Fall 12-11-2020

That's Fall She Wrote: Decreasing the Patient Fall Rate on a Medical-Surgical Unit Through an Enhanced Fall Algorithm in the Electronic Medical Record

Lauren A. Fast
University of San Francisco, laurenakemifast@gmail.com

That's Fall She Wrote: Decreasing the Patient Fall Rate on a Medical-Surgical Unit Through an Enhanced Fall Algorithm in the Electronic Medical Record

Lauren A. Fast

School of Nursing and Health Professions, University of San Francisco

NURS 653: CNL Internship

Dr. Robert Patterson

Dec. 3, 2020

Abstract

All falls, regardless of harm, increase the length of stay for the patient in the hospital (Dunne et al., 2014), and are thus a focus for the Clinical Nurse Leader (CNL) in improving patient outcomes at the microsystem level. This paper will focus on the use of an enhanced fall algorithm (Moskowitz et al., 2020) that combines the use of nursing assessment, medications, laboratory results, and service to assess risk of the patient for falls. This algorithm will be integrated into the electronic medical record (EMR) to aid in clinical decision making and communication between staff and the disciplines. The aim of this project is to decrease the number of patient falls per 1,000 patient days by 50% from 2.04 falls per 1,000 patient days to 1.02 falls per 1,000 patient days by June 30, 2021. Measures for the project after implementation will be the amount of falls per 1,000 patient days. Due to COVID restrictions and difficulty in communication, the scope of this paper and the project will be limited to establishing a clear purpose and intervention for future use to prevent patient falls as well as anticipated results.

Keywords: EMR, electronic medical record, electronic health record, falls assessment

That's Fall She Wrote: Decreasing the Patient Fall Rate on a Medical-Surgical Unit through an Enhanced Fall Algorithm in the Electronic Medical Record

Despite many attempts at improvement, patient falls has remained a concern for acute care settings leading to constant reforms and collaboration. As inpatient hospital falls are considered a "never-event", and are not reimbursed through Medicare, costs to the hospital can be devastating, costing nearly $14,000 per fall with injury (The Joint Commission, 2015). By addressing falls in a cost-effective manner, not only will savings to the hospital be added as a benefit, but patient safety may also be improved.

The microsystem of interest, a medical-surgical unit in a not-for-profit community hospital in a major downtown region, has used the similar goals and values as other major hospitals in the region, including the values of teamwork in providing collaborative healthcare to the community, as indicated in the organization's online profile. As quality improvement and a focus on prevention is a priority for this hospital, an algorithm built into the electronic medical record system to predict patient falls will add to the quality of care provided as well as the continued progress towards effective safe care. A quality improvement project addressing patient safety and reducing costs to the unit will expand on the vision of the hospital to deliver safe, effective care to the patients they serve.

Problem Description

The community hospital of focus is located in a busy downtown metropolitan area and serves mainly non-native English speaking patients. With an older patient population that is reflective of the country at large, an algorithm to predict patient falls to focus prevention on a unit-based scale will be powerful in addressing the Quality and Safety Education for Nurses (QSEN) competencies of patient-centered care and safety (QSEN, 2020).

Historical Falls Data

The number of patient falls with and without injury per 1,000 patient days has been tracked in the hospital of interest for several years. The data that was available for the current project was for the 2017 to 2019 quarters (see Figure 1). A graphic illustrating the fall rate per 1,000 patient days demonstrates an overall low rate of patient falls per quarter, and even fewer falls with injury. The annual average rate of patient falls from 2019 of 2.04 patient falls per 1,000 patient days was used as a baseline (see Figure 1).

In further analysis, a run chart of the available quarterly data (see Figure 2) did not demonstrate special cause variation. Given that there were only eleven data points and seven runs in the run chart, such deviation from the median can be explained through common cause variation. This draws the conclusion that the number of patient falls per quarter was due to common cause variation and does not need further investigation. However, attention should still be devoted into decreasing the rate of patient falls, even for a hospital unit that has relatively low number of patient falls per quarter.

Mobilization Rates

Additional data that was provided by the hospital was detailing mobilization rates for patients, which portrays a range of 50 to 69% of patients being mobilized per shift (see Table 1). A run chart of the percent mobilization for the years 2017 to 2020 showed a shift in the process during the year 2017 (see Figure 3); this suggests special cause variation and should be examined in further research around mobilization practices on the unit. Other years proved to have variations due to common causes.

This assessment is valuable, as early mobilization and strengthening may decrease the rate of falls in acute care settings (Growdon et al., 2017). Though it was beyond the scope of this

project to investigate mobilization and fall prevention, further research should be conducted on the increase of mobilization in relation to the falls rate on the unit.

Staff Survey

A survey conducted with 26 staff members, a majority of staff surveyed from the Medical-Surgical Unit, helped to narrow the focus of improving falls rate on the unit and providing an effective intervention. According to a staff survey taken on October 22nd through October 29th, 73.1% of staff felt that addressing patient falls on the unit is “extremely urgent” (see Figure 4), naming causes of falls as dementia, patient confusion, and lack of sufficient staffing on the unit (see Figure 5).

A fishbone diagram (Figure 6) was used to visualize these causes of patient falls on the unit, as observed by staff members based off of the survey collected. Though the initial intervention planned by the team was to improve communication on the unit, the initial staff survey reported excellent communication on the units of interest, with 65.4% of staff rating communication between nursing, physical therapy, management, and physicians as “Great” or “Excellent” (see Figure 7). In terms of possible solutions to improve the rate of falls on the unit, one staff member suggested “[a] section in Cerner to chart [patient] fall, it’s unclear to when the patient fall and report didn’t say so”. This led to addressing the electronic medical record (EMR) to incorporate falls prevention.

There are no set standards for falls rate per 1,000 patient days when comparing the falls rate of patients in this hospital to national benchmarks (Agency for Healthcare Research and Quality [AHRQ], 2017). However, a study by Bouldin et al. (2013) found that medical surgical units had the highest rate of falls per 1,000 patient days, with a distribution of falls as seen in the table in Table 2. As the unit of interest is a Medical-Surgical unit, the current fall rate of 2.04

patient falls per 1000 patient days places the unit in the lowest quartile of patient falls for medical-surgical units. Despite this information, previous research and literature has demonstrated areas for improvement, as well as the continual need for increased patient safety in today's healthcare system.

Available Knowledge/Literature Review

The PICOT question that was used in reviewing current literature on falls prevention was the following: In medical-surgical patients at a not-for-profit community hospital (P), how does an enhanced fall algorithm (I) compared to lack of use of falls risk assessment in the EMR (C) affect the fall rate (O) within a seven month time span (T)? A CINAHL search using the key words *EMR OR electronic medical record OR electronic health record AND Falls Assessment* yielded 42 results. Seven articles from the years between 2013 and 2020 were used in this literature review to demonstrate evidence for improving falls rates in the hospital, the benefit of using EMR in the prevention of falls, and the need for sustained implementation and evaluation of change.

Falls Prevention Background

Do falls, regardless of severity, always lead to an adverse outcome for the hospital and patients? Researchers found that falls consistently lead to increased length of stay in the hospital. Dunne et al. (2014) conducted a retrospective observational study in examining the effect of falls on length of stay in the inpatient setting, regardless of harm incurred by the fall. Data from a 728 bed acute care setting in Canada was reviewed, and the study found that those who did not fall during their stay were more than twice as likely to be discharged earlier than patients who did experience a fall. This study provides context that patient safety and falls prevention should

remain a priority for the external perception of the hospital as well as for cost savings for the patient and the hospital.

Bouldin et al. (2013) conducted a retrospective observational study to estimate the prevalence of falls in various units to establish a distributional trend of falls on medical, surgical, and medical-surgical floors. Data was collected from the National Database of Nursing Quality Indicators (NDNQI) over a 27 month period over 1,263 hospitals in the United States, which revealed a rate of falls of 3.3 to 11.5 per 1,000 patient days. This research was helpful in establishing benchmark data for the current falls prevention project, as data specific to the medical-surgical unit at the hospital of interest could be evaluated against a national survey of falls on the same type of unit. Bouldin et al.'s study (2013) led to the comparison of the unit of interest of 2.04 patient falls per 1,000 days being placed in the lower quartile of medical-surgical floors, demonstrating a low rate comparatively in adverse events such as falls.

Falls Risk Assessment Tools

Many fall risk assessments have been selected by a variety of medical systems, but are any of them effective in predicting and preventing patient falls? Klinkenberg and Potter (2017) conducted a retrospective observation study to test the validity of the Johns Hopkins Fall Risk Assessment Tool (JHFRAT). The results of this tool demonstrated low sensitivity and low predictive variability, possibly due to using the patient's subjective self-assessment of their mobility status instead of observing the patient walk. Klinkenberg and Potter's research highlighted the need to use a risk assessment tool with nursing assessment skills such as palpation, auscultation, and inspection (2017).

The majority of evidence focused on the fall risk assessment called the Morse Fall Scale (MFS) to alert staff of a patient's increased risk for falls, on a low, moderate, or high risk. Lucero

et al. (2018) used this scale, but called for additional risk factor predictions to be added to the specific unit of interest based on the patterns of the hospital's electronic medical record. The major takeaway from Lucero et al.'s (2018) study was that hospitals should tailor the fall risk scale to their specific population of patients based on trends of data already taken in the EMR.

A major discovery was found in Moskowitz et al.'s 2020 retrospective study to create the Enhanced Fall Algorithm (EFA) from 171,515 hospitalizations and 2,659 falls. Researchers used major components such as nursing assessments, medications, abnormal laboratory values, and hospital service (unit). While the MFS found 28% of patients at high risk for falls, only 3.3% of these patients had a fall. The EFA, which combines the MFS along with the components mentioned above, identified 16.2% of patients at high risk for falls with falls occurring in 5.1% of these patients, indicating that a combination of risk scale and other assessments can be effective in predicting in which patients will actually experience an inpatient hospital fall (Moskowitz et al., 2020). Such high prediction rate is valuable for staff, as a ceiling effect may take place with consistently high rates of patients being categorized as high fall risk without actually experiencing a fall (Ruroede et al.'s 2016), leading to information overload to the nursing staff. Staff should constantly be considered when implementing change, and research provided a solution for promoting buy-in by staff.

Stakeholder Buy-In

Compelling research by Lytle et al. (2015) addressed how to improve compliance with charting falls risk in the EMR of the hospital contributing to the creation of the intervention for this project. It is important to integrate nursing assessment into the EMR as it promotes the ease of communication between disciplines and allows for clinical decision support for the typically busy nurse. Researchers performed a quasi-experimental study design to set up a clinical

decision support within the EMR to remind nurses to document falls risk of the patient, and to alert other staff of the patient's fall risk needs (Lytle et al., 2015). The results of this study, in post-implementation phases, were that documentation of fall risk assessments improved with favorable staff satisfaction, but without clinical change in outcomes. Though there was no clinical improvement in falls prevention, this study indicated that reminders can be set up in future projects to document fall risk assessment to improve compliance with a change in procedure.

