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Emergency Department to Medical Telemetry Bed Flow Optimization

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N660 Evidence-Based Improvement Project Prospectus

Adapted from Squire 2.0 Guidelines

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Abstract

Background: The setting for this quality improvement project is a 22-bed medical telemetry unit that receives approximately 85% of ED admissions. The capacity challenges are one of the major causes of ED admissions beyond the 60-minute benchmark. To create capacity, discharges should happen earlier on the day or before 1:00 p.m. to be able to admit patients within 60 minutes from when the physician writes an order to patient transfer to the telemetry unit.

Problem: Patients are being boarded in the ED for extended times while waiting for an inpatient bed assignment. Longer boarding time in the ED is associated with higher morbidity and mortality rates. In the project setting, patients are routinely boarded in the ED longer than 60 minutes from when an order to admit is written to when the patient reaches the assigned bed. According to McKenna et al. (2019. By looking at ED-to-bed numbers and statistics for East Bay for March, 97% of ED patients were transferred from the ED greater than 60 minutes, with only 3% making it within 60 minutes. Metrics that matter for this unit include a target for patients who have the order to transfer from the ED to the unit. That target is 60 minutes across the entire northern California region. There needs to be balanced demand and capacity in this microsystem.

Interventions: This project aimed to introduce and test a daily noon demand capacity huddle to expedite safe discharge and create more capacity for ED patients that need inpatient beds. The goal was to decrease patient wait time for an inpatient bed, thus improving ED to an inpatient bed within 60 minutes or less from the time of admit order entry. The transfer of patients within 60 minutes or less will help in the timely execution of interventions contributing to decreased LOS, complications, and waste in the system leading to overall patient and healthcare team satisfaction**.**

Outcome Measures: The outcome measure of this project is to improve patient movement from the ED to an inpatient bed to at least 50% of patients within 60 minutes from when the physician writes the admission order to when the patient leaves the ED by July 2023. The process measure of this project includes the percentage of patients who are discharged before 1:00 p.m. and the percentage of patients assigned a bed within 15 minutes of an order entry. The balancing measure of this project is that an increase in expediency with room turnover can compromise patient safety by not following the infection control process.

Results: ED to Bed decreased from April 2023 (six hundred and sixteen minutes) to Four hundred and thirty-four in June 2023. The discharge percentage before 1 pm in April 2023 was 37% and slightly improved in June 2023, at 38%. ED to bed overall percentage was 5% in June 2023 compared to the 3% rate in April 2023

Conclusion: Implementing the daily noon huddle designed to address inpatient capacity constraints and improve patient care outcomes did slightly improve ED to bed time within three months of implementation.

Keywords: ED to bed, demand capacity, overcrowding

Personal Statement

I am a nursing and control supervisor in an urban hospital in the East Bay area. My leadership vision is to create a culture of partnership between the emergency department (ED) and inpatient units for a smooth transition of ED-to-bed standard of 60 minutes, with an excellent care experience for our patients needing admit beds. This topic relates to my core value of human kindness and servant leadership. I chose this topic because of the challenging demand for inpatient beds and actual hospital inpatient capacity in a small urban hospital. Seeing patients with heightened anxiety, discomfort, and potential risk for morbidity and mortality was very unsettling. This improvement project will decrease emergency room adverse effects on patients waiting for an extended period, such as developing pressure ulcers, falls, morbidity, and mortality.

Problem Description

Patients are being boarded in the ED for extended times while waiting for an inpatient bed assignment. Longer boarding time in the ED is associated with higher morbidity and mortality rates. In the project setting, patients are routinely boarded in the ED longer than 60 minutes from when an order to admit is written to when the patient reaches the assigned bed. According to McKenna et al. (2019), during times of overcrowding, delays in ED transfer can lead to complications in patients with acute coronary syndrome. According to Salway et al. (2017), ED overcrowding also increases medical errors and decreases the quality of care given to patients. By looking at ED-to-bed numbers and statistics for East Bay for March, 97% of ED patients were transferred from the ED greater than 60 minutes, with only 3% making it within 60 minutes. Metrics that matter for this unit include a target for patients who have the order to transfer from the ED to the unit. That target is 60 minutes across the entire northern California

region. There needs to be a balanced demand and capacity in this microsystem. The microsystem is a 22-bed medical telemetry unit that receives approximately 85% of ED admissions. The capacity challenges are one of the major causes of ED admissions beyond the 60-minute benchmark. To create capacity, discharges should happen earlier on the day or before 1:00 p.m. to be able to admit patients within 60 minutes from when the physician writes an order to patient transfer to the telemetry unit.

Specific Project Aim

The specific aim of this project: By July 2023, improve patient movement from the ED to an inpatient bed from a baseline of 3% to at least 50% within 60 minutes from when the physician writes the admission order to when the patient leaves the ED.

Available Knowledge

PICOT Question

A PICOT question was developed to aid in a literature search. For this project, the PICOT question was: For ED patients (P) with a transfer order, does managing telemetry unit capacity through early discharge planning (I) boarding time reduce ED to telemetry bedtime (O), compared to current practice (C), over a 3-month period?

Search Strategy

A database search of the published literature was performed through PubMed, EMBASE, Cochrane Database of Systematic Reviews, and Cumulative Index to Nursing and Allied Health Literature (CINAHL). The search terms *emergency department*, *ED*, *ER*, *accident*, *emergency*, *A&E*, *bed ahead*, *bed assignment*, and *pull model* were used with the Boolean operators AND/OR. Filters were applied to limit the return to peer-reviewed studies published between 2010 and 2022 in the English language. The initial return was 75, of which 21 were retained

based on reading titles and keywords. With a further reading of titles and abstracts, articles were excluded if the studies did not address ED overcrowding and/or patient placement in a hospital. The top five studies were chosen for inclusion as the most relevant to the PICOT question from rereading the abstracts and skimming other sections of the papers. The five studies were appraised for the level and quality of evidence using the Johns Hopkins Nursing Evidence-Based Practice Model and Guidelines (Dearholt & Dang, 2017; see Appendix A).

