

Quiet Time Improves the Patient Experience



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Contact
Hours

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ABSTRACT

Background: A quiet environment promotes rest and healing but is often challenging to provide in a busy acute care setting. Improving quiet in the hospital for designated hours improves patient satisfaction. Such efforts have typically been the primary responsibility of the nursing staff.

Local Problem: Two medical units with consistently low Hospital Consumer Assessment of Health Care Providers and Systems (HCAHPS) “always quiet” scores were chosen for this study.

Methods: A multidisciplinary team used Lean methods and the Model for Improvement to test interventions for quiet time (QT) and used HCAHPS “always quiet” scores as the primary outcome measure.

Interventions: The team instituted nighttime and afternoon QT supported by rounding and scripting, dimming lights, lowering staff voices, offering a sleep menu at night, and replacing noisy wheels.

Results: Quiet scores improved on both units after 11 months.

Conclusions: Noise in hospitals is often beyond the scope of nurse-driven improvement; however, a QT protocol led by nurses, developed by multiple stakeholders, and focused on changing expectations for quiet can lead to measurable improvements in patient perception of quiet.

Keywords: hospital, lighting, noise/prevention and control, nursing staff, patient satisfaction, quiet time

Providing patients with rest and quiet can be one of the most challenging aspects of the patient experience in acute care hospitals today. Hospitalized patients are subjected to noise and constant interruptions, leaving little opportunity for restorative sleep and rest that is vital for recovery. Despite efforts of staff to provide an environment conducive to healing, patients are subject to annoyances related to equipment, alarms, doors and elevators, loud voices, artificial overhead lighting as well as a steady stream of visitors, assistive staff, and health care providers.

In addition to the negative clinical outcomes of poor sleep during hospitalization, there can

be economic consequences, as publically reported surveys measure patients’ satisfaction with quietness of the hospital environment and can unfavorably impact perception of overall satisfaction with care.

AVAILABLE KNOWLEDGE

The importance of sufficient sleep quantity and quality to health and well-being has received increased recognition as a public health priority, and for the first time sleep is included in the Healthy People 2020 goals.¹ Although some hospitalized patients have preexisting sleep disorders, others have temporary sleep disturbances due to pain, anxiety, or the effect of medications.^{2,3} Among acutely ill hospitalized patients, sleep disturbance and the inability to complete adequate sleep cycles can cause profound functional and psychological impairment.⁴⁻⁷ Regardless of etiology, patients find it challenging to sleep or rest in the hospital setting due to myriad other factors, such as the unfamiliar environment, inability to perform normal sleep hygiene, and loss of control over noise level, temperature, and lighting.^{2,8,9} Thus, nurses are often challenged in offering patients opportunities for complete sleep cycles and restorative rest.

One intervention that can potentially enhance the patient experience is to identify and promote

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designated quiet hours or quiet time (QT). QT to improve the patient's experience has been variously operationalized in numerous settings over the past few years. Although common noise and disturbance problems were addressed through initiation of QT, hospitals have varied on inclusion of nighttime or afternoon hours, and components of the QT intervention.¹⁰⁻¹² Furthermore, efforts to provide quiet hours have been addressed in the past with mixed success and weak sustainment. All too often, nurses are expected to lead the charge and keep other disciplines accountable for quiet.

AIM: OPPORTUNITY FOR IMPROVEMENT

The purpose of this quality improvement initiative was to improve patient experience as measured by Hospital Consumer Assessment of Health Care Providers and Systems (HCAHPS) scores for quietness in the hospital through implementation of a multidisciplinary QT. The specific aims were to (a) develop, implement, and test QT on 2 medicine units with multidisciplinary stakeholder engagement; (b) create a QT toolkit to share best practices; and (c) facilitate spread of QT across a diverse health care organization.

METHODS

Context

The University of North Carolina Medical Center is a public, academic medical center operated by the state of North Carolina. We chose 2 medical units for this project, comprising 41 beds in private rooms and 16 beds in shared (semiprivate) rooms. Medicine units were chosen as their patients are eligible for HCAHPS surveys, and the units struggled with maintaining adequate quiet.

A unique aspect of this project was the intentional inclusion of multiple stakeholders from various disciplines involved in the patient experience. The project team leader recruited team members from nursing, medicine, physical therapy, laboratory services, nutrition and food services, environmental services, pharmacy, patient transport, volunteer services, and hospital operations and a patient representative.

The team adopted Lean A3 thinking¹³ to identify sources of noise and brainstorm potential remedies and used the Institute for Healthcare Improvement's Model for Improvement¹⁴ to guide identification of changes to be tested, mea-

asures to assess their feasibility and effectiveness, and implementation of numerous PDSA (plan-do-study-act) cycles to test changes and make adjustments as needed. The University Institutional Review Board determined that the study was exempt from further human subject review.