Implementation of Falls Prevention

Although it is beyond the scope of this current project to go through the implementation of the EFA into the EMR, future plans regarding falls prevention implementation should be rigorous in addressing concerns of implementation. Yokota et al.'s study in 2018 can be used as the basis for evidence for the need to include interventions along with a screening tool. Yokota et al. found a decreased rate of falls after implementing a new falls risk assessment tool, but the difference from pre-implementation rates was not statistically significant (2018). As this evidence points out, it is important to note that the Hawthorne effect can be observed in a short intervention and evaluation period; the role of a clinical nurse leader is invaluable as it can provide sustained change through multiple plan-do-study-act (PDSA) cycles and eventually standardization.

Rationale

The change theory that was used in the implementation of this project came from Lippitt's theory. In initiating change, the Clinical Nurse Leader (CNL) should use evidence based theories in initiating and maintaining change at the microsystem level. Mitchell's (2013) research on selecting the change theory for medical-surgical units gave an examination of Lewin's,

Rogers's, and Lippitt's change theories, and how barriers to change and encouraging buy-in are needed by the change agent. Lippit's theory uses four elements from the nursing process in implementing change: assessment, planning, implementation, and evaluation (Mitchell, 2013). There are four phases within these elements: diagnosing the problem, assessing the motivation and capacity for change, assessing the change agent's motivation and resources, selecting progressive change objective, choosing appropriate role of the change agent, maintaining change, and terminating the helping relationship (Mitchell, 2013). These phases and elements were used in the formation of the Gantt Chart (see Figure 8) to organize the phases and stages of the falls prevention project.

Specific Project Aim

The specific project aim was defined as follows: We will decrease the number of patient falls per 1,000 patient days by 50% from 2.04 falls per 1,000 patient days to 1.02 falls per 1,000 patient days by June 30, 2021. This aim statement was informed by data gathered from the hospital of interest, and was used to frame the process for improvement. By decreasing the patient fall rate by a measurable percentage and giving a goal of 1.02 patient falls per 1,000 days, the team will be able to assess on June 30, 2021 if the goals for the project have been met or need adjustments.

Methods

Over the course of three months, existing literature was reviewed, the specific unit of interest was observed and surveyed to discover possible interventions for falls prevention, and current falls data for the unit of interest was collected. A unit assessment was conducted within the initial phases of the project to assess readiness for change and the existing communication

strategies, and the final metrics were used in assessing progress and diagnosing additional changes to be made.

Context

A unit communication assessment tool (see Figure 9) was used in assessing the current communication practices of the unit. This unit appears to have strengths of frequent unit meetings and nursing hand-offs, as well as communication of signage outside of patient rooms. Current barriers to communication exist due to the recent transition to a new model hospital, as well as turnover in the management staff. This recent turnover in management can lead to miscommunication for existing projects and quality improvement strategies, and frequent changes in focus of priority for the unit. To further assess the hospital and microsystem of interest, further analysis on the market competition and financial benefits of the project were performed.

A strengths, weaknesses, opportunities, and threats (SWOT) analysis was conducted (see Table 3), with the aim to assess the current microsystem and communicate the benefit of a falls prevention program to the financial and cultural gain of the institution. In summary, the current strengths and opportunities for the project will be able to overcome weaknesses and barriers. The project team focused on improving the morale of the hospital staff in order to reduce length of stay and decrease adverse events for patients.

A cost-benefit analysis (see Table 4) was used to communicate the net benefits in savings of a falls prevention project that uses a minimal amount of materials with minimal cost of initiation. Given the low start-up costs of the project, an estimated net benefit savings of nearly $75,000 is provided through this analysis. Though any initial projection of savings requires edits after implementation, we project high savings for the hospital, as a result of implementation of a

falls prevention project. These fiscal savings and benefits are in addition to societal and personal benefits of a falls prevention program, such as job satisfaction and lower stress for the interdisciplinary staff.

In using Lippitt's theory of change, a force-field analysis was also conducted in brainstorming forces for change and against change (see Figure 10). A narrow advantage of the forces for change is demonstrated, with further actions being brainstormed in increasing the forces for change while mitigating the factors against change. As a result of this analysis, effective communication skills while promoting buy-in for the management and healthcare team are needed in order to effectively create change at the microsystems level. After these tools of analysis were used, implementation of the intervention was provided, with measurements to assess the success or need for improvement of the proposed change.

Intervention

The intervention that is proposed in this project is the integration of enhanced fall algorithm (EFA) within the Electronic Medical Record (EMR) Cerner. As discussed in the literature review section, an Enhanced Fall Algorithm will be used, combining nursing assessment (with the MFS), laboratory values, medications (antidepressants, antiseizure, etc), and hospital unit to calculate the patient's risk of a fall during hospitalization. The project leaders began the process of intervention in addressing the EFA to the informatics team, who elevated the project to the Cerner Health Care Executive to log a request for the model strategic business unit to review. The timeline for the current project is such that implementation of this intervention at this time is not feasible; therefore, the intervention and aim of this current paper is to set up a plan for future implementation of such an intervention if approved by the strategic business unit.

To address actions and approaches to improve performance, Kotter's eight step change model will be implemented (Kotter, n.d.) with repeated PDSA cycles as necessary (see Figure 11) to adjust strategies for continued improvement. Based off of weekly data gathering for the number of falls per 1,000 patient days, in addition to staff interviews about the ongoing needs of the project, the EFA may be edited and adjusted to match the needs of the unit. These implementation cycles of PDSA will lead to further adjustments until these changes are standardized.

Study of the Intervention

The metric of patient falls per 1,000 days is the standard for measuring falls prevalence in the inpatient setting. This metric was used in the retrospective analysis of falls data, as well as benchmarking data to compare the current unit to other medical-surgical units with similar patient composition. Additionally, nursing satisfaction was rated through interviews in the assessment phase of the project, with nursing satisfaction and feedback to create improvements with each subsequent PDSA cycle. A list of measures used in the analysis of data are listed in the following section.

Measures

The measures collected during this project included: falls per 1,000 patient days, mobilization percentage per shift, staffing ratio, and financial data for the microsystem. While at the time of writing, these metrics have not yet been collected, though we would expect to see a decrease in the rate of patient falls on the unit per 1,000 patient days.

Results and Plan to Implement

Given the time constraints of the project, implementation of the EFA was not able to be completed; however, the efforts to set up and establish the data and assessment of the unit of

interest were integral in the enaction of this project. The nursing informatics team was made aware of the algorithm, and notified the Cerner health care executive and the model strategic business unit. The project as described in the implementation Gantt chart (see Figure 11) details how Kotter's eight steps for change will be followed (Kotter, n.d.), with a sense of urgency and building coalition being utilized in the first month of the project, leading into strategic vision and initiatives and implementation of the project being carried out through the month of January. The Implementation plan will be discussed in further detail in the section below.

Implementation Plan

A comprehensive Gantt chart has been created as a rough draft of how the project will continue to be enacted through the first two quarters of 2021 (see Figure 12). Phase I, create a plan of urgency, will be used in the initial three weeks of the project. A poster presentation of the initial phases (see Figure 13) can be used to introduce the implementation phase to the staff on the medical-surgical floor. This will allow for feedback through a survey conducted in the post-meeting for additional thoughts and potential barriers to be addressed.

Phase II, or building a guiding coalition, will elicit volunteers and unit champions from the initial staff meeting to find members who will be on the medical-surgical unit that can help with the initiation of the project. A falls committee will be composed of volunteers and unit champions, with the intention to meet weekly regarding updates and needed changes to the EFA. Furthermore, in Phase II, a project champion who is an informal leader that other staff members respect and look up to, should be chosen in leading the change for this project. Additionally, Phase III will include the formation of PDSA cycles (see example in Figure 11) into week seven of the project.

Following the formation of PDSA cycles, Phase IV includes volunteer staff to provide revision that will be implemented in the next two weeks into January. This will lead to Phase V which is when the project team will encourage action by removing barriers. In this phase of removing barriers, a suggestion box can be created to gain anonymous feedback from staff. A summary of the project goals and current metrics should be posted in a common area for staff to review for updates, and a process map and FMEA may be necessary to address potential barriers and adverse events from the change in process.

The second half of the project begins with generating short term wins in Phase VI, leading to a falls report data sheet to be created to allow for easy feedback of how the project is performing. A weekly staff meeting will be established from the falls committee, so that unit champions and volunteers will be able to evaluate and plan further PDSA cycles from the falls data feedback. A kick-off party can be planned for early February, so that staff are aware of the firm start date of the project, and an initial PDSA cycle can be enacted over the next three weeks. Phase VII, sustaining acceleration, will be consisting of weekly staff meetings with three PDSA cycles. This phase will be the majority of the implementation project, running from mid February to mid May. PDSA revisions will consist of planning based on the data that has been provided from previous cycles, and revisions to the EFA will be implemented to allow for another studying period of new falls data.

Phase VIII as detailed in the implementation Gantt chart (see Figure 12) is the institution of change. Weekly staff meetings will be held as they were in the seventh phase, and an Standardize-Do-Study-Act cycle will be conducted to standardize the falls prevention algorithm. A unit champion will thereafter be assigned as a point person for the project's continued use, and the falls committee will terminate the helping relationship with the use of EFA as the project. It

is recommended the committee continue efforts to decrease patient falls on the unit (see Discussion for future projects).

Discussion

Summary

Though the project did not include implementation of an EFA into the EMR, a discussion presented here will detail the assessment of the unit, future projects for falls prevention, and lessons learned. The hope from this discussion is that a falls committee will be able to implement the project as designed, with future project ideas to brainstormed for future projects.

Key Findings

The key findings from this project were related to the unit assessment tools, such as the unit communication tool and staff surveys. The staff surveys illustrated the need for improved staffing and possible adjustments to documentation methods, leading to the incorporation of an EFA into the EMR in the current project. Other key findings were related to the 2017-2019 quarterly falls data as given by the hospital, revealing a low patient fall rate for a medical-surgical unit. Both of these key findings led to the specific aim to adjust the electronic medical record to prevent further falls in the unit, despite the pre-existing low falls rate for the hospital.

Lessons Learned

The primary lesson learned during this project was the value of good communication between the project team and administrators who had buy-in. As a result in breakdown of communication, the initial intervention was changed. Ultimately, it would be advised for future projects to utilize texting or in person meetings if possible to gain an understanding of the specific project aim and intervention.

