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Patient Care Sitter Reduction and Fall Safety Improvement

Timothy J. Bock
University of San Francisco, tbock22@gmail.com

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Tim Bock, DNPc, MBA, RN

University of San Francisco

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Marjorie Barter, EdD, RN, CNL, CENP

Timothy Godfrey, SJ, DNP, RN, PHCNS-BC

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Abstract

The financial constraints imposed upon operational budgets by the frequent use of patient care sitters is well known among hospital leadership. Despite the high labor costs associated with direct and continuous observation, this intervention is routinely deployed by frontline care teams in an effort to preserve patients from harm, particularly from accidental falls. This reality creates an opportunity where significant budget savings can be achieved by supplanting the use of patient care sitters with more effective fall prevention strategies. This quality improvement (QI) project implemented a non-psychiatric sitter reduction and fall prevention initiative in two high volume adult acute care units. Through a collaborative process involving frontline staff, clinical subject matter experts, leadership stakeholders, and medical equipment vendor support, this project implemented a three-fold quality improvement effort including education, policy enhancement, and patient safety supply evaluation. This multi-tier engagement included a 60-day clinical evaluation of the program elements where sitter utilization, fall events, and falls with injury were compared to the organization's historical performance. The project produced a 46% reduction in sitter utilization within the two trial units. Though fall outcomes were unaffected by this QI project, the initiative produced results commensurate with contemporary evidence that utilization of patient care sitters can be effectively reduced without risk to patient safety.

Keywords: patient care sitter, sitter reduction, sitter alternative, fall safety, fall reduction, fall prevention, preventing harm from falls, quality improvement, QI

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Introduction

Background Knowledge

The use of patient care sitters presents a conundrum for hospital leadership. While the utilization of sitters to prevent falls is an expensive strategy not well supported by contemporary evidence, the reality is hospitals have a moral imperative to preserve patients from the harm of falling. Patient falls are a leading cause of preventable injury in US hospitals with the Agency for Healthcare Research and Quality (AHRQ) estimating 700,000 to 1,000,000 hospitalized patients fall each year and as many as one third of these fall events are considered preventable ("Preventing Falls," 2015). The Centers for Disease Control and Prevention (CDC) reports the total direct care cost to the US healthcare system for all fall events in those 65 and over is $34 billion annually ("Cost of Falls," 2015). At the individual hospital level the unreimbursed costs for treating an injury resulting from a hospital-related fall ranges from $7,000 to $30,000 depending upon severity (Spetz, Brown, & Adin, 2015). In addition there is the average $55,000 in legal claims and proceedings hospitals pay in resolving litigation associated with healthcare related fall injuries (Boswell, Ramsey, Smith, & Wagers, 2001). Added to these financial expenses are reputational concerns for organizations given performance on fall safety is publically reported information (Boswell et al., 2001). Combining the significant costs and risks associated with patient falls in conjunction with an environment of limited resources, safety interventions to prevent falls must be assessed in light of best evidence to assure interventions are effective and scarce resources are used efficiently.

Acute care hospitals in the United States can easily spend over $1 million dollars annually on sitters and evidence suggests this rate of spend is increasing (Spiva et al., 2012). However, there is scant evidence that using sitters is an effective intervention in preventing

patient falls (Lang, 2014). Unfortunately a perception of efficacy remains as the use of patient care sitters for continuous observation is a familiar strategy employed to prevent patient falls. Despite the lack of evidence supporting sitter efficacy, the line item elimination of sitters is not supported either (Lang, 2014). The focus should be upon implementation of more effective and proven fall prevention measures that obviate the use of patient care sitters.

Experience at the site level.

This evidenced-based sitter reduction and fall prevention initiative was implemented by two adult acute care departments within Legacy Health (LH), a 7-hospital system located in and around the Portland, Oregon metropolitan region. The specific units involved were the Medical Specialties department at Mount Hood Medical Center (MHMC) and the Telemetry Medical unit at Good Samaritan Medical Center (GSMC). The targeted units were approached for participation given their high rates of sitter usage and fall events compared to other acute care departments within LH. Appendix A provides a 2-year summary on sitter utilization trends for both units in comparison to similar departments within the organization. The units participating in the implementation are outlined in black on the provided chart. Both departments show a significant year over year increase in their utilization of patient care sitters that exceeds the high average rate of increase observed across similar units. A comparison of falls over the same time frame among these departments is provided in Appendix B. The organization's fall rates are typically below comparative bench marks. However, the evaluation units demonstrate diverging results from increased sitter usage with MHMC observing a decline in fall events and GSMC showing an increase in fall rates over the same time period.

The organization's sitter utilization and fall prevention efforts are guided by common policies used across all acute care inpatient settings. An initial assessment of fall prevention

practices was conducted regarding the application of these polices. This analysis included the two participating units as well as representative acute care departments at each of the organization's hospital settings. Please note that LH was a 6 hospital system at the time of this analysis as the seventh medical center did not affiliate with the organization until August of 2016. Appendix C records the results of this assessment and demonstrates the variable fall prevention practices employed across LH adult acute care units. Though practice may be defined by system policy, implementation at the discrete unit level is variable and often reflects local context, challenges, and department culture.

Site level information.

The organization assigns the task of tracking sitter utilization to the Staffing Department. The Staffing Department is a centralized team responsible for what is traditionally known as float pool staff. As the organization does not employ a unique cost code for sitter hours worked, all units report sitter usage to the centralized Staffing Department. This team tracks sitter utilization and provides LH leadership with a monthly update for usage across all sites and all departments.

The organization prescribes a specific methodology for the capture of fall events and fall related data. Patient fall events are documented by staff through the organization's I-CARE incident report system. The I-CARE system is a database that provides detailed reports for tracking targeted clinical outcomes and other quality-related data. A detailed summary of patient fall events across the organization's adult acute-care departments is provided in Appendix D. The highest proportion of falls involves falls from bed, accounting for 36.6% of the fall events observed by the organization in FY16. Falls from bed were implicated in seven of the 11 falls with injury recorded and as such demonstrate a priority issue for fall-prevention efforts.

Targeting site level change.

The organization has not previously engaged in a concerted sitter reduction program. The policy guiding sitter usage was first implemented in 2007 with the intent to standardize utilization and minimize the staffing impact on centralized float pool resources. By comparison, efforts to reduce falls have received intense and on-going attention and support. The organization employs a system-level falls reduction committee to guide policy development, quality improvement, and educational standards regarding fall safety. The Falls Committee is led by a Clinical Nurse Specialist (CNS) and has Nurse Manager (NM) representation from each of the organization's inpatient medical centers.

As indicated by Appendix B, the organization has maintained a rate of falls and falls with injury among the acute care environments consistently below national benchmarks (Lake, Shang, Klaus, & Dunton, 2010). These outcomes are a testament to the effectiveness of the Falls Committee and the commitment of LH to preserve patient safety. In contrast, the organization has taken a diffuse approach toward sitter reduction, though in recent years LH has implemented initiatives to more centralize and coordinate these efforts. The organization developed system-level policy revisions in 2013 guiding sitter utilization and assigned accountability to tracking sitter usage to the Staffing Department. The targeted and local implementation of this QI project provided the organization an opportunity to evaluate the effectiveness of the sitter reduction effort prior to the commitment of a system-wide implementation. This relatively small scale approach enabled the project leader and stakeholders to study and refine the initiative based on feedback from end-users and documented performance outcomes. As described by the Institute for Healthcare Improvement (IHI), this approach to program development supports quick process improvement efforts through an iterative application of the plan-do-study-act (PDSA) cycle.

Local Problem

As described in Appendix A, the rate of sitter usage for the implementation departments at MHMC and GSMC are higher than the average observed for similar units within the organization. As will be described in the financial discussion of this project, the standard hourly wage of a patient care sitter at LH is $18.80 when adjusted for applicable shift differentials. Based on the historical sitter usage, the two target units combined for an FY16 spend of $157,250 on patient care sitters. The acute care departments throughout the organization combined to accrue a total patient care sitter expense of $384,968 for FY16.

Despite the organization's increasing use of sitters for patient safety, fall rates are essentially unchanged over recent years. Appendix E provides a 4 year summary review of sitter utilization data and fall prevention outcomes for the evaluation units at MHMC and GSMC. Over this timeframe the target departments experienced a nearly 300% increase in usage of non-psychiatric patient care sitters; however, the same timeframe shows an essentially flat curve with respect to rate of patient falls.

As previously described, LH has committed resources and developed structures to increase awareness concerning the utilization of sitters and specific processes to prevent patient fall events. Despite these actions, the organization's acute care units have significantly increased their overall rate of sitter usage. Similar to the implementation units, even with the increased utilization of sitters the system has observed no change in its patient fall rate. Senior leaders are increasingly aware of this trend in sitter utilization without a corresponding reduction in the observed rate of patient falls. The inefficient use of resources is contrary to the organization's efforts to support lean management principles and implement evidence based patient care

practices. In response to the growing inefficiency and patient safety concerns, the system's Chief Nursing Officer (CNO) requested the project leader to address this issue.

In organizing this quality improvement effort, the project leader vetted the concern with nursing management teams. Data and information were presented to the Falls Committee as well as each acute care department within the organization. Though all areas appeared aware of the concern, it was the project leader's observation the teams were strongly impressed by the trended data. Through this process of presentation and dialogue, general awareness of the issue was raised among key nursing department stakeholders. As a result, multiple requests for project participation were solicited including the targeted units identified for program evaluation.

Intended Improvement

AIM statement.

The aim of this QI project was the implementation of a sitter reduction and fall safety improvement intervention on two adult acute care units with Legacy Health from July 1, 2016 through September 1, 2016 to reduce non-psychiatric sitter utilization by 50%, reduce the rate of patient falls and falls with injury by 25%, and achieve a net operational savings for the organization.

Change trigger.

In response to concerns about increasing sitter costs and intractable patient fall rates, this evidenced-based quality improvement initiative developed and implemented a series of alternative measures to reduce the use of sitters in an effort to improve patient safety. Leveraging the support of senior leaders, the intervention coordinated resources from Nursing, Material Service Operations, Finance, and Quality Improvement in the development, implementation, and evaluation of the project.

Purpose of change.

The purpose of the initiative was to provide the organization an opportunity to discern if alternatives to patient care sitters can effectively reduce the utilization of sitters while also improving patient fall safety performance. As previously described, the use of patient care sitters to prevent falls is an expensive intervention that yields little patient safety benefit. Over the past three years LH has significantly increased its utilization of patient care sitters by nearly 300%; however, the overall rate of fall events and fall events with injury remains unchanged. An exploration of the current best evidence and an effective translation of this evidence into clinical practice was required to make more efficient use of limited resources in preventing patient falls.

Review of the Evidence

Search details.

A review of available evidence was conducted within the CINAHL, Cochrane Library, AHRQ, and Guideline Clearinghouse databases. The search terms employed were: *sitter*, sitter* and fall*, sitter* and effective*, sitter* and patient injury*, sitter* and safety.* The use of the asterisk symbol within the literature searches serves as a wildcard function to broaden the search. Using this symbol at the end of the root term enables the search to return all variations of the base term. For example, the term *effective** will find the words effective, effectively, and effectiveness within the same search. In an effort to secure a wide breadth of evidence, the one limitation applied was a restriction to English articles. Articles considered for inclusion reported either a financial and/or quality outcome measure in assessing the effectiveness of sitters at preventing patient falls in the adult acute care setting. The initial search using the term *sitter** returned a total of 120 published articles. Utilizing the additional search terms across each of the

databases and removing duplicative articles yielded a result of 24 articles. Three additional articles were located through a secondary review of the reference lists of each publication. A review of the abstracts eliminated articles that discussed sitters used to prevent self-harm, sitters studied in long-term care environments, or sitters used in the context of child care. A total of 10 articles from the original 27 met these criteria. The Johns Hopkins Nursing EBP Research Evidence Appraisal Tool guided the literature assessment evaluation. This tool provides a simple algorithm to assure a consistent assessment of nursing evidence. Utilizing this evidence appraisal system, a summation of the reviewed articles is available within the Evaluation Table provided in Appendix F.

Thematic review.

Current evidence presents three main perspectives on the efficacy of sitters in preventing falls. One, increasing the utilization of sitters would have a beneficial impact on patient falls. Two, directly reducing sitters through implementation of a sitter ordering decision algorithm would not increase patient fall rates or harm from falls. Third, replacing sitters with alternative safety strategies would decrease patient falls and associated harm from falls. A list of the mix of interventions presented by each article is available in the Evidence Synthesis Table provided in Appendix G. Examining each of these perspectives in turn illustrates the continuing controversy of using an intervention of limited clinical value.

Boswell, Ramsey, Smith, and Wagers (2001) hypothesized an increased utilization of sitters would decrease patient falls and falls with injury. The target organization had previously integrated a sitter program into the fall safety efforts of their inpatient acute care environments. Prior efforts to prevent falls including reliance upon the diligence of frontline staff, chair alarms, and other interventions were proving unsatisfactory. However, with increasing budget

constraints organizational leaders asked for an analysis of the effectiveness of the sitter program. The authors' retrospective study analyzed 21 months of data involving 37,840 discharges across all of the hospital's seven adult inpatient medical-surgical units. The study found a statistically significant increase in falls following the implementation of the sitter program; though at a positive effective increase of 0.0019 ($p = 0.036$) falls per sitter shift worked, the increase was considered clinically insignificant. In their assessment the authors caution uncontrolled variables such as skill level of sitter and intermittent staffing strain may have masked the benefit of sitter use. Several variables could account for the confounding results; however, the impact of disparate variables should have been mitigated by the study's large volume and time interval. This study in an acute care environment found the active implementation of patient care sitters had an adverse, though minor, impact on patient falls (Boswell et al., 2001).

Two articles presented the second perspective of directly reducing sitter utilization through implementation of a sitter ordering algorithm process. Tzeng, Yin, and Grunawalt, (2008) studied the implementation of a sitter decision tool developed by the authors. The Patient Attendant Assessment Tool (PAAT) was designed to guide the sitter ordering decision process, to target high risk patients for sitter assistance, and to suggest possible safety alternatives. The tool, implemented on two inpatient adult acute care medical units, reduced sitter utilization by more than 60 shifts per month. Unfortunately, one of the trial units measured a statistically significant increase in the rate of falls with injury (0.34/1000 patient day, $p=0.01$) following implementation of the tool. The second trial unit also experienced an increased rate of falls with injury following implementation of the PAAT tool, though this was statistically insignificant. Attempts to isolate sitter usage to the highest fall risk patients was shown to be ineffective in this pilot study (Tzeng et al., 2008).

Spiva and colleagues (2012) investigated the impact on sitter use and fall outcomes following implementation of an initial order review procedure followed by a 12-hour sitter continuance justification process. Their study involved 5 critical care, 2 step-down, and 11 medical-surgical departments within a large acute care hospital. The 7 month post-intervention results showed no statistically significant change in the number of falls (pre = 199, post = 197, p = .96) nor rate of falls (pre = 2.45, post = 2.39, p = .36) across any of the unit types studied while reducing spending of sitters by $322,000 (Spiva et al., 2012). These studies present conflicting information when sitters are actively reduced without formal implementation of alternative strategies. Nurse leaders should take pause when assessing a similarly narrow approach to fall safety.

The final group of articles provide a broader and more holistic approach to sitter management. While each were motivated to reduce utilization of patient sitters, all highlight and promote significant alternative safety strategies. Adams and Kaplow (2013) reported a sitter reduction effort that involved active implementation of a variety of safety alternative strategies including staff education, intentional rounding techniques, and implementation of technologies such as low beds, exit alarm systems, and color-coded wrist bands. Implemented across all of the organization's 57 inpatient departments, the program netted a savings of $1.2 million in its first year. Fall outcomes were not presented statistically; however, the investigators state both rate of falls and severity of falls were lower in each of the two years following implementation of this program (Adams & Kaplow, 2013). Salamon and Lennon (2003) took a similar approach by emphasizing implementation of a wide range of sitter alternatives such as diversional activities for patients, educating staff on use of patient relaxation techniques, designation of on unit observation areas, scheduled toileting rounds, and exit alarms in addition to a sitter use decision

algorithm. This multifaceted approach to patient safety decreased sitter use by 88% and sustained this improvement over the one year review period. The combination of sitter alternative strategies saved the organization $1.15 million dollars without producing any significant change to patient falls or patient injuries from falls (Salamon & Lennon, 2003). These articles suggest a significant reduction in sitter utilization can be safely enacted and sustained in an acute care hospital when supported by implementation of proactive alternative fall safety practices.

Others have shown how similar sitter reductions can be achieved despite the complexity of behavioral comorbidities. Both delirium and confusion place patients at a higher risk for falls and are conditions often cited by nurses as justification for the use of patient care sitters (Laws & Crawford, 2013). It is imperative to provide proper tools and resources for direct patient care staff who have limited time and typically insufficient training for managing psychiatric patients. Programs that offered specific education and real time guidance on the consistent management of behavioral patients within the acute care setting have reduced utilization of constant observation while simultaneously reducing patient fall events (Laws & Crawford, 2013; Rausch & Bjorklund, 2010). One effort involved the novel approach of deploying a psychiatric liaison nurse (PLN) to help guide the management of medical patients with comorbid psychiatric conditions. Comparing the cost of the PLN role to the reduction of sitter hours, the program produced an annualized operational savings of $291,168 while contributing to a 25% reduction in the number of patient fall events (Rausch & Bjorklund, 2010). Efforts to reduce the use of constant observation among a difficult inpatient population can be successful when done in support of the needs of frontline staff who are directly tasked with maintaining patient safety.

The implementation of appropriate evidence-based practices to supplant sitter utilization is essential, though it is important to understand a general overlay of accepted fall prevention efforts has not proven to be effective (Ang, Mordiffi, & Wong, 2011). Fall prevention strategies need to appreciate the interplay of the physical environment, care processes, and particularly the sustaining forces of organizational culture (Choi, Lawler, Boenecke, Ponatoski, & Zimring, 2011). Attempts to reduce sitter utilization while improving fall safety requires a holistic approach, leveraging the role of the professional nurse with appropriate resources and support to prevent falls and fall related injuries (Lang, 2014). While sitters may have a continued role within the hospital setting, the evidence indicates this role could safely be much smaller.

Conceptual Framework

The available evidence on the management and application of sitter programs for patient safety is inconclusive at best (Carrie, 2014). With the paramount importance of preventing falls and particularly falls with injury, hospitals often resort to using this unproven safety tactic (Laws & Crawford, 2013). In the context of inconclusive evidence on sitters this program improvement effort utilized the Iowa Model of Evidence-Based Practice to Promote Quality Care. The Iowa Model was initially envisioned as a practical guide for implementing research into clinical practice. Since publication of the original model in 1994, the developers have evolved the framework to reflect end-user feedback as well as the shifting demands of the healthcare market (Titler et al., 2001). Contemporary application of the model is guided by an expanded purpose to translate best evidence into clinical practice improvement, a keen alignment with the role of the Doctorate of Nursing Practice. The model emphasizes flexibility in recognizing the importance of high-level research, but appreciates such evidence is not always available. The Iowa Model's conceptual framework is well suited to guide this QI project improvement effort to

reduce sitter utilization and improve fall safety because high level, good quality evidence is lacking and clinicians will need to adapt their efforts to best available data and information.

The revised model begins with activation triggers serving as potential catalysts for change. These triggers, either problem- or knowledge-focused, begin the investigation into clinical change. Following identification of a problem, the Iowa Model calls for an assessment of the organization's sense of priority with the issue. Inclusion of this step assures evidence-based care develops in alignment with the articulated priorities of the unit, department, and organization, thus gaining access to resources and improved opportunities for success (Titler et al., 2001). Certainly problem and knowledge triggers are identifiable with patient safety and sitter usage; problem triggers with how best to prevent falls and knowledge triggers on how best to use sitters. All organizations would seemingly prioritize the associated matters of patient safety, staff satisfaction, and cost effectiveness and seek to test improvement options. The test process determines appropriateness of proposed options and the modifications necessary to effectively adapt the changes to real-world clinical practice. In the modern health delivery setting with its temptation to bypass formal application of theory in favor of quick action (Sales, Smith, Curran, & Kochevar, 2006), the Iowa Model's use of test of change pilots supports the call for rapid action while maintaining a firm grounding within a foundational framework. The test and adaptation cycle emphasized by the Iowa Model enables rapid assessment of the many fall safety strategies that could be effective alternatives to the utilization of patient sitters.

Methods

Ethical Issues

Non-psychiatric sitter usage and patient safety are an intertwined narrative and efforts to isolate one from the other ignore this reality. In contrast to the high rate of utilization of patient

sitters, current evidence suggests sitters are not an effective tool in preventing patient falls (Lang, 2014). It is thus tempting to look at sitter labor costs and simply eliminate this line item expense from the operating budget. However, given the ethical and moral imperative to protect patients from harm it is difficult to remove a strategy that may appear to patients, families, and staff that all efforts are in place to prevent falls (Adams & Kaplow, 2013; Lang, 2014). Any effort to reduce use of sitters at the expense of increasing the rate of injury from falls is contrary to the principle of nonmaleficence.

