Background

Hospitalized patients rate sleep quality as worse in the hospital as compared to at home.1 Sleep deprivation counteracts adequate healing and has been associated with impaired immunity, mood disorders, and delirium.

- The inpatient population is vulnerable to sleep disruption from multiple causes including phlebotomy, vital signs, medication administration, and noise from telemetry and intravenous pumps.

- Patients located on 5-West Telemetry Unit sleep an average of 4.35 hours per night, with an average of 4.33 awakenings per night.

Aim

Our aim was to improve patient-reported sleep satisfaction on the 5-W telemetry unit at Thomas Jefferson University Hospital over a 4 month time period (11/2018 to 2/2019) using a Marpac white noise machine.

Methods & Intervention

- Metrics: Patient self-reported sleep quality (used 5 items from the Dutch-Flemish Patient Reported Outcomes Measurement Information System (PROMIS) Sleep Disturbance item bank), and likelihood of recommending the Marpac machine to another patient1

- Population: Patients on 5-West Telemetry

Intervention: A Marpac machine (Figure 1) was placed into a patient’s room. Nursing staff turned the machine on when the patient was ready to sleep

Measurement: Pre/post survey of intervention patients

Results

Dutch-Flemish Patient Reported Outcomes Measurement Information System (PROMIS) Sleep Questionnaire Items. Average scores for each item:

<table>
<thead>
<tr>
<th>Item</th>
<th>Pre-MAR PAC</th>
<th>Post-MAR PAC</th>
<th>Mean Difference (95% CI)</th>
</tr>
</thead>
<tbody>
<tr>
<td>My sleep quality last night was:</td>
<td>2.34</td>
<td>3.82</td>
<td>1.48 (0.91 - 2.07)</td>
</tr>
<tr>
<td>I was satisfied with my sleep:</td>
<td>1.98</td>
<td>3.82</td>
<td>1.84 (1.27 - 2.33)</td>
</tr>
<tr>
<td>My sleep was refreshing:</td>
<td>2.02</td>
<td>3.76</td>
<td>1.74 (1.16 - 2.33)</td>
</tr>
<tr>
<td>My sleep was noisy:</td>
<td>1.31</td>
<td>1.31</td>
<td>-0.65 (-2.32 - 0.02)</td>
</tr>
<tr>
<td>I felt lonely when I woke up:</td>
<td>2.68</td>
<td>1.27</td>
<td>-1.40 (-2.08 - 0.71)</td>
</tr>
</tbody>
</table>

Every question was answered using a 5-point Likert scale, scored as follows: 0, very poor; 1, poor; 2, fair; 3, good; 4, very good; 5, excellent. Items 2, 3, 4, and 5 were reverse-scored.

Table 1: Pre- and Post-Survey Responses

Impact of MAR PAC on Patient’s Sleep as Measured by the Sleep Score

<table>
<thead>
<tr>
<th>n</th>
<th>mean</th>
<th>SE</th>
<th>95% CI</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pre-MAR PAC</td>
<td>0.8</td>
<td>0.71</td>
<td>-1.25</td>
<td>2.93</td>
</tr>
<tr>
<td>Post-MAR PAC</td>
<td>8.84</td>
<td>0.23</td>
<td>7.55</td>
<td>10.63</td>
</tr>
<tr>
<td>Difference</td>
<td>8.04</td>
<td>0.77</td>
<td>5.52</td>
<td>10.56</td>
</tr>
</tbody>
</table>

p < .001

Table 2: Mean Sleep Satisfaction Score Pre- and Post-Intervention

Figure 2. Would the Patient Recommend Marpac to Another Patient

Figure 3. Mean Sleep Satisfaction Score Pre-Marpac and Post-Marpac

Conclusions

- The Marpac white noise machine improved patient sleep satisfaction on a telemetry unit at our institution
- This intervention, combined with other sleep hygiene techniques, has the potential to help hospitalized patients

Limitations: single institution and unit with predominantly cardiac patients on telemetry monitoring.

Future studies:

- Expansion beyond pilot unit to general medical floors and intensive care units to determine if sleep satisfaction can be improved with the Marpac machine.
- Assess Marpac’s impact on length of hospital stay, rates of delirium, and in-hospital falls as these may be reduced with better sleep quality.

References