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Improving Quiet-at-Night on a Telemetry Unit:
Introducing a Holistic Sleep Menu Intervention

Christian Karl Antonio

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Fall 2018

Improving Quiet-at-Night on a Telemetry Unit:

Introducing a Holistic Sleep Menu Intervention

Abstract

Problem

A hospital in San Francisco, California has performed poorly on patient care service as evidenced by low Hospital Consumer Assessment of Healthcare Providers and Systems (HCAHPS) scores. The survey's lowest score was from the "Quiet at Night" measure.

Context

A *Sleep Menu* initiative was implemented in the hospital's telemetry unit. Microsystem assessment and Strengths-Weakness-Opportunities-Threats (SWOT) analysis identified practices that might impede intervention success. Findings showed that benefits and opportunities outweighed costs; cost-benefit analysis estimated an annual net benefit of \$6,354. Other benefits included improved patient well-being, higher HCAHPS scores, increased reimbursement, and improved institutional reputation.

Interventions

A clinical nurse leader led the 3-month *Sleep Menu* practice change project that included several components, including staff education, authentic hourly rounding, mandatory quiet time, and noise mitigation.

Measures

The outcome measure of self-reported hours of sleep was assessed via pre-post survey. Process measures included adherence to a small test of change and a patient survey. Balancing outcome measures were evaluated in terms of staff satisfaction.

Results

The project demonstrated that a quiet-at- night intervention improved patient satisfaction and care experience as well as staff satisfaction. Study participants who self-reported increased hours of sleep rose from 30% to 80%. Patients reported a mean increase in hours slept per night from 3.6 to 5.6 for at least 4 weeks during implementation.

Conclusions

A quiet environment can increase patients' sleep hours and reduce staff work stress. Engagement of unit champions, frontline staff, and patients as well as support from leadership and management yielded positive results. The *Sleep Menu* can potentially improve both patient and organizational outcomes.

Keywords: sleep, hospital noise, quiet-at-night, clinical nurse leader

Improving Quiet-at-Night on a Telemetry Unit:

Introducing a Holistic *Sleep Menu* Intervention

In the recovery process, sleep is essential. A core principle of a patient-centered care is providing comfort to patients. Unfortunately, hospital environments are typically noisy, and as a result, patients rarely get a sound sleep. Among several adverse consequences of patients' lack of sound sleep is that perception of their care experience is adversely affected. Excessive hospital noise has been a long-standing challenge faced by a community hospital in San Francisco, California. A study conducted by Connor and Ortiz (2009) found that hospital environment significantly affects patients' comfort, care experience, and evaluation of care. Environmental factors also impact sleep quality. To date, extant care practices related to providing a quiet night at the hospital have not been effective. Among factors contributing to the persistence of the excessive noise are the hospital's historical lack of an initiative to develop interventions to reduce noise and staff resistance to change. The purpose of this quality improvement project is to improve the hospital's HCAHPS scores and to implement an evidence-based change: A *Sleep Menu* initiative.

Mazer (2006) has reported that noise is the primary cause of sleep deprivation and disturbance. The main sources of noise most commonly identified by patients are staff conversations and noise associated with devices or equipment (Applebaum, Calo, & Neville, 2016). Notably, sustained noise increases patients' health risks and impairs health care workers' performance (Mazer, 2006).

Background and Significance

Florence Nightingale long ago called attention to the detrimental effects of noise, in the clinical environment, and many studies pertaining to noise reduction strategies have originated from her influential work (Hsu, Ryherd, Waye, & Ackerman, 2012). For the project described in this paper, *Sleep Menu* initiative was designed to create a healing environment to improve patient care experience and outcomes. The initiative involved staff education and encouraged patient engagement. During leadership rounding, nurse leaders and staff interact with patients to gather actionable data by providing a patient satisfaction survey, asking patients about their (the patients') preferences, and encouraging patients who felt that the prevailing noise level was unacceptable to voice their dissatisfaction. One of the side benefits of this inquisitive interaction would be to demonstrate that the providers value their patients' experiences and care about the patients themselves.

Impacts for Patients and the System

Research evidence has shown that simple changes in practice and environment can lead to increased levels of patient satisfaction and improved outcomes (Murphy, Bernardo, & Dalton, 2013).

Relevance to Organizational Priorities

Reimbursement is now linked to patient satisfaction, which is defined by HCAHPS (Wilson, Whiteman, Stephens, Swanson-Biearman, & LaBarba, 2017). Hospitals are rewarded through the Hospital Value-Based Purchasing program, in which a reimbursement rate is based on performance and quality of care. Well-rested patients are more likely to be satisfied with their care. A patient's condition—rested or fatigued—can impact the patient's perception of the overall care provided and may be reflected in positive patient satisfaction survey responses.

Therefore, the clinical nurse leader (CNL) anticipated that the multimodal quiet-at-night initiative could potentially achieve health care organizational priorities for improving HCAHPS score, increasing reimbursement rates, and improving patient outcomes.

Problem Description

Setting

The site of the intervention described in this paper was a 120-bed community hospital. Historically, the hospital has performed poorly on patient care service as evidenced by low HCAHPS scores. Following the hospital's 2018 HCAHPS survey, the community hospital has had summary star rating of 2.8 and an overall star rating goal of 3 (range: 1-5). The questions pertaining to the survey's Quiet at Night measure yielded the hospital's lowest score: 1 (highest score: 5).

Current Knowledge

Research has identified several detrimental effects of noise: patients' perception of poor care service and performance, low patient satisfaction, and low reimbursement rates (Wilson et al., 2017). However, despite this evidence, the project's hospital administrators and staff had never made a systematic effort to mitigate noise and improve the HCAHPS scores. As mentioned, this lack of a systematic effort to reduce excessive noise resulted in the hospital's having low patient satisfaction and low reimbursement rates. The *Sleep Menu* initiative has been found to reduce noise in the telemetry unit, improve patients' actual care experience with regard to noise and improve staff performance on this quality measure (Wilson et al., 2017).

The project hospital's quality improvement *Sleep Menu* initiative will be implemented in the hospital's telemetry unit, a 20-bed capacity unit that accommodates a diverse patient population. (The *telemetry units* are nursing units in which patients receive care while in recovery from acute medical conditions or surgery). The patients who participate in the initiative may provide useful insights regarding maintaining quiet in the unit at night. Thus, the outcome of testing the *Sleep Menu*'s multiple noise-reduction strategies in this unit are integral to the improvement of the initiative.

Available Knowledge

The metrics used to assess the progress and efficacy of the multimodal Sleep Menu initiative are HCAHPS score, leadership rounding, staff and patient engagement, and staff satisfaction. The benchmark data are an improved HCAHPS Quiet-at-night score of 3 and increased numbers of patients who report 5 or more hours of uninterrupted sleep. Baseline data obtained are HCAHPS Quiet-at-night score of 1, a summary star rating of 2.8, and an overall star rating goal of 3. Prior to the implementation, 25% of the participants ($n = 15$) reported had 2 hours of sleep, 39% ($n = 23$) had 3 hours, 5% ($n = 3$) had 4 hours, 19% ($n = 11$) had 5 hours, and 12% ($n = 7$) had 7 hours of sleep. As previously mentioned, the baseline data showed that the hospital has had a poor performance with regard to HCAHPS scores and a low number of patients who had reported 5 or more hours of sleep.

PICOT Question

In an adult telemetry unit (P) how does implementation of the best- practice *Sleep Menu* initiative (I) compare with non-implementation of the best- practice *Sleep Menu* (C) improve patient care experiences and outcomes (O) by September 2018 (T)?

Review of the Literature

An electronic search of the Cochrane, PubMed and CINAHL databases used the key terms *hospital*, *noise*, and *quiet at night*. The search was limited to research articles, publication dates no earlier than 2009, and publication in English. The initial literature search yielded a total of 105 articles. Ten of these articles met the search criteria, and of these 10 articles, six were selected for review. For the present review, although few systemic review or level I studies related to noise reduction have been conducted, extant published studies provide high quality information sufficient to address the gap in the current knowledge base. Research evidence was appraised and rated “IIIA,” “LVA,” or “LVB” using the Johns Hopkins Nursing Evidence-Based Practice (JHNEBP) research evidence appraisal tool (see Appendix B).