Hospitals seeking to reduce sitter expense must review the multifactorial nature of fall events and mindfully plan a safety program that supports efforts to reduce falls. This project designed to reduce the use of patient care sitters included measures to enhance fall safety practices. The sitter reduction and safety elements of the project were reviewed and approved by internal system-level stakeholders including Patient Care Value Analysis, Falls Committee, Nurse Executive Council, and the senior leader Operations Council.

Setting

This QI project targeted a systematic implementation of fall prevention and sitter reduction efforts on two separate adult acute care departments. These two units are representative of the organization's typical adult acute care environment. In keeping with the paradigm of quality improvement, the project focused upon immediate outcome improvements, was designed with an emphasis upon sustainability, and applied an adaptive element to modify the initiative based on real-time feedback. Project outcomes were obtained through the organization's internal incident reporting systems. Frontline staff assessment on the performance of the initiative's various improvement elements was intentionally collected throughout the implementation phase of the project. The project lead did not have any conflict of interest

associated with the vendor products evaluated and did not have any reporting relationship among the participating units.

The initiative was deployed on two adult acute care units within LH. The medicine unit at MHMC is a 48 bed adult acute care unit with an average daily census of 40.1 patients. The unit is a standard medical department providing general nursing for the adult acute care population. The telemetry medicine unit at GSMC is a 53 bed adult acute care unit with an average daily census of 37.8 patients. This unit provides telemetry monitoring for adult non-surgical acute care cardiac patients. In addition, the unit is the primary general medicine department for GSMC. Each unit is composed exclusively of private rooms. The units share a common extended hallway layout with a nursing station located near the center of the department. Patient care rooms are located on both sides of the respective hallways. Each department has 4 centrally located rooms that when the door is open provide line of site visibility to the patient from the central nursing station. No other patient rooms can be directly observed from the nursing station.

MHMC has an actively engaged local fall prevention committee. This site-level committee meets on a monthly basis to review all documented fall events that have occurred at MHMC to discern possible patterns associated with patient fall events. Using this information, the team works to devise appropriate mitigation strategies. The nurses on the telemetry unit at GSMC work through the unit's Shared Governance Council and Charge Nurse Committee to effect fall safety improvement practices for the department. Recent initiatives included visible posting of checklists to remind all staff of standard fall practices and implementation of Charge Nurse rounding to validate compliance with fall prevention standards of care. The Nurse

Manager and Assistant Nurse Manager for both departments are active members of the system-level Falls Committee.

Planning the Intervention

A review of patient sitter utilization indicated a system-wide usage of 12.5 FTE per year for non-psychiatric situations; much of this was anecdotally reported as use for fall prevention and patient safety efforts. A gap analysis for this project discerned a quality improvement opportunity with regards to patient safety products and generalized fall safety practices. The gap analysis is discussed in detail under the Planning the Study of the Intervention section of this report. Baseline sitter usage and fall outcome data were pulled from the organization's staffing and quality systems. Top performing departments as evidenced by low sitter utilization and fall rates compared to similar unit types across the organization were identified. The project leader conducted a series of team meetings with top performing departments to identify best practices. In addition, interviews were conducted with teams outside of the top performers in an effort to identify possible barriers to practice. Using the obtained information, a quality improvement plan was developed focusing upon observed variation in fall safety practices between top performing units and comparator departments.

Gap analysis.

A system level gap analysis was performed in order to discern potential practice and process improvement opportunities. A summary of the gap analysis is provided in Appendix H. This analysis involved all of the adult medical units across the organization including a telemetry as well as surgical specialty department. In conjunction with interviews of system level stakeholders, the gap analysis was used to identify the discrete interventions of this QI project. Specifically, from the analysis it was identified that the organization showed significant variation

in fall prevention practices, inconsistent application of current policies applicable to sitter usage and fall prevention guidelines, and gaps in availability of necessary patient safety supplies.

Analysis of local practice.

The gap analysis conducted among the two evaluation departments revealed a passionate commitment to fall prevention; however, these discussions and unit visits revealed notable variations in practice between the two units. The GSMC unit clearly identified a falls champion. This charge nurse has great interest in fall safety efforts and is a continuous voice within the department calling for adherence to fall safety improvement. This individual is a catalyst for fall prevention within the unit and holds the team accountable to compliance with standards of care and new initiatives. A particularly notable observation was this unit's active inclusion of Physical Therapy (PT) and Occupational Therapy (OT) in discussions on fall prevention strategies.

The efforts at MHMC appeared primarily reliant upon the monthly fall event review process. It is noteworthy that the nurse manager of the medical unit is the facilitator for this committee. Though the fall review was intended as a site level review, the facilitator of the meeting challenged the committee to identify both site-wide and unit specific fall safety concerns. Discussions among this team appeared to challenge assumptions and did not tend to dismiss falls as unavoidable events, but did endeavor to discern how practices could be improved at the site. It was unclear if this unit operated unilaterally when implementing fall safety measures if the committee functioned more in an advisory capacity. When planning for this QI project, the project leader was not asked to work with this site committee for purposes of approval or process development. Instead, the leader worked directly with the medical unit itself

as well as the system-level Falls Committee. This process served to streamline communication and enabled the project leader to coordinate all necessary messaging.

As it pertains to sitter usage, it was not apparent that the decision to utilize this resource for fall safety is viewed as a process. The decision to use a sitter was based on feel and perception on the part of staff. For both departments, nursing staff implement the use of patient care sitters through a direct request of the shift charge nurse. The charge nurse staff then seeks to fill this request through various staffing resources.

In contrast, fall safety is a more clearly defined process for both units. Staff conduct prescribed fall safety assessments in accordance with LH policy. The organization leverages the electronic medical record (EMR) to monitor practice compliance and to provide reminders and alerts to frontline staff. Though not a force function, ignoring the requirement to complete a fall safety assessment is not done by accident. Once the assessment is complete, staff implement fall safety measures according to policy and document their efforts within the standard of care (SOC) of the patient record. Again leveraging the functionality of the EMR, this SOC populates specific fall prevention efforts for the duration of the patient admission. Additional fall measures are implemented at the discretion of staff as informed by the nursing process.

As presented in Appendix H, in understanding the different processes involved in sitter decisions and fall safety efforts the project leader worked with frontline staff and management teams in the development of this quality improvement initiative. Teams participated in an assessment of proposed interventions prior to implementation. Changes to timelines and educational initiatives were proposed and incorporated into the project. As previously described, both participating units shared a history of evaluating their work processes and implementing change to improve patient care outcomes. When conducting interviews, staff from both

departments shared comments about effective change management within their respective units. The more successful efforts were those that approached fall safety as a team effort.

A particularly effective method is the coordination of charge nurse leadership and Shared Governance councils. The project lead was advised by many stakeholders to use these unit level groups in order to engage staff leaders. This approach provides for the simultaneous development of specific project initiatives and the necessary processes to implement and sustain such efforts. The project leader thus worked with each department through these entities because the frontline teams understood these structures to support a team approach to clinical quality improvement.

Preliminary education process.

A request to the organization's vendor partners identified a potential new vendor to collaborate with regarding patient safety supplies. While an incumbent vendor was available, the new vendor provided enhanced product and education support as well as a broader variety of patient safety supplies. Working with the organization's Supply Chain Management department, it was determined this potential new vendor presented an opportunity for a supply cost reduction. A contract was then negotiated with the vendor to secure their collaboration with this sitter reduction and fall prevention QI project.

A series of phone conferences with the product vendor sales and clinical team, unit champions, Clinical Practice Support (CPS), and the product lead outlined the product evaluation strategy. Two weeks of onsite education for departmental staff preceded implementation of the product evaluation project. This education included specific instruction from the vendor on use of the various patient safety tools to be used with this quality improvement initiative. Further materials were developed in collaboration with the project lead and CPS as additional fall safety

and prevention education for unit staff. The educational tool developed is provided in Appendix I. This handout outlined the nursing process as applied to fall prevention and was used to raise awareness on the active and leading role of the RN with preventing patient falls. Additional education was provided regarding the critical role of proactive rounding as a means of reducing reliance upon patient care sitters for fall safety. This tool was reviewed with unit champions and shared with department staff prior to the launch of the QI project.

Intended change.

The goal for each department was to reduce utilization of continuous patient observation while simultaneously reducing each unit's rate of falls and falls with injuries. These goals were to be achieved through application of a new and expanded formulary of patient safety products as well as education on fall prevention best practices. The change for the system would include a conversion of current patient safety products to those used in the improvement project. The decision for the conversion was based upon project outcomes and performance of the products as evaluated by front-line staff participating in the evaluation. In alignment with the PDSA improvement project model, the implementation units provided on-going assessment and feedback throughout the duration of this initiative. This continuous quality improvement model enabled the project leader to adapt the project's interventions as necessary to address identified concerns and leverage developing opportunities.

Site leadership.

Unit level leadership within the units was provided by designated Nurse Manager and Assistant Nurse Manager personnel. Working with the project leader, these individuals assisted in project implementation by coordinating necessary education schedules, estimating product utilization requirements, and providing on-going support to front line staff. Unit leadership for

the project provided the critical function of problem identification and communication to the project leader. In addition, unit leaders were active partners in the project and served to communicate messages among their teams in support of the initiative. These efforts helped to maintain staff engagement with the project.

Prior system change.

Several projects related to fall prevention had been implemented within the organization prior to this initiative. These strategies primarily involved changes to policy statements, educational initiatives, and documentation practices. As it pertains to policy, the units understand they are accountable to the practices outlined by the organization's standards of care. However, as noted previously the implementation of these practices is inconsistent. As the organization is fully deployed on an electronic medical record (EMR), tracking compliance with documentation requirements is a matter of automated auditing processes. These audits are conducted by the organization's Quality Assurance Department and the results are shared with frontline management teams. Thus, changes to documentation requirements are easily standardized across the system. Each unit must comply with these system requirements as there is no provision for unique documentation practices within the EMR.

Cost benefit analysis.

A summary of the costs for the 60-day implementation of this QI project is described in Appendix J. The costs associated with staff training and project time were based upon vendor recommendations for education, department review, and operational budgets to determine rates of pay. Successful negotiations secured the patient safety supplies used for the evaluation through a no charge agreement reached with that supplier. This is standard practice for new product assessment and aligns with the organization's approach toward new supply evaluation

and introduction trials. However, for purposes of future scaling of the project, product pricing is included in the financial analysis to reflect the anticipated true cost of conversion and implementation. In this case a 20% cost savings was negotiated with the vendor if the organization adopted the product line and implemented a system-wide conversion to the vendor's patient safety supplies. The variable for sitter reduction costs were determined by dividing FY16 utilization hours into average monthly usage rates for each department participating in the program pilot. Applying the target of a 50% reduction in sitter utilization for both units, this initial implementation was expected to achieve a total reduction of 697 hours. As demonstrated by Appendix J, the project would thus produce a net operational cost savings of $9,704 over the course of this 60-day implementation.

The intent of the QI project was to demonstrate the effectiveness of a sitter reduction initiative; however, the goal of the program was to produce substantial sitter reductions across the organization. To project the financial impact of a system-wide deployment of this initiative, a five year proforma of the project is provided in Appendix K. The proforma is based upon five targeted medical and telemetry acute care units. The 3.60 FTE savings achieved by the program reflects a 50% reduction in the FY16 rate of sitter utilization (Appendix A) for these units. Salary assumptions are based upon the current rate of pay for a patient care sitter within the organization inclusive of an applicable shift differential as well as 2.75% in annual salary inflation. Using the FTE reduction and hourly rate of pay for sitters generates the salary savings reported in the proforma.

An analysis of pricing indicates a conversion to the new patient safety supply vendor will contribute $32,000 annually in direct cost reduction. This direct cost savings is achieved through enhanced pricing offered by the vendor over the organization's existing contracts. The vendor

will introduce a few new safety products as well for which there is no current budget; however, the 20% cost reduction achieved in the conversion takes usage of these new supplies into consideration. Assuming a 50% reduction in FY16 sitter utilization, the program will produce a positive net cash contribution of $152,685 in year one and $851,896 over five years. The net contribution is the sum of all savings achieved, in this case reductions in sitter and supply costs, minus the expenses used to achieve these savings. As there are few expenses associated with the project and successful implementation directly reduces expensive and non-productive patient care sitter FTE, the initiative stands to produce substantial savings for the organization.

Communication plan.

The implementation of this program required engagement with three levels of stakeholder concerns. These perspectives included front line personnel, department managers, and executive leadership. A comparison of these stakeholder groups and their relative interests, needs, and communication risks are provided in Appendix L. At the frontline level is a constituency that needed to be included in the development and practical deployment of the program. Their primary interest was the implementation details of what was being deployed and how it would directly impact personal workflow. The management level of interest revolved around deployment of the initiative, how the project would be managed, what were the training requirements, and how the program would achieve stated goals. The executive level of concern centered upon the project's development, total resource utilization, implementation timelines, goal outcomes, and how the program specifically aligned with organizational strategic priorities.

The message map provided in Appendix M stratifies these interests and how communication of the program was coordinated among the various stakeholders. Understanding the perspectives of the identified stakeholder groups helped inform a

communication strategy that maintained message alignment throughout the organization. Extending the logic of the message map enabled development of specific messages and delivery channels targeted to the needs of program constituents. The message details provided in Appendix M demonstrate how the communication strategy addressed identified areas of concern for each stakeholder team, yet maintained alignment with the core message. While each group may have had a different perspective on the proposed program, success of the project relied upon successfully engaging all interests. Actively segmenting these concerns and delivering key messages through appropriate communication channels helped achieve this goal.

Implementation of the Project

The project was implemented on 2 adult acute care units with the organization. As describe previously the units were identified for inclusion based upon their high rate of increased sitter utilization compared to like units within the organization. Upon identification of the participating units, hospital and department leadership were approached and asked for their willingness to participate with the initiatives. Once participation was secured, planning began for project implementation.

A summary of the interventions deployed with this initiative are outlined in Appendix N. Recognizing the rationale behind sitter utilization and the need to effectively address these concerns, this QI project provided revised practice recommendations based on current evidence and top performers in the organization. Particular best practices identified by the gap analysis included an active fall safety huddle at the beginning of each shift that identifies all high risk patients and the current efforts employed to maintain their safety. Another high yield intervention is inclusion of a scripted safety education discussion with patients during bedside shift report. While other practices produce strong results, these two efforts appear to work

consistently within the organization wherever they are employed. As further described in Appendix N, the program included provision of a new formulary of patient safety equipment for staff. This new vendor provided an expanded set of tools and resources staff can utilize in managing patient safety in lieu of continuous observation. Particularly notable was the inclusion of a patient body belt. This non-restraint device is designed to remind patients to call for help when assistance is required as opposed to impulsively exiting the chair or bed. The tool is easily removable by the patient; however, the time delay and tactile action required provide an opportunity to identify patient egress movements and to remind the patient to call for assistance.

Detailed operations plan.

Overall project implementation is outlined by the work break down structure (WBS) provided in Appendix O. As provided in the WBS, the initial 60-day implementation contained several deliverables and was designed to serve as a template for broader deployment. This QI project required collaboration with several existing organizational structures. Acquisition of new products involved both clinical and supply chain departments. Efforts to develop staff directed interventions required collaboration with the Falls Committee as well as Clinical Practice Support (CPS). Both of the program initiatives, practice improvement and patient safety equipment evaluation, required various staff training and communication. The CPS department is charged with the oversight of all staff education efforts and therefore training was coordinated with this team.

The patient supply vendor provided direct support for their portion of the initiative. This support included coordination of identified training, onsite assistance during the first days of implementation, and provision of a 24-hour customer service contact. The vendor was to reduce onsite presence to an “as needed” basis in an agreed upon timeline among the vendor,

participating units, and the project leader. In the case for both departments onsite support was discontinued within five business days of the start date of the program. From that point forward the vendor conducted weekly check-ins with the evaluation units. The project leader continued to serve as a resource to unit managers, champions, and staff throughout the implementation and evaluation period.

Project roles.

The roles involved with implementing and managing the project are described in Appendix P. The detailed functions described in Appendix P extend directly from the primary deliverables identified in the WBS. Each deliverable was assigned a leader or leadership team accountable to the implementation of all tasks associated with their function. While the DNP student assumed leadership among several areas, he was not the leader across all individual functions. This required the student to navigate between leadership and support roles among various tasks while maintaining overall leadership of the project.

A particular issue was the need to coordinate and maintain the interconnected timelines associated with the evaluation. For example, while not leading the contract negotiations with the vendor, the student collaborated with Supply Chain Management throughout this phase to assure negotiations were completed in sufficient time to assure availability of new supplies in time for the launch of the initiative. A failure to meet this timeline could have resulted in project delays or implementation without sufficient training that could have compromised patient safety. It was a critical function of the project leader to coordinate timelines of all deliverables associated with this QI implementation. No function of the project was completed in isolation of supporting roles, further underpinning the multidisciplinary collaboration required in the development, execution, and evaluation of this quality improvement effort.

Planning the Study of the Intervention

The effectiveness of project implementation was managed through a process of frequent communication with the participants. These communications were implemented to maintain continuous contact among disparately located operational teams and the project lead. The project leader initially conducted weekly conversations with the planning team to clarify expectations, identify process gaps, and implement identified corrective actions. This process continued through the first three weeks of implementation and then shifted to an every other week schedule. In this manner the team was able to quickly identify knowledge gaps and improvement opportunities. A summary of the issues identified and resolved through this process are provided in Appendix Q.

As an example, standard documentation within the organization's EMR on use of the patient body belt was resolved across both units on the same day a staff member identified a concern. A series of screen shots and reference to applicable policies was developed by the project lead, CPS, unit champions and distributed to unit staff within 4 hours of the initial inquiry. Similarly, a supplier compatibility issue with nurse call systems was resolved for both units on the same day the product concern was identified. This issue involved the availability of the correct type and quantity of nurse call adapter cables for both units. The concern was brought to the attention of the vendor and a supply of new cables, one for every chair alarm used in the trial, was delivered by the end of the business day.

The educational and supply components of this initiative were intended to provide staff with additional means of reducing both sitter usage and rate of patient falls. The education of staff was aimed at increasing their awareness of patient safety concerns and enhance their understanding of existing best practices and improve confidence in using non-sitter interventions

to prevent falls. The supply elements of the initiative were presented to staff as an alternative to patient care sitters and were intended to expand the safety tools and options available to staff. Combining the educational and supply elements of this initiative aimed to provide staff with knowledge and tools necessary to supplant their use of patient care sitters in preventing fall events.

Project timeline.

The timeline for the project work is provided in detail by the Project Gantt Chart found in Appendix R. In anticipation of project prospectus approval, work had already begun in generating support and interest with the initiative. This effort focused upon garnering executive backing for the project in addition to wide stakeholder support. In keeping with the Iowa Model, this initial work with executives is critical to establish the project as a priority initiative for the organization so as to obtain access to limited resources. Working with stakeholders serves to identify knowledge and problem triggers with current practice and to stimulate the organization toward clinical change.

Upon establishing a sense of priority with the project, the next phase in the work involved completion of the gap analysis and the development of specific quality improvement initiatives. This work extended directly from the gap analysis and focused upon addressing identified concerns with current clinical practice. The specific project elements were developed in collaboration with frontline staff and our CPS team members. Working with the identified evaluation teams, the final project was revised and presented to both the GSMC and MHMC leadership team for their approval. The final version of the project, including targeted goals and anticipated budget impact was presented to our system Falls Committee and Senior Operations Council for approval.

Targeting a project go-live date of 7/1/2016, the project lead facilitated completion of the evaluation contract with our product supplier by June 1st. Doing so enabled the Supply Chain Management team to arrange necessary supply logistics as well as provide sufficient time to conduct staff training on the new products. Simultaneous to this effort the project leader completed the department education on practice and policy regarding sitter utilization and patient fall prevention.

It is the experience of the project lead that all such education and training should be timed to occur immediately before the launch of a new initiative. Training that occurs too distant from the start date of a project, early or late, is a barrier to successful project implementation. Conclusion of necessary training should coincide with the start of the initiative. The project lead assured all education was timed appropriately and scheduled to lead directly into the launch of the new program. Following the launch of this QI project, the project lead implemented a series of check-in processes and communication to address any concerns. As previously described and detailed in Appendix Q, several issues were identified through this process. Effective and responsive communication channels enabled rapid problem solving and implementation of appropriate corrective actions.

A critical project date was planned for August 15 regarding a possible extension of the project through the month of September. The concept of extending the initiative was inserted into the planning as a possible mitigation strategy for unknown disruptions to the project. All stakeholders agreed that it was necessary to have some planning in place should it be necessary to extend the project in order to complete a sufficient clinical evaluation of the initiative. During the course of the 60-day implementation no such disruption occurred. A brief phone conference was held on August 15 between the project leader, unit champions and managers, and the vendor

who all agreed the project had not been disrupted. Therefore, the team decided to conclude the evaluation phase of the project as planned on August 31st. Following conclusion of the initiative, the project lead gathered outcome data and assembled the final project report details. The outcomes were reviewed with the implementation units, the Falls Committee, Nurse Executive Council, and the SVP Operations Council as these entities are critical stakeholders and are directly involved in decision making about future deployment of this QI project.

Local change processes.

