Fall Prevention for Adult Patients in Perioperative Units

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Abstract

Background: In the United States, patient falls have become a critical issue that negatively impacts our healthcare system. Even with continued emphasis on fall prevention, falls continue to occur frequently in hospitals across the United States. Falls are not benign events, and often lead to some level of patient harm or even death. Furthermore, since falls have been designated preventable hospital acquired conditions in acute care settings, they are no longer be reimbursed by insurance companies. The risk to patient safety as well as lack of reimbursement for falls are two major factors that support the need to prevent falls in acute care settings. In perioperative units, a highly vulnerable population exists, along with barriers to fall prevention.

Local Problem: In a community-based hospital located in a Maryland suburban community, a comprehensive fall prevention plan was initiated to promote safety and prevent falls in this population.

Interventions: Based on an extensive literature review, a fall prevention bundle was initiated on all adult patients in the perioperative units. This bundle included the following components: high fall risk wrist bands, non-skid socks, fall prevention signs, and fall education. Bundle compliance was tracked and measured using compliance audit tools. Additionally, falls were calculated as number of patient falls per 1,000 bed days.

Results: After initiation of the comprehensive fall prevention bundle, staff had a high compliance rate with measures: wrist bands present, 97%; signs present, 100%; call bell within reach, 97%; education given, 89%; and non-skid socks on, 99%. Furthermore, no falls have occurred since bundle implementation. Therefore, the falls rate during this time is 0.

Conclusions: Based on this data, the successful implementation of a fall prevention bundle has the potential to decrease the number of falls in a vulnerable population.

Background

In the United States, patient falls have become a critical and prevalent issue that negatively impacts patients and the health care system. According to the Agency for Healthcare Research and Quality (AHRQ), the rate of falls is approximately 3-5 per 1000 bed days (2017). Moreover, this rate amounts to upwards of 1 million patient falls annually in the United States alone, making it a consistent problem reported on The Joint Commission's top ten list of sentinel events (AHRQ, 2017). Unfortunately, falls are not benign events, and one-third to one-half of all falls leads to patient harm (AHRQ, 2017). Harm can include minor harm, serious injury, delayed discharge, psychological distress, and even death (AHRQ, 2017). Vulnerable populations, specifically the elderly, cognitively impaired, sensory deficient, and physically impaired, have a higher incidence of falls compared with the general population (AHRQ, 2017).

Local Problem

According to the Maryland Health Services Cost Review Commission, falls rates in Maryland hospitals have been decreasing since 2010; however, falls remain the top reported adverse events in the state (Maryland Health Services Cost Review Commission, 2018). Additionally, the commission reported that patients older than 65 years of age were much more likely to experience an adverse event, including a fall, in the hospital compared to younger patients (2016). These statistics indicate that older adult patients hospitalized in Maryland are a population vulnerable to falls, even without other confounding risk factors.

In a community-based hospital located in a Maryland suburban community, falls rates for adult patients in the perioperative care units were increased over a two-year time period from 2016-2018. Although the unit goal was zero falls, four patients in the perioperative unit fell during this time period, according to the unit's clinical educator (Susan Lee, personal

communication, October 5, 2017). Starting in 2008, The Centers for Medicare and Medicaid Services (CMS) identified falls with injury as preventable hospital acquired conditions, making no falls acceptable, and offering no reimbursement to health care organizations for these incidents (CMS, 2015). Unfortunately, several barriers to fall prevention existed within the unit structure and population of patients where this quality improvement project was implemented, including the following: high fall risk due to receipt of sedatives, recent invasive procedures, physical disability, poor visualization of patients, poor lighting, large unit size, and fast patient turnover (Susan Lee, personal communication, October 5, 2017).

The implementation of evidence based interventions in hospitals is critical to patient safety and quality care. There is evidence in the literature that supports the use of multi-dimensional patient fall prevention programs to prevent falls. The purpose of this project was to implement a fall prevention bundle in conjunction with a patient education plan at a suburban community hospital in order to reduce the number of falls in the perioperative unit. The fall prevention bundle included non-skid socks, high fall risk wristbands, and high fall risk signage for all patients. Education included a one-page pictorial fact sheet that was given to each patient at admission. The short term goals of this project included 100% of staff receiving education about the new interventions, and an 80 % compliance with the interventions at the end of a three-month period. Education to staff included lecture at staff meetings, handouts, resources available on the unit, and an e-mail describing the intervention. The long-term goal was to reduce the unit's falls rate to zero.

Literature Review

Evidence-based interventions and actions for prevention of falls are imperative to patient safety in all units, especially in perioperative areas. Identification of specific fall prevention

interventions was the focus of this extensive literature review. This review also includes how a

positive organizational safety culture can have increased efficacy in successfully implementing

fall prevention programs. Next, specific plans and interventions that have shown success at fall

reduction and fall risk reduction were identified. Finally, this review concluded with an

assessment of the impact of incorporating patient fall prevention education in conjunction with

fall prevention programs.

Culture

To generate a positive and lasting change, support from organizational leaders and staff is

critical. Prior to initiating a new program, organizational support and readiness for change are

essential to assess (White et al., 2016). Evaluation of staff and organizational leader's

perceptions of the program prior to implementation was found to be important in order to tailor

implementation plans to meet the needs of the organization (The Health Research & Educational

Trust of the American Hospital Association, 2017). In the Agency for Healthcare Research and

Quality's Fall Prevention Toolkit, several important first steps involve engagement of staff and

leaders to gain support for the program (Ganz et al., 2013). Additionally, some researchers

described the importance of event analysis after falls occur and to perform root cause analysis on

these events (Spoelstra, Given, & Given, 2012). Some researchers that had inconclusive study

results identified poor organizational support as a high priority confounding factor that they

believed limited their program's effectiveness (Ganz et al., 2013).

Organizational support varied widely among participants in various studies about fall

prevention. Overall, units and organizations that had strong administrative and clinical support

were most likely to have success in implementing a fall prevention program (Choi, Lawler,

Boenecke, Ponatoski, & Zimring, 2011; Miake-Lye, Hempel, Ganz, & Shekelle, 2013; Spoelstra,

et al., 2012; The Health Research & Educational Trust of the American Hospital Association, 2017). Multidisciplinary team engagement was another facet of organizational support and culture that had a positive correlation with fall prevention program success (Ganz et al., 2013; Miake-Lye et al., 2013).

Interventions

Most researchers evaluated fall prevention measures as bundled interventions: several measures employed simultaneously. In the ambulatory surgery population, the most commonly utilized fall prevention interventions include the following: high fall risk signage, call bell usage, high fall risk wristbands, and fall prevention protocols (LeCuyer, Lockwoodm & Locklin, 2016; Spoelstra et al., 2012). Seven studies reporting outcome measures after implementation of a fall prevention bundle showed a reduction in the falls rates post implementation (Cameron et al., 2012; Choi et al., 2012; Coussement et al., 2008; Dykes et al., 2017; The Health Research & Educational Trust of the American Hospital Association, 2017; LeCuyer et al., 2016; Maike-Lye et al., 2013). Further investigation of outcomes and study measures yielded valuable information about data quality.

