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BY CHRISTINE M. MEADE, PhD, AMY L. BURSELL, PhD, LYN KETELSEN, MBA, RN

Effects of Nursing Rounds on Patients' Call Light Use, Satisfaction, and Safety

SCHEDULING REGULAR NURSING ROUNDS TO DEAL WITH PATIENTS' MORE MUNDANE AND COMMON PROBLEMS CAN RETURN THE CALL LIGHT TO ITS RIGHTFUL STATUS AS A LIFELINE.

ABSTRACT

OBJECTIVE: There is limited research on patient call light use as it pertains to effective patient-care management, patient safety, and patient satisfaction. Therefore, this study sought to determine the frequency of and reasons for patients' call light use, the effects of one-hour and two-hour nursing rounds on patients' use of the call light, and the effects of such rounding on patient satisfaction, as well as patient safety as measured by the rate of patient falls.

METHODS: A six-week nationwide study was performed using a quasi-experimental nonequivalent groups design; baseline data was taken during the first two weeks. Analyses were performed on data from 27 nursing units in 14 hospitals in which members of the nursing staff performed rounds either at one-hour or two-hour intervals using a specified protocol.

RESULTS: Specific nursing actions performed at set intervals were associated with statistically significant reduced patient use of the call light overall, as well as a reduction of patient falls and increased patient satisfaction.

CONCLUSIONS: A protocol that incorporates specific actions into nursing rounds conducted either hourly or once every two hours can reduce the frequency of patients' call light use, increase their satisfaction with nursing care, and reduce falls. Based on these results, we suggest operational changes in hospitals, emphasizing nurse rounding on patients to achieve more effective patient-care management and improved patient satisfaction and safety.

KEY WORDS: Call light, rounds, patient safety, patient satisfaction, learning, patient-care management

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The call light can be a lifeline for hospitalized patients, but it can also impose considerable demands on nurses' time. Several studies have documented the unfavorable effects of patients' frequent use of the call light on the effectiveness of patient-care management on inpatient units,^{1,3} which may already be compromised by staffing shortages^{4,6} and burnout and job dissatisfaction among nurses.^{7,9} The empirical literature on call light use and on systematic approaches to conducting bedside rounds (referred to here as *rounding*) as a strategy for patient-care management is sparse. The impetus for this study was therefore twofold: to verify the authors' observations as researchers and practitioners regarding the amount of time nurses spend responding to call lights and how this affects patient-care management, and to address the dearth of empirical evidence surrounding this topic, in order to better assist hospitals and nurses to improve daily operations and patient safety.

Research has shown that patients use call lights largely for problems that do not require responses from an RN or LPN and that can be appropriately handled by certified nursing assistants (CNAs).^{2, 10} Van Handel and Krug categorized and quantified patients' reasons for using the call light and found that most use occurred at meal and medication times, when staff was busiest.³ This led to two interventions to reduce patient call light use: the addition of a nonnurse staff position (a unit assistant), and the implementation of "reactive-proactive" procedures (such as, when responding to a call light, asking the patient and his roommates whether they need any additional assistance). Moreover, Gersh reported that the use of an unlicensed "patient service partner" (whose job description included "housekeeping, food service, and nursing technician tasks") decreased call light response time, improved the attitudes of those responding, and increased the time that RNs and LPNs had available for patient education and documentation.¹ And Castledine suggested the initiation of "patient comfort rounds" every two hours to assess the adequacy of pain control, to observe patients' general condition (including cleanliness and need to use the toilet), and to meet any other nonmedical needs but did not conduct research to directly measure the effectiveness of such an intervention.¹¹ In summary, rigorous assessment of patient-care management systems is needed to determine the best ways to reduce call light use and burnout and fatigue among hospital personnel, as well as increase patient satisfaction and safety.

The use of interdisciplinary rounding teams with certain types of patients and hospital units has

resulted in reduced incidence of pressure ulcers among patients in the surgical ICU and among patients who stay in the ICU for more than 72 hours.¹² Researchers have reported mixed results on the question of whether daily interdisciplinary rounding increases operational efficiency across patient and unit types as measured by length of stay,¹³⁻¹⁵ but there is evidence of increased staff satisfaction.¹⁵ Finally, Sterman and colleagues found more effective pain management and improved patient satisfaction among patients with cancer when nurses engaged in specific actions, such as making semiweekly pain management rounds, educating patients on pain management, and recommending changes in pain management approaches to physicians.¹⁶ Interdisciplinary rounding can, therefore, positively affect patient care and operational efficiency. However, an important, still unanswered question is this: Can a systematic, nursing-only (rather than interdisciplinary) rounding protocol that *anticipates* patients' needs result in better patient-care management?

A patient's perception of the quality of nursing care largely depends on the nurse's ability to meet the patient's needs.

Hospitalized patients often require assistance with basic self-care tasks, such as using the toilet, ambulating, and eating, and usually communicate their needs by using the call light. Therefore, a patient's level of satisfaction with nursing care depends principally upon the patient's perception of how well the nursing staff has been able to meet his needs. Research attempting to measure patient satisfaction by measuring perceptions of the quality of nursing care has assessed both "humanistic" and more "concrete" behaviors.¹⁷⁻¹⁹ Several studies have evaluated patient perception of nursing care and consistently identified specific elements of nursing care that are very important to patients: smiles, humor, reassurance, kindness, compassion, gentle touch, and a nurse's ability to anticipate the patient's needs. These elements of care largely determine whether a patient will be satisfied with the care given.^{18, 20, 21} Not surprisingly, these studies also emphasize the importance of a nurse's physical presence to a patient's perception of nursing care. Moreover, research and training programs discuss

TABLE 1. Actions to Be Taken by Nursing Staff Members During Rounding

<p>(Each nursing staff member in the experimental groups received the following instructions regarding actions to be performed for each patient during one-hour and two-hour rounding.)</p> <p>The following items will be checked and performed for each patient. Upon entering the room, tell the patient you are there to do your rounds.</p>	
1	Assess patient pain levels using a pain-assessment scale (if staff other than RNs are doing the rounding and the patient is in pain, contact an RN immediately, so the patient does not have to use the call light for pain medication).
2	Put medication as needed on RN's scheduled list of things to do for patients and offer the dose when due.
3	Offer toileting assistance.
4	Assess the patient's position and position comfort: ask if patient needs to be repositioned and is comfortable.
5	Make sure the call light is within the patient's reach.
6	Put the telephone within the patient's reach.
7	Put the TV remote control and bed light switch within the patient's reach.
8	Put the bedside table next to the bed.
9	Put the Kleenex box and water within the patient's reach.
10	Put the garbage can next to the bed.
11	Prior to leaving the room, ask, "Is there anything I can do for you before I leave? I have time while I am here in the room."
12	Tell the patient that a member of the nursing staff (use names on white board) will be back in the room in an hour (or two hours if two-hour protocol is in use) to round again.

how patients' perceptions of the quality of nursing care are influenced not only by nurses' physical presence but by the quality of attentiveness or emotional awareness that they bring to the encounter—an essential feature of care.^{22, 23} The nurse has to demonstrate her availability in a manner that the patient finds meaningful or comforting.²⁴⁻²⁸ Other

important aspects of patients' perceptions of nursing care quality relate to more concrete nursing actions, such as correct and prompt attention to physical needs, timely administration of medication, and pain assessment.²⁹

In summary, a patient's perception of the quality of nursing care largely depends on the nurse's ability to meet the patient's needs as well as foster a relationship with the patient. The premise of the current study is that patients would perceive that proactive nurses who provide consistent care will meet their physical and emotional needs. Specifically, we hypothesized that nursing rounds on medical, surgical, and medical-surgical units, conducted on a regular schedule by nursing staff who perform a specific set of actions, would

- reduce call light use.
- increase patient satisfaction.
- improve patient safety, as measured by the frequency of patient falls.

