Sleep to Heal: Creating a Quiet at Night Environment

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Sleep to Heal: Creating a Quiet at Night Environment

Victor Marie V. Blardony

University of San Francisco

NURS 670 - Internship

Dr. Cathy Coleman, DNP, RN, PHN, CPHQ, CNL

July 28, 2024
Sleep to Heal: Creating a Quiet at Night Environment

Abstract

Problem: Noise in hospitals disrupts patient well-being, recovery, and satisfaction. A 120-bed community hospital in South San Francisco consistently scored below the national average for nighttime quietness (Medicare, 2023).

Context: Over six months, a multidisciplinary committee launched the Quiet at Night (QAN) Program, focusing on the high-acuity telemetry unit. The program utilized Kotter’s 8 Steps Model and the Institute for Healthcare Improvement Model for Improvement (MFI) to tackle nighttime noise issues.

Interventions: Quiet hours were established from 8:30 p.m. to 6:00 a.m. Patients were provided an “Enhanced Sleep Menu” that included a sleep sound machine and “sleep kits” (eye masks and earplugs). Equipment alarms were adjusted to reduce unnecessary noise, creating an environment conducive to rest. The QAN committee also distributed T-shirts as part of its promotional outreach.

Measures: The primary outcome was assessed using National Research Corporation (NRC) real-time metrics, reflecting organizational data and trends in Hospital Consumer Assessment of Healthcare Providers and Systems (HCAHPS) scores. Nightly audits were conducted to evaluate patient utilization and staff adherence to the interventions.

Results: In six months, the program reached a satisfaction score of 50%. Staff adherence to the interventions remained consistently high, as demonstrated by nightly audit results.

Conclusions: The QAN initiatives significantly reduced nighttime noise disturbances and enhanced patients’ sleep quality. To ensure sustainable outcomes, organizational leaders must support multi-faceted interventions and unit-based staff engagement. An interdisciplinary QAN
leadership team is essential to provide oversight, address barriers, offer incentives, and foster a culture of continuous learning and improvement.

*Keywords*: noise, quiet-at-night, telemetry, sleep kits, staff engagement, outcomes
Personal Leadership Statement

Nurses embody heroism in their daily work, dedicated to improving lives through their expertise and compassion. As a Clinical Nurse Leader (CNL), this writer envisions inspiring each team member to reach their full potential within an environment of mutual respect and equality. This approach is central to fostering a continuous learning and improvement culture, empowering all team members to contribute ideas that enhance patient-centered care. With inherent strengths in contextual understanding, consistency, promoting harmony, and facilitating communication—particularly as a maximizer identified by CliftonStrengths (Clifton, 2021)—this CNL upholds a standard of excellence. By nurturing the potential of others and fostering a supportive environment, this leader consistently aims to not only meet but exceed team and organizational goals.

The Quiet at Night (QAN) Program exemplifies this leader's commitment to excellent and holistic care by addressing the comprehensive needs of patients and families, promoting restorative sleep, and improving outcomes through reduced noise disturbances. This initiative reflects a dedication to ongoing improvement and ensuring meaningful patient interactions. Additionally, this project synthesizes the diverse roles of CNLs outlined by the American Association of Colleges of Nursing (AACN), including clinician, outcomes manager, clinical advocate, and educator (American Association of Colleges of Nursing, 2018). Building on the program's successful implementation and results, this leader envisions further advancing the CNL practice by correlating it directly with measurable improvements in quality and safety outcomes (Bender et al., 2019).

Problem Description

The noise issue within hospital environments is increasingly recognized for its profound impact on patient well-being, recovery, and overall satisfaction. Hospitals diligently address this
challenge by assessing quietness outside patient rooms as a critical quality indicator (Ford-Martin, 2015). This indicator has a direct influence on reimbursement structures and patient-reported outcomes, such as the Hospital Consumer Assessment of Healthcare Providers and Systems (HCAHPS) (Knighten & Waxman, 2023) developed by the Agency for Healthcare Research and Quality (AHRQ). The correlation between disrupted sleep patterns and prolonged healing times, increased sedative usage, and the development of delirium among hospitalized individuals prompts healthcare institutions to prioritize a quiet and interruption-free environment during nighttime hours (Hedges et al., 2019).

A local community hospital in South San Francisco (SSF) consistently scores below the national average of 62% for nighttime quietness (Medicare, 2023), prompting the selection of its high-acuity telemetry unit as a pilot microsystem for improvement. The high-acuity telemetry unit, an 18-bed inpatient unit specializing in cardiac monitoring, primarily serves middle-aged and older adult patients with conditions such as acute myocardial infarction (AMI), congestive heart failure (CHF), stroke, and newly diagnosed arrhythmias. Staffing includes one unit manager (UM), three assistant nurse managers (ANMs), 33 regular and 19 per diem registered nurses (RNs), six regular and two per diem patient care technicians (PCTs), along with one monitor technician and one unit assistant per shift.

Despite generally positive feedback about the work environment, patient and organizational concerns persist regarding noise levels, particularly at night. The Quiet at Night (QAN) Program was established to address these noise issues. A committee of hospital stakeholders was tasked to implement evidence-based interventions to create a quiet environment and boost patient satisfaction, utilizing a comprehensive literature review, and the Model for Improvement (MFI) as defined by the Institute for Healthcare Improvement (IHI) (Institute for
Healthcare Improvement, 2021). Although HCAHPS scores were initially the primary metric assessed, the introduction of the National Research Corporation (NRC) real-time metrics offers more organizational data and insights while reflecting broader trends observed in HCAHPS scores and currently remains the primary evaluation metric (https://nrchealth.com).

**Specific Project Aim**

The overarching goal of this project is to enhance the healing atmosphere in the hospital by improving the quality of sleep among patients. The strategy involves instilling a culture of quiet during nighttime hours through a multimodal initiative dedicated to enhancing sleep conditions by July 31, 2024. Specifically, the improvement project aims to increase the quiet at night score reported by the National Research Corporation real-time metric from the current baseline of 38.5% to a target of 40.5% in hospitalized adult patients in the high acuity telemetry unit (See Appendix A).

**Available Knowledge**

A PICOT (population, intervention, comparison, outcome, and timeframe) question is utilized for evidence-based literature searches. For this project, the PICOT question is: In hospitalized adult patients in the high acuity telemetry unit (P), how does the application of an enhanced multimodal sleep routine compare to current practice (C) (I) improve patient satisfaction ratings /outcomes (O) within six months of implementation (T)?