The research studies that reported outcome measures after initiation of fall prevention measures varied in type, validity, and measures reported. In the meta-analysis of randomized controlled trials (RCTs) by Cameron et al. (n=29,972), one of the largest studies found, multi-intervention plans lead to decreased falls rate ratios (RaR=.69; 95% CI .49-.96) (2012). Choi et al. (2012) also performed a systematic review of RCTs and controlled before and after studies, in an attempt to determine effective fall prevention interventions. The extensive review (34 studies, sample size ranging from n=54 to n=37,082) showed that 12 out of 14 studies measuring fall rate post intervention had significantly improved falls rates after their intervention (p<.05). The

systematic review of controlled before and after studies (n=8) by Coussement et al. (2008) evaluated relative risk of falling (RRfall) and relative risk of being a faller (RRfaller). In this review, fall rate after intervention was statistically significant (RRfall=.74; CI .58-.96); the fall risk was not significant. Finally, in the studies by Dykes et al. (2017) and Lecuyer et al. (2016), falls rates were calculated in controlled before and after studies; both studies had decreased fall rates after the introduction of an intervention. Based on these results, the use of a comprehensive, tailored fall prevention plan is recommended.

Overall, it was difficult for researchers to develop recommendations based on systematic reviews, since interventions and results varied widely among individual participants. Additionally, research studies that comprised the reviews often evaluated success using different measures; not all studies focused on falls rate. In several studies, results varied based on the interventions and population chosen. While the rate of falls declined in all studies, decreased fall risk was not always achieved (Cameron et al., 2012). However, many researchers used fall risk to determine the most appropriate interventions for their patients, and had positive results of fall reduction (Dykes et al., 2017; LeCuyer et al., 2016). Even with these differences, overall the implementation of fall prevention measures provided positive outcomes. In the ambulatory surgery population, patients are considered high fall risk due to confounding factors; thus, targeting interventions to meet high fall risk standards is appropriate (LeCuyer et al., 2016; Spoelstra et al., 2012).

A comprehensive fall prevention plan is essential to implement; however, the specific targeted interventions must be tailored to fit the unit and population for which they are designed. While implementing all fall prevention interventions may seem like the best option for fall prevention, this will not result in a successful program if multiple interventions are not feasible.

In the systematic review of RCTs and controlled before and after studies by Hempel et al., results

showed that the complexity of fall prevention interventions showed no dose-response impact on

the program's effectiveness (Post-intervention incidence rate ratio [IRR]; Pooled IRR= .77

[p=.17, CI .52-1.12, I^2 = 94%]) (2013). Therefore, implementation of simple and achievable

measures may provide optimum results for fall prevention.

Patient Education

Empowering patients and family members to partner with healthcare providers has

potential benefits for fall prevention and other health concerns. In two separate studies, engaging

and educating patients about fall risks and prevention measures led to a significant reduction in

falls rates (Cameron et al., 2012; Opsahl et al., 2017). Cameron et al. (2012) performed an

extensive meta-analysis of RCTs, which showed benefits to incorporating patient education in

fall prevention plans. Opsahl et al. (2017) describe a cohort study (n=2,148) where patient

education was added to fall prevention plans, and fall rates were calculated (falls per 1,000 bed

days). In the study by Opsahl et al., falls rates decreased to less than three falls per one-thousand

bed days, which was less than the national benchmark (2017). In one controlled before and after

study, patient knowledge after implementing an educational program about fall prevention

increased significantly on a qualitative survey (Dykes, et al., 2017). Making fall prevention

patient-centered tailors interventions to specific characteristics of patients based on risk factors

(Dykes et al., 2017). The interventions that are employed after this tailored assessment are then

focused and targeted to overcome patient-specific issues (Dykes et al., 2017).

Patients are at the center of our healthcare system, and should remain partners in their

care. Engagement of patients in fall prevention programs incorporates their views, beliefs, and

values into the plan (Cameron et al., 2012; Opsahl et al., 2017). Healthcare workers can employ

various safety measures and prevention strategies, but optimal effectiveness is difficult to achieve without the key stakeholder's, the patient's, involvement (Dykes et al., 2017; Opsahl et al., 2017).

The ideal combination of organizational support for a culture of safety, optimum fall prevention interventions, and patient education provide a multi-faceted approach to tackle the issue of patient falls. While improving each part of the plan has been shown to improve falls rates on its own, the combination of all three will provide solutions to the patient safety issue from different facets of the problem. By initiating a quality improvement project with though given to targeting potential problem areas, a successful outcome of decreased falls was more likely.

<div align="center">**Theoretical Framework**</div>

The use of a theoretical framework provides guidance and structure in implementing a practice change. The Plan, Do, Study, Act (PDSA) model is an effective model to use for rapid cycle improvement, used to implement quality improvement changes in a variety of settings (White, Dudley-Brown, & Terhaar, 2016). In each phase of the cycle, specific tasks are completed that guide implementation in a linear and logical manner, and each phase is completed in order prior to moving to the next. Additionally, the model flows in a cyclic manner, allowing for continuous quality improvement. In the planning phase, objectives are formed, predictions are made, and plans for a change are constructed (White et al., 2016). In the do phase of the model, the plan is implemented on a small scale, and implementation issues are evaluated (White et al., 2016). During the study phase, results of the trial are analyzed and compared to predictions (White et al., 2016). In the act phase, the intervention is modified based on the trial

results and analysis (White et al., 2016). After this cycle is complete and modifications are made, the next cycle of PDSA can begin.

Utilizing Plan, Do, Study, Act to Reduce Falls

The PDSA model was used to provide an organizing structure for activities and interventions for the fall reduction quality improvement project. Since each step of the model was defined and specific tasks occur at each phase, the model provided a methodical plan for implementation that was followed by all team members. A rapid cycle process improvement model, such as PDSA, was ideal for the implementation of the fall prevention initiative since it is completed within a three-month period.

Prior to the fall prevention intervention's implementation, all phases of the PDSA model were clearly defined and described with project stakeholders. During the planning phase, the intervention (fall prevention bundle initiation and patient education) was identified. Goals and predictions of the project included short-term and long-term outcomes, and predictions were that staff would implement the intervention and falls rates would decrease over time. In the do phase, the interventions were initiated. To begin, staff education regarding the plans occurred, followed by introduction of the interventions on the unit. Informatics staff will assist in initial data analysis of patient education and fall prevention interventions through use of the electronic medical record (EMR). Complete data analysis from the three-month trial occurred in the study phase, using data obtained from the EMR. Observations, successes, and potential failures were evaluated alongside the data. Finally, in the act phase changes to the intervention were made based on data analysis obtained from the EMR. The modified intervention reflected new knowledge obtained from the completed cycle, and provided a more comprehensive and sustainable intervention and plan for fall prevention.

