Error Prevention in ICU

Ruth Kleinpell PhD RN NP FAAN
Rush University Medical Center
Chicago Illinois USA
Patient safety is a major focus in healthcare and an international area of concern.

Ensuring patient safety in the intensive care unit (ICU) is especially important due to the complexity of care.
Targeting Errors in the ICU

- ICU care often involves more intensive monitoring and more frequent clinician evaluation.
- However, the acuity level of patients and intensive focus of care make the ICU especially vulnerable to adverse events including medical errors.
Health Care Delivery Errors

- 27% of events are a result of medical errors
- 70.5% of adverse events resulted in failure that lasted <6 months to recover
- 2.6% of patients have permanent disabilities
- 13.6% resulted in death

Institute of Medicine, To Err is Human: Crossing the Quality Chasm, 1999
Areas for Safety Focus in the ICU

- Unplanned extubations/reintubations
- Disconnections of lines, catheters, drains
- Medication errors
- Skin breakdown
- Restraint Use
- Falls/Injuries
- Infections
  - VAP, CR-BSI, UTI, MRSA, C Diff, others
Errors in the ICU

- Several studies have analyzed the incidence of adverse events in the ICU
  - Sentinel Evaluation Study in Europe
    - 205 ICUs, 1913 patients
  - The Safety Study in the US
    - Year long study of adverse events in 2 ICUs
    - 391 patients with 1480 ICU days

Rothschild JM et al CCM 2005;33:1694-1700; Valentin A et al Int Care Med 2006;32:1591-1598
Patient safety in intensive care: results from the multinational Sentinel Events Evaluation (SEE) study

Observational 24 hour cross sectional study of incidents in 205 ICUs with 1913 patients
A total of 38.8 events per 100 patient days was observed

Significant factors:
Patient to nurse ratio
Any organ failure
Higher intensity in level of care
Time of exposure
## Table 4 Observed rates of sentinel events

<table>
<thead>
<tr>
<th></th>
<th>Events per 100 patient-days</th>
<th>Lower 95% CI</th>
<th>Upper 95% CI</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total</td>
<td>38.8</td>
<td>34.7</td>
<td>42.9</td>
</tr>
<tr>
<td>Lines, catheters, drains</td>
<td>14.5</td>
<td>12</td>
<td>16.9</td>
</tr>
<tr>
<td>Medication</td>
<td>10.5</td>
<td>8.6</td>
<td>6.0</td>
</tr>
<tr>
<td>Prescription</td>
<td>5.7</td>
<td>4.4</td>
<td>7.1</td>
</tr>
<tr>
<td>Administration</td>
<td>4.8</td>
<td>3.6</td>
<td>6</td>
</tr>
<tr>
<td>Equipment</td>
<td>9.2</td>
<td>7.4</td>
<td>11.1</td>
</tr>
<tr>
<td>Airway</td>
<td>3.3</td>
<td>2.4</td>
<td>4.3</td>
</tr>
<tr>
<td>Alarms</td>
<td>1.3</td>
<td>0.6</td>
<td>1.9</td>
</tr>
</tbody>
</table>
The impact of staffing levels

- Patient to nurse ratio and physician staffing levels have been examined as a factor related to
  - Nosocomial infection rates
  - Medication errors
  - Post operative complications
  - Failure to rescue

Nurse staffing and patient outcomes in critical care: A concise review

Daleen Aragon Penoyer, PhD, RN, CCRP, FCCM

Outcomes most frequently studied were infections, mortality, postoperative complications, and unplanned extubation. Most studies suggested that decreased nurse staffing is associated with adverse outcomes in intensive care unit patients.

Conclusions: Findings from this review demonstrate an association of nurse staffing in the intensive care unit with patient outcomes and are consistent with findings in studies of the general acute care population. A better understanding of nurse staffing needs for intensive care unit patients is important to key stakeholders when making decisions about provision of nurse resources. Additional research is necessary to demonstrate the optimal nurse staffing ratios of intensive care units. (Crit Care Med 2010; 38:1521–1528)
Patient Safety Round Table

Improving the outcome of critically ill patients remains an ideal that every practicing Intensivist strives to achieve.