Review of Evidence

Weiss et al. (2004) performed a survey study to validate a model to predict ED overcrowding. The objective was to develop a simple screening tool that can be used to determine the degree of ED overcrowding easily and quickly. A 5-question reduced model was developed from a 23-question site sampling form and evaluated for predictive validity. The study consisted of 336 site samplings at eight academic medical centers. The reduced 5-question model predicted the full model with 88% accuracy. Overcrowding, as determined by the 23-question model, occurred between 12% and 73% of the time, with a mean of 35%. Two hospitals in the study were overcrowded more than 50% of the time. The authors suggested that the simple questionnaire can be used in any ED to determine on which days an ED is overcrowded and enable ED administration to present a simple number to hospital administration that communicates the degree of overcrowding in a manner comparable to other EDs using the same assessment tool. Strengths of the study were the design of the 23-question site sampling survey with four subscales developed from the current literature on ED overcrowding and the large number (42) and frequency (every 4 hours) of sampling times randomized over 3 weeks, for a total of 336 samplings. The study was restricted to academic medical centers, limiting the generalizability of the results to other settings. The study was appraised as Level III Quality B.

Barthélemy et al. (2019) published a retrospective cohort study utilizing data collected from 3,476 patients with traumatic brain injury (TBI) admitted to a major government hospital in Phnom Penh, Cambodia between June 2013 and June 2018. The purpose of the study was to determine if a relationship existed between injury-to-admission delay (IAD) and patient clinical outcomes and length of stay (LOS). A statistical approach was used to analyze data from medical records of 2,125 TBI patients. The results showed worsening outcome on the Glascow Outcome Scale for coma and longer LOS with increased IAD, especially beyond the 4-hour threshold. The authors suggested data from studies such as theirs could aid in the development of capacity-building efforts to minimize IAD as much as possible. A strength of the study was the large dataset of medical records for TBI diagnosis in a well-delimited population (75% men, with a median age of 27 years and a range of 21 to 37 years). No limitations were noted. The study was appraised Level III Quality B.

Hsu et al. (2019) performed a before-and-after intervention study in the ED of an acute 1,300-bed medical center in Taiwan to explore solutions to ED overcrowding and reducing ED LOS of more than 48 hours. In this study, three action plans were created and implemented: giving patients a choice to transfer to another hospital, increasing the turnaround time for beds and monitoring daily the demand and capacity, and reassessing patients who have hospital LOS greater than 32 hours. A strength of the study was the careful identification and definition of dependent and possibly confounding variables. A limitation was the short duration of the study and minimal participation of directors in all departments involved in throughput. The study was appraised Level III Quality B.

According to Webster et al. (2016), when placed in various units or relocated infra-unit or infra-hospital, patients experienced increased risks secondary to meeting throughput and

operational challenges of the organization. Webster et al. defined 65.8% of patient movement as secondary to operational needs and efficiency versus conditional needs. This latent condition places patients at increased risk, with patients noting increased stress with infra-unit and infra-hospital relocation. The study was appraised Level II Quality B.

According to Yuzeng et al. (2019), a hospital-wide approach is necessary to drive significant improvements on the ED wait time for inpatient bed placement and admissions from different entities. Input and collaboration from frontline staff are crucial in creating a systematic patient placement process to eliminate or decrease wait times. This study was appraised Level III Quality B.

Synthesis of Evidence

The evidence from these studies suggests a pull method of patient placement from ED to an inpatient bed to decrease the total wait time will improve the quality of care provided. The best practices identified during this review and appraisal included initiating a multidisciplinary care team noon huddle, developing a *think noon* checklist of patients' discharge needs the day before the expected discharge date, and utilizing Info View reports to track progress or improvement needed for the project. The literature strongly supported that late afternoon hospital discharges are one of the main factors that contribute to ED admission bottlenecks.

Rationale

Theoretical Framework

Havelock's theory of change is derived from Kurt Lewin's theory of change (Barrow et al., 2022). The framework has six steps: (a) building relationships, (b) diagnosing the problem, (c) gathering resources, (d) choosing the solution, (e) gaining acceptance, and (f) self-renewal. In the first step, relationships are built among the staff, physicians, and stakeholders. For this

project, nurse managers and directors of important departments, such as ED, transport, and nursing, will be sought out for support. The second step is when the problem is diagnosed, information gathered, and available data collected, such as ED-to-bed time in the hospital system where the project will be carried out. The third step is collaboration to come up with the right plan of action and implementation. The fourth step is to adopt the best solution and put it into action. The fifth step is monitoring the action plan's progress. For this project, the fourth and fifth steps will include rounding on the nursing staff and physicians and conducting interviews to assess progress on the test of change. The sixth and final step is to establish the change as standard practice and to include it in hospital policy.

Working in healthcare is everchanging. This theory of change guides the clinical nurse leader (CNL) by recognizing the necessity to adapt to workflow changes that benefit patients. This theory helps in planning, executing, and sustaining the improvement project with careful consideration of the values, culture, and people in the microsystem. It also helps in acknowledging the fact that change is always challenging. According to McEwen and Wills (2011), "For most individuals, change creates uncertainty and anxiety" . This change theory provides a structured way to plan change. It provides strategies that encourage motivation to change rather than resistance.

Context

The CNL's microsystem is a 22-bed telemetry unit in a small 50-bed urban community hospital. The ED has 24 beds, an average daily census of 200 patients, with 10 to 15 patients admitted daily to the medical-surgical telemetry unit. Because most ED patients are admitted to this microsystem, throughput improvement can significantly impact the overall hospital metric. The telemetry unit is staffed with registered nurses (RNs), patient care technicians, and unit

assistants to provide care. Physicians, physical and occupational therapists, social workers, patient care coordinators, and transporters are part of the multidisciplinary team that is part of the patient's healthcare team in the microsystem. A team was formulated by the CNL, which included nursing supervisors, inpatient nurse managers, hospital-based physicians, emergency medicine physicians, ED leadership, ED RNs, and nursing operations directors to kickstart the project. Meetings are held once a week to collaborate and formulate the improvement plan. A strength, weaknesses, opportunities, and threats (SWOT) analysis was performed to understand interventions necessary for achieving performance improvement. Data collection methods were direct observation, literature review, interviews, and surveys.

The microsystem is grounded in the core values of human kindness, equality, and respect. There are processes in place for a timely, respectful resolution when challenges arise. The microsystem is also invested in resources to provide patients' families support when unanticipated patient outcomes happen.