Implementation Plan

A quality-improvement project focused on fall prevention and patient education was implemented in the perioperative units of a suburban medical center. The patient sample included patients admitted to any of the perioperative units who were age 18 or older. The patient sample size (n=142) was the number of patients who received the intervention and were included in data collection. The nurse sample size (n=33) was the number of nurses and patient care technicians working bedside in these units. Inclusion criteria for nursing staff was full-time employment status in the perioperative units, and agreement to participate in the project.

Procedures and Timeline

This quality improvement project was implemented within a 14-week timeframe in Fall, 2018. During weeks one and two, a team of nursing staff champions were assembled and trained about the fall prevention bundle. These staff members received training via in-person Fall Prevention Training (Appendix C) and completed the Fall Prevention Competency (Appendix D) to demonstrate their understanding of the training. Additionally, these staff champions were educated about data collection, auditing, and weekly communication with the project leader.

During weeks three and four, the entire nursing staff was educated about the fall prevention bundle. The Fall Prevention Pre-Survey (Appendix E) was administered, followed by in-person Fall Prevention Training (Appendix C). Staff then completed the Fall Prevention Competency (Appendix D). Nursing staff champions were asked to provide education and competencies to staff members who were unable to attend the in-person training.

During weeks five to 12, the fall prevention bundle initiative began. All patients meeting inclusion criteria received the fall prevention bundle: non-skid socks, high fall risk wrist bands, fall prevention signage, and fall prevention education. Continuous quality improvement was

ensured through site visits by the project leader, auditing by the staff champions, and weekly

communication between stakeholders. Once weekly, champions were asked to complete a Fall

Prevention Bundle Audit (Appendix F). Information collected was used to monitor progress and

alter the project as needed to ensure optimal effectiveness.

During weeks 13 and 14, the staff were asked to complete the Fall Prevention Post-

Survey (Appendix G).

Data Collection Plan

The data obtained through this project was process data. Data collection included mining

of documentation in the electronic medical record (EMR) for falls prevention measures, fall

prevention bundle audits, and staff surveys. Within the EMR, nurses are able to document fall

prevention measures.   During training, staff were instructed to document theses measures when

they implement the fall prevention bundle. Audits were performed on the compliance with the

fall prevention bundle. The audit tool contained five assessment measures that correlated with

the fall prevention bundle's components. Nursing staff champions were asked to complete one

audit weekly.

Qualitative data was also collected via the staff pre and post intervention surveys

(Appendices C and E). The goal of these surveys was to gain an understanding of staff

perspectives about the fall prevention bundle, current practice, and effectiveness of the change.

Responses were analyzed and compiled to determine which themes were present.

Data Analysis Plan

For quantitative measures (patient education reports and audits) descriptive statistics were

used and calculated using Excel. For the EMR reports of patient education about falls prevention

and for audit tool components, dichotomous, nominal variables (yes/ no) were used. Percentages

(mean, median, and mode) and frequency were used to describe how often fall prevention education was provided to patients. Additionally, audit tool data was analyzed using frequency and percentages to determine how often each component of the fall prevention bundle was utilized.

Staff surveys elicited qualitative data about staff perceptions related to the fall prevention bundle. These responses were analyzed and grouped by theme for comparison. These themes were used to guide implementation, and to determine which areas are a priority focus.

Human Subject Protection Measures

In order to protect human subjects, data collection did not include any identifiable patient information or specific demographics. A project description was submitted to the University of Maryland Baltimore Institutional Review Board (IRB) for a Non Human Subjects Research (NHSR) determination, and was obtained in July, 2018. Approval to implement the project was also sought from the organization, and was also obtained in July, 2018.

Sustainability

Throughout the project, nursing leaders on the unit (the clinical educator) and staff (project champions) were engaged as partners. Since staff were performing education, completing audits, and overseeing the project, they had the ability to sustain the project independently and advance further necessary changes. After the implementation period ended, the intervention continued and was led by the nursing staff champions who were involved in the quality improvement project. At project completion, results were disseminated by the project leader at three separate nursing quality improvement forums. This dissemination will enable the spread of results, challenges, and successes, to other nursing leaders who are interested in fall prevention.

Results

During program implementation, several processes were changed to promote fall prevention. The fall prevention bundle was implemented, and included universal high fall precautions for all perioperative patients. The new process for these interventions included adding the additional physical items during admission (wristbands and socks), and incorporating enhanced education throughout the patient's time in the unit. Another change was that unit staff played a key role in education and auditing of fall prevention measures.

Analysis of qualitative data on the pre-survey revealed several important themes that helped to guide implementation and the interventions chosen. Not all respondents completed all survey questions. Of the entire staff who had the ability to complete the survey (n=33), the majority (n=26, 79%) provided responses. Not all respondents completed all survey questions. Two survey items: barriers and facilitators, elicited theme responses. In the barriers question "What barriers to fall prevention are specific to your unit or population," there were four major themes identified. The themes and their prevalence for barriers were as follows: physical (n=6), operational (n=2), patient/population specific (n=10), and education (n=2). Physical included needed materials and some environmental constraints, such as the lack of ability to use bed alarms. Operational themes included time and workflow barriers. Patient and population specific themes included patient characteristics, physical injury, and sedative administration. Finally, education barriers were the lack of materials and time to provide education. In the facilitators question "What are some things that can make fall prevention easier to achieve," there were three themes identified. The themes and their prevalence were as follows: operational (n=4), education (n=10), and physical (n=5). Operational related to workflow

changes, education related to easy education to provide and time to provide it, and physical

described physical interventions to decrease falls.

During the implementation period, 132 patients meeting inclusion criteria were included

in the project and data collection. Additionally, 33 nursing staff members were who agreed to

participate in the program were also included in data collection. Of nursing staff participating in

the program, 100% (n=33) received training about the intervention and passed the competency

evaluation. All measures of the fall prevention bundle were audited on a bi-weekly basis (at

minimum) to determine compliance rates as percentages (See Figure 2). Compliance rates for

the measures were as follows: wrist bands present, 97% (n=128); fall risk signage present,

100% (n=132); call bell within reach of patient, 97% (n=128); patient education provided, 89%

(n=118); and non-skid socks on patient, 99% (n=131) (See Figure 1). In addition to audit data,

falls rate was calculated for the fiscal year quarter prior to implementation, and during

implementation. For fiscal year 2019 quarter one, the period prior to implementation, the falls

rate was 0.25 falls per 1,000 patient visits. For fiscal year 2019 quarter two, the implementation

period, the falls rate was 0.00 falls per 1,000 patient visits.

At the end of the project, unintended benefits and consequences were evident. A major

positive outcome was the ability to educate 100% of staff about the intervention at a unit-based

education day. The clinical site representative and unit champions were highly invested and

involved in the project, which helped to facilitate this level of compliance. Additionally, their

support enabled all staff members to be aware and competent in performance of the intervention.