METHODS

Design. To test the hypotheses, we used a quasi-experimental design with nonequivalent groups.³⁰ There was nonrandom assignment of hospital units to experimental and control groups; in this case, chief nursing officers and nurse managers at the participating hospitals assisted in the assignment of each unit to one of the three study groups: control, "one-hour rounding," and "two-hour rounding." (One-hour rounding was defined as rounds being performed once an hour between 6 AM and 10 PM and once every two hours between 10 PM and 6 AM. Two-hour rounding was defined as rounds being performed once every two hours during the entire 24-hour period.)

The decision to perform one-hour or two-hour rounding was made by each hospital, after discussions with the principal investigator (CM), who ensured that the sample was stratified according to type of unit (medical, surgical, or combined medical-surgical), unit size, and frequency of rounding. In several cases, units were asked to change to a different rounding protocol to ensure that the sample was balanced.

There were two conditions in each experimental group: baseline measurement that lasted for two weeks and either one-hour rounding or two-hour rounding, which lasted for four weeks. The measurement of call light use was divided into two-week time periods so that the interventions (one-hour and two-hour rounding) could be compared with the baseline. Therefore, at each hospital, the study lasted six consecutive weeks, and hospitals could choose to begin at any time from January 15 to April 1, 2005, to minimize interference with hospital operations. Final data from all participating hospitals were collected by June 1, 2005.

Participating in the Call Light Study

ONE NURSE MANAGER ENCOURAGES HER STAFF TO MAKE HOURLY ROUNDS.

"In the beginning, I didn't believe it," admits nurse manager Bette Dructor, RN, of the medical-surgical unit at Northeastern Hospital-Temple University Health System in Philadelphia. Researcher Christine Meade (one author of this study) was seeking to convince her and another unit's nursing manager that her staff should take on additional rounds for a study she was conducting on call light use. The demands on staff were high, but the benefits, Meade promised, would prove to be far reaching.

"There are some patients you're just never going to please, no matter how many times you go into their rooms," Dructor says of her initial reluctance to participate. "I just thought this was one more thing for our limited staff of nurses to do."

But when she heard Meade's presentation, she warmed up to the idea. The researcher impressed Dructor with her argument that additional rounds could create a better work environment for staff. Meade assured her that regular, hourly rounds would result in fewer calls from patients. This would in turn lead to fewer distractions, a quieter work environment, and better organization.

Once she'd been convinced, Dructor had to convince her staff of 28. "I told them they wouldn't be interrupted by call lights anymore while giving medications or patient education," she says. But the realities of nursing demands made her staff skeptical. "You can get so frustrated in nursing," says Dructor, "kicked down by the patients and the politics."

Her staff balked. The nursing assistants were especially disgruntled; they believed they would bear the brunt of what they perceived to be extra work, Dructor says. But once the hourly rounds were initiated, aides were surprised to find RNs pitching in on rounds aides were unable to do. And everyone appreciated the unfamiliar quiet on the floor: call light use was cut by 65%.

"You never hear RNs say they have more time," Dructor notes. "I didn't believe that if they did, they would ever admit it." But that's exactly what they said. Meade's interventions gave them during the month-long study intervention; they also reported a decrease in the



Nursing assistants Elizabeth Bonk and Kim Lyons discuss with medical-surgical unit manager Bette Dructor, RN, the implementation of hourly rounds.

Courtesy of Northeastern Hospital-Temple University Health System

patient fall rate, fewer pressure ulcers, and less skin breakdown. Dructor hopes that the number of lawsuits against the hospital will drop, too.

"The patients love it," she says. "I hear them tell their family members during visiting hours when rounds are being done, 'Oh, she's just checking on me to make sure I'm all right.'" She's amended the protocol since the end of the study by cutting rounds back to once every two hours from 10 PM to 6 AM—she has found that patients have fewer needs during these hours and it avoids waking them unnecessarily.

Soon other units in the hospital were hearing about the positive results of participating in the study, and all units have since mandated hourly rounds. She told managers of other units, "You learn so much from the rounding logs. You'll see the trends in pain control: if we see that a patient asked for pain medication six times in 24 hours, we know we're not controlling that patient's pain."

But the best part of participating in the study, Dructor says, has been seeing the success of her staff. "We are a small hospital without a lot of resources. I am so proud of them for pulling it off." —Alison Bulman, editorial coordinator

Observations made in the first two weeks served as a baseline measurement of call light frequency and the reasons for call light use. A list of 26 reasons for call light use was devised based on our review of the literature (for example, Van Handel and Krug's 1994 study³) as well as our clinical experience. The rounding conditions were implemented over the next four weeks. All members of the nurs-

ing staff, including RNs, CNAs, LPNs, patient care assistants, and patient care technicians (PCTs), were required to perform specific actions during every patient interaction in both the one-hour and two-hour rounding conditions (see Table 1, page 60). As is consistent with standard hospital practices, patients were not awakened if they were sleeping, during either day or evening hours, unless

TABLE 2. Average Daily Census and Hours per Patient Day in Study Units During the One-Hour and Two-Hour Rounding Periods

	National mean*	One-hour control units (mean)	One-hour rounding units (mean)	Two-hour control units (mean)	Two-hour rounding units (mean)
Average daily census	—	24.6	22.7	29.8	31.9
Hours per patient day	8.12	8.73	8.33	8.65	8.81

Note: hours per patient day are hours of work spent in direct patient care.

* Taken from Cavouras CA, Suby C. 2004 survey of hours report: direct and total hours per patient day (HPPD) by patient care units. 15th ed. Phoenix: Labor Management Institute; 2004.

TABLE 3. Comparison of Call Light Use, According to Major Reason Category

Major reason category	Control group; % (number of calls)	One-hour rounding group; % (number of calls)	Two-hour rounding group; % (number of calls)
Serious Medical Concerns	36.7 (4,953)	34.3 (4,527)	39.6 (5,628)
Secondary Medical Concerns	19.9 (2,684)	21.9 (2,894)	18 (2,553)
Nonserious Personal or Health Issues	14.3 (1,932)	13 (1,718)	12.3 (1,740)
Room Amenities	1.8 (241)	1.4 (191)	1.6 (231)
No Reason/Miscellaneous	27.3 (3,684)	29.4 (3,886)	28.5 (4,049)
Total	100 (13,494)	100 (13,216)	100 (14,201)

it was necessary for treatment. The control group units simply collected data on the frequency of and reason for call light use as it occurred for the entire six-week period.

Each unit implemented the rounding schedule that would best fit its staffing patterns and patient needs. However, on 95% of hospital units, CNAs, PCTs, or nursing aides rounded on the odd hours and RNs rounded on the even hours. Nursing staff members who performed the rounding were required to complete all patient-care tasks, unless they weren't authorized to dispense medication or work with IVs. Additionally, all hospital units in the experimental and control groups provided the principal investigator with internal patient satisfaction and safety data (the number of falls) for the month prior to the four weeks of rounding.

For further details on the study's design, see *More on Methods and Statistics*, page 68.

