of 81.4% (P=0.008) after the intervention period (2017). This improvement represented movement from the lowest decile against the AHRQ benchmark in the 2012 survey to the 25th percentile at baseline in 2015 to the 50th percentile in the 2017 survey.

Process measures were used to ensure accountability and to develop ongoing learning and feedback systems. For example, unit-based nursing night leadership completed “end of evening” electronic data capture to verify the presence and participation of the rounding interdisciplinary team. Since the launch of the program a total of 2,640 opportunities were present for intern/nursing staff proactive rounding on WATCHER patients. A total of 1,920 interactions occurred for a rate of 72.7%.

A total of 41 critical events that occurred at night (codes, RRT activation) in patients that were not proactively identified as watchers were analyzed by the primary teams using the structured reflection form (this process commenced in October 2016). Twelve of the 16 teams that cover the general medicine patients completed at least one reflection form for these patients, thus demonstrating feasibility of this approach. Of the 41 patients, 1 patient had a cardiac arrest, 28 had unplanned transfers to a higher level of care, and 12 had RRTs but remained in the room. Many insights were had on the part of the day teams. A few examples of learnings and reflections included the need for earlier consultation of specialists, more attention to changes in daytime vital signs, need for more aggressive medical management, different triage decisions regarding level of care from emergency trauma center, and more aggressive use of blood products.

A convenience sample of 105 staff members was surveyed using an electronic survey capture tool. The majority of the survey respondents were nurses and intern/resident physicians (82.8%) (Figure 3). As indicated by the survey results (Table 1) the overall program was extremely well received. The 9:30 p.m. interdisciplinary huddle was shown to be positive in improving situational awareness (67% somewhat or completely agreed) and in allowing the development of appropriate action planning for risk mitigation. (66.9% somewhat or completely agreed.)

Through its use of structured process and standard language the CSNP has dramatically improved the organization’s ability to be proactive in identifying risk; 67.6% somewhat or completely agreed that it helped reduce risks of unanticipated clinical decline and 84.7% somewhat or completely agreed the watch created clarity and focus for priority setting (Table 1). The CSNP has led to improved interactions (72.4% somewhat or completely agreed) and collaboration and communication between disciplines at night (71.4% somewhat or completely agreed), while simultaneously impacting efficiencies (52.3% somewhat or completely agreed) and “joy at work” (37.2% somewhat or completely agreed) (Table 1).

> Table 1: Clinical Role of Survey Respondents (N=105)

<table>
<thead>
<tr>
<th>Role</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nurse Leader</td>
<td>40.9%</td>
</tr>
<tr>
<td>Intern/Resident Physician</td>
<td>41.9%</td>
</tr>
<tr>
<td>Respiratory Therapist</td>
<td>0.02%</td>
</tr>
<tr>
<td>Moonlighter Physician</td>
<td>0.02%</td>
</tr>
</tbody>
</table>

**Figure 3. Clinical Role of Survey Respondents (N=105)**
Sustainability of any new initiative or tactic is key for long-term improvement. The CSNP is likely to be more sustainable given that it has a direct causal link between the program and the outcomes presented within the initiative. Hence, its success into other core daily activities where a high degree of accountability exists. These include structured and supervised physician sign-outs, hospitalwide safety calls during the day where patients are now also being discussed, as well as the aforementioned ability to collect real-time performance data that can be fed back to leadership should drift emerge. The study demonstrated that 37.2% of providers experienced more joy at work through this initiative. With better-organized provider clinicians caring for patients during the evening and has improved my joy at work through this initiative.

Many lessons have been learned through this project. Through the lens of the reliability framework we needed to carefully follow the form of the initiative:

1. Set expectations, 2. educate, and then only, then 3. hold accountable. We found that we needed to be very clear regarding the expectations. Each error that occurs is standard work needed to be distributed repeatedly and regularly in writing to staff that rotated at night. For staff that may be present for only a few shifts a month, just-in-time training for the physicians who cover patients during the evening, and their nursing counterparts. While physician staff in our initiative took the form of interns in training and moonlighters, other facilities can vary the program dependent on their coverage model (e.g., fellows, residents, interns, nurse practitioners, hospitalists, intensivists, etc.). Nursing departments are all organized differently but all have unit-based staff and leadership as well as a senior nurse who is operationally “in charge” in the evening. Other types of providers (e.g., respiratory technicians, pharmacists, laboratory professionals, etc.) can be brought in as necessary and able.

This article is published under the Creative Commons Attribution-NonCommercial license. This article is published under the Creative Commons Attribution-NonCommercial license.

References


Discussion

Given the face validity of the results and the fact that interventions naturally are born from and are aligned to safety and high reliability science, the program has merit to be replicated at other facilities. The initiative can be replicated in other facilities given its ability to be modified to any hospital’s structures. The program simply needs to have a coordinated approach between physicians who cover patients during the evening and their nursing counterparts. While physician staff in our initiative took