A comprehensive literature search was conducted using various databases such as CINAHL, PubMed, JBI, and Cochrane. The search was initiated with specific keywords: "noise," "hospital," and "sleep." The focus was on identifying English-language articles published within the past ten years that targeted the adult population aged eighteen and above. The initial search produced 265 articles, then refined to include only those that met the specified criteria. This
refinement resulted in a selection of 19 relevant studies. Eight articles were carefully chosen for a thorough review. Five of these articles will be discussed and appraised here using the Johns Hopkins Nursing Evidence-based Practice (JHNEBP) Model criteria (See Appendix B).

Antonio (2020) introduced a commendable quality improvement project that introduced a holistic "sleep menu" in a similar microsystem that addressed a significant patient complaint. The subsequent improvement in the patients' care experience and staff engagement, along with the increase in self-reported uninterrupted sleep hours by patients, demonstrated the effectiveness of the intervention. Discussion on the sustainability of these improvements and potential challenges in implementation would enrich the narrative's depth and applicability for similar healthcare settings. This study was Level V-A per criteria set by JHNEBP (Dang et al., 2022).

A literature review conducted by Dickson et al. (2019) explored potential reasons for how music affects sleep quality and the time it took for subjects to fall asleep. This was particularly beneficial when music or sound machines were employed to distract or mask background noise. It was rated Level V-B per JHNEBP criteria.

A study at the University of North Carolina Medical Center by Hedges et al. (2019) implemented a quality improvement initiative utilizing Lean Methodology (www.lean.org) and the Institute for Healthcare Improvement's (IHI) Model for Improvement. The initiative focused on two medical units, which included 41 beds in private rooms and 16 beds in semi-private rooms, and involved multiple stakeholders from various disciplines. Specific interventions were thoroughly discussed and implemented, such as scripting, dimming lights, and addressing equipment-generated noises. The study observed significant improvements in HCAHPS "quiet" scores on both units, with one unit increasing from 33% to 71% and from 53% to 70% on the other
unit over 11 months. As per the criteria set by JHNEBP, this study was classified as Level V-B evidence.

A quasi-experimental study conducted at Ali Ibn Abi Talib Hospital, Iran, aimed to assess the efficacy of non-pharmacologic interventions in enhancing sleep quality among 135 Critical Care Unit (CCU) patients in 2017. Patients were divided into two groups - control, eye masks, earplugs, and quiet time protocol; and matched based on background variables. The interventions, including eye masks, earplugs, and a quiet time protocol, were implemented within three days of admission and found to improve sleep quality. These methods further elucidated that non-pharmacologic interventions are not only more cost-effective but also associated with a reduced incidence of side effects compared to pharmacological treatments (Ebrahimi Tabas et al., 2019). Based on JHNEBP criteria, this study was classified as Level II-B evidence.

In their 2018 systematic review and meta-analysis using the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) guidelines, Garside et al. targeted adults (over 18 years) in acute and mental health inpatient settings who had overnight hospital stays with admission before 10:00 pm. Noise reduction interventions, ranging from single to multi-faceted approaches, were evaluated, such as providing headphones when watching TV and putting pagers on vibrate. The author reported a significant decrease in disturbed sleep, approaching statistical significance at the 5% level. Despite the included studies’ low quality and varied interventions, the findings underscore the potential effectiveness of noise reduction strategies in inpatient settings. This study, rated Level III-B by JHNEBP criteria, highlights the feasibility of implementing noise reduction interventions to promote sleep in hospital settings.

The above-mentioned articles delve into enhancing sleep quality in hospitals through continuous quality improvement and non-pharmacological methods, focusing on reducing noise
through scripting and implementing quiet time protocols. Garside et al.'s (2018) meta-analysis substantiates the efficacy of these interventions and provides valuable insights for similar projects aiming to improve patient rest in comparable hospital settings.

**Rationale**

The team chose to integrate Kotter's eight-step change model (See Appendix C) to address problems common to organizational change management efforts (Pelletier & Beaudin, 2024). The hospital's subpar patient quietness and satisfaction scores created a sense of urgency, leading to the formation of the Quiet at Night (QAN) committee and the resulting QAN program. This diverse team included nurses, patient care technicians, monitor technicians, and unit assistants from the high-acuity telemetry unit, with strong support from senior leadership, combining a variety of perspectives and skills for a comprehensive approach.

The QAN committee developed a clear vision: to create a quieter, more restful nighttime environment for patients. They identified all potential noise sources, including people factors, environmental conditions, processes, and equipment, and devised targeted interventions (See Appendix D). The committee communicated this vision to the unit's staff to ensure buy-in and gather feedback, fostering a culture of collaboration and shared responsibility.

Empowering staff to contribute ideas and take the initiative, the QAN leadership committee used the PDSA (Plan-Do-Study-Act) cycle to test small changes and identify effective interventions (Institute for Healthcare Improvement, 2021). Building on these successes, the QAN committee continually refined project interventions and anticipated broader implementation. For example, they embedded successful interventions into the hospital's standard workflow and culture through consistent communication and recognition of staff contributions.
**Context**

Despite the generally positive feedback about the work environment in the high-acuity telemetry unit, concerns persist regarding noise levels, particularly at night. The QAN committee is dedicated to implementing evidence-based interventions to create a quiet and healing environment. This initiative aligned with the hospital's goal of enhancing patient sleep quality and satisfaction, generating strong support from senior leaders, and fostering a shared sense of responsibility among frontline staff.

While the project anticipated potential benefits such as improved patient recovery and reduced hospital stay, challenges such as initial resistance to change among some frontline staff and external factors like supply chain interruptions posed obstacles (See Appendix E). To address these challenges, the QAN committee utilizes Kotter's eight-step change model and PDSA cycles for improvement (Institute for Healthcare Improvement, 2021), enabling a structured approach to problem-solving and intervention implementation. By fostering collaboration and iterative refinement of small tests of change strategies and tools, the committee strives to establish effective measures to achieve outcomes that promote a culture of quiet and elevate the overall patient experience, underscoring the hospital's commitment to continuous improvement in patient care.

**Interventions**

Through a series of consultative meetings among members of the QAN committee and utilizing the PDSA cycle, part of the IHI Model for Improvement, interventions are introduced for small tests of change. Initially, quiet hours were reintroduced, and eye masks and ear plugs were implemented for patients' use. After positive feedback from staff and patients alike, using a sleep sound machine and adjusting parameters for telemetry alarms were subsequently included. The full implementation of the QAN Project was launched at the beginning of the year (See Appendix
F), introducing a standardized workflow (See Appendix G) that provides for expanded quiet hours and an enhanced sleep menu (See Appendix H) for patients. Members of the committee provided two separate informational campaigns to cater to evening and night staff and cover both weekend crews. Campaign t-shirts (See Appendix I) were specially designed and worn by committee members to help raise awareness of the project. Marketing materials such as signages were introduced, and flyers and pamphlets were distributed to encourage more buy-in from staff.