RESULTS

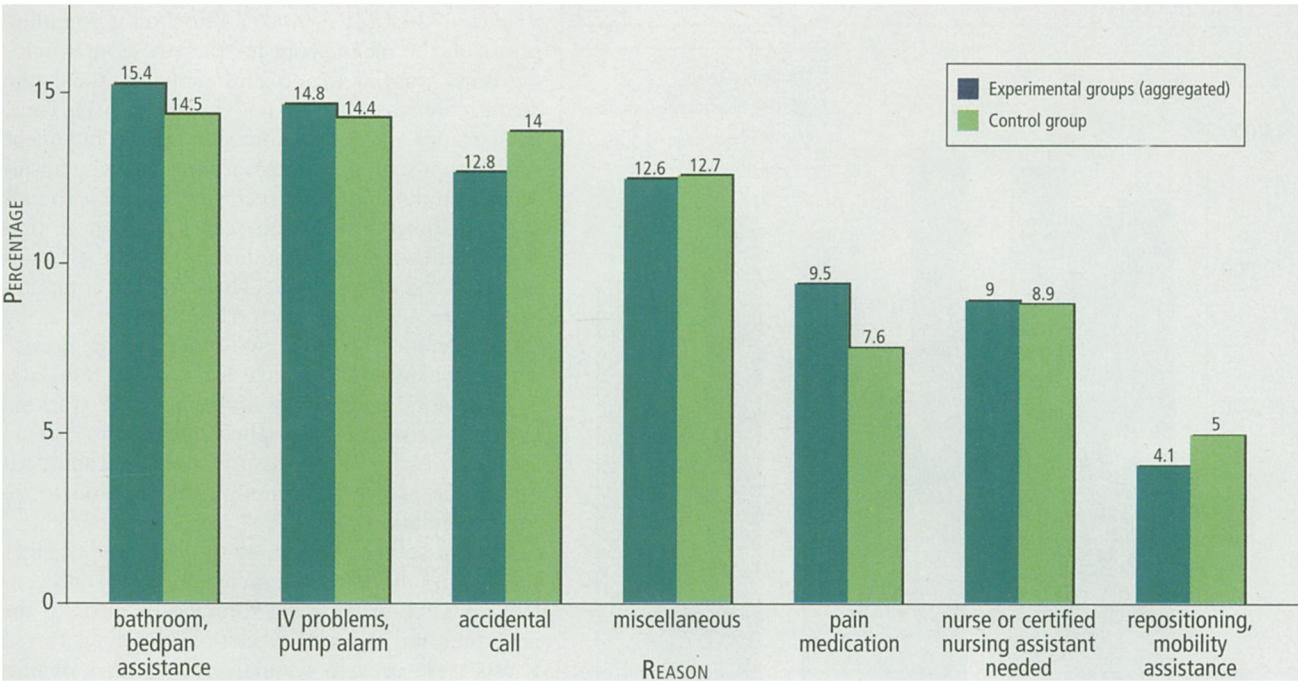
Of the 22 hospitals (46 units) that participated in the study, data from eight hospitals (19 units) were

excluded from analyses because of poor reliability and validity of data collection. Hospitals and units were excluded if rounding logs revealed that more than 5% of data elements were missing, suggesting that nursing staff members hadn't consistently performed the rounding and, therefore, had produced unreliable data. It's important to note that approximately 72% of the hospitals had existing internal checks and balances to verify the accuracy of the call light records, including Hill-Rom electronic call light recording systems (four hospitals, 29%) or 24-hour communication centers or nursing desk staff whose primary job was to receive all the call light requests from patients and page nurses to the rooms (six hospitals, 43%).

The average daily census and direct (worked) hours per patient day in the experimental and control groups are provided in Table 2 (above), as are nationwide normative data.

Frequency of call light use. Data on 108,882 instances of call light use were collected from 14 hospitals (27 units) over a six-week period: the mean number of call lights answered was 4,381.7 on the

FIGURE 1. MOST COMMON REASONS FOR CALL LIGHT USE



Note: none of the differences between the experimental and control groups was statistically significant. Percentages do not add up to 100 because these are only the seven most common of the 26 reasons for call light use. The total number of calls was 108,882.

15 experimental units (total number of call lights answered was 65,726) and the mean number of call lights answered was 3,596.3 in the 12 control units (total number of call lights answered was 43,156).

The top seven of the 26 individual reasons for call light use are shown in Figure 1 (above). There were no significant differences between the control and experimental groups. The 26 individual reasons for use of the call light were further classified into five “major reason categories”: No Reason/Miscellaneous (for example, “accidentally pushed call light” and “can’t understand patient on intercom at nursing station”), Room Amenities (for example, “move telephone closer” and “room temperature adjustment”), Nonserious Personal or Health Issues (for example, “personal needs assistance” and “beverage request”), Secondary Medical Concerns (for example, “bathroom/bedpan assistance” and “repositioning and mobility assistance”), and Serious Medical Concerns (for example, “iv problems/pump alarm” and “pain medication”).

Between the control and experimental groups, there were no statistically significant differences in the proportions of call light calls made in each major reason category, indicating that the groups were comparable at baseline (see Table 3, page 62).

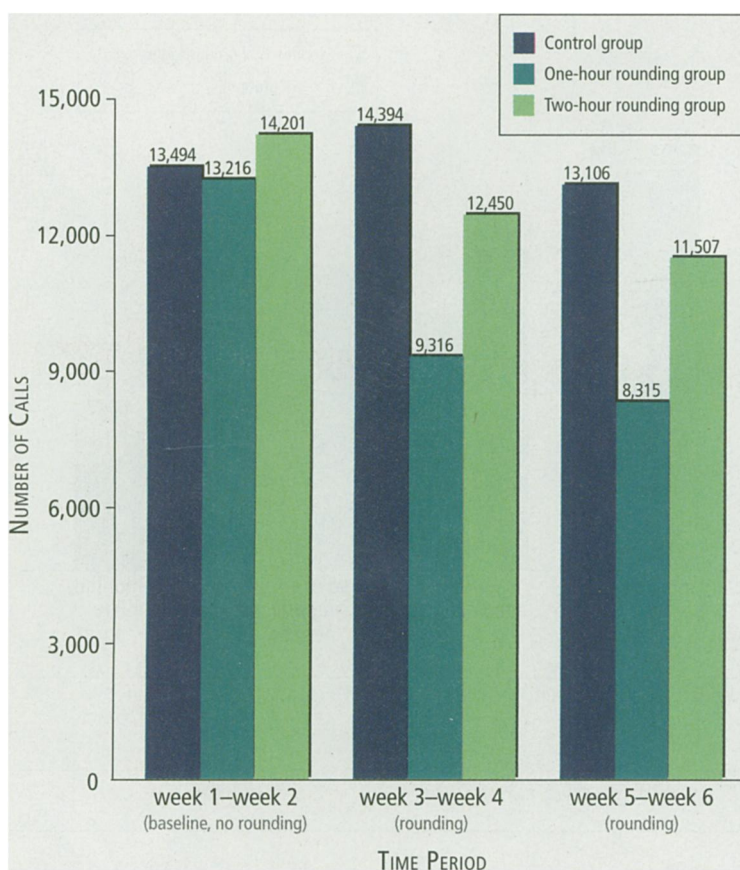
Serious Medical Concerns and No Reason/

Patient satisfaction increased during the rounding protocol in both the one-hour and two-hour rounding groups.

Miscellaneous were the major reason categories with the most and second most calls across all three groups and all three time periods (at baseline, week 3 through week 4, and week 5 through week 6). Figure 2 (page 64) shows the dramatic decline in call light use in both the one-hour and two-hour rounding conditions, compared with the control group.

Binomial tests revealed significant reductions ($P = 0.007$) in call light use for the one-hour rounding condition across all three time periods and for all major reason categories, except in the weeks 3 and 4 and weeks 5 and 6 periods for the major

FIGURE 2. FREQUENCY OF CALL LIGHT USE IN THE THREE GROUPS



reason categories Room Amenities and No Reason/Miscellaneous (see Figure 3, page 65). Figure 4 (page 65) illustrates the decline in call light use for the two-hour rounding condition from baseline to weeks 5–6. As with the one-hour rounding condition, binomial tests revealed significant reductions across all three time periods and for all major reason categories, except in the weeks 3 and 4 and weeks 5 and 6 periods for the major reason categories Room Amenities, No Reason/Miscellaneous, and Nonserious Personal and Health Issues ($P = 0.06$).

Patient satisfaction. We performed t test comparisons of patient satisfaction scores on data from the one-hour and two-hour rounding units. The data compared were the patient satisfaction scores from a four-week period prior to the start of the rounding protocol and scores collected during the four-week rounding protocol. (Interestingly, mean patient satisfaction scores in the control groups at baseline were slightly higher than in the treatment groups and declined over the course of the study.)

The mean score for the 28-day period prior to rounding for the units using one-hour rounding

was 79.9 on a 100-point scale, and the mean score during the rounding protocol on those units was 91.9 ($t = 736.58$, $P = 0.001$). Prior to the rounding protocol, the mean score for the two-hour rounding units was 70.4, and during the protocol, the mean score was 82.1 ($t = 657.11$, $P = 0.001$). Thus, both groups showed significant increases in patient satisfaction scores, although it's unclear why hospitals and units that performed the two-hour rounding had lower satisfaction scores than those that performed one-hour rounding at both the beginning and end of the study. (The statistical computations were performed with STATS software, using the "difference between two independent means" procedure.) We did not have access to the raw data. The vendors at each hospital who were tracking patient satisfaction supplied mean satisfaction scores for each unit, the sample sizes, and standard deviations, which was enough information to do t test calculations.