In general, extant literature describes the connection of noise to patients’ general health and the need to address its harmful effects. Despite many studies on noise reduction strategies, little research has focused on supportive interventions such as improving acoustics and establishing auditory standards in purchasing medical equipment (Applebaum, Calo, & Neville, 2016; Hsu et al., 2012; Mazer, 2006). The *Sleep Menu* with several interventional components (e.g., such as keeping doors closed, providing earplugs and eye masks, and dimming the lights), resulted in improvements in patients’ quality of sleep and in positive responses from patients. These interventional practices led to significant improvement in noise reduction and improved patient care experience (Applebaum, Calo, & Neville, 2016; Connor & Ortiz, 2009; Murphy, Bernardo, & Dalton, 2013; Wilson et al., 2017). The most important finding that can be applied in an improvement project is that small changes to help patients get a restful night’s sleep can positively impact the patient care experience (Connor & Ortiz, 2009; Murphy, Bernardo, & Dalton, 2013). Lastly, all articles reviewed proved that staff and patient’s engagement, interprofessional team involvement are crucial in implementing quiet-at-night initiatives

effectively (Applebaum, Calo, & Neville, 2016; Connor, & Ortiz, 2009; Hsu et al., 2012; Mazer, 2012; Murphy, Bernardo, & Dalton, 2013; Wilson et al., 2017).

Rationale

The development and implementation of the multimodal *Sleep Menu* initiative was guided by a conceptual framework that includes Watson's theory of human caring, Kotter's 8-step change model, and the IHI PDSA cycle. These models were chosen for their simplicity, appropriateness, and applicability in the quality improvement project.

Theory of human caring. Jean Watson is a nurse theorist and nursing professor internationally recognized for her work in the field of nursing and for her subsequent development of human caring theory. Watson's theory focuses on the importance of the relationship between caregivers and patients. A primary core concept of her theory is "relational caring for self and others based on a moral/ethical/philosophical foundation of love and values" (Watson Caring Science Institute, 2010, para. 2). Watson believes that providing care for patient goes beyond having many nursing skills and a job description. Watson's theory was originally based on 10 "caring factors," which subsequently evolved to become 10 *caritas* (i.e., love of human kind) processes; Watson's more developed theory added a spiritual dimension of care. This author chose the theory of human caring to guide nursing practice because the theory asserts that caring is an important healing source. Furthermore, the 10 caring factors (i.e., *caritas* processes) provide a guide for creating the healing environment that is essential to the multimodal *Sleep Menu* initiative.

Eight-step change model. The 8-step change model was developed by John Kotter, a Harvard Business School professor, and distinguished leadership and change expert (Nelson, Batalden, & Godfrey, 2007). The model's eight steps are to create urgency, form a guiding

coalition, create a vision, communicate the vision, empower people, create short-term wins, build on the change, and anchor the changes. The model's steps are further divided into three phases. The first phase (steps 1–3) is creation of a climate of change. The second phase (steps 4–6) entails engaging and enabling the whole organization. Lastly, the third phase (steps 7–8) involves implementing and sustaining the change. This author found Kotter's change model to be an easy step-by-step guide to apply to the initiative. Furthermore, the model focuses on preparing for and accepting change—rather than on the actual change itself. Utilizing this change model in developing and implementing the *Sleep Menu* initiative will help employees to support and promote the changes and make it successful.

Plan-Do-Study-Act cycle. The plan-do-study-act (PDSA) cycle is a part of the Institute for Healthcare Improvement's model for improvement. The model is a simple, yet powerful tool for testing changes on a small scale and delivers quick results. The *Plan phase* involves developing the objective of the test, predicting results and planning how to test the change. The *Do phase* refers to carrying out the test, observe and document problems. The *Study phase* includes analyzing and comparing results to predictions and summarizing learning. In the *Act phase*, modifications are identified and a plan for the next test is prepared. Once a quality improvement initiative is implemented, application of the principles of the PDSA cycle are applied in order to improve the process and to determine whether the changes lead to improvement. Furthermore, the benefit of the PDSA cycle is that it can be restarted with a different plan to improve changes if it failed to achieve the desired results.

Specific Project Aim

The specific aim of the quality improvement project is to improve the percentage of patients in a telemetry unit who will report receiving 5 or more hours of uninterrupted sleep from

a baseline of 30% to 50% by September 2018; all patients in the study will be monitored by telemetry.

Global Aim

To decrease noise at night, promote staff engagement, and improve patient care experience score as measured by HCAHPS; specifically, the project's global aim is to improve the patient care experience score from a recent Summary Star Rating score of 1 to a score of 3 by December 2018.

Methods

Context

In order to understand the interaction of health care professionals and patients with the current processes in the telemetry unit, a microsystem assessment was conducted. Also, to examine factors that can affect the implementation of the *Sleep Menu* initiative, a SWOT analysis was also performed. Lastly, to determine the benefits and costs of the initiative, a return on investment was conducted. The following discussion is the summary of key findings.

Microsystem assessment. Prior to implementing an organizational-wide initiative, the proposed multimodal *Sleep Menu* initiative was tested in the telemetry unit; as previously mentioned, all patients participating in the study were monitored by telemetry. A telemetry unit is a "microsystem", a small group of people working together to provide direct care to one specific group of patients. A hospital comprises different microsystems that collaborate with each other to simultaneously achieve their various purposes. Interventions in each microsystem are required to improve a hospital's performance. As suggested by Nelson, Batalden, & Godfrey (2007), use of the Dartmouth Microsystem Assessment Tool (see Appendix F) to assess the

microsystem enabled the author to understand the current system and processes, identify flaws in the existing care practices related to providing a quiet environment and align the initiative with the organizational goals to improve outcomes of care.

Purpose. The purpose of a telemetry unit is to provide holistic nursing care for patients before and after surgery and while patients are recovering from acute medical conditions. This care includes providing maximum patient comfort and safety such as restful sleep; such care results in fewer complications, faster recovery and healthier outcomes (Nelson, King, & Brodine, 2008).

Patients. The patient population varies from medical, surgical, burn, orthopedic, chemotherapy and bariatric patients as well as patients with multiple chronic conditions. The population age of these patients is from 19 years old to 76 years old and above; within this age range, older adults have the highest numbers of admission rates.

Professionals. The interprofessional team consists of one manager, six assistant nurse managers, multiple physicians, two laboratory technicians, two pharmacists, multiple patient care coordinators, one social worker, and the palliative care team. The patient–nurse ratio is 4:1. The teams' health care professionals are deeply compassionate and strive to meet each patient's unique needs by involving the patient and her or his family in the decision-making and developing care plans (Nelson, King, & Brodine, 2008).

Processes. The telemetry unit has interconnected work processes and shared information environment; accordingly, communication, coordination, and collaboration with other interprofessional teams are vital. However, in this unit, some processes need improvement. Notably, such process improvements have been hampered by the identified barriers of lack of staff effort and resistance to change. Patient perceptions are revealed through data gathered in

surveys completed by both patients and caregivers. Training and seminars are conducted to encourage interventions and to effectively implement improved processes.

Patterns. The members of the interprofessional team in the telemetry unit meet once a month. Assistant nurse managers also hold a separate monthly meeting. Prior to the beginning of every shift, a daily “huddle” with frontline staff is conducted for at least 10 minutes. This “huddle” provides an opportunity for staff to discuss emerging issues, identify necessary changes, and formulate solutions to identified problems (Yu, 2015). In addition, the monthly meeting allows the interprofessional team to celebrate accomplishments and to commend staff members for their hard work and accomplishments; this recognition augments morale and confidence to perform better in delivering quality care.

Strengths–Weaknesses–Opportunities–Threats analysis. A strength–weaknesses–opportunities–threats (SWOT) analysis was performed to examine the internal strengths and weaknesses of the telemetry unit and to analyze the possible external opportunities and threats that could impact implementation of the multimodal *Sleep Menu* initiative (see Appendix G).

The most substantial negative internal forces identified in the SWOT analysis were resistance to change and lack of staff engagement. Implementing changes can be challenging for senior nurses who are used to a particular practice. In addition, staff nurses may feel undervalued because they are not often involved in organizational meetings. As a result, staff nurses do not actively participate in change efforts. Without the support and compliance of nurses, the multimodal *Sleep Menu* initiative could not be effectively implemented. On the other hand, competent nurse leaders and investments in new technologies are internal forces that have a positive impact on the proposed initiative.