Leading the project remotely emphasized the need for clear communication among frontline staff, project expectations, and managing the change process. The project relied heavily upon local unit champions and management teams to facilitate this communication. In this manner the project leader worked extensively with site champions and managers to assure all practice expectations of the initiative were well understood. The project leader collaborated with CPS on all formal communications regarding the project's practice elements that were in turn provided to the site champions and managers. These site leaders were responsible for forwarding messaging to staff through the communication channels established and preferred by each unit. In this fashion communication was provided in a unit-specific manner from the management team and not in a top-down method as may have been the case had the project leader assumed this function. Frontline staff concerns and questions were thus addressed immediately by the local management team. Those questions that could not be resolved were brought forward to the project leader.

Implementation of the project initiatives were hard-wired into work flow processes wherever possible. This proved most practical in regards to the patient safety products employed with the evaluation. All existing patient safety products from the current vendor were

sequestered away from both participation units and replaced with the evaluation vendor's supplies. Where it made logistical sense, products were supplied directly into each patient care room so as to be readily available when needed by staff. This worked well for the durable chair alarm devices that could be sanitized and used on multiple patients.

As it pertains to the implementation of clinical practice change following the education initiative, compliance was not formally tracked. Rather, the approach implemented was a series of regular reminders provided through the site champion and manager teams. These reminders included messaging during staff huddles, posting of education materials, and a review at staff meetings. Though the project leader made inquiries to the site teams, no reports came back identifying a lack in understanding of the concepts provided by the education sessions and materials. However, it is stressed that both departments promoted a strong sense of safety commitment among their frontline staff members. As previously discussed, both teams understood patient harm events as avoidable situations and shared a history of implementing local improvement efforts to reduce these occurrences. The project efforts benefitted from these strong, quality minded cultures that demonstrated receptiveness to applying new concepts and tools to promoting patient safety.

Methods of Evaluation

SWOT analysis of current state.

Though the project garnered significant interest among executives within the organization, implementation of this QI project was met with several notable barriers. Among these were resistance to change, enculturated expectation on the use of sitters, and competition for resources necessary for program development. A SWOT analysis (Appendix S) was derived from the project gap analysis work to discern current state and identify barriers to

implementation particular to this project and target organization. The SWOT specified concerns that needed to be addressed, most notably the cultural presumption of staff that sitters should be used to prevent patient falls. Equally concerning was the perspective that strategies to replace sitters necessarily translate into increased workload burden for front line staff. Any effort to change practice that does not appreciate the influence of these realities would likely fail. The SWOT also identified strengths and opportunities that were leveraged to the advantage of program implementation and the project leader.

A key strength to the program was the support of senior leadership who provided access to resources and helped raise the profile and priority of this project. As detailed by the aforementioned Iowa Model, securing executive leadership who can convey a sense of organizational priority to the program was crucial for project success. By publically supporting and promoting this effort, the executive champion provided the program with a connection to positive leadership influences regardless of implementation site. Utilizing the knowledge gained from the SWOT analysis effort, the project leader was able to implement necessary mitigation strategies regarding weaknesses and threats while leveraging identified project strengths and opportunities. A summary account of this work is provided in the SWOT Resolution Plan (Appendix T).

Measurement integrity and definition.

The success of the program was evaluated on the basis of four outcome metrics: sitter utilization in hours, rate of patient falls, rate of patient falls with injury, and net program cost. Each of the first three measured outcomes was compared to historical baseline performance as these metrics are currently tracked by the organization. Each outcome has a collection and validation methodology in place from the organization, particularly important given the varying

definitions that could be applied to sitter, fall event, and fall injury. Evaluation of the program utilized the target organization's current definition for these variables enabling a direct comparison to historical performance. Thus, the assessment of the program was conducted in metric terms already understood and utilized within the organization's quality improvement framework. Within the organization's policies and procedures, these terms are defined as:

- Patient sitter is any job class assigned to the direct and constant observation of a patient.
- Sitter utilization is the number of hours recorded by the organization's staffing office in which personnel are assigned to the role of patient sitter.
- Fall event is an unplanned, assisted or unassisted decent to the floor by a patient. All such events, regardless of level of harm or injury to the patient are to be recorded in the organization's incident report system.
- Fall rate is the number of documented fall events per 1,000 patient days.
- Fall injury is diagnosed as a moderate (sprain, deep laceration) or severe (fracture, change in mental status) harm or death resulting from a fall event.
- Fall injury rate is the number of qualifying fall injury events per 1,000 patient days.

Operational measurement.

The target organization currently collects incident information on all patient fall events. While constrained by staff compliance with data entry, the format utilized by the organization provides for a consistent collection of variables for each documented fall. For purposes of this QI program the key variables of site, unit type, and documentation of reportable injury are available for each fall event. Each of these variables are force function elements of the

organization's reporting software and thus must be answered by the reporting staff member. For purposes of the fall information required to track outcomes for this project, none is collected in a default manner. Aggregated fall data was incorporated into census statistics from the organization's financial reporting system to derive the outcome metrics of rate of falls and rate of falls with injury. The program observed the standard rate of event per 1,000 patient days as is used in current evidence on fall reporting.

The metric for net program cost outcome was the difference calculated for the program's initial and on-going costs minus dollars saved by reducing usage of sitter hours. It is notable that the organization does not include cost avoidance in the formal process of project budgeting. This decision by the organization's financial team is based upon the assertion such savings cannot be directly reflected in operational budgets, as opposed to a decrease in use of sitters that can be removed from the budget via a reduction in FTE hours for the associated job codes. Therefore, a formal calculation of dollars saved from avoided costs realized through the reduction in patient harm from falls was not included in the net program cost metric. However, patient safety is a corner stone effort of the project. A recent review estimates the current cost of care for moderate to severe patient fall injuries to be between $15,444 and $30,931 per event (Spetz, Brown, & Adin, 2015).

Budgetary return on investment.

The final version of the planned intervention required few financial resources in comparison to the potential savings offered. As described previously, the supply savings offered $32,000 per year. However, the more significant savings stems from the 50% reduction in non-psychiatric patient care sitter hours targeted by the project. If this goal were achieved, the annual savings among the organization's adult acute care units would exceed $130,000. As reported

previously in the 60-Day Evaluation Budget (Appendix J), the one cost associated with project implementation was training time for staff. This amounted to a cost of $4,200 to train the 120 frontline FTE involved with the project. The project leader made use of the train the trainer concept and worked with unit champions to hone a clear and concise educational message for all staff involved. As part of the product evaluation portion of the initiative, the project leader worked with the vendor to secure two weeks of vendor-provided education in support of the evaluation products and their application in fall prevention. As described previously, several on-site resources and check-in sessions were organized for the initial weeks following the launch of the initiative. This provided additional just in time training for staff and reinforced prior education efforts. In this manner the overall resources required for training, deployment, and utilization of the initiative's policy concepts, fall prevention strategies, and new patient safety supplies was kept to a minimum.

As reported in Appendix J, the project used the contracted pricing for the vendor products to derive the dollars savings of 20% that would be realized across all units should the organization convert to these new products. Based on historical product run rates for both evaluation sites, the 60-day savings would result in an $800 reduction in operational costs. Presuming the 50% reduction in sitters is achieved, the departments would realize a total of $13,104 in labor cost savings. Given that the initial cost of deployment was constrained to $4,200 in training costs, as outlined in Appendix J the evaluation was expected to achieve a savings of $9,704 within the 60-day trial period. In that the break-even point was expected to be achieved in a mere 26 days, further return on investment analysis would appear unnecessary.

Analysis

Quantitative methodology.

The targeted outcomes for this QI project are direct measurements pulled from the organization's data collection systems. The outcomes assessed were the measured differences in hours of patient care sitters utilized, recorded falls per 1,000 patient days, and fall injuries incurred per 1,000 patient days between the evaluation period and the preceding fiscal year baseline. All these measures are numerically quantifiable and thus amenable to qualitative analysis. As the rate of sitter utilization and fall events naturally varies, it was anticipated that a difference in outcomes would be observed across the target units involved in the initiative as well as the comparative adult acute care units. With a difference expected, a statistical analysis was employed to ascertain probability that any change was significant or possibly random.

Critical to the interpretation of the project was a probability analysis of the measured differences in outcomes for the target metrics. Given the binomial nature of the outcomes as a difference in a single measurement between baseline and evaluation, a simple p value analysis was conducted. The use of this statistic served to understand the probability, or statistical likelihood that the observed measurements were the result of a change in the system or random chance. The value of $p < 0.1$ was set as the determination that an outcome was statistically significant. Though research efforts typically set $p < 0.05$ for such an analysis, the value of 0.1 is not uncommon. Particularly as it pertains to a quality improvement initiative where robust management of confounding variables and influences are less important than an assessment of the operational effectiveness in translating best evidence into practice, a wider interpretation of statistical significance appeared warranted.

Probability using Excel.

The probability assessment was conducted using Microsoft Excel 2013. The functionality of Excel enabled direct analysis of spreadsheet data to determine data set averages,

variability, and t distributions. Understanding that the change could be an increase or decrease in the mean, a 2-tailed t test was employed with each analysis. A demonstration of how Excel was used to conduct these calculations is provided in Appendix U. Though outcomes of the project will be discussed in detail in the Results section of this report, the example calculations in Appendix U are based upon actual fall rate data derived from this quality improvement initiative. The multi-step calculations used embedded Excel formula functions that enabled subsequent arithmetic analysis to determine the probability statistic for each data set.

System stability.

Though probability analysis was important in determining the significance in observed outcomes, such reviews provide a partial picture. Whether a system is stable or in a state of variation could obscure or highlight the effect of the project. To more clearly understand the impact of this QI project, an assessment of system stability was necessary. Control chart analysis is particularly useful when considering time series data as is the case with this project where outcomes are measured over time and performance can be assessed on a monthly basis.

To perform this analysis, control charts were constructed for target and comparative units that were inclusive of both baseline and evaluation data. Control chart analysis examines the trends in data over time to discern if the average outcome observed is stable or changing. This assessment is conducted by looking for consecutive runs of data points relative to prior performance, the average, and statistical control limits (Sylvia & Terhaar, 2014). A system under stable conditions is considered to be unchanging despite some variation in measured outcomes. In this manner the average outcome is observed to be stable and predictable over time. Thus, the impact of this project to produce a change within the system can be directly observed through the chart analysis. The same principles of chart analysis can be used to

identify systems that are unstable. These conditions are understood to reflect a changing process that impacts the average measured outcome of the system. This change can lead to either an improvement or degradation of outcomes. A chart analysis can reveal if prior modifications to the system preceded this QI project and has a direct impact on how results are interpreted.

Results

Program Evaluation and Outcomes

Performance data for each targeted metric was collected for the implementation units at GSMC and MHMC. These outcomes were assessed for both units to determine the impact of this QI project within these clinical care settings. Similar data was simultaneously collected among the organization's other adult acute care units not involved with this initial implementation. The same outcome metrics were assessed to monitor performance in clinical environments that did not participate with the initiative. In this fashion a direct comparison could be constructed between those departments involved in the initial implementation of this QI project and those that were not.

As previously described, all elements of the QI project proceeded on each evaluation unit without interruption. Because the project plan included pre-launch education by unit champions, supported by materials produced by the project leader, the requisite clinical education and training proceeded without difficulty before the implementation of the project. No pre and post education comparative analysis was conducted with staff; however, a clinical evaluation tool was used by the project leader to discern basic staff perspective on their preparation for implementation of the QI project. This methodology is consistent with the project leader's role within Value Analysis and how the organization conducts product evaluation assessments. The evaluation tool was sent out to staff at mid-cycle of the evaluation timeline to allow team

members to acclimate to the different elements of the initiative. The survey returned 74 staff responses and from these results 8 respondents answered that the pre-launch education was insufficient for this initiative. Just over 75% of staff agreed or strongly agreed that the provided safety products were effective in helping keep their patients safe. Because of the collaborative effort of the project team, staff was well informed with how to resolve issues that arose and had confidence in their efforts to improve overall patient safety. The combination of these factors and strong on-site support from unit champions served to maintain consistency in practice throughout the implementation phase of the QI project.

Patient care sitter outcomes.

The initial catalyst for this project was the organization's growing interest in reducing its utilization of non-psychiatric patient care sitter hours used to prevent patient falls. As described previously, the organization has experienced a significant increase in the number of hours used for patient care sitters without any decrease to the measured rate of falls. This project was tasked with addressing this issue.

Appendix V presents the outcomes of this QI project on the utilization of non-psychiatric patient care sitters by the MHMC and GSMC implementation units. The data was collected from July 1st through August 31st, 2016 and then annualized in order to compare to the baseline data from FY16. As recorded in Appendix V, during this initial implementation the MHMC and GSMC units reduced their use of patient care sitters by 32.8% ($p = 0.83$) and 57.9% ($p = 0.93$) respectively. Combining the performance of these two departments, the target units participating in the QI project reduced their overall utilization of patient care sitters by 46% ($p = 0.96$). Unfortunately, due to high variability associated with sitter utilization these results were not statistically significant. However, the results need to be taken in context with the patient care

units that were not involved with the initial implementation of this QI project and continued to use existing practices and procedures in managing patient safety.

As described previously, the organization has increased its use of patient care sitters by 300% over the preceding few years. This seemingly unchecked trend was observed to continue among the non-participating units that reported a 101.9% ($p = 0.23$) annualized increase in sitter hours during the implementation phase of this QI project. Though again due to high variability in the usage of patient care sitters, this finding did not prove to be statistically significant. However, of the 4 statistically significant findings observed, all occurred within non-participating units and all involved an increase in sitter utilization. These units spanned across all unit types including GSMC Surgical (increase 360.2%, $p = 0.03$), Emanuel Medical (increase 175.8%, $p = 0.01$)), GSMC Medical (increase 491.8%, $p < 0.001$), and Salmon Creek Telemetry (increase 110.3%, $p = 0.1$). In total these 4 units increased their sitter hour utilization by 13,352 compared to their baseline; this is a 197% increase for the year.

Fall rate outcomes.

As previously described, the concerns relating to patient care sitter hours and fall events were not considered mutually exclusive issues by the project leader. Any effort to reduce sitter hour utilization could not come at the expense of increased harm to patients. As detailed in the literature review of this project, current evidence consistently reports that sitters do not improve fall rates and multiple examples are available describing how organizations have successfully reduced their use of sitters without an increase in patient harm events. Appendix W details the patient fall event outcomes for this QI project. The results presented cover the same timeframe as the sitter outcomes previously described and are similarly annualized to provide a comparison

to FY16 baseline data. The two metrics reported for fall events include the number of falls per 1,000 patient days and the aggregate number of fall events with injury.

For the implementation units at MHMC and GSMC, a small and statistically insignificant increase in the rate of patient falls was observed for both units. The unit at MHMC measured an increase of 0.21 falls/1,000 patient days ($p = 0.41$) while the trial department at GSMC showed an increase of 0.33 falls/1,000 patient days (0.45) compared to baseline performance. Collectively the two units observed an increase of 0.27 falls/1,000 patient days ($p = 0.42$) which tracked in parallel with the increase measured among the acute care units not involved with the initial implementation of this QI project (increase 0.30 fall/1,000 patient days, $p = 0.43$). Again, these results were not evaluated to be statistically significant. The one significant result observed in the rate of falls occurred with the Emanuel Medical unit that saw a 106.7% increase ($p = 0.02$) in falls compared to FY16 baseline performance. The lack of statistical significance is likely due to the low event rates reported across the organization. As detailed in Appendix B, the organization's acute care departments compare well with national benchmarks for patient fall rates. For this QI project the annualized data showed that the adoption of alternatives to patient care sitter did not have an adverse effect on the rate of patient fall events.

Fall injury outcomes.

The assessment of fall events with injury was not analyzed for statistical significance due to the extreme infrequency of such events. With an aggregate number of 27 occurrences in 136,168 patient days in FY16 and the scant rate of 0.02 fall injuries per 1,000 patient days, it is inappropriate to annualize 2 months of data to construct a comparison. The system as a whole observed 1 fall with injury during the implementation phase and this occurred on a unit not participating with this QI project. Thus, while the implementation units at MHMC and GSMC

did not observe a fall with injury during the trial period, the project leader did not annualize this outcome to 0 such events per year and compare it to the 8 total events recorded by these units in FY16. Though the initial implementation results are optimistic, a longer duration in the application of this QI project is necessary before a trend can be statically identified.

Labor savings achieved.

While not quite achieving the target goal of 50%, the units implementing this QI project reduced their cumulative sitter utilization by 46%, which stands in stark contrast to the substantial increase in usage monitored across the rest of the organization. Using the current wage rate of $18.80, the target units produced an annualized savings of $72,324 compared to a total cost increase of $232,180 observed across the non-participating units.

Discussion

Summary

In the final assessment of this QI project, the initiative as whole can be considered a qualified success. Though the target goals described in the AIM statement were not achieved, the outcomes produced were significant particularly as it pertains to the project's impact on sitter utilization. Taken in context with the performance among the organization's adult care units that were not involved with this initial implementation, the departments at MHMC and GSMC achieved a remarkable reduction in non-psychiatric patient care sitter hours. While not statistically significant, the 46% decrease by MHMC and GSMC stands in stark contrast to the 300% increase observed by the organization in recent years. The outcomes are more remarkable when considered against the 102% increase observed among those units not involved with the initial launch of this QI project. While not reducing the rate of patient fall events as initially intended, the implementation units deployed an initiative designed to reduce reliance on patient

care sitters and did so without a negative impact on their observed rate of patient falls. In a healthcare market increasingly concerned with prudent management of financial resources, these results provide leaders a framework for reversing the organization's rapidly increasing and expensive trend of using patient care sitters to prevent patient harm. The efforts of this QI project achieved substantial cost savings while maintaining current quality related to fall events. Performance evaluation will continue as the project elements become more embedded within the organization to determine if the original targeted outcomes can be achieved.

Key findings.

A key finding with the project was the lack of statistical significance to the substantial reduction in sitter hours resulting from the project implementation at MHMC and GSMC. From a mathematical perspective, the rates of utilization for these departments and across the organization are highly variable. As shown in the control charts provided by Appendix X, the high variability produces significant upper and lower control limits regarding sitter utilization. A control chart for the initial implementation units is provided in Table 1 and a comparable chart for LH's other acute care units is available in Table 2 of Appendix X. Chart analysis for both groups shows that the systems are in control with respect to utilization of patient care sitter hours.

However, wide variations in usage are apparent as evidenced by the large delta between upper and lower control limits. The increasing range of data requires a larger change in the average to discern statistical significance. The range for the implementation units spanned from 0 to 1,300 hours per month, thus, because of the high variability relative to the outcome the 46% reduction for these units did not achieve statistical significance.

A similar logic extends to those units not involved with the initial deployment of this QI project where the more than doubled rate of sitter usage did not achieve statistical significance. However, an examination of the control chart for GSMC and MHMC shows that the 60-day implementation of this QI project is extending a notable downward trend in sitter utilization. This trend, highlighted in red, includes measurement 13 and 14, which correspond to the two months of data associated with this quality improvement initiative.

The evolving trend within these units demonstrates that while the system was previously unchanged and stable, this QI project may have induced a change contrary to prior trends. The run of 4 consecutive data points below the mean does not yet indicate the system is unstable and changing; however, the recent data straddles an outcome minus 1 standard deviation (sd) from the mean with the last result of the trial well beyond -1sd. The principles of chart analysis state that a run inclusive of 4 out of 5 data points more than 1sd from the mean indicates an unstable and changing system (Sylvia & Terhaar, 2014). The trend observed is not yet conclusive; however, near term results are promising. Particularly as compared to Table 2 where the system is clearly stable with a predictable ebb and flow performance that continues to push the average number of sitter hours used ever higher.

A review of the fall rate control charts reveals similarly stable systems. These charts provided in Appendix Y show that neither the implementation units at GSMC and MHMC nor the organization's other acute care departments incurred a demonstrable change. This conclusion is supported by the lack of any unstable runs detected through the control charts (Sylvia & Terhaar, 2014). The chart for the initial implementation units provided by Table 1 reveal a consistently stable system. Though several measurements occur outside of 1 sd from the average, no runs are sufficiently long to signal a change within the system (Sylvia & Terhaar,

2014). There is a single data point 1 on Table 2 for the organization's other acute care units that reveals a special cause event where a finding occurred outside of the established lower control limit (Sylvia & Terhaar, 2014). It is assessed that this point was an anomalous event as subsequent data points return to the mean and consistently remain within a 1sd of the established average.

The use of the control charts is a meaningful exercise in understanding the results of this QI project. First, because the organization is constantly pursuing improvements to its patient fall rates it was important to understand if any of these efforts were changing the system. If a change in fall rates occurred in response to an antecedent project, this reality would inform the interpretation of the results of this quality improvement initiative. As revealed by the control charts, no prior change in the system was apparent. Second, understanding that the systems are stable enables the opportunity to isolate this initiative and look for signals that the project has induced a change. A strong sitter reduction result is apparent among the units involved in the initial implementation of this QI project that runs contrary to the stable increase observed among other acute care departments.

Important lessons.