Central to this project is the expansion of nightly quiet hours, specifically between the hours of 8:30 pm and 6:00 am. The start of the quiet hours is paged overhead with relaxing music. Simultaneously, lights are dimmed in the hallways, signages are placed at high-traffic areas in the unit, nighttime care is clustered, and everyone is encouraged to use their "library voices."

The enhanced Sleep Menu now includes patients' preferred choice of eye masks and ear plugs, the use of a sleep sound machine installed in each room, turning off overhead lights, and closing doors for patients who are not at risk of safety or falls. Alarms are adjusted to the lowest audible setting, including bedside telemonitors and equipment alarms.

From a business perspective, the QAN project could decrease patients' average length of stay (LOS) in the high-acuity telemetry unit (See Appendix J). Typically, this unit has an average census of fifteen patients daily, with an average LOS of four days, totaling 1440 collective hours. Considering that the average daily cost of hospitalization in California hits $4,568, translating to $190 per hour, the unit's operational expense amounts to approximately $274,000 daily. Upon implementation, the Quiet at Night (QAN) initiative could potentially cut the average LOS by a conservative estimate of ten percent. This equates to a reduction of 144 hours from the total 1440 hours, potentially saving $27,400 in daily costs. Accounting for implementation expenses, a net of $17,800 in cost avoidance is anticipated (See Appendix J).
Study of the Intervention

In a study conducted at a large urban hospital, the implementation of designated quiet hours led to a notable reduction in noise levels during the night, resulting in improved sleep duration and quality among patients (Smith et al., 2020). These findings underscore the effectiveness of this simple yet impactful intervention in promoting better sleep outcomes for patients in hospital settings. Furthermore, the designation of quiet hours aligns with patient-centered care principles, emphasizing the importance of meeting patients' holistic needs, including their need for rest and comfort (Dewan & Anderson, 2018).

The overall effectiveness of the SSF hospital's QAN Program, as implemented by its committee, will be evaluated using the National Research Corporation (NRC) real-time metric on nighttime quietness (See Appendix K). Patients in the high acuity telemetry unit who are admitted as inpatients and discharged to home or home health receive outreach from the National Research Corporation (NRC) via text, email, or phone within one to three days of discharge. They will be prompted to rate different aspects of their hospital care experience. The NRC collects and analyzes the top box scores and publishes the results on its website. Patient utilization and staff compliance with the program's interventions are measured through nightly audits.

Upon achieving the established goal and validating the program's effectiveness, there is an intense desire for its subsequent project expansion and incremental spread to include all the remaining units within the hospital.

Ethical Considerations

The Quiet at Night Program in a South San Francisco (SSF) hospital requires careful navigation of ethical considerations to balance healing environments with patient autonomy and preferences. While many patients benefit from a quiet setting for rest and recovery, others,
especially those who rely on familial or cultural support, may find comfort and healing in more social or active nighttime environments (Nakamura et al., 2011).

Respecting patient autonomy is a cornerstone of ethical healthcare practice (American Nurses Association, 2017). Patients have the right to make decisions about their care environment. Policies aimed at creating a quieter environment should be implemented in a way that respects patients' choices and autonomy, ensuring they are not unduly restricted from receiving the social or familial support they need. Cultural diversity adds another layer of complexity. Different cultural backgrounds influence perceptions of noise and nighttime activities. Healthcare providers must recognize and respect these cultural differences to tailor inclusive and sensitive interventions to diverse patient needs.

Considering these potential issues when implementing this project aligns with the Jesuit values and the American Nurses Association (ANA) Ethical Standards. It embodies *cura personalis* by recognizing patients' diverse needs and autonomy. Nurses prioritize individualized care by respecting patients' preferences for a healing environment. Additionally, the project reflects diversity in all its forms by considering cultural backgrounds and beliefs. Nurses ensure interventions do not disadvantage certain populations, upholding equity and inclusivity. Lastly, the initiative demonstrates "being people for others" (University of San Francisco, n.d.) by advocating for patients' well-being and promoting equitable care.

As articulated by organizations like the American Nurses Association, ethical guidelines stress the importance of equity and inclusivity in healthcare (ANA, 2017). Nurses are crucial in advocating for equitable care practices that consider each patient's unique circumstances and preferences. In the context of the Quiet at Night (QAN) Program, this means ensuring that noise
reduction measures are applied thoughtfully and do not unintentionally disadvantage certain patient populations.

The QAN Program exemplifies a thoughtful approach to quality improvement in healthcare, prioritizing the tranquility essential for patient recovery and respecting patient autonomy and cultural diversity. By adhering to the ethical standards of the American Nurses Association and embracing Jesuit values, this initiative not only enhances the healing environment but also fosters an inclusive and equitable atmosphere for all patients. Through these efforts, healthcare providers can ensure that patient care is compassionate and individualized, ultimately promoting better health outcomes and patient satisfaction.

This project has been approved as an exempt quality improvement project by faculty using QI review guidelines and does not require IRB approval (See Appendix L). In addition, the KP RDO has reviewed the documents submitted for the project. The project does not meet the regulatory definition of research involving human subjects (See Appendix M).

**Outcome Measures Results**

Data sourced from the NRC website spanning January to June 2024 demonstrated marked improvements in quiet time scores. The introduction of the QAN Program led to a significant increase in quiet time scores, reaching 64% in the first three months, exceeding the 40.5% initial target (See Appendix N).

Concurrently, nightly audits highlighted increased utilization of eye masks, ear plugs, and sleep sound machines among patients, alongside enhanced adherence by staff in adjusting telemetry alarms. Data also indicated a discernible preference among patients for sleep sound machines over traditional eye masks and ear plugs (See Appendix O).
However, scores experienced a decline in April due to ongoing facility upgrades and construction activities occurring during late-night and early-morning hours, including within designated quiet periods. This generated disruptive noise on closed units and adjacent floors, resulting in significant patient complaints during routine leadership rounds. Additionally, concurrently unforeseen interruptions occurred in the supply chain for sleep kits (comprising eye masks and ear plugs) and sleep sound machine batteries. These unforeseen challenges resulted in a score of 14% due to these temporary setbacks. Measures have since been implemented to standardize these essential supplies' procurement and distribution processes. Following the resolution of these barriers, the positive upward trend in quiet time scores reached 50% at six months.

A study by Antonio (2020) showed that the presence of travel nurses can adversely impact quiet at night scores. Although a number of travel nurses were indeed present during this project's implementation, keeping a core staff of nurses in the unit, daily and shift huddles, nightly utilization audits by committee members, and leadership rounding were routinely performed on travel nurses and regular staff alike to mitigate such a problem.