SWOT Analysis

A SWOT analysis of strengths, weaknesses, opportunities, and threats was conducted. Strengths identified for this medical telemetry unit include having a nursing team that is united in the goal of providing excellent patient-centered care. The unit also has all patient care equipment that helps the nurses provide excellent quality care to the patients. The weaknesses identified included challenges in communication between nurses, physicians, and other healthcare staff using VOCERA, a new communication system that just rolled out 2 months ago, along with high staff turnover, delays in accepting reports from the ED, late discharges, and delayed room turnover. Opportunities for improvement include raising awareness on the importance of discharging patients before noon to create capacity for ED patients admitted, standardization of

the discharge process, and collaboration with the Environmental Services department to ensure room turnover happens promptly. Threats present include the current global pandemic, which contributes to a high influx of patients who need to be seen in the ED with a possibility of being admitted to an inpatient unit and budgetary constraints due to decrease healthcare membership in the last two years (see Appendix B)

Communication Plan and Power Interest Grid

Completing a power/interest grid made it clear that the clinical director, telemetry manager, and ED manager all have a high interest in the project. The chief operating officer (COO) has moderate interest and high power and influence. The ED and hospital physicians have moderate interest and power, and the staff all have a high interest. Thus, the communication plan will be to keep the COO and clinical director up to date on the project via email every other week. For those with high interests who are involved with the day-to-day work, communication can occur in the huddle. Physician interest can be managed and communicated through MS TEAMS, which is used regularly to communicate. Physicians also participate in morning huddles. Information can be relayed to them at that time, as well.

Overcrowding in the ED increases the length of hospital stay, adversely impacts patient outcomes, and reduces patient satisfaction (Barthélemy et al., 2019). As a treatment facility, the ED is where patients arriving at the hospital can be given initial treatment for acute care needs without a prior appointment. The acceptable LOS in an ED is 6 hours (Samavedam, 2021). When there is a decision to admit, the patient should be given a bed assignment within 60 minutes of order entry to prevent delays that can adversely impact the outcome and lengthen hospital stays. Long waits in the ED when a bed is unavailable also increase complaints and reduce patient perceptions of care.

Problems with ED overcrowding and throughput contribute to inefficiencies within the ED associated with high-stress levels among staff, poor communication among staff and between staff and patients, and uncertainty about necessary supplies (Handel et al., 2010). However, the issue of overcrowding may indicate hospital-wide inefficiencies, such as staffing shortages and demand-to-capacity ratios that need to be balanced for optimal inpatient flow. Efficient patient flow within the hospital can improve outcomes and excellent care experience.

CNLs must understand the dynamics of the microsystem of focus to allow a substantial impact on the processes that will improve patient outcomes. A comprehensive assessment enables leaders and team members to focus on data and other sources. The CNL performed a microsystem assessment and unit profile for this telemetry unit to identify patient placement challenges and to address improvement opportunities. This performance improvement plan is geared to create a 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 entry on HealthConnect. The primary focus of this project is patient-centered care. Placing the patient at the center of every healthcare provider's health decision may result in better patient outcomes. Timely movement of a patient to the assigned inpatient room will provide privacy, an opportunity to become acquainted with a primary care team, allow family visitation, and the patient can begin treatment as soon as possible (see Appendix C).

Intervention

As part of the quality improvement project, the main intervention will be the use of a daily noon demand capacity huddle. The team extracted data to establish a baseline metric to determine why ED-to-bed transfers exceed 60 minutes. Some reasons were bed unavailability, ED RN to floor RN handoff delay, longer room turnaround time, and diagnostic and laboratory

test delays. With the data at hand, the two top reasons for ED-to-bed delay are bed unavailability and RN handoff delay. The team decided to work on bed unavailability. The first test of change identified by the team was to discuss discharges that are projected for the day and identify barriers to expedite safe discharge. This practice change was initiated right after the 12-noon staffing call. The nursing supervisor and assistant nurse managers stay on the teams call; the nursing supervisor shares her screen that shows patients who are projected to be discharged for the day and calls them one by one and asks the assistant nurse managers (ANMs) if there are barriers to discharge and how can we help remove the barrier and expedite a safe discharge for the patients. After identifying the reasons, the ANMs will return to the units and follow up with the physicians or discharge planners on the discharge status. Then the ANMs will send a team chat to the nursing supervisor on the discharge status of the patients. The second intervention is that the bed control supervisor thoroughly reviews the patient's chart upon admit order entry to ensure placing the patient at the appropriate level of care and in right geographic location, especially for patients with high fall risk, before assigning a bed. Third, the bed control supervisor assigns the bed within 15 minutes of admit order entry.

The study of the intervention was done daily. The number of demand capacity huddles was evaluated daily and tallied weekly. This constant evaluation is essential when implementing change within the microsystem.

In this project, throughput optimization aligns with the organizational goals of efficiency in terms of health outcomes and affordability for the patients. The total cost for this project is estimated at $112,800 in the first year. A 10% improvement is projected to increase efficiency by $449,280 for the organization. The project anticipates that with improvement measures, the ED-to-bed within 60 minutes can increase by 50%. With this project contributing to organizational

efficiency, this anticipates lower staff turnover and decrease in waste in clinical and material resources (see Appendix D)

Study of the Intervention

Measurement Strategy

The outcome measure of this project is to improve patient movement from the ED to an inpatient bed to at least 50% of patients within 60 minutes from when the physician writes the admission order to when the patient leaves the ED by July 2023. The process measure of this project includes the percentage of patients who are discharged before 1:00 p.m. and the percentage of patients assigned a bed within 15 minutes of an order entry. The balancing measure of this project is that an increase in expediency with room turnover can compromise patient safety by not following the infection control process.

Plan, Do, Study, and Act

The team will be using a plan, do, study, and act (PDSA) method for implementing the main intervention. The following are three of the PDSA cycles the team will be completing.

PDSA 1 – ED-to-Bed Assignment

The team will plan (P) how to implement an assignment for patients who are in an ED bed and have an order for the transfer to ensure they are assigned a telemetry bed within 15 minutes. Once the workflow is developed (D), the staff will be educated on how to complete the workflow. The team will track the progress using the patient assignment log (S). The team will modify the workflow based on patient outcomes and will re-educate the staff based on any workflow changes (A).

