University of Texas at Tyler
Scholar Works at UT Tyler

MSN Capstone Projects | Nursing

Fall 12-6-2020

Impact of Hourly Rounding on Fall Rates: A Benchmark Paper

Monica D. Smith
The University of Texas at Tyler

Follow this and additional works at: https://scholarworks.uttyler.edu/nursing_msn

Part of the Nursing Commons, and the Quality Improvement Commons

Recommended Citation

Smith, Monica D., "Impact of Hourly Rounding on Fall Rates: A Benchmark Paper" (2020). *MSN Capstone Projects.* Paper 95.
http://hdl.handle.net/10950/2798

This MSN Capstone Project is brought to you for free and open access by the Nursing at Scholar Works at UT Tyler. It has been accepted for inclusion in MSN Capstone Projects by an authorized administrator of Scholar Works at UT Tyler. For more information, please contact tgullings@uttyler.edu.

Impact of Hourly Rounding on Fall Rates: A Benchmark Paper

A Paper Submitted in Partial Fulfillment of the Requirements

For NURS 5382: Capstone

In the School of Nursing

The University of Texas at Tyler

by

Monica Smith, BSN, RN, CRRN

December 6, 2020

Contents

Acknowledgments

Executive Summary

Implementation and Benchmark Project

1. Rationale for the Project
    a. Clinical Issue
    b. Current Practice
    c. Need for Change in Current Practice
    d. Barriers to Implementation
2. Literature Synthesis
3. Project Stakeholders
4. Implementation Plan
5. Timetable/Flowchart
6. Data Collection Methods
7. Cost/Benefit Discussion
8. Discussion of Results

Conclusions/Recommendations

References

Appendices

Acknowledgments

It is important for me to express my gratitude to those that have been instrumental in helping me get to this point in my academic endeavors. First and foremost, I am thankful to God for leading me with power and trusting me with what he knew I could bear. I am also thankful to my amazingly supportive husband Johnny and children, Tierrah and Jaydon, who now appreciate and see the value in hard work and dedication to professional development. Next, I want to thank you, Dr. Danice Greer, for your unbelievable compassion, profound wisdom, and guidance. You have not only inspired me to be academically excellent, I am inspired to be excellent daily in my nursing profession. Thank you, Dr. Pamela Lake, for being a spiritual rock for me. I will never forget the support you both gave me while battling serious chronic illnesses. Thank you for being flexible and innovative in helping me reach my academic goals. The COVID-19 pandemic flipped all of our worlds upside down and changed the face of medicine and clinical education. You were pillars of strength, character, and resilience during one of the most challenging times in the history of our being.

Executive Summary

Falls and fall-related injuries create a significant financial burden on patients and healthcare organizations, particularly in adult inpatient hospital units such as rehabilitation and medical-surgical units. Costs associated with additional hospital days, diagnostic testing and potentially fall-related surgeries can average about $14,000 per fall (The Joint Commission, 2015). Moreover, falls can be devastating in older adults, impacting their overall quality of life. According to Abou et al., 20% of yearly individual costs associated with falls are among patients with Parkinson's disease (2020). This paper addresses an evidence-based intervention change project to reduce falls in an adult inpatient hospital setting in Houston, Texas. The change project site is a 60-bed inpatient medical-surgical rehabilitation hospital. The hospital is Joint Commission Certified in Hip Fracture Care, Stroke Care and identified as a Stroke Center for Excellence. Common medical conditions treated at the hospital are stroke, spinal cord injuries, amputations, Parkinson's disease, traumatic brain injuries, and hip fractures. This is a proposal to implement a pre-and post-implementation change project. An interdisciplinary team approach will be utilized to implement purposeful hourly rounding as a method to decrease fall rates among adults that are determined to be at risk for falling. This project aims to address the following question: In inpatient adult facilities (P), how does purposeful hourly rounding (I) compared to usual care (C) affect fall rates (O) within a three-month timeframe (T)?

Fall rates have been shown to decrease with effective patient-centered nursing interventions that include purposeful hourly rounding to address patient needs (Grillo et al., 2019). Common patient needs that are addressed in hourly rounding are toileting, pain status, positioning or comfort, and ensuring the patient's personal belongings are within reach, also known as the 4 P's of hourly rounding. Evidence-based change is needed to ensure highly

reliable fall-related patient outcomes and prevent loss of reimbursement from regulatory agencies such as the Centers for Medicare and Medicaid Services (CMS) (CMS, 2020; Fehlberg et al., 2018). Improving patient outcomes in this hospital can also reduce the negative impact on marketing referrals that sustain regular business and revenue. The current practice needs change due to several factors: potential increasing fall rates due to higher acuity patients with multiple comorbidities, fall precautions not consistently being implemented for patients at risk, staff not utilizing safe patient mobility strategies that they have learned, slow response times to call lights, fall-related life-threatening injuries, deaths, and lawsuits. A cost analysis of materials needed for fall risk identifiers and education resulted in an estimated $1800 for the three-month implementation timeframe. The return on investment (ROI) will be significant due to increased nursing efficiency and reduction in fall-related costs (Nuckols et al., 2017). The interdisciplinary project team hopes to improve fall rates, decrease patient-related injuries, and significantly increase cost-savings to the hospital through purposeful hourly rounding. These cost savings can be used to allocate towards other initiatives to improve organizational outcomes.

Impact of Hourly Rounding on Fall Rates: A Benchmark Paper

Implementing a successful fall prevention program can contribute to a significant decrease in fall-related costs and increased improvement in achieving positive organizational and patient outcomes. This paper addresses the need to develop and implement a fall prevention program that includes purposeful hourly rounding to reduce fall rates in an inpatient setting. The PICOT for this intervention project is as follows: In inpatient adult facilities (P), how does purposeful hourly rounding (I) compared to usual care (C) affect fall rates (O) within a three-month timeframe (T)? According to Althobaiti, S.W., purposeful hourly rounding is defined as a "systematic and proactive nursing interventions that are meant to anticipate and address the needs of the admitted patients" (p. 3, 2019).

Rationale for the Project

Falls occur frequently in adult inpatient settings with inpatient falls happening at a rate of up to 5 per one thousand patient days (PSNet, 2019). Injuries related to falls, especially in older patient populations, have a significant impact on organizational finances and operational outcomes. The Centers for Disease Control (CDC) states that at least one in four people age 65 or older will fall yearly and over 3 million will receive emergent treatment for injuries (CDC, 2017). According to a cost analysis study of falls in the elderly, direct medical expenses exceeded $650 million for non-fatal and fatal fall-related injuries (Burns, Stevens, & Lee, 2016, p. 101). The Agency for Healthcare Research and Quality (ARQH) reported that nearly 1,000,000 people in this country fall in hospitals (ARQH, 2018).

Though most falls do not lead to death, annually more than 37 million falls require medical attention according to the World Health Organization (WHO, 2018). Elderly patients are in a vulnerable patient population at greater risk for falling. Researchers have studied the

effectiveness of purposeful or intentional rounding on fall rates, however, there is a need for more high levels of evidence to support this intervention in fall prevention programs.