Strengths

The contributions to the success of this project can be attributed to the "down-time" during which falls data was being collected and synthesized for the team. A full literature review was able to be conducted in preparation for the project, and a robust implementation plan could be devised for future use at the hospital. The potential for this intervention of the EFA could be widespread as hospitals are constantly looking to increase savings and patient safety.

Conclusions

The EMR could be a useful tool in predicting patients' susceptibility to falls while staying in the hospital. As medical-surgical units are at high risk for falls, an enhanced fall algorithm with increased accuracy in predicting falls will prevent future adverse events and streamline the nursing documentation process. This project could be adapted to various units of the hospital of interest, as it accommodates for service provided to the patient and a variety of medications prescribed. Recommendations for future projects for falls prevention would include further research on the use of mobilization in prevention of falls, as well as improved handoff technique between the nursing staff.

References

Agency for Healthcare Research and Quality. (2013, January). *Tool 3H: Morse fall scale for identifying fall risk factors.* AHRQ. https://www.ahrq.gov/professionals/systems/hospital/fallpxtoolkit/fallpxtk-tool3h.html

Agency for Healthcare Research and Quality. (2017, September). *Module 5: How to measure fall rates and fall prevention practices -- training guide.* AHRQ.gov. https://www.ahrq.gov/professionals/systems/hospital/fallpxtraining/workshop/module5/mod5-trguide.html

Bouldin, E. D., Andresen, E. M., Dunton, N. E., Simon, M., Waters, T. M., Liu, M., Daniels, M. J., Mion, L. C., & Shorr, R. I. (2013). Falls among adult patients hospitalized in the united states: Prevalence and trends. *Journal of Patient Safety, 9*(1), 13 - 17. https://doi.org/10.1097/PTS.0b013e3182699b64

Dunne, T. J., Gaboury, I., & Ashe, M.C. (2014). Falls in hospital increase length of stay regardless of degree of harm. *Journal of Evaluation in Clinical Practice, 20*(4), 396 - 400. https://doi.org/10.1111/jep.12144

Growdon, M. E., Shorr, R. I., & Inouye, S., K. (2017). The tension between promoting mobility and preventing falls in the hospital. *JAMA Internal Medicine, 177*(6), 759 - 760. https://doi.org/10.1001/jamainternmed.2017.0840

The Johns Hopkins Health System Corporation. (2007). *Johns Hopkins Fall Risk Assessment Tool.* Johns Hopkins Medicine. https://www.hopkinsmedicine.org/institute_nursing/models_tools/jhfrat_acute%20care%20original_6_22_17.pdf

The Joint Commission. (2015, September 28). *Preventing falls and fall-related injuries in health care facilities.* Sentinel Event Alert. https://www.jointcommission.org/-/media/deprecated-unorganized/imported-assets/tjc/system-folders/topics-library/sea_55pdf.pdf?db=web&hash=53EE3CDCBD00C29C89B781C4F4CFA1D7

Joint Commission Center for Transforming Healthcare. (n.d.) *Patient safety*. JCCTH. https://www.centerfortransforminghealthcare.org/improvement-topics/preventing-falls/

Klinkenberg, W. D., & Potter, P. (2017). Validity of the johns hopkins fall risk assessment tool for predicting falls on inpatient medicine services. *Journal of Nursing Care Quality, 32*(2), 108 - 113. https://doi.org/10.1097/NCQ0000000000000210

Kotter. (n.d.) *The 8-step process for leading change.* Kotter Inc. https://www.kotterinc.com/8-steps-process-for-leading-change/

The Leapfrog Group. (2020, April 30). _____ *hospital.* Leapfrog Hospital Safety Grade. https://www.hospitalsafetygrade.org

Lucero, R. J., Lindberg, D. S., Fehlberg, E. A., Bjarnadottir, R. I., Li, Y., Cimiotti, J. P., Crane, M., & Prosperi, M. (2018). A data-driven and practice-based approach to identify risk factors associated with hospital-acquired falls: Applying manual and semi- and fully-automated methods. *International Journal of Medical Informatics, 122*(2019), 63 - 69. https://doi.org/10.1016/j.ijmedinf.2018.11.006

Lytle, K. S., Short, N. M., Richesson, R. L., & Horvath, M. M. (2015). Clinical decision support for nurses: A fall risk and prevention example. *Computers, Informatics, Nursing, 33*(12), 530 - 537. https://doi.org/10.1097/CIN.0000000000000192

Mardis, M., Davis, J., Benningfield, B., Elliott, C., Youngstrom, M., Nelson, B., Justice, E. M., & Riesenberg, L. A. (2017). Shift-to-shift handoff effects on patient safety and outcomes: A systematic review. *American Journal of Medical Quality, 32*(1), 34 - 42. https://doi.org/10.1177/1062860615612923

Marianjoy Inc. (2007). *Marianjoy Fall Risk Assessment Tool for Inpatient Rehabilitation.* Marianjoy. https://cdn-links.lww.com/permalink/jncq/a/jncq_2015_09_07_ruroede_1500068_sdc1.pdf

Mitchell, G. (2013). Selecting the best theory to implement planned change. *Nursing Management, 20*(1), 32 - 37. https://doi.org/10.7748/nm2013.04.20.1.32.e1013

Moskowitz, G., Egorova, N. N., Hazan, A., Freeman, R., Reich, D. L., & Leipzig, R. M. (2020). Using electronic health records to enhance predictions of fall risk in inpatient settings. *The Joint Commission Journal on Quality and Patient Safety 2020, 46*(4), 199 - 206. https://doi.org/10.1016/j.jcjq.2020.01.009

QSEN. (2020). *QSEN institute competencies.* QSEN.org. https://qsen.org/competencies/

Ruroede, K., Pilkington, D., & Guernon, A. (2016). Validation study of the marianjoy fall risk assessment tool. *Journal of Nursing Care Quality, 31*(2), 146 - 152. https://doi.org/10.1097/NCQ.0000000000000158

Yokota, S., Tomotaki, A., Mohri, O., Endo, M., & Ohe, K. (2018). Evaluating the effectiveness of a fall risk screening tool implemented in an electronic medical record system. *Journal of Nursing Care Quality, 33*(4), E1 - E6. https://doi.org/10.1097/NCQ.0000000000000315

Table 1

Mobilization per shift in 2020, Medical-Surgical Unit

Month	Shift 1	Shift 2	Shift 3
Jan	95%	30%	15%
Feb	97%	31%	11%
Mar	93%	31%	8%
Apr	92%	36%	9%
May	89%	35%	8%
Jun	85%	36%	19%
Jul	86%	39%	21%
Aug	90%	45%	21%

Table 2

Distribution of fall and injurious fall rates per 1,000 patient days (Bouldin et al., 2013, p. 11)

		Percentile				
	Unit Type	10th	25th	50th	75th	90th
All Falls	Medical	2.49	3.13	4.06	5.03	6.04
	Surgical	1.36	2.02	2.76	3.61	4.60
	Medical-Surgical	1.86	2.66	3.54	4.55	5.71
Injurious Falls	Medical	0.26	0.59	0.96	1.36	1.79
	Surgical	0.08	0.31	0.57	0.88	1.24
	Medical-Surgical	0.17	0.49	0.83	1.21	1.64

Table 3
SWOT Analysis

Strengths **What can we use? (Internal)** - Increase patient satisfaction - Increase hospital's reputation - Increase Safety score of Hospital - Improve on Hospital's Values of Quality Improvement and Teamwork	**Weaknesses** **What can we improve? (Internal)** - Morale of Nursing staff? - Current rate of falls in the Medical-Surgical unit - Improved EHR predictions of falls risk for patients
Opportunities **What can we exploit? (External)** - Reduce length of stay - Reduce adverse events - Reduce miscommunication - Industry trends of safety in falls prevention	**Threats/Challenges** **What needs to be mitigated? (External)** - Sustainable financial backing for the project - Rate of technological change making it difficult for nurses to adapt to methods of communication - Coronavirus Pandemic may lead to distractions from decreasing falls - Nurses who need to adapt and adjust to a new method of communication (education)

Table 4

Cost-Benefit Analysis Table

Cost-Benefit Analysis (per 1,000 patient days)					
Benefits					
Item	**Savings**	**Number**	**Frequency**	**Subtotal**	**Total Savings**
Cost for Fall with Injury	$14,056	3.54 falls (Bouldin et al., 2013)	1000 patient days	$49,758	$49,758
Length of Stay	$3,532 per day for inpatient hospital cost (KFF, 2020)	6.3 days added to LOS for falls (Joint Commission Center, 2020)	3.54 falls per 1000 patient days	$45,916	***$128,529***
Costs					
Item	**Savings**	**Number**	**Frequency**	**Subtotal**	**Total Cost**
IT Training/Set-Up	$55.57/hour (median salary for Health Care IT in SF)	8 hours	One time cost	$444.56	$444.56
IT Reformatting time	$55.57/hour (median salary for Health Care IT in SF)	8 hours	One time cost	$444.56	$889.12
Training Time for Nurses	$51.98/hour (median salary for RN in SF MS unit)	2 nurses, 3 shifts, 0.5 hrs	One time cost (training)	$155.94	$1,045.06
Nursing Time	$51.98/hour (median salary for RN in SF MS unit)	0.1 hr, 8 patients	1000 patient days	$41,584.00	$42,629.06
Project Weekly Meetings	$51.98/hour for nurses, $56.91/hour for administration	6 nurses, 3 admin	23 planned meetings	$11,100.03	***$53,729.09***
Net Benefits Calculation					
					Calculation
				Benefits	$128,529
				Costs	$53,729
				Net Benefits	***$74,800***