Interventions

Root causes of noise were identified by the project team, and a gap analysis guided the selection of interventions to be tested. This process yielded the following interventions.

Quiet hours

Members representing each discipline provided feedback on how specific QT hours would affect their workflow and patient care. We chose to introduce both nighttime and afternoon quiet hours, a practice that is not universal across hospitals that have adopted QT. The hours of 2 to 4 PM were chosen as afternoon quiet hours based on the patient's natural circadian cycle and the quieter workflow. Midnight to 3 AM was initially selected for nighttime quiet hours due to scheduled early morning rounds by phlebotomy services. These rounds could not be changed without creating negative balancing effects, such as delays in discharge. During the PDSA cycles, the team discussed the use of flashlights, calm approach, and quieter voices as measures that could be employed to assure that the quiet was maintained and the work completed. This experience led the steering committee to reconsider the message of QT and subsequently adopted the position that "quiet time does not mean no-care time" and all agreed to extend QT to 5 AM.

Preparing patients for QT

Lights at the nurses' station were dimmed at the beginning of QT, and an announcement made via the nurses' hands-free wearable badge device to remind staff that QT is beginning. The team developed a script, and unit staff rounded to provide patients and visitors with an explanation of the importance of providing a low interruption period in the patient's busy day to assist with rest. The scripts used on admission and with pre- and post-QT are shown in the Table. Unit staff offered to lower overhead lights and close doors unless the patient requested that the door remain open. Nonpharmacologic sleep aids such as eye masks, ear plugs, warm blankets, and

Table. Scripting for Quiet Time

<i>On admission scripting:</i> Hi, Mrs Smith, Due to your busy schedule while in the hospital, our unit observes quiet time from 2 to 4 pm each afternoon and from 11 pm at night to 5 am each morning. We dim the lights, so you can rest and close the door to your room during these hours.
<i>Pre-QT scripting:</i> Hi, Mrs Smith, Is there anything I get you before quiet hours begin? Remember if you need anything, just call.
<i>Post-QT:</i> Hi, Mrs Smith, the quiet time hours are over now, we hope you were able to rest. Is there anything I can get you?

Abbreviation: QT, quiet time.

pillows were offered as part of a sleep menu in preparation for the nighttime QT.

Addressing noisy equipment

During the unit tours, the team discovered one of the loudest noises came from the plastic wheels on the oversized trash carts. After checking with several vendors and conducting PDSA cycles with our environmental services team members, rubberized wheels were purchased to replace the plastic wheels. The carts were not only quieter, they were easier to maneuver. In a subsequent cycle of improvement, the chairs at the nurses' station were also equipped with quieter wheels.

Lowering voices

Staff members focused attention during QT on keeping their voices low and much effort was exerted to encourage staff to freely—but politely—remind their colleagues of the need to lower voices. Large signs were purchased and displayed at key locations around the units to inform visitors and staff from other units about the hours and importance of QT. As part of the earliest PDSA cycles, several staff members created a game as a fun and nonpunitive way to provide feedback and remind their colleagues if their voices became too loud.

Measures

The HCAHPS survey is a 32-item standardized instrument, developed by the Centers for Medicare & Medicaid Services, summary results from which are publically reported on the Medicare.gov Hospital Compare Web site.¹⁵ HCAHPS surveys are sent to a random sample of patients from eligible adult inpatient units between 48 hours and 6 weeks after discharge. The focus of this project was the item, “During your hospital stay, how often was the area around your room quiet at night?” measured on a scale

of 1 “never quiet” to 5 “always quiet.” Since Hospital Compare reports the proportion of “always quiet” responses, this was selected as the primary outcome measure for this project.

Patient-reported sleep and noise were measured during the hospital stay using the Richard Campbell Sleep Questionnaire (RCSQ),¹⁶ a 5-question, 0- to 100-mm visual analog scale that has been validated to reliably assess sleep depth, latency, awakenings, percentage of time awake, and sleep quality, summarized in an overall sleep score. Higher scores indicate better sleep. In addition, there is a sixth item for quietness, where higher scores indicate greater quietness, which is not calculated in the total sleep score.¹⁶ The RCSQ was administered to a convenience sample of patients before implementation and then at 30, 60, and 90 days by project team members who were trained in its use by the one of the authors of this study.