Clinical Issue

In the current hospital setting, fall rates have consistently fluctuated over the last two years. The monthly goal for falls is less than seven falls per 1000 patient days. Year-to-date data revealed that this goal was met about 50% of the time. Peaks in fall rates over the past two years are inconsistent, making it difficult to identify correlations of patient populations with specific times of the year. Patients have prolonged hospital stays resulting in increased costs to the patient and the organization. Patients also experience delayed healing and recovery due to falls. Various comorbidities of older inpatients contribute to the need for better fall prevention systems. Documentation of purposeful hourly rounding is highly inconsistent. Patient engagement in the plan of care for fall prevention needs to improve. During weekly fall rounds, the Fall Program Committee identified gaps in staff documentation of fall education and the patients' level of understanding of their role in preventing a fall. Due to staffing and budget concerns, sitter resources are limited when high fall risk patients require advanced safety monitoring. Another issue identified is the lack of accuracy with utilizing the Morse Fall Scale for risk determination. Nurses at the change site reported not having a clear understanding of how the tool works and feel that it is not always the best tool for assessing risks for the patient population. Cho et al. also found this to be a common concern in a study on the validity of fall risk assessment tools (2019). A strength, weakness, opportunity, and threat (SWOT) analysis was conducted to identify internal and external factors that could potentially impact the success of the project [See Appendix B].

Current Practice

All clinical staff from nursing and therapy attend a three-hour hands-on continuing education course focused on safe patient mobility strategies and fall prevention. Annually this course is mandatory as a one-hour refresher course. Upon hire, all nursing staff, nurses, and nursing assistants are educated and trained on purposeful hourly rounding. Initial rounds include using a structured communication model acronym named AIDET which stands for Acknowledge, Introduce, Duration, Explanation, and Thank You (Allen et al., 2016). Ongoing rounds are structured by utilizing the 4 Ps of hourly rounding which addresses pain, potty, position, and personal belonging. Typical rounding is conducted every hour during the day and every two hours at night. During orientation, nursing staff must be validated on these skills by a preceptor with actual patients using an evidence-based validation tool.

Monthly mock fall drills are held with day and night shift staff. Nurses use the Morse Fall Risk Assessment tool on admission to determine a patient's risk of falling. Once the score is determined, the nursing staff implements fall precautions based on a predetermined protocol depending on scores and nursing assessment. High fall risk scores are prominently displayed on the clinicians' dashboard in the electronic health record upon login.

The interdisciplinary Fall Program Committee meets monthly to review falls for the previous month and evaluate effectiveness and adherence to interventions. Nurse supervisors submit a daily report of patients that are at high risk for falls to the interdisciplinary senior leadership team. The Senior leadership team rounds daily on all patients to identify opportunities and risks. Once a fall occurs, the care team completes a post-fall huddle then the incident report and post-fall assessment are documented. All falls are 100% audited by the quality team and debriefings are performed with the staff involved.

Need for Change in Current Practice

Though the hospital has several potentially effective interventions in place, the primary missing piece of the puzzle is the need for developing a culture of safety. According to Lopez-Jeng & Eberth, patient safety culture can be developed with interdisciplinary education and reinforcement of expected values (2019). Currently, documentation of hourly rounding is highly inconsistent. The quality of rounding is also inconsistent. Though the hospital initiated the use of portable iPads for real-time point of care documentation for the nursing assistants, many of them do not use them. Some staff take time to implement purposeful hourly rounding in which they address the patient's personal and safety needs and other staff do not. Poor staffing and staffing ratios also contribute to the issues faced with effective hourly rounding. Nurses in this facility report that with a 1:8 nurse-patient ratio, they do not have enough time to effectively perform hourly rounding. Other factors and issues that speak to why the current practice needs to change are higher acuity patients, fall precautions not being implemented for patients at risk, staff not utilizing safe patient mobility strategies that they have learned, slow response times to call lights, fall-related life-threatening injury and deaths, and lawsuits.

Barriers to Implementation

Potential barriers include staff buy-in and attitudes about change, patient perception of risk of falls, utilization of additional resources, and associated costs to the organization. Utilizing shared governance to improve work engagement may contribute to overcoming the barriers with staff involvement. A patient-centered approach to include the patient and caregiver in the education of fall risk and care plan development has been shown to be an effective measure to counter barriers (Avanacean et al., 2017).

Financial and human resources, as well as materials such as handouts, pamphlets, patient education posters, and fall precaution identifiers, will be needed to enact the change. The

physical and occupational therapists will aid nursing with training and implementation. Additional laptops are needed for education and documentation training. Funding approval is needed for staff to clock in for additional training and meetings and participation incentives. Additional IT support may be needed as the team evaluates current clinical documentation.

Implementing a change initiative can be challenging in many ways. Organizations must consider the risks versus benefits of evidence-based interventions and change (Melnyk & Fineout-Overhalt, 2018). In the healthcare industry, the stakeholders are typically a diverse group such as patients, families, frontline staff, hospital leadership, regulatory agencies, and so on. This diversity brings about many different perspectives and expectations on how change should happen. The success of this project will depend on effective communication and fall prevention education of the staff and patients (ARQH, 2013). One of the challenges with implementing a fall prevention program is gaining buy-in and improving stakeholder engagement. Part of the implementation plan for the project is to include regular involvement from the pharmacy to review medications of those patients that are considered to have a high risk for falls. A solution to make it easier for the pharmacy to have regular engagement would be to include a pharmacy representative in the weekly interdisciplinary team conferences. The project lead can add a standing invite on the pharmacy's Outlook calendar and send reminders. Helping patients and families to understand what is in it for them to participate is also key to effective implementation. Education on fall prevention should be part of the daily conversation with patients and family members throughout the stay.

Literature Synthesis

Several themes emerged in the search for evidence to support purposeful or intentional hourly nursing rounds as an evidence-based intervention to decrease fall rates. Fall

rates have been shown to decrease with effective patient-centered nursing interventions that include purposeful hourly rounding to address patient needs. Common patient needs that are addressed in hourly rounding are toileting, pain status, positioning or comfort, and ensuring the patient's personal belongings are within reach, also known as the 4 P's of hourly rounding. Systematic reviews of randomized control trials (RCTs) and mixed studies showed a statistically significant decrease in fall rates (Avanecean, Calliste, Contreras, Lim, & Fitzpatrick, 2017; Taylor, E., & Hignett, S., 2016; Manojlovich, 2016). Previous evidence-based change projects utilizing hourly rounding interventions as part of the implementation plan showed a statistically significant reduction in fall rates of up to fifty to seventy-five percent (Brosey & March, 2015; Daniels, 2016; Grillo, Firth & Hatchel, 2019).

Systematic reviews of literature and evidence indicate that nursing responsiveness to call lights impacts effective fall prevention programs. Patients perceive prolonged wait times for a nurse's response to their call for assistance as a hindrance to adhering to a patient-centered fall prevention care plan (Mitchell, Lavenberg, Trotta, & Umscheid, 2014; Radecki, Reynolds & Kara, 2018). A strong association between nursing responsiveness to call lights and intentional hourly rounding has been identified to support improvement in patient satisfaction, fall rates, and fall-related events (Toole, Meluskey, & Hall, 2015; Avanacean et al., 2017; Christiansen et al., 2018).