An ongoing concern with the program's implementation is the risk of increased fall incidence when the lights are off and patients' room doors are closed. Data from the hospital's Quality Department indicates that three falls resulting in injury occurred in the high-acuity telemetry unit in 2023. In contrast, from January to June 2024, only one fall with injury was reported in the same unit. However, the available data does not specify the exact timing of the 2024 fall, precluding a direct correlation with the project's implementation. Improvement in data collection, including the time of fall incident, may be able to establish a relationship between falls and the closure of patients' room doors in the future.
Summary

Implementing the Quiet at Night (QAN) Program in the hospital's telemetry unit was a strategic effort to significantly improve patient sleep and overall satisfaction by minimizing nighttime disturbances. Central to the program is the designation of quiet hours, the installation of sleep sound machines in every room, and the adjustment of telemetry alarms to reduce unnecessary noise. Lessons learned and built upon a prior QAN improvement effort in a similar setting, the project incorporated non-pharmacologic interventions, including distributing eye masks and ear plugs to patients, dimming lights, and closing patients' room doors.

During the initial months from January to March 2024, the QAN initiative demonstrated promising results as quiet time scores consistently met or surpassed the targeted threshold. There was a notable preference among patients for using sleep sound machines over traditional aids. However, challenges arose in April due to disruptions caused by construction noise and supply chain issues. These setbacks prompted the implementation of standardized procedures for supply procurement, resulting in a notable recovery of scores reaching 50% by June 2024. After outcomes are met and maintained, the replication and sustainability plan will be developed and implemented.

Inconsistent workflow implementation or external supply disruptions can cause setbacks. Addressing these challenges involves continuous staff education reinforcements and developing contingency plans. The implications for practice are clear: effective noise reduction initiatives require comprehensive planning, strong team collaboration, and a steadfast commitment to patient-centered care.

Key to the initiative's success are the multidisciplinary committee members who are dedicated to process improvement and enhanced patient care experiences. Strong leadership support, continuous staff information, and patient education efforts are also vital. These elements
not only facilitated the adoption of a new standardized workflow but also ensured sustained adherence to noise reduction strategies over time. The achievements of the QAN initiative underscore its potential for long-term sustainability and replication among similar hospital units, with the potential for improved health outcomes and enhanced patient experiences. Lesson learned: one quality improvement project on QAN may not be enough and plans for sustainability must be incorporated into project charters.

Conclusions

Implementing the Quiet at Night (QAN) Program in the high-acuity telemetry unit underscores the significant impact of targeted interventions on patient sleep quality and satisfaction. The program's key components—designating quiet hours, providing an enhanced sleep menu, and adjusting telemetry alarms—have effectively reduced nighttime disturbances, as evidenced by improved quiet time scores within the six months of implementation. Despite facing challenges such as construction noise and supply chain disruptions, the program demonstrated resilience by adopting standardized procurement processes and continuous staff education, leading to a recovery in performance metrics.

Looking forward, the QAN Program sets a precedent for broader application across other hospital units, emphasizing the critical role of an interdisciplinary approach in healthcare innovation. The dedication of committee members, supported by engaged leadership, has been instrumental in fostering a culture of continuous improvement and patient-centered care. The experience gained from this initiative suggests that ongoing efforts and adaptive strategies are essential for sustaining and scaling successful interventions. By consistently addressing both internal and external challenges, healthcare organizations and payors
(https://www.medicare.gov/care-compare) can enhance patient outcomes and satisfaction, ultimately contributing to a quieter and more healing hospital environment.
References

https://www.aacnnursing.org/cnl


https://doi.org/10.1097/01.naj.0000718660.44502.86


Without quality sleep, patients may face lengthier healing times and increased sedative use and may develop delirium. Giving patients a quiet and interruption-free time allows for better quality sleep and improves patient recovery. Noise has become such a problem in hospitals that patients are routinely asked how often the area outside their room is silent at night as part of their overall hospital care experience, and hospital reimbursements are directly correlated to patient satisfaction metrics. A local community hospital in South San Francisco aims to improve its performance on this metric, as captured by the National Research Corporation (NRC).

<table>
<thead>
<tr>
<th>Desired State</th>
<th>Current State</th>
<th>Action Steps</th>
</tr>
</thead>
<tbody>
<tr>
<td>A high-acuity telemetry unit is designated as a pilot for the program. The program aims to achieve a National Research Corporation (NRC) real-time target score of 40.5% after six months of implementing the initiatives.</td>
<td>The telemetry unit’s year-to-date score NRC real-time is 38.5%.</td>
<td>1. Creating a Quiet at Night (QAN) committee composed of concerned hospital stakeholders dedicated to identifying and implementing evidence-based practices that promote a restful and healing hospital environment for patients and improve patient satisfaction as measured by system-wide and federally mandated hospital metrics.</td>
</tr>
<tr>
<td>Adjusting alarm parameters to minimize alarms decreases noise levels at night to promote a quiet environment.</td>
<td>Alarms are set at full volume all the time</td>
<td>2. Identifying and designating committee members as unit champions who will help educate other healthcare team members about the program.</td>
</tr>
<tr>
<td>Increased use of readily available supplies which are proven to help promote sleep</td>
<td>Supplies are available but not being used consistently or provided by staff</td>
<td>3. Designating 8:30 pm as the start of QAN every night and will be paged overhead.</td>
</tr>
<tr>
<td>QAN committee will continuously identify and modify measures to enhance noise reduction and sleep promotion using PDSA (Plan-Do-Study-Act)</td>
<td>None currently</td>
<td>4. Implementing marketing strategies to increase awareness and support of the program: installing standees at designated locations, handing out flyers and T-shirts for committee members</td>
</tr>
<tr>
<td>1. Alarm reduction measures: Adjust alarm volumes for bedside telemonitor and infusion pumps to minimum audible levels and adjust alarm parameters of central telemonitor.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2. Installing white noise machines in every room and encouraging their use</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1. Encouraging patients to use eye masks and ear plugs, and tune in to care music channel for sleep.</td>
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<td></td>
</tr>
<tr>
<td>2. Designated unit champions will update healthcare team members about the QAN initiatives during shift huddles, particularly between evening and night shifts.</td>
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<tr>
<td>Unit champions will also audit the unit for initiative compliance and report findings during committee meetings.</td>
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</tbody>
</table>
### Appendix B

