Critical Care Outreach: Extending Critical Care Services Outside of an ICU

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### Background
- Rapid Response teams were implemented with goals of early recognition and rapid treatment to improve patient outcomes. University of Chicago Medicine introduced a Rapid Response Team (RRT) in late 2008.
- Unfortunately, subtle signs and symptoms of clinical deterioration often go unnoticed, resulting in a failure or delay in calling for help, administering acute therapies, and transferring to a higher level of service when needed.

### Aims
- Decrease ward cardiac arrests, mortality and resource utilization for ward patients via proactive identification and rounding on high-risk patients.

### The Intervention
- In February 2013, the UCM hired a dedicated cadre of Critical Care Outreach Nurses (CCON) to proactively round in high-risk patients, who are identified by recent transfers out of the ICU and query of charge nurses on the wards.
- The group currently consists of 5.1 FTEs, which enables single provider 24/7 coverage for ward patients.
- This is different than the previous emergency response system of RRTs, where activation is a passive process.
- Proactive rounding by CCONs have been limited to Mitchell during the pilot, which resulted in a natural experiment as units that moved to the CCD represented a concurrent pre-and post-controls to the pre- and post-intervention units of Mitchell.

### Results
- Both ICU transfers and ICU length of stay decreased in the intervention group, resulting in a reduction in total ICU bed utilization (-25% vs +60%)
- Ignoring the increase in the control units, proactive rounding saved an estimated 945 ICU bed days over 9 months, without which we would have needed an additional 3.5 ICU beds to care for the same patients each day (and 8.75 critical care nurse FTEs).

<table>
<thead>
<tr>
<th>ICU Length of Stay</th>
<th>Adult ward cardiac arrest rate</th>
<th>Observed/Expected Mortality</th>
</tr>
</thead>
<tbody>
<tr>
<td>Control</td>
<td>Intervention</td>
<td>Control</td>
</tr>
<tr>
<td></td>
<td>n ICU LOS, hours Median (IQR)</td>
<td>n ICU LOS, hours Median (IQR)</td>
</tr>
<tr>
<td>Before CCOT (3/2012-12/2012)</td>
<td>634 65 (30-158)</td>
<td>478 84.5 (38-226)</td>
</tr>
<tr>
<td>After CCOT (3/2013-12/2013)</td>
<td>842 71.5 (34-150)</td>
<td>383 71 (33-171)</td>
</tr>
<tr>
<td>Change, %</td>
<td>10% -16% 22% -35% -14% -43%</td>
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</tbody>
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Table. The before-and-after effects of implementing proactive rounding by the critical care outreach team (CCOT), in the intervention and control groups. Expected mortality uses the University Healthsystem Consortium 2012 risk model.

### Lessons Learned
- Proactive rounding in Mitchell was associated with a decrease in cardiac arrests, mortality and ICU length of stay, which was not seen in CCD.
- The intervention was cost effective.

### Next Steps
- Expand the Critical Care Outreach program to proactively round in both hospitals.
- Earlier and more accurate identification of high acuity patients using real-time, automatic risk-score calculation and alerting.

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