Collectively, the impact of external forces is more positive than negative. Technological advances have a significant positive effect on noise reduction. New strategies and services can help educate nurses and improve health care environment acoustics to optimize patients' comfort and healing, boost HCAHPS scores, and achieve full cost reimbursement. The potential benefits of a new or increased health care competition encourage nurse leaders to perform better and to focus more on delivering quality care experience.

In conclusion, the positive effects of the telemetry unit's strengths and opportunities were believed to exceed in consequence the negative effects of the weaknesses and threats that might hinder the implementation of the initiative.

Return on investment. Cost–benefit analysis is a useful method to analyze the benefits relative to the costs of a program or service (Penner, 2017). This analysis helps to identify the optimal size for projects or programs and can provide a framework for program evaluation or the financial analysis in a business plan (Penner, 2017).

The annualized expense associated with the *Sleep Menu* initiative—including personnel and non-personnel expenses cost \$18,646 for one year (see Appendix H). These costs included staff salaries and education, noise tracker equipment, quiet-at-night kit, and survey materials. The current annual hospital reimbursement benefit resulting from one improved HCAHPS score equates to \$25,000 (internal estimate from the hospital finance department). Subtracting the expenses, yields a net benefit of \$6,354 annually (see Appendix H). Clearly, improvement initiatives that align with the HCAHPS measures underscores the value of targeted intervention such as the quiet-at-night.

Other related benefits represent improvements in the overall patient care experience. These anticipated improvements include sound sleep at night, which translates into faster

recovery, reduced length of hospital stays, and decreased hospital costs. A satisfied patient is inclined to have a higher HCAHPS score and to refer the hospital to other patients. Improved HCAHPS scores increase reimbursement rates, and more patient referrals increase revenue. Thus, increasing the hospital's reputation and recognition are more attractive to the public. This return of investment (ROI) suggests that the holistic *Sleep Menu* initiative offers value to the patients and organization.

Intervention

The development of the multimodal *Sleep Menu* initiative started from meeting the stakeholders, who consisted of the Patient Care Service (PCS) director, Patient Care Experience director, unit manager, Environmental Service (EVS) director, assistant nurse manager (ANM), house supervisor, and staff nurses. The meetings purpose was to define the topic and to establish the aim statement and measures. The author performed a microsystem assessment and SWOT analysis in the telemetry unit. The author collected and presented baseline data with the unit council and developed the following plan:

1. Staff education and engagement about *Sleep Menu* initiative.
2. Implementation of the *Sleep Menu* intervention including:
  - a. keeping the door closed;
  - b. dimming of the lights;
  - c. providing earplugs; and
  - d. provision of eye masks.
3. Decrease noise at night and provide a sound nighttime sleep to patients by reducing the non-essential activities such as vitals and lab draw between 9:00 p.m.–6:00 a.m. quiet times.

4. Conduct authentic hourly rounding and increase patient engagement.

Study of Intervention

The focus of this quality improvement project was the implementation of *Sleep Menu* initiative. This initiative required nurses to change their perception of noise, their behavior with regard to noise, and many aspects of their work routine to provide quiet hours for patients. The efforts to implement changes were facilitated by staff education and engagement, authentic hourly rounding, introducing the *Sleep Menu* itself, and consequent environmental noise mitigation.

The CNL served as an educator for both patients and other health care professionals under his supervision (American Association of Colleges of Nursing [AACN], 2007). The CNL provided education programs and used health related information to modify nursing care to improve health care outcomes. In order for the health care staff to understand the deleterious effects of noise to patients' outcomes and the importance of noise control, it was necessary to conduct staff education and engagement to raise awareness (Murphy, Bernardo, & Dalton, 2013). This knowledge helped staff to determine the source of noise that was negatively affecting patients and initiated a way to reduce the noise or improve the environment. The author conducted a staff education with the unit champion and enforced use of the teach-back method to ensure that every staff member understood the education. The same education and method were conducted by the unit champion to other involved health care staff members.

Authentic hourly rounding was one of the essential parts of the multimodal *Sleep Menu* initiative. Rounding enabled nurse leaders to gather useful information from patients and let them know about the organizational goal of providing uninterrupted sleep at night (Wilson et al., 2017). Engaging with patients during leadership rounding provided reassurance that their health

care needs would be met; this reassurance reduced patients' anxiety and helped them sleep at night. During the rounds, nurse leaders used a survey to ascertain patients' perception of noise and their feedback from the previous night shift. In addition, the nurse leaders made ensured 100% compliance from staff with the *Sleep Menu* initiative. The information obtained from rounding will be used to reduce hospital noise and to monitor the progress of the multimodal *Sleep Menu*'s components.

As an advocate, the CNL kept patients well informed about their health and the interventions to promote health (AACN, 2007). The CNL communicated effectively with the team to assess patients' unique needs and to include them in redesigning care plans with their preferences.

Being a clinician and an outcomes manager, the CNL used evidence-based information to identify effective nursing interventions and change practices to impact outcomes of care (AACN, 2007). A quiet-at-night *Sleep Menu* was provided to patients to choose their preferences in keeping their room quiet at night. The *Sleep Menu* offered earplugs, eye masks, and a do-not-disturb door sign. The *Sleep Menu* also indicated the specified time for quiet at night—9:00 p.m. to 6:00 a.m. During the education sessions, staff members and others were encouraged that, during the quiet hours, they should speak quietly and move as quietly as possible. The *Sleep Menu* also included other interventions to choose from, such as keeping the doors closed and turning the lights off. In accordance with specified quiet hours, nurses limited non-essential patient care activities (e.g., vitals sign and lab draw between 9:00 p.m. to 6:00 a.m.) to avoid sleep disturbance. These multiple interventions helped decrease the noise, provided comfort to patients and eventually improved their sleep hours.

For patients, a quiet environment promotes rest, higher quality of sleep, and faster healing (McGough et al., 2018). However, in a hospital, completely eliminating noise is impossible. Indeed, noise is a constant and ubiquitous feature of a clinical environment, given the requirements for conversations, care activities, and the use of medical equipment and communication devices. Environmental noise mitigation is necessary to reduce or control the noise.

In the *Sleep Menu* intervention, improving the environment included posting visual reminders for the staffs and visitors to be quiet at night. During quiet hours, lights were dimmed in hallways, and staff members were asked to lower the volume of their cell phones and other communication devices. Simple changes in the environment included, for example, fixing noisy doors and replacing squeaky wheels. In addition, the possibility of investing in soundproof or sound-absorbing materials and the utilization of “white” noise (i.e., noise comprising sounds of many frequencies) is being explored. As a leader–team manager, the CNL was able to manage and ensure the compliance of team members (AACN, 2007). The CNL collaborated with team members in modifying nursing practices and interventions to improve patient care outcomes.

Measures

In order to achieve stable growth and improvement, health care organizations constantly strive to identify the most important measurements to use. Three types of quality measures—outcome, process and balance—can be used to assess and compare the quality of health care organization. *Outcome measures* refer to the impact of a health care service on the health status of patients. It is usually the quality and cost target of improvement projects. *Process measures* indicate the steps or action taken by the health care provider to lead in a specific outcome metric. *Balance*

measures are metrics used to ensure that an improvement in one area is not negatively affecting another area.

Family of measures. Timely patient feedback was collected through a survey to evaluate the effectiveness of the intervention and improvements. The outcome measure was determined by a patient survey administered pre- and post-intervention. The survey contained four items that asked patients about (a) the number of hours they slept, (b) causes of disruption, (c) whether the unit was kept quiet during a patient's overall stay, and (d) the source(s) of noise; the survey also asked participants for their suggestions regarding noise reduction at night (see Appendix I). The process measure included adherence to the small test of change; patient perception of noise was determined during authentic hourly rounding and patient survey. Balancing outcome measures would be determined by the staff satisfaction.

