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### ED to Telemetry Bed: Optimizing Nurse Communication & Decreasing Team Frustration

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ED to Telemetry Bed: Optimizing Nurse Communication & Decreasing Team Frustration

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### Abstract

**PROBLEM:** According to the Institute of Medicine, boarding inpatients in the emergency department (ED) can result in an increased risk for medical errors, delay in treatments, and decreased quality of care. The goal is to move the patient to the hospital bed within 60 minutes from the time an order is written for admission. Current average monthly compliance for ED throughput and admission to the inpatient bed is at 45% compared to the target of 70%. Lack of standardization during handoff can lead to delays, miscommunication and causes team frustration.

**CONTEXT:** In 2022, this community hospital's ED microsystem had limited capacity, and increased ED volume compared to 2021. The hospital measures ED admissions to the inpatient bed as a performance metric. One microsystem and one shift on a telemetry (tele) unit were identified to test and analyze new approaches to reduce delays, optimize nurse communication, decrease team frustration, and create a realistic business case. A 15% improvement was projected to yield an increase in efficiency by \$60,346.44 for the tele unit. The ED's loss for six months was estimated at \$1,011,832.70 so a 15% improvement could yield a benefit of \$151,774.90.

**INTERVENTIONS:** In person hand-off between the ED and the telemetry nurse was implemented. Team Strategies and Tools to Enhance Performance and Patient Safety (TeamSTEPPS) evidence-based tool SBAR (Situation, Background, Assessment, Recommendation) was adopted to standardize reporting. The change was initially implemented on one shift, utilizing small test cycles, and was later established as a standard of communication on all shifts.

**MEASURES:** The primary outcome measure was to track the ED to bed metric before and after each test of change with a target of 15% improvement over six-months. The process measure included measuring nurse satisfaction with the current handoff process and the rate of compliance with the use of SBAR tool on one shift (evenings). By July 1<sup>st</sup>, 2022, 65% of admissions on the second shift on the Telemetry unit

were to experience a 1:1 handoff between the ED and the Telemetry nurse within 60 minutes from the time an admit order is written utilizing the standardized TeamSTEPPS SBAR tool.

**RESULTS:** Over six months, the practice change resulted in partial improvement. The time it took for the patient to leave the ED, from when the bed was assigned, decreased from an average of 76 minutes to 26 minutes from January to April 2022. Interim data indicates the overall outcome measure remained unchanged at 45%. Standardization led to timely start of care interventions on the telemetry unit leading to increased care team satisfaction.

**CONCLUSION:** A Clinical Nurse Leader can effectively lead and collaborate between different microsystems to test and implement evidence-based tools and strategies to improve clinical, staff, and operational outcomes.

*Keywords:* ED throughput, ED crowding, telemetry, handoff, SBAR, CNL, outcomes

## Introduction

Today's hospitals struggle with lengthy ED visits and idle staffed beds. ED overcrowding, increased wait times, and patients leaving without being seen (LWBS) can contribute to patient dissatisfaction and financial loss. According to Probus & Smith (2020), ED throughput is measured by the length of stay (LOS), which includes increments of time between arrival and departure from the ED. Boarding (holding admitted patients unnecessarily in the ED waiting for a hospital bed when one is available) is a significant challenge faced by the hospitals throughout the nation. The Joint Commission (2021) highlights that reducing the time patients remain in the ED can improve access to treatment and increase quality of care. Reducing this time potentially also facilitates a timely start of care specific to the patient condition and increases the capability to provide additional treatment for urgent and life-threatening situations. Recognizing these risks, The Joint Commission standards require ED LOS as a reportable hospital measure. Rocha et al. (2021) report that boarding leads to increased mortality, delayed drug administration, and patient and staff dissatisfaction, with 10% of patients suffering an avoidable adverse event, of which 7.3% are fatal. Optimizing the ED's throughput, reducing the LOS, and the risk of bottlenecks can promote quality care, patient safety, staff satisfaction, and reflect a key performance indicator for hospital EDs (Probus & Smith, 2020). Therefore, patient care transfers should begin immediately upon order entry in the ED for admission.

## Problem Description

A telemetry (Tele) unit microsystem in this small urban community hospital receives over eighty percent of admissions via the ED. The current handoff process involves a phone call between the ED and Tele unit nurse where the Electronic Health Record (EHR) serves as a repository of patient information. There is no standardized format followed for the report. A Tele nurse is allotted fifteen minutes to review the patient chart in the EHR and then is expected to call the ED for a report. Frequent

distractions, a chaotic and noisy environment, busy shift, high patient acuity, shifting priorities, nurse unavailability, and inability to perform timely review of pertinent patient information in the EHR can lead to delays in admissions and ineffective or suboptimal communication during handoff. According to Galatzan et al. (2022) miscommunication during nursing handoffs continues to be the primary cause of sentinel events. To monitor throughput and timely start of interventions this hospital measures the number of admits to the tele unit that arrive within sixty minutes from the time an admit order is written in the ED. Only 45% of admissions currently meet this metric. Of the reasons captured for delay, nurse unavailability for report (Appendix A) was found to be the major contributor for delays (52%) in a baseline analysis. An A3 summary was created for quality/performance improvement utilizing Lean methodology (Appendix B) to review and summarize the problem.

### **Available Knowledge**

#### **PICOT question**

The search for evidence was initiated by developing a population, intervention, comparison, outcome, and timeframe (PICOT) question: In patients admitted to the hospital telemetry unit (P), how does nurse knowledge exchange at bedside between the ED primary RN and the telemetry unit RN utilizing evidenced based tool SBAR (I) compared to current process of knowledge exchange via telephone (C) impact patient wait time for a bed from the time order is written in the ED to the time patient is moved to the inpatient bed (O) within a six-month period (T).

#### **Literature search**

Based on the PICOT question, an electronic literature search was conducted in the Cochrane Database, CINAHL, Ovid, and Pub Med using the following terms: Hand off, ED boarding, bedside report, bedside handoff, and ED to inpatient. Search criteria were set to include English only, peer reviewed, and research articles published between 2017 to 2022. The search yielded 38 articles of which twelve

met intended search criteria and six articles were selected for appraisal (Appendix C). The evidence search includes three retrospective reviews, two cross sectional analyses, and one lean methodology performance improvement project. The selected articles were evaluated using Johns Hopkins Evidence-Based Practice (JHEBP) research evidence appraisal tool (Johns Hopkins Medicine, n.d.; [https://hsl.upstate.edu/uploads/20200214-jhneb/2017\\_Appendix-D\\_Evidence-Level-and-Quality-Guide.pdf](https://hsl.upstate.edu/uploads/20200214-jhneb/2017_Appendix-D_Evidence-Level-and-Quality-Guide.pdf)).

### **Synthesis of literature**

The best practices identified during this review and appraisal included initiating a multidisciplinary care team Admission Conference Call (ACC), the development of an ED to Inpatient Handoff Guideline, utilizing a dedicated ED patient coordinator, and the use of standardized tools such as IPASS and SBAR to cover important patient specific care elements. Literature strongly supported the need to improve communication to avoid errors, and decrease costs related to patient flow, capacity, and care. Most of the research outlined interventions primarily from the ED context only. Very few articles took a multidisciplinary combined approach between the ED and inpatient teams to identify collaborative interventions and provided an outline on how to implement them collectively. According to Weberg et al. (2019) the dynamics of change and innovation are best understood and advanced when several things are known. These include the key stakeholders of the work to be changed (who), the rationale for change (why), the content to be changed (what), the timing for the change (when), and the techniques to change effectively (how). This PI Project therefore incorporates and explicitly outlines all elements of the change process.

### **Rationale**

#### **Role of the Clinical Nurse Leader**

A Clinical Nurse Leader (CNL) must have the knowledge, skills, and attitudes (KSAs) to optimize quality and safety in their healthcare microsystem and strive to align PI projects with meso and macrosystem goals (QSEN Institute, 2020; Johnson & Sollecito, 2020; King et al., 2019). In systems-based practice, the CNL plays a pivotal role and assumes accountability for patient-centered outcomes through the assimilation and application of evidence-based information to design, implement, and evaluate patient-care processes and models of care delivery (King et al., 2019; American Association of Colleges of Nursing [AACN], 2021).

### **Change Models**

Change is constant in health care. Implementing intentional changes in process improvement is challenging and requires a structured approach (Mitchell, 2013). Two change management models were incorporated in this PI project. First, coordinating a multidisciplinary approach for brainstorming, reviewing workflows, and stimulating process improvement, this CNL utilized the Institute for Healthcare Improvement (IHI) Model for Improvement (MFI) which asks three questions: What is the team trying to accomplish, how will the team know if change is an improvement and what change can be made that will result in an improvement (Appendix D). In question three of the MFI, tests of change were conducted to integrate the best evidence and team ideas through PDSA (Plan, Do, Study, Act) cycles.

Second, Kurt Lewin's theory of change also served as a framework to guide the project (Appendix E). Lewin's theory of planned change embraces three different phases identified as unfreezing, moving, and refreezing (Appendix F). Unfreezing recognizes the needed improvement and facilitates awareness of ways to overcome previous methods or patterns (McGrath et al., 2020). This stage was significant for the PI project and served as the driving force that encouraged team cooperation, collaboration, and empowerment. When change is introduced, driving forces can either



encourage or resist the change. Identifying these forces through a forcefield analysis is a critical realization of the change process (Shiey, 2013). In the ED and Tele units, motivation to do the right thing for the patient by all nurses led to behavioral change with respect to attitude and positive culture transformation. Recognizing early adopters and resisters guides the strategy to help move the change forward (Shirey, 2013). The resisters were identified early by the PI team and the vocal union members were brought to the table to encourage buy-in from the beginning of the project. During the unfreezing stage, laminated cards of SBAR served as a reminder and helped direct standardized communication. Often, the unknown element with change sparks fear for those involved (Shirey, 2013). Progress was tracked and numbers were reported in huddles that served as a catalyst for supporting the change. In addition, staff were rewarded with small gifts to promote positive behavior. The final stage of Lewin's theory, refreezing, is for sustaining the change (McGrath et al., 2020). Ongoing monitoring of the handoff processes with SBAR reinforced use of the standardized communication that was shared in shift huddles and multidisciplinary rounds. Progress was tracked and success was shared with the nurses in regular rounding by the Chief Nurse Executive and the Medical Director.

### **Project aims**

#### **Global aim**

By July 2023 a 1:1 primary nurse hand off using SBAR will become the standard of communication for handoff on all three shifts between the ED and the telemetry unit for all admits.