Figure 1

Summary of Falls Data for 2017 to 2019

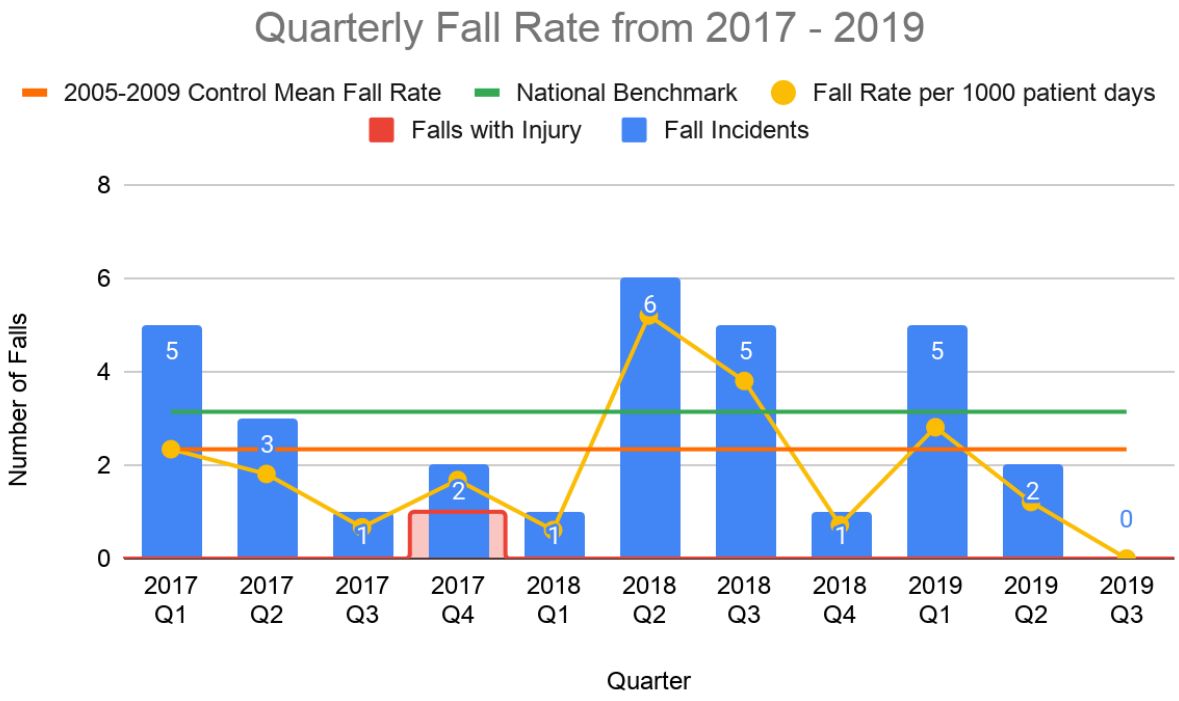


Figure 2

Run Chart of Falls per Quarter from 2017 to 2019

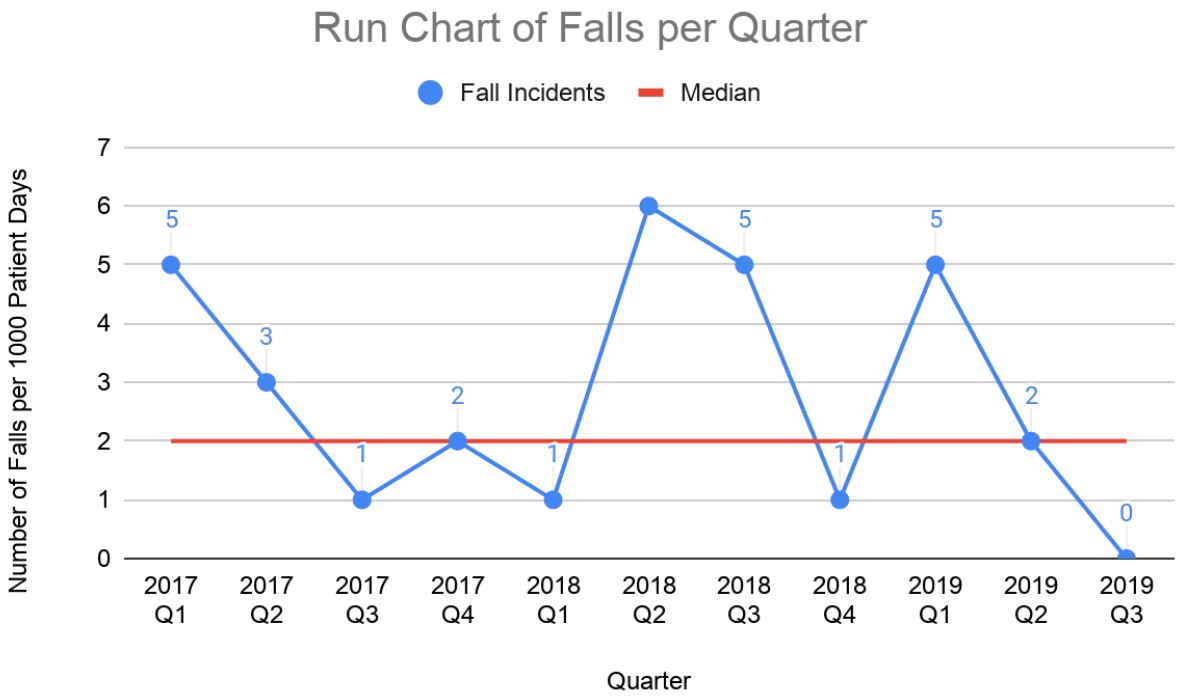


Figure 3

Run Chart for Percent Mobilization for 2017 - 2020

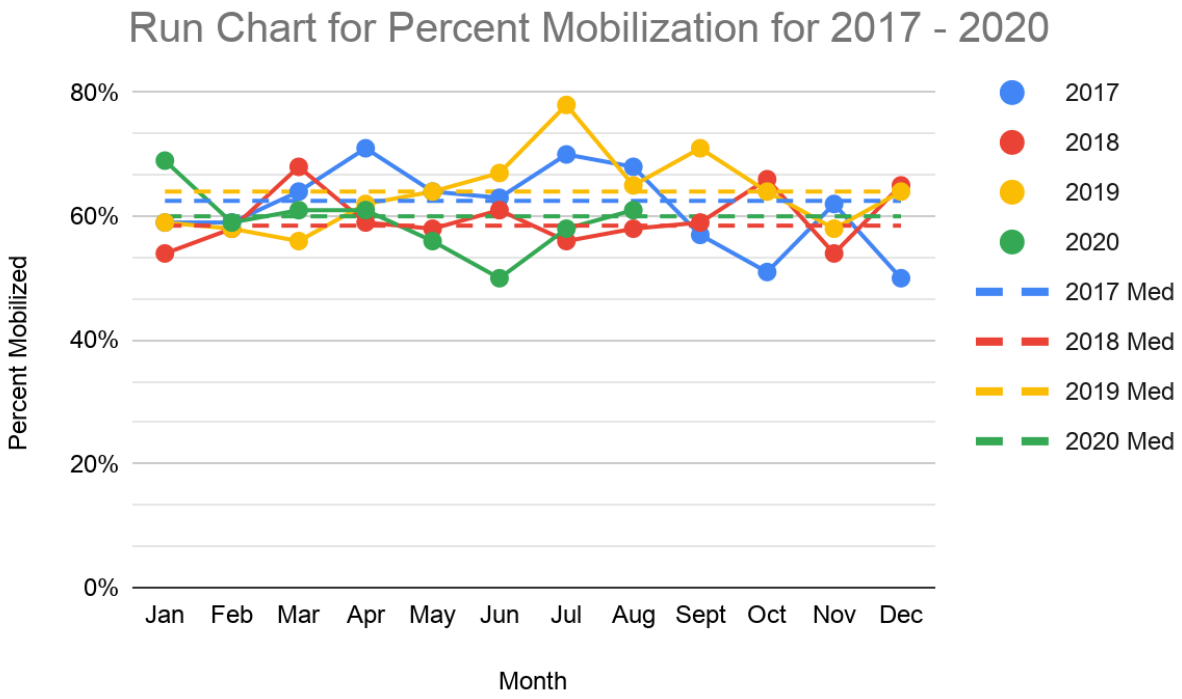


Figure 4

Staff Survey of the Urgency around Falls Prevention

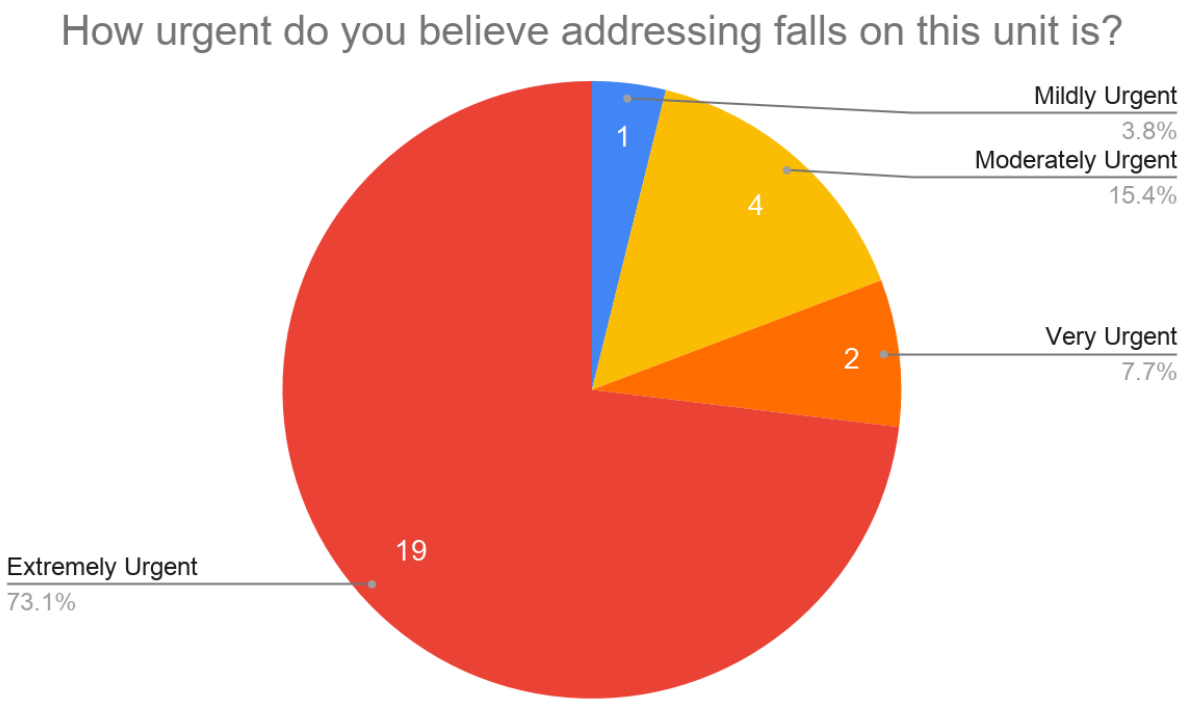


Figure 5