Ethical Considerations

The project was reviewed by faculty and was determined to qualify as an evidence-based change-in-practice project, rather than as a research project. Institutional review board (IRB) review was not required. The author observed the ethical guidelines in the development and proposal of this project; such guidelines pertained to plagiarism, informed consent, misconduct, data falsification, and redundancy. The author also considered ethical responsibilities involved in developing and implementing nursing interventions. Thus, this project was aligned with the American Nurses Association *Code of Ethics for Nurses*, with Provisions 2, 4, 6 and 7. Provision 2 states that a patient is a nurse's priority (Olson & Stokes, 2016). As stated earlier, the aim of the multimodal *Sleep Menu* initiative was to provide a quiet hospital environment conducive to undisturbed night sleep for patients. Provision 4 states that it is a nurse's responsibility to make the decisions and to make efforts to provide patients with the best possible care (Olson & Stokes,

2016). The author recognized the need to rectify extant problems associated with excessive noise and therefore attempted to improve patient outcomes and to meet health care organizational priorities. Provision 6 states that a nurse (with the collaboration of other health professionals) should maintain and improve the ethical work environment (Olson & Stokes, 2016). The initiative involved educating staff members about the effects of noise and engaged staff in improving nursing practice supportive of maintaining a quiet environment in accordance with the patients' preferences. Lastly, Provision 7 states that a nurse should continue to grow professionally by studying evidence-based researches, incorporating best practices, and learning updated health care standards and policies (Olson & Stokes, 2016). The author had the opportunity to lead a change, work with other professionals, and improve as a nurse leader by researching and applying evidence-based practice into the initiative.

Results

After the implementation of the *Sleep Menu* initiative, post-intervention survey results were compared with the data gathered from pre-intervention survey. Results showed a significant improvement in the patients' perception of noise and increased numbers of hours of sleep.

Outcome Measure Results

Fifty-nine patients completed the pre-intervention survey, and 174 patients completed the post-intervention survey ($N = 233$). Some of the patients who completed the pre-intervention survey were not able to complete the post-intervention survey because they were discharged from the hospital. Thus, pre-post data collection from the same set of patients was not possible. Confused and non-verbal patients were excluded. An independent samples *t*-test (also known as unpaired *t*-test) was used to test, analyze, and compare the statistical difference between the

means of the two groups—specifically, to determine the average hours of sleep between pre- and post-intervention.

Initial test using the *Sleep Menu*. Prior to the implementation of the *Sleep Menu* intervention, 25% of the participants ($n = 15$) reported had 2 hours of sleep and 39% ($n = 23$) had 3 hours. In addition, 5% ($n = 3$) had 4 hours of sleep, 19% ($n = 11$) had 5 hours, and 12% ($n = 7$) had 7 hours of sleep. However, the post-intervention survey showed patients had a significant difference in the hours of sleep. A 9% ($n = 15$) reported had 2 hours of sleep, and 4% ($n = 7$) had 3 hours of sleep—a significant improvement from the pre-intervention condition. Also, 7% ($n = 12$) reported having 4 hours of sleep; 25% ($n = 44$), 5 hours; 12% ($n = 21$), 6 hours; 34% ($n = 60$), 7 hours; and 9% ($n = 15$), 8 hours of sleep (see Appendix J). Overall, the *Sleep Menu* and the quiet- at- night intervention showed a statistically significant difference in the hours of sleep pre- vs. post-intervention and results of the test revealed a ($p \leq .001$), which provides strong evidence that the difference is highly significant.

Baseline and post-intervention data on sleep disruption. Factors that caused sleep disruption were considered and used to determine whether the difference in sleep was independent of those other factors. The pre-intervention survey results revealed that 29% ($n = 17$) complained about vitals, 7% ($n = 4$) complained about lab draws, 17% ($n = 10$) complained about staff conversation, and 47.5% ($n = 28$) complained about other issues (e.g., health condition, bathroom breaks, and equipment noise). After the implementation, the percentage for each disruption decreased 10% ($n = 17$) complained about vitals, 2% ($n = 3$) complained about laboratory draws, 7% ($n = 13$) complained about staff conversation, and 16% ($n = 28$) complained about other issues. Also, 65% ($n = 113$) reported that they did not experience any sleep disruption and were satisfied with their quiet night and care (see Appendix K). The test

resulted in a ($p \leq .001$) as well, indicating that there is a significantly greater number of hours of sleep and less disruption post-*Sleep Menu* and quiet-at-night interventions implementation.

Percentage of patients who reported sleeping 5 or more hours. The numbers of sleep hours from pre- to post-intervention were plotted in a run chart to monitor the average number of sleep hours and determine whether the specific aim of this project—50% of patients will report 5 or more hours of uninterrupted sleep—was achieved. The pre-intervention survey resulted to 30.5% ($n = 18$) of patients who self-reported that they had 5 or more hours of uninterrupted sleep and 69.5% ($n = 41$) had less than 5 hours of sleep. Patients also complained about sleep disruption and the hospital's not being quiet at night. However, post-intervention survey results yielded more than twice as many patients who self-reported that they had 5 or more hours of uninterrupted sleep, with 80% ($n = 139$) and decrease in patients who had less than 5 hours of sleep with 20% ($n = 35$) (see Appendix L). Notably, there was a low average number of hours of sleep and low percentage of patients who had 5 or more hours of sleep in the post-intervention survey at the beginning of the project (see Appendices L and M) and patients complained that it was noisy and many disruptions. This is because staff nurses who worked that night were float nurses and they were not informed and educated about the intervention.

Averages sleep hours pre-and post-intervention. The results show that the average number of hours of sleep indicated by the post-intervention group ($n = 174$) was 5.6 hours; in comparison, the pre-intervention group ($n = 59$) reported an average of 3.6 hours of sleep (see Appendix M).

The initiative was made possible by engaging the entire interprofessional team. Staff members were encouraged to share their ideas, and as a result, they responded enthusiastically in planning and designing the interventional components of the noise-reduction initiative. This staff

engagement improved staff's performance and satisfaction. The team ensured the full compliance of nurses and other staff members by conducting a meeting and asking feedback from patients during leadership rounding. The team also helped other nurses who were newly assigned to the unit to incorporate quiet at night interventions into their daily work routine.

The positive outcomes of the implementation of the components of the *Sleep Menu* initiative were expected, but further improvement is still certainly possible. The team hopes that this project will be improved and sustained.

Considering the significant differences between pre- and post-intervention of the *Sleep Menu*, the initiative's effectiveness will still be measured by the HCAHPS score. In order for the initiative to be considered truly effective, the goal of improving the HCAHPS's Quiet at Night score from 1 to 3 must be achieved. While waiting for the next administration of the HCAHPS survey—which is conducted quarterly—the team will continue to monitor progress, evaluate results, and improve interventions as appropriate in order to improve the likelihood of the hospital's receiving a higher overall HCAHPS score.

Discussion

Introducing and implementing *Sleep Menu* and implementing quiet-at-night has been beneficial to the host hospital. As mentioned earlier, prior to the implementation, staff assessment had ascertained that team members lacked education about noise reduction and were resistant to change. Also, because patients were not satisfied with their hospital stay, the hospital had received a poor rating on HCAHPS Quiet at Night score. The staffs' lack of education and engagement and patient poor care experience changed within a period of a few months when the *Sleep Menu* practice change project was initiated. Staff members understood the need to ameliorate the problems associated with excessive noise, they became more satisfied with their

work, and they were able to adopt changes. In adopting the initiative's recommendations, staff members have collaborated and supported the individual planned interventions and positively changed relevant behaviors and work routines. Patients, who were able to get enough sleep hours without interruption, expressed appreciation for the team's efforts to improve their quiet at night experience. Patients supported the initiative by consenting to surveys, offering suggestions, and commending staff members for their work. Patients' positive, expressed recognition created an amicable work environment—a development that has been, advantageous both to patients and to staff members.

The noise-reduction strategies and development of component interventions were in accordance with the evidenced-based projects in the reviewed literature. However, this project did not include measuring the decibels levels, establishing auditory standards in purchasing medical equipment, and considering the use of soundproof materials like the interventions suggested by literature. On the other hand, the positive impacts of the interventions were expected to be similar to the results of the improvement projects reported in the literature. Raising staff members' awareness of the problems associated with excessive noise, promoting staff engagement, and designing simple but effective interventions are helpful solutions for reducing noise at night and improving the patient care experience (Applebaum, Calo, & Neville, 2016; Connor & Ortiz, 2009; Hsu et al., 2012; Mazer, 2006; Murphy, Bernardo, & Dalton, 2013; Wilson et al., 2017).

Summary

Noise is pervasive in the health care setting. Excessive noise is linked to sleep disturbances and, for patients, to negative reactions that jeopardize the patients' health outcomes.