A variety of lessons were learned from this QI project. Critical was the use of the Iowa Model as a framework for translating evidence into practice within the organization. As healthcare organizations are exceedingly complex entities, attempting to implement change necessarily competes with a wide variety of other quality improvement opportunities the organization must consider. The simple act of starting a project requires a mindful approach by the project leader to identify a need within the organization based on available outcome data or an observable knowledge deficit. By itself this starting point is insufficient as the project has not

distinguished itself from other opportunities. The critical early step is to either discern or establish the project as a priority issue for the organization (Dang et al., 2015). If established as a priority for the organization, the project leader can then move forward with development and implementation knowing he or she has access to scarce resources and executive support.

Particularly useful for this effort was the exercise in stratifying stakeholders (Appendix L) and crafting messages based on the perceived perspectives of the project. In this manner the project leader was able to modify the message as necessary to maintain a consistent emphasis while working to build a sense of priority with the project's goals among diverse stakeholder interests. It is this author's observed experience that far too often this crucial initial discernment is dismissed and that projects fail to deliver because they do not secure appropriate support from leaders who can resolve barriers to implementation. As a consequence, much effort is expended on projects that produce little benefit because they do not take time to engage leadership and align with the priorities of the organization (Singer & Vogus, 2013).

The planning of this project included several frontline and organizational stakeholders. Within these planning efforts was development of the specific initiatives as well as an established line of communication. It was highly beneficial to the execution of the project that care was taken during the development process to detail role accountability and a specific communication plan. As a result of these efforts the evaluation teams were able to quickly communicate identified concerns directly with the person responsible for resolving the issue. As portrayed in Appendix Q, several issues did arise following implementation of the initiative. Because of the communication and role plans established during the planning phase of the project these concerns were escalated quickly and resolved promptly and without disruption to the overall initiative. This QI project ran smoothly and without incident because frontline staff

was clear about the roles of the various stakeholders. Projects without such established plans foster frustration, delays, and disruptions to results.

The value of testing a change and refining the change based on established feedback loops is central to effective translation of evidence into practice (Dang et al., 2015). This project was designed with the distinct purpose of testing changes prior to consideration of a system-wide implementation. In this manner the initiative provided the opportunity for staff to test the proposed changes and provide feedback on their effectiveness and barriers to implementation. This PDSA process requires time, perseverance, and an openness to seeking and understanding the perspective of others, particularly as it relates to the feedback of frontline staff who do the work and whose assessment of a project is crucial to success. However, one must plan effective means of collecting this feedback and creating efficient venues for busy staff to engage in this process. The communication plan, inclusion of staff in project development, and the identification of unit level champions did well to incorporate the frontline voice into this project.

Finally, it is important to understand the results achieved not so much for their statistical significance, but rather their managerial importance. Yes, it is true that no statistical conclusions can be taken directly from the project's sitter reduction results; however, from an operational point of view the outcomes cannot be dismissed. With a growing sense that the use of sitters is justified under the auspices of preventing patient harm, the organization has observed a dramatic increase in the use of non-psychiatric sitter hours in recent years to no improvement in measures of patient safety and fall prevention. With the annualized gains observed during this project, the organization will measure an increase of more than 400% compared to usage just 3 years ago. The positive outcomes realized by the implementation units run contrary to this unstainable trajectory. These two units shared a similar 3-year trend as the rest of the organization until

implementation of this QI project. Taken in context with the performance of the rest of the organization these results strongly suggest the current escalation in sitter utilization can be curtailed.

Disseminating results and sustaining gains.

The improvement in sitter usage achieved by the project will be sustained through two primary processes. First, the current project outcomes will be presented to and reviewed by organizational stakeholders and decision makers. Results will be provided to demonstrate the effectiveness of the project initiatives and to seek approval and authorization to move forward on two key decisions regarding program implementation. The first of these decisions will revolve around conversion from the organization's current patient safety supply vendor to the evaluation vendor used during the course of the project. The decision will follow established Clinical Value Analysis processes, of which the project leader is deeply familiar.

The second of these decisions is the implementation of policy changes and staff education resulting from this project. While the project did not achieve the reduction in patient falls as targeted, the fact that sitter utilization was reduced by nearly 50% without a statistically significant change in fall outcomes illustrates some effectiveness in identifying alternative strategies to continuous observation. The project leader has worked with the CPS team to revise the organization's system-wide annual education and skills training on patient fall prevention. The staff education handout provided in Appendix I is the foundation for the revision to clinical education.

The second process for sustaining change will be either a continuation of the current project or a move toward system-wide implementation. This decision will require input from the CPS department, though the change in practice will be made by the organization's Nurse

Executive Council (NEC). The project lead will provide program results and facilitate these discussions before the end of the calendar year. It is the project leader's experience that the NEC is equally likely to recommend a continuation of the current project to allow for further data collection as it is to decide for system-wide implementation. This occurs as the result of competing demands for time and resources that restrict the ability of nursing departments to take on new implementations. The NEC is keenly aware of not wanting to overload the nursing departments with a high number of project initiatives out of concern for implementation burnout and fatigue. The organization is implementing a number of high profile projects effecting nursing departments within the next few months that have pre-existing implementation deadlines due to Information Services (IS) strategic scheduling. This project, though promising, will likely wait for full implementation until early 2017.

Recognizing this possibility and the erosion such a delay could have with project engagement, the project leader will prepare a couple of solutions for sustaining the gains achieved and extending the results across the organization. First, the project can begin the product safety conversion prior to full implementation of the entire QI program. This will have the benefit of leveraging vendor resources to support some initial education initiatives while securing immediate cost savings for the organization. Second, given that the current units at MHMC and GSMC are well versed in the project and all elements of the education, training, and supplies, it seems prudent to at least continue with the project among these two departments. It will not cost the organization any additional resources and will provide for a continuation of collecting outcome data and staff feedback to further evaluate the effectiveness of the project. If the NEC raises concern as to the need to attend to other required initiatives, it appears reasonable

these two steps can be accommodated without meaningful disruption to other project schedules and with notable benefit to the organization.

Implications for Advanced Nursing Practice.

For advanced practice, the project has a few important implications. First, project consideration and development do not occur in isolation of competing interests and opportunities. With the myriad of regulatory agencies, budget concerns, and resource constraints affecting healthcare organizations, the need to accurately identify and remain focused on priority initiatives is an increasingly important strategic requirement. Failure to do so risks wasting scarce resources on projects that do not align with the organization's mission, strategic vision, and operational necessities. It is incumbent upon the advanced practice leader to discern projects based on true needs of the organization to assure resources are not wasted. Once a priority project is identified, the advance practice leader must frame the meaning of the issue in objective terms that can generate necessary executive support. Understanding that resources are limited, securing executive sponsorship provides the leader with access to time, budgets, and influence that will sustain the project over time and within the context of competing initiatives.

As it pertains to this project specifically, the issue of patient care sitters and fall prevention can be appreciated as a dull and uninteresting endeavor. Sitter utilization is a rather common place consideration and risks becoming an enculturated norm or expectation within a department, division, hospital, or system. A large portion of the burden on the advanced practice leader is to take a routine and pedestrian topic like patient care sitters and translate it into a priority concern among disparate stakeholder interests. Doing this effectively requires a convergence in understanding the clinical, ethical, operational, and financial implications of routine sitter utilization. Applying the tools and knowledge gained from an advanced practice

course of study enables the project leader to navigate these varied perspectives with confidence and clarity. Where others may view sitters with tedium and frustration, a broad understanding of the issue enables the advanced practice leader to see these challenges as opportunities. Realizing the opportunity requires the effective translation of such a trend in language and terms that hold meaning for the stakeholders involved.

The advanced practice leader must also recognize the importance of results, despite the lack of mathematical significance. Parallel to the concept to best available evidence, this project demonstrates the reality of best available outcomes. The advanced practice leader must understand the context of the results and derive meaning from outcomes that may not be as explicit as statistical significance. Working with the multifactorial concerns of patient care sitter utilization and patient safety, it is difficult to envision how competing factors and issues did not influence the outcomes of this project. Conception of a project attempting to isolate factors would be exceedingly complicated and applicable only in situations similarly tightly controlled. The advanced practice leader recognizes such limitations and endeavors a reasonable course of action to translate best evidence into current practice, despite the many challenges posed by that environment. As an end, results may not always reveal the statistical clarity one prefers. The outcomes may present the best available results and the project leader must comprehend and understand such information within the context of the environment, aim of the project, and significance to strategic goals. The outcomes of this QI project require such an interpretation.

Relation to Other Evidence

The results of this QI project parallel results published in the literature. As provided in the Evidence Synthesis Table (Appendix G), the preponderance of the published literature suggests that organizations can effectively reduce usage of patient care sitters without negatively

impacting patient fall rates. While there is not one identifiable best standard to reduce sitter utilization, a comprehensive program that supports clinician decision processes with proper education, practice changes, and safety supplies is likely to be more effectively than those efforts that focus solely upon the issue of sitter usage (Lang, 2014). This project provided staff education, practice, and products as alternative measures to the use of patient care sitters. Combining these options into a comprehensive quality improvement initiative in a fashion similar to the successful programs identified in the literature review, both GSMC and MHMC achieved results that echo the outcomes observed in the evidence.

The organization itself has taken a passive interest in sitter reduction efforts. This is not to imply sitter utilization does not pose a concern, but instead that no formal and active efforts to expressly reduce sitter usage have been enacted. However, the system has implemented several measures to increase awareness of sitter utilization as evidenced by a central mechanism for tracking and reporting sitter hours used by the organization's patient care departments. Budget reporting processes also call out the impact of sitters at the unit level, but fall short of enacting specific mitigation efforts to reduce this usage. This project stands alone as the sole initiative in recent years with the direct purpose of reducing sitter utilization. The evaluation units far outperformed the comparison units that did not participate with the initiative. Left unchecked, all other adult acute care units within the organization doubled their rate of sitter usage compared to baseline use of the prior year. By contrast, the evaluation units reduced their utilization by nearly half, a meaningful outcome the organization cannot ignore. The passive strategy of reporting on sitter utilization is ineffective at reducing such usage. This situation, commensurate with published evidence, requires the active development of alternative strategies and options as was provided by this QI project.

Change at the unit level.

Fall safety improvements cannot be achieved without frontline action. The enacting of fall prevention initiatives ultimately rests with the organization's patient care staff and the individual choices they make. Implementation of evidence-based fall prevention programs will be moot if not internalized and expressed in the daily activities of staff. Engaged teams committed to safety make daily practice of interdisciplinary collaboration, clear transition of care communication, and constant vigilance to identify and resolve safety concerns (Singer & Vogus, 2013). Fall prevention efforts include a multitude of potential interventions; however, effective translation of evidence-based strategies into practice is notoriously difficult (Tzeng, 2011).

A positive culture of safety with its commensurate commitment to the care of the patient has shown to improve the effectiveness of fall prevention implementation. While specific fall safety training and education are necessary, such measures implemented in isolation of cultivating a caring and committed attitude among staff do not produce enduring results (Tzeng, 2011). Though organizational measures of culture are important, it is the perception of frontline staff on the culture of safety that is a leading indicator of overall patient safety performance, not the reported perception of the senior leadership team. Frontline staff are more clearly aware of the safety risks facing their patients and can attest to how well the organization and its leaders appreciate and respond to these risks (Singer, Lin, Falwell, Gaba, & Baker, 2009). This reality reinforces the necessity of focusing on the actual environment of patient safety, tailoring interventions to address identified risk factors, and engaging teams as active contributors to the development and implementation of patient safety initiatives.

Barriers to Implementation/Limitations

Factors affecting results.

Many issues arising from this quality improvement effort could affect the implementation of this project to other practice environments. The project was implemented with a specific intent to reduce sitter utilization among the participating units. The initial impetus of the project came as a result of a challenge offered by the CNO and this call to a solution was repeated throughout the development and early implementation stages of the initiative. As guided by the Iowa Model, time and attention was given to generating a sense of urgency and importance to this topic. These issues were developed into a project narrative that focused upon reducing sitter utilization and doing so under the specific attention of the organization's senior leader team.

One could conceive how such preparation targeting a specific reduction in sitter utilization could influence the performance of departmental staff who were working on a highly visible and anticipated project. Critical to mitigating this concern was adherence to data collection methodologies that were consistent with the organization's existing processes. Doing so reinforced the reliability of project outcomes and enabled a direct analysis with baseline and comparative performance. Additionally, the project lead and champions attempted to maintain a sense of intellectual curiosity among frontline staff by reinforcing the evaluative nature of the work. This was accomplished by collaborating with staff in the development of the program initiatives that the frontline teams understood to be most effective in preserving patient safety. Additionally, staff were queried throughout the initiative to provide honest feedback and assist with the PDSA cycle to improve overall performance.

As noted throughout this discussion, the issue of clinical efforts to reduce patient falls is not without significant confounding variables. Any project aimed at minimizing patient fall events is restricted by the context in which it was developed, implemented, and evaluated. The project elements were developed in collaboration with frontline staff in response to a system-

wide gap analysis and designed to address those issues thought to present the best opportunity for improvement. This context specific implementation was based upon the perceived needs of this organization at the time of implementation, but the program did not reduce patient falls as intended. While the fall prevention elements of this project did not achieve the intended goal of reducing falls by 25%, the program did manage to maintain the already low fall rate despite a 46% reduction in sitter utilization among the evaluation units. Thus, the initial implementation of this QI project produced significant cost savings for the organization without any detrimental impact on patient safety.

Variation in local implementation.

As described, this QI project was implemented on two different adult acute care units with the target organization. These units were located in separate medical centers and employed different teams with different cultural norms and expectations regarding practice. Though both shared a common source of guidance from the same policy, standard of care, and practice statements, the teams were distinct entities from each other. The GSMC team had access to additional champion resources and a particularly engaged staff. This team was highly energetic and contributed throughout the development process of the project. The GSMC team maintained a frontline focus with the project as unit champions and other team members took active roles with the project. The unit manager offered guidance and access, but it was the frontline team that engaged in the development sessions, gap analysis work, and exercised the feedback loops of the PDSA cycle.

By comparison, the MHMC team did not have as much frontline staff involvement with project development. In part this is due to the highly engaged nature of the unit manager who leads both the site and system falls prevention teams. This manager was highly articulate on the

issue of patient falls and had a strong grasp on needs and issues impacting performance. The MHMC team was highly responsive during the evaluation period itself providing feedback on perceived performance and improvement opportunities.

Recognizing the differences between the teams, the project leader modified communication efforts accordingly. With the MHMC team, messages and inquires worked through the manager. For the GSMC team the project lead was able to work directly with unit champions and corresponded with several frontline staff. Over the course of the short 60-day implementation, it is difficult to discern if these differences produced a notable change in outcomes for the two participating departments. From a lesson learned perspective, it can be appreciated that program execution is subject to implementation differences based on environmental variations. The effective project leader must be observant to these contextual realities and plan appropriate mitigation. Similar to fall prevention where no single best practice fits all clinical environments, no single deployment strategy fits all implementation settings.

Measurement inaccuracy.

The project data collection and management processes were developed to mirror those procedures already in use within the organization. However, it should be acknowledged that the methods employed by the organization to capture sitter utilization and fall event data are dependent upon self-reporting systems. None of this data is automated by either the payroll system or EMR. Everything is collected from frontline staff and managers who report sitter utilization hours to the Staffing Department or record fall events in the organization's incident reporting system. It is conceivable that with such reliance upon self-reporting systems that not all relevant data was consistently collected. As a result, missing data and imprecise information is a forgone conclusion with this project. Despite the imperfections associated with such data,

the mitigation to this issue was to maintain consistency in collection methodologies. This decision elevated the importance of measurement precision over measurement accuracy. While a true value may not have been captured, because collection systems were consistent the data was directly comparable to comparator and baseline performance.

Interpretation

As previously stated and detailed in Appendices V and W, the initiative failed to achieve the three goals outlined by the project AIM statement. Though the outcomes showed a 46% reduction in sitter utilization, due to the high variability in sitter usage this finding was determined to be statistically inconclusive. The rate of patient falls recorded during the evaluation likewise did not show a significant change from baseline performance. While the count of injuries from falls did decrease appreciably, the baseline rate of 0.28 injuries per 1,000 PD requires a broader timeline for an accurate comparisons to baseline. In the end, the project implementation timeline of 60 days was insufficient to detect changes to the system. The strong baseline performance on the organization with regards to preventing patient falls indicates that few easy wins remain in terms of further reducing these rates. However, the results are promising and provide an indication to the organization of how substantive reduction in sitter utilization can proceed without risk to patient safety.

Financial implications for leaders.

The most notable finding with the project is the disparity in sitter utilization outcomes between the evaluation departments and those comparator units that were not involved in the initiative. As detailed by Appendix V, the participating units far outpaced their counterparts in relation to changes in sitter utilization over baseline performance. Over the same timeframe of this QI project where the implementation units were observed to reduce usage by 46%, the

combined performance of all other adult acute care departments across the organization recorded a 101.9% in sitter utilization. For the management and leadership of the organization, this is a result that should not go unnoticed. Tasked with the obligation to efficiently manage financial and human resources to the benefit of the patient experience, healthcare leaders need to be vigilant in their approach to removing waste and improving outcomes. Without specific intention to reduce its year over year doubling in sitter utilization, the organization will incur an ever increasing financial burden extending from the use of direct patient care observation. And while these costs continue to rise, no effective return on this investment has been realized through a reduction in patient falls.

Using annualized performance from the evaluation period the comparator units were observed to increase their year over year spend on sitters from $227,762 to $459,942. The financial burden resulting from this increasing reliance on patient care sitters will manifest itself in reduced capacity to provide investment in more beneficial patient care endeavors. By comparison, using the same methodology the evaluation units decreased spend on patient care sitters from $157,206 to $84,882. To think of this differently, as a combined acute care cluster inclusive of the comparator and evaluation departments, the MHMC and GSMC units accounted for 41% of the sitter spend incurred by the organization during the baseline year. After implementation of this QI project, MHMC and GSMC accounted for less than 16% of the dollars spent on sitters by the organization's acute care departments. The evaluation units greatly reduced their respective financial footprint on the overall costs incurred by the organization. The savings realized by MHMC and GSMC provides LH with financial flexibility to deploy resources in support of the organization's stated mission. This project provides a window into how wasteful spend on sitters could be reduced at considerable cost savings for the organization.

Implications for leading change.

The next phase of this project initiative is the previously described consideration of how the program should or should not be rolled across the organization. It is presumed the outcomes generated by this project will garner interest in extending this program to other acute care units. This project should be viewed as an evaluation of a program proposal subject to a robust PDSA process. With that in mind, subsequent revisions to the project should seek to identify knowledge and problem triggers associated with patient falls because the program as structured failed to achieve this goal (Dang et al., 2015). In this manner the next iteration of the program should include consideration of improved patient safety interventions to address the gap observed in the outcomes of this project.

Beyond seeking to improve the interventions, the consideration of a broad expansion of the program will need to leverage the results of the current project to establish additional urgency and priority with reducing the organization's utilization of patient care sitters. As outlined by the Iowa Model, this is a critical step in creating support for and generating the resources necessary to promote and sustain effective change processes (Dang et al., 2015). While support for this project was endorsed as a time-limited evaluation thus requiring less organizational urgency, expanding the program to a system-wide implementation will necessitate the initiative be viewed as a high priority concern across many additional stakeholders. As a consequence, subsequent change leadership will need to focus upon creating a diverse network of support that share the same urgency in the need for implementation of this program. While the outcomes of this project provide a strong foundation for establishing the priority associated with this initiative, this step cannot be taken for granted. The next steps in translating this program into clinical

practice across the organization require attention to the principles of effective change leadership as can be learned through an advanced practice course of study.

Understanding cause and effect.

As indicated previously, patient falls are a multifaceted issue composed of many contributory factors. This QI project sought to show that the use of patient care sitters does not improve patient fall outcomes, despite a general sense among frontline staff to the contrary. The results, though statistically limited, appear to indicate that reducing patient care sitter utilization does not result in an increased patient fall rate. Further, it can be appreciated where sitter usage increased significantly no corresponding decrease in patient fall rate was observed. Despite the dramatic divergence in sitter utilization between the evaluation units and the comparator units, both groups observed nearly identical results for patient fall outcomes. While this quality improvement initiative did not effectively intervene on those causes contributing to the organization's patient fall rate, the outcomes demonstrate that the use of patient care sitters is likewise ineffective. When sitter utilization was observed to change, no corresponding change in fall events was observed. As a result, the organization can move forward with confidence that its growing reliance upon patient care sitters to reduce fall events can be drastically reduced.

Process ownership.