Staff Survey Responses on the Cause of Patient Falls on the Unit

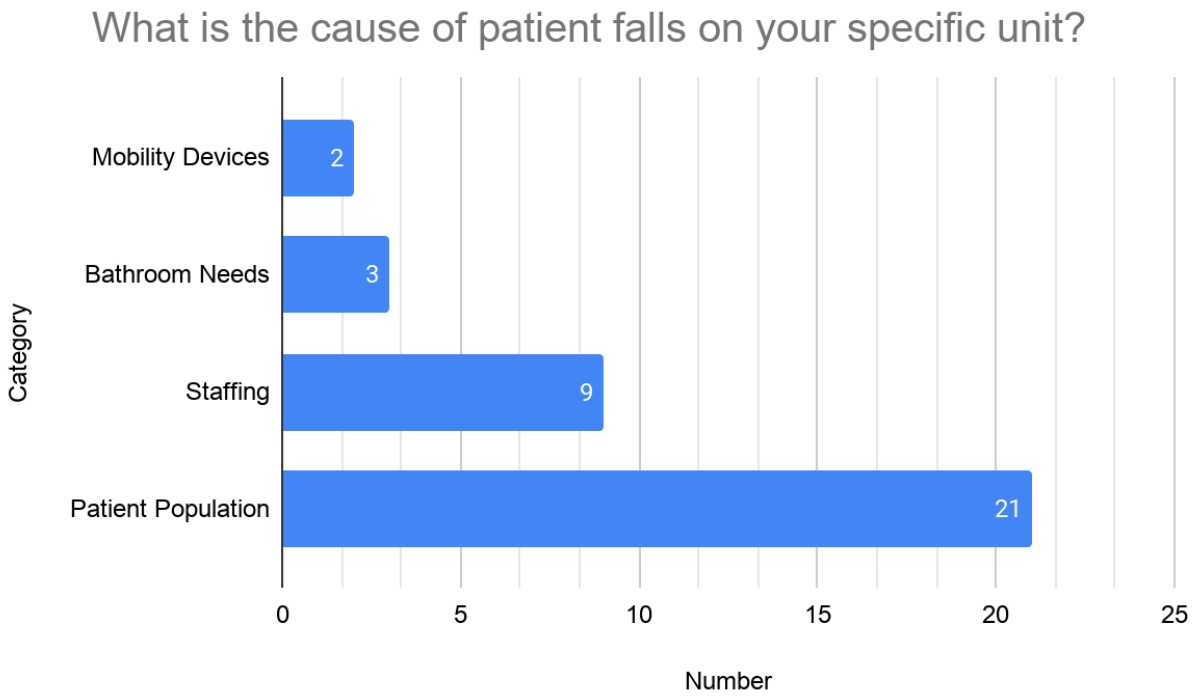


Figure 6

Fishbone Diagram for Patient Falls in the Medical-Surgical Unit

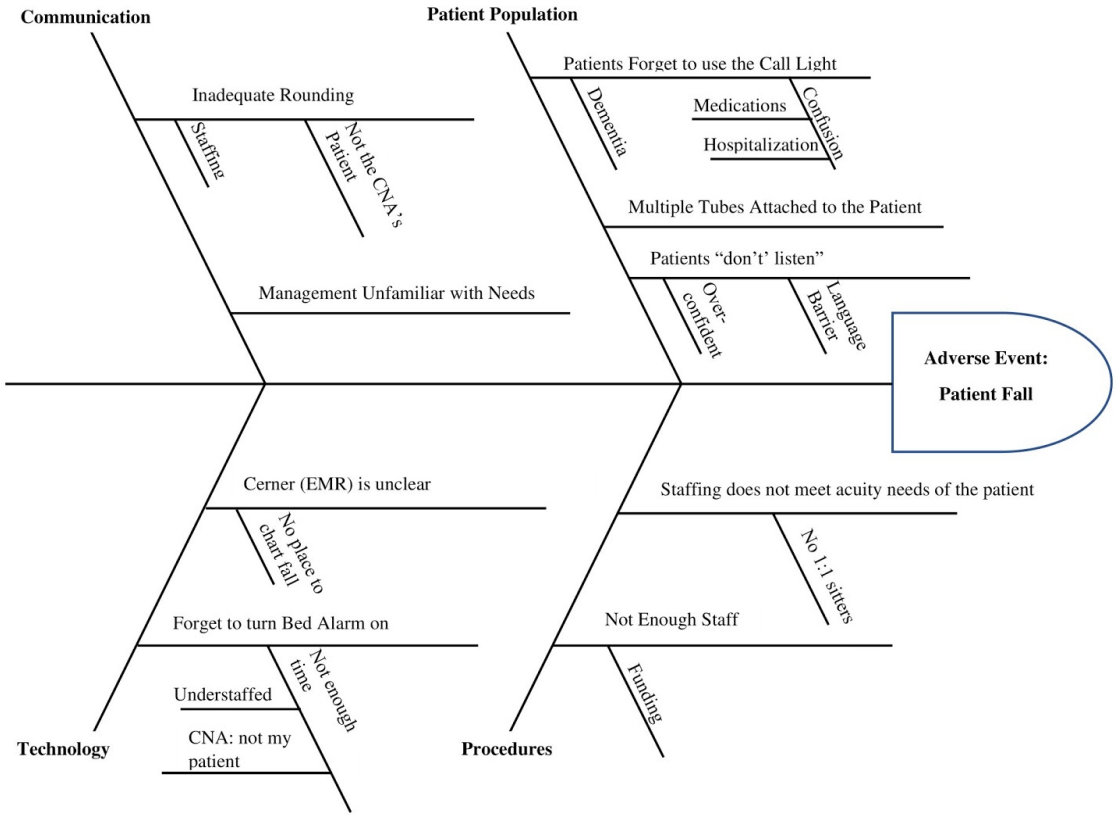


Figure 7

Staff Survey Subjective Rating of Communication

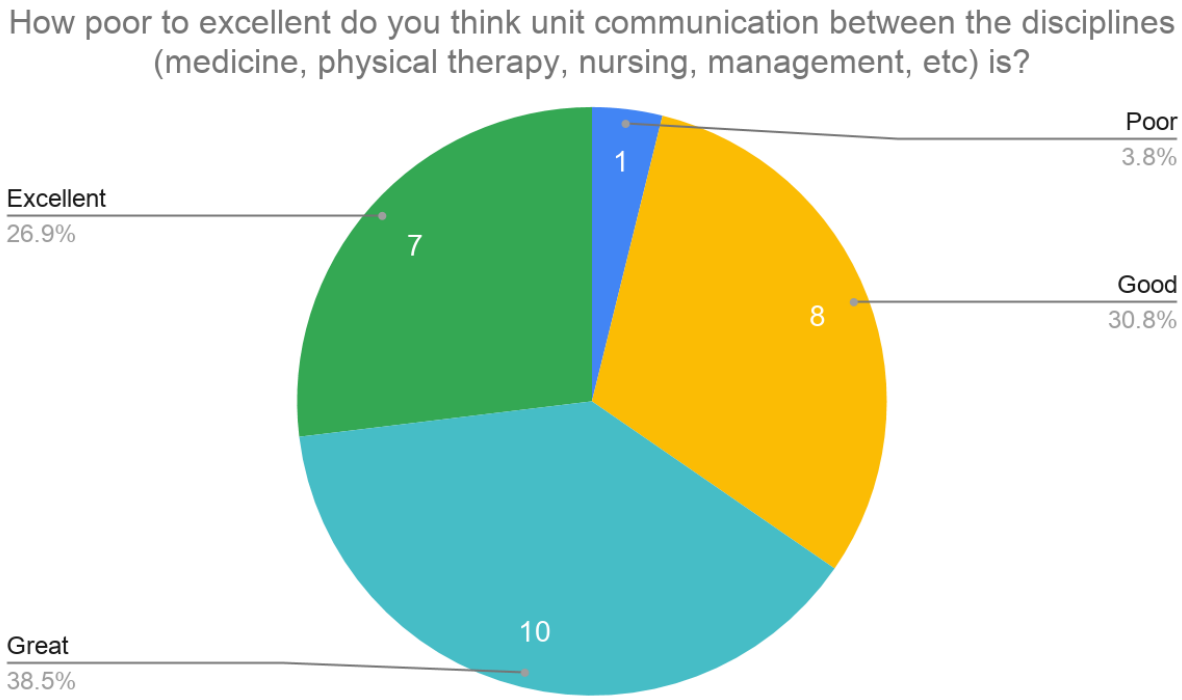
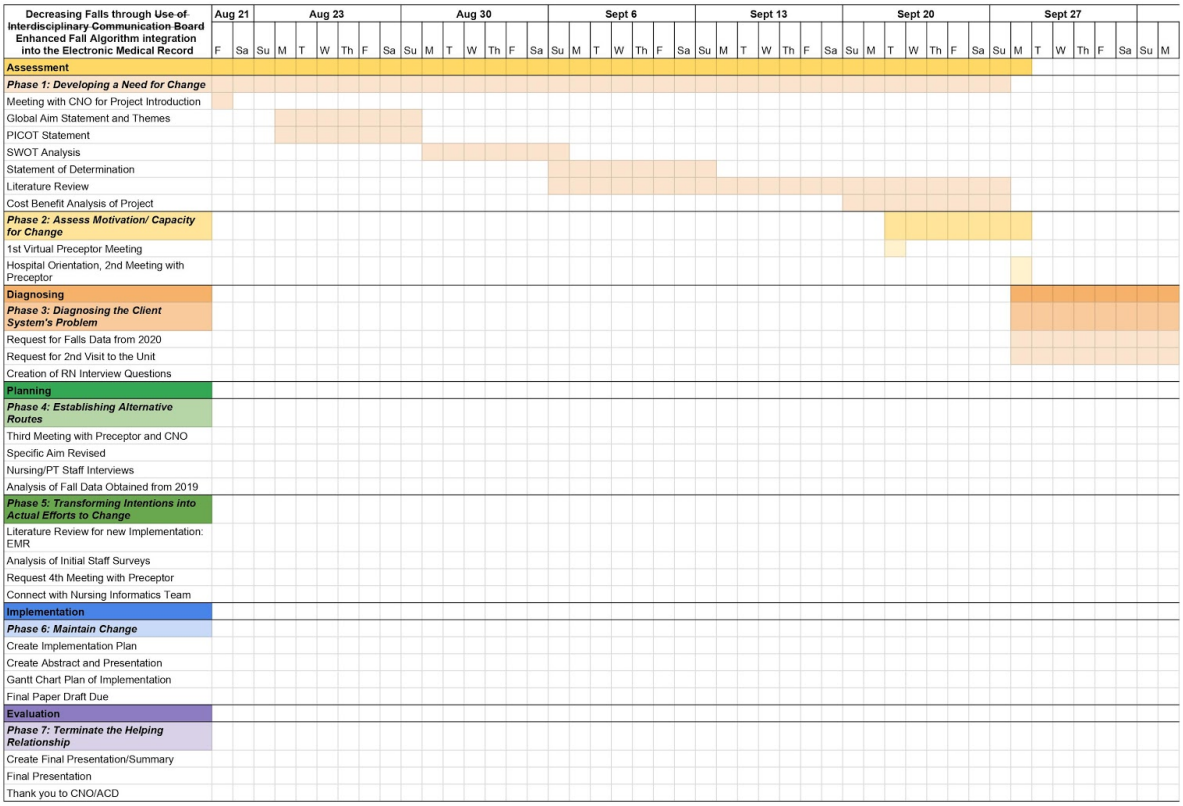
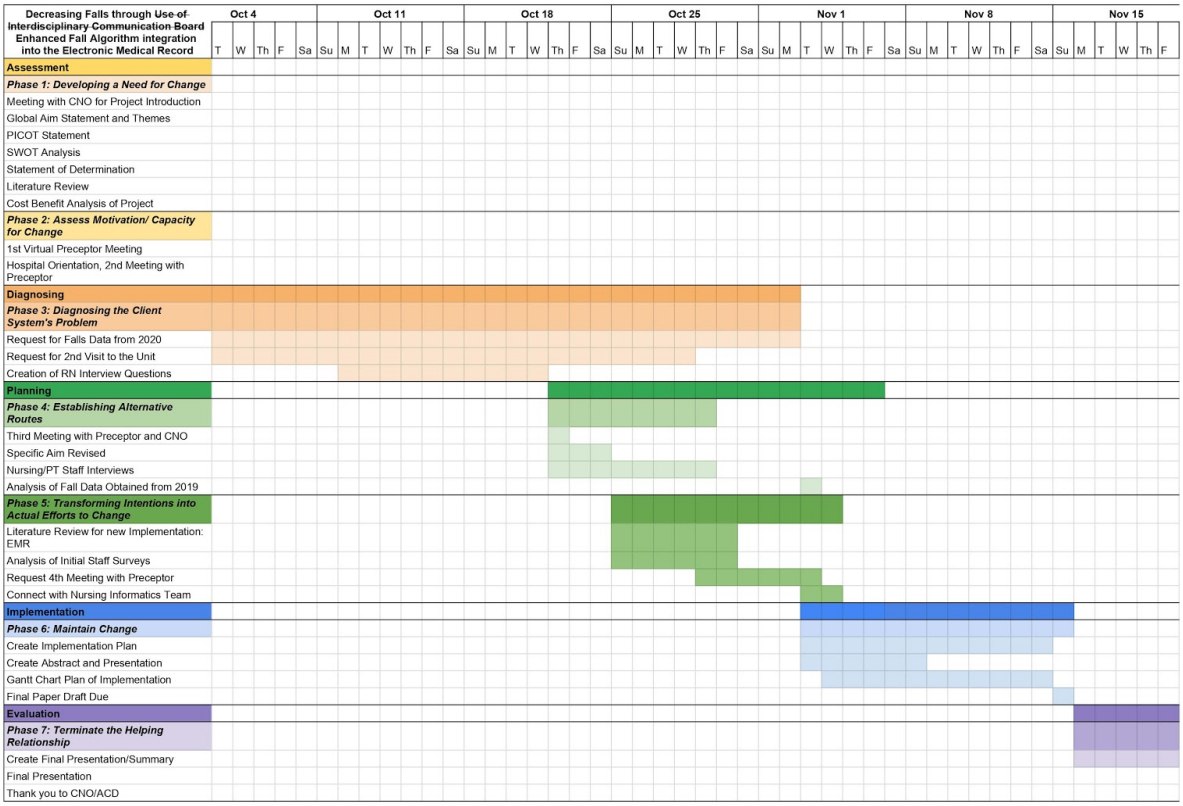