Patient safety. We wanted to determine whether the rate of falls decreased on experimental and control units, comparing the four weeks prior to the rounding and the four weeks of rounding. Paired t tests were used to compare the number of falls during the baseline period to the experimental period on both the control and experimental units. The analysis revealed that significant reduction in falls occurred only with one-hour rounding.

DISCUSSION

This multisite study was designed to test the hypotheses that a rounding intervention could reduce hospital patients' use of the call light (particularly for minor patient needs), increase patient satisfaction, and reduce the rate of patient falls. Given the variety of hospital types (small, large, rural, urban) that participated in the study, we believe these findings are generalizable to the majority of U.S. hospitals.

The first hypothesis was supported: regular rounding during which nursing staff performed specific actions significantly reduced patient call light use. Patient satisfaction increased during the rounding protocol in both the one-hour and two-hour rounding groups. Specifically, nurses who conducted rounds hourly saw patients more often in a 24-hour period and patient satisfaction levels were higher for the one-hour condition, when compared with the two-hour rounding condition. However, this analysis is tenuous for two reasons. First, as mentioned above, we did not have access to the raw data; rather, vendors tracking patient satisfaction supplied the data and we have to assume it was accurate. Second, it's unclear why the hospital units on which two-hour rounding was conducted had lower satisfaction levels prior to the implementation of the rounding protocol, as com-

pared with those units on which one-hour rounding was conducted. It's possible that, because hospitals could choose which protocol worked best for them, those that chose the two-hour protocol may have had less-well-developed patient-care management systems to begin with, and therefore opted to participate in the less rigorous protocol.

Patient falls were significantly reduced only during the one-hour experimental rounding. While the number of falls did decline in the two-hour rounding group, the finding was not statistically significant. Replication of this study with a larger sample may be helpful in determining whether two-hour rounding reduces falls. Nursing staff satisfaction was not tested in this study. Initially, when the hospital training was conducted, nursing staff in the experimental units expressed concerns about whether they would have the time to perform the rounding as well as their normally scheduled tasks. Some also wondered who would do the rounding and said they thought that it should be a team effort, with RNs and other nursing professionals sharing the rounds. However, at the end of the study, anecdotal data verbally reported by nursing staff who worked on the experimental units indicated that they were more satisfied with the additional time they had to care for their patients as well as to perform other tasks (such as charting and patient education), because the rounding reduced the number of call lights they had to answer, thus freeing up time for other tasks. Nursing staff members who performed one-hour rounding reported that units were quieter; also, they reported that they were able to be more attentive and respond more quickly when call lights rang, because the ring was not part of the "normal" noise on the unit anymore.

Taken together, these analyses suggest that one-hour rounding positively affects patient and nursing staff welfare. Considering the nursing shortage, issues of fatigue and burnout, and the growing health care demands of the baby boom generation, nursing units could greatly benefit by using a one-hour rounding protocol to achieve greater efficiency. This could translate into greater work satisfaction and, possibly, reductions in fatigue and burnout, as well as patients who are more satisfied.

Limitations. Our study used a quasi-experimental design, which doesn't ensure equivalence between groups. We don't know all the specific factors each hospital considered when making decisions about assignments to control or one-hour and two-hour rounding groups. However, although the comparability of call light use, in terms of the proportions of calls made in each major reason category, suggests some equivalence between the control and experimental groups, the difference in patient satisfaction between the one-hour and two-hour rounding

FIGURE 3. VARIATION IN FREQUENCY OF CALL LIGHT USE BY MAJOR REASON CATEGORY OVER TIME IN THE ONE-HOUR ROUNDING GROUP

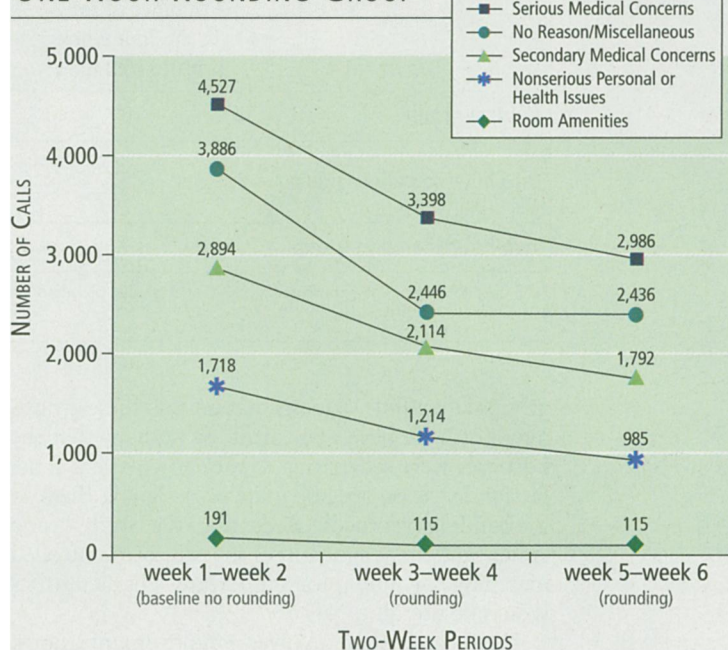


FIGURE 4. VARIATION IN FREQUENCY OF CALL LIGHT USE BY MAJOR REASON CATEGORY OVER TIME IN THE TWO-HOUR ROUNDING GROUP

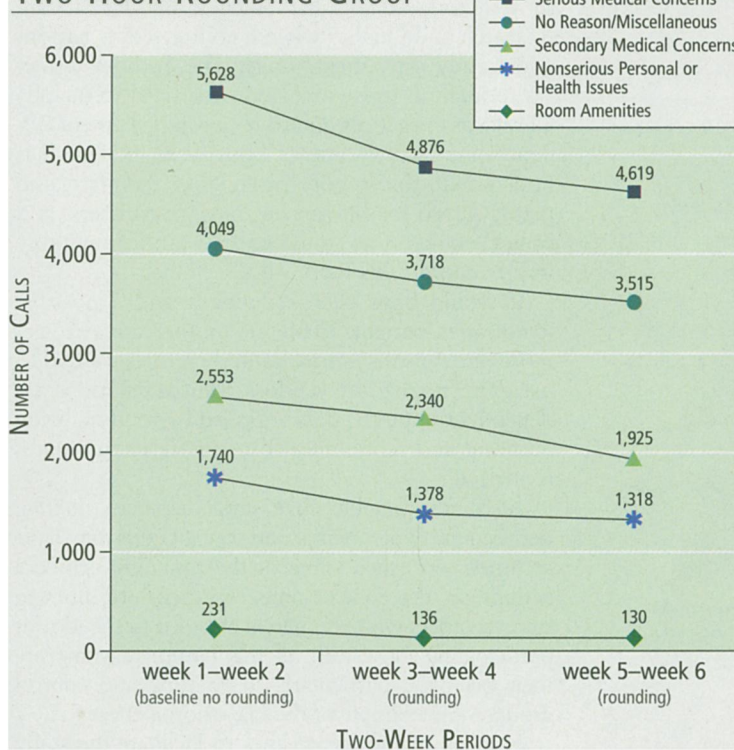


TABLE 4. COMPARISON OF FREQUENCIES OF PATIENT FALLS IN THE FOUR WEEKS PRIOR TO ROUNDING AND DURING FOUR WEEKS OF ROUNDING ON EXPERIMENTAL AND CONTROL UNITS

Group	Number of falls in the four weeks prior to rounding*	Number of falls during the four weeks of rounding	Statistic and significance
Control group	18	17	not significant
One-hour rounding group	25	12	$t = 3.074$ $P = 0.01$
Two-hour rounding group	19	13	not significant

* All hospital units in the experimental and control groups provided the principal investigator with internal patient data on falls for the month prior to the four weeks of rounding.

groups at baseline suggests that units in these groups may not have been equivalent, or perhaps that the hospitals were attempting to raise low patient satisfaction levels on specific units by assigning them to a rounding protocol. Repeating the study using either random assignment or investigator-controlled matching of units for important characteristics would be useful.