A key contributor to the success of reducing sitters with this quality improvement initiative was the active engagement of frontline staff, particularly with the development and implementation of the project. Working from the assumption that the frontline is in the position to best understand workflow needs and limitations, the project leader sought to leverage this team knowledge toward the overall improvement of the program. As described throughout this work, frontline staff and unit champions were engaged all the way through the project. This

served to develop the work in light of the gaps in practice, education, and safety tools as understood by those who apply these resources in the capacity of direct patient care. The function of including staff in the development of safety processes within their own environment is a key feature in developing a climate of safety within the unit and promoting a positive culture receptive to quality improvement efforts (Singer & Vogus, 2013). Particularly as it pertains to fall safety improvement programs, a culture of safety among staff is a critical component to success (Black, Brauer, Bell, Economidis, & Haines, 2011). While adherence to established principles of leadership and change management are important in the effective translation of evidence to practice, one cannot underestimate the centrality of working with and leveraging the skill of those who implement the change at the bedside. Beyond being mutually beneficial, the relationship between the leader and the bedside in effecting practice change is mutually dependent. The leader owns the role of creating the catalyst for change, providing the resources and opportunity for implementing change, and elaborating the motivation behind the need for change. The frontline staff has responsibility for enacting the change by contributing to the development work, voicing concerns about the implementation, and seeking to resolve barriers to sustaining the effort. Together, the leader and team can share mutual learnings, monitor outcomes, and apply the PDSA improvement process to further advance the cause of the quality improvement initiative (Singer & Vogus, 2013).

Conclusions

This QI project demonstrated that the target organization can effectively reduce the use of patient care sitters without an adverse effect on patient falls and falls with injury. The project, implemented on 2 separate adult acute care units with a history of high sitter utilization, engaged frontline staff in the development of education, practice recommendations, and safety supply

evaluations to reduce reliance on patient care sitters to prevent patient falls. Though the project failed to explicitly achieve its targeted goals, the results are nonetheless useful in providing some insight as to how sitter utilization at LH can be dramatically reduced.

Implications for further improvement.

This project specifically targeted non-psychiatric patient care sitters deployed to prevent patient harm from fall related events. The initiatives developed were built in collaboration with frontline staff working within the acute care departments of LH. Though existing policies and practices were already in place regarding sitter utilization and fall prevention efforts, a system-wide gap analysis revealed sporadic compliance with these stated patient care guidelines. Working with the frontline teams and expert stakeholders, this QI project leveraged these resources to specifically frame a sitter reduction program. While the program enjoyed notable success in reducing the costs associated with sitter utilization, the project was not as successful as was envisioned in reducing the rate of patient fall events. In consideration of future performance, this mixed outcome cannot be ignored.

As indicated by this project effort, a critical starting point in successful change implementation is creating a sense of urgency and priority within the organization concerning the intended project. Though this project did well to craft a message centering upon the financial implications of sitter reduction that generated significant interest and support for the initiative, it may be that the project leader failed to create a parallel sense of urgency concerning patient safety. This messaging is important because it most directly affects the frontline staff who are engaged in the work of operationalizing the initiative. For the work to have meaning and impact on those who implement the initiative, the leader should create a sense of priority with the patient fall elements of the project.

While staff may have an appreciation for financial savings achieved by a sitter reduction effort, the ultimate outcome on the operational budget will not be visible to them. In fact, what may be visible is a reduction in sitters as a resource; and this could be viewed as a loss. To sustain the project in a manner meaningful to direct patient care staff requires a message and intent that resonates with their professional role at the bedside. Thus, the critical step in creating priority for this work among frontline staff necessitates framing the project around patient outcome improvement and specific harm reduction. More time, attention, and development concerning this aspect of the initiative will provide for an improved opportunity for creating the desired change.

A few barriers to effect such a message exist including difficulty in translating patient fall events into meaningful financial outcomes, the fact that current performance exceeds national benchmark standards, and the reality that patient fall reduction studies are inconsistent in design, outcome, and meaning. By comparison, sitter reduction messaging is simple, easily translated into financial performance, and well supported by published evidence. It will be incumbent upon future leaders of this work to craft a message that speaks clearly to the urgency around the fall reduction elements of this project.

Improving the change process.

Messaging is not the only element of the project that requires additional review for creating future change. The fall reduction efforts themselves necessitate additional discernment and translation into practice. This raises the concern about the lack of statistically significant quantitative evidence available concerning the effectiveness of various fall prevention efforts (Hempel et al., 2013). As much as falls are multifactorial events, so too are the number of possible interventions that could be considered to prevent falls. Though some strategies such as

the use of evidence-based screening tools, inclusion of family in fall prevention education, and implementation of hourly rounding are components of nearly all fall reduction initiatives, many more could be considered (Hempel et al., 2013).

Particularly as it pertains to the adult acute care setting, further fall prevention strategies must be based upon the needs of the specific patient care context and adopted to the unique requirement of each patient (Shever, Titler, Mackin, & Kueny, 2011). Because context and environment have a direct impact on patient fall outcomes, these elements must be incorporated at the unit level. Failure to do so renders the QI project subject to over generalization and risks applying strategies that are not relevant to the target environment and situation. To overcome this barrier frontline staff should be included in analyzing the patient care setting, discerning the potential strategies to be applied within the environment, and developing the implementation processes most suitable to the care team, its culture, and the patients they serve (Johnson et al., 2011). Though in doing so, the effective project leader must be considerate of proven change management and implementation processes.

A notable deficit with current evidence on fall reduction strategies is the lack of evaluation concerning implementation procedures (Hempel et al., 2013). While in some respects this is understandable given the diverse nature of healthcare environments, this reality creates a challenge for those who intend to implement sustainable change. The project leader is hampered both in respect to what should be done and how best to implement what is thought to be most effective in reducing patient fall events. Though the available evidence regarding best practices in preventing patient falls is inconsistent, the success of any effort to reduce patient falls is directly linked to the effectiveness of implementation and compliance strategies (Hempel et al., 2013).

With respect to reducing falls, the advanced practice leader must incorporate knowledge concerning evaluation of best available evidence and applicable implementation strategies. It is insufficient to direct efforts solely to the discernment of the change desired without equal consideration of how this intention is to be achieved. The outcome of the investigation and analysis into the clinical question presents what ought to be done. However, this intellectual appreciation of the particular does not by itself create the action of implementation. Rather, the advanced practice leader gathers the information obtained and in collaboration with a transdisciplinary project team generates the implementation processes most suitable to the culture and environment in which they are creating change.

Other Information

Funding

Finally, the selected patient safety supply vendor did provide project supplies, materials, and onsite support for the equipment evaluation portion of this project. This support was provided in contract between the vendor and LH and occurred in a manner commensurate with all other supply evaluation engagements for the organization. Consistent with organizational policy and practice, the vendor did not participate in any aspect of staff evaluation and was excluded from analyzing staff comments and feedback regarding this project. No further source of direct financial support or funding was involved in the development, implementation, or interpretation of this QI project. The approved Statement of Determination Form for the project is provided in Appendix Z. The Organizational Letter of Support is provided in Appendix AA.

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Appendices

Appendix A

LH Comparative Sitter Utilization, FY15 and FY16

	4/1/2014 - 3/31/2015 (FY15)				4/1/2015 - 3/31/2016 (FY16)				
Surgical - 2220*	Census	Sitter Hours Count	Sitter Hours per Pt Days	Sitter FTE Count	Census	Sitter Hours Count	Sitter Hours per Pt Days	Sitter FTE Count	Year Over Year
*150 EMC (2220 + 2120)	13,191	2,643	0.20	1.27	15,065	1632	0.11	0.78	-45.9%
200 GSMC	7,799	458	0.06	0.22	8,064	458	0.06	0.22	-3.3%
300 MPMC	8,338	64	0.01	0.03	8,404	78	0.01	0.04	20.9%
350 MHMC	4,133	363	0.09	0.17	4,619	640	0.14	0.31	57.8%
600 SCMC	8,212	88	0.01	0.04	7,938	3	0.00	0.00	-96.5%
Totals	**41,673**	**3,616**	**0.09**	**1.74**	**44,090**	**2811**	**0.06**	**1.35**	-26.5%
Medical - 2210**									
150 EMC	11,817	4,170	0.35	2.00	12,039	5035	0.42	2.42	18.5%
**200 GSMC (2245)	4,826	128	0.03	0.06	5,345	379	0.07	0.18	167.3%
300 MPMC	11,045	300	0.03	0.14	11,282	356	0.03	0.17	16.2%
350 MHMC	13,375	2,178	0.16	1.05	14,643	3962	0.27	1.90	66.2%
600 SCMC	12,301	1,120	0.09	0.54	11,287	1210	0.11	0.58	17.7%
Totals	**53,364**	**7,896**	**0.15**	**3.80**	**54,596**	**10942**	**0.20**	**5.26**	35.4%
Telemetry -2111***									
150 EMC	4,214	805	0.19	0.39	4,455	1287	0.29	0.62	51.2%
***200 GSMC (2125)	13,783	1522	0.11	0.73	13,801	4400	0.32	2.12	188.7%
300 MPMC	5,199	75	0.01	0.04	5,060	144	0.03	0.07	97.3%
600 SCMC	10,846	1077	0.10	0.52	14,166	893	0.06	0.43	-36.5%
Totals	**34,042**	**3479**	**0.10**	**1.67**	**37,482**	**6724**	**0.18**	**3.23**	75.5%
Summary Total									
All Units	129,079	14,991	0.12	7.21	136,168	20,477	0.15	9.84	29.48%

Appendix B

LH Comparative Fall Rates, FY15 and FY16

	4/1/2014 - 3/31/2015 (FY15)						4/1/2015 - 3/31/2016 (FY16)					
Surgical - 2220*	Census	Total Fall Count	Fall Rate per 1000 Pt Days	Fall Injury Count	Injury Rate per 1000 Pt Days	Compare to National Benchmark	Census	Total Fall Count	Fall Rate per 1000 Pt Days	Fall Injury Count	Injury Rate per 1000 Pt Days	Compare to National Benchmark
*150 EMC (2220 + 2120)	13,191	31	2.35	2	0.15	0.44	15,065	63	4.18	3	0.20	-1.39
200 GSMC	7,799	26	3.33	3	0.38	-0.54	8,064	26	3.22	0	0.00	-0.43
300 MPMC	8,338	13	1.56	0	0.00	1.23	8,404	16	1.90	0	0.00	0.89
350 MHMC	4,133	15	3.63	1	0.24	-0.84	4,619	8	1.73	0	0.00	1.06
600 SCMC	8,212	26	3.17	3	0.37	-0.38	7,938	12	1.51	0	0.00	1.28
Totals	**41,673**	**111**	**2.66**	**9**	**0.22**	0.13	**44,090**	**125**	**2.84**	**3**	**0.07**	-0.05
Baseline Comparison (1) Surgical Units			**2.79**									
Medical - 2210**												
150 EMC	11,817	70	5.92	3	0.25	-1.41	12,039	64	5.32	1	0.08	-0.8
**200 GSMC (2245)	4,826	15	3.11	1	0.21	1.40	5,345	11	2.06	0	0.00	2.5
300 MPMC	11,045	27	2.44	1	0.09	2.07	11,282	37	3.28	0	0.00	1.2
350 MHMC	13,375	54	4.04	5	0.37	0.47	14,643	46	3.14	1	0.07	1.4
600 SCMC	12,301	29	2.36	2	0.16	2.15	11,287	30	2.66	3	0.27	1.9
Totals	**53,364**	**195**	**3.65**	**12**	**0.22**	0.86	**54,596**	**188**	**3.44**	**5**	**0.09**	1.1
Baseline Comparison (1) Medical Units			**4.51**									
Telemetry -2111***												
150 EMC	4,214	15	3.56	2	0.47	-0.21	4,455	33	7.41	1	0.22	-4.06
***200 GSMC (2125)	13,783	43	3.12	3	0.22	0.23	13,801	48	3.48	2	0.14	-0.13
300 MPMC	5,199	11	2.12	0	0.00	1.23	5,060	0	0.00	0	0.00	3.35
600 SCMC	10,846	42	3.87	1	0.09	-0.52	14,166	35	2.47	1	0.07	0.88
Totals	**34,042**	**111**	**3.26**	**6**	**0.18**	0.09	**37,482**	**116**	**3.09**	**4**	**0.11**	0.26
Baseline Comparison (1) Stepdown Units			**3.35**									
Summary Total												
All Units	129,079	417	3.23	27	0.21		136,168	429	3.15	12	0.09	

(1) Lake, E., Shang, J., Klaus, S., & Dunton, N. (2010). Patient falls: Association with hospital Magnet Status and nursing unit staffing. *Research in Nursing & Health*, 33, 413-425. http://dx.doi.org/10.1002/nur.20399

Appendix C

LH Fall Prevention Practice Variability

Initiative	Unit1	Unit2	Unit3	Unit4	Unit5	Unit6
Bedside report – all shifts and transitions of care	X		X			X
Proactive rounding	X	X	X			X
Documentation of compliance with rounding	X		X			
Education of patient on fall risk for all shifts			X			X
"Scripting" of patient safety education			X			
Visual display board that tracks fall performance			X			
Bed alarms all patients	X					X
Bed alarms some patients			X	X		
Escort all patients during restroom use						X
Charge RN safety rounds/review	X		X	X	X	X
No patient is allowed to walk alone			X			X
Move high risk patients closer to central station	X	X	X			X
Frequent use of chair alarms				X		X
Daily team huddle includes fall safety alerts		X	X			
Signs and other visual alerts for fall concerns		X	X			
Restraint devices in lieu of sitter utilization				X		X
Real-time debrief of falls			X			X

Appendix D

LH Fall Type Comparison FY16

4/1/2015 - 3/31/2016 (FY16)

Surgical - 2220*	Census	Total Fall Count	Falls From Bed	%	Falls From Chair	%	Falls From Toilet or Commode	%	From Wheelchair	%	Unknown or Unwitnessed or Other	%	While Ambulating	%	While Standing	%	While Transfering	%	Inury Falls*
*150 EMC (2220 + 2120	15,065	63	24	38.1%	9	14.3%	5	7.9%	2	3.2%	7	11.1%	9	14.3%	5	7.9%	1	1.6%	1
200 GSMC	8,064	26	7	26.9%	4	15.4%	5	19.2%	0	0.0%	1	3.8%	2	7.7%	3	11.5%	3	11.5%	
300 MPMC	8,404	16	2	12.5%	1	6.3%	3	18.8%	0	0.0%	0	0.0%	4	25.0%	3	18.8%	2	12.5%	
350 MHMC	4,619	8	3	37.5%	2	25.0%	0	0.0%	0	0.0%	0	0.0%	2	25.0%	0	0.0%	1	12.5%	
600 SCMC	7,938	13	3	23.1%	2	15.4%	3	23.1%	0	0.0%	2	15.4%	3	23.1%	0	0.0%	0	0.0%	
Totals	**44,090**	**126**	**39**		**18**		**16**		**2**		**10**		**20**		**11**		**7**		**1**
% of Falls by Type			**31.0%**		**14.3%**		**12.7%**		**1.6%**		**7.9%**		**15.9%**		**8.7%**		**5.6%**		
Medical - 2210**																			
150 EMC	12,039	63	25	39.7%	8	12.7%	9	14.3%	0	0.0%	4	6.3%	7	11.1%	7	11.1%	3	4.8%	1
**200 GSMC (2245)	5,345	12	1	8.3%	3	25.0%	2	16.7%	0	0.0%	1	8.3%	3	25.0%	2	16.7%	0	0.0%	
300 MPMC	11,282	36	10	27.8%	7	19.4%	1	2.8%	0	0.0%	4	11.1%	8	22.2%	2	5.6%	3	8.3%	
350 MHMC	14,643	46	16	34.8%	4	8.7%	5	10.9%	1	2.2%	1	2.2%	9	19.6%	4	8.7%	2	4.3%	1
600 SCMC	11,287	32	13	40.6%	2	6.3%	1	3.1%	0	0.0%	3	9.4%	6	18.8%	6	18.8%	0	0.0%	3
Totals	**54,596**	**189**	**65**		**24**		**18**		**1**		**13**		**33**		**21**		**8**		**5**
% of Falls by Type			**34.4%**		**12.7%**		**9.5%**		**0.5%**		**6.9%**		**17.5%**		**11.1%**		**4.2%**		
Telemetry -2111***																			
150 EMC	4,455	33	16	48.5%	7	21.2%	3	9.1%	0	0.0%	1	3.0%	2	6.1%	4	12.1%	1	3.0%	1
***200 GSMC (2125)	13,801	47	22	46.8%	9	19.1%	1	2.1%	0	0.0%	0	0.0%	7	14.9%	7	14.9%	1	2.1%	2
300 MPMC	5,060	11	7	63.6%	1	9.1%	1	9.1%	0	0.0%	0	0.0%	0	0.0%	1	9.1%	1	9.1%	1
600 SCMC	14,166	42	15	35.7%	8	19.0%	1	2.4%	0	0.0%	3	7.1%	7	16.7%	7	16.7%	1	2.4%	1
Totals	**37,482**	**133**	**60**		**25**		**6**		**0**		**4**		**16**		**19**		**4**		**5**
% of Falls by Type			**45.1%**		**18.8%**		**4.5%**		**0.0%**		**3.0%**		**12.0%**		**14.3%**		**3.0%**		
Summary Total																			
All Units	136,168	448	164		67		40		3		27		69		51		19		From Bed (7), From Commode/toilet (3), Ambulating (1)
% of Falls by Type			36.6%		15.0%		8.9%		0.7%		6.0%		15.4%		11.4%		4.2%		

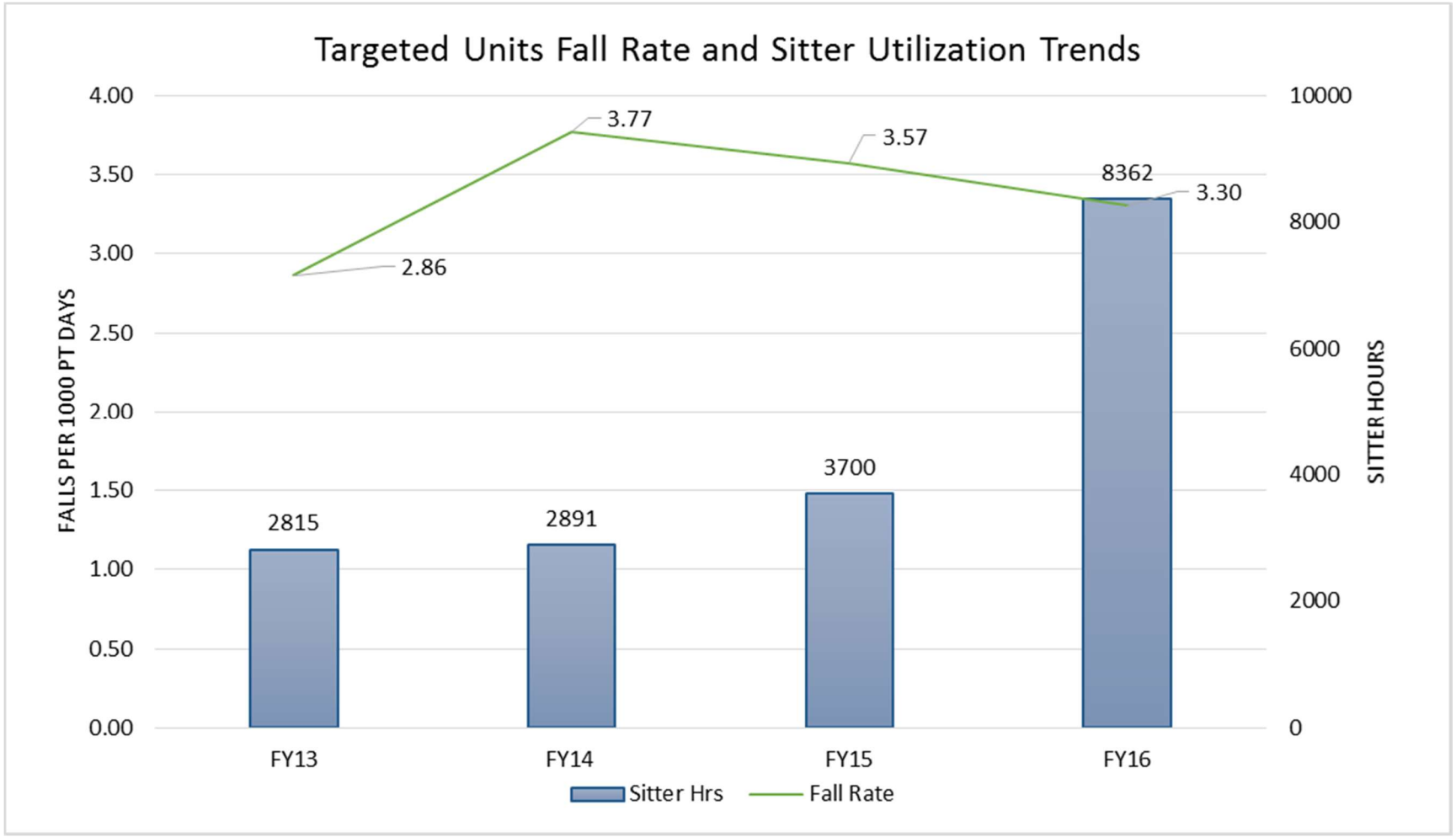
* Injury defined by the organization as major = fracture, change in mental status, moderate = sprain or deep laceration.

Unit #1 most common type of fall

Unit #2 most common type of fall

Appendix E

Sitter Use and Fall Trends MHMC and GSMC



Sitter utilization trend is reported for non-psychiatric sitters. All patient care sitters utilized for risk of self-harm, suicide ideation, or on medical, legal, or psychiatric hold status are excluded from this data and project.