Controlling—and, as is often necessary, reducing— noise levels in the hospital is necessary for the provision of a healing environment for patients to improve their health outcomes and overall experience during their hospital stay. In planning the *Sleep Menu* initiative, conducting a microsystem assessment and literature review provided useful insights and realistic expectations. Also, researching conceptual frameworks helped guide and identify the best practices and approach that can be adopted in implementing changes. Staff education, authentic hourly rounding, the *Sleep Menu* intervention, and environmental mitigation are effective interventions to provide a quiet environment and improve patient uninterrupted sleep hours. Patient engagement promotes trust between patients and the health care professionals; this trust in turn leads to improved health outcomes. The CNL as an outcome’s manager, team leader, educator, and advocate is capable of administering a quality improvement project and leading organizational change.

Key Findings

The initiative’s data revealed that, after the *Sleep Menu* interventions, both the quality and quantity of patients’ sleep improved markedly. In addition, favorable responses were obtained from the patients’ survey and data. Notably, the data revealed a considerable increase in patients’ level of satisfaction with the hours of sleep and quiet at night. The intervention also improved staff members’ level of satisfaction and reduced stress in the environment. The percentage of causes of sleep disruption decreased; indeed, a large number of patients reported that they experienced no sleep disruption. The project’s specific aim—that by September 2018, 50% of the patients in the telemetry unit would report 5 or more uninterrupted sleep hours—was achieved.

Lessons Learned

Small changes in the environment and care practices can make a big difference not only for patients but also for nurses, other staff members, and the organization. Simple interventions to reduce noise can help meet patients' health care and comfort needs. Patients' satisfaction is influenced by their care experience. Thus, in order to improve their satisfaction, patients' perception of noise and preferences at night should be considered—and effective interventions must be developed and implemented. This recommendation applies to staff members as well. By encouraging them to share their insights and ideas, it will increase their satisfaction and improve their work performance. Change cannot be achieved in an instant. A quality improvement project takes time and effective communication. Collaboration with the team and with other health care professionals and administering a culture of continuous learning are necessary in order for an organization to achieve a long-term success.

Limitations

The *Sleep Menu* quality improvement project was implemented only in a telemetry unit of a single acute care community hospital. Accordingly, the generalizability of the project's findings and conclusions to other types of nursing units and hospitals is limited. Another project limitation is that the amount of sleep time was self-reported and therefore subject to bias—such as bias in the form of patients' providing overly positive responses to avoid being judged negatively. Differences in patients' ages, genders, type of rooms, and proximity to nursing stations may have also influenced their responses and may also be an additional source of bias. The project's method of survey presented another limitation. Because patients were typically discharged in a short period of time, having the same patients respond to both the pre-intervention survey and the post-intervention survey was not possible; hence, the patients who completed the pre-intervention survey were different from the patients who completed the post-

intervention survey. Moreover, during and following the *Sleep Menu* initiative, some patients voiced complaints about sleep disruption (e.g., from nighttime staff conversations). Despite efforts made before and during the initiative to increase staff members' acceptance of change, some of the staff members might have been reluctant to change and, as a result, were negligent in implementing the *Sleep Menu* intervention. Other staff members, whose satisfaction increased, may have felt more positive because of their (the staff members') contribution to the project. The data from the HCAHPS survey are not yet available because the survey is conducted quarterly. Furthermore, this project report provides no data with regard to the relationship between the project's cost and benefits.

Key Success Factors

The Sleep Menu initiative is nascent, and its initial success was not without challenges. The most crucial contributors to the initiative's initial success were staff education and engagement. Raising awareness about noise motivated nurses and other staff members to act by sharing their experiences and by offering useful ideas to develop interventions. The unit champion performed a key role in three ways: (a) behaviorally, by modeling the appropriate behaviors and care practices; (b) cognitively, by educating staff members; and (c) affectively, by providing staff members with encouragement and other affective support. Informing patients and their families about the initiative may have been a contributing factor in the patients' increased satisfaction with care experience. Sharing the goals with the staff members encouraged them to welcome changes. Collectively, these methods and approaches promoted staff unity with regards to ameliorating the factors that contribute to excessive noise levels and, more generally, in achieving a common goal. The support of the senior leaders and the management was also essential in conducting the initiative and its component interventions.

Conclusions

Usefulness of the Work

This 3-month quality initiative served to introduce a culture of continuous improvement and patient-centered care within a busy, noisy telemetry unit. The CNL fostered team engagement and stimulated the momentum and enthusiasm to deliver results that exceeded the expectations of both the team and the hospital's leadership. To elicit specific patient-centered choices for reducing noise at night, the evidence-based *Sleep Menu* was customized for each patient on admission. The project demonstrated a practical approach for implementing short-term quiet-at-night interventions that may potentially improve long-term HCAHPS patient satisfaction and care experience scores. In conclusion, both patient and staff satisfaction improved as a result of the project's holistic *Sleep Menu* intervention. Notably, patients increased the number of self-reported hours of sleep—from an average of 3.6 hours per night to 5.6 hours; furthermore, this improvement was maintained for at least 4 weeks. The positive results of this improvement project stemmed from effective engagement of three key roles: unit-based champions, front line staff, and the patients.

Sustainability and Potential for Spread

To ensure sustainability, the self-reported hours of sleep data will be monitored by unit champions on a daily, weekly, and monthly basis to assess success factors, barriers and results on all shifts prior to developing a spread plan to implement use of the *Sleep Menu* checklist on other units. The sustainability and spread plan will be developed by unit management in collaboration with the CNL, quality nurse consultant, physician quality leader, and the interdisciplinary unit-based Quiet-at-Night Committee.

Implications for Practice

Clearly, a quiet environment can increase the number of sleep hours for patients and can create a less stressful work environment for front line nurses and ancillary staff. For unit-based improvement projects such as the *Sleep Menu* initiative described in this paper, it is essential that the CNL obtain support from front line staff and from leaders and management who collectively view noise reduction as a high priority. Given the numerous benefits that noise reduction initiatives can confer both to patients and to the organization, the *Sleep Menu* can potentially improve both patient and organizational outcomes.

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Appendix A

CNL Project: Statement of Non-Research Determination Form

Student Name: Christian Karl Antonio

Title of Project: Improving the Patient Care Experience and Outcomes with multimodal Quiet-at-Night Initiatives.

Brief Description of Project:

A) Aim Statement: The aim of this project is 50% of the patients in a telemetry will report 5 or more uninterrupted sleep hours by September 2018.

B) Description of Intervention: This project describes a multimodal *Sleep Menu* initiative on one unit designed to ensure noise reduction and promote a quiet hospital healing environment, with the goal of improving the patient care experience and outcomes. The quiet-at-night committee will develop a plan to promote quiet-at-night, which includes authentic leadership rounding, staff education, a nighttime sleep promotion cart, and patient involvement with patient's preference for quiet at night and use visual aids and harness of simple technology to remind staff to be quiet at night.

C) How will this intervention change practice? The multimodal *Sleep Menu* initiative may improve patient satisfaction and outcomes related to noise at night. Increase in patient satisfaction scores. Improve and promote effective communication and collaboration within the interprofessional team. Promote patients' engagement. Boost the staff nurse's moral, satisfaction and teamwork. Create a healthy and healing environment.

D) Outcome measurements: 50% of the patients will report 5 or more uninterrupted sleep hours.

Process Outcome: Compliance with the quiet at night initiatives. Authentic hourly rounding: quietness of hospitals

Balancing Outcome: RN staff's satisfaction.

To qualify as an Evidence-based Change in Practice Project, rather than a Research Project, the criteria outlined in federal guidelines will be used: (<http://answers.hhs.gov/ohrp/categories/1569>)

☐ This project meets the guidelines for an Evidence-based Change in Practice Project as outlined in the Project Checklist (attached). Student may proceed with implementation.

☐ This project involves research with human subjects and must be submitted for IRB approval before project activity can commence.