Patient satisfaction scores are directly correlated with nurse responsiveness as indicated in the HCAHPS survey. Questions on the survey ask the patients' perception of how quickly the nursing staff responded to a call for assistance. The reports from the HCAHPS survey give the opportunity for hospitals to be incentivized for improving the quality of care provided (CMS, 2020). Systematic reviews and evidence-based practice projects have shown that effective

implementation of hourly rounding interventions has positively improved fall rates and patient satisfaction scores (Mitchell, Lavenberg, Trotta, & Umscheid, 2014; Christiansen et al., 2018; Avanacean et al., 2017; Grillo, Firth & Hatchel, 2019). Developing a culture of safety is another theme that emerged in the literature review. Evidence suggests a positive correlation between fall rates with staff and patient engagement in the development of a safety culture through fall education (Heng et al., 2020; Lopez-Jeng & Eberth, 2019).

Project Stakeholders

The stakeholders impacted by the change are the patients and their caregivers, nursing staff, mid-level, and senior leadership teams. A multidisciplinary team of case managers, physical and occupational therapists, nurses, physicians, and quality and risk personnel, will develop, implement, and track the change initiative. The Chief Executive Officer (CEO) and the Chief Nursing Officer (CNO) are needed for permission to conduct the change project and to contribute to organizational and financial support. The Quality and Risk Director will be the gatekeeper. The managers and frontline nursing and therapy staff are allies and will be gaining coworker buy-in, executing, and assisting with monitoring and documenting the progress of the change interventions. Nurses and nurse assistants will be responsible for carrying out purposeful hourly rounding and documentation.

Implementation – Planned

The project team will use a structured framework to aid in achieving outcomes. The project team will utilize the Plan, Do, Study, Act (PDSA) model to conduct this initiative. The project will be broken down into four phases of three weeks each for a total of three months. The first phase is the planning phase. Once permission is granted and the budget is approved by senior leadership to conduct the project, the project team will launch the program. To begin

implementation, the Fall Program Committee will identify and engage key stakeholders. Baseline and ongoing data will be established for monitoring the progress and effectiveness of interventions. This data includes fall rates, nursing hourly rounding documentation, call light usage and response-time reports, post-fall huddle documentation, case-specific debriefing notes, and fall-related costs. Next, the timeline and pre-and post-surveys will be developed. The new initiative will be communicated to all staff and training sessions will be conducted to teach clinical staff how to implement the interventions. Multiple meeting times will be offered to increase the engagement of the night shift project team members and staff.

The second phase is the action phase in which the project interventions are carried out. Implementation of purposeful hourly rounding will begin on the day shift starting at 0630. To reduce incidences of falls during shift change, the nursing assistants will begin their shifts at 0630 instead 0645 when the nurses come in. This will allow them to be done with report and begin purposeful rounding while the nurses are giving report. Nursing rounds begin with bedside shift report. Rounding will include utilizing AIDET and updating the communication board while addressing the 4Ps. The nursing assistant will only be allowed to use the iPads for real-time rounding documentation and their computers will be redistributed for use in education. This will improve efficiency and accuracy by eliminating double documentation whereby the nursing assistant writes down patients' vitals, intake and output, and other data on a piece of paper later transferring the data into the electronic medical record (EMR). The nurse and nursing assistant will alternate purposeful rounding times each hour, nurses on the odd hours, and nursing assistants on the even hours. The Nurse Manager and Nurse Supervisor will monitor staff behaviors to help motivate and remind them to follow the fall program interventions. Beginning week two, the night shift will begin monitored implementation of strict, timely

purposeful rounding every two hours. This will continue on day and night shift for the remaining weeks of the project.

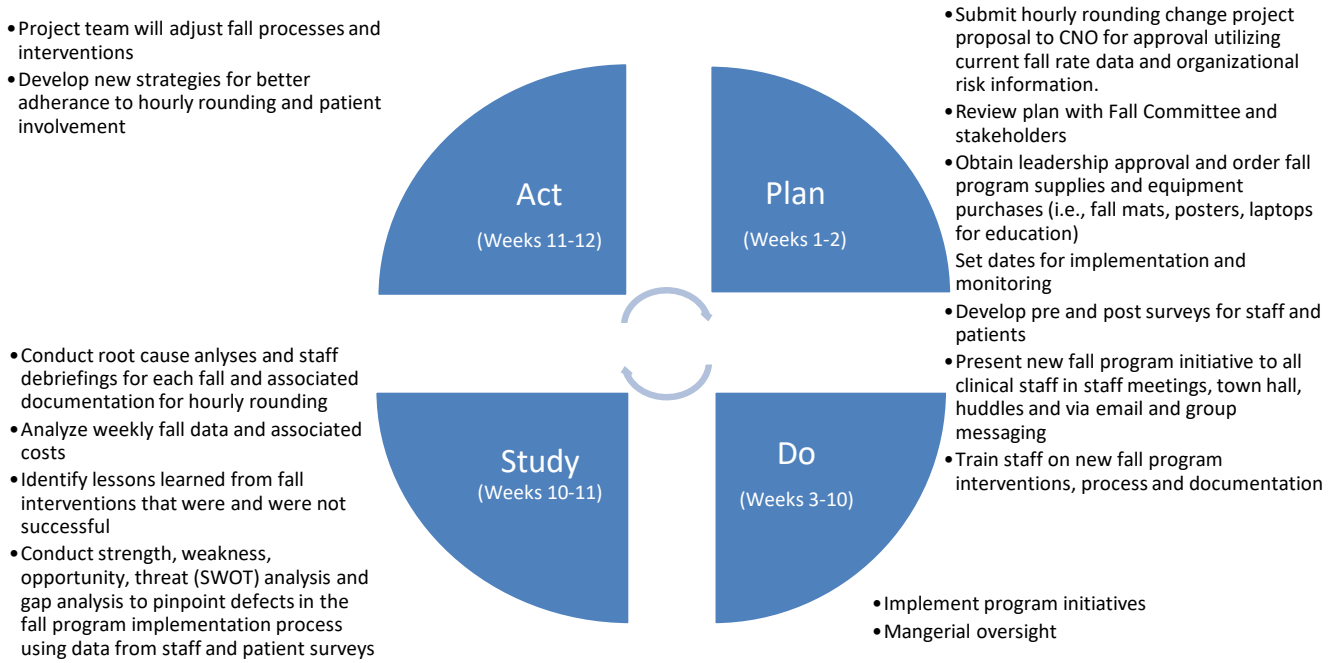
During the third phase, the project team will conduct root cause analyses and staff debriefings to evaluate any falls that occur during the project. Data extraction will occur weekly and be presented at the Fall Program Committee meeting. Staff will be notified and celebrated weekly of progress. Another SWOT analysis will be conducted to identify deficits in the program. Finally, the project team will review trends, amend fall processes, and develop or implement new evidence-based strategies to ensure the sustainability of the progress made.

Timetable/Flowchart

The project implementation period will span three months. The team will utilize the Plan, Do, Study, Act (PDSA) model to describe the phases of the project and for continuous quality improvement. The Lean Six Sigma Define, Measure, Analyze, Improve and Control (DMAIC) model will be used to identify the major phases of the project. This model has been shown to be effective in improving fall prevention program processes (Kuwaiti & Subbarayalu, 2017).