PDSA 2 – Chart Review

The team will plan (P) how to implement an assignment for patients who are in an ED bed and have an order for transfer to ensure they are assigned a telemetry bed within 15 minutes. Once the workflow is developed (D), the staff will be educated on how to complete the workflow. The team will track the progress using the patient assignment log (S). The team will modify the workflow based on patient outcomes and will re-educate the staff based on any workflow changes (A).

PDSA 3 – Noon Huddle

The team will plan (P) how to implement an assignment for patients who are in an ED bed and have an order for transfer to ensure they are assigned a telemetry bed within 15 minutes. Once the workflow is developed (D), the staff will be educated on how to complete the workflow. The team will track the progress using the patient assignment log (S). The team will modify the workflow based on patient outcomes and will re-educate the staff based on any workflow changes (A).

Ethical Considerations

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). The team decided that patient safety should be the core of driving change (American Association of Colleges of Nursing, 2021). Patients waiting in the ED for an extended period can jeopardize patient and staff safety. While improving throughput is essential from the institutional and financial perspective, focusing on the metric alone without considering all care elements and safety can cause harm to the patient. Delayed discharges ripple

effect on ED-to-bed, making room turnaround time longer; hence, ED-to-bed becomes longer than 60 minutes.

Beneficence means an obligation to assist others in pursuing vital and legitimate interests. Beneficence includes identifying and removing possible harms that may deter these pursuits (McClelland, 2015). While moving patients to the telemetry bed is crucial to help decrease overcrowding, patient and staff safety should never be compromised. According to the American Nurses Association (2015) Code of Ethics, Provision 4, nurses have the authority, accountability, and responsibility to make decisions and take actions that promote health and provide optimal care. This project has been approved as a quality improvement project by faculty using QI review guidelines and does not require IRB approval.

Results

Add your outcome measure results

Discussion

Summary

This project aimed to introduce and test a daily noon demand capacity huddle to expedite safe discharge and create more capacity for ED patients that need inpatient beds. The goal was to decrease patient wait time for an inpatient bed, thus improving ED to an inpatient bed within 60 minutes or less from the time of admit order entry. The transfer of patients within 60 minutes or less will help in the timely execution of interventions contributing to decreased LOS, complications, and waste in the system leading to overall patient and healthcare team satisfaction**.**

Key Findings

Key findings and success factors are the participation and collaboration of the multidisciplinary team from all microsystems impacting the change process and support from the senior leaders, which were the key contributors to success. Frontline staff involvement was crucial in communicating discharge barriers to physicians and finding resolutions to expedite a safe discharge. Initially, the assistant managers thought the huddle was a waste of time and that they could have done other audits instead. However, the leadership team observed that being proactive in removing barriers to discharge as early as possible helps create capacity for ED borders waiting for an inpatient bed for a long time. The initial frustration from the assistant nurse managers catalyzed the improvement of team engagement.

Implications of Practice

Implications for practice throughout the performance improvement project, the CNL applied and performed various CNL roles. The CNL has additional masters-level competency in clinical systems leadership, which helped to assess frontline patient care structures and processes to identify how to improve patient care coordination by implementing targeted improvement processes (Bender et al.,2021). CNLs are in the prim. e position to facilitate collaboration at the microsystem and 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.

Lessons Learned

Many lessons were learned throughout the implementation. Assessment of the microsystem is essential to understand the unit's functionality and culture (QSEN Institute,2020). Reassessment is vital to analyze change and to understand what interventions will result in an improvement. Early involvement of critical stakeholders helps expedite change to ensure

success. Time in motion observation (Gemba) facilitates more profound understanding and collaboration among the frontline staff. Positive rewards and recognition lead to increased compliance and less pushback.

Evidence-based literature and tools can facilitate the end users to understand the purpose of the improvement project to create change. Project implementation will sometimes provide an unintended outcome. The new process facilitated the development of a renewed appreciation for each multidisciplinary team member and created camaraderie among the ED and inpatient healthcare team. This performance improvement project has also led to the development of standard work for the leadership team and reinforced the importance of lean management system application.

Sustainability

Sustainability is an essential part of the performance improvement project to ensure the sustainability of implemented changes. The standardized workflow dissemination was posted via TEAMs huddle board, and the assistant nurse managers' and nursing supervisors' responsibility is to ensure that the process is consistently followed. Metrics of the weekly data are visually displayed on the leader board. The Chief Nurse Executive performs weekly check-ins to ensure continued compliance with the established process.

Conclusion

Clinical Nurse Leaders can effectively lead a performance improvement project and implement evidence-based processes to improve patient throughput. ED throughput cannot be improved singularly. Multidisciplinary team involvement is critical to make a meaningful and sustainable change that leads to improvement. Microsystem assessment and utilization of change models are crucial for effective communication strategies. Improving throughput for hospitals is

an effective strategy to curtail costs, decrease waste, and improve capacity in the Emergency Department. Decreased inpatient capacity, integrated with administrative processes focusing only on efficiency and not paying attention to patient placement, has been attributed to system-induced harm events and unfavorable health outcomes. These adverse events increase when efforts to relieve hospital capacity constraints are not prioritized. This problem is multifaceted and involves a multidisciplinary team approach to resolve it.

Healthcare leaders and frontline staff require further knowledge to understand the increased risks of long ED-to-bed wait times. Leader empowerment is necessary to build an organizational culture and support improvement efforts while allowing frontline staff to apply knowledge and innovate within system workflows creating more substantial alignment in overcoming organizational challenges and improvements in quality. Finally, this performance improvement project highlights the need for a deeper focus on the system-level workflows that drive efficiency and facilitate capacity constraints within medical centers.

Usefulness of the Work

If the intervention did not work what are some of your thoughts about why and next steps

Implications for Practice

What are the implications for others who face the same issues?