Figure 8

Gantt Chart for Fall Prevention Project




Decreasing Falls through Use of Interdisciplinary Communication Board Enhanced Fall Algorithm integration into the Electronic Medical Record
Oct 4
Oct 11
Oct 18
Oct 25
Nov 1
Nov 8
Nov 15
T W Th F Sa Su M T W Th F Sa Su M T W Th F Sa Su M T W Th F Sa Su M T W Th F Sa Su M T W Th F Sa Su M T W Th F
Assessment
Phase 1: Developing a Need for Change
Meeting with CNO for Project Introduction
Global Aim Statement and Themes
PICOT Statement
SWOT Analysis
Statement of Determination
Literature Review
Cost Benefit Analysis of Project
Phase 2: Assess Motivation/ Capacity for Change
1st Virtual Preceptor Meeting
Hospital Orientation, 2nd Meeting with Preceptor
Diagnosing
Phase 3: Diagnosing the Client System's Problem
Request for Falls Data from 2020
Request for 2nd Visit to the Unit
Creation of RN Interview Questions
Planning
Phase 4: Establishing Alternative Routes
Third Meeting with Preceptor and CNO
Specific Aim Revised
Nursing/PT Staff Interviews
Analysis of Fall Data Obtained from 2019
Phase 5: Transforming Intentions into Actual Efforts to Change
Literature Review for new Implementation: EMR
Analysis of Initial Staff Surveys
Request 4th Meeting with Preceptor
Connect with Nursing Informatics Team
Implementation
Phase 6: Maintain Change
Create Implementation Plan
Create Abstract and Presentation
Gantt Chart Plan of Implementation
Final Paper Draft Due
Evaluation
Phase 7: Terminate the Helping Relationship
Create Final Presentation/Summary
Final Presentation
Thank you to CNO/ACD


Decreasing Falls through Use of Interdisciplinary Communication Board Enhanced Fall Algorithm integration into the Electronic Medical Record
Nov 22
Nov 29
Sa Su M T W Th F Sa Su M T W Th F Sa
Assessment
Phase 1: Developing a Need for Change
Meeting with CNO for Project Introduction
Global Aim Statement and Themes
PICOT Statement
SWOT Analysis
Statement of Determination
Literature Review
Cost Benefit Analysis of Project
Phase 2: Assess Motivation/ Capacity for Change
1st Virtual Preceptor Meeting
Hospital Orientation, 2nd Meeting with Preceptor
Diagnosing
Phase 3: Diagnosing the Client System's Problem
Request for Falls Data from 2020
Request for 2nd Visit to the Unit
Creation of RN Interview Questions
Planning
Phase 4: Establishing Alternative Routes
Third Meeting with Preceptor and CNO
Specific Aim Revised
Nursing/PT Staff Interviews
Analysis of Fall Data Obtained from 2019
Phase 5: Transforming Intentions into Actual Efforts to Change
Literature Review for new Implementation: EMR
Analysis of Initial Staff Surveys
Request 4th Meeting with Preceptor
Connect with Nursing Informatics Team
Implementation
Phase 6: Maintain Change
Create Implementation Plan
Create Abstract and Presentation
Gantt Chart Plan of Implementation
Final Paper Draft Due
Evaluation
Phase 7: Terminate the Helping Relationship
Create Final Presentation/Summary
Final Presentation
Thank you to CNO/ACD

Figure 9

Unit Communication Assessment Tool

University of San Francisco School of Nursing and Health Professions

N653 Internship

Unit Communication Assessment Tool

Unit: __Medical-Surgical, 3rd Floor__ Organization/setting:_Hospital, SF___

Unit Characteristic:	**Assessment:**
Noise level on unit	The noise level on the unit was quiet, with the nursing hand-off being performed in a calm manner.
Manager: ● Visibility of manager, staff ● Communication patterns from manager to staff (giving/receiving feedback etc.) ● Receptiveness of manager to staff and patient/family concerns	The nurse manager was on the floor, and appears to be in communication with the nursing staff. The Acute Care Nursing Director seems familiar with the nursing staff on the floor, recognizing if a nurse is working an unusual shift (night versus day). It is unclear how much time management staff spends on each of the floors, but they seem to know and recognize the nursing care staff.
Report/handoff ● Method of delivery (face-to-face; recorded? patient rounds?) ● Systematic? Variation between shifts?	Report is given in a team in-person, face to face, in a huddle in the middle of the shift. It is unknown if these reports and handoffs vary between shifts.
Nurse-patient communication	Nurse to patient communication could use improvement as there appears to be a language barrier and communication barrier. Improvements could be made in terms of interpreter availability and/or use of technology in translation.
Gossip/evidence of bullying behavior; disrespect, incivility	There is no evidence of bullying behavior, although communication regarding the nursing staff from the director could be improved.

Social support for nurses, staff	There is a survey sent out by the management team regarding staff morale; the effectiveness of these surveys and the transparency of the staff is still unclear.
Conflict resolution	It is unknown how conflict resolution is on this particular unit; however, there seems to be a lack of communication regarding the boards outside of patient rooms and the use of room numbers instead of patient names during the morning huddle.
Interdisciplinary communication which includes physician-nurse communication	I have not yet been able to observe physician-nurse communication.
General observations about work environment/culture; team communication	Altogether, the team communication within the unit appears to be healthy; there could be some improvement regarding the communication methods between management and staff. This could be due to the recent change in management team, as well as changes in adjusting to the new hospital at Hospital.