Figure 1

PDSA Cycle Implementation Timetable



Data Collection Methods

Baseline data will be extracted from the data reporting system that interfaces with the EMR and from the EMR directly. This data includes fall rates, nursing hourly rounding documentation, call light usage and response-time reports, post-fall huddle documentation. Additional data collected will be case-specific debriefing notes and fall-related costs. The data needed to reflect the success of outcome measures is weekly fall data detailing the number of falls per patient 1000 days, hourly rounding observation, and documentation data. The costs associated with additional diagnostic testing such as x-rays and head computerized tomography (CT) scans along with RN time for fall documentation and data comparison of dependent variables of fall rates, patient satisfaction, and call light response times will indicate how the change impacted the organization

Cost/Benefit Discussion

A cost analysis was conducted to determine a potential budget for the project. The estimated monthly costs of new fall prevention door signs, posters, and other identifiers are about $600 per month, $1800 for the duration of the project. The return on investment (ROI) will be significant due to increased nursing efficiency and reduction in fall-related costs (Nuckols et al., 2017). Possible costs of bringing the change to the organization include the costs of team planning meetings which may include meals for the participants, marketing collateral costs to include the program as a marketing tool, initial equipment purchases (i.e., fall mats), and initial staff training. Costs associated with sustaining the change include the costs of maintaining equipment, ongoing staff education and incentives, ongoing audits and program evaluation, and keeping fall program supplies stocked. Nuckols et al., 2017, conducted a pre-post design hourly rounding fall prevention program and concluded estimated net costs savings of about 72% in one year for fall-related costs, training, and time that Registered Nurses (RNs) spent on activities associated with falls such as assessment, documentation and closer monitoring. A six-year study on pre-and post-implementation of a fall prevention program showed a reduction of fall-related costs from $117, 754.12 to $811.70 in a 12-month period (Galbraith et al., 2011).

Discussion of Results

Due to the COVID-19 pandemic, this project is written as a benchmark project. Once the project is implemented, the hope is that the project team will have a more diverse understanding of effective fall prevention strategies. Purposeful rounding should have a uniform definition but be adaptable to different environments and patient populations. Ideally, fall rates will decrease over the three-month period, staff will feel empowered to sustain a culture of safety and leaders will develop a unified culture of inclusion and praise with staff members.

Conclusion and Recommendations

Recommendations for the next steps of this project include developing strategies to implement effective patient-centered rounding. In this population, patient-centered interventions are key to the successful sustainability of change. The use of volunteers to aid in patient engagement and companionship could offer several benefits to the patient and organization. Fall prevention efforts should start in the community. If patients are engaged in fall prevention at home, fall-related injury hospital rates and costs should decrease. I also recommend a risk identification tool that is patient population specific. This hospital regularly serves patients with upper and lower extremity amputations. The Morse Fall Score tool does not always provide the best means to identify risk for this population. I believe evidence from studies related to lower extremity fall prevention interventions specific to inpatients with lower extremity amputations would be advantageous for consideration in the future (Hunter et al, 2016). Highly reliable outcomes can be achieved when evidence is put into practice. As a future MSN, I recommend nursing professional development initiatives for this facility in order to empower nursing engagement and leadership with continuous quality improvement projects. The organization should consider striving for achieving Pathway to Excellence designation (American Nurses Credentialing Center, 2020). These efforts will demand a culture change that will benefit the patients, staff, and the surrounding community. I believe turnover and staffing will decrease and new nurses will proudly desire to work and develop professionally at this hospital.

References

Abou, L., Alluri, A., Fliflet, A., Du, Y., & Rice, L. A. (2020). Effectiveness of physical therapy interventions in reducing fear of falling among individuals with neurologic diseases: A systematic review and meta-analysis. *Archives of Physical Medicine and Rehabilitation*, 170–180. https://doi.org/10.1016/j.apmr.2020.06.025

Allen, T., Rieck, T., & Salsbury, S. (2016). Patient perceptions of an AIDET and hourly rounding program in a community hospital: Results of a qualitative study. *Patient Experience Journal*, *3*(1), 42–49. https://doi.org/10.35680/2372-0247.1115

Althobaiti, S. W. (2019). Impact of the use of the 4Ps in hourly rounds on reductions in patient falls in wards. *Journal of Contemporary Scientific Research (ISSN (Online) 2209-0142)*, *3*(7), 1–7. http://www.jcsronline.com/wp-content/uploads/2019/09/Volume3Issue7Paper1.pdf

American Nurses Credentialing Center. (2020, October 5). *Pathway to Excellence Program® | ANCC*. ANA. https://www.nursingworld.org/organizational-programs/pathway/

ARQH. (2013, January). *Appendix: Bibliography of studies implementing fall prevention practices*. https://www.ahrq.gov/professionals/systems/hospital/fallpxtoolkit/fallpxtk-appendix.html

ARQH. (2018). *Falls Prevention*. https://www.ahrq.gov/topics/falls-prevention.html

Avanecean, D., Calliste, D., Contreras, T., Lim, Y., & Fitzpatrick, A. (2017). Effectiveness of patient-centered interventions on falls in the acute care setting compared to usual care.

JBI Database of Systematic Reviews and Implementation Reports, *15*(12), 3006–3048. https://doi.org/10.11124/jbisrir-2016-003331

Brosey, L. A., & March, K. S. (2015a). Effectiveness of structured hourly nurse rounding on patient satisfaction and clinical outcomes. *Journal of Nursing Care Quality*, *30*(2), 153–159. https://doi.org/10.1097/ncq.0000000000000086

Burns, E. R., Stevens, J. A., & Lee, R. (2016). The direct costs of fatal and non-fatal falls among older adults — United States. *Journal of Safety Research*, *58*, 99–103. https://doi.org/10.1016/j.jsr.2016.05.001

Centers for Disease Control (2017, February 10). *Important Facts about Falls | Home and Recreational Safety | CDC Injury Center*. https://www.cdc.gov/homeandrecreationalsafety/falls/adultfalls.html

Centers for Medicare & Medicaid Services (2020, February 11). *HCAHPS: Patients' Perspectives of Care Survey | CMS*. https://www.cms.gov/Medicare/Quality-Initiatives-Patient-Assessment-Instruments/HospitalQualityInits/HospitalHCAHPS

Centers for Medicare and Medicaid Services. (2020, February 11). *Hospital-Acquired Conditions | CMS*. https://www.cms.gov/Medicare/Medicare-Fee-for-Service-Payment/HospitalAcqCond/Hospital-Acquired_Conditions

Cho, E. H., Woo, Y. J., Han, A., Chung, Y. C., Kim, Y. H., & Park, H. -. A. (2020). Comparison of the predictive validity of three fall risk assessment tools and analysis of fall-risk

factors at a tertiary teaching hospital. *Journal of Clinical Nursing*, *29*(17–18), 3482–3493. https://doi.org/10.1111/jocn.15387

Christiansen, A., Coventry, L., Graham, R., Jacob, E., Twigg, D., & Whitehead, L. (2018b). Intentional rounding in acute adult healthcare settings: A systematic mixed-method review. *Journal of Clinical Nursing*, *27*(9–10), 1759–1792. https://doi.org/10.1111/jocn.14370

Daniels, J. F. (2016). Purposeful and timely nursing rounds: a best practice implementation project. *JBI Database of Systematic Reviews and Implementation Reports*, *14*(1), 248–267. https://doi.org/10.11124/jbisrir-2016-2537