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Appendix A. Evaluation Table

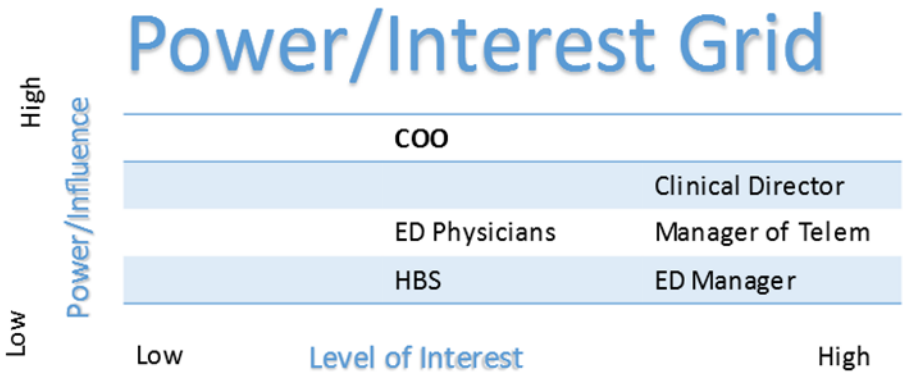
Study	Design	Sample	Outcome/Feasibility	Evidence rating
Barthélemy, E. J., Spaggiari, R., Corley, J., Lepard, J. R., Staffa, S. J., Iv, V., Servadei, F., & Park, K. B. (2019). Injury-to-admission delay beyond 4 hours is associated with worsening outcomes for traumatic brain injury in Cambodia. *World Neurosurgery*, *126*, e232–e240. https://doi.org/10.1016/j.wneu.2019.02.019	Retrospective Cohort	3,476 patients with traumatic brain injury	Increasing was associated with worsening outcome, especially beyond the 4-hour threshold in the ED.	L III B
Wolak, E., Jones, C., Leeman, J., & Madigan, C. (2020). Improving throughput for patients admitted from the emergency department: Implementation of a standardized report process. *Journal of Nursing Care Quality*, *35*(4), 380–385. https://doi.org/10.1097/ncq.0000000000000462	Lean methodology was applied to decrease length of stay for admitted patients needing hospital bed.	Large urban academic medical center with 1,600 monthly ED admit rate, with 50 inpatient units.	The length of time to give/receive patient handoff decreased from 3.8 min. to 2.8 min.	L III A
Weiss, S. J., Derlet, R., Arndahl, J., Ernst, A. A., Richards, J., Fernández-Frankelton, M., Schwab, R., Stair, T. O., Vicellio, P., Levy, D., Brautigan, M., Johnson, A., & Nick, T. G. (2004). Estimating the degree of emergency department overcrowding in academimideal centers: Results of the National ED Overcrowding Study (NEDOCS). *Academic Emergency Medicine*, *11*(1), 38–50. https://doi.org/10.1197/j.aem.2003.07.017	Survey study design	23 question site sampling	Patient placement utilizing the pull model in ED-to-bed decreases the total wait time of patients in the ED needing inpatient bed.	L III B
Driesen, B. E. J. M., van Riet, B. H. G., Verkerk, L., Bonjer, H. J., Merten, H., & Nanyakkara, P. W. B. (2018). Long length of stay at the emergency department is mostly caused by organizational factors outside the influence of the emergency department: A root cause analysis. *Plos One*, *13*(9), e0202751. https://doi.org/10.1371/journal.pone.0202751	Observational retrospective record review study	568 patients visited the ED during the selected week (January 2017)	ED length of stay has many factors beyond the ED itself. There is a necessity to address reduction of ED-LOS in a multidisciplinary approach.	L III B
Yuzeng, S., & Lee, L. H. (2019). Improving the wait time to admission by reducing bed rejections. *BMJ Open Quality*, *8*(3), e000710. https://doi.org/10.1136/bmjoq-2019-000710	PDSA cycle	6,500 admissions from all sources, such as ED, surgery, electives	A hospital-wide approach is necessary to drive significant improvements on the ED wait time to inpatient bed placement and admissions coming from different entities. Input and collaboration from frontline staff is	L III B

			crucial in creating a systematic process of patient placement to eliminate of decrease wait times.	
Jones, S., Moulton, C., Swift, S., Molyneux, P., Black, S., Mason, N., Oakley, R., & Mann, C. (2022). Association between delays to patient admission from the emergency department and all-cause 30-day mortality. *Emergency Medicine Journal*, *39*(3), 168–173. https://doi.org/10.1136/emermed-2021-211572	Cross-sectional, retrospective observational study	Patients admitted from every type 1 (major) ED in England between April 2016 and March 2018	Delays to hospital inpatient admission for patients in excess of 5 hours from time of arrival at the ED are associated with an increase in all-cause 30-day mortality.	L III B

Appendix B. SWOT Analysis

Strengths	**Weaknesses**
Staff collaboration Unit equipment availability Leadership support	Lack of standard in discharge process Delayed room tunaround time Inpatient bed availability
Opportunities	**Threats**
Collaboration with interdepartmental stakeholders Financial efficiency Increased health plan membership Achieve timely and excellent quality of care	High influx of patients in the ED Ancillary departments, such as laboratory, radiology delay Ambulance diversion Inpatient delay in discharge

