Implementing the ABCDEF Bundle in the Cardiothoracic Intensive Care Unit

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Purpose
- To implement and evaluate the effect of the ABCDEF bundle to increase compliance of its elements, improve patients’ outcomes, and enhance teamwork and collaboration in the cardiothoracic intensive care unit (ICU) at Ronald Reagan UCLA Medical Center.

Background
- Pain, agitation, and delirium (PAD) are major problems for critically ill patients and their families.
- In 2015, the Society of Critical Care Medicine launched a quality improvement (QI) initiative called the ICU Liberation Collaborative to facilitate the implementation of PAD guidelines by using the evidence-based ABCDEF bundle to increase teamwork and improve patient and family outcomes (Table 1).
- Our Cardiothoracic ICU was one of the 76 hospital units involved in this national collaborative initiative.

Strategy and Implementation
- **Plan-Do-Check-Act QI model** was used to facilitate project implementation with an inter-professional team (IPT) that included registered nurses, administrative nurses, physician, pharmacist, respiratory care practitioner and physical therapist.
- IPT team, led by an administrative nurse, received training, monthly co-learning calls and webinars, and met regularly to plan bundle element interventions and discuss project progress.
- Retrospective data collection and gap analysis was used to identify opportunities for improvement among the bundle elements (Table 2).
- Monthly data collection was performed by the IPT to monitor compliance with the bundle elements.
- Multi-modular strategies such as emails, staff meeting, huddle highlight, bulletin board, journal club, annual competency, leadership meetings, were used by the IPT for staff education on bundle elements and progress updates.
- Descriptive statistics were used to describe the compliance, outcome and survey data.

Outcomes

**Table 1. ABCDEF Evidence-based bundle elements**

<table>
<thead>
<tr>
<th>Symptoms</th>
<th>Monitoring Tools</th>
<th>Bundle Elements</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pain</td>
<td>Numeric Rating Scale (NRS)</td>
<td>Pain Intensity &amp; Management (PIM)</td>
</tr>
<tr>
<td>Agitation</td>
<td>Richmond Agitation Scale (RASS)</td>
<td>Mobility Assessment &amp; Support (MABS)</td>
</tr>
<tr>
<td>Delirium</td>
<td>Confusion Assessment Method for the ICU (CAM-ICU)</td>
<td>Delirium Management (DM)</td>
</tr>
</tbody>
</table>

**Table 2. Interventions made to implement ABCDEF bundle**

<table>
<thead>
<tr>
<th>Root cause</th>
<th>Solution</th>
<th>Owner</th>
<th>Results</th>
</tr>
</thead>
<tbody>
<tr>
<td>A: No CPOT</td>
<td>Updated and Implemented CPOT</td>
<td>RNs, MDs</td>
<td>Tend CPOT hospital-wide, Pain protocol</td>
</tr>
<tr>
<td>B: No safety screen tools for SIT &amp; SRT</td>
<td>Created SARS/BRH Protocols</td>
<td>RNs, MDs</td>
<td>Protocols</td>
</tr>
<tr>
<td>C: No RASS</td>
<td>RASS tool to T1 optimization committee</td>
<td>RNs, MDs</td>
<td>RASS tool use on all ICU patients</td>
</tr>
<tr>
<td>D: No evidence-based delirium assessment tool and protocol</td>
<td>Implemented CAM-ICU and Delirium Protocol</td>
<td>RNs, MDs</td>
<td>CAM-ICU Delirium protocol</td>
</tr>
<tr>
<td>E: No patient safety screening for mobility</td>
<td>Implemented BMAT</td>
<td>RNs, MDs</td>
<td>BMAT Hospital-wide use</td>
</tr>
<tr>
<td>F: Inconsistent family engagement</td>
<td>Increased number of family members involved in rounds</td>
<td>RNs, MDs</td>
<td>Increase family involvement in daily rounds</td>
</tr>
</tbody>
</table>

**Figure 1. Sedation assessment compliance out of all ICU days**

**Figure 2. Delirium assessment compliance out of all ICU days**

**Figure 3. Early mobility and exercise compliance out of all ICU days**

**Figure 4. Family engagement compliance out of all ICU days**

**Figure 5. Pre- and Post-Collaborative Staff Survey, with Likert scale responses ranging from never (1) to always (5).**

**Figure 6. Patients with no delirium per PAD-recommended assessment.**

- Increased compliance with RASS (from 17% to 97%), CAM-ICU (from 57% to 85%), and BMAT (from 80% to 95%) (Figures 1-3).
- Family participation in daily rounds increased from 19% to 95% (Figure 4).
- Staff survey showed higher mean scores in teamwork and collaboration (Figure 5).
- The number of patients with delirium-free ICU stays increased from 87% to 92% post implementation of the bundle (Figure 6).

**Implications for Practice**
- High performance compliance with the bundle elements supported evidence-based practice.
- Bundle elements are now incorporated in the ICU daily goals sheets, and used for every patient, every day.
- Collaboration continues between the unit-based committees and IPT to maintain sustainability of the improvements.
- Future efforts will continue to educate and increase awareness of bundle-generated protocols.