Ambient noise level was recorded at baseline, during the month before the project, using a Wensn hand-held digital sound-level meter (T Tocas, ShenZhen City, China) and a Quest Model 2900 Integrating and Logging Sound Level handheld meter (Quest Technologies, Oconomowoc, Wisconsin) to check for reliability. All recordings were overseen by the medical center's industrial hygienist for the Department of Environmental Health and Safety. It is recommended that indoor noise levels should not exceed 35 to 45 dB(A).¹⁷ Noise recordings were performed inside and outside the doors of rooms selected by the staff on both units to represent both private and shared (semiprivate) rooms, as well as locations close to and away from the nurses' station. Mean decibel levels were measured over random short intervals to capture high and low levels, and specific sources of peak noise levels were noted. Locations selected for baseline measurements were repeated at

9 months during the sustainability phase of the project.

Analysis

All statistical tests were done with Stata 10.1 (StataCorp LP, College Station, Texas). RCSQ scores were not normally distributed (Shapiro-Wilk test for normality $P < .001$), so statistical comparisons between baseline and 90-day measurements were made using the Wilcoxon rank sum test for equality of medians.

RESULTS

HCAHPS for quietness

As shown in the Figure, HCAHPS "always quiet" scores improved on both units from pre- to postimplementation at 11 months. Unit 1 improved from 33% to 71%. Unit 2 improved from 53% to 70%. Although the overall trend was upward on unit 2, a decline was noted for 3 consecutive months, 3 months into the project, where "always quiet" did not comprise the majority of scores. During that period, the unit was experiencing some challenging staffing issues.

Richard Campbell Sleep Questionnaire

Fifty patients completed the RCSQ pre- and 102 completed it postimplementation. Sleep scores declined on both units; however, neither difference was statistically significant (see the Supplemental Digital Content, Figure, available at: <http://links.lww.com/JNCQ/A492>). Of note, however, the greatest improvement in sleep scores was observed in shared rooms.

The RCSQ score for quietness, item 6, did not differ significantly for either unit, though the quietness item scores were high overall (median

>90 on a 0- to 100-point scale). As expected, total sleep scores were significantly associated with quiet scores (odds ratio 2.5, 95% confidence interval, 1.3-4.9), indicating that those who reported greater quietness were likely to report better sleep.

Noise levels

Average noise dB(A) decreased from 59.3 (range, 56-82.3) to 53.5 (range, 44-72) during the afternoon QT hours. At the second recording, postintervention, one of the authors accompanied the industrial hygienist to note where peak readings were still occurring. Peak readings noted were due to elevators, bed movement, and voices at higher than normal levels.

DISCUSSION

Improvements were realized in patient satisfaction with quietness on HCAHPS publically reported scores. Although no improvements were seen in quiet scores on the RCSQ, sleep and noise were significantly and positively associated, with the greatest improvement in sleep scores seen in shared rooms. This improvement in the sleep scores in the shared rooms may have been influenced by a concurrent strategy at the hospital to improve patients' overall experience with shared rooms. This strategy included providing amenity kits containing headphones, earplugs, and eye masks for all patients in shared rooms. Ambient noise levels improved in the afternoon, though the extent of the change was modest.

One of the strengths of this study was the inclusion of stakeholders from multiple disciplines throughout the hospital. Unlike previous studies, where the majority of QT initiatives were the responsibility of nurses and ancillary nursing

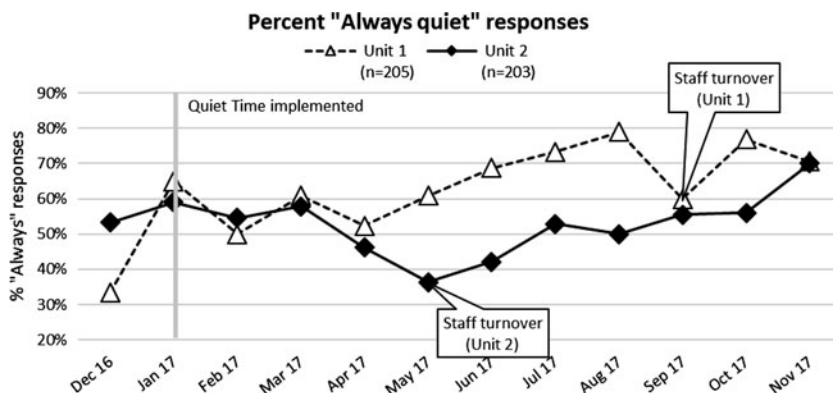


Figure. Percentage of patients reporting that area around their room was "always" quiet at night.

staff,^{11,12,18} our study included multiple health care personnel including volunteer services and patient representatives in planning and all facets of PDSA cycles leading up to the final QT components.