#### **Specific aim**

By July 1<sup>st</sup>, 2022, 65% of patients on the second shift on the Telemetry unit will experience a 1:1 patient handoff between the ED and Tele nurse within 60 minutes from the time admit order is written utilizing the standardized TeamSTEPPS SBAR tool.

### Context

According to Harris et al. (2018), the microsystem is the essential building block of the point where the care delivery must work well to improve the quality of process outcomes (work of the professionals). A Clinical Microsystem Assessment provides the foundation for the CNL to understand the complexities, culture, teamwork, processes, and patterns, and gather the baseline metrics needed to prioritize and stimulate change for improvement. CNLs must understand the structure of their microsystems to make a meaningful impact on the processes that drive patient outcomes. A comprehensive assessment allows leaders and teams to focus on data and other sources from systems as a whole and facilitates recognition of dynamically complex environments and the interdependent interactions within each component (See Appendix G; Johnson & Sollecito, 2020). Emphasis on systems also helps avoid blame where team members participate as partners and consultants resulting in intrinsic team motivation and a higher level of individual engagement (Johnson & Sollecito, 2020). For this telemetry unit, the CNL conducted a microsystem assessment and unit profile (Appendix H) to determine quality gaps and to address the improvement opportunity.

This Performance Improvement (PI) Plan aimed to create an interdepartmental standardized, evidence-based handoff workflow to facilitate patient admissions from the ED to the telemetry unit in less than 60 minutes from when the admission order is written in the ED. This PI Project Plan focused on the following three Quality and Safety Education for Nurses (QSEN, 2020) competencies: (1) "Patient-Centered Care" – more efficient throughput workflows increase care continuity and comfort to the patient. Quickly moving the patient to the assigned hospital room will provide privacy, introduce the primary care teams, and allow family visitation. Most importantly, the patient can begin treatment more promptly. (2) "Teamwork and collaboration" – clarifying overlapping roles and functions within various departments increases knowledge about job responsibilities to provide smoother transitions and quality of care for patients. Additionally, collaboration creates an atmosphere of respect and

understanding about different job duties and increases effective communication and satisfaction for the care team. (3) “Quality Improvement” – improving this process will decrease the length of stays and can lead to higher patient, and staff satisfaction.

### **Microsystem**

This CNL’s microsystem is a thirty-eight-bed telemetry unit embedded in a small 120-bed urban community hospital. The ED is a Level III Trauma Center with twenty beds that serves patients with medical and surgical conditions such as diabetes, renal disease, heart disease, cancer, and acute appendicitis. The ED’s average daily volume is 113 patients, and 13-15 patients are admitted daily to the hospital. On average 10 patients are admitted daily to the tele unit under study. Since most admissions arrive to this CNL’s microsystem, any improvement can have a large impact on the overall hospital performance metric.

### **Team Development and Quality Improvement Tools**

The telemetry unit employs Registered Nurses (RNs), Patient Care Technicians (PCTs), and Unit Assistants (UAs) to provide care. Doctors, Physical and Occupational Therapists, Social Workers, Care Coordinators, and Transporters are other disciplines that participate in patient care in this microsystem. The CNL started this improvement project by formulating a team that included Nurse Managers, Nursing Supervisors, Hospital-Based Physician (HBS), Emergency Medicine Physician, ED Leaders, RNs, and Area Portfolio Leader to formulate a Leadership Team to kickstart the project. Meetings were held weekly to develop a plan. A strength, weaknesses, opportunities, and threats (SWOT) analysis was performed (Appendix I) within the team to gain insight into which interventions were necessary to test and adopt changes. Interviews, direct observation, literature review, consultation, and data collection techniques were the methods utilized to gather information. Results were shared via team huddles and staff and multidisciplinary meetings. An A3 (Lean Management Systems) summary, created by the Lead Team,

Project Charter (Appendix J), and Gantt Chart helped to track the progress of the Project (Appendix M). Process maps and flow diagrams were developed to enhance learning (Appendices K & L). Lean management has been widely adopted in healthcare since 2000 due to its benefits of improving productivity, flexibility, reactivity, efficiency, process capacity and quality, with positive effects on patient safety and mortality (Tiso et al., 2021). A multidisciplinary team approach was utilized for brainstorming. Time was allotted to all to conduct activities such as observation (Gemba), meetings etc. All stakeholders actively participated regularly, and results of progress were shared with all staff in the participating micro and mesosystems. Progress was also reported to the hospital senior administrative leadership including nursing and physician leadership quarterly via pre-established venues.

First meeting session with the stakeholders revealed multiple opportunities for the CNL's microsystem and for the ED. For example, it became apparent that the ED team's lack of understanding of the telemetry unit admission workflows created confusion and frustration for all. A significant portion of the first session was spent on explaining the unit profile to each other. Another learning for the team was the value in bringing members from the two microsystems together to develop shared understanding of the problem at hand. The initial meeting brought the stakeholders together and made the improvement opportunity visible to all. Everyone agreed that a 15% improvement was a realistic and an achievable goal.

### **Business Case**

In addition to the benefits, optimizing throughput provides a financial gain and aligns with the hospital's goal to improve affordability. Total cost for this project was estimated at \$45,480.00 (Appendix N). Six-month loss in unit efficiency was estimated to be \$402,309.60 (Appendix O). 15% improvement was projected to yield an increase in efficiency by \$60,346.44 for the tele unit. In addition, the ED's loss for six months amounts to \$1,011,832.70. A 15% improvement would yield a benefit of

\$151,774.90. Total efficiency improvement for the hospital is \$212,121.34 for six months or \$424,242.68 annually. Although this improvement plan will help generate a substantial amount of savings (efficiency), it does not lead to an increase in hospital revenue. Revenue increase was seen to come from improvement in left without being seen (LWBS) patients. The ED averages 12.5 patients per month that leave without being seeing after registering. The plan assumes that with improvement measures the ED can decrease this number by 50%; therefore, generating an additional revenue of \$36,000.00 for six months or \$72,000 annually (Appendix P).

### **Interventions**

The team captured reasons for delays for two weeks to establish a baseline metric. Some of the reasons captured were unavailability of a staffed bed, dirty bed, diagnostic test delay, communication delay and nurse unavailability (Appendix A). Team used two criteria to identify an issue to solve; one was to select something that the team had control to change and the second was to select the highest frequency reason to gain the biggest impact with a test of change. The team chose to work on nurse unavailability, the biggest delay reason (52%). First test of change identified by the multidisciplinary team was to shift patient handoff to in person report between the tele nurse and the ED RN instead of the current telephone report process. This practice change was tested on one shift only (evening). Second iteration led to ensuring that only the primary ED RN accompanies the patient to the unit to ensure that continuity of care is maintained. Final test of change incorporated evidence based TeamSTEPPS SBAR tool to standardize the entire handoff process (Appendices Q & R).

### **Study of the Interventions**

The microsystem team started by documenting the current workflow for the patient admission. Data was captured via the EHR. Reasons for delay were discussed and decision was made to document and track them via the EHR. Multidisciplinary teams from both areas grouped together to identify key

drivers and formulated a simple fishbone diagram (Appendix L). Themes emerged around communication, process, role clarity, supplies, and people. Teams went to Gemba to observe each other's workflow, environment, challenges, and obstacles. After reviewing the baseline data, the team prioritized to focus on nurse unavailability for a report to develop their first test of change for the PDSA cycle.

### **Measures**

The CNL led the team to develop a comprehensive measurement strategy by outlining one outcome measure, two process measures and two balance measures. The primary outcome measure was to track the ED to bed metric before and after each PDSA cycle. The target was set to make a total of 15% improvement over a six-month period. The process measures included measuring the RN satisfaction with the current handoff process and post PDSA cycles (Appendix S); and the rate of compliance with the use of SBAR tool on one shift (evening) on the tele unit. An increase in compliance was rewarded with small incentives such as coffee cards and facility swag. Lastly, balance measures were established to ensure that the PDSA cycles were not impacting negatively in another area. This included measurement of staff morale with a pre and post PDSA implementation survey and by tracking patient experience scores.

### **Ethical Consideration**

"Cura Personalis" is a core Jesuit value that means care of the person and paying attention to the needs of the other by showing respect to their unique circumstances and concerns (University of San Francisco, 2022; <https://myusf.usfca.edu/mission-council/living-mission>). Team consensus was achieved that patient safety should serve as the core principle to drive systems change (AACN, 2021). When a rushed work environment occurs to move patients to the unit without due diligence, it can jeopardize patient and staff safety. While improving throughput is important from the institutional and financial

perspective, chasing the metric alone without considering all care elements and safety can cause harm to the patient. For example, certain interventions can be completed with more timeliness in the ED such as diagnostic tests like a MRI or CT. Placing too much pressure on the inpatient RN has the potential to compromise care to the other patients assigned to them and these elements should always be considered in the shared decision-making process. A push to meet the metric may not provide enough time to the telemetry RN to properly set up a patient room and coordinate help of the ancillary resources such as a Respiratory Therapist for nebulizer treatments or dialysis. Rushing can also lead to inappropriate level of care decisions where one patient decompensates quickly thus creating an urgent need for an immediate up transfer to the ICU, thereby compromising patient safety in the process, increasing work, cost, and leading to unnecessary waste. These examples contribute to moral distress for the care teams (Taylor, 2022).

Beneficence is an obligation to assist others in their pursuit of important and legitimate interests. Beneficence includes the identification and removal of possible harms that may deter these pursuits (McClelland, 2015; [Stanford Encyclopedia of Philosophy, 2013](#)). While it is important to move patients to the telemetry bed in order to help decrease crowding, care should be taken that patient and staff safety are never compromised in the process. The American Nurses Association Code of Ethics stipulates that “the nurse has authority, accountability, and responsibility for nursing practice: makes decisions; and takes action consistent with the obligation to promote health and to provide optimal care” (American Nurses Association [ANA], 2015, Provision 4). Therefore, CNLs have the obligation to ensure that decisions related to improving throughput and efficiency do not undermine patient safety.

A statement of non-research determination was submitted to the University of San Francisco School of Nursing and Health Professions Institutional Review Board (IRB). The project is considered an evidenced-based change and a non-research practice project. This project has been approved as a

quality improvement project by faculty using Quality Improvement review guidelines and does not require IRB approval (see Appendix T).