Appendix F

Evaluation Table
Template derived from Melnyk & Fineout-Overholt (p. 552)

Citation: Authors(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	*Appraisal of Worth to Practice Strength of the Evidence
Boswell et al., (2001), The cost-effectiveness of a patient-sitter program in an acute care hospital: A test of the impact of sitters on the incidence of falls and patient satisfaction	None	Retrospective epidemiological study. Tracked the incidence of falls following the intentional increase in the usage of patient care sitters.	Study conducted over 21 months, involving 5 medical and 3 surgical inpatient acute care units in a large urban US hospital.	• IV1 - 8 hour sitters shifts worked • DV1 - Number of patient falls • DV2- Costs associated with sitter usage and fall care	Sitter effect calculated using Poisson regression model. Shift and falls data collected by actual count. Costs directly calculated.	• Sitter effect in patient fall per sitter shift worked. • Cost/savings per sitter shift worked	• Effect size on pt. falls = 0.0019 for each sitter worked (positive effect is an increase). • Net cost of sitter initiative increased cost of care by $156.24 per shift.	Level: II Quality: B
Tzeng, Yin, & Grunawalt, (2008), Effective assessment of use of sitters by nurses in inpatient care settings.	None	Retrospective descriptive study. Tested the effective use of the Pt. Attendant Assessment Tool (PAAT) has on requests/use of sitters and subsequent pt. safety.	Study conducted over an 18 month period involving 2 acute care adult units (U1 and U2) within an urban hospital located in Michigan.	• IV1 – PAAT assessment tool • DV1 – # of sitter requests • DV2 - rate of pt. falls • DV3 – rate of pt. falls with injury	Using independent t-tests, DVs were compared 6 months post to 12 prior to implementation of PAAT tool.	• Sitter requests made • Rate of all falls/1000 pt. days • Rate of falls with injury/1000 pt. days	U1: • Sitter requests reduced by 40/mos. • Fall rate fell by 0.40/1000 pt. days • Fall with injury increased by 0.34/1000 pt. days ($p<0.05$) U2: • Sitter requests reduced by 14/mos. • Fall rate fell by 0.98/1000 pt. days • Fall with injury increased by	Level: II Quality: B

							0.09/1000 pt. days (p>0.05)	
Spiva et al., (2012), An evaluation of a sitter reduction program intervention	None	Descriptive study. Following development and implementation of a fall safety program, data was collected on fall events, sitter hours, and sitter costs.	Data collected 7 months pre/post implementation. Involved 5 critical care, 11 med-surge, and 2 step down units of a 633 bed community hospital in southeastern US.	• Sitter hours • Number of falls • Fall rates	Shift and falls data collected by actual count. Costs directly calculated.	• Sitter hours used • Sitter costs • Count of pt. falls • Calculated fall rate	• Sitter use decreased by 30,010 hours • Sitter expense reduced by $321,823 • Total count of falls decreased from 199 to 197 (p=0.96) • Rate of falls statistically unchanged 2.45 to 2.39 (p=0.36)	Level: III Quality: B
Lang, (2014), Do Sitters Prevents Falls? A review of the literature.	None	Comprehensive literature review.	12 articles from a search of CINAHL, Medline, PsychINFO, Psych & Behavioral Sciences Collection	NA	NA	NA	• Adding sitters does not typically reduce falls • Reducing sitters is not linked to increasing falls • Guidelines of sitter usage play a key role in pt. safety	Level: III Quality: B
Adams & Kaplow, (2013), A sitter reduction program in an acute health care system	None	Descriptive project improvement study. Following rolling implementation of fall safety and sitter reduction program, tracked fall rates and sitter costs.	Study tracked data 12 months pre and 24 months post implementation. Conducted across all 57 inpatients units of the 4 hospital Emory Health system.	• Sitter FTE • Number of falls • Fall rates	FTE and falls were collected by actual count. Fall rates direct calculated.	• Sitter FTE utilized • Sitter costs • Falls/1000 pt. days	• Sitter FTE reduced by 53 • Sitter costs reduced by $1.2m/yr. • Falls/1000 pt. days unchanged.	Level: III Quality: B
Rausch & Bjorklund,(2010), Decreasing the costs of constant observation (CO)	None	Descriptive project improvement study. Implementation of a psych liaison RN (PLN) to provide inpatient	Study tracked data for 4 months following fully deployment of the PLN role. Conducted in urban US 800 bed	• CO shifts • Number of pt. falls	CO shifts worked and falls collected by direct count. CO expense directly calculated.	• CO shifts worked/mo. • Count of pt. falls • Total cost of CO	• CO shifts worked reduced by 293/month • Falls declined by 25%	Level: III Quality: C

		consultation for CO patients.	Magnet-designated hospital.			shifts worked	• CO expense decreased $97,056.	
Salamon & Lennon, (2003), Decreasing companion usage without negatively affecting patient outcomes: A performance improvement project	None	Descriptive project improvement study. Following implementation of an alternative safety program and sitter requisition review procedure.	Study compared 3 months pre to 12 months post program implementation. Conducted on a 59-bed sub-acute unit with a 1000 bed US academic medical center.	• Sitter shifts • Number of pt. falls	Sitter shifts worked and falls data collected by direct count. Sitter expense directly calculated.	• Sitter shifts worked/mo. • Count of pt. falls • Count of patient fall w/fracture • Total cost of sitter shifts	• Sitter shifts worked reduced by 88% • Count of pt. falls unchanged • Count of pt. falls w/fracture unchanged • Sitter expense reduced by $1.15m/yr.	Level: III Quality: C
Laws & Crawford, (2013), Alternative strategies to constant patient observation and sitters	None	Descriptive project improvement study. Following implementation of new sitter risk screening protocol, collaborative safety strategy program with emphases on dementia and delirium	Tracked outcome performance 3-6 months post program implementation. Conducted in 173 bed acute care hospital of the Kaiser system in northern CA.	• Sitter FTE utilized. • Rate of pt. falls • Rate of pt. falls with major injury or death.	FTE and falls data collected by direct count.	• Total sitter FTE utilized • Rate of pt. falls/1000 pt. days • Rate of pt falls with major injury/1000 pt. days.	• Sitter utilization reduced by 20% • Rate of falls = 0.47/1000 pt. days (no baseline) • Count of pt. falls w/major injury = 0.0/1000 pt. days	Level: III Quality: C

* “Appraisal of Worth to Practice Strength of the Evidence” based upon the Johns Hopkins Nursing EBP Research Evidence Appraisal Tool

Appendix G

Evidence Synthesis Table

	Boswell (2001)	Tzeng (2008)	Spiva (2012)	Adams 2013)	Salamon (2003)	Laws (2013)	Rausch (2010)	*Lang (2014)
Interventions								
**Strength of evidence	Level: 2 Qlty.: B	Level: 2 Qlty.: B	Level: 3 Qlty.: B	Level: 3 Qlty.: B	Level: 3 Qlty.: B	Level: 3 Qlty.: C	Level: 3 Qlty.: C	Level: 3 Qlty.: C
Sitter increase	X							X
Sitter decrease		X	X	X	X	X	X	X
Fall risk algorithm					X	X		X
Sitter request decision algorithm		X	X	X	X			X
Shift by shift assessment of sitter need		X	X		X			X
New technology (chair alarms, low beds, etc.)				X	X			X
RN education on sitter alternative			X	X	X			X
Increased RN or staff rounding				X		X	X	X
Family education			X	X				
Specialty RN role							X	
Fall outcome								
Fall increase	X	X						X
Fall decrease		X	X	X		X	X	X
No impact on falls			X		X			

* Comprehensive literature review article
** As identified in Evaluation Table, Appendix F

Appendix H

Gap Analysis

Future State	Current State	Action Step/s
All acute care departments have access to a full breadth of patient safety supplies and products	• Acute care departments were observed to not have access to all of the patient safety supplies currently available within the system. This stems from a lack of awareness on availability or a lack of knowledge in how to obtain. • Current product line available to the system does not include some supplies that are supported by evidence as a best practice fall prevention intervention. Specific products not readily available: o Wireless chair alarms o Multi-function alarm pad (chair, bed, etc.) o Activity apron for distraction o Non-restraint devices that can be used to accommodate patient activity, but reduce risk for unintended exit actions	• Conducted line by line identification of all currently available safety supplies and provided ordering numbers for each. • For any products without ordering numbers, secured contract ordering number for each. o Disseminated both of the above via broadcast emails to nursing management teams. • Identified a new vendor that provided the full breadth of patient safety supplies desired by the organization. Conducted an evaluation of this supplier for consideration of system-wide conversion to their patient safety product line.
All acute care nursing teams apply best evidence fall prevention efforts into their daily patient care efforts	• Practice among all acute care departments is guided by two primary LH patient care policies. The policy is not well understood as evidenced by inconsistent practice across the system in regards to use of patient care sitters and implementation of fall prevention efforts. • Some units in the organization are recognized as best performers within their peer group (low use of sitters and low fall rates), but their practices are not shared across other units that do not perform as well.	• Developed education tool to assist CPS and Management in education of staff on current fall prevention best practices. • Revamped policy “take away” message into a more intuitively understood practice guideline center upon the nursing process. • Presented disparity in practice with organizational Nurse Executive Council. Used their support to raise awareness through site education and the system Falls Committee. Education tools to be rolled into system level annual fall prevention education program.

Acute care nursing teams recognize the use of non-psychiatric patient care sitters as an intervention of last resort and consistently prioritize the use of more effective and proven fall prevention strategies.	• The acute care units within the organization have differing geographic footprints from one another, this impacts the effectiveness of sitter reduction and fall safety from one site to the next. Observation is that patient care sitters are too often a first intervention used is some locations. • Policy guiding use of direct observation for patient safety is not well understood. Few knew of its existence and fewer yet understood is application.	• For the evaluation units, conducted walk through with their teams to identify what supplies and education are most suited to their respective environments. Key shared findings: o Chair alarms required for each room (currently 1 for 4 rooms) o Nurse call system integration required for all alarms o Consolidating high fall risk patients limited to less than 4 patients due to limited line of site visibility o Foam body belt can only be used in conjunction with either a bed or chair alarm – not to be used independently due to limited line of site visibility • Incorporated key point education concerning use of patient care sitters into previously mentioned education tools.

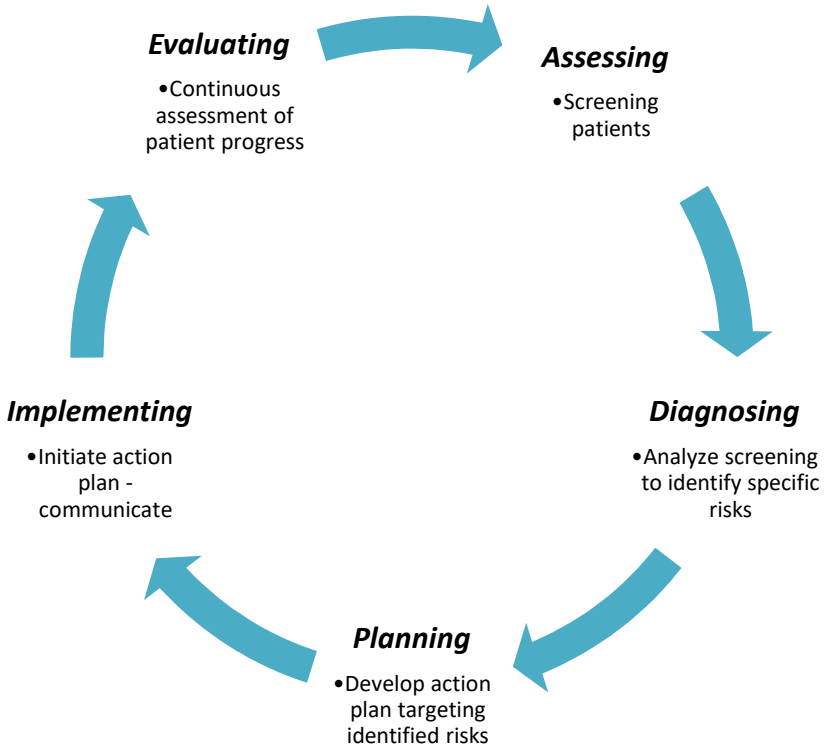
Gap analysis conducted 1/1/16 – 3/31/16 via system-wide interviews of acute care staff, department leaders, and internal fall prevention experts. Interviews involved 6 adult acute care departments that spanned all 5 LH hospital sites. In addition the interviews included the system Falls Committee, Clinical Practice Support staff, and centralized staffing department teams.

Appendix I

Staff Education Handout – Nursing Process and Rounding

Nursing Process

Preventing Patient Falls



1. *Assessing - generates a number*

In conjunction with LH Policy 900.1154, screen all patients using Morse Scale to identify fall risk. This information gathering is completed upon initial care of the patient, but is repeated throughout the course of the stay as the condition of the patient evolves.

2. *Diagnosing - generates a determination of risk and articulates the cause of that risk*

Connect the information gathered from the assessment to a clear understanding of the fall risk profile of the patient.

- "My patient is currently at a high risk for falls because . . ."
- "My patient is currently not a fall risk because . . ."

The "because . . ." portion of the above statements is crucial as it identifies the specific causative factors associated with a patient's risk. It is this step where over generalization occurs and generic response patterns begin to develop.

3. *Planning - generates the action steps that target the risk factors for each patient*

Using the diagnosis as a foundation, coordinate tools and resources to develop the interventions that specifically address the cause of risk identified above. This phase is the development of evidence-based interventions that serve to target the fall risk factors/context for each patient. This is where over generalization of "standard interventions" occurs when the fall safety plan is based upon available tools/resources as opposed to the explicit fall risk.

- Because my patient has an unsteady gait, but can readily follow instructions - I will be sure to include a consult with Physical Therapy on the possibility of gait training and the use of assistive devices.
- Because my patient has an unsteady gait, but can readily follow instructions – there is no need for a bed alarm.

4. *Implementing - the nursing care actions taken to assure patient safety*

With preventing falls as the key outcome for the plan of care, the nurse works with other team members, the patient, and family to assure the patient is kept safe from falling. Critical to this effort is clear communication with the patient and family on their role in the plan of care as well as the responsibility of others on the care team. Essential conversations include:

- (Shift Team) – What the plan is and how all team members will be involved, especially CNA and Charge Nurse.
- (Patient) – Review the observed risk with the patient, commitment to their safety, planned interventions, and what they are going to do to assist you in keeping them safe.
- (Family) – When available, utilize as a safety advocate and reminder mechanism for the patient regarding the safety plan.

5. *Evaluating - restarts the nursing process using outcomes on the goals of care to determine the effectiveness of the current fall safety plan*

The nursing process is not stagnant and requires continual and ongoing adaptation to meet the changing needs of each patient. The essential question is to determine if the goals of care (in this case fall safety) were met. Did issues arise that were not effectively accounted for by the current plan of care? If so, how does the plan need to be modified to target the new or changing risk? Again, communication

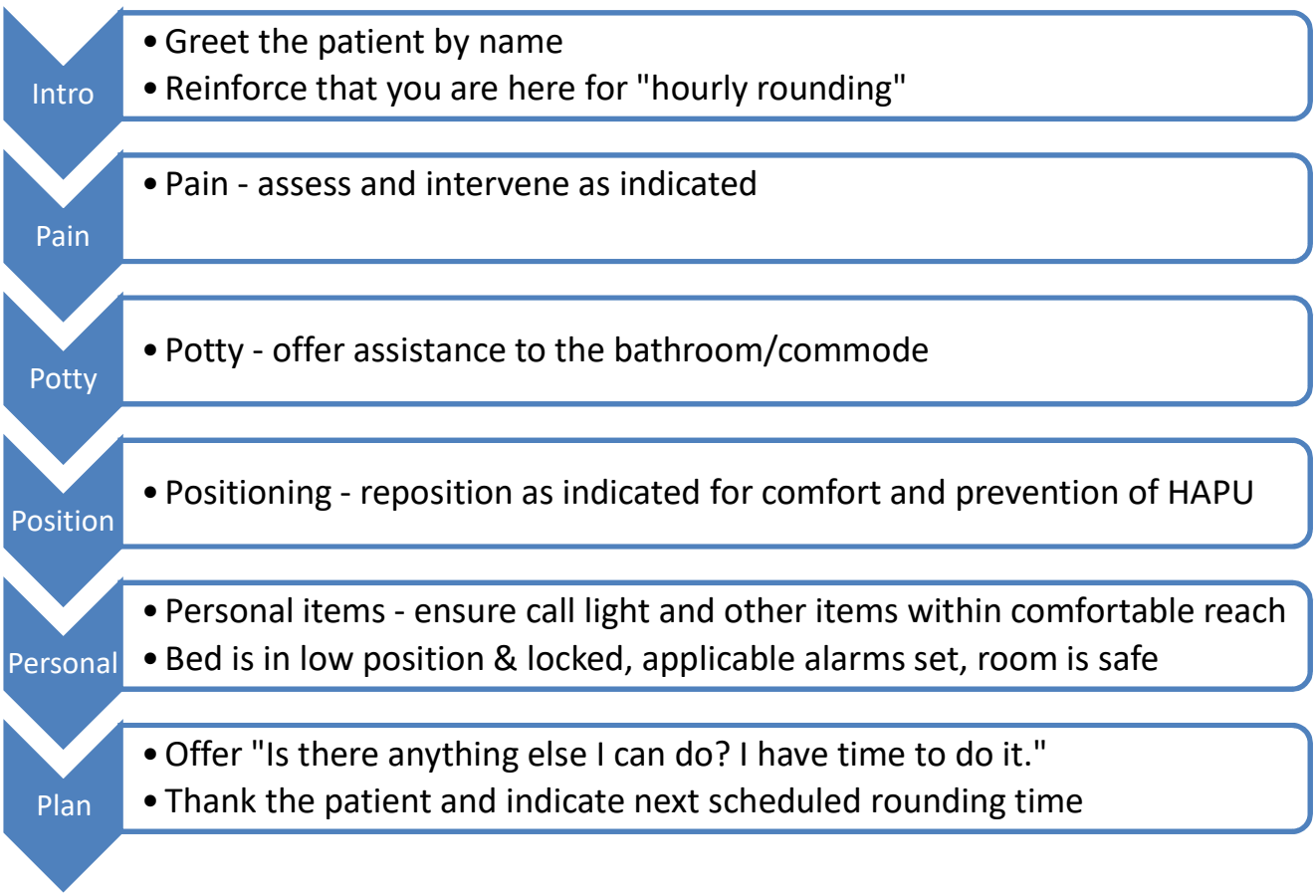
among the team is critical to assure the plan of care is fully and appropriately implemented across all shifts and team members throughout the duration of care.

- (Shift Team) – As applicable, huddle on new or evolved risk, plan, and intervention.
- (Charge Nurse) – Update the CN on the status of the patient to assure they are fully informed of resource requirements for implementing the necessary plan of care.
- (Patient/Family) – Provide necessary updates and modifications regarding the fall safety plan.
- (Shift Report) – Provide an assessment on the effectiveness of the current plan of care, any updates made, and ongoing needs to assure patient safety.

Proactive Rounding

Improving patient outcomes

Proactive rounding has been incorporated into standard nursing care practice at Legacy Health for several years. Contemporary integrative reviews have found that rounding on patients consistently reduces the rate of patient fall events on acute care units (Hicks, 2015). The concept of proactive rounding has stabilized in recent years among nursing departments that deploy the intervention for patient safety, satisfaction, and overall quality improvement (Olrich, Kalman, & Nigolian, 2012). The standard flow in proactive rounding occurs as follows:



As opposed to the lack of evidence supporting the use of patient care sitters to prevent falls (Shever, Titler, Macklin, & Kueny, 2011), seemingly all iterations of scheduled rounding reduce the rate of falls among hospitalized patients (Hicks, 2015).

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Appendix J

60-Day Evaluation Budget

Item	Cost/(Savings)	Evaluation Quantity	60-Day Cost/(Savings)	Assumptions
Staff Training	$35/hour	1 hour/FTE	$4,200	60 FTE per department
Patient Safety Supplies	(20%)	60 day supply	($800)	Savings based on historical usage of $1,000/month per unit
Sitter Reduction	($18.80/hour)	Unit 1 = 367 hours Unit 2 = 330 hours	($13,104)	Based off of 50% reduction in FY16 average monthly sitter usage.
		60-Day Evaluation Total	($9,704)	Savings

Appendix K

5-Year Proforma

		Year 1	Year 2	Year 3	Year 4	Year 5	Total
Incremental FTEs		(3.60)	(3.60)	(3.60)	(3.60)	(3.60)	(3.60)
Expenses:							
Salaries		$ (134,685)	$ (138,389)	$ (142,195)	$ (146,105)	$ (150,123)	$ (711,496)
Benefits		-	-	-	-	-	-
Supplies		(32,000)	(32,000)	(32,000)	(32,000)	(32,000)	(160,000)
Staff Training		14,000	1,400	1,400	1,400	1,400	19,600
Total Expenses		$ (152,685)	$ (168,989)	$ (172,795)	$ (176,705)	$ (180,723)	$ (851,896)
Net Operating Income		$ (152,685)	$ (168,989)	$ (172,795)	$ (176,705)	$ (180,723)	$ (851,896)
Net Legacy Contribution		**$ 152,685**	**$ 168,989**	**$ 172,795**	**$ 176,705**	**$ 180,723**	**$ 851,896**
Capital Investment	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Cash Flow from Oper.		152,685	168,989	172,795	176,705	180,723	851,896
Add Depreciation		-	-	-	-	-	-
Annual Net Cash Flow	-	152,685	168,989	172,795	176,705	180,723	851,896
Discounted at 6.5%	704,667	143,366	148,991	143,048	137,357	131,906	
Cumul. Net Cash Flow	$ -	$ 152,685	$ 321,674	$ 494,468	$ 671,173	$ 851,896	

The yellow highlighted sections represent salary reductions achieved through a 50% reduction in sitter utilization and the recurrent supply savings achieved by conversion to the new patient safety supply vendor. Salary expense increase reflects an annualized 2.75% cost of labor increase. The supply contract is a 5-year agreement with locked pricing over the duration of the contract term.

