Using Technology to Improve Efficacy of Patient Repositioning

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Background

Hospital acquired pressure injuries (HAPIs):
- Associated with poor patient outcomes
- Costs can range from $2,159 - $21,410 (CALNOC, 2017)
- Can result in an increased length of stay, 6-10 additional days

Orange Coast Memorial Critical Care Unit (CCU):
- In 2016, 45 HAPIs with potential costs of $97,155 – $963,450
- After evaluation of our practice, the incidence of HAPIs was above CALNOC benchmark

Patient repositioning is the gold standard of care

Question: Does our practice of repositioning result in adequate offloading of pressure?

Purpose

The purpose of this performance improvement project was to pilot the efficacy of a wireless monitoring system in the CCU to measure:
- Patient repositioning ≤ every 2 hours
- Adequacy of offloading pressure areas ≥ 20°
- Incidence of HAPIs

Acknowledgements

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Description of Innovation

Leaf Sensor
- A wireless, wearable single use sensor, placed on the sternum
- Sensor battery life is 21 days and costs $199
- The sensor provides real time visual turn cues on patient’s individual needs

Compliance
- Defined as offloading pressure ≥ 20° to reperfusion tissue
- Green visual cue indicates offloading ≥ 20° achieved
- Turn Angle: turn is of sufficient magnitude to provide adequate offloading
- Frequency: turns provided as often as necessary, but not more often than necessary
- Reperfusion time: Pressurized tissue is given enough time for reperfusion between turns
- Research illustrates turn compliance > 85% reduces risk of pressure injury five times

Sample and Setting
- The sample included 189 patients monitored in the CCU over a 90-day period (May, July, & Aug)

Results

Table 1: Inclusion

<table>
<thead>
<tr>
<th>Inclusion</th>
<th>Exclusion</th>
</tr>
</thead>
<tbody>
<tr>
<td>Patient with Braden ≤ 18</td>
<td>Comfort care patients</td>
</tr>
<tr>
<td>Nurse clinical judgement</td>
<td>Hemodynamically unstable patients</td>
</tr>
</tbody>
</table>

Table 2: Pilot HAPI Outcomes

<table>
<thead>
<tr>
<th>Stage</th>
<th>Baseline May July Aug 2016</th>
<th>Intervention May July Aug 2017</th>
</tr>
</thead>
<tbody>
<tr>
<td>I</td>
<td>2</td>
<td>0</td>
</tr>
<tr>
<td>II</td>
<td>4</td>
<td>0</td>
</tr>
<tr>
<td>III</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>DTI</td>
<td>2</td>
<td>5</td>
</tr>
<tr>
<td>Total</td>
<td>10</td>
<td>5</td>
</tr>
</tbody>
</table>

Table 3: Pilot Financial Outcomes

<table>
<thead>
<tr>
<th>Outcome</th>
<th>Dollars</th>
</tr>
</thead>
<tbody>
<tr>
<td>Unreimbursable treatment cost per HAPI (Avg)</td>
<td>$11,784</td>
</tr>
<tr>
<td>Potential HAPI Costs ($58,922 x 5)</td>
<td>$58,920</td>
</tr>
<tr>
<td>LEAF Sensor Cost (through 8/31/2017)</td>
<td>($38,606)</td>
</tr>
<tr>
<td>Potential Cost Savings</td>
<td>$20,314</td>
</tr>
</tbody>
</table>

Table 3: Pilot Financial Outcomes

| Potential Cost Savings | $20,314       |

Nursing Implications

- The use of technology can ensure appropriate offloading
- Nurses must use clinical judgment in initiating the Leaf sensor. Don’t focus on the Braden Score
- Device related HAPI’s continue to be a challenge (i.e., CPAP, oxygen tubing, waffle boots)
- Leaf can provide visual cues to assist the nurse with patient care and prioritization
- Leaf daily reports increase visibility of turn compliance

CCU HAPI 3+ above CALNOC benchmark
- LEAF pilot began May of 2017:
  - May CCU HAPI 3+ performance below CALNOC benchmark
- LEAF sensor not used in June:
  - June performance above benchmark