### **Outcome Measure Results**

With the implementation of the ED to telemetry bed improvement project on the 2<sup>nd</sup> shift, the metric showed partial improvement. The time it took for the patient to leave the ED, from the time bed was assigned, decreased from an average of 76 minutes to 26 minutes from January 2022 to April 2022 (Appendix U). Variation in data also decreased during the same timeframe (Appendix V). However, overall hospital throughput metric remained unchanged around 45% (Appendix W). During this time the hospital experienced extremely high census related to the impact of the pandemic. The hospital is budgeted for 65 patients. The average daily census of the hospital increased and remained high around 85 patients. The demand for telemetry beds continuously exceeded the overall capacity of thirty-eight available beds. As a result, boarding hours in the ED increased significantly. This led to difficulty in measuring the real impact of the change. TeamSTEPPS SBAR tool benefitted both teams and its adoption increased to over 95% within the first two weeks.

A self-assessment tool was delivered to 40 Telemetry RNs (Appendix S). 19 RNs took the survey of which 10 RNs 'strongly agreed', and 9 'agreed' that a standardized report will contribute to improve patient safety ([Survey Results](#)). The team successfully adopted the TeamSTEPPS SBAR tool and standardization led to improved staff satisfaction and patient safety. Staff morale increased in the ED, and initially decreased on the telemetry unit on the happy face scale. However, staff engagement with the process increased significantly and the telemetry nurses collectively identified many opportunities for improvement. For example, the admission notification process to the admitting RN was not streamlined. There was a gap between when the admitting RN was notified of the admission compared to the ED, leading to less time to prepare for an admission. As a result of this feedback, standardization



of communication was developed within the inpatient leadership team. Establishment of standard work for the nursing supervisors and nurse managers led to improved overall workflows, including same time notification to both the ED and the admitting RN, which led to improved satisfaction for the entire care team. This not only improved compliance but also overall efficiency of all hospital units. The patient experience scores remained unchanged from before and after the implementation of the change.

## **Discussion**

### **Summary**

The purpose of this project was to introduce and test evidence-based practices and tools to standardize throughput between the ED and the telemetry microsystem. The goal was to decrease time for patients waiting for an inpatient bed so that care interventions could begin for the patient contributing to decreased LOS, complications, and waste in the system leading to improved unit communication and overall team satisfaction. The project's specific aim was to improve the RN handoff process with a 1:1 nurse knowledge exchange between the ED and the admitting telemetry RN on the 2<sup>nd</sup> shift within sixty minutes from the admit order. The team was successful in implementing the change and the initial results are encouraging despite the high patient census.

### **Key findings and success factors**

The participation and collaboration of the multidisciplinary team from all microsystems impacting the change process, and support from the senior leaders, were the key contributors for success. Involvement of the vocal union members and the front-line staff and having them observe each other's work, initially thought as a wasteful and costly expense by leadership, turned out to be the best contributor to expedite the implementation and buy-in for the change process. Initial frustration from the telemetry nurses served as a catalyst to improve team engagement and satisfaction. For example, some comments from staff were- "I am glad we moved to bedside report as now I know what the

expectation is of everyone”; “ I have to do less detective work as now I can get answers directly from the ED RN”;. To operationalize a standardized, consistent, and reliable process ongoing monitoring and feedback is required. The nurse managers continue to seek feedback and results are shared on the unit visibility board. This PI project improved leadership and staff relationships and contributed to enhancing the ‘speak up culture’ on the unit. The CNLs efforts to improve transparency, open and stimulate two-way communication, and reinforce data driven improvement work, utilizing A3 thinking, positively contributed to changes in the work environment. One of the key roles of the CNL is to foster a culture of learning and continuous improvement (King et. al.,2019). This PI project supported improvement work between two microsystems (ED and the telemetry unit) thereby supporting interdepartmental collaboration and learning.

### **Lessons learned**

Many lessons were learned throughout the implementation. Assessment of the microsystem is an essential starting point to understand the unit functionality and the unit culture (QSEN Institute, 2020). Reassessment is important to analyze change and to understand what interventions will result in an improvement. Early involvement of key stakeholders can help expedite change to ensure success. Inter-microsystem observation (Gemba) facilitates deeper understanding and collaboration between the front-line staff. Positive reward and recognition can lead to increased compliance and less pushback. Utilization of evidence-based literature and tools can facilitate the end users to understand the “why” behind the change. Project implementation can sometimes provide an unintended outcome. The new process has facilitated the development of renewed appreciation for each other’s work and have created new friendships and connections between the ED and telemetry staff. This PI project has also led to the development of standard work for the leadership team and reinforced the importance of executing lean management systems.

### **Implications for practice**

Throughout the PI project, the CNL graduate student was able to apply and exercise different CNL roles. The CNL has additional masters-level competency in clinical systems leadership, which is used to assess frontline patient care structures and processes to identify where the coordination of the patient's plan of care can be strengthened implementing targeted improvement processes (Bender et. al.,2021). CNLs are in the prime position to facilitate collaboration at the microsystem and the mesosystem levels to facilitate evidence-based improvements. The improvements deployed in this project can be replicated and provide a framework for utilization and ongoing implementation.

### **Sustainability**

Sustainability is an important step in the PI project to ensure that changes implemented will be continued in perpetuity. Standardized workflow was posted on the huddle board and the nurse managers are responsible to ensure they review the process with all newly hired staff. Laminated cards and pocket cards of the TeamSTEPPS SBAR tool were created to facilitate compliance with the use of the tool. Metrics of the weekly success are visually displayed on the visibility board. Random checks are completed by the Chief Nurse to ensure continued compliance with the established process.

### **Conclusion**

CNLs can effectively lead collaboration between different microsystems to implement evidence-based tools and strategies for a PI improvement including active listening. ED throughput cannot be improved singularly. Inpatient involvement is critical to make a meaningful and sustainable change that leads to improvement. Microsystem assessment and utilization of change models help to create effective communication strategies. Improving throughput for the hospitals is an effective strategy to curtail costs, decrease waste, and improve capacity in the ED. Interprofessional collaboration, leadership

involvement, and participation of the front-line staff are crucial elements during the change implementation process.

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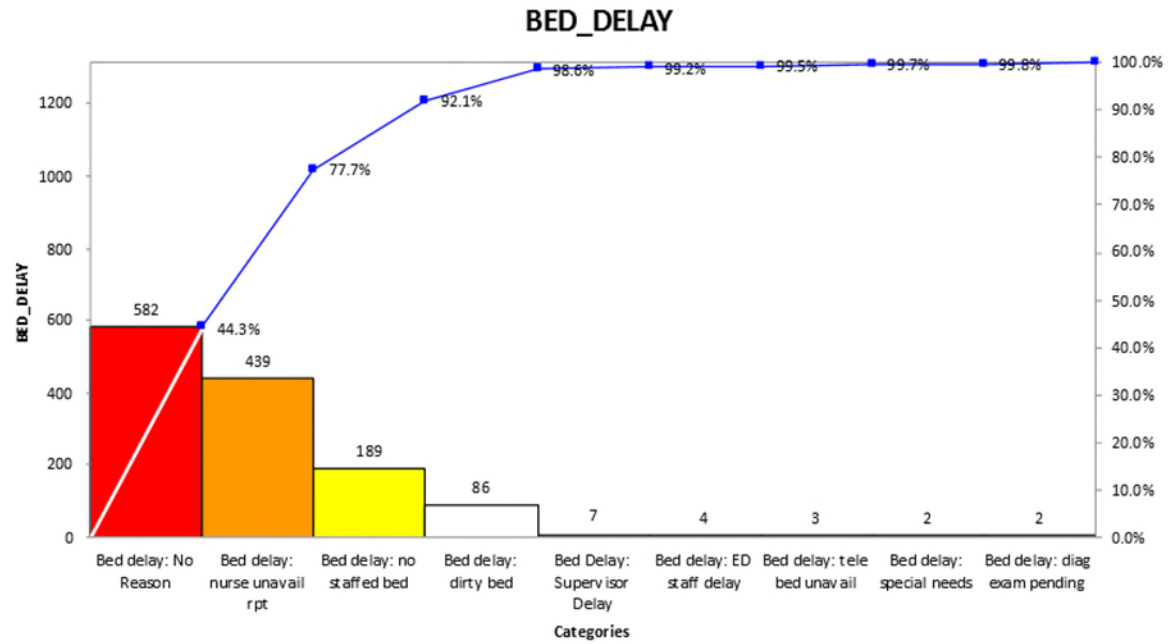
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## Appendix A Delay Reasons

### Review of Delay Reasons

Reasons	BED_DELAY	0.0%
Bed delay: No Reason	582	44.3%
Bed delay: nurse unavail rpt	439	77.7%
Bed delay: no staffed bed	189	92.1%
Bed delay: dirty bed	86	98.6%
Bed Delay: Supervisor Delay	7	99.2%
Bed delay: ED staff delay	4	99.5%
Bed delay: tele bed unavail	3	99.7%
Bed delay: special needs	2	99.8%
Bed delay: diag exam pending	2	100.0%



## Appendix B

### Project A3

**SSF Project Name: ED to Floor Placement Improvement**

**Primary Key Performance Indicator:** Quality / Care Experience

**Problem Statement:** The percentages of patients admitted to the floor within 60 minutes after the Admission order has been written was 45% in 2019. The average time between admit orders and bed placement in SSF has been around 124 minutes. There is variation in roles and responsibilities, inefficient communication, and redundant activities among the House Supervisor, ANM, and ED nurse related to timely patient placement resulting in high wait times and risk of quality care issues.

**Aim Statement:** Improve the % of patients with ED to Floor time within 60 from 45% to 60% (median) in the South San Francisco Hospital by January 1, 2022.