The green highlighted section documents the program's projected net positive cash flow contribution as calculated with a 50% reduction in sitter utilization.

Appendix L

Stakeholder Stratification

Stakeholder Group	Primary Concerns	Point of Risk
Frontline Staff	<u>Personal Workflow</u> • How will this impact me • What is being added to my shift versus what is being taken away <u>Autonomy</u> • Does this change accurately reflect my unit environment – will this work • Do/did I have a say in this change • How do I provide feedback	Without adequate "buy-in" and staff engagement based on awareness of clear benefits to staff and patients, project will be viewed as a burden. If staff do not have a strong understanding of the value add of the project, the program will fail at the point of implementation.
Department Managers	<u>Clinical Operations</u> • How is the program going to be rolled out among the staff • How much effort is expected of staff • Does this compete/duplicate other initiatives • How does this initiative improve the performance of my unit among the metrics for which I am accountable <u>Change Leadership</u> • What is the level of readiness or acceptance among the team for this change • How is the PDSA improvement cycle to be managed for this project	Managers must have assurance that providing access to staff time and workflow will produce proportionately more gain than resources invested. If the project is perceived to require more that the unit is capable of providing for little demonstrable gain, the program will be denied access to the critical resource of staff time necessary for development and training. As such, the project will fail at the point of deployment.
Executive Leadership	<u>Strategic Alignment</u> • What will this project achieve and does it align with our strategic plan • Is this a "best use" of the resources required to implement • What is the scalability of the project <u>Project Sponsorship</u> • What resources are needed • Is the proposal reasonable in its stated goals, timelines, and ROI • Are the project assumptions and measurement tools appropriate	Executive leaders require all projects align with strategic goals and are not at odds with the priorities of the organization. Projects will be scrutinized for this alignment as well as overall resource stewardship. If the program is understood not to align with organizational strategy or presents a wasteful approach to resource utilization, the project will fail at the point of development.

Appendix M

Message Mapping

Core message - "Reducing sitters by supporting staff with best practice tools will dramatically lower costs, improve patient outcomes, and save staff time."

Staff	Managers	Executives
	Themes and Perspectives	
Who is doing this? Why is this necessary? Is this a credible change? How does it help me? Will my patients benefit? Are we not doing something now that we should be?	Is my team ready for another challenge? How is this going to get accomplished? Do we have time for this? Does this align with the goals for our unit?	Why should we be interested in doing this? Are these the appropriate outcomes? Do we have confidence in the plan? Does this project compete with other goals?
	Interests and Goals	
Keep my patients safe Save me time Improve my workflow	Reduce rate of falls Reduce utilization of sitters Ease of implementation Do not disrupt my staff What if something goes wrong-mitigation plan	Demonstrable ROI Improve reportable fall rates Sound program strategy Potential scale of program
	Communication Preferences	
Within the context of other scheduled meetings – no added meetings (if possible) Email One page flyers Staff communication boards Unit newsletter	Personal so I can dig into my questions With small group of colleagues/experts to assess validity of evidence Keep me informed all along the way – this is my team	Ground work communication with potential champions Formal meeting Crisp Power Point Periodic email with bullet points

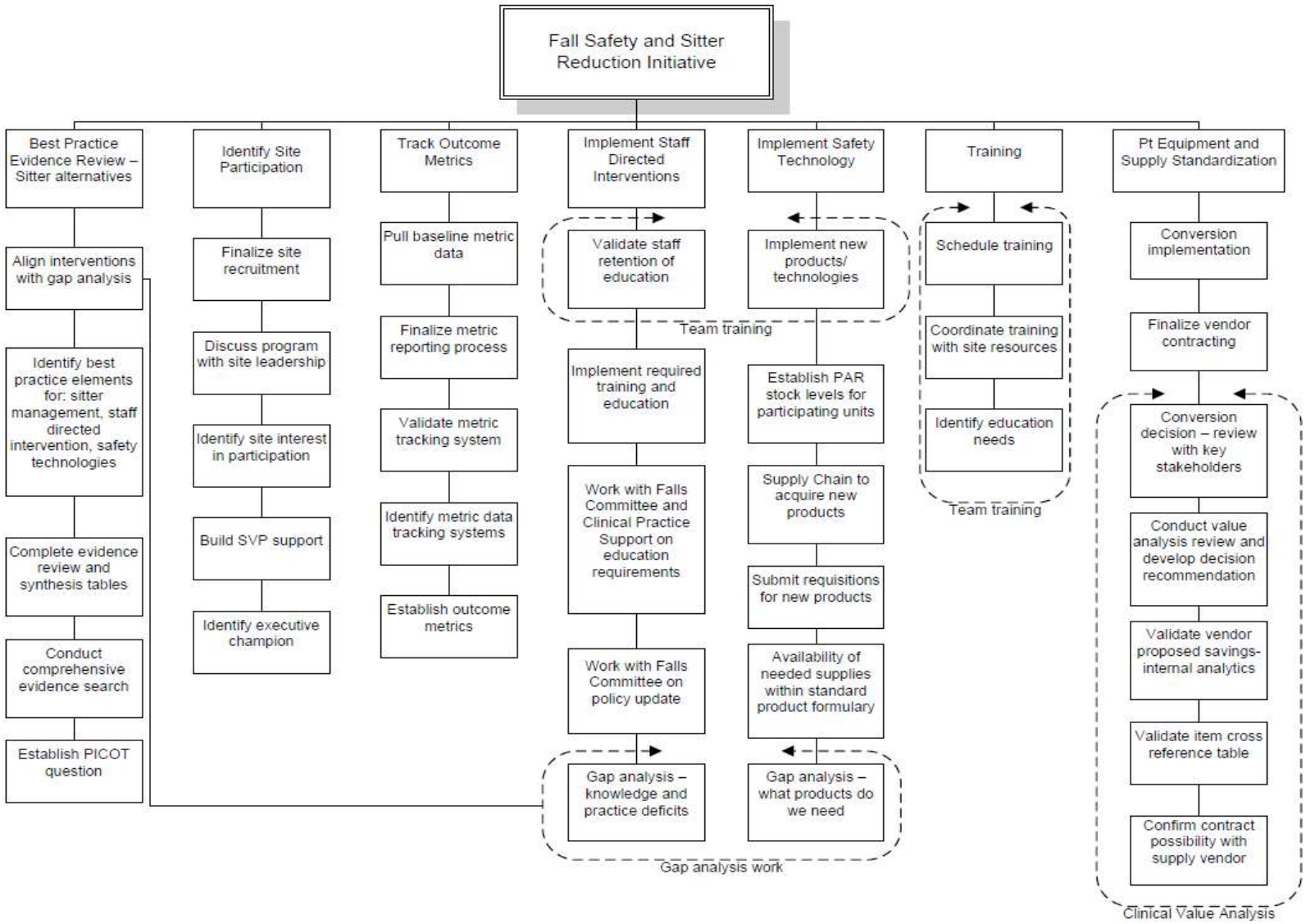
Appendix N

Project Initiatives Summary

Improvement Element	Source	Description	Comments
Best Practice	• Evidence review • Legacy policy • Shared best practice • Subject matter experts	A collaborative effort among project manager, organizational resources, and front line staff. A review of current evidence was compared to current policy and assessed against actual practice unit performance. Identification of most effective practices was followed by an active dissemination of these practices among the targeted intervention departments. The dissemination of this practices included education provided through various staff meetings, Fall Risk Committee education, vendor provided best practices education, handouts, and emails.	A gap analysis assessment has been completed among targeted units. Working with staff, the gap analysis provided the basis for development of this best practices initiative as well as the preferred methods for education, training, and communication channels.
Patient Safety and Supplies	• New product vendor - DeRoyal	This high value vendor presents a direct cost savings on patient safety products for the organization. Additionally, this vendor provides alternative tools and equipment that staff can use to assure patient safety. This initiative is expected to produce a $32,000 annual savings for the organization. A 60-day deployment and clinical evaluation of the vendor's patient safety product line was conducted in support of patient sitter reduction and fall prevention initiative.	Notable new equipment includes; • Cordless chair and mobility alarms • Non-restraint roll belts • Improved patient mobility support equipment

Appendix O

Initiative WBS



Appendix P

Project Functions and Roles

Function	Description	Leader	Supporting Roles
Best Practice Evidence Review	Discern best available evidence and develop education and tools for translation into practice.	DNP Student	• CPS • Falls Committee • Participating units
Identify Site Participation	Identify appropriate unit/s for inclusion in the implementation project. Once identified, recruit participation among units by garnering support from staff, managers, and executive site leadership.	DNP Student	• Quality and Finance teams provided data
Track Outcome Metrics	Develop process for consistent measurement of agreed upon outcome metrics. Discern baseline data and conduct analysis of clinical outcomes.	DNP	• Quality – falls data • Staffing – Sitter utilization data
Implement Staff Directed Interventions	Based upon best evidence review and corresponding tool development, implement education and communication initiatives	Unit Champions and Managers	• DNP Student provided facilitation and guidance • CPS coordinated requirements and reviewed materials
Implement Safety Technology	Deploy patient safety supplies to be used with the project. Deployment includes contracting, delivery stocking, and incorporation into unit practice.	Supply Chain Management with Supply Vendor	• DNP Student provided active support (coordinating communication, developing task schedule, and clarifying expectations) through Value Analysis role
Training	Specific training for the patient safety supplies used in the evaluation.	Vendor and CPS	• Unit Champions served to coordinate on unit scheduling • DNP student served as facilitator to assure timelines were met and communication needs were addressed
Pt Equipment and Supply Standardization	This is a future consideration of the project should the organization decide to move forward with a system-wide conversion to the patient safety supplies evaluated with this initiative	Supply Chain Management and Value Analysis	• DNP Student will present findings of the evaluation to organization stakeholders for their consideration of a possible product conversion.

Appendix Q

Issue Identification and Resolution

Issue	Description	Resolution Process
Call Light Cable Compatibility	The organization utilizes two different nurse call systems. The gap analysis revealed chair alarms integrated directly with the existing nurse call systems were more effective in notifying all staff of a patient exist event. However, chair alarm systems must be configured with the appropriate data port connection to facilitate such integration. With two different systems identified, the project required two separate and distinct configurations. Failure to meet this requirement can result in a complete shutdown of the nurse call system.	The project leader coordinated a compatibility review with the vendor and site Clinical Engineering teams. Compatibility requirements were confirmed, documented, and tested prior to initiation of the training phase of the project. No failures occurred during the trial.
Insufficient Nurse Call Cable Inventory	The gap analysis discovered that not all units in the organization understood how to use the cable than connected the chair alarm to the unit nurse call system. The MHMC unit participating in the evaluation was one such unit. In addition, those units that understood how to use the cable did not know how to order replacement cables or did not have sufficient cables on hand for their stock of chair alarms. Thus many alarms units were deployed without connection to the nurse call system.	The project leader worked with Supply Chain Management (SCM) to assign an ordering number for nurse call cable. A broadcast message throughout the organization detailing how to order replaced nurse call cables. The project leader worked directly with the patient safety supply vendor to provide one cable for every chair alarm to be used with the evaluation.
Unclear Documentation of Non-restraint Education	One product used for this evaluation was the foam patient body belt. Key to use of this device is education on the self-release function of the belt as well documentation of patient return demonstration on their ability to release the belt. Without this documentation, use of the belt would need to be treated as a restraint with the requisite provider ordering and high frequency documentation protocols. It was reported to the project leader in week 2 that this documentation was not understood and as a result staff were choosing to not use this safety device.	DNP student worked with CPS to identify appropriate documentation of return demonstration release within the organization’
Unclear product ordering expectations	Toward the final weeks of the 60-day evaluation, units were running short on certain patient safety supplies. There arose confusion as to how these supplies were to be ordered and who was going to pay for them. One unit was going to stop their participation, assuming the evaluation had been completed given that no more trial product was available.	DNP student clarified expectations between vendor and SCM. All products were supplied by the vendor without disruption to the evaluation and at no cost to either of the participating units.

Appendix R

Project Gantt Chart

ID	Task Name	Start	Finish	Duration
1	Engage select SVPs to serve as executive champions	10/12/2015	10/23/2015	10d
2	Meet with identified end-users and stakeholders	10/15/2015	1/6/2016	60d
3	Prospectus approval	12/15/2015	12/15/2015	0d
4	Conduct Gap analysis	11/2/2015	3/4/2016	90d
5	Recruit site/unit participation	2/1/2016	2/26/2016	20d
6	Program development meetings	12/1/2015	2/22/2016	60d
7	Draft safety initiative program	3/1/2016	4/11/2016	30d
8	Finalize data collection methodology and validate	1/4/2016	2/5/2016	25d
9	Market search for possible consolidation and standardization of patient safety equipment	12/15/2015	2/15/2016	45d
10	Propose product safety evaluation to Value Analysis Council	2/15/2016	3/25/2016	30d
11	Present final initiative to stakeholders	4/15/2016	4/15/2016	0d
12	Present project goals and initiatives to system Senior VP Council	5/16/2016	5/16/2016	0d
13	Finalize contracting for patient safety vendor product evaluation	3/25/2016	5/26/2016	45d
14	Site/department training	6/1/2016	6/28/2016	20d
15	Complete logistics for new supply stock supplies on evaluation units	6/1/2016	6/28/2016	20d
16	Patient safety and sitter reduction project Go Live Launch	7/1/2016	7/1/2016	0d
17	On-site patient safety supply vendor support	7/1/2016	7/14/2016	10d
18	Daily monitoring effort	7/1/2016	7/14/2016	10d
19	PDSA Improvement effort	7/1/2016	8/25/2016	40d
20	Communicate weekly updates	7/1/2016	7/14/2016	10d
21	Transition to weekly monitoring	7/28/2016	8/24/2016	20d
22	Communicate biweekly updates	7/1/2016	8/25/2016	40d
23	Assess project continuation beyond scheduled end date	8/1/2016	8/12/2016	10d
24	Make decision to extend evaluation date or conclude as scheduled 8/31	8/15/2016	8/15/2016	0d
25	Project scheduled end date	8/31/2016	8/31/2016	0d
26	Finalize outcome data	9/1/2016	9/28/2016	20d
27	Project report – Draft #1	8/1/2016	10/21/2016	60d
28	Submit Draft #1	10/17/2016	10/17/2016	0d
29	Present results to end-user departments, stakeholders, and executive leadership	10/3/2016	10/14/2016	10d
30	Project report – Draft #2	10/20/2016	11/9/2016	15d
31	Final revisions DNP project write-up	11/15/2016	11/23/2016	7d
32	Submit DNP Final write-up	11/21/2016	11/21/2016	0d
33	Present DNP project results	12/9/2016	12/9/2016	0d

Appendix S

SWOT Analysis

SWOT Element	Assessment
Strengths (internal)	• High level executive interest in support of project goals • Large amount of historical data available on fall events • Evidence shows sitter usage does not prevent falls • Engaged stakeholders, internal experts want to address issue
Weaknesses (internal)	• Poor data collection methods regarding current sitter utilization • High number of sitter alternative measures could be considered for fall prevention efforts • Would require practice change for nursing departments • Incident collection database changed in May 2015 - may impact ability to pull historical fall event data
Opportunities (external)	• Clinically focused project enabling creation of new networking relationships • Significant dollar savings could be reinvested in other priority programs
Threats (external)	• Cultural acclimation by staff in the use of sitters to prevent patient harm • Patients, families, and staff may perceive efforts on sitter reduction as a risk to patient safety

Appendix T

SWOT Resolution Plan

SWOT Element	Assessment	Intervention/Leverage
Strengths (internal)	• High level executive interest in support of project goals • Large amount of historical data available on fall events • Evidence shows sitter usage does not prevent falls • Engaged stakeholders, internal experts want to address issue	• Keep executive champion well informed on project progress. Seek speaking venues as necessary to maintain executive engagement • Use data to demonstrate trends and correlation with organizational sitter usage • Recruit critical stakeholder experts and engaged staff with project development team
Weaknesses (internal)	• Poor data collection methods regarding current sitter utilization • High number of sitter alternative measures could be considered for fall prevention efforts • Would require practice change for nursing departments • Incident collection database changed in May 2015 - may impact ability to pull historical fall event data	• Maintain consistency with collection processes to assure like for like comparison • Work with evidence and teams to identify "best alternatives" to sitters – present education that is cohesive and aligned with organizational policies on sitters • Include staff and champions on development of project initiatives • Work with Quality department to assure fall data used is accurate and complete
Opportunities (external)	• Clinically focused project enabling creation of new networking relationships • Significant dollar savings could be reinvested in other priority programs	• Secondary benefit to such system-level project work • Work with executive champion to report project findings and savings derived from implementation
Threats (external)	• Cultural acclimation by staff in the use of sitters to prevent patient harm • Patients, families, and staff may perceive efforts on sitter reduction as a risk to patient safety	• Again, use teams to help develop the project and provide evidence demonstrating the ineffectiveness of sitters • Work with staff, vendor, and CPS to development language and speaking points about project and commitments to safety

Appendix U

P Value Analysis with Excel

Target MH/GS	Compare	
0.88	0.35	
5.71	4.20	
5.91	4.02	
3.35	3.14	
2.27	3.33	
2.20	3.92	
2.60	4.51	Baseline Data
2.56	3.44	
6.04	2.63	
1.24	2.76	
1.28	3.73	
5.06	3.70	
5.52	4.41	Eval Data
1.60	2.52	

Summary	Target		Compare	
n	12	2	12	2
X Bar	3.258817	3.564356	3.311735	3.463533
s^2	3.390578	3.843585	1.082502	0.897252
n-1	11	1	11	1
n-1*s^2	37.29636	3.843585	11.90752	0.897252
s pooled	3.428329		1.067065	
SE pooled	1.414164		0.788958	
t	-0.21606		-0.1924	
df	12		12	
Prob	0.416287		0.425322	

Variable	Excel Function
n	COUNT
X Bar	AVERAGE
s^2	VARIABILITY
n-1	Calculation
n-1*s^2	Calculation
s pooled	Calculation
SE pooled	Calculation
t	Calculation
df	Calculation
Prob	TDIST(2)

P value calculation demonstration. This example calculation includes outcome data on rate of falls/1000 patient days observed for the evaluation units at MHMC and GSMC and the comparative adult acute care units across the rest of the system. In this calculation, though the average rate of fall event increased among both populations, neither outcome was determined to be statistically significant due to measured p values of 0.416287 and 0.425322 respectively.

Appendix V

Sitter Utilization Outcomes

	4/1/2015 - 3/31/2016 (FY16)				7/1/2016 - 8/31/2016 (Annualized)				Change in Sitter Utilzation				
Surgical	Census	Sitter Hours Count	Sitter Hours per Pt Days	Sitter FTE Count	Census	Sitter Hours Count	Sitter Hours per Pt Days	Sitter FTE Count	Sitter Hours Count	Sitter Hours per Pt Days	Sitter FTE Count	% Change Hours	p Value
150 EMC	15,065	1632	0.11	0.78	11,815	2088	0.18	1.00	456	0.07	0.22	27.9%	0.33
200 GSMC	8,064	458	0.06	0.22	7,547	2108	0.28	1.01	1,650	0.22	0.79	360.2%	0.03
300 MPMC	8,404	78	0.01	0.04	8,142	35	0.00	0.02	-43	0.00	-0.02	-54.7%	0.67
350 MHMC	4,619	640	0.14	0.31	5,069	483	0.10	0.23	-157	-0.04	-0.08	-24.6%	0.66
600 SCMC	7,938	3	0.00	0.00	7,900	0	0.00	0.00	-3	0.00	0.00	-100.0%	NA
Totals	**44,090**	**2811**	**0.06**	**1.35**	**40,474**	**4714**	**0.12**	**2.27**	**1,903**	**0.24**	**0.91**	67.68%	0.19
Medical													
150 EMC	12,039	5035	0.42	2.42	11,468	13888	1.21	6.68	8,853	0.79	4.26	175.8%	0.01
200 GSMC	5,345	379	0.07	0.18	5,275	2243	0.43	1.08	1,864	0.35	0.90	491.8%	<0.001
300 MPMC	11,282	356	0.03	0.17	10,691	147	0.01	0.07	-209	-0.02	-0.10	-58.7%	0.88
350 MHMC	14,643	3962	0.27	1.90	14,341	2661	0.19	1.28	-1,301	-0.09	-0.63	-32.8%	0.83
600 SCMC	11,287	1210	0.11	0.58	9,743	871	0.09	0.42	-339	-0.02	-0.16	-27.99%	0.66
Totals	**54,596**	**10942**	**0.20**	**5.26**	**51,518**	**19810**	**0.38**	**9.52**	**8,868**	**1.03**	**4.26**	81.05%	0.01
Telemetry													
150 EMC	4,455	1287	0.29	0.62	6,788	595	0.09	0.29	-692	-0.20	-0.33	-53.8%	0.69
200 GSMC	13,801	4400	0.32	2.12	14,194	1854	0.13	0.89	-2,546	-0.19	-1.22	-57.9%	0.93
300 MPMC	5,060	144	0.03	0.07	4,886	130	0.03	0.06	-14	0.00	-0.01	-10.1%	0.59
600 SCMC	14,166	893	0.06	0.43	14,200	1878	0.13	0.90	985	0.07	0.47	110.3%	0.10
Totals	**37,482**	**6724**	**0.18**	**3.23**	**40,068**	**4457**	**0.11**	**2.14**	**-2,267**	**-0.32**	**-1.09**	-33.7%	0.77
Summary Total													
Evaluation Units	28,444	8,362	0.29	4.02	28,535	4,515	0.16	2.17	-3,847	-0.27	-1.85	-46.0%	0.96
Comparison Units	107,724	12,115	0.11	5.82	103,525	24,465	0.24	11.76	12,350	0.12	5.94	101.9%	0.23

The evaluation units are in red bolded font.