**Evaluation Table**

<table>
<thead>
<tr>
<th>Study</th>
<th>Design</th>
<th>Sample</th>
<th>Outcome/Feasibility</th>
<th>Evidence rating</th>
</tr>
</thead>
<tbody>
<tr>
<td>Antonio, C. (2020). Improving quiet at night on telemetry unit: Introducing a holistic sleep menu intervention. <em>AJN, American Journal of Nursing</em>, 120(10), 58–64. <a href="https://doi.org/10.1097/01.naj.0000718660.44502.b5">https://doi.org/10.1097/01.naj.0000718660.44502.b5</a></td>
<td>Quality Improvement Project</td>
<td>Fifty-nine patients were interviewed for baseline assessment, and one hundred seventy-four participated in the interventions implemented</td>
<td>The interventions resulted in a marked decrease in sleep disruptions and a notable increase in the duration of uninterrupted sleep. This is useful as it indicates that similar strategies could be successfully implemented across various acute care settings.</td>
<td>JHNEBP Level V-A</td>
</tr>
<tr>
<td>Dickson, G., &amp; Schubert, E. (2019). How does music aid sleep? literature review. <em>Sleep Medicine</em>, 63, 142–150. <a href="https://doi.org/10.1016/j.sleep.2019.05.016">https://doi.org/10.1016/j.sleep.2019.05.016</a></td>
<td>Literature Review</td>
<td>One hundred and one peer-reviewed studies</td>
<td>The study confirms that auditory stimulation has a positive impact on improving sleep quality. This is particularly beneficial when music or sound machines are employed to distract or mask background noise.</td>
<td>JHNEBP Level V-B</td>
</tr>
<tr>
<td>Ebrahimi Tabas et al. (2019) Effect of eye masks, earplugs, and quiet time protocol on sleep quality of patients admitted to the cardiac care unit: A clinical trial study. <em>Medical - Surgical Nursing Journal</em>, 8(3) <a href="https://doi.org/10.5812/msnj.98762">https://doi.org/10.5812/msnj.98762</a></td>
<td>A quasi-experimental study with a pre-test and post-test design</td>
<td>The study includes one hundred thirty-five patients admitted to the CCU in a general hospital in Zahedan, Iran</td>
<td>Eye masks, earplugs, and Quiet Time protocol improve sleep quality. The study is helpful as it demonstrates that enhancing sleep quality using non-pharmacological methods is achievable, more economical, and associated with fewer side effects than pharmacological interventions.</td>
<td>JHNEBP Level II-B</td>
</tr>
<tr>
<td>Garside et al. (2018) Are noise reduction interventions effective in adult ward settings? A systematic review and meta-analysis. <em>Applied Nursing Research</em>, 44, 6–17. <a href="https://doi.org/10.1016/j.apnr.2018.08.004">https://doi.org/10.1016/j.apnr.2018.08.004</a></td>
<td>Systematic review and meta-analysis following Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA).</td>
<td>Eight hundred thirty-four records were identified from health-related databases, and nine studies were included in the review.</td>
<td>The meta-analyses show that the interventions that promote sleep significantly decrease disturbed nights, which approaches statistical significance at the 5% level. Several noise reduction interventions were identified: one study implemented a single intervention, while the rest were multi-faceted. This study mirrors the multimodal approach employed in this CNL’s project, highlighting</td>
<td>JHNEBP Level III-B</td>
</tr>
<tr>
<td>Hedges, C. et al (2019).</td>
<td>A Quality Improvement Study using the Lean Method and the Institute for Healthcare Improvement’s (IHI) Model for Improvement</td>
<td>Two medical units comprising 41 private room beds and 16 beds in semi-private rooms at the University of North Carolina Medical Center</td>
<td>Marked improvements in HCAHPS “quiet” scores with project implementation. Unit 1 improved from 33% to 71%. Unit 2 improved from 53% to 70% at 11 months. The project design intentionally included multiple stakeholders from different disciplines involved in the patient experience. The study serves as a model for including multiple stakeholders in project implementation.</td>
<td>JHNEBP Level V-B</td>
</tr>
</tbody>
</table>
Appendix C

Kotter's 8-Step Change Model

Source: Visual Paradigm Online (https://online.visual-paradigm.com/app/diagrams/#infoart:proj=0&type=KottersChangeModel&gallery=/repository/5ece2b7f-162b-44be-958a-8a0b54cdd453.xml&name=Kotter%27s%208%20Step%20Change%20Model)
## Appendix D

### Driver Diagram

<table>
<thead>
<tr>
<th>Noise Reduction (Creating a Quiet at Night Environment)</th>
<th>Primary Drivers</th>
<th>Secondary Drivers</th>
<th>Change Ideas</th>
</tr>
</thead>
<tbody>
<tr>
<td>Environmental Factors</td>
<td>Alarm Reduction</td>
<td>Adjusting equipment alarm parameters to minimum levels and/or as allowed by existing protocols</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Equipment</td>
<td>Use of &quot;soft wheels&quot; to reduce noise caused by friction</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Workplace Culture</td>
<td>Designating 8:30 pm to 6 am as quiet hours</td>
<td></td>
</tr>
<tr>
<td>Patient centered care and comfort</td>
<td>Pain management</td>
<td>Providing adequate pain relief to reduce discomfort and agitation</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Sleep Promotion</td>
<td>Offer sleep-enhancing amenities such as dimming of lights, white noise machine, eye mask, and earplugs</td>
<td></td>
</tr>
<tr>
<td>Staff Training and Support</td>
<td>Communication Strategies</td>
<td>Use of &quot;library voice&quot; during quiet hours</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Staff Education</td>
<td>Educating staff on the importance of quiet for patient recovery</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Informational rounds and shift huddles to promote QAN initiatives</td>
<td></td>
</tr>
</tbody>
</table>
## Appendix E

### SWOT Analysis

<table>
<thead>
<tr>
<th></th>
<th>Favorable/Helpful</th>
<th>Unfavorable/Harmful</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Strengths</strong></td>
<td>• The (Quiet at Night) QAN is identified as a priority project, generating strong support from senior leaders.</td>
<td>• Expected initial resistance to change by some frontline staff.</td>
</tr>
<tr>
<td></td>
<td>• A sense of urgency from the frontline staff members to improve their performance on the QAN metric.</td>
<td>• Decrease support from frontline staff, particularly those not working the night shift or floated from other units.</td>
</tr>
<tr>
<td></td>
<td>• The team values initiatives supported by evidence.</td>
<td>• Lack of buy-in from frontline staff that project initiative will improve patient satisfaction.</td>
</tr>
<tr>
<td></td>
<td>• A culture of teamwork and shared responsibility toward achieving a common goal.</td>
<td>• Potential inability to sustain gains by the program.</td>
</tr>
<tr>
<td></td>
<td>• Some resources (eye masks, ear plugs, and care channels) needed are already readily available for utilization.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• A strong cognizance of the need to provide an environment conducive to sleep to enhance patient recovery</td>
<td></td>
</tr>
<tr>
<td><strong>Weaknesses</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>I.</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Opportunities</strong></td>
<td>• Faster recovery from improved sleep quality</td>
<td>• Supply chain issues</td>
</tr>
<tr>
<td></td>
<td>• Improved patient satisfaction ratings</td>
<td>• Family members visiting at night or after visiting hours.</td>
</tr>
<tr>
<td></td>
<td>• Reduction in length of stay (LOS) due to improved recovery</td>
<td>• Unsatisfactory patient experience scores could lead employers not to choose the hospital</td>
</tr>
<tr>
<td></td>
<td>• Potential cost reduction due to decreased LOS</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Potential Increase in Medicare/Medical reimbursement from improved HCAHPS satisfaction rating</td>
<td></td>
</tr>
<tr>
<td><strong>Threats</strong></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
## Appendix F