However, during evaluation it was evident that one of the bundle measures, education provided

to patients and families, was difficult to assess via audit. Some auditors utilized the EMR

documentation to determine if education was given; however, others simply asked the nurse.

Additionally, these rates declined as the project progressed. Another negative unintended consequence was that most staff did not participate in the Fall Prevention Post Survey; only two responses were received, and thus were not used for analysis. Project costs were minimal since all materials were already part of the unit supply.

Discussion

Based on the results of the quality improvement project, implementation of a fall prevention bundle has the ability to improve fall rates in a perioperative unit. After the implementation period began, no falls occurred, as compared to four falls in the two years prior to the project's implementation. As discussed in the literature review, use of bundled fall prevention interventions provide the highest level of falls safety (Cameron et al., 2012; Choi et al., 2012; Coussement et al., 2008; Dykes et al., 2017; The Health Research & Educational Trust of the American Hospital Association, 2017; LeCuyer et al., 2016; Maike-Lye et al., 2013), and this strategy was successful in this perioperative population as well.

A major strength that had a positive impact on the outcome was that 100% (n=33) of nursing staff members received and successfully completed the fall prevention competency. This ensured that all were aware and competent in performing the bundle prior to the start of the implementation period. Additionally, significant feedback regarding staff perspectives about falls prevention on the unit was obtained prior to implementation, and was used to guide the project.

There were several limitations to the implementation of this project. This quality improvement project was created for a specific population and setting in a specified institution, with interventions tailored to meet the very specific needs of this setting. Because of this, the quality improvement project was limited in its generalizability. Additionally, threats to internal

validity exist with this project such as potential bias, no blinding, lack of control groups, and use of different pre and post non-randomized samples. The short duration of this quality improvement project (14 weeks) also presents limitations to adequate implementation.

Accurate auditing was difficult to complete with fall prevention education. Fall prevention education compliance was also the area where the least compliance was present on auditing (n=118, 89%). Lack of education was one area that was initially identified as a barrier to fall prevention (on the pre-survey), as well as something that could help to improve rates. Auditors utilized the EMR in order to determine if this education occurred; however, staff expressed that this may not have been the best method of measuring if education truly occurred. As staff suggested, education often occurs, and they would not receive credit for this unless it was correctly documented. Some auditors also asked staff members whether or not education was performed. This method also had its flaws, because nurses stated they were not likely to report that they did not perform education when asked. Use of a more validated and consistent method of measurement would have provided a better idea about the true compliance with patient education.

Finally, collection of post-intervention survey data could have provided insight about the intervention. Two responses were received, and the number was not significant and was not able to be used in analysis to draw conclusions about the staff perceptions. Low compliance may have been due to method of survey (e-mail), competing obligations, or lack of strong feelings toward the intervention.

There were several efforts made to attempt to adjust for project limitations. As a response to potential inaccuracies with education auditing, different auditing methods were trialed throughout the implementation period. These different methods included staff interviews

during audits, EMR documentation audits, and strictly observational auditing. Even though many different methods were trialed, a consensus was not reached about which method was most effective and accurate. Moving forward, a combination of EMR auditing as well as interviews with auditing seem to have the highest potential for accuracy. In order to attempt to gain more post-survey responses, the survey was sent multiple times, and an alternate paper format was also delivered to the unit.

Conclusions

Overall, the implementation of a fall prevention bundle of interventions for adults in perioperative units was a useful and effective intervention. Since the auditors are staff nurses, and the project had significant support from nursing leadership, there is a high likelihood that this project will be sustained. These key stakeholders have been vested and involved from the start of the project, and remained active participants throughout the implementation period. There were very low costs to the project, and it did not impact the nurse's work flow in a significant way that would hinder sustainability of practice changes. Additionally, all nurses received training, and based on audit results, the intervention has been integrated into their work flow. In advancing this quality improvement project, audit tools were left on the unit, so that staff could perform on-going monitoring. Since all nurses received training, these experienced nurses are able to train future nurses about the intervention. With successful implementation of a fall prevention bundle, there is the potential to eliminate falls as a patient safety problem on this unit. While there remained a need for better patient and family education surrounding falls, and better methods for measuring education, these results provided promise that fall prevention is achievable. In the future, falls prevention efforts on this unit should focus more on partnering with patients and families and incorporating falls education into daily patient care activities.

Based on the success of this project, there is potential for others to benefit from the positive

outcomes achieved in this setting. While generalizability is difficult due to the specific setting

and population, quality improvement falls prevention projects that utilize multi-bundled

interventions along with strong organizational and nursing leadership support are more likely to

be successfully implemented across practice settings.