Appendix W

Fall Event Outcomes

		4/1/2015 - 3/31/2016 (FY16)				7/1/2016 - 8/31/2016 (Annualized)					Change in Fall Outcomes			
Surgical	Census	Total Fall Count	Fall Rate per 1000 Pt Days	Fall Injury Count	Injury Rate per 1000 Pt Days	Census	Total Fall Count	Fall Rate per 1000 Pt Days	Fall Injury Count	Injury Rate per 1000 Pt Days	Total Fall Count	Fall Rate per 1000 Pt Days	% Change in Rate	p Value
150 EMC	15,065	63	4.18	2	0.13	11,815	42	3.55	0	0.00	-21	-0.63	-15.0%	0.85
200 GSMC	8,064	26	3.22	3	0.37	7,547	18	2.39	0	0.00	-8	-0.84	-26.0%	0.69
300 MPMC	8,404	16	1.90	0	0.00	8,142	24	2.95	0	0.00	8	1.04	54.8%	0.25
350 MHMC	4,619	8	1.73	1	0.22	5,069	6	1.18	0	0.00	-2	-0.55	-31.7%	0.65
600 SCMC	7,938	12	1.51	3	0.38	7,900	6	0.76	0	0.00	-6	-0.75	-49.8%	0.67
Totals	**44,090**	**125**	**2.84**	**9**	**0.20**	**40,473**	**96**	**2.37**	**0**	**0.00**	-29	-0.46	-16.3%	0.76
Medical														
150 EMC	12,039	64	5.32	3	0.25	11,468	126	10.99	0	0.00	62	5.67	106.7%	0.02
200 GSMC	5,345	11	2.06	1	0.19	5,275	12	2.27	0	0.00	1	0.22	10.5%	0.43
300 MPMC	11,282	37	3.28	1	0.09	10,691	24	2.24	0	0.00	-13	-1.03	-31.5%	0.79
350 MHMC	14,643	46	3.14	5	0.34	14,341	48	3.35	0	0.00	2	0.21	6.5%	0.41
600 SCMC	11,287	30	2.66	2	0.18	9,743	30	3.08	0	0.00	0	0.42	15.8%	0.42
Totals	**54,596**	**188**	**3.44**	**12**	**0.22**	**51,518**	**240**	**4.66**	**0**	**0.00**	52	1.22	35.3%	0.11
Telemetry														
150 EMC	4,455	33	7.41	2	0.45	6,788	28	4.12	1	0.15	-5	-3.28	-44.3%	0.76
200 GSMC	13,801	48	3.48	3	0.22	14,194	54	3.80	0	0.00	6	0.33	9.4%	0.45
300 MPMC	5,060	11	2.17	0	0.00	4,886	6	1.23	0	0.00	-5	-0.95	-43.5%	0.75
600 SCMC	14,166	35	2.47	1	0.07	14,200	42	2.96	0	0.00	7	0.49	19.7%	0.36
Totals	**37,482**	**127**	**3.39**	**6**	**0.16**	**40,068**	**130**	**3.24**	**1**	**0.02**	3	-0.14	-4.2%	0.56
Summary Total														
Evalution Units	28,444	94	3.30	8	0.28	28,535	102	3.57	0	0.00	8	0.27	8.16%	0.42
Comparison Unit:	107,724	346	3.21	19	0.18	103,524	364	3.52	1	0.01	18	0.30	9.47%	0.43

The evaluation units are in red bolded font.

Appendix X

Table 1

Sitter Utilization Control Chart – Initial Implementation Units

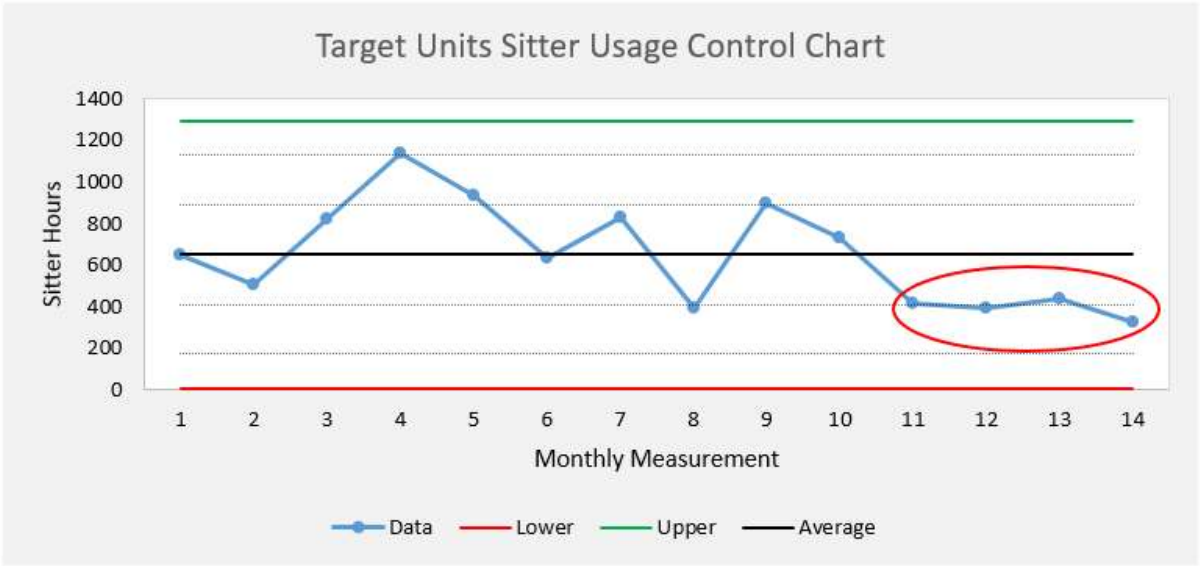
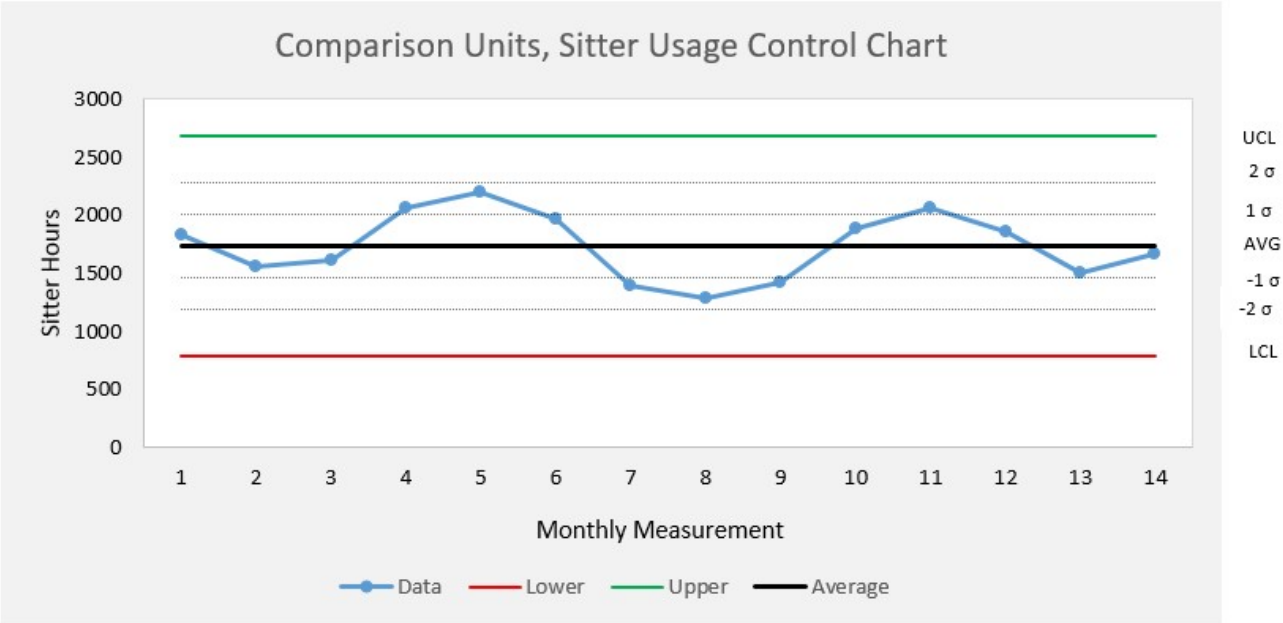


Table 2

Sitter Utilization Control Chart – Other Acute Care Units



Appendix Y

Table 1

Fall Rate Control Chart – Initial Implementation Units

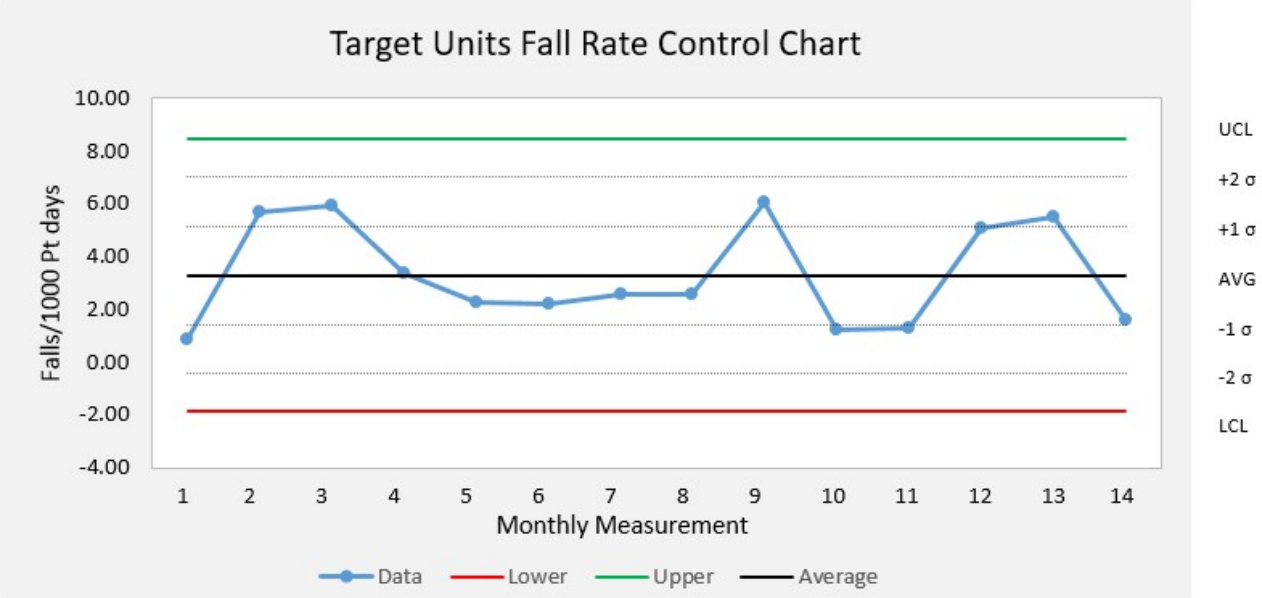
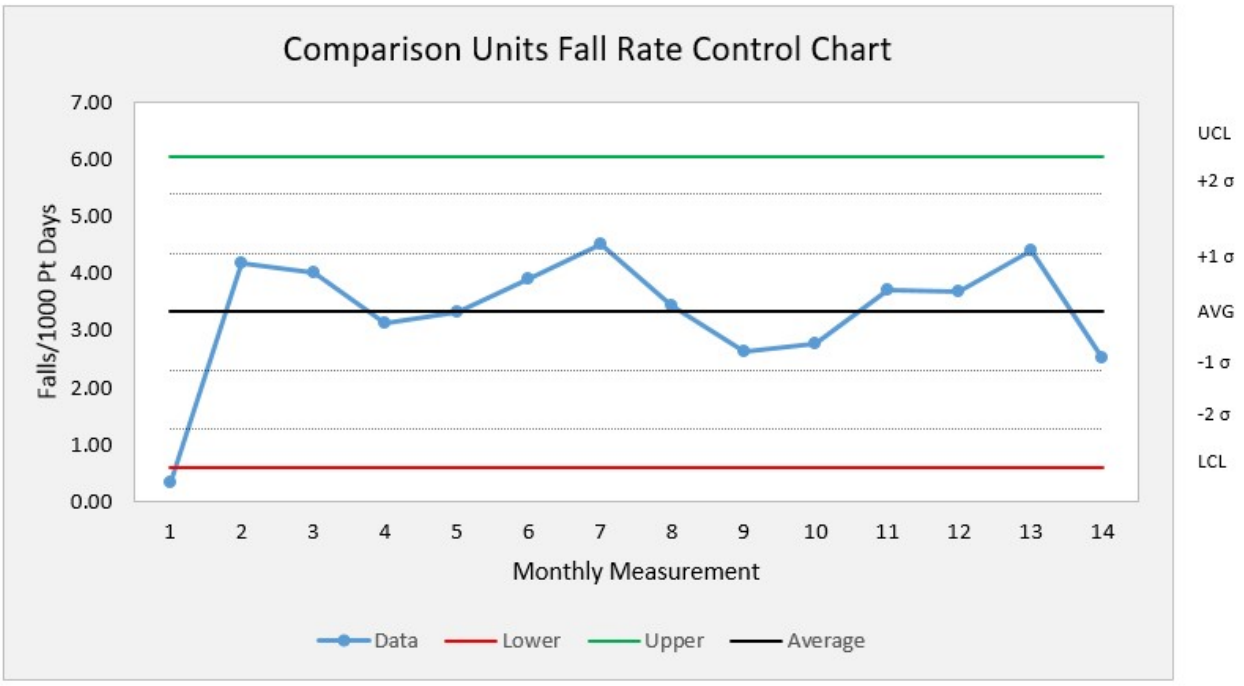


Table 2

Fall Rate Control Chart – Other Acute Care Units



Appendix Z

DNP Project Approval Form: Statement of Determination

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Student Project Approval: Statement of Determination

Student Name: Timothy Bock

Title of Project: Sitter Reduction: Replacing Use of Sitters with Evidence-Based Patient Safety Alternatives

Brief Description of Project:

A) Aim Statement:
During the implementation of the sitter efficacy improvement intervention from February 1, 2016 through August 1, 2016 the program will reduce patient fall rates and harm from falls at the targeted hospital site while simultaneously reducing site reliance upon patient care sitters. Utilizing the Iowa Model of Evidence-Based Practice to Promote Quality Care the project will implement small and quick test of change interventions based on identified problem and knowledge triggers across each of the participating inpatient departments. The program will monitor fall reports, sitter utilization, and alternative strategy effectiveness in real-time as a feedback loop for continual process improvement. Aggregate reports will be provided to the project's executive sponsor on a bi-weekly basis. Goals of the program are to reduce the fall rate by 25%, harm from fall events by 25%, and sitter utilization by 75%.

B) Description of Intervention:
A site specific intervention will improve patient fall safety and reduce the utilization of sitters through implementation of three evidence-based intervention types:

- Management - Use of standardized screening, ordering, and reassessment process for utilization of sitters for continuous patient observation.
- Technology and Equipment - Training and access to safety alternatives such as mobile exit alarms, diversionary activities, and low beds.
- Direct Staff Intervention - Staff training on staff directed safety interventions such as public observation, de-escalation, implementation of enhanced rounding, scheduled bathroom rounding.

C) How will this intervention change practice?
This performance improvement effort will modify the manner in which assessments, ordering, and continuation of the sitter intervention occurs within the participating site. Current practice is non-standard with a high degree of process variation across and within departments. In coordination with standardization of sitter management, the implementation of training, technology, equipment, and proactive rounding practices will provide a new

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and broad inventory of alternative safety options for staff. As a whole this project, through its minimization of sitter usage, is anticipated to provide the organization with substantial savings in direct labor costs.

D) Outcome measurements:

- Fall outcome performance will be extracted from the internal StatIT database. This historical database captures all reported fall events and fall events with injury as defined by the organization.
- Patient census data will be extracted from the organization's electronic medical record system that provides a nightly audited census. This number will be used in calculation for rates of falls and falls with injury.
- Sitter utilization will be collected by a site specific staffing documentation tool and validated against the organization's time and attendance system. Savings will be calculated directly using an average hourly rate provided by the organization's Payroll department.

To qualify as an Evidence-based Change in Practice Project, rather than a Research Project, the criteria outlined in federal guidelines will be used: (http://answers.hhs.gov/ohrp/categories/1569)

✓ This project meets the guidelines for an Evidence-based Change in Practice Project as outlined in the Project Checklist (attached). Student may proceed with implementation.

☐ This project involves research with human subjects and must be submitted for IRB approval before project activity can commence.

Comments:

EVIDENCE-BASED CHANGE OF PRACTICE PROJECT CHECKLIST *

Instructions: Answer YES or NO to each of the following statements:

Project Title: Sitter Reduction: Replacing Use of Sitters with Evidence-Based Patient Safety Alternatives	**YES**	**NO**
The aim of the project is to improve the process or delivery of care with established/ accepted standards, or to implement evidence-based change. There is no intention of using the data for research purposes.	X	
The specific aim is to improve performance on a specific service or program and is a part of usual care. ALL participants will receive standard of care.	X	
The project is NOT designed to follow a research design, e.g., hypothesis testing or group comparison, randomization, control groups, prospective comparison groups, cross-sectional, case control). The project does NOT follow a protocol that	X	

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overrides clinical decision-making.		
The project involves implementation of established and tested quality standards and/or systematic monitoring, assessment or evaluation of the organization to ensure that existing quality standards are being met. The project does NOT develop paradigms or untested methods or new untested standards.	X	
The project involves implementation of care practices and interventions that are consensus-based or evidence-based. The project does NOT seek to test an intervention that is beyond current science and experience.	X	
The project is conducted by staff where the project will take place and involves staff who are working at an agency that has an agreement with USF SONHP.	X	
The project has NO funding from federal agencies or research-focused organizations and is not receiving funding for implementation research.	X	
The agency or clinical practice unit agrees that this is a project that will be implemented to improve the process or delivery of care, i.e., **not** a personal research project that is dependent upon the voluntary participation of colleagues, students and/ or patients.	X	
If there is an intent to, or possibility of publishing your work, you and supervising faculty and the agency oversight committee are comfortable with the following statement in your methods section: *"This project was undertaken as an Evidence-based change of practice project at X hospital or agency and as such was not formally supervised by the Institutional Review Board."*	X	

ANSWER KEY: If the answer to ALL of these items is yes, the project can be considered an Evidence-based activity that does NOT meet the definition of research. IRB review is not required. Keep a copy of this checklist in your files. If the answer to ANY of these questions is NO, you must submit for IRB approval.

***Adapted with permission of Elizabeth L. Hohmann, MD, Director and Chair, Partners Human Research Committee, Partners Health System, Boston, MA.**

STUDENT NAME (Please print): Timothy Bock

Signature of Student: Timothy J. Bock **DATE: 7/20/2015**

SUPERVISING FACULTY NAME (Please print): Dr. Marjorie Barter

Signature of Supervising: : _____ **DATE** 7/22/2015

Appendix AA

Letter of Organizational Support

Legacy Health
1919 N.W. Lovejoy St.
Portland, OR 97209
503.415.5600 *phone*
503.415.5777 *fax*

October 29, 2015

To Whom It May Concern:

Tim Bock has received permission from Legacy Health to conduct his DNP project, "Sitter Reduction and Fall Improvement: A Quality Improvement Initiative" within our organization. He will be working directly with identified department managers and staff in the course of his project. The Senior VP and Chief Nursing Officer will serve as the executive champion for this initiative and is specifically included within the communication plan for project.

Sincerely

Carol Bradley, MSN, RN, CENP

Senior VP and Chief Nursing Officer
Legacy Health
cbradley@lhs.org