Falls | PSNet. (2019, September 8). https://psnet.ahrq.gov/primer/falls

Fehlberg, E. A., Lucero, R. J., Weaver, M. T., McDaniel, A. M., Chandler, A. M., Richey, P. A., Mion, L. C., & Shorr, R. I. (2017). Impact of the CMS No-Pay Policy on hospital-acquired all prevention related practice patterns. *Innovation in aging*, *1*(3), igx036. https://doi.org/10.1093/geroni/igx036

Galbraith, J. G., Butler, J. S., Memon, A. R., Dolan, M. A., & Harty, J. A. (2011). Cost Analysis of a Falls-prevention Program in an Orthopaedic Setting. *Clinical Orthopaedics and Related Research®*, *469*(12), 3462–3468. https://doi.org/10.1007/s11999-011-1932-9

Grillo, D. M., Firth, K. H., & Hatchel, K. (2019). Implementation of purposeful hourly rounds in addition to a fall bundle to prevent inpatient falls on a medical-surgical acute hospital unit. *Medsurg Nursing*, *28*(4), 243-246,261. Retrieved from

https://ezproxy.uttyler.edu/login?url=https://search-proquest-com.ezproxy.uttyler.edu/docview/2310239145?accountid=7123

Heng, H., Jazayeri, D., Shaw, L., Kiegaldie, D., Hill, A.-M., & Morris, M. E. (2020). Hospital falls prevention with patient education: A scoping review. *BMC Geriatrics*, *20*(1), 1–12. https://doi.org/10.1186/s12877-020-01515-w

Heng, H., Jazayeri, D., Shaw, L., Kiegaldie, D., Hill, A.-M., & Morris, M. E. (2020). Hospital falls prevention with patient education: A scoping review. *BMC Geriatrics*, *20*(1), 1–12. https://doi.org/10.1186/s12877-020-01515-w

Hunter, S. W., Batchelor, F., Hill, K. D., Hill, A.-M., Mackintosh, S., & Payne, M. (2016). Risk factors for falls in people with a lower limb amputation: A systematic review. *PM&R*, *9*(2), 170-180.e1. https://doi.org/10.1016/j.pmrj.2016.07.531

Kuwaiti, A. A., & Subbarayalu, A. V. (2017). Reducing patients' falls rate in an academic medical center (AMC) using six sigma "DMAIC" approach. *International Journal of Health Care Quality Assurance*, *30*(4), 373–384. https://doi.org/10.1108/ijhcqa-03-2016-0030

Lee, S. H., & Kim, H. S. (2016). Exercise interventions for preventing falls among older people in care facilities: A meta-analysis. *Worldviews on Evidence-Based Nursing*, *14*(1), 74–80. https://doi.org/10.1111/wvn.12193

Lopez-Jeng, C., & Eberth, S. D. (2019). Improving hospital safety culture for falls prevention through interdisciplinary health education. *Health Promotion Practice*, *21*(6), 918–925. https://doi.org/10.1177/1524839919840337

Manojlovich, M., Lee, S., & Lauseng, D. (2016). A Systematic Review of the Unintended Consequences of Clinical Interventions to Reduce Adverse Outcomes. *Journal of Patient Safety*, *12*(4), 173–179. https://doi.org/10.1097/pts.0000000000000093

Melnyk, B. M., & Fineout-Overholt, E. (2019). Evidence-based practice in nursing & healthcare: A guide to best practice (4th ed.). Alphen aan de Rijn, Netherlands: Wolters Kluwer.

Mitchell, M. D., Lavenberg, J. G., Trotta, R. L., & Umscheid, C. A. (2014). Hourly Rounding to Improve Nursing Responsiveness. *JONA: The Journal of Nursing Administration*, *44*(9), 462–472. https://doi.org/10.1097/nna.0000000000000101

Nuckols, T. K., Needleman, J., Grogan, T. R., Liang, L.-J., Worobel-Luk, P., Anderson, L., … Walsh, C. M. (2017). Clinical effectiveness and cost of a hospital-based fall prevention intervention. *JONA: The Journal of Nursing Administration*, *47*(11), 571–580. https://doi.org/10.1097/nna.0000000000000545

Radecki, B., Reynolds, S., & Kara, A. (2018). Inpatient fall prevention from the patient's perspective: A qualitative study. *Applied Nursing Research*, *43*, 114–119. https://doi.org/10.1016/j.apnr.2018.08.001

Taylor, E., & Hignett, S. (2016). The SCOPE of hospital falls. *HERD: Health Environments Research & Design Journal*, *9*(4), 86–109. https://doi.org/10.1177/1937586716645918

The Joint Commission. (2015, September). *Sentinel event alert* (Issue 55). https://www.jointcommission.org/-/media/deprecated-unorganized/imported-

assets/tjc/system-folders/topics-library/sea_55pdf.pdf?db=web&hash=53EE3CDCBD00C29C89B781C4F4CFA1D7

Toole, N., Meluskey, T., & Hall, N. (2015). A systematic review: barriers to hourly rounding. *Journal of Nursing Management, 24*(3), 283–290. https://doi.org/10.1111/jonm.12332

World Health Organization. (2018, January 16). *Falls*. https://www.who.int/news-room/fact-sheets/detail/falls

Appendix A

Synthesis Table

Evaluation Table Template-Modified Fall 2020
Monica Smith NURS5382

PICOT Question: In inpatient facilities (P), how does purposeful hourly rounding (I) compared to usual care (C) affect fall rates (O) within an eight-week timeframe (T)?
PICOT Question Type (Circle): **Intervention** Etiology Diagnosis or Diagnostic Test Prognosis/Prediction Meaning

Caveats

1) The **only studies** you should put in these tables are the ones that **you know answer your question** after you have done rapid critical appraisal (i.e., the keeper studies)
2) Include APA reference
3) Use abbreviations & create **a legend** for readers & yourself
4) Keep your descriptions brief – there should be **NO complete sentences**
5) This evaluation is for the purpose of knowing your studies to synthesize.

Place your APA References here (Use correct APA reference format including the hanging indentation):

References

Avanecean, D., Calliste, D., Contreras, T., Lim, Y., & Fitzpatrick, A. (2017). Effectiveness of patient-centered interventions on falls in the acute care setting compared to usual care. *JBI Database of Systematic Reviews and Implementation Reports*, *15*(12), 3006–3048. https://doi.org/10.11124/jbisrir-2016-003331

Christiansen, A., Coventry, L., Graham, R., Jacob, E., Twigg, D., & Whitehead, L. (2018b). Intentional rounding in acute adult healthcare settings: A systematic mixed-method review. *Journal of Clinical Nursing*, *27*(9–10), 1759–1792. https://doi.org/10.1111/jocn.14370

Daniels, J. F. (2016). Purposeful and timely nursing rounds: a best practice implementation project. *JBI Database of Systematic Reviews and Implementation Reports*, *14*(1), 248–267. https://doi.org/10.11124/jbisrir-2016-2537

Grillo, D. M., Firth, K. H., & Hatchel, K. (2019). Implementation of purposeful hourly rounds in addition to a fall bundle to prevent inpatient falls on a medical-surgical acute hospital unit. *Medsurg Nursing*, *28*(4), 243-246,261. Retrieved from https://ezproxy.uttyler.edu/login?url=https://search-proquest-com.ezproxy.uttyler.edu/docview/2310239145?accountid=7123