Figure 10

Force-Field Analysis for the Planned Change

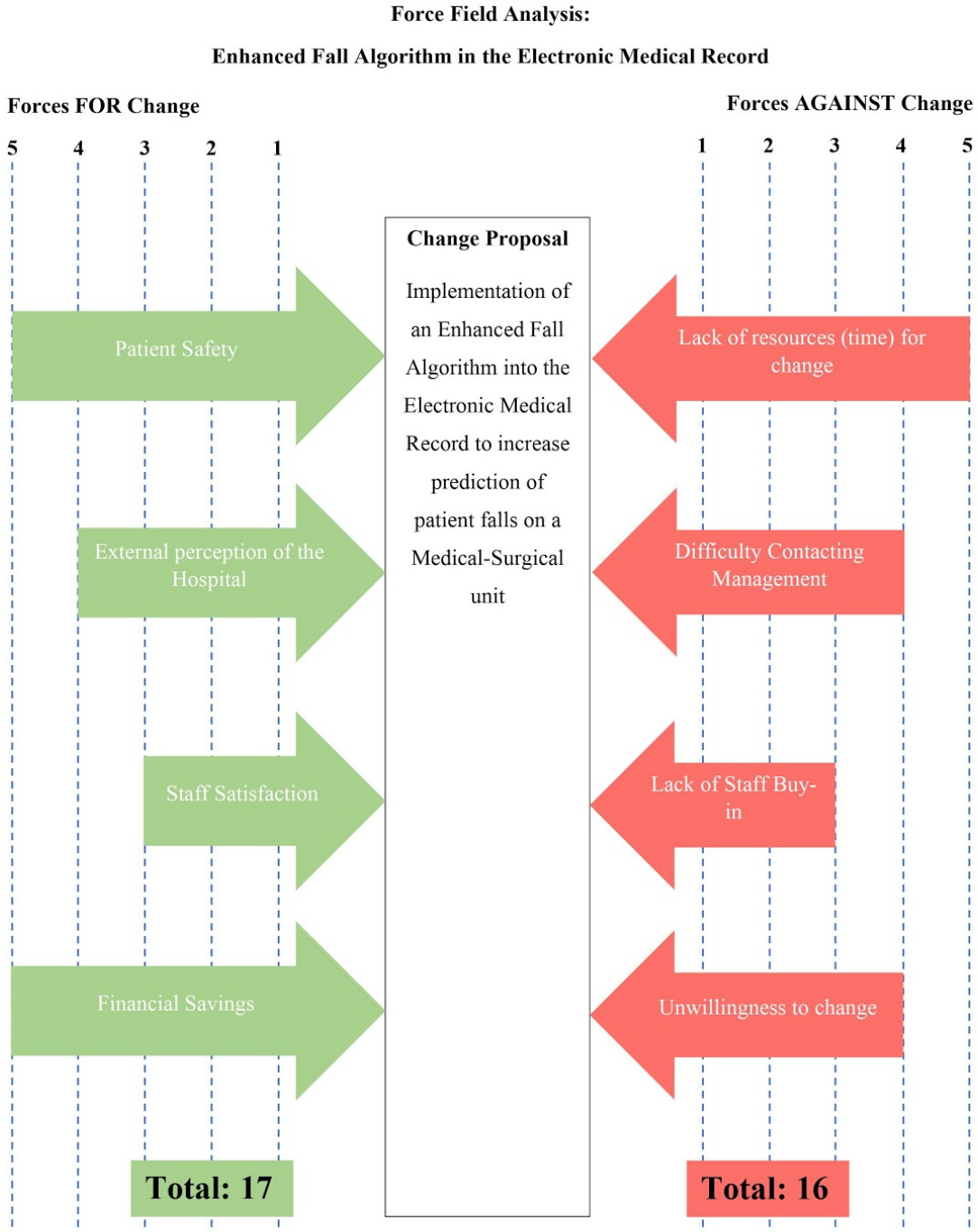
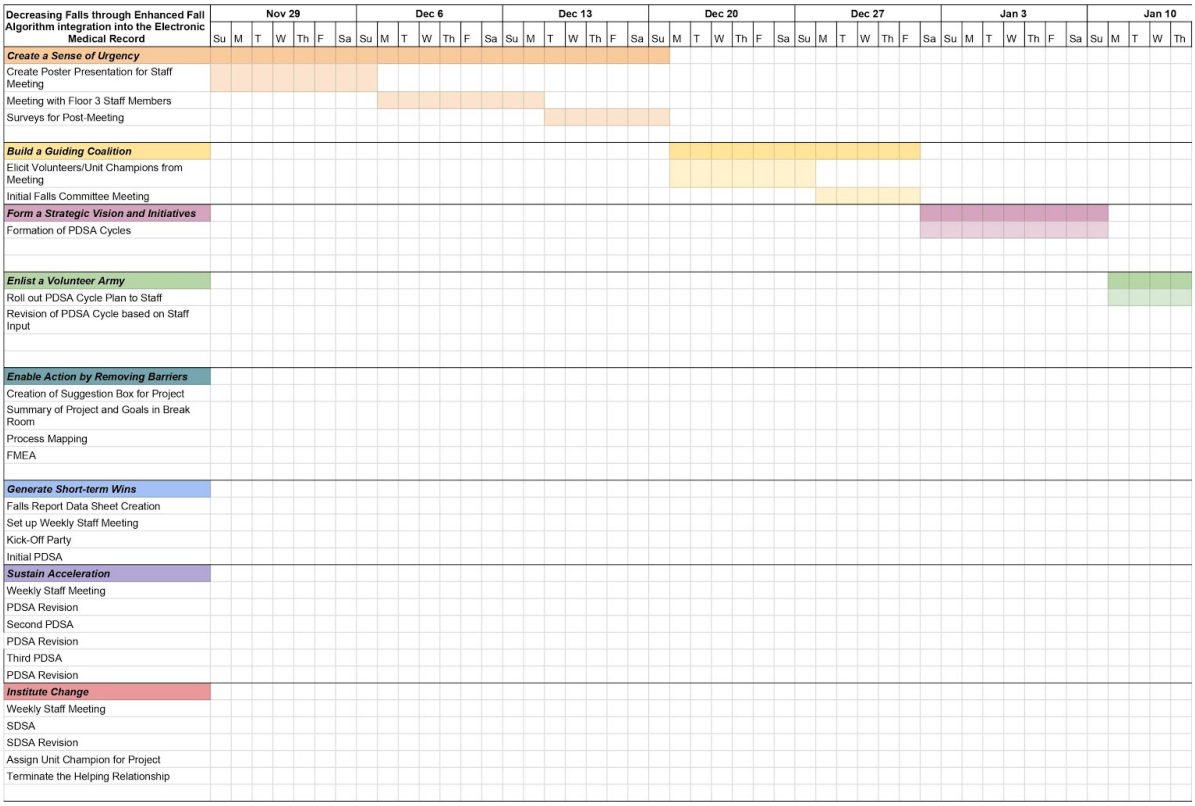


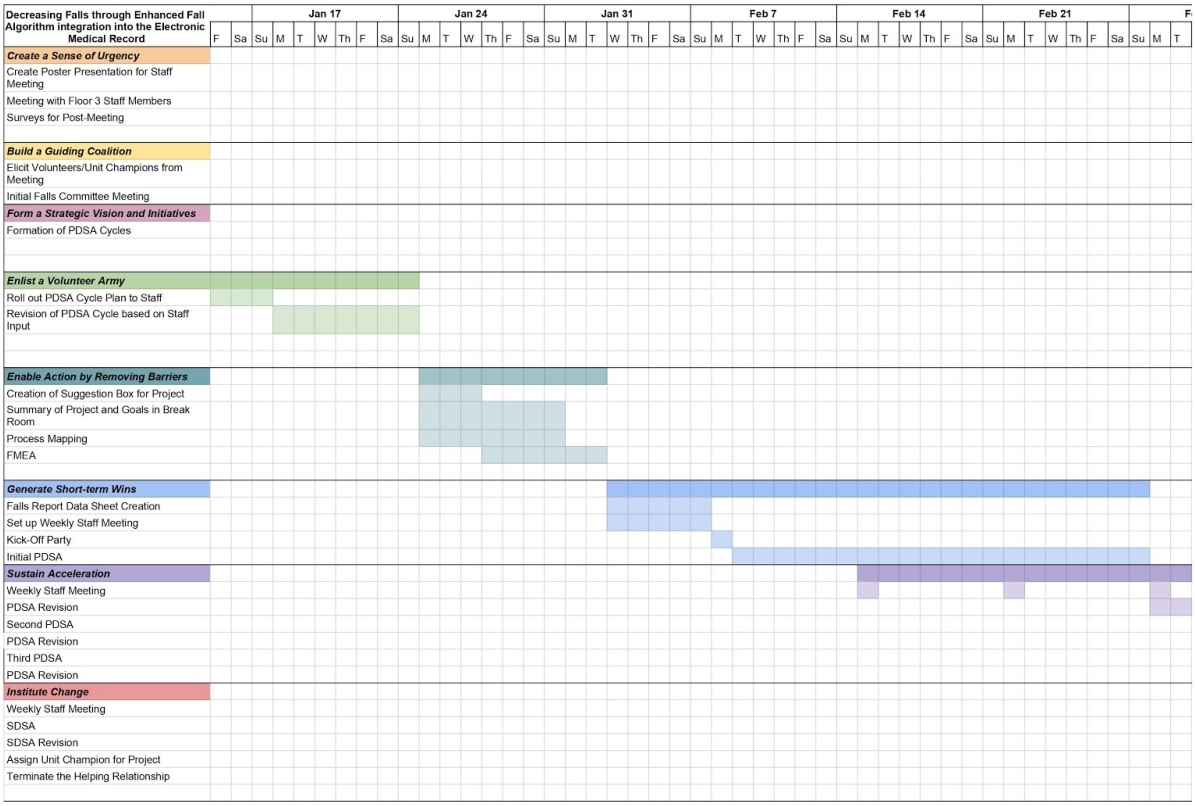
Figure 11

Planned PDSA Cycles for Implementation

Figure 12

Gantt Chart Plan for Implementation for 2021 Quarters 1-2




Decreasing Falls through Enhanced Fall Algorithm integration into the Electronic Medical Record
Jan 17
Jan 24
Jan 31
Feb 7
Feb 14
Feb 21
F Sa Su M T W Th F Sa Su M T W Th F Sa Su M T W Th F Sa Su M T W Th F Sa Su M T W Th F Sa Su M T W Th F Sa Su M T W Th F Sa Su M T
Create a Sense of Urgency
Create Poster Presentation for Staff Meeting
Meeting with Floor 3 Staff Members
Surveys for Post-Meeting
Build a Guiding Coalition
Elicit Volunteers/Unit Champions from Meeting
Initial Falls Committee Meeting
Form a Strategic Vision and Initiatives
Formation of PDSA Cycles
Enlist a Volunteer Army
Roll out PDSA Cycle Plan to Staff
Revision of PDSA Cycle based on Staff Input
Enable Action by Removing Barriers
Creation of Suggestion Box for Project
Summary of Project and Goals in Break Room
Process Mapping
FMEA
Generate Short-term Wins
Falls Report Data Sheet Creation
Set up Weekly Staff Meeting
Kick-Off Party
Initial PDSA
Sustain Acceleration
Weekly Staff Meeting
PDSA Revision
Second PDSA
PDSA Revision
Third PDSA
PDSA Revision
Institute Change
Weekly Staff Meeting
SDSA
SDSA Revision
Assign Unit Champion for Project
Terminate the Helping Relationship


Decreasing Falls through Enhanced Fall Algorithm integration into the Electronic Medical Record
eb 28
Mar 7
Mar 14
Mar 21
Mar 28
Apr 4
Apr 11
W Th F Sa Su M T W Th F Sa Su M T W Th F Sa Su M T W Th F Sa Su M T W Th F Sa Su M T W Th F Sa Su M T W Th F Sa Su
Create a Sense of Urgency
Create Poster Presentation for Staff Meeting
Meeting with Floor 3 Staff Members
Surveys for Post-Meeting
Build a Guiding Coalition
Elicit Volunteers/Unit Champions from Meeting
Initial Falls Committee Meeting
Form a Strategic Vision and Initiatives
Formation of PDSA Cycles
Enlist a Volunteer Army
Roll out PDSA Cycle Plan to Staff
Revision of PDSA Cycle based on Staff Input
Enable Action by Removing Barriers
Creation of Suggestion Box for Project
Summary of Project and Goals in Break Room
Process Mapping
FMEA
Generate Short-term Wins
Falls Report Data Sheet Creation
Set up Weekly Staff Meeting
Kick-Off Party
Initial PDSA
Sustain Acceleration
Weekly Staff Meeting
PDSA Revision
Second PDSA
PDSA Revision
Third PDSA
PDSA Revision
Institute Change
Weekly Staff Meeting
SDSA
SDSA Revision
Assign Unit Champion for Project
Terminate the Helping Relationship