Comments:

EVIDENCE-BASED CHANGE OF PRACTICE PROJECT CHECKLIST *

Instructions: Answer YES or NO to each of the following statements:

Project Title: Improving the Patient Care Experience with Multimodal Quiet at Night Initiatives.	YES	NO
The aim of the project is to improve the process or delivery of care with established/ accepted standards, or to implement evidence-based change. There is no intention of using the data for research purposes.	YES	
The specific aim is to improve performance on a specific service or program and is a part of usual care . ALL participants will receive standard of care.	YES	
The project is NOT designed to follow a research design, e.g., hypothesis testing or group comparison, randomization, control groups, prospective comparison groups, cross-sectional, case control). The project does NOT follow a protocol that overrides clinical decision-making.	YES	
The project involves implementation of established and tested quality standards and/or systematic monitoring, assessment or evaluation of the organization to ensure that existing quality standards are being met. The project does NOT develop paradigms or untested methods or new untested standards.	YES	
The project involves implementation of care practices and interventions that are consensus-based or evidence-based. The project does NOT seek to test an intervention that is beyond current science and experience.	YES	
The project is conducted by staff where the project will take place and involves staff members who are working at an agency that has an agreement with USF SONHP.	YES	
The project has NO funding from federal agencies or research-focused organizations and is not receiving funding for implementation research.	YES	
The agency or clinical practice unit agrees that this is a project that will be implemented to improve the process or delivery of care, i.e., not a personal research project that is dependent upon the voluntary participation of colleagues, students and/ or patients.	YES	
If there is an intent to, or possibility of publishing your work, you and supervising faculty and the agency oversight committee are comfortable with the following statement in your methods section: <i>“This project was undertaken as an Evidence-based change of practice project at X hospital</i>	YES	

<i>or agency and as such was not formally supervised by the Institutional Review Board.”</i>		

ANSWER KEY: If the answer to **ALL** of these items is yes, the project can be considered an Evidence-based activity that does NOT meet the definition of research. **IRB review is not required. Keep a copy of this checklist in your files.** If the answer to ANY of these questions is **NO**, you must submit for IRB approval.

*Adapted with permission of Elizabeth L. Hohmann, MD, Director and Chair, Partners Human Research Committee, Partners Health System, Boston, MA.

STUDENT NAME (Please print): Christian Karl Antonio

Signature of Student:

DATE_____

SUPERVISING FACULTY MEMBER NAME (Please print): Dr. Nancy Taquino

Signature of Supervising Faculty Member

DATE_____

Appendix B

Evaluation Table

Study	Design	Sample	Outcome/Feasibility	Evidence rating
Applebaum, D., Calo, O., & Neville, K. (2016). Implementation of quiet time for noise reduction on a medical–surgical unit. <i>Journal of Nursing Administration</i> , 46(12), 669-674. doi:10.1097/NNA.0000000000000424.	Non-Experimental (Descriptive Comparative).	80 patients in a medical surgical unit. 40 patients who were hospitalized before the nurse-led intervention was used. 40 patients hospitalized after the nurse-led intervention was implemented.	This is an evidence-based project that explores patient perceptions of noise in the acute care setting and it determines the efficacy of a quiet time nurse-led intervention on noise reduction. Useful for promoting staff engagement and teamwork. Designing and implementing interventions in regards with hospital noise.	L III A
Wilson, C., Whiteman, K., Swanson-Biearman, B., & LaBarba, J. (2017). Improving the patient's experience with a multimodal quiet at night initiative. <i>Journal of Nursing Care Quality</i> , 32(2), 134-140. doi:10.1097/NCQ.0000000000000219.	Quality Improvement.	2 hospital units from a 350-bed acute care hospital. Patients from the medical	It describes a multimodal noise reduction program/ intervention designed to ensure a quiet hospital environment, with a	L V A

		oncology unit and medical–surgical unit.	goal of improving patient satisfaction or patient care experience. Useful in developing and implementing quiet at night interventions.	
Murphy, G., Bernardo, A., & Dalton, J. (2013). Quiet at night: Implementing a nightingale principle. <i>The American Journal of Nursing</i> , 113(12), 43-51. doi:10.1097/NCQ.0000000000000219.	Quality Improvement.	None	It illustrates the use of noise reduction strategies to provide patients a sound night's sleep. It also shows how many small changes in care practices and environment can have a cumulative effect that promotes rest, sleep, and healing. This initiative also includes the importance of involving all members of the team in the improvement effort, as well as departments that provide support and services on the unit, and patients and family members. Useful for promoting staff	L V A

			engagement and teamwork. Promoting patient-centered care and implementing interventions.	
Hsu, T., Ryherd, E. E., Waye, K. P., & Ackerman, J. (2012). Noise pollution in hospitals: Impact on patients. <i>Journal of Clinical Outcomes Management</i> , 19(7), 301-309. Retrieved from http://www.turner-white.com/pdf/jcom_jul12_noise.pdf .	Literature Review.	None	This review reveals that hospital noise is a serious issue linked to several potential negative reactions in patients. Alertness, mood, coping abilities, healing time, and length of stay are just a few of the potential impacts of patient sleep disturbance. Patient sleep has been shown to be negatively affected by the sound environment. Useful in developing guidelines for developing evidence-based interventions regarding hospital noise.	L V A
Connor, A., & Ortiz, E. (2009). Staff solutions for noise reduction in the workplace. <i>The Permanente Journal</i> , 13(4), 23. Retrieved from https://www.ncbi.nlm.nih.gov/pmc/articles/PMC 2911833/ .	Quality Improvement.	None	This highlights the importance and value of staff members, patient and family and other discipline's	L V A

			engagement to achieve the goal of noise reduction. It also describes the success of noise reduction intervention introduced by the staff members. It gives importance to even small changes made to decrease noise levels can affect patient well-being and improve their satisfaction level. Useful in promoting the importance of staff engagement and patient centered care.	
Mazer, S. E. (2012). Creating a culture of safety: Reducing hospital noise. <i>Biomedical Instrumentation & Technology</i>, 46(5), 350-355. doi:10.2345/0899-8205-46.5.350.	Expert Opinion.	None	This describes creating a therapeutic environment of care requires participation and skills from all departments. A culture of quiet is one that is in balance with all hospital activity and that contributes to comfort and care for the patient and family.	L V B

			Useful in redesigning patient care in regards with reducing hospital noise.	

Note: Adopted from the Johns Hopkins Nursing Evidenced-Based Practice Appraisal Tool (n.d.).

Key findings of the literature support using a multimodal intervention and staff ad patient engagement.

Appendix C

Project Charter

Project Charter: Improving the Patient Care Experience and Outcomes with Multimodal Quiet at Night Initiatives.

Global Aim: To decrease noise at night, promote staff engagement and improve patient care experience score as measured by HCAHPS from a Summary Star Rating score of 1 to 3 by December 2018.

Specific Aim: The aim of this project is 50% of the patients in a telemetry unit will report 5 or more uninterrupted sleep hours by September 2018.

Background: Sleep plays an extremely important role in a patient's recovery process. Research evidence proved that sleep allows the body to repair and restore itself resulting in faster healing. However, noise is pervasive in a hospital setting and it is the chief complaint of patients for disturbance and sleep deprivation. Noise is an unwanted sound that can cause auditory and non-auditory health effects (Basner et al., 2014). Hospital noises include loud conversations, alarms and beeping of machines, phones ringing and paging systems. Exposure to noises elicits negative responses from patients such as annoyance, anger, anxiety and stress that significantly add to the burden of illness (Basner et al., 2014). Noise also negatively affects nurses' and staffs' work performances as they get exhausted, burned out, and irritable (Mazer, 2006). These effects are detrimental to patients' health outcome. A number of studies have shown that establishing a quiet environment offers a healing atmosphere for patients. Applebaum, Calo & Neville (2016) suggested that educating nurse and staffs on reducing noise can help address noise problems and achieve a quieter and healing environment.

Table 1

Sponsors

Chief Nurse Executive	
Patient Care Service Director	
Unit Departmental Manager	
Care Experience Director	

Goals. Noise is the primary cause of sleep deprivation that can lead to negative responses and adverse health outcomes. The main sources of noise are from conversations and medical equipment in the care environment (Murphy, Bernardo & Dalton, 2013). Sleep supports healing. Providing a quieter environment through implementing noise reduction strategies is beneficial for the patients. The goals of the *Sleep Menu* initiative include

- increasing patient care experience score and patient outcomes.
- implementing multimodal quiet-at-night initiative.
- increasing staffs and patient engagement.