**Approach:** Incorporating best practices for different tests of change to identify a more seamless process.

**Risks/Dependencies:** Staffing shortages created by COVID and L39 strike and the higher demand for staffing including surges. Upcoming Flu season with increased demands

**Key Stakeholders:** ED, House Supervisors, Floor nurses

**Phase:** Assessment – in progress

**Timeline:** In progress

PM: TBD  
 Leads: Winta Mogos, Ian Erskine  
 Sponsors: : James Anderson MD, Edward Baddour MD, Dennis Kneoppel

Recent Activity	Current Activity:	Next Steps:
Interviews of stakeholders completed Workgroup identified A3 problem statement and SMART Goal Completed Data review and reconciliation scheduled Process map completed.	Brainstorming session completed Tests of changes identified	PDSA testing under various conditions

Metric Name	Metric Type (Outcome or Process)	Baseline	Target	Current
ED to <u>bed</u> time (June)	Outcome	45% (2019)	60% (Stretch 70%) Ultimately moving to 80% (Stretch 90%)	45% (YTD)
% Delay Reason no staffed bed	Process			
Appropriate placement for level of care	Balancing			

**Appendix C**  
**Evaluation Table**

Citation	Conceptual Framework	Design/Method	Sample/Setting	Variables Studied and Their Definitions	Measurement	Data Analysis	Findings	Appraisal: Worth to Practice
Humphrey et al. (2022)	None	<p><b>Retrospective random sample review.</b> Purpose: Role of miscommunication in malpractice claims. The aim was to evaluate the prevalence and characteristics of claims that include communication failures, and the potential of structured handoff tools to prevent them. The costs associated with communication failures were also captured.</p>	<p><b>Sample:</b> CRICO Strategies Comparative Benchmarking System (CBC) database was used to narrow review to 498 cases out of 627 that were randomly selected out of more than 30 million claims. <b>Setting:</b> This database includes more than 300,000 claims from 550 hospitals including academic and community hospitals.</p>	Iterative process was utilized to come up with 15 questions that were used to evaluate the claims. Evidence for communication failure, type of failure, where the error occurred, who was involved and if there was a handoff, and the potential for tool to prevent failure.	Communication errors were discovered in 244 claims or 49% of cases.	Research Electronic Data Capture software program was used and tested for reliability. Regression analysis, <i>t</i> tests & Kruskal-Wallis tests were utilized based on data.	<p>Communication errors were identified in 49% of cases. Most of the cases occurred in inpatient units (45%), outpatient areas (30%) and most responsible service was medicine (21%) followed by surgery (18%). Total cost was 97.1 million. Cases with communication errors were less likely to be dropped (54% versus 67%), P=0.015. Communication errors cost 58 million. 40% involved handoff.</p>	<p><b>JHNEBP Critical Appraisal Tool Rating:</b> JHNEBP Level-II A <b>Strengths:</b> Large random sample size, use of a large database, use of robust data analysis tools. <b>Limitations:</b> 15 question tool was created from scratch. Software program was only 81% reliable. The study used 2 researchers.</p>

Citation	Conceptual Framework	Design/Method	Sample/Setting	Variables Studied and Their Definitions	Measurement	Data Analysis	Findings	Appraisal: Worth to Practice
Hendrickson et al. (2019)	None	Cross sectional online survey (2017) to test an intervention for ED to PICU Handoff-Admission Conference Call (ACC) as an intervention to improve handoff. The survey was developed internally and tested prior to delivery. A similar survey was delivered 5 years prior (2012), and questions were left unchanged. Multiple choice questions were used along with comments. Out of 2192 admissions 653 ACCs were completed in 2017.	<b>Setting:</b> 254 bed quaternary care academic hospital with 3600 patient admissions/year. <b>Sample:</b> Online Survey was delivered to the nurses and doctors who participated in ACC. A total of 1072 individuals were invited to take the survey. It was completed by 161 respondents (26%).	7 questions pertaining to ACC were asked to gauge benefits and satisfaction with the intervention. 11 elements of whether ACC improves interdisciplinary alignment, impact on patient throughput, content variability compared to traditional handoff, quality of conversation, amount of time spent, variability, benefits outweigh inconvenience, and overall satisfaction were measured.	Out of 161 participants 132 (43 RNs & 89 MDs) participated in ACC. Their responses were gathered on a 1-5 scale.	Mean and SD are reported for Likert scale. Comments were summarized qualitatively.	In 2012 time to transfer to the floor was tracked and no difference was noted between ACC's and traditional phone call report. In 2017 similar results were seen in patient throughput. Mean responses showed ACC improves alignment, it was preferred by inpatient team more than the ED, benefits outweigh inconveniences. Free text comments showed similar preference for ACC.	<b>JHNEBP Critical Appraisal Tool Rating:</b> III B <b>Strengths:</b> IRB approval. Limitations of the study are clearly identified. Clearly reported measurable questions. <b>Limitations:</b> Low response rate of only 26%. Survey does not assess objective patient safety and logistics. ACC compliance was only 30% for admissions.

Citation	Conceptual Framework	Design/ Method	Sample/ Setting	Variables Studied and Their Definitions	Measurement	Data Analysis	Findings	Appraisal: Worth to Practice
Schreyer et al. (2017)	None	3 phase retrospective study that observed admissions over 12 months. First phase focused on calculating true costs of boarded ED patients. 2 <sup>nd</sup> phase focused on calculating opportunity costs for those patients who left without being seen (LWBS) .3 <sup>rd</sup> phase focused on the care provided to boarded patients to determine true resource utilization. Critically ill patients not suitable for holding, psych and peds patients were excluded.	Conducted in urban teaching hospital with annual volume of 76,000 and 26% ED admission rate with 55 ED beds. Convenience sample of admitted patients waiting for a bed for longer than 1 hour.	Total costs of boarded patients in the ED. Opportunity costs of lost revenue with patients LWBS. Resources available and resources consumed.	Cost for 3 phases were calculated by getting information from the hospital finance team. Hospital had the potential to generate 28k of additional revenue per day or over 6 million over the course of a year.	No statistical tools were needed. Cost vs benefit of an observational unit were explored from a business perspective.	1. Admitted patients spent anywhere between 60 mins. to 122 mins. in the ED. Total boarding time for 1 year was 32,094. Cost/pt./bed hour was \$58.20 in the ED and \$24.80 on the floor. For observational cost was calculated to be \$ 19.20. 2. 21.5 patients LWBS for a loss of \$ 27,796/day. 3. Admitted patient spent 2.3 hours in the ED. ED bed cost twice as much to care for admitted patients.	<b>JHNEBP Critical Appraisal Tool Rating:</b> III B <b>Strengths:</b> Robust calculations using real data. Objective data capture. <b>Limitations:</b> Study conducted at a single hospital and may not be appropriate to generalize results. Assumption that there is no startup cost for opening an observation unit.

Citation	Conceptual Framework	Design/ Method	Sample/ Setting	Variables Studied and Their Definitions	Measurement	Data Analysis	Findings	Appraisal: Worth to Practice
Baloescu et al. (2020)	None	Cross sectional analysis of two 2018 CMS hospital compare data sets: Medicare hospital spending/pt. & Timely & effective care. Hypothesis was tested that hospitals with greater ED boarding have corresponding higher risk-adjusted costs.	CMS merged data from all 50 states and over 4000 hospitals was reviewed for the 2 data sets. Data sets were collected from 4740 unique hospitals (1215 in southern US, 691 Mid-West, 531 western region & 466 eastern US). 689 (24%) had low ED volume, 586 high (20%) and 687 (24%) very high ED volume and 941 (32%) with medium ED volume. 2309 hospitals were included in the analysis.	<b>Control Variables:</b> Clearly defined. Median time for ED arrival to hospital bed, boarding time, median time from ED arrival to D/C, ED door to MD eval and left without being seen (LWBS). <b>Outcome measure:</b> Hospitals average spending for a admission episode.	Hospitals averaged 288.33 min from ED arrival to admitted bed, boarding averaged 114 min, 150 min for ED visit, 23 min for door to eval and average of 1.89% (22) LWBS. Hospitals with higher quality of care as evidenced by superior timeliness of care have low cost of providing care.	Multivariate linear regression analysis was performed to measure the ED crowding measures. Stepwise regression techniques were utilized to identify the most parsimonious model. Study found consistent relationship between ED crowding, including boarding, and increase in hospital spending.	Regression analysis adjusted to ED crowding demonstrated that 1 minute increase in ED boarding results in 0.00015 increase in Medicare spending per beneficiary (MSPB). Hospitals with medium, high & very high volumes were associated with higher MSPB. ED arrival to ED departure was not associated with MSPB.	<b>JHNEBP Critical Appraisal Tool Rating:</b> II A <b>Strengths:</b> <i>p</i> value scores were < 0.0001. Large data set covered the entire US for different volume ED's.  <b>Limitations:</b> None identified. Complex language used made it difficult to follow.

Citation	Conceptual Framework	Design/Method	Sample/Setting	Variables Studied and Their Definitions	Measurement	Data Analysis	Findings	Appraisal: Worth to Practice
Wolak et al. (2020)	Lean Methodology	<p>Lean methodology was utilized for improvement work to decrease length of stay for admitted patients needing hospital bed. Two tools were developed after 7 tests of change and were implemented hospital wide via policy creation.</p> <p><b>Specific Aim:</b> To apply Lean methods to implement a standardized, evidence-based ED-to inpatient RN handoff.</p>	Large urban academic medical center with 1600 monthly ED admit rate with 50 inpatient units. All nursing areas represented in the study.	Outcome metric: ED LOS for all ED patients & ED LOS for admitted patients waiting for bed. The number of reports attempts decreased from 10 pre implementation to 3 post implementations.	<p>During the 3-month observation admissions from the ED ranged between 1402 to 1694 with an average of 1585 admissions. Baseline ED LOS was found to be 497 min and post implementation it was 479 min. Average admission wait time was 154 min pre and decreased to 144 min.</p>	Observational data was compared for seasonal variability by comparing it to previous year. Pre and post implementation data was manually compared.	Patient transfer time decreased from 30.5 minutes to 21.7 minutes. The length of time to give/receive report decreased from 3.8 min to 2.8 min. ED length of stay and admission wait times did not improve.	<p><b>JHNEBP Critical Appraisal Tool Rating:</b> III A</p> <p><b>Strengths:</b> Tests of change clearly identified. Clear aim statement. IRB exemption &amp; approval from hospital research council.</p> <p><b>Limitations:</b> No global aim outlined. Timeline missing in aim statement. Data was captured manually can be biased and can create errors. Lack of sustain phase in the project.</p>