### GANTT Timeline

<table>
<thead>
<tr>
<th>Task #</th>
<th>Description of Tasks and Communication Interventions</th>
<th>2023</th>
<th>2024</th>
<th>Status</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Microsystem assessment</td>
<td></td>
<td></td>
<td>Completed</td>
</tr>
<tr>
<td>2</td>
<td>Identifying sponsors and key stakeholders</td>
<td></td>
<td></td>
<td>Completed</td>
</tr>
<tr>
<td>3</td>
<td>Creation of Quiet at Night Committee</td>
<td></td>
<td></td>
<td>Ongoing</td>
</tr>
<tr>
<td>4</td>
<td>Data gathering to assess utilization of current sleep menu (eye masks and ear plugs)</td>
<td></td>
<td></td>
<td>Completed</td>
</tr>
<tr>
<td>5</td>
<td>Committee meetings to identify problems and possible solutions, draft strategies for implementation new initiatives (white noise machine), gap analysis</td>
<td></td>
<td></td>
<td>Completed</td>
</tr>
<tr>
<td>6</td>
<td>Draft project budget and plan</td>
<td></td>
<td></td>
<td>Completed</td>
</tr>
<tr>
<td>7</td>
<td>Procurement of funding, signages, and educational campaign materials</td>
<td></td>
<td></td>
<td>Completed</td>
</tr>
<tr>
<td>8</td>
<td>Staff training and orientation to QAN initiatives</td>
<td></td>
<td></td>
<td>Ongoing</td>
</tr>
<tr>
<td>9</td>
<td>Project implementation</td>
<td></td>
<td></td>
<td>Ongoing</td>
</tr>
<tr>
<td>10</td>
<td>Bimonthly committee meetings to monitor progress of initiatives</td>
<td></td>
<td></td>
<td>Ongoing</td>
</tr>
<tr>
<td>11</td>
<td>Daily shift huddles to further educate staff and disseminate information on the project</td>
<td></td>
<td></td>
<td>Ongoing</td>
</tr>
<tr>
<td>12</td>
<td>Periodic evaluation of Interventions</td>
<td></td>
<td></td>
<td>Ongoing</td>
</tr>
</tbody>
</table>
Appendix G

QAN Workflow

**SLEEP TO HEAL: Striving to Create a Quiet at Night Surrounding**

**QUIET AT NIGHT (QAN) WORKFLOW**

- **U/Hs and PCTs**
  - assist the primary RNs in putting the sleep hygiene kit with the corresponding flyer in all the admission buckets
  - take out and display the QAN signs at the station starting from 8:30PM and put them back at 6AM

- **ANMs**
  - ensure that all admission buckets include the sleep hygiene kit and QAN flyer
  - help to navigate the different QAN initiatives to staff

- **PRIMARY RNs**
  - educate their patients regarding the sleep hygiene kit and the availability and use of the sleep sound machine on admission and every night
  - lower the volume of the bedside monitors to level 1 starting at 8:30PM and put it back to level 5 at 6AM
  - check the patients' P/E/R for the alarm parameters and communicate with MD
  - coordinate with MD and MT in adjusting the parameters of the "non actionable" alarms (e.g., chronic A fib on med VS new onset)

- **MONITOR TECHS**
  - adjust alarm monitor parameters per the primary RN
  - silence the central monitor alarms promptly

***ALL STAFF ARE ENCOURAGED TO USE THEIR QUIET VOICES FROM 8:30 PM TO 6 AM***

**LIGHTS WILL BE DIMMED BY SECURITY FROM 8:30 PM TO 6 AM**

(Designed by and approved for implementation by the Quiet at Night Committee. Revised 03/2024)
Appendix H

Sleep Menu

SLEEP MENU
Available for your healing stay and comfort
(Please mark with check sign)

- EYE MASK
- EAR PLUGS
- SLEEP SOUND MACHINE
- LIGHTS OFF
- DOOR CLOSED

(Designed by and approved for implementation by the Quiet at Night Committee. Revised 03/2024)
Appendix I

Quiet at Night Committee

Members of the Quiet at Night committee wore the campaign T-shirts during the project launch from L to R: T. Timbreza, V. Blardony, M. Ignacio, E. Balancio, S. Brown, C. Riotoc, B. Abuan, S. Raymundo, G. Burns, C. Pereda, and R. Barrios. The picture was taken and posted here with permission from the group.
Appendix J

Improving Sleep Quality to Reduce Length of Stay by 10% in Hrs/Day

<table>
<thead>
<tr>
<th>Improvement Revenue Cost Avoidance</th>
<th>Hrs/ Day</th>
<th>Cost / Hr</th>
<th>Total Cost / Day</th>
<th>Total Cost</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total average of LOS in Telemetry (SE) unit</td>
<td>1, 440</td>
<td>$190.3/hr</td>
<td>$274,032</td>
<td>$8,220,960</td>
</tr>
<tr>
<td>ADC =15 Ave LOS = 4 days</td>
<td>(LOS x ADC x 24 hrs)</td>
<td>$4,568/ 24 hrs</td>
<td>(Hrs/Day) x (Cost/Hr)</td>
<td>(Total cost/day) x 30</td>
</tr>
<tr>
<td>Total reduction of LOS by 10%</td>
<td>144</td>
<td>$190.3</td>
<td>$27,403</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Improvement Cost</th>
<th>Number</th>
<th>Hourly Rate + 0.5 Benefit</th>
<th>Improvement Cost (30 mins x2 class sessions)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Registered Nurses</td>
<td>36</td>
<td>$150</td>
<td>$5,400</td>
</tr>
<tr>
<td>Patient Care Technicians</td>
<td>6</td>
<td>$67.5</td>
<td>$405</td>
</tr>
<tr>
<td>Unit Assistants</td>
<td>6</td>
<td>$60</td>
<td>$360</td>
</tr>
<tr>
<td>Monitor Technicians</td>
<td>6</td>
<td>$60</td>
<td>$360</td>
</tr>
</tbody>
</table>

| Education materials/supplies | | | $3,000 |
| Total costs for 2 class sessions (30 mins each) | | | $9,525 |