Table 2

Measures

Measure Outcome	Data Source	Target
50% of the patients will report 5 or more uninterrupted sleep hours.	Survey of patients from the <i>Sleep Menu</i> unit champion during rounding	50%
<i>Process</i>		

Hourly rounding: Quietness of hospital	# of positive Quiet Hospital survey	100%
Compliance with the <i>Sleep Menu</i> initiative	# of patients and staff nurse responses to survey	100%
<i>Balancing</i> Staff Satisfaction	# of staff nurses survey	100%

Table 3

Team

Clinical nurse leader/ Lead nurse	Christian Antonio
RN co-lead	
Unit staff nurse champions	
Patient care technician	
Patients	
Unit clerk	

References

- American Association of Colleges of Nursing (AACN). (2007). *AACN white paper on the education and role of the clinical nurse leader*. Retrieved from <http://cnlassociation.org/wp-content/pdf/ClinicalNurseLeader.pdf>
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Basner, M., Babisch, W., Davis, A., Brink, M., Clark, C., Janssen, S., & Stansfeld, S. (2014).

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Mazer, S. E. (2006). Increase patient safety by creating a quieter hospital environment.

Biomedical Instrumentation & Technology, 40(2), 145.

Murphy, G., Bernardo, A., & Dalton, J. (2013). Quiet at night: implementing a nightingale principle. *The American Journal of Nursing*, 113(12), 43-51.

Note: References for the Project Charter.

Measurement Strategy

Background (Global Aim): To decrease noise at night, promote staff engagement and improve patient care experience score as measured by HCAHPS from a Summary Star Rating score of 1 to 3 by September 2018.

Population Criteria. All Telemetry Inpatients.

Data Collection Method: The data will be obtained from patients' and nurses' surveys. The team will engage individuals from different departments to help develop noise reduction strategies. In addition, the team will identify and list down all the potential sources of noise to create a survey form and find out which source is the most troublesome for patients. A short satisfaction survey will also be created for nurse staffs to evaluate results. The results from the HCAHPS survey and short satisfaction surveys after the implementation of the quiet-at-night initiative will be compared to the collected baseline data to evaluate the strategies' effectiveness.

Table 4

Data Definitions

Data Element	Definition
<i>Hospital Consumer Assessment of Health care Providers and Systems (HCAHPS) Quiet at Night Survey</i>	A patient satisfaction survey required by the Centers for Medicare and Medicaid Services for all hospitals in the United States.

<i>Multimodal Sleep Menu Initiative</i>	A program to effectively reduce noise, promote sleep and improve patient experience to increase patient satisfaction.
<i>staff engagement</i>	The emotional commitment the employee has to the organization and its goal.
<i>staff satisfaction</i>	A measure of nurses' and staffs' if they are happy and contented and fulfilling their desires and needs at work.

Table 5

Measures Description

<i>Measure</i>	Measure Definition	Data Collection source	Goal
<i>HCAHPS Quiet-at-Night Score</i>	N= number of HCAHPS Survey with “ <i>always</i> ” response for hospital quietness. D= number of patients admitted	HCAHPS score Quarterly	3
<i>Staff nurse engagement</i>	N= number of staff survey D= total number of staff nurses on the unit	Questionnaire/Survey/ weekly	100%

<i>Percentage of leadership rounding on night shift</i>	N= number of positive Quiet Hospital response from patients D= number of patients admitted	Rounding questionnaire/ daily	100%
<i>Staff satisfaction</i>	N= number of staff survey D= total number of staff nurses on the unit	Staff Meeting Survey/ monthly	100%

Appendix D

Quiet-at-Night Driver Diagram

Note: Chart created by author and adapted from a Google template June 2018.

Appendix E

Timeline

Stages	Tasks	Months

		JUL 2018	AUG 2018	SEP 2018	OCT 2018	NOV 2018	DEC 2018
Planning	- Define topic with unit sponsor. - Establish aim statement and measures.						
Research	- Review previous and current HCAHPS score. - Perform microsystem assessment. - Conduct literature search						
Design	- Meet with unit council to create content of <i>Sleep Menu</i> initiative. - Select conceptual frameworks as guidelines (caring theory, Kotter's 8-steps change theory, and PDSA cycle). - Identify required resources. - Estimate project cost.						
Approval	Present proposed <i>Sleep Menu</i> initiative to PCS Director for approval of budget and implementation.						
Implementation	- Conduct meetings with DNM, ANM, Unit Champions and staff. - Pre-implementation Survey/leadership rounding - Staff education						
	- Implementing <i>Sleep Menu</i> initiative (keeping doors closed, dimming lights, providing ear plugs and eye masks and clustering non- essentials patient activities) - Leadership rounding - Patient education - Meeting with preceptor (monthly) - Data collection						
Presentation	- Class poster presentation - University poster presentation						

Note: Timeline created by author June 2018.

Appendix F

Inpatient Unit Profile

Inpatient Unit Profile									
A. Purpose: Why does your unit exist?									
Honors the whole person and family, respects individual values and choices, and ensures continuity of care.				Site Contact:			Date: March 16, 2018		
Administrative Director:				Nurse Director:			Medical Director:		
B. Know Your Patients: Take a close look into your unit, create a "high-level" picture of the PATIENT POPULATION that you serve. Who are they? What resources do they use? How do the patients view the care they receive?									
Est. Age Distribution of Pts:		%	List Your Top 10 Diagnoses/Conditions				Patient Satisfaction Scores		% Always
19-50 years		7.8 %	1. Sepsis		6. Acute Kidney Failure		Nurses		3
51-65 years		12.4 %	2. Stroke		7. Pneumonia		Doctors		3
66-75 years		11.2 %	3. Syncope		8. Surgery		Environment		1
76+ years		68.6 %	4. Heart Failure		9. Urinary Tract Infection		Pain		3
			5. Gastrointestinal Bleed		10. Hypertension		Discharge % Yes		3
% Females							Overall % Excellent		2.8 %
Living Situation		%	Point of Entry			Pt Population Census: Do these numbers change by season? (Y/N)			Y/N
Married			ED Admissions			Pt Census by Hour			Y
			Clinic			Pt Census by Day			Y
Live Alone			Others			Pt Census by Week			Y
Live with Others			Transfer			Pt Census by Year			Y
Skilled Nursing Facility			Discharge Disposition			30 Day Readmit Rate			Y
Nursing Home			Home			Our patients in Other Units			Y
Homeless			Home with Visiting Nurse			Off Service Patients on Our Unit			Y
Patient Type	LOS avg.	Range	Skilled Nursing Facility			Frequency of Inability to Admit Pt			Y
Medical	2.41		Other Hospital			*Complete "Through the Eyes of Your Patient", pg 8			
Surgical	2.64		Rehab Facility						
Mortality Rate	2.8		Transfer to ICU						

Inpatient Unit Profile							
C. Know Your Professionals: Use the following template to create a comprehensive picture of your unit. Who does what and when? Is the right person doing the right activity? Are roles being optimized? Are all roles who contribute to the patient experience listed?							
Current Staff	Day FTEs	Evening FTEs	Night FTEs	Weekend FTEs	Over-Time by Role	Admitting Medical Service	%
MD Total						Internal Medicine	72.4
Hospitalists Total						Hematology/Oncology	7
Unit Leader Total						Pulmonary	
CNSs Total						Family Practice	
RNs Total	7.5	7.5	6.5			ICU	
LPNs Total						Other (ed Observation)	20.6
LNAs Total						Supporting Diagnostic Departments	
Residents Total						(e.g. Respiratory, Lab, Cardiology, Pulmonary, Radiology) Lab, respiratory, IR, Cardiology/Pulmonary, Surgical OR	
Technicians Total (PCT)	3.5	3	2				
Secretaries Total							
Clinical Resource Cord.							
Social Worker							
Health Service Assts.							
Ancillary Staff (UA)	2	2	-				
Do you use Per Diems? ☒ Yes ☐ NO		Staff Satisfaction Scores					%
Do you use Travelers? ☒ Yes ☐ NO		How stressful is the unit?				% Not Satisfied	
Do you use On-Call Staff? ☒ Yes ☐ NO		Would you recommend it as a good place to work?				% Strongly Agree	
Do you use a Float Pool? ☒ Yes ☐ NO							
*Each staff member should complete the Personal Skills Assessment and "The Activity Survey", pgs. 10 - 12							
D. Know Your Processes: How do things get done in the microsystem? Who does what? What are the step-by-step processes? How long does the care process take? Where are the delays? What are the "between" microsystems hand-offs? NKE, AHV.MDR. Delays in admitting patients and discharging patients.							
1. Create flow charts of routine processes.		Do you use/initiate any of the following?		Capacity	# Rooms	# Beds	
a) Overall admission and treatment process		Check all that apply		41	41	41	
b) Admit to Inpatient Unit		x Standing Orders/Critical Pathways		# Turnovers/Bed/Year _____			
c) Usual Inpatient care		x Rapid Response Team		Linking Microsystems			
d) Change of shift process		x Bed Management Rounds		(e.g. ER, ICU, Skilled Nursing Facility)			
e) Discharge process		x Multidisciplinary/with Family Rounds		ED, ICU, TCU, Med surgical, orthopedics, Telemetry.medsurg, patient care coordinators, physicians, social work, and palliative care.			
f) Transfer to another facility process		☐ Midnight Rounds					
g) Medication Administration		☐ Preceptor/Charge Role					
h) Adverse event		x Discharge Goals					
2. Complete the Core and Supporting Process Assessment Tool, pg. 14							
E. Know Your Patterns: What patterns are present but not acknowledged in your microsystem? What is the leadership and social pattern? How often does the microsystem meet to discuss patient care? Are patients and families involved? What are your results and outcomes?							
• Does every member of the unit meet regularly as a team? Yes		• Do the members of the unit regularly review and discuss safety and reliability issues? Daily huddles, safety conversations.		• What have you successfully changed?			
• How frequently? once a month				• What are you most proud of? It's an alpha site. Lots of opportunity to enhance quality care.			
				• What is your financial picture?			
• What is the most significant pattern of variation?				*Complete "Metrics that Matter", pgs. 20 & 21			