In research that involves whole organizations, and in which there is a great deal of human interaction coupled with 24-hour operations, it's impossible to ensure that every nurse will perform the protocol and record data correctly during every patient interaction. Our thoughts are similar to those expressed by the Agency for Healthcare Research and Quality when it completed its nationwide study on patient safety. The authors wrote, "Although all those involved tried hard to include all relevant practices and to review all pertinent evidence, inevitably some of both were missed. It is hoped that this report provides a template and plants a seed for future clinicians, researchers, and policy makers as they extend and inevitably improve upon this work."³²

It would have been redundant and a possible irritation to patients to fill out another survey to get more patient satisfaction data; therefore, we had to use data supplied by vendors. Our calculations are dependent upon the data supplied by vendors being accurate and representative of the discharge dates requested.

Also, it's possible that staff members floating between the experimental and control units may have at times performed some of the rounding protocol actions on the control units. Furthermore, nursing staff members who are merely exposed to the idea of participating in a study of this nature may modify their behavior, particularly in baseline and control groups—an example of the Hawthorne effect.³³

Nursing managers' abilities to facilitate the study varied, and some units experienced management

changes during the research. The degree to which these issues affected the units' performance and the variation among them in call light reduction is unclear.

Future directions. First and foremost, we hope other researchers will attempt to replicate these results, preferably in a nationwide representative study of at least six months' duration, so that more rigorous assessment of the long-term effects of these protocols can be made. This would permit more robust analyses of any enduring effects of rounding on call light use, patient satisfaction, and patient safety. Data collection should extend to hospital-acquired decubitus ulcers, particularly among the elderly and those with conditions that require longer hospitalizations. Second, more systematic assessments of both patients' and staff members' satisfaction should be made, to determine the best ways to improve the intervention for both groups. Third, it would also be beneficial for hospital administrators, chief nursing officers, and nursing staff members to track more closely how well the reduced call light use enables nursing staff members to redirect their time and energy to other patient care tasks. Whether and how any time gained by a reduction in call light use can be used to improve staffing patterns and whether and under what circumstances nursing staff members other than RNs can conduct nursing rounds are questions deserving of further study.

Fourth, hospitals that were excluded from the analyses because of poor reliability and validity of data (more than a third of the total number enrolled) are also those hospitals that didn't have extensive internal systems of checks and balances in place to monitor the frequency of and reasons for call light use. Researchers may want to use this as an additional criterion for participation in future studies. Finally, as with any training program, a key factor to successful implementation of an intervention on a nursing unit is hospital leadership, espe-

One Year Later

FOLLOW-UP WITH HOSPITAL UNITS PARTICIPATING IN THE HOURLY ROUNDING AND CALL LIGHT STUDY.

Many of us know from experience that it's easier to do something for a short time than to make it a part of our everyday behavior. Health care organizations throughout the country are similarly challenged to make those interventions and procedures known to work well a habitual part of daily operations—a process described by Quint Studer of the Studer Group as "hardwiring."¹

Given this understanding, we wanted to follow up with the hospital units that participated in our call light study a year ago. Our purposes in doing this follow-up were to understand

- whether the units continued the hourly rounding after the study period.
- whether other units in the hospital had adopted hourly rounding.
- what, if any, enhancements or adaptations were made to the actions adopted for the study.
- how patient satisfaction scores and fall rates had changed from the beginning of the study.

This summary presents data only from the 14 hospitals whose data were analyzed in the study.

- Of the units that participated in the rounding, 12 (85.7%) continued the practice. Of the two that did not, one had experienced a management change and the new manager was unable to sustain the rounding protocol. The other unit was closed temporarily because it was being renovated.
- Of the hospitals that participated in the study, 13 (92.8%) decided to expand the rounding to other units or all units in the hospital.
- Patient satisfaction scores (that is, scores that reflected patients' perceptions of the overall quality of care on the unit) continued to increase over the year. The increase in the mean score for all of these units was 8.9 points on a 100-point scale, from 79.9 to 88.8. Note that the units in the experimental group increased the average rating by 12 points during the study, so this is a consistent level of improvement, suggesting that hardwiring is taking place on these units. (Two hospitals have monitored the percentage of "excellent" ratings rather than the mean score. The two units in the rounding groups at these hospitals have increased the percentage of "excellent" ratings from 38.3% at the start of the study to 80.1%.)

Patient Satisfaction and Safety at One Year

Quantitative Measures	Before Rounding	Current
Patient satisfaction rating reflecting the "overall quality of care on the unit" (mean)	79.9	88.8
Percentage of "excellent" ratings	38.2%	80.1%
Reduction in falls*	—	60%

* In the four weeks prior to the start of the study there were 25 falls; in four weeks one year after the end of the study there were 10.

- Comparing the four weeks prior to rounding with four weeks one year after the study, falls have been reduced by an overall 60%. Note that the units in the study reduced falls by approximately 50% in the one-hour rounding group.
- Hospitals have made enhancements to help nursing staff continually practice the rounding protocol. These include the following:
 - Laminated pocket cards have been made for the nursing staff, so they're continually reminded of the actions to perform on the rounds.
 - Rounding boards were mounted to the outside of the patients' doors to ensure that rounding occurred and could be easily monitored by anyone walking through the unit.
 - Actions to be performed on rounds were printed, laminated, and posted on the patients' doors as a constant reminder to staff and to let visitors know how the unit cares for its patients.
 - Eight hospitals printed cards that nursing staff members can leave on bedside tables so that patients who were asleep during rounding will know that rounds were conducted. The cards have space for the staff member to write in her name and the time that rounds were performed.

A detailed summary for each participating hospital is available from the authors at chris.meade@studergrupp.com.—Christine M. Meade, PhD

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cially that of nurse managers, who have to ensure that all members of the nursing staff are diligent in carrying out the protocol. The hospitals and units that had to be eliminated from this study are evidence that full compliance with a new protocol

doesn't come easily and that staff are sometimes reluctant to participate.

Our findings provide evidence that improved patient-care management and patient satisfaction and safety are achievable with interventions that nurses

More on Methods and Statistics

The rationale for the four-week duration of rounding is based on the cognitive-behavioral and learning literature, which suggests that the more complex the cognitive-behavioral learning program (such as the protocol of questions that nurses ask patients during rounds), the longer it may take learners to fully integrate new behaviors into their repertoire. This process is known as "behavioral shaping"³¹ and has been widely and successfully applied in various situations, including humanistic approaches to psychotherapy.^{22, 23} The four weeks of rounding were divided into two two-week periods for the purposes of analysis, so that the strength of the learning curve—how quickly the intervention affected patient call light use—could better be determined.

Hospital sample selection. Hospitals were allowed to participate if they met the following criteria: per diem employees from outside agencies accounted for 5% or less of staff; they had medical-surgical units, surgical units (including orthopedic patients), or medical units (including oncology, telemetry, or neurology patients); and the units they assigned to the study had to have strong nurse managers who had the ability to oversee the study, supervise staff, and manage data-collection compliance (the chief nursing officer in each hospital recommended the units that had the strongest nurse managers). Twenty-two hospitals (46 units) participated in the study. All participating hospitals were required to have at least one hospital unit in the experimental group and one unit with similar types of patients in the control group. In every hospital that elected to participate, approval was obtained from the facility's institutional review board or through appropriate internal review processes. The participating hospitals were from 14 states, representing urban and rural populations, and the number of beds ranged from 25 to more than 600.

Hospital orientation and training. On the units using the experimental protocol, the principal investigator conducted training sessions to explain the purpose of the experiment and demonstrate the actions to be performed while rounding. The sessions were videotaped for staff members who were unable to attend. On the control group units, the chief nursing officer and the hospital unit nurse managers and secretaries met with the principal investigator to be trained in the methods to be used to record the frequency of and reasons for call light use. Nurses from the control group units weren't exposed to any training sessions, to prevent their inadvertent implementation of the specific actions to be performed in the experimental groups.