Although, there are hundreds of research papers published every year that help us to understand the complex interactions of physiology, pathology and clinical medicine very few have a significant impact on outcome measures that are relevant to patients themselves.

One area of clinical practice that is often overlooked, but can impact significantly on relevant patient outcomes, is the process of care.

Read more...
Patient Safety Round Table

Improving the outcome of critically ill patients remains an ideal that every practicing intensivist strives to achieve.

Although, there are hundreds of research papers published every year that help us to understand the complex interactions of physiology, pathology and clinical medicine very few have a significant impact on outcome measures that are relevant to patients themselves.

One area of clinical practice that is often overlooked, but can impact significantly on relevant patient outcomes, is the process of care.

Read more...
Aim: Raise patient safety to the top of the scientific agenda with the hope of increasing the quality of care provided to patients and improving outcomes.

Focus on teamwork, collaboration, communication, multidisciplinary approaches
Communication skills and error in the intensive care unit
Tom W. Reader\textsuperscript{a}, Rhona Flin\textsuperscript{a} and Brian H. Cuthbertson\textsuperscript{b}


Error studies in the intensive care unit have shown good communication to be crucial for ensuring patient safety.

Interventions to improve communication in the intensive care unit have resulted in reduced reports of adverse events, and simulated emergency scenarios have shown effective communication to be correlated with improved technical performance.
Joint Commission National Patient Safety Goal:
Hand-off Communication
Impact of Multidisciplinary Team Training in a Surgical Intensive Care Unit

Surgical ICU Rush University Medical Center
Overview

- Poor communication has been readily identified as a contributing factor to medical errors.

- Crew Resource Management has been found to improve communication, patient safety and outcomes in specific patient populations.
Team decision-making, assertive statements, identification of red flags and hardwired safety tools are critical components of CRM

After development and implementation of these communication tools, data was collected on the following items:
- Device utilization (central lines, arterial lines, urinary catheters and drains)
- Infection rates
- Compliance with mechanical ventilation bundles
- Medication reconciliation
Results

- ↓ device utilization (foley device utilization decreased from above the 50% percentile (FY10Q3) to less than the 25th percentile (FY10Q4)
- ↓ urinary catheter associated infection rates
- 100% medication reconciliation
- Improved mechanical ventilation bundle compliance
Urinary Catheter Utilization Ratio

10th Percentile: 0.63
25th Percentile: 0.75
50th Percentile: 0.82
## Daily Goals Worksheet

<table>
<thead>
<tr>
<th>GOAL</th>
<th>NOTES</th>
<th>0700-1500</th>
<th>1500-2300</th>
<th>2300-0700</th>
</tr>
</thead>
<tbody>
<tr>
<td>What needs to be done for the patient to be discharged from the ICU?</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>What is this patient’s greatest safety risk?</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pulmonary/Ventilator: HOB 30 degrees or greater</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sedation Vacation and Assessment of Readiness to Extubate</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>PUD Prophylaxis</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>DVT Prophylaxis</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

The Johns Hopkins University. Quality & Safety Research Group Tool Kit.
Before 0700- Off going resident will notify SICU charge RN the expected patient flow for AM rounds. Begin rounds at 0800-this will be announced overhead with room location of where starting.

<table>
<thead>
<tr>
<th>RN</th>
<th>RN Rounds Crosscheck (including but not limited to)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>sedation</td>
</tr>
<tr>
<td></td>
<td>SBT</td>
</tr>
<tr>
<td></td>
<td>Nutrition</td>
</tr>
<tr>
<td></td>
<td>Need for foley/central line</td>
</tr>
<tr>
<td></td>
<td>prophylaxis</td>
</tr>
<tr>
<td></td>
<td>family issues, transfer, order clarifications</td>
</tr>
<tr>
<td></td>
<td>nursing issues-skin, activity, HOB</td>
</tr>
</tbody>
</table>

- I have concerns with the following_________________.
  (examples include but are not limited to: skin breakdown, sedation/pain, family issues, glucose control, order clarifications, duplicate orders, etc)
Summary

A number of strategies can be used to promote safety in the ICU

Continued focus on ICU safety issues will enhance the quality of care and safety for patients to promote best outcomes