Citation	Conceptual Framework	Design/ Method	Sample/ Setting	Variables Studied and Their Definitions	Measurement	Data Analysis	Findings	Appraisal: Worth to Practice
Ouyang et al. (2021)	None	Retrospective study performed over a 2-year period. The association of pt. admission decisions and 7-day ED revisit probability with ED crowding levels measured by total ED volume, MD workload and boarding patients.	<p><b>Setting:</b> Tertiary care hospital ED with 50 beds &amp; additional 8 fast track beds.</p> <p><b>Sample:</b> 2013 to 2015 timeframe. 146,743 visit records were reviewed. Patients with disposition of LWBS, AMA, or transfer were excluded. Only patients with admit or D/C criteria were included. Of 141,035 selected charts 32,477 were admissions and 108,558 were discharged.</p>	3 variables were measured. ED Census: Total number of patients waiting to be seen & pts. whose treatments are in process. Boarder Census: Number of boarding pts. MD workload: number of pts. in the ED/total ED MDs on duty.	141,035 patient visit records were reviewed to find correlation.	Modified Poisson regression models with R was used over logistic regression to avoid exaggeration. Positive correlation was found between ED census and patient admissions as well as MD workload, 1.006 (CI 95%). Negative correlation was found between boarding and admissions, 0.991 (CI 95%).	Patients were more likely to be admitted if there were more patients in the ED, Increased MD workload led to more hospital admissions, meaning admitting more 'grey zone' pts. for a 'safe admission'. Pts. were less likely to be admitted if there were pts. boarding in the ED. These patients had a high 7-day revisit probability.	<p><b>JHNEBP Critical Appraisal Tool Rating:</b> II A</p> <p><b>Strengths:</b> IRB approval. Large data set.</p> <p><b>Limitations:</b> Single hospital data. Only patient count was included and variables like LOS were omitted.</p>



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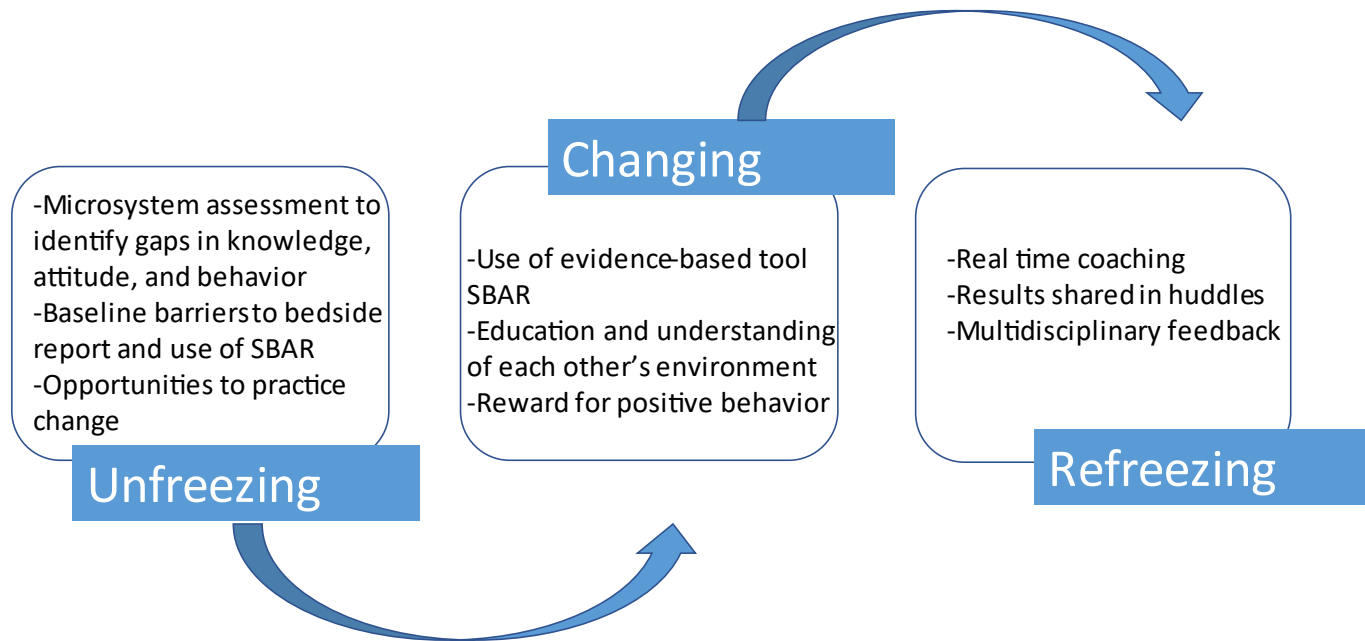
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### Appendix D

#### IHI Model for Improvement



**Appendix E**  
**Lewin Change Theory**



Note: Adopted from McGrath (2020). Pictorial created by author, April 2022

## Appendix F

### Levin's Change Theory

**Implementing Bedside Report: Strategies for Nurse Educators**

Using Lewin's theory of planned change, the following suggestions can be employed when developing an educational in-service for staff and transitioning to the use of bedside report.

**Unfreezing**  
The purpose of this first phase is to confront and challenge existing staff attitudes and beliefs towards bedside report.

- Assemble a committee (staff nurses, unit managers, educators) to provide assistance and guidance
- Create and distribute a pre-implementation survey to determine views on the current handover
- Conduct literature review on bedside report to obtain background information
- Provide staff with an explanation and rationale behind the change, while being available to answer questions and provide information about the transition

**Moving**  
It is during this second phase that education is provided to the staff and the process of bedside report is introduced and implemented.

- Explore literature on current standard scripts
- Involve staff in decisions regarding process (who is involved, what information is covered, script to be used)
- Provide an educational in-service that includes role-playing and communication exercises
- Coordinate debriefing sessions and meetings to identify problems, concerns, or barriers
- Be available to others

**Refreezing**  
During the third phase, bedside report has been incorporated into daily practice.

- Implement mandatory continuing education and annual performance competencies
- Incorporate education into new staff orientation
- Provide feedback to staff (anonymous surveys, HCAHPS scores)

Reference- 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>

## Appendix G

## Microsystem Assessment Tool

## Telemetry Microsystem Assessment of Data Sources and Data Collection Actions

Page/Type of Data	Data Source/Data Collection Action	Date/Owner
Know Your Patients		
B1. Estimated Age Distribution of Patients	Continuum Director	9/16/2021
B2. Living Situation	Social Work Manager	9/16/2021
B3. Patient Type-LOS average-Range	Continuum Director	9/16/2021
B4. Mortality Rate	Quality Data	9/17/2021
B5. List Your Top Diagnosis/Conditions	Nurse Manager	9/18/2021
B6. Point of Entry	Nursing Sup.	9/21/2021
B7. Discharge Disposition	Patient Care Coordinator	9/20/2021
B8. Patient Satisfaction Scores (Patient Survey pg 7)	Care Experience Leader	9/16/2021
B9. Patient Population Census ("A Day In The Life" pg 8)	Data Analyst	9/21/2021
Page 6 C Know Your Professionals		
C1. Current Staff	Staffing Manager	9/22/2021
Travelers	Staffing Office	9/22/2021
On-Call Staff	Staffing Manager	9/22/2021
Float Pool	Staffing Manager	9/22/2021
C2. Admitting Medical Service	Admitting	9/22/2021
C3. Supporting Diagnostic Departments	Radiology, Lab	9/22/2021
C4. Staff Satisfaction Scores (Staff Survey pg 9) (Personal Skills Assessment pg 10 – 11) (Activity Survey pg 12)	Chief Nurse	9/23/2021
Page 6 D Know Your Processes		
D1. Create Flow Charts of Routine Processes	In progress	10/25/2021
D2. Capacity-Rooms and Beds	Nurse Manager/38	9/18/2021
D3. Turnovers/Bed/Year	10/day	9/18/2021
D4. Linking microsystems (Patient Cycle Time Tool pg 13) (Core and Supporting Processes pg 14) (High Level Flowchart pg 15)	ED/OR/Direct/IR/Org	9/21/2021
Page 6 E Know Your Patterns		

E1. Most Significant Pattern	NM/ Discharges around 3pm	9/18/2021
E2. Successful Change	NM/Improved mobility from 2 to 4.4 average	9/18/2021
E3. Most Proud of	CNE/Staff Retention	9/23/2021
E4. Financial Picture	Finance Officer	9/23/2021





Do you use Per Diems? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> NO	<b>Staff Satisfaction Scores</b>		<b>%</b>
Do you use Travelers? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> NO	How stressful is the unit?	% Not Satisfied	15%
Do you use On-Call Staff? <input type="checkbox"/> Yes <input type="checkbox"/> NO	Would you recommend it as a good place to work?	% Strongly Agree	85%
Do you use a Float Pool? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> NO			
<b>*Each staff member should complete the Personal Skills Assessment and "The Activity Survey", pgs 10 - 12</b>			
<b>D. Know Your Processes:</b> How do things get done in the microsystem? Who does what? What are the step-by-step processes? How long does the care process take? Where are the delays? What are the "between" microsystems hand-offs?			
<b>1. Create flow charts of routine processes.</b>	<b>Do you use/initiate any of the following?</b>	<b>Capacity</b>	<b># Rooms</b> __45__
a) Overall admission and treatment process	Check all that apply		<b># Beds</b> __38__
b) Admit to Inpatient Unit	<input type="checkbox"/> Standing Orders/Critical Pathways	<b># Turnovers/Bed/Year</b> Average 8-10 dc/day	
c) Usual Inpatient care	<input checked="" type="checkbox"/> X Rapid Response Team	<b>Linking Microsystems</b>	
d) Change of shift process	<input checked="" type="checkbox"/> X Bed Management Rounds	(ER, ICU, Skilled Nursing Facility )	
e) Discharge process	<input type="checkbox"/> X Multidisciplinary/with Family Rounds	<b>ED, Admitting, OR Other KP</b>	
f) Transfer to another facility process	<input type="checkbox"/> Midnight Rounds		
g) Medication Administration	<input type="checkbox"/> Preceptor/Charge Role		
h) Adverse event	<input type="checkbox"/> X Discharge Goals		
<b>2. Complete the Core and Supporting Process Assessment Tool, pg 14</b>			
<b>E. Know Your Patterns:</b> What patterns are present but not acknowledged in your microsystem? What is the leadership and social pattern? How often does the microsystem meet to discuss patient care? Are patients and families involved? What are your results and outcomes?			
<ul style="list-style-type: none"> <li>Does every member of the unit meet regularly as a team? Y</li> </ul>	<ul style="list-style-type: none"> <li>Do the members of the unit regularly review and discuss safety and reliability issues? Yes</li> </ul>	<ul style="list-style-type: none"> <li>What have you successfully changed? Mobility Scores</li> </ul>	
<ul style="list-style-type: none"> <li>How frequently? Q2 Month</li> </ul>		<ul style="list-style-type: none"> <li>What are you most proud of? Staff Retention</li> </ul>	
<ul style="list-style-type: none"> <li>What is the most significant pattern of variation? Late Discharges</li> </ul>	<ul style="list-style-type: none"> <li>What is your financial picture? Green</li> </ul>		