Data collection instruments and procedures. Call light logs were used to record the time, room number, and reasons the patients used the call lights. Call light logs were kept at the nursing desk and data were recorded on all

shifts either by unit secretaries or staff working in the 24-hour communication centers (whose primary job was to receive all the call light requests from patients and page nurses to the rooms). In hospitals without such staff members on duty around the clock to receive and record call light requests, a call light log was posted in each patient's room as close as possible to the patient's bed so that nursing staff answering call lights could record the call. The nursing staff member who responded to the call light determined which of the 26 reasons for call light use was applicable to a specific occurrence and either used the code or wrote the reason for the patient's use of the call light, which was then coded by the Alliance for Health Care Research's data entry staff.

In addition, nursing staff members who performed one-hour or two-hour rounding recorded their rounding times and provided general comments about the patient in a rounding log. If a patient was discharged or a room didn't have a patient, staff members were instructed to indicate in the log the reason the room was empty, to ensure that every bed was accounted for in the data collection process. Logs were collected daily by unit secretaries or nurse managers at 7 AM, the end of each 24-hour period. Nurse managers reviewed the rounding logs and call light logs on a daily basis to ensure compliance with the research protocol; if necessary, they took action to ensure compliance. Nurse managers also verified that rounding was being performed by asking patients. Nurse managers from the experimental and control groups forwarded data weekly to the principal investigator. The principal investigator visited each hospital during various stages of the study to ensure compliance with the research design and methods.

The patient satisfaction data came from surveys developed by commercial vendors used by the hospitals, who in turn gave the principal investigator the hospital units' mean scores, which were based on the discharge date of the patient. Although hospitals used different questionnaires and vendors (vendors used by the units in the study were Press-Ganey [10 hospitals], NRC+Picker [two], and Professional Research Consultants [two]), all surveys included a question about overall nursing care, which was consistent in terms of content and scale conversion. Specifically, all measures computed a mean patient "overall nursing care score" (that is, a patient satisfaction score) that ranged from zero to 100. Mean patient satisfaction scores were based on a five-point Likert-type scale (1 = "poor" or "strongly disagree," 5 = "excellent," "very good," or "strongly agree") and converted to a 100-point scale. (Applying different instruments to measure the same construct is common. For example, various IQ and achievement tests are used nationally and employ different metrics that have been determined to be sufficiently equivalent.)

When describing their research, authors try to use terminology that accurately expresses their research procedure. This may present a few challenges, however, when the methodology employed is unique or involves a procedure that is not usually associated with that terminology.

Consider, for example, the terms *experimental* and *quasi-experimental*. In an experimental design, the researcher randomly assigns study participants to treatment and control groups. In a quasi-experimental design, however, the group assignment process is based on a preexisting condition or naturally occurring event that preceded the study. For example, when examining the effect of eye color on a person's perceptions of his attractiveness to others, eye color would be a preexisting condition. The researcher cannot change this feature; therefore, assignment of participants to groups would be predetermined—on the basis of the participant's existing eye color. Similarly, if one is examining physical endurance levels in people who have no history of heart disease, those who have experienced a recent onset of heart disease (within one year), and those who have a history of heart disease (longer than a year), the assignment of participants to a treatment condition would be predetermined—on the basis of their history of heart disease.

In each of these examples, assignment to a treatment condition is based on a preexisting condition or naturally occurring event that is outside of the experimenter's control. The distinction here is that the criteria for including a subject in a particular experimental condition are controlled by the researcher. If, as part of a study, participants are assigned to a treatment condition not as a result of randomization or a preexisting condition or naturally occurring event but

because of the actions of another person in the study, it would be difficult to consider the study's design quasi-experimental. If another person who is not the researcher determines the assignment of participants to a treatment condition during the course of the study, it's reasonable to ask whether this process biases the study methodology in some way and, possibly, the outcomes.

Clearly, to avoid concerns of bias, it's best to ensure that, when possible, the researcher controls the assignment process or verifies that the assignment of participants to treatment conditions is due to a preexisting or naturally occurring event. In the rare instance that the assignment of study participants to a treatment condition is due to factors other than researcher control or a preexisting event, it's best not to characterize such a study design as quasi-experimental because the method by which participants were assigned to a treatment condition may be inconsistent with the procedures assumed in a study of that kind. Instead, when the assignment of subjects is outside of the experimenter's control and not due to preexisting conditions, the researcher should consider other terms for describing the study methodology.

In addition, a study design incorporating multiple observations that include baseline measurements taken during one time period and measurements taken during other periods in time (days or weeks later) can more accurately be described as a "time series" or "time sampling" design, a type of quasi-experimental research that implies that multiple measures are obtained at specific time intervals.—Deborah Fish Ragin, PhD, associate professor, Montclair State University and research assistant professor, Department of Emergency Medicine, Mount Sinai School of Medicine

can initiate and carry out. We hope that hospitals will embrace the approach outlined here to determine whether similar operational changes to rounding protocol would be as beneficial to them as it was to the hospitals that participated in this study. ▼

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Effects of Nursing Rounds on Patients' Call Light Use, Satisfaction, and Safety

1. Previous research has shown that patients use call lights largely for issues that

- a. should be handled by a nurse.
- b. could wait until the next time staff enter the room.
- c. are frivolous.
- d. can be handled by a certified nursing assistant.

2. According to Van Handel and Krug, which of the following times attracts the most call light use?

- a. meal times
- b. bedtime
- c. early morning
- d. visiting hours

3. Which intervention did Gersh report to be effective in decreasing call light response time?

- a. reactive–proactive procedures
- b. patient comfort rounds
- c. liberal visitation policies
- d. use of unlicensed “patient service partners”

4. According to Halm and colleagues, having interdisciplinary rounding teams in the surgical ICU was instrumental in

- a. reducing length of hospital stay.
- b. increasing operational efficiency.
- c. reducing the incidence of pressure ulcers.
- d. ensuring timely administration of medication.

5. According to previous research by Fagerstrom and others, a specific element of nursing care that is very important to patients is

- a. nursing actions aimed at shortening the patient's stay.
- b. the nurse's ability to anticipate the patient's needs.
- c. demonstrations of the nurse's knowledge and expertise.
- d. the nurse's facility as a liaison between patients and physicians.

6. To participate in the authors' study of call light use, hospitals had to meet several criteria, which included

- a. having strong nurse managers.
- b. having at least one ICU.
- c. keeping their use of agency staff at 10% or less.
- d. offering maternal–child health among its services.

7. Besides reviewing the rounding logs and call light logs on a daily basis, nurse managers verified that the rounding was being performed by

- a. observing staff at rounding times.
- b. asking unit secretaries.
- c. checking patients' medical records.
- d. asking the patients.

8. Nurses in the experimental groups performed which of the following specific checks or activities during rounding?

- a. offering a beverage or snack
- b. giving a back and neck massage
- c. putting the garbage can next to the bed
- d. assisting with hair combing, shaving, or both

9. The results of the authors' study of call light use indicated that the most common category of reasons for call light use at baseline was

- a. Room Amenities.
- b. Serious Medical Concerns.
- c. No Reason/Miscellaneous.
- d. Secondary Medical Concerns.

10. Comparing the four weeks prior to rounding with four weeks one year after the study, falls had been reduced overall by

- a. 40%.
- b. 50%.
- c. 60%.
- d. 70%.

11. The most frequent individual reason for call light use was

- a. pain.
- b. alarms.
- c. accidental use.
- d. bathroom or bedpan assistance.

12. Based on the results of their study, the authors concluded that only one-hour rounding (not two-hour rounding)

- a. increased patient satisfaction.
- b. reduced patient falls.
- c. increased nursing staff satisfaction.
- d. decreased call light use.

13. Nursing staff members who performed one-hour rounding reported that the units were

- a. quieter.
- b. safer.
- c. more pleasant.
- d. less stressful.

14. An acknowledged limitation of the authors' study is its

- a. method of data analysis.
- b. inadequate sample size.
- c. lack of equivalence between groups.
- d. lack of generalizability.

15. The authors recommend which additional criterion for hospitals included in future studies of rounding and its effect on call light use?