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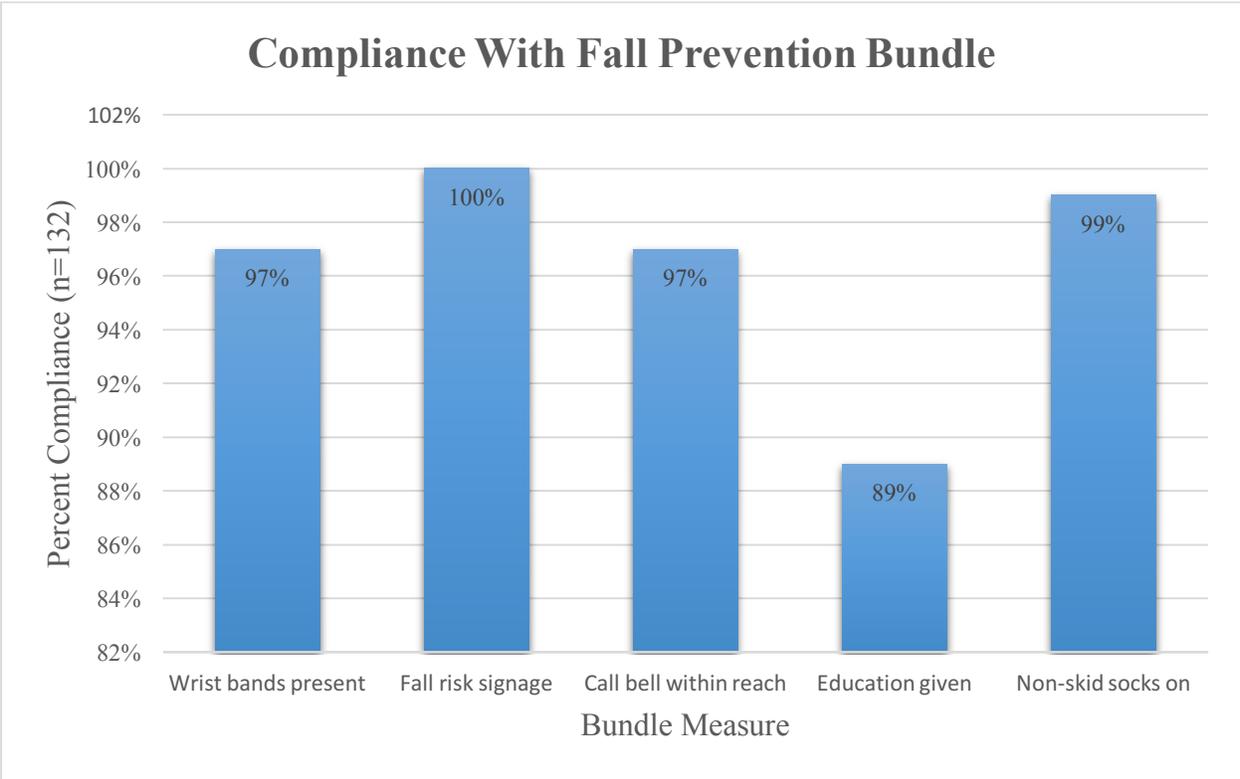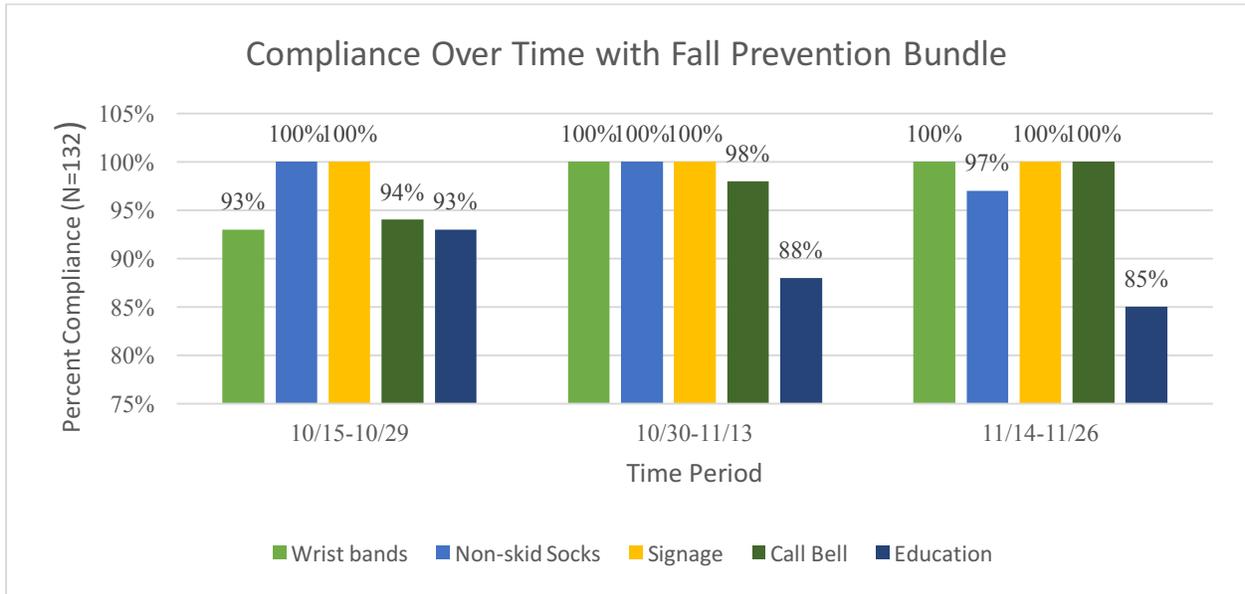	*and healthcare* (2nd ed.). Springer Publishing Co. ISBN-13: 978-0-8261-1784-7

Figure 1

Compliance With Fall Prevention Bundle

Figure 2

Compliance Over Time with Fall Prevention Bundle

Appendix A: External Evidence Table

Author(s), year	Study Objective/ Intervention	Design	Sample (*n*)	Outcomes Studied (how measured)	Results	*Level of Evidence Rating/ Grade
Cameron, Gillespie, Robertson, Murray, Hill, Cumming, & Kerse (2012)	To determine the best interventions for falls prevention in elderly patients in health care facilities/ Various fall prevention measures evaluated (Exercise, comprehensive fall prevention plan, and vitamin D supplement)	Meta-analysis of RCTs; Cochrane review	60 RCTs (with 60,345 participants); 43 trials in care facilities (n= 30,373), 17 in hospitals (n=29,972)	Rate ratio (RaR) and Confidence Intervals (CI=95%)	In care facilities: Vitamin D supplement reduced rate of falls (RaR .63; 95% CI .46 - .86), and interventions targeting multiple fall risk factors showed inconclusive benefit In hospitals: multi-intervention plans lead to decreased falls (RaR .69; 95% CI .49-.96)	I/B
Choi, Lawler, Boenecke, Ponatoski, & Zimring. (2011)	To determine the best comprehensive fall prevention interventions/ Fall prevention measures related to physical environment, care process and culture, and technology	Systematic review of RCTs, quasi-experiments, controlled before and after, cohort studies	34 studies, sample size (n) ranging from n=54 to n=37,082	Significant change in fall rate post-interventions (P value <.05)	14 studies measured change in fall rate post intervention initiation. 12 out of 14 studies found fall rate to be improved at a statistically significant level (p<.05). Interventions related to environment, care process, and technology all improved falls rates	I/B
Coussement, De Paepe, Schwendimann, Denhaerynck, Dejaeger, & Milisen. (2008)	To determine characteristics and effectiveness of fall prevention interventions in hospitals/ Multiple fall prevention interventions	Systematic review of controlled before and after studies	8 studies: 7 controlled before and after, 1 RCT	Relative risk of fall (RRfall) and Relative risk of being a faller (RRfaller) were calculated; 95% CI were used	In 6 studies, fall rate post intervention was statistically significant (RRfall .74, CI .58-.96); in 7 studies, the likelihood or rate of fallers was not statistically significant (RRfaller .87, CI .7-1.08)	I/B
Dykes, Duckworth, Cunningham, Dubois, Driscoll, Feliciano, … & Scanlon. (2017)	To implement a patient-centered fall prevention toolkit at the unit level	Controlled before and after	Not specified: Study occurred in high-risk units at two different hospitals in NYC	Rate of falling per 1000 bed days	Rate of falling after initiative implementation decreased from .47 to .31 per 1000 bed days.	VI/B