**Appendix I**  
**SWOT ANALYSIS**

<b>STRENGTHS</b>	<b>WEAKNESSES</b>
<ul style="list-style-type: none"> <li>• <b>Enhances patient &amp; staff satisfaction</b></li> <li>• <b>Integrated system</b></li> <li>• <b>Gaining expertise in throughput</b></li> <li>• <b>Reduced time to be admitted</b></li> <li>• <b>Increased ED volume</b></li> <li>• <b>Leading the organization in best practices</b></li> <li>• <b>Leadership Support</b></li> </ul>	<ul style="list-style-type: none"> <li>• <b>Difficult to get a cohesive team</b></li> <li>• <b>Gaps in Service departments</b></li> <li>• <b>Number of MDs and Nurses needed</b></li> <li>• <b>Sustainability</b></li> <li>• <b>Time requirement may not be realistic</b></li> <li>• <b>Learning curve</b></li> </ul>
<b>OPPORTUNITIES</b>	<b>THREATS</b>
<ul style="list-style-type: none"> <li>• <b>Partnering w/hospital departments on best practices</b></li> <li>• <b>Leading the organization in process improvement</b></li> <li>• <b>Financial return</b></li> <li>• <b>Community trust and reputation</b></li> </ul>	<ul style="list-style-type: none"> <li>• <b>Culture change</b></li> <li>• <b>Staff resistance</b></li> <li>• <b>Lack of Resources</b></li> <li>• <b>Loss of staff</b></li> <li>• <b>Demographic Changes</b></li> </ul>

## Appendix J

### Project Charter

**Project Title:** Ed to Telemetry Bed: Optimizing Nurse Communication & Decreasing Team Frustration

**Team Members:** ED & Telemetry Unit nurses, House Supervisors, Assistant Nurse Managers, Nurse Managers, ED Director, ED & Hospital Medical Director, Assistant Medical Group Administrator, Chief Nurse Executive, Area Portfolio Leader

**University/Organization:** University of San Francisco

#### What are we trying to accomplish?

**Problem:**

According to the Institute of Medicine, boarding inpatients in the emergency department increases the risk of medical errors, missed treatment or delays in treatments, increased costs, and decreased quality of care. Proper hand-off between the ED and the admitting unit is an essential step to facilitate patient transfer in order to ensure continuity and safety of patient care. Delays and miscommunication during nursing hand-off prolongs patient stay in the ED and can lead to sentinel events, adverse patient outcomes and frustration for the care team. Efforts to minimize delays allow timely initiation of patient specific care, improved patient and care team satisfaction, decreased waste, and improved ED capacity.

**Rationale:**

Our hospital has limited ED capacity (20 beds), increased ED volume (14% increase), and increased boarding hours (36%) compared to 2020. Average ED patient volume is 113 patients per day. The hospital measures ED admit to bed as a performance metric. The goal is to move the patient to the inpatient bed within 60 minutes from the time an order is written for admission. Target is to achieve 70% compliance. Current average monthly compliance is at 45%. Of the reasons captured for delays, nurse unavailable for report was found to be the major contributor (52%). 1:1 in person RN hand-off between the ED and Tele nurse was chosen as a test of change to try to minimize delay caused by unavailability of a nurse over the phone.

**Aim Statement:**

By July 1st 65% of patients on the second shift on the Telemetry unit will experience a 1:1 patient handoff between the ED and Tele nurse within 60 minutes from the time admit order is written.

**Expectations:**

Minimizing delays and improving hospital throughput will help reduce ED overcrowding, decreased waste related to room turnover, and improve staff and patient satisfaction.

#### Outcome (or Project Measures)

**Process Measures:**

Establish baseline with delivery of self-assessment tool to all RNs in the ED and 2<sup>nd</sup> shift Tele Unit.

TeamSTEPS tool SBAR to standardize bedside report

Reward for improved compliance

**Balancing Measures:**

Measure staff morale with happy face score scale before and after the implementation

Measure patient experience scores before and after implementation

**What Changes Can We Make to Improve?**

**Key Stakeholders:**

**Whose input and support will this project require?** CNE/AMGA/MD/Directors/NM/ANM/ED and Tele Nurses. How will you engage these key stakeholders? Weekly meetings, Gemba, A3 thinking.

**Change Ideas:**

Try bedside report as opposed to current telephone report.

Standardize reporting using evidence-based tools

**Barriers:**

What are the barriers to the success of your project? Time, staff engagement & availability, shifting priorities for leadership & leadership support, potential initial increased cost.

**References**

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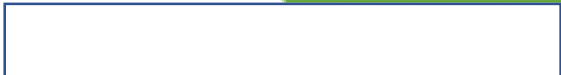
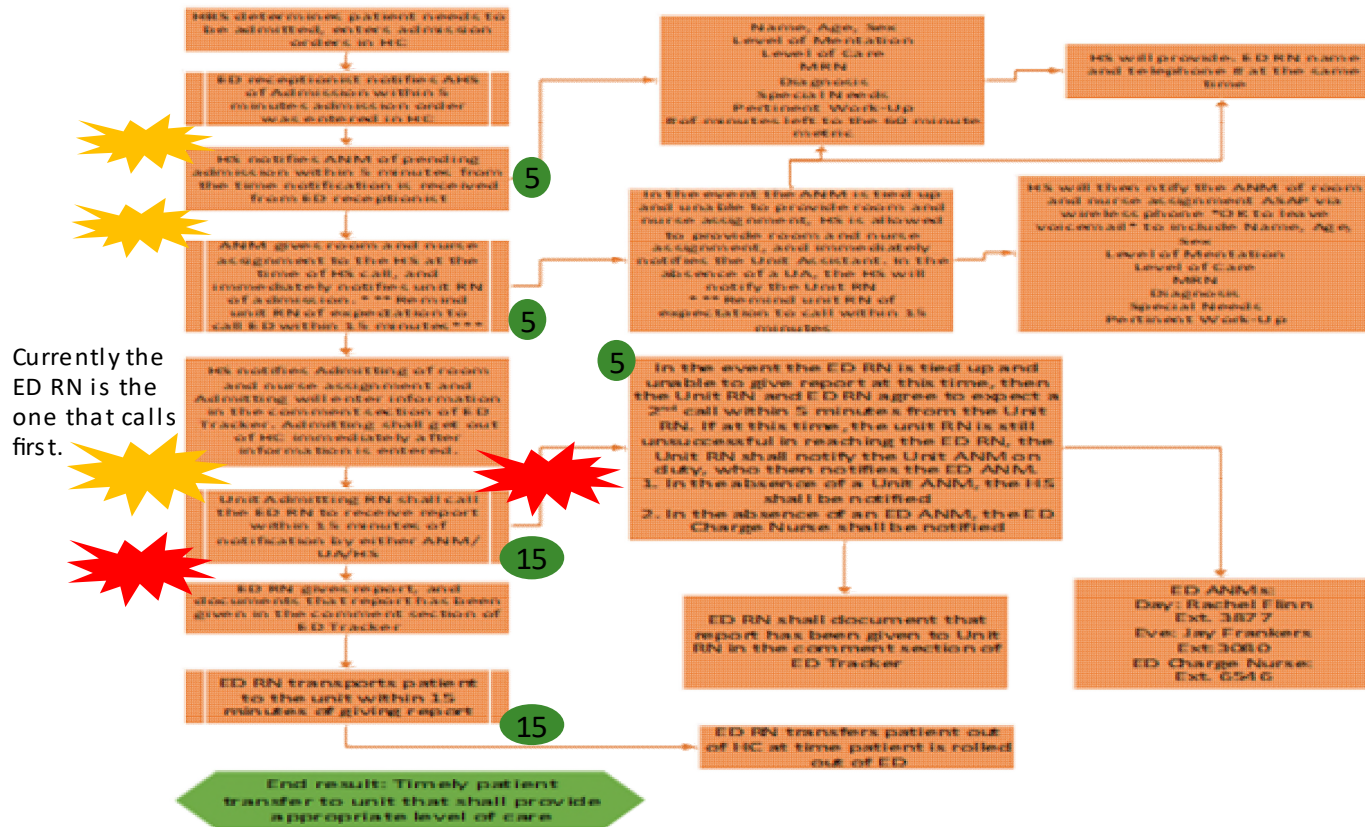
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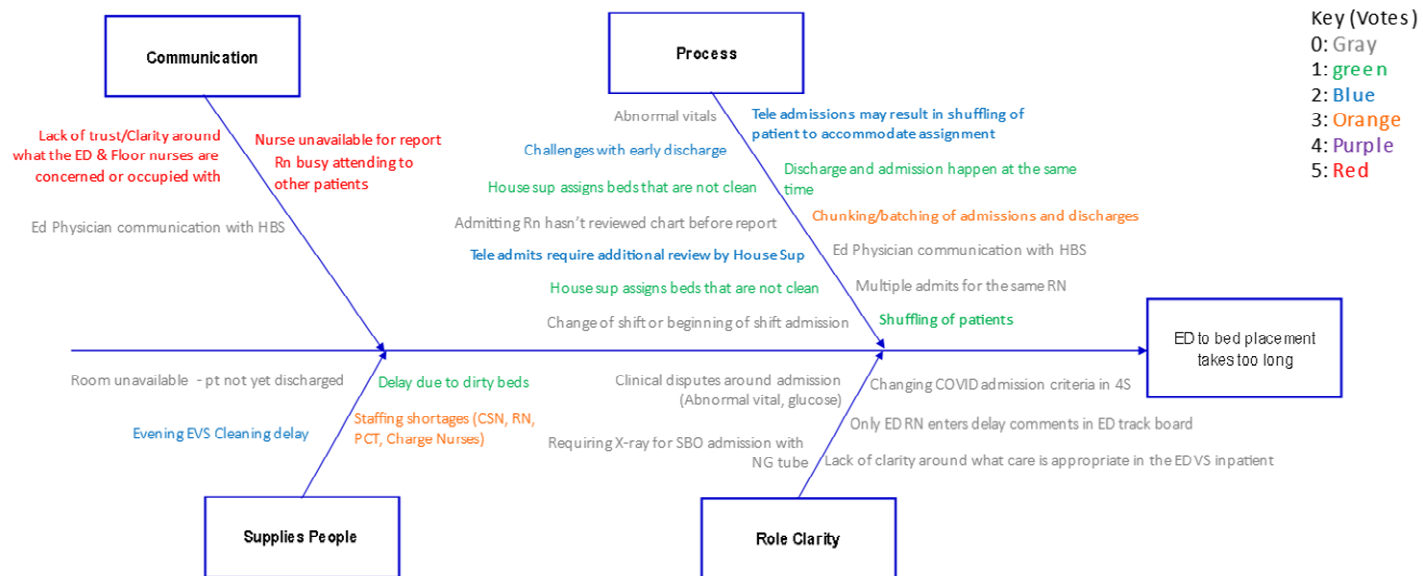
### Appendix K Process Map