- a. Allow researchers access to the units to monitor protocol compliance.
- b. Include unlicensed assistive personnel in the patient care teams.
- c. Provide adequate and predefined nurse staffing across all participating units.
- d. Ensure extensive internal systems of checks and balances are in place to monitor call light use. ▼

Hourly Rounding: A Replication Study

Todd Olrich, Melanie Kalman, and Cindy Nigolian

While the concept of hourly rounding is not new, it is undergoing resurgence in hospitals throughout the United States. During the mid-20th century, nurses commonly rounded on their patients. As staffing shortages worsened, however, rounding occurred less frequently. Hourly rounding now offers a protocol to delineate actions that result in better patient outcomes (Meade, Bursell, & Ketelsen, 2006).

The medical-surgical clinical nurse specialist (CNS) at a northeast hospital examined unit data regarding fall rates and patient satisfaction for a 15-month period and call light usage for a 4-week period. Fall rate was 1.73-3.37 per 1,000 patient days. Call light usage data from the computerized data retrieval system showed 2,237-4,223 individual uses of the call light within a 2-week period. Of these calls, 57.75% were related to requests for toileting, pain management, personal needs, or comfort concerns such as positioning. Post-discharge patient satisfaction data showed 25% of patients were not highly satisfied nor would they definitely recommend the hospital to others. Data demonstrated significant opportunity for improvement.

The CNS convened a team to identify interventions to improve patient fall rates, call light usage, and patient satisfaction scores. In addition to the medical-surgical CNS, the team included a geriatric CNS, two nurse managers, a nurse researcher, and a statistician. The team decided to replicate the study by Meade and colleagues (2006).

Purpose

The purpose of this study was to determine the effect of hourly rounding on fall rates, call light usage, and patient satisfaction in an

Preventing falls in hospitalized patients, increasing patient satisfaction, and decreasing call light usage are constant challenges nurses face every day. This quasi-experimental study replicates Meade, Bursell, and Ketelsen's (2006) study on a rounding protocol, demonstrating improvements in the above variables.

inpatient medical-surgical patient population.

Literature Review

A literature search of Medline and CINAHL (1950-2007) found three studies on hourly rounding. Meade and co-authors (2006) used a quasi-experimental design and non-equivalent groups to study hourly and 2-hour rounding for 6 weeks. Nurses and nurse aides followed a specific protocol during rounding. The protocol consisted of eight actions (see Table 1). When patients were asleep, staff did not awaken them but performed environmental checks only. Reasons for call-light usage were documented by nurses in a call-light log. These data were analyzed jointly by the researchers and placed into one of 26 categories (see Table 2). Results indicated both hourly and every 2-hour rounding decreased call-light usage and increased patient satisfaction. Patient satisfaction increased significantly on the units using hourly rounding, from 79.9 on a 100-point scale to 91.9 ($p=0.001$), and on the every 2-hour rounding units from 70.4 to 82.1 ($p=0.001$). Patient call-light usage decreased significantly in the hourly rounding units ($p=0.007$) and every 2-hour

rounding units ($p=0.06$). Falls decreased only when rounding was done hourly. Limitations of this study included non-equivalence between the control and the experimental units because the units were not assigned randomly. Additionally, nurses from the experimental units may have performed some rounding behaviors when working on the control units.

Culley (2008) replicated the study by Meade and co-authors (2006) as a pilot on three units over 8 weeks after collecting 1 month of baseline data. It is unclear if control units were used. Patient satisfaction increased and call-light usage decreased on the three units. Call-light reductions were 77% on the step-down unit, 31% on the surgical unit, and 56% on the medical unit. The author did not examine patient falls.

A third study on hourly rounding was published as a brief (Assi, Wilson, Bodino, Bogner, & Lemenski, 2008). The study could not be evaluated because design, sample size, protocol, and analysis were not discussed. Authors found a decrease in the patient fall rate from 6.1 to 2.65 falls per 1,000 patient days, a reduction in call-light usage (62.5%), and an increase in patient satisfaction to 87%.

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TABLE 1.
Actions During Hourly Rounding

The following items will be checked for <i>each</i> patient:	
1.	Nursing staff enter room, greet patient, and say, "Hi, Mrs./Mr. Jones, I am here to do my rounds to check on your comfort."
2.	Pain assessment using a pain intensity scale (if staff other than RNs are rounding and the patient is in pain, RNs will be contacted immediately by the person rounding so the patient does not have to use the call light for analgesia).
3.	An hour prior to analgesia is due, the patient will be asked if she/he is starting to feel pain. If the answer is "yes," the RN will schedule analgesia administration.
4.	Toileting assistance will be offered.
5.	A patient positioning and comfort assessment will occur, including covering the patient if needed.
6.	Environmental check <ul style="list-style-type: none"> • Call light within reach • Telephone within reach • TV control and bed light switch within reach • Bedside table close to bed • Tissue box and water within reach
7.	Prior to leaving the room, each staff member asks, "Is there anything I can do for you before I leave? I have time to do it."
8.	Staff also will tell the patient when rounding next will be conducted (in 1 hour).

While the literature contained only three studies about hourly rounding, there are many reports of fall-prevention interventions in the acute care setting. According to Krauss and co-authors (2005), falls among hospitalized patients account for 70% of hospital accidents. In U.S. hospitals, fall rates range from 2.3 to 7 falls for every 1,000 patient care days. Many falls occur during unassisted, elimination-related activities. Healy, Oliver, Milne, and Connelly (2008) indicated 25% of falls result from falling out of bed. Approximately 30% of these falls result in injury, with 4%-6% serious. Injuries include fractures or death. Fractures in older adults, who are most at risk for falling, are notable (Hayes, 2004). Injuries related to falls can lead to extended hospitalization and increased costs. According to Amador and Loera (2007), hospital costs for patients injured during falls are \$4,200 higher than for patients who do not fall.

A systematic review from the Joanna Briggs Institute examined falls in acute care hospitals (Evans, Hodgkinson, Lambert, Wood, &

Kowanko, 1998). The objective of the review was to examine the effectiveness of fall interventions. Authors reviewed 100 studies, two of which were randomized control trials and the rest quasi-experimental. Interventions included alarm systems, identification bracelets, evaluation of fall-incidence reports, and programs using multiple fall-prevention strategies. Authors found none of the interventions were effective in fall prevention. Hourly rounding was not reviewed in this document, which demonstrated the need to continue research on effective fall-prevention interventions.

Oliver and co-authors (2006) completed a meta-analysis examining strategies to prevent falls in hospitals and care homes. The analysis included 43 studies, but only 13 of them pertained to hospitalized patients. Of these, five were randomized and eight were prospective studies. Authors deemed all but one of the eight studies to be poorly designed. Most of the studies used multiple fall-prevention strategies but not hourly rounding. Some did show statistical significance.

TABLE 2.
Identified Categories

Pushed the call light accidentally
Bathroom/Bedpan assistance
Bed problem
Call-light problem
Door needs to be closed.
Equipment problem/question
Food or drink request
IV problems/pump alarm
Medication request
Miscellaneous
No reason was written on log.

Coussement and co-authors (2008) also performed a meta-analysis examining strategies to prevent falls in hospitals and long-term care facilities. Their analysis of eight studies found no fall-prevention programs that reduced the number of falls. Lastly, Healy and colleagues (2008) systematically reviewed 24 studies of the effect of bedrail use on falls. They found bedrail use did not increase the risk of falls or injury from falls.

Roszell, Jones, and Lynn (2009) identified the call light as a "fundamental communication tool that connects the nursing staff and their patients" (p. 69). According to Meade and colleagues (2006), call lights can be a lifeline for patients. However, answering lights imposes considerable demands on nurses' time. Research findings noted the negative impact of frequent use of call lights on the effectiveness of inpatient care management (Meade et al., 2006). In hospitalized patients, use of call lights often is related to the need for assistance with basic self-care tasks, such as toileting, ambulating, and eating. Therefore, satisfaction with nursing care may depend principally upon a patient's perception of how well the nursing staff has met those needs (Deitrick, Bokovoy, Stern, & Panik, 2006; Roszell et al., 2009). Rounding by nursing personnel leads to decreased call-light usage and patient falls, and increased patient satisfaction (Meade et al., 2006).