<table>
<thead>
<tr>
<th>Project savings/ Cost avoidance (ROI)</th>
<th>Reduced Hrs (of LOS /day)</th>
<th>Cost Avoidance</th>
<th>Project Cost Avoidance (for the first day)</th>
<th>Total Savings / Month</th>
</tr>
</thead>
<tbody>
<tr>
<td>Reduce LOS in SE by 10%</td>
<td>144</td>
<td>$27,403 / day</td>
<td>$17,878</td>
<td>$822,090</td>
</tr>
</tbody>
</table>

Note: Starting the second day, the cost avoidance would be 27,403 unless additional training is required
Appendix K

Measures

<table>
<thead>
<tr>
<th>Measures</th>
<th>Source</th>
<th>Target</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Outcome</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Increase in % of patients reporting that the area around their rooms is quiet at night</td>
<td>National Research Corporation (NRC) real-time score</td>
<td>40.5%</td>
</tr>
<tr>
<td><strong>Process</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Increased in % of patients utilizing current sleep enhancement bundle: eye mask, earplugs</td>
<td>Nightly audits</td>
<td>20%</td>
</tr>
<tr>
<td>Increase in % of patients utilizing NEW sleep enhancement tool: white noise machine</td>
<td>Nightly audits</td>
<td>20%</td>
</tr>
<tr>
<td>Increased staff adherence with alarm reduction measures during quiet hours</td>
<td>Nightly audits</td>
<td>90%</td>
</tr>
<tr>
<td><strong>Balancing</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Monitor # incidence of falls in the unit related to QAN interventions implementation (e.g., lights off, door closed)</td>
<td>Data from Quality Department</td>
<td>Same as the same period last year</td>
</tr>
</tbody>
</table>
Appendix L

Statement of Non-Research Determination Form

Student Name: Victor Marie V. Blardony

Title of Project: Sleep to Heal: Creating a Quiet at Night (QAN) Environment

Brief Description of Project:
Noise has become such a problem in hospitals that patients are routinely asked how often the area outside their room is silent at night on the Hospital Consumer Assessment of Healthcare Providers and Systems (HCAHPS) survey (Ford-Martin, 2015), and hospital reimbursements are directly correlated to patient satisfaction metrics (Knighten & Waxman, 2023). Without good sleep, patients may face lengthier healing times, increased sedative use, and may develop delirium. Providing patients quiet and interruption-free time facilitates better quality sleep and improves patient recovery. Kaiser South San Francisco aims to improve its performance on this metric as captured by National Research Corporation (NRC) real-time score, which is reflective of HCAHPS.

A) Aim Statement:

By July 31, 2024, after the implementation of a sleep change package, the project aims to achieve a healing hospital environment by promoting and measuring quality sleep through creation of a culture of quiet at night.

B) Description of Intervention:

The project interventions will maximize healing by providing an environment conducive to sleep, especially at night. The Southeast unit (telemetry) is designated the pilot unit based upon delivering the lowest HCAHPS scores compared to the entire hospital. Initiatives include reinforcing adherence to current interventions such as using eye masks and earplugs, and introducing new ones, such as scripting, routine adjustment of equipment and alarms, and use of sleep sound machines. These will be implemented using the Model for Improvement from the Institute for Healthcare Improvement.

C) How will this intervention change practice?

An environment conducive to sleep promotes faster healing, less use of sedatives, and prevents delirium. Effective interventions also prevent possible medical complications associated with prolonged hospitalization, such as physical deconditioning, immobility, pressure ulcers, etc. Faster recovery leads to shorter
lengths of stay (LOS), thereby reducing operating costs for the hospital. Furthermore, improved patient satisfaction, as captured by HCAHPS, directly affects hospital reimbursements from Medicare.

**C) Outcome measurements:**

1. Improvement of NRC real-time satisfaction score on quiet at night from a baseline of 39% to a target of 40.5% as agreed upon by the QAN committee.
2. Increased patient utilization of sleep enhancement modalities such as eye masks, earplugs and white noise machines as reflected on nightly audits.
3. Increased staff compliance to alarm reduction measures.

**References**


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](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:

<table>
<thead>
<tr>
<th>Project Title:</th>
<th>YES</th>
<th>NO</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sleep to Heal: Creating a Quiet at Night (QAN) Environment</td>
<td></td>
<td></td>
</tr>
<tr>
<td>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.</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>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.</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>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.</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>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.</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>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.</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>The project is conducted by staff where the project will take place and involves staff who are working at an agency that has an agreement with USF SONHP.</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>The project has NO funding from federal agencies or research-focused organizations and is not receiving funding for implementation research.</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>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.</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>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: “The Research Determination Committee for the Kaiser Permanente Northern California region has determined the project does not meet the regulatory definition of research involving human subjects per 45 CFR 46.102(d)”</td>
<td>X</td>
<td></td>
</tr>
</tbody>
</table>

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): Victor Marie V. Bladorny

Signature of Student: Victor Bladorny
DATE: Feb. 20, 2024

SUPERVISING FACULTY MEMBER NAME (Please print):
Cathy Coleman, DNP, MSN, CPHQ, CNL

Signature of Supervising Faculty Member
Catherine Coleman
DATE 3/7/24 (rev)

DEPARTMENT MANAGER (Please print):
Baby Lyn C. Abadilla

Signature: __________________________
DATE: 3/13/2024

NURSING PROFESSIONAL DEVELOPMENT DIRECTOR NAME (Please print):
Pamela C. Pilotin

Signature: __________________________
DATE: 3/18/24

NURSING OPERATIONS DIRECTOR NAME (Please print):
Evangeline Rico, DNP, RN, CNL

Signature: __________________________
DATE: 03-13-24
Appendix M

RDO Approval Letter

Date: March 30, 2024
Subject: RDO KPNC 24-071
Title: Sleep to Heal: Creating a Quiet at Night Environment

Dear Dr. Ly:

The Research Determination Committee for the Kaiser Permanente Northern California region has reviewed the documents submitted for the above-referenced project to be used by Victor Bladony, MSN student. The project does not meet the regulatory definition of research involving human subjects as noted here:

Not Research

The activity does not meet the regulatory definition of research per 45 CFR 46.102(d): Research means a systematic investigation, including research development, testing and evaluation, designed to develop or contribute to generalizable knowledge.