Heng, H., Jazayeri, D., Shaw, L., Kiegaldie, D., Hill, A.-M., & Morris, M. E. (2020). Hospital falls prevention with patient education: A scoping review. *BMC Geriatrics*, *20*(1), 1–12. https://doi.org/10.1186/s12877-020-01515-w

Kuwaiti, A. A., & Subbarayalu, A. V. (2017). Reducing patients' falls rate in an academic medical center (AMC) using six sigma "DMAIC" approach. *International Journal of Health Care Quality Assurance*, *30*(4), 373–384. https://doi.org/10.1108/ijhcqa-03-2016-0030

Manojlovich, M., Lee, S., & Lauseng, D. (2016). A Systematic Review of the Unintended Consequences of Clinical Interventions to Reduce Adverse Outcomes. *Journal of Patient Safety*, *12*(4), 173–179. https://doi.org/10.1097/pts.0000000000000093

Mitchell, M. D., Lavenberg, J. G., Trotta, R. L., & Umscheid, C. A. (2014). Hourly rounding to improve nursing responsiveness. *JONA: The Journal of Nursing Administration*, *44*(9), 462–472. https://doi.org/10.1097/nna.0000000000000101

Nuckols, T. K., Needleman, J., Grogan, T. R., Liang, L.-J., Worobel-Luk, P., Anderson, L., … Walsh, C. M. (2017). Clinical effectiveness and cost of a hospital-based fall prevention intervention. *JONA: The Journal of Nursing Administration*, *47*(11), 571–580. https://doi.org/10.1097/nna.0000000000000545

Radecki, B., Reynolds, S., & Kara, A. (2018). Inpatient fall prevention from the patient's perspective: A qualitative study. *Applied Nursing Research*, *43*, 114–119. https://doi.org/10.1016/j.apnr.2018.08.001

Toole, N., Meluskey, T., & Hall, N. (2015). A systematic review: barriers to hourly rounding. *Journal of Nursing Management*, *24*(3), 283–290. https://doi.org/10.1111/jonm.12332

Citation: (i.e., author(s), date of publication, & title)	**Conceptual Framework**	**Design/ Method**	**Sample/ Setting**	**Major Variables Studied and Their Definitions**	**Measurement of Major Variables**	**Data Analysis**	**Study Findings**	**Strength of the Evidence (i.e., level of evidence + quality [study strengths and weaknesses])**
Author, Year, Title	**Theoretical basis for study** **Qualitative**		**Number, Characteristics of the sample (not Inclusion/exclusion criteria),**	**Independent variables (e.g., IV1 = IV2 =)**	**What scales were used to measure the outcome variables**	**What methods were used to answer the**	**Statistical findings (i.e., for every statistical test you have in the**	• **Strengths and limitations of the study (Consider the validity of the study and/or flaws In the method not just what Is stated as limitations)** • **Risk of harm if study intervention or findings implemented** • **Feasibility of use in your practice**

	Traditio n		**Attrition rate & why?**	**Dependent variables (e.g., DV =)**	**(e.g., name of scale, author, reliability info [e.g., Cronbach alphas])**	**clinical questio n (i.e., all stats do not need to be put into the table)**	**data analysis column, you should have a finding) or qualitative findings (themes and subthemes)**	• **Remember: level of evidence (See Melnyk & Finout-Overholt handout) + quality of evidence = strength of evidence & confidence to act** • **Use the USPSTF grading schema http://www.ahrq.gov/clinic/3rduspstf/ratings.htm**
ARTICLE #1 Mitchell, M., Lavenberg, J., Trotta, R., Umscheid, C. (2014); Hourly Rounding to Improve Nursing Responsiveness	None	Systematic review/Integrative/ Meta-analysis	N=16 articles; Comparative studies, full-text, pre-post design studies How many of each?	IV1= Rounding intervention intervals – one or two-hourly rounding IV2= Rounding intervention staff – nurses and/or nurse assistive staff IV3= Structured task list or scripts DV1=Patient satisfaction scores DV2=Nursing staff responsiveness DV3=Call light usage DV4=Fall rates	Various surveys used to measure responses incl Press Ganey HCAHPS	GRADE analysis to evaluate effect size	24% - 80% reduction in falls; median fall reduction 57% Call light usage decreased 23% – 70%; median reduction of 54% 9 of 16 studies reported fall rates	**<u>For each of the following, bullet or number items</u>**: 1.Strengths: Compared 16 articles; all pre-post test quasi-experimental design; rigorous analysis with descriptive tables using GRADE analysis 2. Limitations: variability in how studies were conducted and inconsistency in how results were measured; no randomized studies; pre-post design; inconclusive causal effect 3. Risk of harm: None 4. Feasibility: 5. Level of evidence for the PICOT question type: Level 1 6. Quality of the evidence: Moderate-high reliability; high level of confidence to apply to practice **USPSTF: Grade:** B **Level of Certainty: Moderate**
ARTICLE #2 Radecki, B., Reynolds, S., & Kara, A. (2018). Inpatient fall prevention	None	Qualitative: Descriptive Grounded theory using constant comparison	N=12 patients; 7 men & 5 women; 3 patients in medical progressive care units 3 patients on medical units	DV1=patient perspective on fall prevention interventions	Standardized open-ended interview approach	Transcript analysis	Three major themes identified: T1: ”How I see myself” T2: “How I see the interventions ”	**<u>For each of the following, bullet or number items</u>**: 1.Strengths: strong sample size for qualitative study; analysis method reached data saturation 2. Limitations: Study excluded patients with cognitive impairments who can be at

from the patient's perspective: A qualitative study			6 patients on surgical units Ages 38 to 89 years; mean of 62.5 years				T3: "How I see us"	highest risk; limited generalizability d/t all patients in same location; facility piloted a fall prevention process during the study 3. Risk of harm: None 4. Feasibility: Applicable to my current practice 5. Level of evidence for the PICOT question type: Level VI 6. Quality of the evidence: supports patient perspective in decision making **USPSTF: Grade:** B **Level of Certainty:** Moderate
ARTICLE #3 Christiansen, A., Coventry, L., Graham, R., Jacob, E., Twigg, D., & Whitehead, L. (2018). Intentional rounding in acute adult healthcare settings: A systematic mixed-method review	None	Systematic review of quantitative and qualitative studies	N=21 QNS: n=13 QLS: n=4 MMS: n=4 SLRS: n=0 Studies done in USA (n=13), Australia (n=5), Iran (n=1), UK (n=1) and Saudi Arabia (n=1)	IV1=Rounding intervention intervals – one or two-hourly rounding IV2=Rounding intervention staff – nurses and/or nurse assistive staff IV3=Structured task list or scripts IV4=Intentional rounding versus usual rounding DV1=falls rates DV2=patient satisfaction DV3= call bell use DV4=Nurse satisfaction/attitude toward IR (qual) DV5= nursing responsiveness	JBI Meta-Analysis of Statistical Assessment and Review Instrument (JBI-MAStARI) Appraisal checklist from the Qualitative Appraisal Review Instrument (QARI)	Narrative summary	6 out of 21 studies showed significant reduction in falls	**For each of the following, bullet or number items**: 1.Strengths: Strong sample size of quantitative articles; rigorous review of various studies 2. Limitations: Limited control for extraneous variables (p.1791); validity limited by variability in measurement of IR 3. Risk of harm: None 4. Feasibility: Results and patient population relevant to PICOT 5. Level of evidence for the PICOT question type: Level I 6. Quality of the evidence: Moderate reliability; Moderate level of confidence to apply to practice **USPSTF: Grade:** B **Level of Certainty:** Moderate