Appendix C. Power/Interest Grid

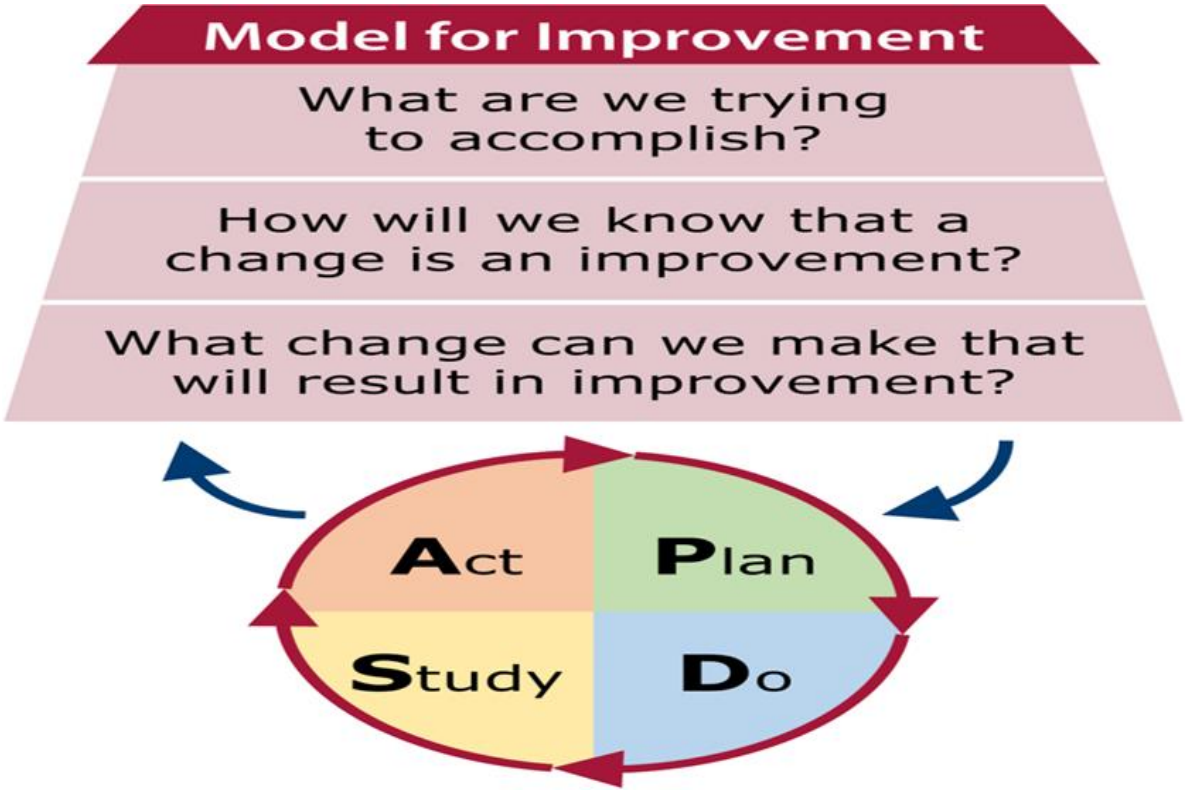


Appendix D. Budget/ROI

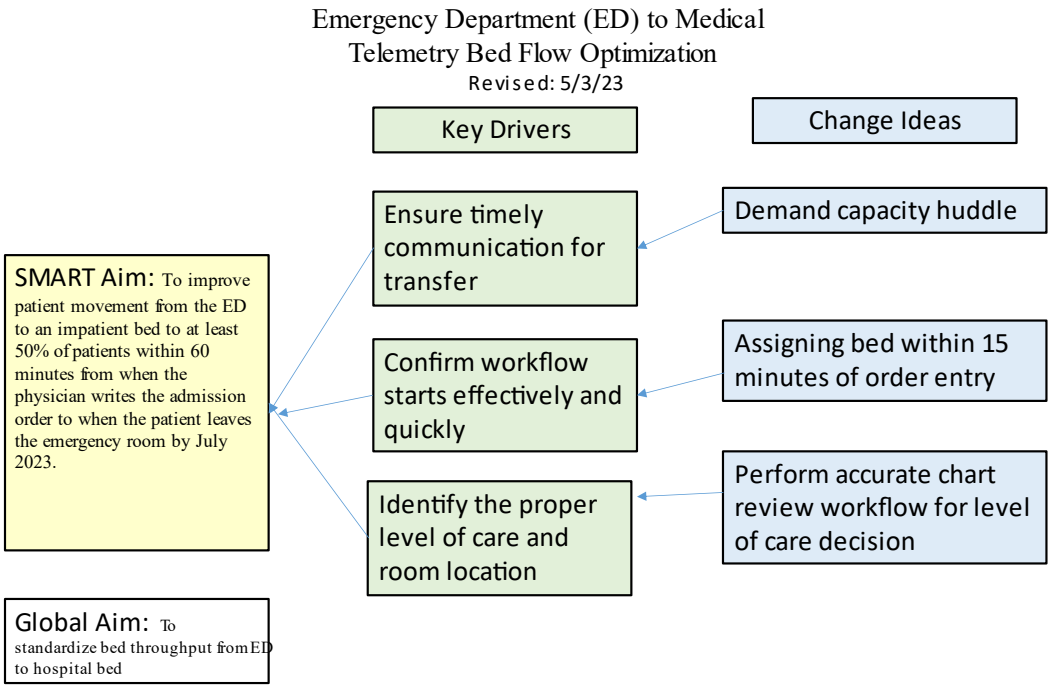
Improvement Revenue (Cost Avoidance)	**Admits/day**	**Days per Month**	**Cost per Month**	**Year 1**	**Year 2**
ED Admissions (average of 10 per day, $1,248 per visit with low to moderate severity)	$12,480	30	$374,400	$4.492,800	$8.985,600
Total Cost:					
Improvement Costs	**Time in hours**	**Wage/hr**	**Cost/week**	Cost/month	Year 1
PCS Nurse Manager	2	$100	$200	$800	$9,600
PCS Assistant Manager	2	$90	$180	$720	$8,640
ED Manager	2	$100	$200	$800	$9,600
Nursing Supervisor	2	$95	$190	$760	$9,120
HBS	1	$150	$150	$600	**$7,200**
ED Physician	1	**$150**	**$150**	$600	$7,200
Floor RN	8	$80	$640	$2,560	$30,720
ED RN	8	$80	$640	$2,560	$30,720
Training cost (snacks, flyers, coffee, water)	$1,500 (one-time cost)				
Total Cost	$114,400	$845	$2,350	$9,400	$112,800
Project Savings/Cost Avoidance (ROI)	**Year 1 Annual Cost Savings**				