Methods

The site for this quasi-experimental study was a 506-bed teaching hospital in the northeast United States. Approval from the institutional review boards (IRB) of both the hospital and the university associated with the study was obtained. Informed consent of research participants was waived by the IRB because no patient identifiers were used and only aggregate data were reported.

Two medical-surgical units were selected based on their similar size, significant fall rates, and mix of post-operative and medical patients. Data were collected for patient falls, patient satisfaction, and call-light usage prior to the implementation of nurse rounding. One unit was designated as the experimental unit and one the control. The experimental unit was chosen based on the nurse manager's strong desire to be involved in the study. In addition, the experimental unit served as its own control, with data compared before and during the intervention. The sample consisted of all patients discharged from the units during the 1-year study period ($N = 4,418$).

Data concerning number of falls and level of patient satisfaction were collected for 6 months before the intervention and 6 months during the intervention using occurrence reports and post-discharge patient satisfaction surveys. Call-light data were collected from the call-light retrieval system for 2 weeks before the study and 4 weeks during the intervention. Reasons for call-light usage were documented by nurses on a log similar to the tool used by Meade and co-authors (2006).

Two weeks prior to implementing nurse rounding, all nurses and unlicensed assistive personnel (UAP) on the experimental unit attended a CNS-led educational session about performance of hourly rounding. Medical-surgical float pool RNs and UAP also were trained on rounding during this time period.

Hourly rounding was performed from 6:00 a.m. to 10:00 p.m. and included all eight actions (see Table 1). After each round, staff completed

the log kept outside the door. From 10:00 p.m. to 6:00 a.m., rounding occurred every 2 hours. If the patient was asleep, staff completed the environmental check only.

The nurse managers (NM) and CNSs routinely completed leadership rounds three times a week on the experimental unit to ensure staff completed hourly rounding. They asked patients if rounding was occurring, reviewed rounding logs, and reminded staff to round. Rounding also was discussed at every staff meeting. The NMs and CNSs worked to remove barriers to rounding to help in staff success. Four months after the start of hourly rounding, all staff on the experimental unit attended a 1-hour refresher course taught by one of the CNSs. This class reinforced rounding behaviors and gave staff feedback on the rounding process.

Data Analysis

Three variables were analyzed: patient falls, call-light usage, and patient satisfaction. Measures of central tendency and spread were calculated for all variables. Chi-square tests and rank sum tests were used to compare baseline and post-intervention demographic characteristics and reasons for call-light usage between experimental and control units.

Results

Before the study, the fall rate on the experimental unit was 3.37/1,000 patient days. The rate decreased to 2.6/1,000 patient days with the rounding intervention. While this was not significant statistically ($p = 0.672$), the 23% reduction in falls was significant clinically. Patient fall rate on the control unit increased during the intervention time period.

Analysis of means (ANOM) u-charts (SAS version 9.1) were generated to determine if statistically different rates of call-light usage occurred for pre-, initial, or post-implementation time periods. Decision limits based on $\alpha = 0.05$ were computed from the data. In ANOM, subgroups within the decision limits are not significantly different, while subgroups outside the

decision limits are significantly different. Based on this analysis, a statistically significant call-light usage occurred during the first week of the intervention. However, a statistically significant rise in call-light usage occurred in the next 2 weeks due to one delirious patient (see discussion in "Limitations"). The final week of call-light data showed no statistically significant change. The small sample size used in this study made it difficult to validate a statistically significant change.

The proportion of patients who indicated they were satisfied with their care on each unit before and after the intervention also was calculated and compared. No statistically significant differences ($p = 0.383$) occurred in patient satisfaction between the pre-rounding and post-rounding groups. These data were garnered from post-discharge patient surveys. While rounding did not affect the patient satisfaction on the discharge surveys, anecdotal evidence from the nurse leaders' rounds showed increased patient satisfaction.

Discussion

Study findings suggest hourly rounding by nursing personnel positively impacts the three variables studied: patient fall rates, call-light usage, and patient satisfaction. Although not statistically significant, patient fall rates decreased 23% on the experimental unit. Satisfaction scores also have the potential for showing long-term positive gains based upon patient feedback during leader rounds. Patients who had frequent admissions to the unit noted a difference after implementation of hourly rounding. They perceived the nursing staff to be more attentive. Although statistically significant differences were not identified in call-light usage or patient satisfaction during the study, researchers anticipate continued improvement with persistent re-enforcement of rounding behaviors and data collection.

Hospital-wide patient census also decreased during the study. No attributable reasons could be correlated with this decline. Because of this, many nurses from other units

floated to the experimental unit. Because they were not trained to follow the rounding protocol and appreciate the importance of rounding, many of them did not perform rounding. Based on feedback from leader rounds, hourly rounding appeared effective when the patient trusted a staff member will return. Patients who did not trust this would happen were more apt to use the call light. With a large number of nurses floating from other units, this trust was broken many times. Floating of nurses to a rounding unit should be limited as much as possible, or all staff in the hospital should be educated in the hourly rounding protocol.

Limitations

The major limitations of this study were a non-randomized sample and the small sample size. Replication of the study with a larger sample is needed. Because the sample was small, an outlier impacted the study perhaps to a greater degree than if there was a larger sample. The outlier, a delirious patient, used the call light 187 times in a 6-day period. He did not need a nurse but, in his delirium, kept ringing the light. This biased the call-light data significantly for the 2nd and 3rd weeks of the intervention. If the data from this patient were eliminated from the study, a significant change in call light usage the 2nd week and a lower than average number of call lights the 3rd week would have been seen. Hourly rounding has the potential to impact call-light usage, and may have demonstrated significance had the sample size been larger.

Researchers also recognized the need for staff champions, the necessity of sharing results with staff in a timely manner, and the need to train all staff in rounding procedures. Although staff members appeared supportive of hourly rounding, staff champions were not enlisted. Neither of the CNSs was based primarily on the experimental unit; both had responsibilities for other units. Second, the temporary transfer of the NM to another unit halfway through the implementation phase possibly affected the suc-

cess of rounding. Without consistent support on all three shifts, achieving change became more difficult.

Finally, technical difficulties with the call-light data collection system did not allow weekly data tracking throughout the study. Lack of immediate weekly feedback on the rounding effects was detrimental in keeping staff interested in rounding. Likewise, reports of falls were not received until almost 4 months into the rounding process.

Nursing Implications

Results of the current study show potentially promising effects of hourly rounding on patient falls, patient satisfaction, and patient call-light usage. If nursing leaders want to implement hourly rounding protocols successfully, attention should be focused on enlisting staff champions to ensure rounding behaviors are performed consistently on all shifts. In addition, data should be generated in a timely manner and distributed to staff as positive reinforcement of rounding outcomes. Strong consideration also should be given to implementing hospital-wide hourly rounding to ensure all nurses have been trained on related protocols. Implemented appropriately, hourly rounding shows potential to increase patient satisfaction, decrease call-light usage, and decrease patient falls.

Recommendations for Future Research

Hourly rounding is an important part of quality patient care. Evaluating call-light usage over a longer period of time than allowed by this study would be beneficial. Future qualitative research should focus on patients' perceptions of how often and how present nurses were during their hospitalization. Future research also should examine a possible correlation between decreased patient complications and staff performance of hourly rounds.

Conclusion

Decreasing patient falls and increasing patient satisfaction are

important goals of any institution. Call-light usage is connected to both patient falls and patient satisfaction (Meade et al., 2006). Falls decreased on the experimental unit in this study but patient satisfaction did not improve, possibly due to small numbers. Anecdotally, patients expressed increased satisfaction. Call-light usage did not improve; however, unexpected issues may have influenced this, including a delirious patient with the ability to use the call light. Continued emphasis must be placed on the need to answer call lights frequently and continue hourly rounding. This study has added to the body of knowledge demonstrating the importance of hourly rounds. **MSN**

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continued on page 36

Hourly Rounding

continued from page 26

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