Consistent with Boehm and Morast,¹⁹ we built upon the value of getting everyone's input and went beyond the nursing staff. This was vital in establishing the best time of day for quiet hours. In previous studies, resistance to changes in workflow was reported from physicians and other nonnursing personnel who were excluded from decisions about quiet hours.¹⁸⁻²⁰ Furthermore, in an effort to minimize interruptions in some hospitals, visitors were restricted, and only essential tasks and activities were permitted during QT.^{21,22} Through the course of our PDSA cycles, the team determined that restricting interruptions to provide care was not feasible. We garnered greater stakeholder engagement once we adopted the message that “quiet time does not mean no-care time.”

Consistent with other studies, we chose 2 hours, with 2 to 4 PM being a common afternoon time.^{19,21,23-25} Two to 4 PM is often cited as the low point in the circadian cycle and therefore more amenable to afternoon rest.²¹ In quasiexperimental studies, afternoon QT also resulted in greater numbers of patients observed sleeping in a neurointensive care unit²⁰ and an orthopedic unit.²¹

Consistent with previous studies, we anecdotally found a balancing effect of staff appreciation for a calm time in the afternoon with dimming of the lights. Reimer reported significant decreases in nurses' stress scores during afternoon QT with dimming of lights.²⁵ Cranmer and Davenport²³ found decreases in both staff and parent fatigue (nonsignificant) during QT in a pediatric unit, though no difference was found in noise level.

Consistent with previous studies, we experienced noted improvement in HCAHPS quietness scores during the study.^{11,12} However, sustaining initial increases in HCAHPS scores was a concern in several studies. Murphy et al¹¹ reported challenges sustaining QT gains related to staffing issues, while Olson et al²⁰ reported staff found the workflow during QT to be challenging. Decreases in always quiet scores during this project, especially for 3 months for unit 2, were thought to be associated with a period when staffing was difficult, and there was greater use of nurses

who were not as familiar with the project. This validated our belief that QT requires a culture change to ensure compliance.

Measured improvement in sound levels was more of a challenge, and levels rarely fell to the recommended 45 dB(A) or less. Hospitals are noisy places, and noise remains above recommended standards in acute care settings, despite US Environmental Protection Agency and World Health Organization recommendations that indoor sound levels not exceed 35 to 45 dB(A).^{17,26,27} To put this in context, 45 dB(A) would be equivalent to library quiet. Even in what we considered very quiet settings, we logged levels at 50 dB(A)—the equivalent of the noise of a dishwasher running. Our industrial hygienist pointed out that legacy HVAC (heating, ventilation and air conditioning) systems provide a constant sound that would be nearly impossible to eliminate in an older structure such as our facility. In conducting our sound-level monitoring, we noted the accompanying sources of spikes in noise (doors, loud voices, and noisy carts)—equivalent to noisy traffic at more than 60 dB(A)—and focused our attention on those that were amenable to change. Likewise, something as simple as dimming lights resulted in the lowering of voices, but we found that 1 of our 2 units was not equipped with dimmers. In summary, many environmental adaptations are costly and beyond immediate remedy, but can be included in recommended improvements when units or hospitals are undergoing future renovations.

We present in this article what worked on our units. To spread our best practices within our large, diverse organization, we created and shared a toolkit of our successful practices for others in the organization to try (See the Supplemental Digital Content, Description of Toolkit, available at: <http://links.lww.com/JNCQ/A491>). As a result of our work, our hospital has adopted standard nighttime QT of 11 PM to 5 AM. Afternoon hours are decided by individual units based on their needs and workflow.

Limitations

There were several limitations to the generalizability of these results. There is always the possibility of patients responding to questionnaires in a socially biased manner, and this may account for the more favorable quietness scores on the RCSQ that was administered in-person

versus the responses to the HCAHPS survey. Furthermore, the respondents to the RCSQ were not a matched sample as it would not have been possible to ensure that the same patients were in the hospital at both periods. We did not explore any other factors related to individuals' sleep such as preexisting sleep disorders, pain levels, or medications.

The noise recordings were not 24-hour continuous recordings. Initially, we sought to conduct noise recordings on the unit as baseline for the Lean project to establish a reason for action. We then chose to check again at 9 months during the sustainment phase. Future research is recommended to focus specifically on changes in noise levels over several months as a result of interventions.

CONCLUSIONS

Implementing and sustaining a QT initiative involves a comprehensive improvement strategy. Much of the noise in hospitals is beyond the scope of nurse-driven improvement; however, a QT protocol led by nurses, developed by multiple stakeholders, and focused on changing expectations for quiet can lead to measurable improvements in patient perception of quiet and quality of sleep.

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