This determination is based on the information provided. If the scope or nature of the project changes in a manner that could impact this review, please resubmit for a new determination. The word "research" should not appear in any posters or publications resulting from this project. Further, if publications, presentations or posters are generated from this project the following wording must be used to reference to the project research determination outcome:

"The Research Determination Committee for the Kaiser Permanente Northern California region has determined the project does not meet the regulatory definition of research involving human subjects per 45 CFR 46.102(d)"

You are expected, however, to implement your study or project in a manner congruent with accepted professional standards and ethical guidelines as described in the Belmont Report (http://www.hhs.gov/ohrp/humansubjects/guidance/belmont.html).

Additionally, you are responsible for keeping a copy of this determination letter in your project files as it may be necessary to demonstrate that your project was properly reviewed. Provide this approval letter to the Physician in Charge (PIC), your Area Manager, and Chief of Service, to determine whether additional approvals are needed.

Finally, all manuscripts/case series/case studies must receive written approval prior to submission to a journal or book. The Principal Investigator (PI) or first author (if different) must request their PIC1, or the Division of Research (DOR) Director2, or the Research & Innovation Academy (RIA)3 or an equivalent level leader4 review and provide written approval for publication submission. The PI is responsible for retaining a copy of the approval.

Sincerely,

The Research Determination Committee
KPNC-RDO@kp.org

1PIC approval is required for all manuscripts/case series/case studies that do not include a DOR employee as an author; including but not limited to medical students, residents, and fellows.

2DOR Director approval is required for all manuscripts/case series/case studies that include DOR employees as authors. 3For all nurse-authored manuscripts/case series/case studies, approval by the Research & Innovation Academy is required. 4If you are not sure who this would be, please contact the Research Determination Office (KPNC-RDO@kp.org)
Appendix N

QAN Score vs Target Score

[Graph showing QAN vs. Target Score over months from January to June]
Appendix O
Utilization Chart

Eye Mask/Ear Plugs vs Sleep Sound Machine

Month

Month

Eye Mask & Ear Plugs Sleep Sound Machine Adjustment of Alarms

January February March April May June

0.0% 10.0% 20.0% 30.0% 40.0% 50.0% 60.0% 70.0% 80.0% 90.0% 100.0%

90.0%
Appendix P
Stakeholder Power Grid Analysis

Keep Satisfied
- Chief Medical Officer
- Chief Nurse Officer
- Chief Financial Officer

Manage Closely
- Quality Director
- Care Experience Director
- Patient Care Services Director
- Unit Manager

Monitor
- Visitors
- Internal/External Vendors (e.g. Housekeeping, engineering, etc.)

Keep Informed
- Assistant Nurse Managers
- Case Managers
- Nurses
- Unit Assistants
- Patient Care Technicians
- Monitor Techs
Appendix Q

Project Charter

Team:
Victor Blardon, Lead; ANM, Co-Lead; Clinical Innovation Deployment Leader, Care Experience Director; RNs; Monitor Technicians, Unit Assistants

Project:
Sleep to Heal: Creating a Quiet at Night Environment

Sponsor:
Nursing Operations Director

Project Start Date:
Jan 07, 2024

Last Revised:
Nov. 30, 2023

What are we trying to accomplish?

Problem
Sleep is essential to healing, especially in a hospital setting where noise is present round the clock—from overhead paging, equipment alarms, personnel traffic, etc. Patient satisfaction for nighttime quietness in Kaiser South San Francisco is below the national average at 62% as measured by the Hospital Consumer Assessment of Healthcare Providers and Systems (HCAHPS) survey. (Medicare, 2023)

Project Description (defines what)
This project aims to maximize healing by providing an environment conducive to sleep, especially at night. The Southeast unit (telemetry) is designated the pilot unit, with the lowest scores for the entire hospital. Initiatives include interventions already in place, such as using eye masks and earplugs, and new ones, such as scripting, routine adjustment of equipment and alarms, and use of sleep sound machines.

Rationale (defines why)
Noise has become such a problem in hospitals that patients are routinely asked how often the area outside their room is silent at night on the Hospital Consumer Assessment of Healthcare Providers and Systems (HCAHPS) survey (Ford-Martin, 2015), and hospital reimbursements are directly correlated to patient satisfaction metrics. (Knighten & Waxman, 2023). This project aims to increase the quiet at night score reported by the National Research Corporation real-time metric from the current baseline of 38.5% to a target of 40.5% in hospitalized adult patients in the high acuity telemetry unit. Without good sleep, patients may face lengthier healing times, increased sedative use, and may develop delirium. Giving patients a quiet and interruption-free time allows for better quality sleep and improves patient recovery.

Expected Outcomes and Benefits
An environment conducive to sleep promotes faster healing, less use of sedatives, and prevents delirium. (Hedges et al., 2019) This also prevents possible medical complications associated with prolonged hospitalization, such as physical deconditioning, immobility, pressure ulcers, etc. Faster recovery means shorter lengths of stay, thereby reducing operating costs for the hospital. Furthermore, improved patient satisfaction, as captured by HCAHPS, directly affects hospital reimbursements from Medicare.

Aim Statement
At the end of the sixth month from implementation, the project aims to achieve a healing hospital environment by promoting quality sleep through a culture of quiet at night.

How will we know that a change is an improvement?

Outcome Measure(s)
1. Improvement of National Research Corporation (NRC) real-time score on the quiet at night (QAN) from a baseline of 38.5 to a target of 40.5%, as agreed on by the committee.
2. Patients will be asked to rate their sleep quality from 0 to 5 during leadership rounds. Scores will be gathered and tabulated every week.
3. Test the effectiveness of initiatives via PDSA every two months for 6 months.

**Process Measure(s)**
1. Increased promotion of sleep-enhancing bundles by nursing staff, including eye masks, ear plugs, and white noise machines; and increased patient utilization to up to 30% or 4 to 5 patients in the unit every night.
2. Increased nursing staff compliance to alarm reduction measures and use of "library voices" during quiet hours from 8:30 pm to 6:00 am.
3. Increased visibility of materials promoting the QAN project, such as standees, posters, and t-shirts.

**Balancing Measure(s)**
1. Patient traffic (e.g., admissions and discharges during quiet hours or between 8:30 pm and 6:00 am) may be affected, causing inadvertent delays and lower throughput scores.

What changes can we make that will result in improvement?

**Initial Activities**
1. Creation of a quiet committee where possible solutions to the problems can be discussed, eventually implemented, and revised as necessary.
2. The PDSA tool will be utilized as it is the model for improvement of choice by Kaiser Permanente.

**Change Ideas**
1. Reintroduction of readily available and evidence-based sleep enhancement measures such as eye masks and ear plugs.
2. Installation and promoting the use of white noise machines in every room.
4. Staff education through regular roving carts and shift huddles.

**Key Stakeholders**
1. SE Telemetry staff - regular staff meetings and shift huddles to encourage active participation.
2. Middle Management - updates on quality metrics to show potential improvements.