Cost avoidance - Improvement cost = Net savings	$449,280				

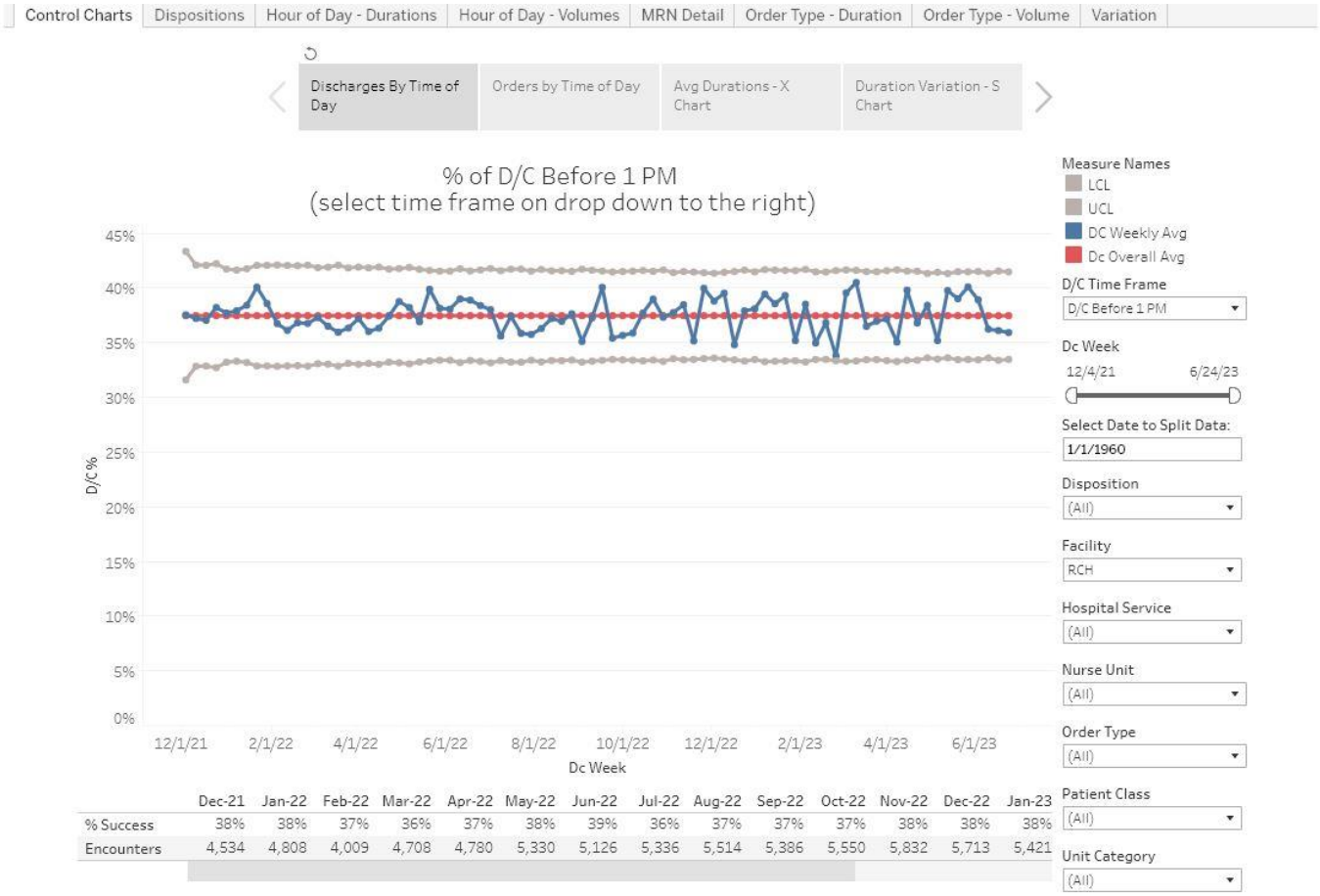
Appendix E. Model for Improvement



Appendix F. Bed Flow Optimization

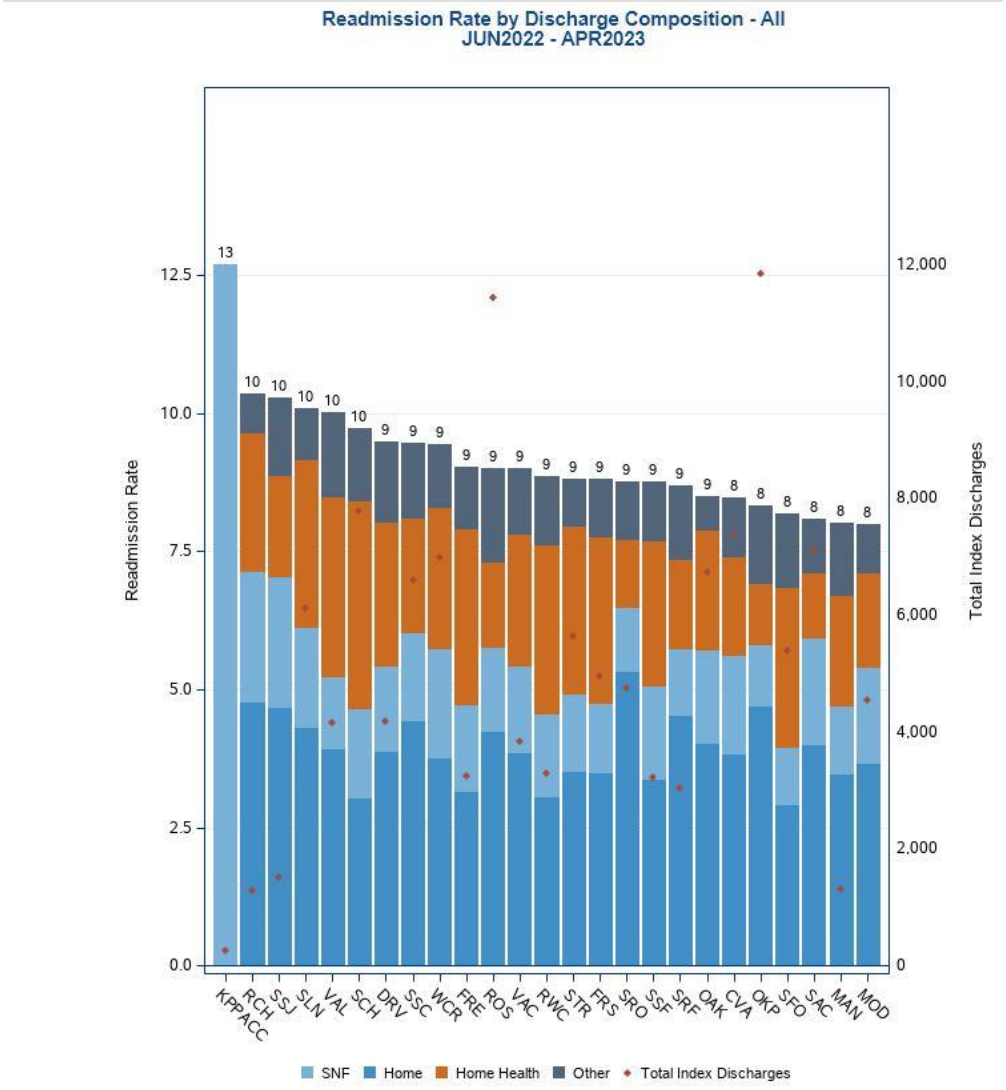


Appendix G

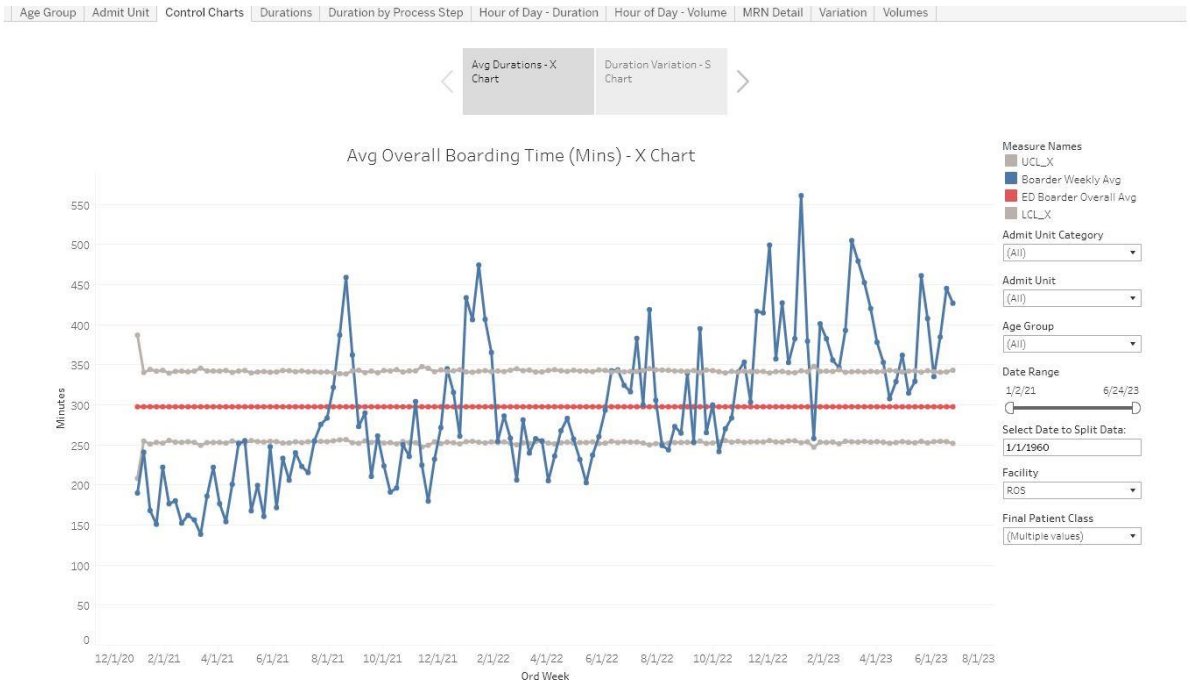


	Dec-21	Jan-22	Feb-22	Mar-22	Apr-22	May-22	Jun-22	Jul-22	Aug-22	Sep-22	Oct-22	Nov-22	Dec-22	Jan-23
% Success	38%	38%	37%	36%	37%	38%	39%	36%	37%	37%	37%	38%	38%	38%