Note: Table adapted from Dartmouth Microsystem Assessment Tool (Nelson, Batalden, & Godfrey, 2007).

Inpatient Unit Metrics That Matter			
Name of Measure	Definition & Data Owner	Current & Target Values	Action Plan & Process Owner
<i>General Metrics</i>			
HCAPS Rate		Current: 2.8 Target: 3.5	
Falls		Current: 30 Target: 0	Perform a fall debriefing after each fall, submit form in MJ's box at the staffing office Discuss patient fall at each huddle. Document on designated shift debrief tool as appropriate
Discharge by 3pm		Current: 52% Target: 56%	Ensure implementation and staff compliance to Patient Discharge Workflow algorithm Ensure access to SSF Next Day Discharge Projections (Tuck in Tool)
Improve HCAHPS at Quiet-at-night score to ≥ 4		Current: 1 Target: 4	Ensure staff provide Quiet-at-night bag on admission Message at shift huddle: remind/encourage patient to use

			quiet-at-night bag. (available on nightstand) Charting in room, face to face with patient vs. sitting at desk Assure lights are dimmed and when they aren't, call engineering Overhead page is done, if not call the operator
ED to Floor within 60minutes		Current: 60% Target: 80%	Ensure implementation and staff compliance to applicable elements of ED to Floor algorithm Remind staff to call ED/PACU for report 15 minutes from notification of admission Coaching for excellence of staff as appropriate
Improve HCAHPS at Cleanliness of Room score to ≥ 4		Current: 1 Target: 4	Perform a quick sweep of unit at unit rounding to observe for cleanliness/clutter At leadership rounding, check patient room for cleanliness, and free of clutter (nigh stand, window sill). Notify RN or PCT

			Notify EVS if trash bins are 2/3 full

Note: Table adopted from Dartmouth Microsystem Assessment Tool (Nelson, Batalden, & Godfrey, 2007).

Appendix G

Strengths-Weaknesses-Opportunities-Threats (SWOT) Analysis

Note: Chart created by author June 2018.

Appendix H

Project Expenses and Cost-Benefit Analysis

COST BENEFIT ANALYSIS			
HOSPITAL MEASURE			ANNUAL REIMBURSEMENT
QUIET AT NIGHT			\$25,000.00
IMPROVEMENT COST			
PERSONAL EXPENSES	NUMBER OF STAFF	HOURLY RATE +.3 Benefits	ANNUAL COST (30mins x1 class sessions)
REGISTERED NURSES	20	\$104	\$12,480.00
PATIENT CARE TECHNICIAN	2	\$39	\$468.00
UNIT ASSISTANT	2	\$39	\$468.00
NON-PERSONAL EXPENSES	NUMBER OF ITEM	COST	ANNUAL COST
NOISE TRACKER EQUIPMENT	7	\$40	\$280.00
QUIET AT NIGHT KIT	100	\$4	\$4,800.00
EDUCATIONAL MATERIAL		\$100	\$100.00
STAFF SURVEY		\$50	\$50.00
TOTAL EXPENSES			\$18,646.00
PROJECT SAVINGS/NET BENEFIT (Annual Reimbursement- Total Expenses)			\$6,354.00

Note: Chart created by author August 2018 based on the internal financial data computation of HCAHPS metrics and annual reimbursement.

Appendix I

Daily Patient “Quiet at Night” Feedback Form

1. During your hospital stay, how many hours of sleep did you have without disruption? (Check One)

- ☐ 1-2 hours
- ☐ 3-5 hours
- ☐ 6-7 hours
- ☐ 8 and more
- ☐ Other (Please state):

Please state what caused the disruption:

2. During your overall stay, did the hospital keep your night quiet? (Check One)

- ☐ Yes
- ☐ No

3. If you answered NO to question #2, what caused the noisy night (Check all that apply)?

- ☐ Telephone noise
- ☐ Nursing staff conversation
- ☐ Sounds from transporting patient (Stretchers, etc.)
- ☐ Equipment sounds (alarms, beeping, etc.)
- ☐ TV sounds
- ☐ Other (Please state):

4. Please state any suggestion(s) on how we can make your night quiet:

Note: Self-report feedback form created by author June 2018.

Appendix J

Baseline and Post-Intervention Data

Note: Chart created by author September 2018. Test of change using the *Sleep Menu*.

Appendix K

Baseline and Initial Post-Intervention Data

Note: Chart created by author September 2018. Test of change using the *Sleep Menu*.

Percentage of patients who reported of 5 or more hours of sleep

	Jun 28 2018	Jul 02 2018	Jul 03 2018	Jul 04 2018	Jul 05 2018	Jul 06 2018	Jul 07 2018	Aug 30 2018	Aug 31 2018	Sep 01 2018	Sep 02 2018	Sep 03 2018	Sep 04 2018	Sep 05 2018	Sep 06 2018	Sep 07 2018	Sep 08 2018	Sep 09 2018	Sep 10 2018	Sep 11 2018	Sep 12 2018	Sep 13 2018	Sep 14 2018	Sep 16 2018	Sep 20 2018	Sep 21 2018	Sep 25 2018	Sep 26 2018	Sep 27 2018	Sep 28 2018	Sep 29 2018	Oct 02 2018	Oct 03 2018
5 or >	3	2	1	2	2	5	3	7	8	1	5	3	1	4	9	7	8	9	4	9	11	5	8	4	7	6	3	5	6	2	1	4	2
Count	9	10	9	7	7	9	8	8	8	6	6	3	2	7	9	10	9	15	9	11	12	6	9	5	7	6	4	5	7	2	1	4	2
Percent	33.3%	20.0%	11.1%	28.6%	28.6%	55.6%	37.5%	87.5%	100.0%	16.7%	83.3%	100.0%	50.0%	57.1%	100.0%	70.0%	88.9%	60.0%	44.4%	81.8%	91.7%	83.3%	88.9%	80.0%	100.0%	100.0%	75.0%	100.0%	85.7%	100.0%	100.0%	100.0%	

Note: Percentage of patients who self- reported having 5 or more hours of uninterrupted sleep baseline compared to post-intervention. Internal data and graph compiled by Hospital Quality Department.

Average Sleep Hours Baseline and Post- Intervention

Note: Range of average baseline hours of sleep compared to post-intervention. Graph compiled by Hospital Quality Department.

Integrated Conceptual Framework

Note: Pictorial created by author to reflect Watson Theory (1979), Kotter Change Theory (Nelson, Batalden, & Godfrey, 2007) and IHI Model for Improvement (2009). Images obtained from Google Images September 2018.

Appendix O

Sleep Menu Checklist

SLEEP MENU

It is important to us that we create a healing environment for you, so you can rest and heal.

Would you like:

☐ Keep the **door closed**?

☐ **Ear plugs**?

☐ Your **lights off** at night?

☐ **Eye masks**?

☐ A **Do Not Disturb** sign?

Quiet time from:
9:00PM TO 6:00AM

Note: Created by author June 2018.