ARTICLE #4 Toole, N., Meluskey, T., & Hall, N. (2015). A systematic review: barriers to hourly rounding	None	Systematic review/mixed method review of various levels of evidence	N=20 articles Level 6 =10 (MM, QL descriptive, single descriptive) Level 3 =3 (QN, quasi-experimental, well designed without randomized control) Level 7 =3 expert opinion Level 1=1 literature review	IV1=One or two-hourly rounding IV2=Nurses and/or nurse assistive staff IV3= Intentional rounding versus usual rounding DV1=fall rates DV2=sustainment of hourly rounding DV3=Nurse satisfaction/attitude toward IR	Hierarchy of Evidence for Interventional Studies	Thematic analysis	6 Major themes identified: T1=workload issues T2=burdensome rounding logs T3=missing staff buy-in T4=patient acuity levels T5=lack of adequate staff education T6=lack of sustainability	**For each of the following, bullet or number items**: 1.Strengths: Levels of evidence for each study in Table 1 2. Limitations: Most articles were not clinical trials; limited key terms in search limited results 3. Risk of harm: None 4. Feasibility: Identified barriers to sustaining IR program 5. Level of evidence for the PICOT question type: Level I 6. Quality of the evidence: Moderate to high reliability; applicable to current practice **USPSTF: Grade:** B **Level of Certainty:** Moderate
ARTICLE #5 Avanecean, D., Calliste, D., Contreras, T., Lim, Y., & Fitzpatrick, A. (2017). Effectiveness of patient-centered interventions on falls in the acute care setting compared to usual care	None	Systematic review of RCTs	n=5 randomized control trials	IV1= Patient-centered interventions IV2=Usual care interventions DV1=Fall rates/number of falls DV2=fall-related injuries	Methodological validity using the standardized critical appraisal instrument from the (JBI-SUMARI)	Narrative summary	3 out of 5 RCTs showed statistically significant decrease in fall rates	**For each of the following, bullet or number items**: 1.Strengths: Only RCTs reviewed 2. Limitations: limited number of high quality studies; limited evidence for sustainability 3. Risk of harm: None 4. Feasibility: relevance to current practice 5. Level of evidence for the PICOT question type: Level I 6. Quality of the evidence: Moderate to high reliability **USPSTF: Grade:** A **Level of Certainty:** High

ARTICLE #6 Grillo, D. M., Firth, K. H., & Hatchel, K. (2019). Implementation of purposeful hourly rounds in addition to a fall bundle to prevent inpatient falls on a medical-surgical acute hospital unit	None	CQI Pilot	112-bed medical-surgical hospital unit, average daily census 108	IV1=purposeful hourly rounds during day IV2=purposeful 2-hour rounds at night	CQI PDSA Chi Square test t-test		75% decrease in fall rates	**For each of the following, bullet or number items**: 1.Strengths: Time frame allowed for strong data collection 2. Limitations: limited number of high quality studies; limited evidence for sustainability 3. Risk of harm: None 4. Feasibility: relevance to current practice 5. Level of evidence for the PICOT question type: Level IV 6. Quality of the evidence: Moderate to high reliability **USPSTF: Grade:** B **Level of Certainty:** Moderate
Article #7 Daniels, J. F. (2016). Purposeful and timely nursing rounds: A best practice implementation project	Maslow's Hierarchy of Needs Model	Pre-post design Change project	28 bed med surg unit	**IV1=** Rounding intervention intervals – one or two-hourly rounding IV2= Rounding intervention staff – nurses and/or nurse assistive staff DV1=Patient satisfaction scores DV2=Fall rates	JBI-PACES HCAPHS	Narrative Summary Tables Charts GRiP Matrix	Fall rates decreased by 50% Nursing compliance with fall interventions increased by 64% Staff responsiveness increased by 15%	**For each of the following, bullet or number items**: 1.Strengths: Best practice evidence used 2. Limitations: limited evidence for sustainability; low generalizability; no control unit; potential bias in nursing behavior; call light usage not evaluated 3. Risk of harm: None 4. Feasibility: relevance to current practice 5. Level of evidence for the PICOT question type: Level IV 6. Quality of the evidence: Moderate to high reliability **USPSTF: Grade:** B **Level of Certainty:** Moderate