## ED to Floor Process Map



### Appendix L Cause and Effect Diagram

## ED to Floor Improvement Project Cause & Effect Diagram





**Appendix N**

Project Cost Estimate

PROJECT TEAM COST										
	Area Portofolio Leader	Unit Nurse Manager	ED Leader	Nursing Supervisor	Hospital Based Physician	Emergency Medicine Physician	ED RN	Unit RN	Total	Total Cost/Week
<b>Time/Week in Hours</b>	1	2	2	2	1	1	4	4	17	
<b>\$ Wage/hr</b>	\$ 120.00	\$ 95.00	\$ 95.00	\$ 95.00	\$ 140.00	\$ 140.00	\$ 90.00	\$ 90.00	\$ 865.00	
<b>Cost/week</b>	\$ 120.00	\$ 190.00	\$ 190.00	\$ 190.00	\$ 140.00	\$ 140.00	\$ 360.00	\$ 360.00	\$ 1,690.00	\$ 1,690.00
<b>Conference Room</b>										
<b>Paper Cost</b>	\$ 15.00	\$ 15.00	\$ 15.00	\$ 15.00			\$ 20.00	\$ 20.00	\$ 100.00	\$ 100.00
<b>Misc Stationery</b>	\$ 25.00	\$ 25.00		\$ 15.00			\$ 20.00	\$ 20.00	\$ 105.00	\$ 105.00
<b>Total/Member</b>	\$ 160.00	\$ 230.00	\$ 205.00	\$ 220.00	\$ 140.00	\$ 140.00	\$ 400.00	\$ 400.00		
<b>Total</b>										\$ 1,895.00
<b>Project Duration</b>	24 weeks or 180 days								<b>Total Project Cost</b>	\$ 45,480.00



## Appendix O

## Financial Analysis

## ED Loss in Efficiency

<b>Admits/day</b>	12
<b>55% delayed</b>	6.6
<b>Average Delay in hours</b>	2
<b>Per hour visit cost</b>	\$ 456.27
<b>Cost to unit/day</b>	\$ 6,022.81
<b>Cost to unit/week</b>	\$ 42,159.70
<b>Cost to unit/ 24 weeks</b>	\$ 1,011,832.70
<b>15% Improvement</b>	\$ <b>151,774.90</b>

## Tele Unit Loss

<b>Admits/day</b>	12
<b>55% delayed</b>	6.6
<b>Average Delay in hours</b>	2
<b>Per hour unit cost</b>	\$ 181.42
<b>Cost to unit/day</b>	\$ 2,394.70
<b>Cost to unit/week</b>	\$ 16,762.90
<b>Cost to unit/ 24 weeks</b>	\$ 402,309.60
<b>15% Improvement</b>	\$ <b>60,346.44</b>

Source- California Department of Health Care Access and Information (HCAI). (2022). *Hospital Chargemaster*. [Hospital Chargemasters - HCAI](#)

**Appendix P**  
**Revenue Potential**

## PROJECT TEAM REVENUE

**24 WEEK  
IMPROVEMENT**

Average ED LOS in Hours	5.26	4.47
Cost of ED Intermediate Visit	\$ 2,400.00	
ED Bed Cost/hour	\$ 456.27	
Hospital Room Cost Tele Unit/day	\$ 4,354.00	
Room Cost/hour	\$ 181.42	
Average admits/day	12	
Baseline metric	5.4	
Target metric	7.2	
Pt. gain/day with improvement	1.8	
Improved Unit efficiency/day	\$ 326.55	\$ 58,779.00
Improved ED efficiency/day	\$ 821.29	\$ 147,832.70
LWBS/ month	12.5	6.25
LWBS Per Day	0.42	
Assume 50% improvement LWBS	0.2	
Real ED Revenue Increase 6 months	\$ 36,000.00	\$ 36,000.00
Total Hospital efficiency Improvement		\$ 206,611.70
<b>Total Revenue Increase</b>		<b>\$ 36,000.00</b>

**Source-** California Department of Health Care Access and Information (HCAI). (2022). *Hospital Chargemaster*. [Hospital Chargemasters - HCAI](#)

## Appendix Q

### SBAR Tool

**SBAR:** Situation-Background-Assessment-Recommendation

Before filling out the template, first save the file on your computer. Then open and use that version of the tool. Otherwise, your changes will not be saved.

### Template: SBAR

<b>S</b>	<p><b>Situation:</b> What is the situation you are calling about?</p> <ul style="list-style-type: none"> <li>Identify self, unit, patient, room number.</li> <li>Briefly state the problem, what is it, when it happened or started, and how severe.</li> </ul>	<p><small>Situation What is the situation you are calling about. Identify self, unit, patient, room number. Briefly state the problem, what is it, when it happened or started, and how severe.</small></p>
<b>B</b>	<p><b>Background:</b> Pertinent background information related to the situation could include the following:</p> <ul style="list-style-type: none"> <li>The admitting diagnosis and date of admission</li> <li>List of current medications, allergies, IV fluids, and labs</li> <li>Most recent vital signs</li> <li>Lab results: provide the date and time test was done and results of previous tests for comparison</li> <li>Other clinical information</li> <li>Code status</li> </ul>	<p><small>Background Pertinent background information related to the situation could include the following. The admitting diagnosis and date of admission. List of current medication</small></p>
<b>A</b>	<p><b>Assessment:</b> What is the nurse's assessment of the situation?</p>	<p style="text-align: center;"><small>Assessment What is the nurses assessment of the situation</small></p>
<b>R</b>	<p><b>Recommendation:</b> What is the nurse's recommendation or what does he/she want? Examples:</p> <ul style="list-style-type: none"> <li>Notification that patient has been admitted</li> <li>Patient needs to be seen now</li> <li>Order change</li> </ul>	<p><small>Recommendation What is the nurses recommendation or what does he/she want? Examples. Notification that patient has been admitted. Patient needs to be seen now. Or</small></p>

**Appendix R**  
**SBAR Reporting**

<b>S - Situation</b>	<b>Patient Sticker</b>						
	Chief Complain: _____						
<b>B-Background</b>	<b>Medical History:</b>						
	<b>Medication Allergies</b>						
<b>A-Assessment</b>	<b>Recent Vital Signs</b>	<b>BP</b>	<b>HR</b>	<b>RR</b>	<b>Temp</b>	<b>O2 Sat</b>	<b>Pain</b>
	<b>Critical Labs</b>						
	<b>Pertinent Xray result</b>						
	<b>Pertinent CT Result</b>						
	<b>Isolation Status</b>				<b>Ambulation Status</b>		
<b>R- Recommendation</b>	<b>Treatment &amp; Plan of Care</b>	<b>Medication Given</b>					
		<b>O2 Therapy</b>					
		<b>Others</b>					

**Appendix S****RN Survey**

I find it enjoyable to give and receive report from another RN in person

**Strongly Agree**     **Agree**     **Disagree**     **Strongly Disagree**

In person Nurse Knowledge Exchange is an effective way to gather pertinent information about my patient

**Strongly Agree**     **Agree**     **Disagree**     **Strongly Disagree**

It is easy for the ED RNs and the unit RNs to talk openly

**Strongly Agree**     **Agree**     **Disagree**     **Strongly Disagree**

Communication between nurses on the unit and the ED nurses can improve

**Strongly Agree**     **Agree**     **Disagree**     **Strongly Disagree**

The accuracy of information passed between the ED and the unit can improve

**Strongly Agree**     **Agree**     **Disagree**     **Strongly Disagree**

The ED nurses fully understand the information that I need to care for my patient

**Strongly Agree**     **Agree**     **Disagree**     **Strongly Disagree**

The information I receive during handoff prepares me adequately to care for my patient

**Strongly Agree**     **Agree**     **Disagree**     **Strongly Disagree**

It is often necessary for me to go into the medical chart to check for the accuracy of information received during handoff

**Strongly Agree**     **Agree**     **Disagree**     **Strongly Disagree**

I believe a standardized report can contribute to improve patient safety

**Strongly Agree**     **Agree**     **Disagree**     **Strongly Disagree**

I am familiar with tools for standardized reporting such as **I-PASS** and **SBAR**

**Strongly Agree**     **Agree**     **Disagree**     **Strongly Disagree**

## Appendix T

**CNL Project: Statement of Non-Research Determination Form**

**Student Name:** Harmandeep  
Madra

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**Title of Project:** ED to Telemetry Bed- Optimizing Nurse Communication & Decreasing Team Frustration.

**Brief Description of Project:**

According to the Institute of Medicine, boarding inpatients in the emergency department increases the risk of medical errors, missed treatment or delays in treatments, increased costs, and decreased quality of care. Proper hand-off between the ED and the admitting unit is an essential step to facilitate patient transfer to ensure continuity and safety of patient care. Delays and miscommunication during nursing hand-off prolongs patient stay in the ED and can lead to sentinel events, adverse patient outcomes and frustration for the care team. Efforts to minimize delays allow timely initiation of patient specific care, improved patient, and care team satisfaction, decreased waste, and improved ED capacity.

**A) Aim Statement: (Specific)** By July 1st 65% of patients on the second shift on the Telemetry unit will experience a 1:1 patient handoff between the ED and Tele nurse within 60 minutes from the time admit order is written utilizing standardized TeamSTEPPS tool SBAR.

**Global Aim:** By July 2023 a 1:1 primary nurse hand off using SBAR will become the standard of communication on all 3 shifts on the telemetry unit.

**B) Description of Intervention:** Patient hand off between the ED and Telemetry Unit primary RN will take place in person at bedside on the Telemetry Unit utilizing SBAR.

**C) How will this intervention change practice?** TeamSTEPPS tool SBAR will help reduce variation and will allow to add structure, and consistency to help standardize bedside patient hand off between the ED and the Telemetry Unit primary RN. This intervention will help eliminate waste associated with delays in current practice related to nurse unavailability for a telephone report. This process will facilitate timely start of interventions for admitted patients on the Telemetry Unit within 60 minutes from the time an admit order is written in the ED for at least 65% of admissions.