Author(s), year	Study Objective/ Intervention	Design	Sample (n)	Outcomes Studied (how measured)	Results	Level of Evidence Rating/ Grade
Hempel, Newberry, Wang, Booth, Shanman, Johnsen, …& Ganz. (2013)	To determine interventions, implementation, and adherence of fall prevention measures in U.S. hospitals/ Multiple fall prevention interventions	Systematic review and meta-analysis	59 studies (controlled before and after and RCTs), where hospitals report fall prevention interventions and rates of falls	Post-intervention incidence rate ratio (IRR); meta-regression analysis; 95% CI	Pooled IRR = .77 (.52-1.12, p=.17), I^2= 94%; no systematic association between implementation intensity/complexity and plan adherence There is a need for better reporting of outcomes and interventions/ implementation plans	V/B
Ganz, Huang, Saliba, Shier, Berlowitz, VanDeusen Lukas, …Neumann, (2013)	To review literature to create a clinical practice guideline toolkit for implementing fall prevention measures in hospitals/ Multiple fall prevention interventions	AHRQ Clinical Practice Guideline	Not described	Not described	Specific interventions/ efficacy unclear; literature search supports comprehensive fall prevention plan	AGREE II ratings: (1- 56%), (2-61%), (3-50%), (4-61%), (5-83%), (6-50%)
The Health Research & Educational Trust of the American Hospital Association (prepared for AHRQ) (2017)	AHRQ safety program for ambulatory surgery: implementation of QI initiatives to decrease HAIs, decrease adverse events, promote safety culture, and engage patients	Quality Improvement Project	665 facilities located in 47 U.S. states (affecting over 2 million patient surgeries)	Culture (pre/post survey), Patient satisfaction (surveys pre/post), Hospital admission rates, and Adverse events	Rates varied throughout organizations, with organizational culture and leadership as drivers for successful program adoption In facilities with organizational support, measured outcomes rates improved	VI/B
LeCuyer, M., Lockwood, B., & Locklin, M. (2016)	To implement fall prevention plans in a suburban ambulatory surgery center using the AHRQ ASC Toolkit (and centering focus around patient risk assessment, communication, and culture)	Quality Improvement Project	1,220 patients considered "at-risk" for falls	Fall rate per 1000 bed days	Falls rates decreased to zero in the year following implementation. In subsequent quarters, there were falls that exceeded the national benchmark, but were less then the organization's previous rate. Organizational support for the QI project remains high.	VI/B

Author(s), year	Study Objective/ Intervention	Design	Sample (n)	Outcomes Studied	Results	Level of Evidence Rating/ Grade
Miake-Lye, Hempel, Ganz, & Shekelle. (2013)	To review literature regarding fall prevention in hospitals to determine potential benefits and harms/ Multiple fall prevention interventions	Systematic review	19 studies: 4 systematic reviews, 2 new RCTs, controlled before and after	Rate of falling (RR); 95% CI	Overall benefits: In RCTs, falls were reduced (RR .69, CI .49-.96) Harms: little data concluded, but authors discuss the following have potential for harm constipation (vitamin D side effect, potential increase in physical restraint use, sedation use)	I/B
Opsahl, Ebright, Cangany, Lowder, Scott, & Shaner. (2017)	To determine the effectiveness of bundled fall prevention interventions combined with patient education to reduce falls	Cohort study	2,148 patients in two separate units/populations	Fall rate per 1000 bed days	In both units with combined interventions, falls rates declined to the national benchmark of <3 falls per 1000 patient days.	IV/B
Spoelstra, Given, & Given. (2012)	Literature review to enable development of hospital-based evidence based fall prevention programs	Systematic review	13 articles (focused on interventions) including systematic reviews, RCTs, and controlled before and after	Results of individual studies were described; Falls rate per 1000 bed days	Specific interventions/ efficacy unclear; literature search supports comprehensive fall prevention plan	V/B

Rating System for Hierarchy of Evidence

<u>Level of the Evidence</u> <u>Type of the Evidence</u>

I (1) Evidence from systematic review, meta-analysis of randomized controlled trails (RCTs), or practice-guidelines based on systematic review of RCTs.

II (2) Evidence obtained from well-designed RCT

III (3) Evidence obtained from well-designed controlled trials without randomization

IV (4) Evidence from well-designed case-control and cohort studies

V (5) Evidence from systematic reviews of descriptive and qualitative studies

VI (6) Evidence from a single descriptive or qualitative study

VII (7) Evidence from the opinion of authorities and/or reports of expert committees

(Melnyk & Fineout-Overholt, 2014)

Rating Scale for Quality of Evidence
A: High – consistent results with sufficient sample, adequate control, and definitive conclusions; consistent recommendations based on extensive literature review that includes thoughtful reference to scientific literature
B: Good – reasonably consistent results; sufficient sample, some control, with fairly definitive conclusions; reasonably consistent recommendations based on fairly comprehensive literature review that includes some reference to scientific evidence
C: Low/major flaw – Little evidence with inconsistent results; insufficient sample size; conclusions cannot be drawn

(Newhouse, 2006)

Appendix B: MAP-IT

DNP Project Name: <u>Fall Prevention for Adult Patients in Perioperative Units</u>

DNP Project Purpose Statement: The purpose of this project is to implement a fall prevention bundle in conjunction with a patient education plan at a suburban community hospital in order to reduce the number of falls in the perioperative unit.

Short-Term SMART Objective: *By* <u>October 15, 2018,</u> *we will* <u>provide education about the fall prevention bundle to 100% of nursing staff in perioperative units.</u>
Long-Term SMART Objective: *By* <u>December 1, 2018</u> *we will* <u>have a nursing staff compliance rate of at least 80% with the fall prevention bundle.</u>

Population/Context: This project will be implemented at a suburban, community hospital in the perioperative units. The population focuses on adult patients receiving same day surgeries. Patients include those in pre-operative holding areas as well as patients in recovery after procedures. The fall prevention program will be implemented for all patients meeting this criteria during the implementation period. In the perioperative unit, all patients are considered to be high fall risk due to the nature of recent procedures, or needed procedures. Falling prior to surgery may cause additional harm, risks, and even delay a patient's necessary surgical procedure. Falling after surgery may also cause harm and delay discharge from the hospital. Even though falls may have serious consequences to patients and the hospital, currently there are minimal fall prevention measures in place in these units. The aim of project leaders is to implement feasible fall prevention measures and patient education about falls.

Mobilize: *WHO will help facilitate the changes in structures and processes (practices)?*
List of Core Team Members –
1. Clinical Educator- Susan Lee, MS, RN: This stakeholder is involved in unit education and quality improvement. She has extensive knowledge about the unit's functioning, challenges related to project implementation, and potential solutions. She is in an administrative position and knows channels and connections that are needed to facilitate a quality improvement change. She leads education on new initiatives in the perioperative areas. For this project, she is the liaison between the DNP student and the hospital. She presented the initial problem and need for resolution to The University of Maryland, School of Nursing. As the project is developed, she is utilized as a point person to generate feasible ideas, answer questions, and aid in successful implementation.
2. School of Nursing Faculty- Dr. Gina Rowe: This stakeholder is facilitating project implementation by providing support and guidance for the project. Throughout the planning and implementation process, she is utilized as a resource and expert on creating a quality improvement project.
3. Staff Nurses on falls committee (names): These nurses currently hold positions on the falls committee for the unit. Since they already have an interest and buy-in to fall prevention, their support and partnership is key. These nurses have been monitoring, tracking, and working to prevent falls on the unit already. Their assessment of the problem and possible solutions, along with assistance in obtaining buy-in, is critical.
4. Staff Nurses and Patient Care Technicians: These team members are responsible for actually performing the new fall prevention tasks. Prior to design of the intervention, staff will be surveyed to gain insight on the problem. They are all key team members because without their buy in, the intervention will not be successful.
5. Joint and Spine Unit staff and General Surgery Unit staff: According to Susan Lee, these are other units in the hospital with similar populations (only more focused on specific medical conditions). They are currently working on fall prevention measures in these units. Collaboration with these employees regarding fall prevention measures may be beneficial in planning and implementing the program.