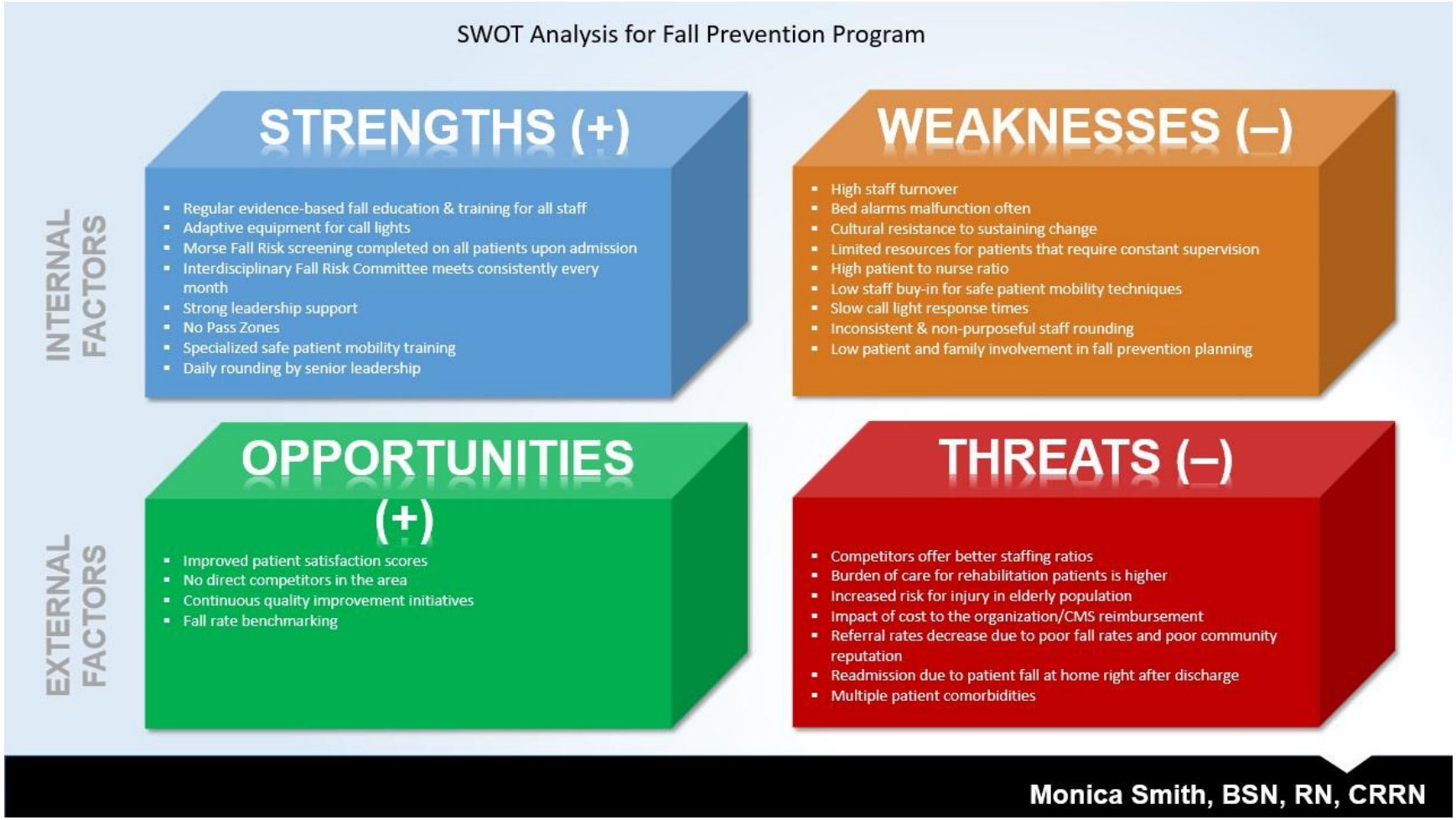
Article #8 Nuckols, T. K., Needleman, J., Grogan, T. R., Liang, L.-J., Worobel-Luk, P., Anderson, L., … Walsh, C. M. (2017). Clinical effectiveness and cost of a hospital-based fall prevention intervention	Quality Cost Framework	Uncontrolled Pre-post design Change project	2 hospitals One 266 bed hospital One 700 bed hospital Adult med surg and step-down units	IV1= Hourly Rounding intervention IV2= Rounding intervention staff – nurses and/or nurse assistive staff IV3=Rounding using 4 or 5Ps of hourly rounding DV1= Fall rates DV2=Fall-related costs	Regression model	Narrative Summary	Fall rates decreased 53% Estimated 72% net cost savings due to purposeful hourly rounding Projected gross savings of $0.8 million to $1.9 million per year	**<u>For each of the following, bullet or number items</u>**: 1.Strengths: Best practice evidence used 2. Limitations: limited evidence for sustainability; Adherence was self-reported; potential undetected changes in rounding practices at one site 3. Risk of harm: None 4. Feasibility: relevance to current practice 5. Level of evidence for the PICOT question type: Level IV 6. Quality of the evidence: Moderate to high reliability **USPSTF: Grade:** B **Level of Certainty:** Moderate
Article #9 Kuwaiti, A. A., & Subbarayalu, A. V. (2017). Reducing patients' falls rate in an academic medical center (AMC) using six sigma "DMAIC" approach	Six Sigma DMAIC	Prospective study design Research Paper	All inpatients units of one hospital	IV1= Hourly Rounding intervention IV2= Rounding intervention staff – nurses and/or nurse assistive staff DV1= Fall rates	DMAIC RCA CQI	Narrative Summary Pareto Chart Analysis	71% reduction in falls 88% nursing adherence to hourly rounding	**<u>For each of the following, bullet or number items</u>**: 1.Strengths: Evidence for sustainability 2. Limitations: Not identified 3. Risk of harm: None 4. Feasibility: relevance to current practice 5. Level of evidence for the PICOT question type: Level IV 6. Quality of the evidence: Moderate to high reliability **USPSTF: Grade:** A **Level of Certainty:** High
Article #10 Taylor, E., & Hignett, S. (2016). The SCOPE of hospital falls	Stability	Systematic Review of full-text mixed studies	N=27 Level 1- Level 3 studies Inpatient acute care hospitals	IV1=organization (policy/operations) IV2=people (caregivers/staff, patients) IV3=environm	Matrix method for appraisal NVivo Version 10 for single	Thematic analysis for narrative synthesis	7 studies=SS reduction in falls (4 incl rounding as an intervention)	**<u>For each of the following, bullet or number items</u>**: 1.Strengths: hospital site date using Trust 2. Limitations: post-observation small sample size; limited evidence for sustainability 3. Risk of harm: None

				ent (facility design) IV4=Interventions DV1=Falls DV2=Injury	studies data extraction		6 studies=SS reduction in injuries	4. Feasibility: relevance to current practice 5. Level of evidence for the PICOT question type: Level I 6. Quality of the evidence: Moderate to high reliability **USPSTF: Grade:** B **Level of Certainty:** Moderate
Article #11 Manojlovich, M., Lee, S., & Lauseng, D. (2016). A Systematic Review of the Unintended Consequences of Clinical Interventions to Reduce Adverse Outcomes	None	Systematic review of literature	N=122 N=72 articles on fall reduction	IV=hourly rounding IV2=SCDs IV3=multiple fall interventions IV4=federal policy DV1=patient falls DV2=CAUTI DV3=vascular catheter-assoc. infections DV=unintended consequences	No scales used	Thematic analysis for narrative synthesis	Significant reduction in falls Sustained fall intervention programs that included hourly rounds	**For each of the following, bullet or number items**: 1.Strengths: Evidence of sustainability 2. Limitations: small sample size; broad inclusion criteria; study focus on unexpected results 3. Risk of harm: None 4. Feasibility: relevance to current practice 5. Level of evidence for the PICOT question type: Level III 6. Quality of the evidence: Moderate to high reliability **USPSTF: Grade:** B **Level of Certainty:** Moderate
Article #12 Heng, H., Jazayeri, D., Shaw, L., Kiegaldie, D., Hill, A.-M., & Morris, M. E. (2020). Hospital falls prevention with patient education: A scoping review	Arksey and O'Malley (2005) framework for scoping reviews	Systematic review and Meta-analysis of RCTs	N=43 systematic reviews or RCTs	IV1=multifactorial interventions including nursing rounds IV2=patient education DV=fall rates	Joana Briggs Prisma-ScR	Thematic analysis	Reduction in fall rates due to rounding Education improved fall rates	**For each of the following, bullet or number items**: 1.Strengths: Evidence of reduction in fall rates; highest level of evidence included 2. Limitations: post-observation small sample size; limited evidence for sustainability 3. Risk of harm: None 4. Feasibility: relevance to current practice 5. Level of evidence for the PICOT question type: Level I 6. Quality of the evidence: high reliability **USPSTF: Grade:** A **Level of Certainty:** High

Legend:

N/A = Not applicable
IV = Independent variable
DV = Dependent variable
QNS= Quantitative synthesis
QLS=Qualitative Synthesis
MMS=Mixed method synthesis
SLRS= Systematic/literature review synthesis
T1=Theme 1
T2=Theme 2
IR=Intentional rounding
JBI-PACES=Joanna Briggs Institute Practical Application of Clinical Evidence System
RCA=Root Cause Analysis
GRiP= Getting Research into Practice (GRiP) audit and feedback tool
MM=Mixed Method
QL=Qualitative
QN=Quantitative
JB-SUMARI= Joanna Briggs Institute System for the Unified Management, Assessment and Review of Information
DMAIC=Define, Measure, Analyze, Improve, Control Model
CQI=Continuous Quality Improvement Model
PDSA=Plan, Do, Study, Act Model
PDCA=Plan, Do, Check, Act model
SS=statistically significant
CAUTI=catheter-associated urinary tract infection

Used with permission, © 2007 Fineout-Overholt

Appendix B

SWOT Analysis