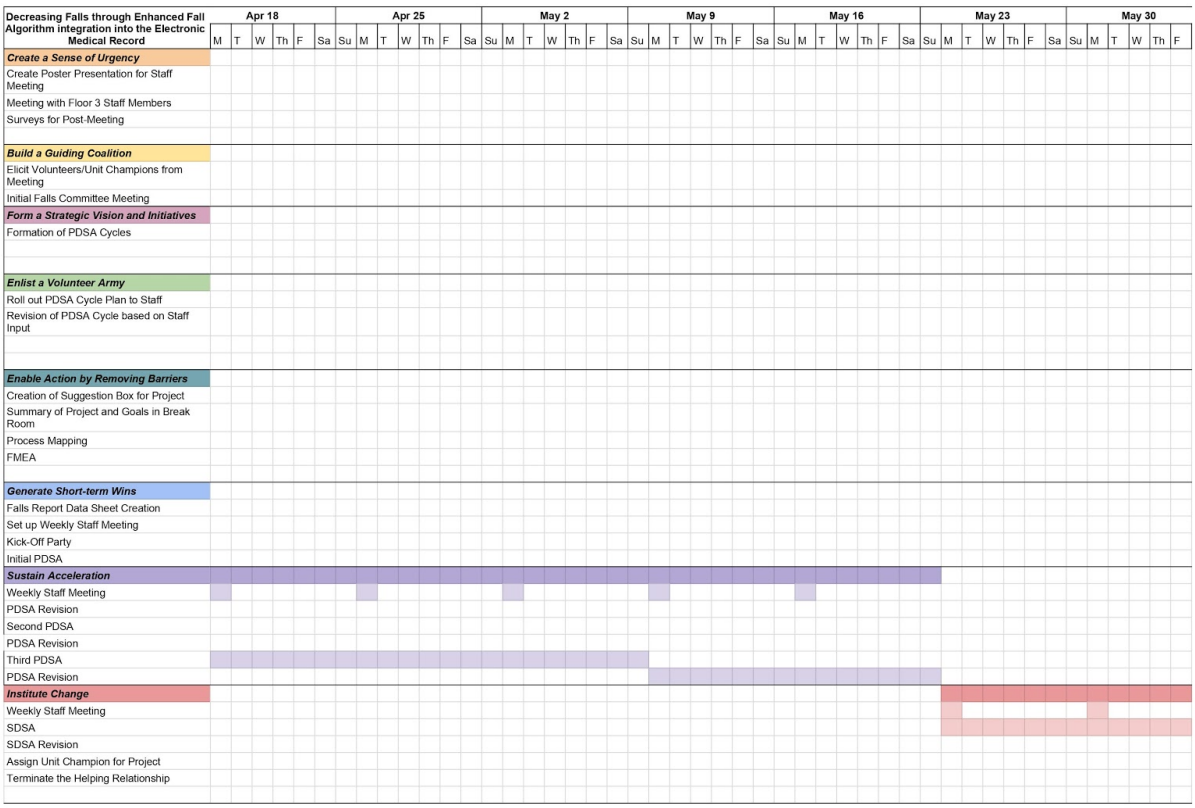
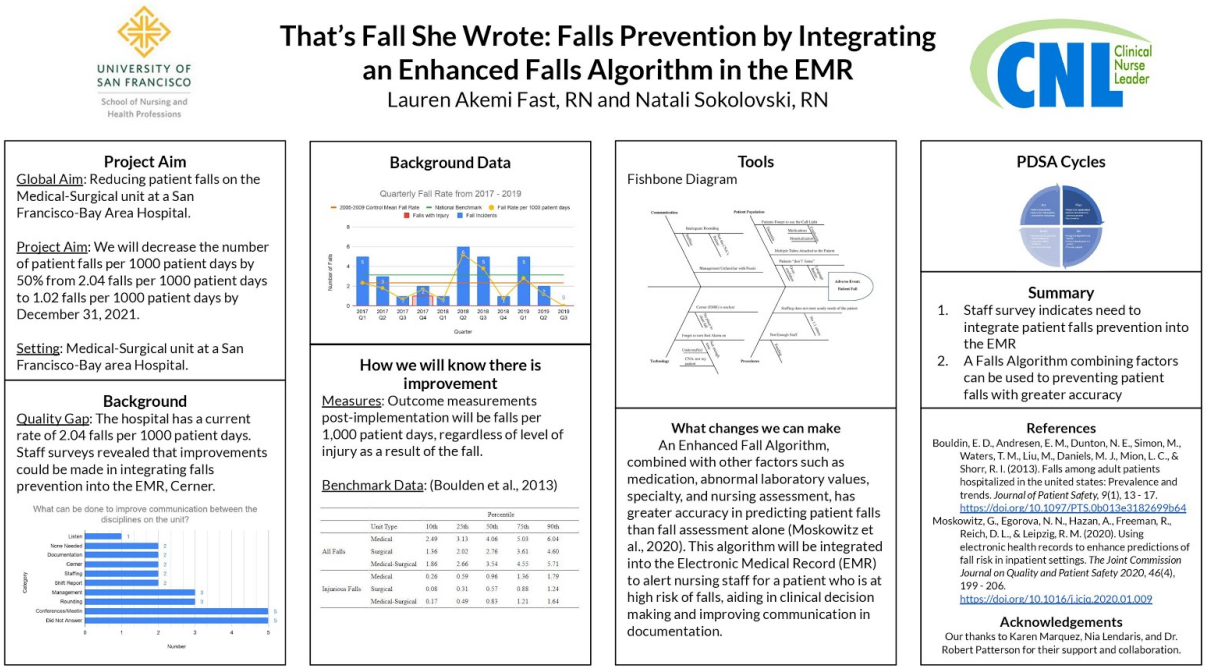

Decreasing Falls through Enhanced Fall Algorithm integration into the Electronic Medical Record
Apr 18
Apr 25
May 2
May 9
May 16
May 23
May 30
M T W Th F Sa Su M T W Th F Sa Su M T W Th F Sa Su M T W Th F Sa Su M T W Th F Sa Su M T W Th F Sa Su M T W Th F
Create a Sense of Urgency
Create Poster Presentation for Staff Meeting
Meeting with Floor 3 Staff Members
Surveys for Post-Meeting
Build a Guiding Coalition
Elicit Volunteers/Unit Champions from Meeting
Initial Falls Committee Meeting
Form a Strategic Vision and Initiatives
Formation of PDSA Cycles
Enlist a Volunteer Army
Roll out PDSA Cycle Plan to Staff
Revision of PDSA Cycle based on Staff Input
Enable Action by Removing Barriers
Creation of Suggestion Box for Project
Summary of Project and Goals in Break Room
Process Mapping
FMEA
Generate Short-term Wins
Falls Report Data Sheet Creation
Set up Weekly Staff Meeting
Kick-Off Party
Initial PDSA
Sustain Acceleration
Weekly Staff Meeting
PDSA Revision
Second PDSA
PDSA Revision
Third PDSA
PDSA Revision
Institute Change
Weekly Staff Meeting
SDSA
SDSA Revision
Assign Unit Champion for Project
Terminate the Helping Relationship

Figure 13

Poster Presentation



Appendix A

Statement of Determination

UNIVERSITY OF SAN FRANCISCO | School of Nursing and Health Professions

Project: Statement of Determination and Non-Research Determination Form

Student Name: Lauren Fast

Title of Project: That's Fall She Wrote: Decreasing the Patient Fall Rate on a Medical-Surgical Unit through an Enhanced Fall Algorithm in the Electronic Medical Record

Brief Description of Project: An enhanced fall algorithm that combines nursing assessment, medication type, critical laboratory results, and service will be used on the Medical-Surgical unit to decrease the rate of patient falls.

- **Data that Shows the Need for the Project:** Though Leapfrog Safety has rated this Hospital at an above-average level of safety for falls (Leapfrog, 2020), improvements can continually be made in falls prevention in hospitals with an already low rate of patient falls (Lancaster et al., 2007). All falls, regardless of harm, increase length of stay for the patient (Dunne et al., 2014), and thus increase costs for the hospital.
- **Aim Statement:** We will decrease the number of patient falls per 1000 patient days by 50% from 2.04 falls per 1000 patient days to 1.02 falls per 1000 patient days by December 31, 2021.
- **Description of Intervention(s):** Previous research has shown falls risk assessment tools to have little validity in determining patient risk for falls. As literature from the Joint Commission demonstrates (Moskowitz et al., 2020), an enhanced fall algorithm that combines nursing assessment, medication type, critical laboratory results, and service (unit) can assess a patient's risk for falls with greater accuracy than fall assessment alone. This algorithm will be integrated into the Electronic Medical Record (EMR) to alert nursing staff for a patient who is at high risk of falls, aiding in clinical decision making and improving communication in documentation.
- **Desired Change in Practice:** We hope to decrease the rate of falls in the Medical-Surgical unit at this hospital by incorporating informatics into the risk assessment and communication of fall risk in the electronic medical record.
- **Outcome measurement(s):** Outcome measurements post-implementation will be falls per 1,000 patient days, regardless of level of injury as a result of the fall. A fall is defined as "an event which results in a person coming to rest inadvertently on the ground or floor or other lower-level" (WHO, 2018).

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)

X 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:

References

UNIVERSITY OF SAN FRANCISCO | School of Nursing and Health Professions

EVIDENCE-BASED CHANGE OF PRACTICE PROJECT CHECKLIST *

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

Project Title: Decreasing the Patient Fall Rate on a Medical-Surgical Unit through an Enhanced Fall Algorithm in the Electronic Medical Record	**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.	YES	
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.	YES	
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 overrides clinical decision-making.	YES	
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.	YES	
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.	YES	
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.	YES	
The project has **NO** funding from federal agencies or research-focused organizations and is not receiving funding for implementation research.	YES	
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.	YES	
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*	YES	

UNIVERSITY OF SAN FRANCISCO | School of Nursing and Health Professions

or agency and as such was not formally supervised by the Institutional Review Board."		

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): Lauren Fast

Signature of Student: 

DATE: 11/2/2020

SUPERVISING FACULTY MEMBER NAME (Please print): Robert Patterson

Signature of Supervising Faculty Member:

DATE: 11/4/2020