Others I will mobilize after the draft plans have been developed-

1. Charge Nurses: Once quality improvement plans are in place, nurse leaders on the unit will be crucial in facilitating fall prevention on a day to day basis. Charge nurses will be utilized as unit champions that will oversee daily activities. They will track progress, and report any issues with implementation to the project leader in real time. This will allow for enhanced data collection, and assessment of implementation from the perspective of those actually performing implementation.
2. Information Technology Specialists- These specialists will be asked to obtain reports about compliance with fall prevention measures. This data will provide information about whether or not implementation is successful.

Assess: *WHAT structures and processes (practices) need to change and WHY? What structure, process, and outcome measures will be used to measure progress?*
Currently, all patients in the perioperative unit are considered high risk; however, minimal interventions to prevent falls are in place. The standard of practice involves incorporating fall prevention measures into the fall prevention plan. In the literature, as many feasible interventions as possible are included as bundled activities to promote the optimal outcome. Additionally, the project leaders hope to empower patients to be active in their health through incorporating patient education into the fall prevention plans. Appropriate activities and necessary changes are described in detail below.

1. Safety measures: New evidence based fall prevention measures should be employed. Since all patients who are receiving sedatives and have had recent procedures are considered high fall risk, there is a need for additional fall prevention measures. The fall prevention measures that are feasible to implement in this setting and population include the following: High fall risk signage, high fall risk bracelets, and non-skid socks for all patients.
    - This will be measured through IT analysis of fall prevention documentation by nursing staff.
    - Additionally, survey of nursing staff periodically (prior to, during, and after) the QI process will provide additional detail about the success of the implementation.
2. Nursing education: Nursing staff is key to successfully reducing falls, because nurses are at the bedside with the patients. Nursing staff will need to have education about new fall prevention plans in order for implementation to be successful. During patient care, the fall prevention activities should be incorporated. This will not be able to happen if nurses are unaware of the plans.
    - This will occur through the project leader presenting education at staff meetings and through e-mail to all nursing staff.
    - Prior to the start of the intervention, all staff will receive education. There will be a brief competency/ questionnaire for staff to complete to determine effectiveness of staff education.
3. Admission education: Currently, patients are not receiving any education regarding falls and high fall risk. In this plan, patients are included as partners in fall reduction plans. Education provided to patients in the units is key to fall reduction.
    - There is currently patient education information in all patient rooms located on a ring that is reviewed by all patients in the pre-operative area. A new information page regarding fall prevention will be added to this ring.
    - This will be measured through IT analysis of fall prevention documentation by nursing staff.
4. Admission process: Currently, there is no specific fall prevention bundle implemented at admission. Moving forward with this project, each room should be set up with patient education materials, and falls prevention bundle items prior to patient admission. Having these items readily available in rooms will make implementation and modifying practice easier for nursing staff.
    - This will be measured through IT analysis of fall prevention documentation by nursing staff.
    - Feedback about how the implementation of this intervention is working will be provided on a weekly basis by unit falls champions (charge nurses). Any issues should be communicated to the project coordinator in real time, in order to make changes to the plans if needed.
    - In follow up surveys of staff, they will be asked if the admission bundle was utilized consistently, and for feedback about the process.
5. Call bells: Currently, bells ring to nurse's phones only. However, in order to provide quicker service to patients, and to prevent patients from getting up on their own, call bells will ring to nursing assistant's phones as well.
    - The clinical educator is able to contact IT in order to facilitate this change.

- The preliminary survey to staff will ask whether or not nurses and patient care technicians believe that this change would positively impact response time to patients.

Plan: *HOW will these changes be made (strategies and tactics)? WHEN will these changes be made?*
1. Strategies and Tactics:
   - Staff survey: A pre-intervention, interim, and post-intervention survey will be distributed to nursing staff.
   - Educational seminar: A presentation about the new intervention will be presented at the unit's staff meeting. For staff who cannot attend, the presentation will be e-mailed as well.
   - In-person education and training: During the program roll out, the project leader will be on the unit a few days the first week, and then at minimum on a bi-weekly basis. During time on the unit, discussion with staff about the intervention will occur as well as observation. If staff are unsure about the intervention, real-time training will occur.
   - Project champions: These are nurses who are interested in participating in QI projects and are interested in fall prevention. Ideally, this group will include charge nurses who have a wide reach and influence on the unit. They will be the daily leaders of the project's implementation, and point people to deliver results and progress information to the project leader.
   - Bundled interventions: All fall admission interventions (bracelets, socks, signs) will be bundled together in one place in the equipment room. This will ensure ease of implementation and decrease staff forgetfulness in using the resources.
   - Collaboration with other departments: The Joint and Spine and General Surgery units will be contacted to determine if our simultaneous project implementations can benefit from sharing information, ideas, and resources.
   - Data Collection:
       i. Documentation of nurses receiving education: All nurses who receive education regarding the new intervention will sign in at information sessions. This will allow tracking to ensure all nurses receive education.
       ii. Nursing documentation of fall prevention measures: Documentation of fall prevention is performed within Epic. I.T. will be consulted to pull reports of the documentation compliance for fall prevention. This will show how often fall prevention is being performed.
       iii. Weekly nursing reports regarding intervention effectiveness: Qualitative data will be collected through collaboration with nurses on the unit. Information about the effectiveness of the intervention, that may not be captured in the fall documentation, can be described in further detail here. These reports will be simple written logs that are accessible to nursing staff on the units.
2. When changes will be made:
   - Staff survey: Pre-intervention survey to be given in August; interim to be given in late October, post will occur in December.
   - Educational seminar: Education will occur at the unit's August staff meeting, and again at the September staff meeting. E-mail content will be sent at this time as well.
   - Project champions: Will be designated prior to initiation of the intervention, during September. These staff members will be given additional information and methods for contact the project leader with any concerns.
   - Bundled interventions: The resources will be bundled together in September.
   - Collaboration with other departments: To occur in August, prior to intervention.
   - Data Collection:
       i. Documentation of nurses receiving education: During the August and September staff meetings. Staff that are missed will be emailed the content by September 30.
       ii. Nursing documentation of fall prevention measures: Data collection will occur prior to intervention in August, at a mid-point in November, and a final collection in December.

iii. Weekly nursing reports regarding intervention effectiveness: After the educational period concludes in October, reports will be completed on a continuous basis. The project leader will be on the unit at least every two weeks to evaluate reports and update program plans.