**D) Outcome measurements:** Process measures- Self assessment tool will be delivered to RNs on the Telemetry Unit to establish baseline data. SBAR tool will be introduced

to all ED and Telemetry Unit RNs and compliance will be measured for 2 weeks. Reward (coffee cards, facility swag) will be provided to improve compliance. Balancing Measures- Staff morale will be measured before and after implementation of bedside report. Patient experience scores will be measured in hope that patient satisfaction will improve with reduction in delays with admissions.

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:**

<b>Project Title: ED to Telemetry Bed- Optimizing Nurse Communication &amp; Decreasing Team Frustration.</b>	<b>YES</b>	<b>NO</b>
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.	<b>X</b>	
The specific aim is to improve performance on a specific service or program and <b>is a part of usual care</b> . ALL participants will receive standard of care.	<b>X</b>	
The project is <b>NOT</b> 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 <b>NOT</b> follow a protocol that overrides clinical decision-making.	<b>X</b>	
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 <b>NOT</b> develop paradigms or untested methods or new untested standards.	<b>X</b>	
The project involves implementation of care practices and interventions that are consensus-based or evidence-based. The project does <b>NOT</b> seek to test an intervention that is beyond current science and experience.	<b>X</b>	
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.	<b>X</b>	

The project has <b>NO</b> funding from federal agencies or research-focused organizations and is not receiving funding for implementation research.	<b>X</b>	
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., <b>not</b> a personal research project that is dependent upon the voluntary participation of colleagues, students and/ or patients.	<b>X</b>	
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: <i>“This project was undertaken as an Evidence-based change of practice project at Kaiser South San Francisco hospital and as such was not formally supervised by the Institutional Review Board.”</i>	<b>X</b>	

**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): Harmandeep Madra**

Signature of Student: \_\_\_\_\_ *HMadra* \_\_\_\_\_ DATE 4/8/2022

**SUPERVISING FACULTY MEMBER NAME (Please print): Dr. Cathy Coleman**

*Catherine M. Coleman DNP, CNL*  
Signature of Supervising Faculty Member: \_\_\_\_\_ DATE 5/4/22

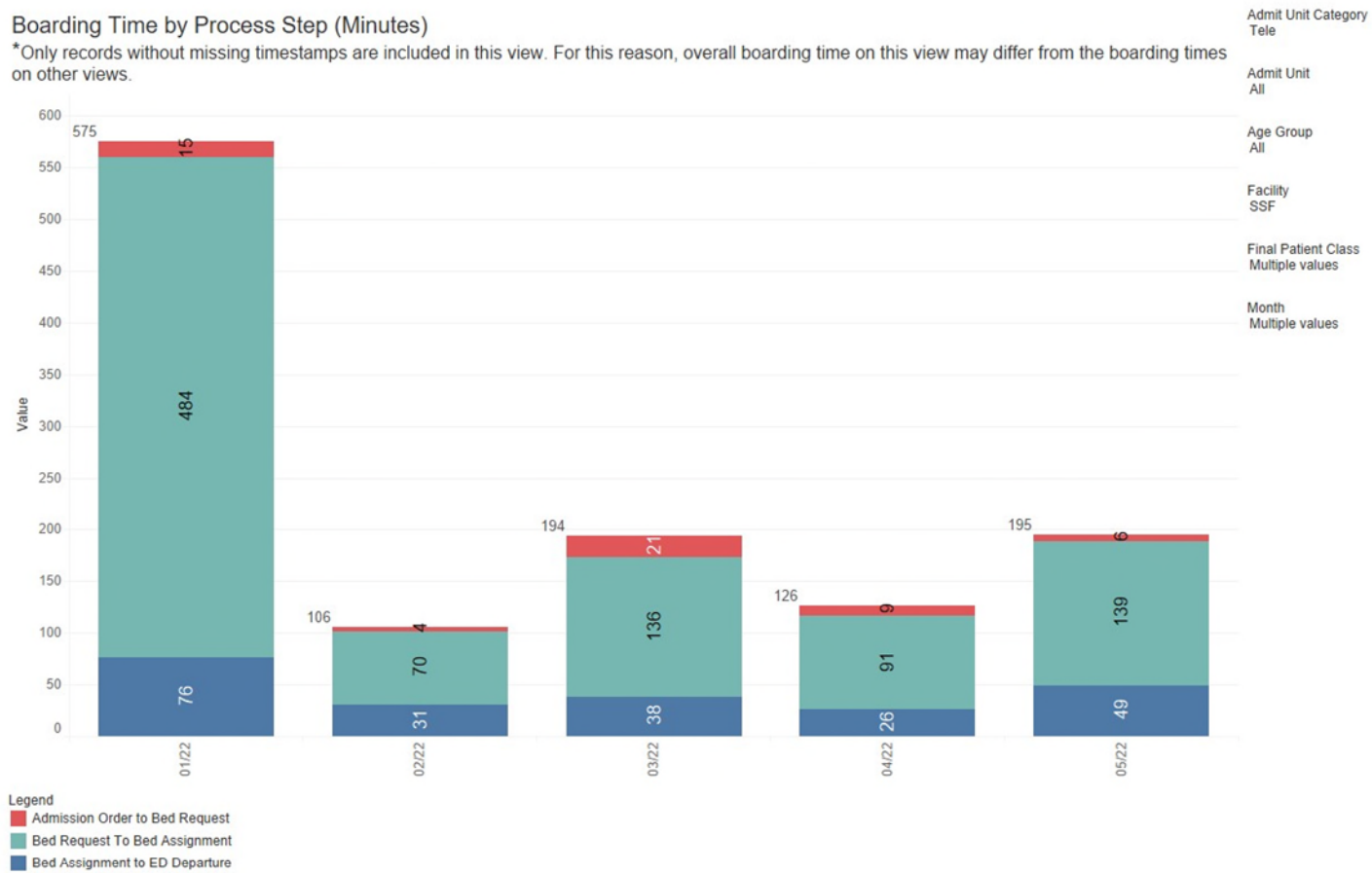


### Appendix U

#### Results Detail- Breakdown by minutes

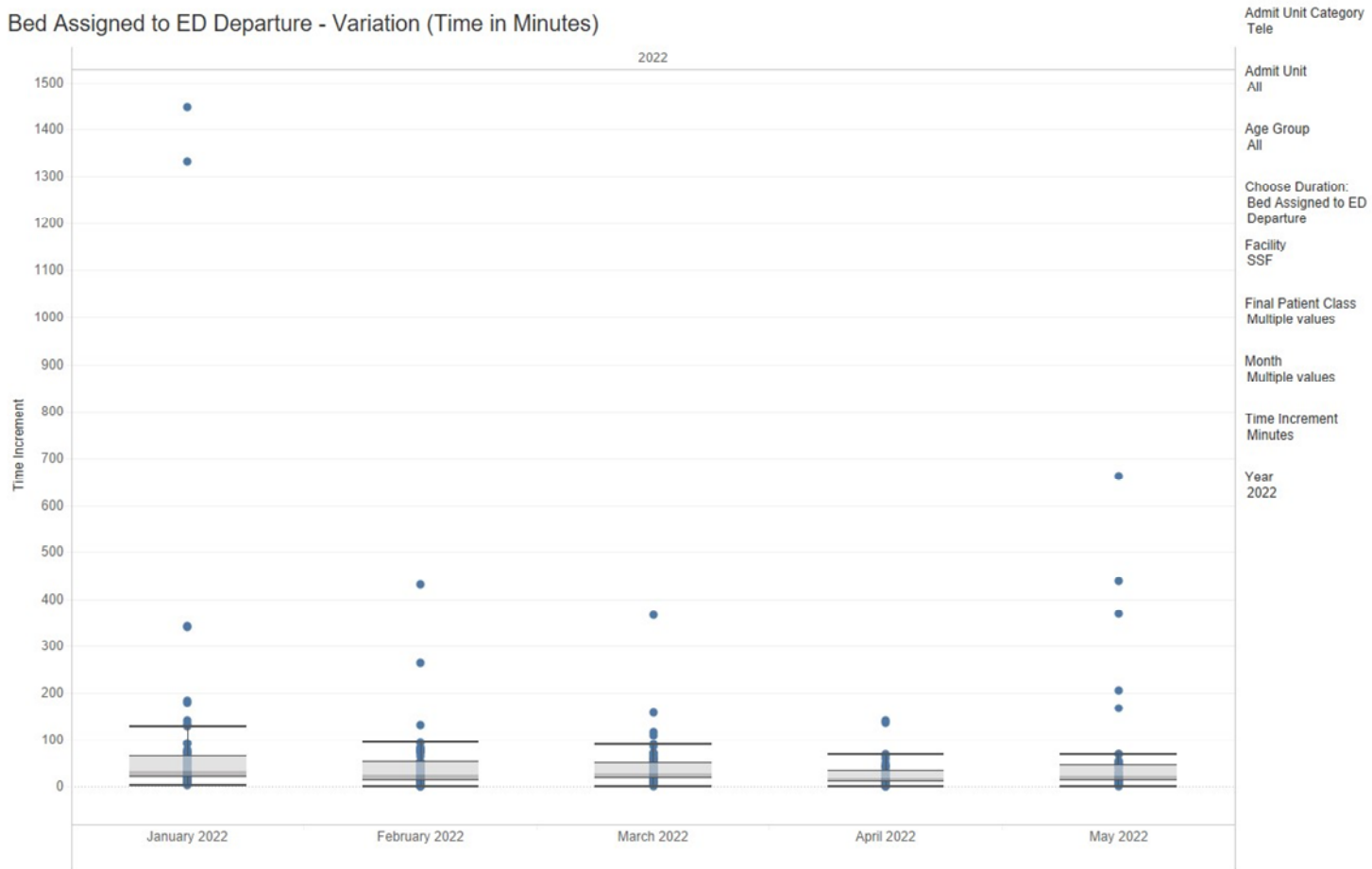
Boarding Time by Process Step (Minutes)

\*Only records without missing timestamps are included in this view. For this reason, overall boarding time on this view may differ from the boarding times on other views.



### Appendix V Box Plot Variation

Bed Assigned to ED Departure - Variation (Time in Minutes)



**Appendix W**

**Outcome Measure: ED to Bed Results**

Month	% ED to Floor <60 Minutes	Hospital Average Daily Census (ADC)
Sep-21	50	72
Oct-21	51	75
Nov-21	55	78
Dec-21	30	90
Jan-22	12	95
Feb-22	43	80
Mar-22	41	85
Apr-22	41	82
May-22	29	89