Implement: *WHAT strategies and tactics were used? WHEN were the desired changes made?*
Step 1: Perform small tests of change

Step 2: Full-scale implementation

Track: *WHAT structures and processes (practices) were changed based on the metrics we used to measure progress (including frequency of assessment)? HOW did these changes affect outcomes? WHAT do we need to do differently to make greater progress toward improving outcomes?*

Date: _____ Re-Assessment Date 1: _____ Re-Assessment Date 2:_____, etc.

Plan Developed by (List all contributors): Beth Pruitt, RN, BSN; Gina Rowe, DNP, FNP
  The Institute for Perinatal Quality Improvement (PQI) grants the University of Maryland School of Nursing permission to utilize and make modifications to
PQI's MAP-IT worksheet to support the DNP students learning.
For permission to further modify or utilize PQI's MAP-IT worksheet in other settings contact: info@perinatalQI.org.
Reference: Guidry, M., Vischi, T., Han, R., & Passons, O. MAP-IT: a guide to using healthy people 2020 in your community. U.S. Department of Health and

Human Services. The Office of Disease Prevention and Health Promotion, Washington, D.C. https://www.healthypeople.gov/2020/t

Appendix C: Fall Prevention Training

Learning Objectives	Content Outline	Method of Instruction	Time Spent	Method of Evaluation
Nursing staff will be able to state the components of the fall prevention bundle.	• Fall risk designation/ importance of project • Description of components • Necessity of components • How to fit components into current work flow	Demonstration (Verbal/ Written)	10 minutes	Observation, Return Demonstration
Nursing staff will be able to describe how to document compliance with the fall prevention bundle.	• Visual demonstration of EMR documentation • Description of importance of documentation	Demonstration (Verbal/ Written)	10 minutes	Observation, Return Demonstration
Nursing staff will be able to recite a uniform fall prevention phrase.	• Explanation for use of a standard fall prevention phrase • Important key words for staff to recite	Demonstration (Verbal/ Written)	10 minutes	Observation, Return Demonstration

Appendix D: Fall Prevention Competency

1. What fall risk are all of our patients considered to be?
        Answer: High

2. What items are included in the new fall prevention bundle?
        Non-skid socks, high fall risk wristbands, fall prevention signage in patient
    rooms, ensuring patient call bells are within reach (and how to use the call bell), and fall
    prevention education

3. How are fall prevention measures documented?
        EMR: safety and fall prevention button

4. What is the phrase that we use when educating patients about our fall prevention bundle?
        "For your <u>safety</u>, <u>please use your call bell</u> and wait for assistance (show patient
    how to operate the call bell). <u>You are considered at high risk for falls</u> for the next 24
    hours due to the nature of the procedure that you are having today. Please leave your
    yellow wristband on as a reminder."

Appendix E: Fall Prevention Pre-Survey

1. What barriers to fall prevention are specific to your unit or population?

2. What interventions are currently used for fall prevention?

3. Do patients receive any fall prevention education currently?

4. What are some things that could make fall prevention easier to achieve?

5. How would you rate your unit overall for fall prevention? (0 = no measures or education in place, 10 = we are the best that we could be)

6. Any other comments/ideas?

Appendix F: Fall Prevention Bundle Audit Tool

Date: _____   Time: _____

Observation	Wrist band(Y/N)	Non-skid socks (Y/N)	Fall signage (Y/N)	Call bell within reach (Y/N)	Education provided (Y/N)	Comments*
1						
2						
3						
4						
5						
6						
7						
8						
9						
10						

* Please include comments about any situation when measures are not in place. This is to ensure adequate understanding of the situation. Information will help me to make the program more effective.

Appendix G: Fall Prevention Post Survey

1. How would you rate the ease of performing the fall prevention bundle? (0 = very difficult, 10 = extremely easy)

2. Do you believe that the fall prevention bundle is being used consistently?

3. Are patients receiving fall prevention education?

4. What are some things that you would change about the fall prevention bundle if you could?

5. How would you rate your unit overall for fall prevention? (0 = no measures or education in place, 10 = we are the best that we could be)

6. Any other comments/ideas?

Appendix H: Project Proposal Summary

Falls in healthcare facilities are issues that negatively impact patients and the health care system. According to the AHRQ, patient falls in the United States amount to nearly one million events annually (2017). Up to half of the time, falls lead to some level of adverse health consequence for patients (AHRQ, 2017). According to the Maryland Health Services Cost Review Commission (2018), falls remain the top reported adverse events in the state.

In a community-based, suburban, Maryland hospital, the falls rates for adult patients in the perioperative units have increased in the past two years. Starting in 2008, the Center for Medicare and Medicaid Services (CMS) identified falls with injury as preventable hospital acquired conditions (CMS, 2015). This designation determined that no falls with injury are acceptable, and healthcare facilities will no longer be reimbursed for these incidents (CMS, 2015). In the literature, bundled interventions appropriate for the setting and population are recommended (Cameron et al., 2012). Additionally, education of patients has been shown to have a positive effect on fall prevention (Opsahl et al., 2017).

The purpose of this project is to implement a fall prevention bundle in conjunction with a patient education plan in the perioperative units. The bundle will be initiated on all adult patients in the perioperative units. The bundle will include non-skid socks, high fall risk wrist bands, ensuring call bells are within reach, and fall risk signage for patients. Additionally, educational materials for patients and an education plan will be incorporated.

This quality improvement project will be implemented within a 14-week timeframe. During weeks one and two, a team of nursing staff champions will be assembled and trained about the new process, via in-person fall prevention training. During weeks three and four, the entire nursing staff will be asked to complete a pre-survey about current practice, and then will receive education about the new practice change. During weeks five to 12, the fall prevention initiative will go-live. All patients meeting inclusion criteria will receive the fall prevention bundle: non-skid socks, high fall risk wrist bands, fall prevention signage, and fall prevention education. Continuous quality improvement and monitoring will be conducted through site visits by the project leader, on-going monitoring and auditing by the staff champions, and weekly e-mail communication between the champions and project leader. During weeks 13 and 14, the staff will be asked to complete the fall prevention post-survey (Appendix E).

Data collection will be conducted by obtaining reports of fall prevention education documentation in the Electronic Medical Record (EMR), weekly audits of fall prevention bundle compliance, and staff pre and post surveys. The EMR data and audits will be evaluated using descriptive statistics: frequency and averages will be calculated. Staff qualitative surveys will be analyzed and grouped by themes. Themes will then be evaluated using frequency and averages. Falls rates, determined by number of falls per 1,000 bed days, will be evaluated in the future and compared to rates prior to implementation using t-testing.

In order to protect human subjects, data collection will not include any identifiable patient information or specific demographics. A project description will be submitted to the University of Maryland Baltimore Institutional Review Board (IRB) for a Non Human Subjects Research (NHSR) determination. Approval to implement the DNP project will also be sought from the organization.