Encounters	4,534	4,808	4,009	4,708	4,780	5,330	5,126	5,336	5,514	5,386	5,550	5,832	5,713	5,421

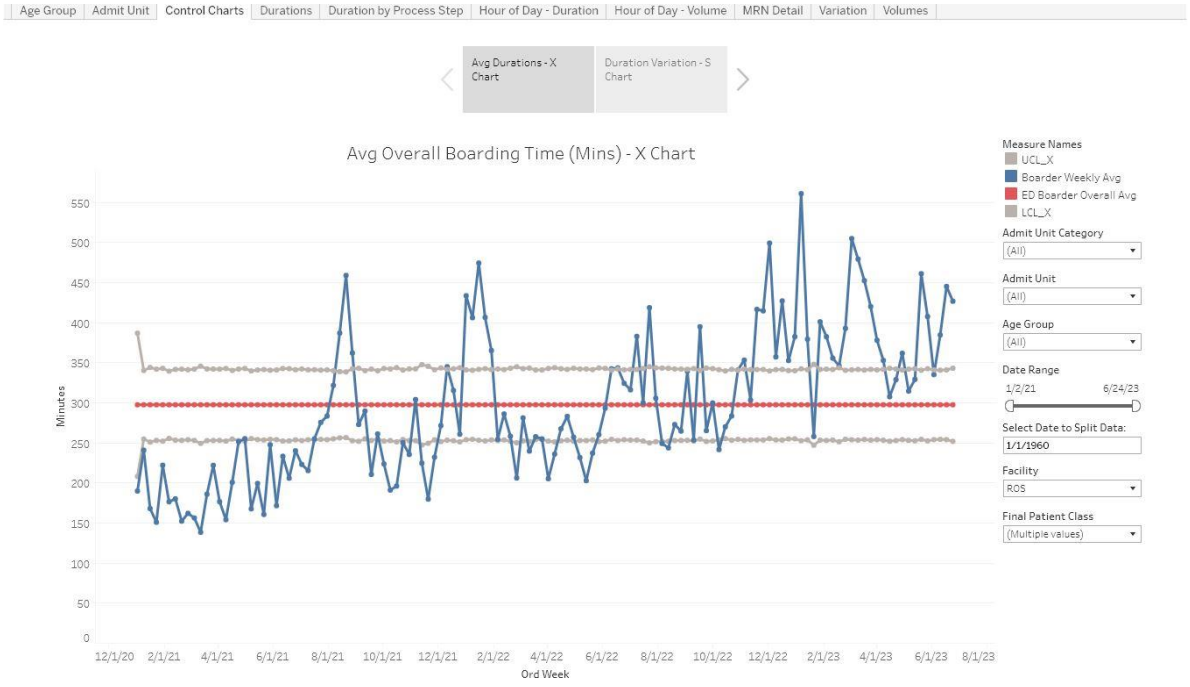
Appendix H


Readmission Rate by Discharge Composition - All
JUN2022 - APR2023
Readmission Rate
Total Index Discharges
12.5
10.0
7.5
5.0
2.5
0.0
12,000
10,000
8,000
6,000
4,000
2,000
0
13
10 10 10 10 10
9 9 9 9 9 9 9 9 9 9 9
8 8 8 8 8
KPPACC RCH SSJ SLN VAL SCH DRV SSC WCR FRE ROS VAC RWC STR FRS SRO SSF SRF OAK CVA OKP SFO SAC MAN MOD
SNF
Home
Home Health
Other
Total Index Discharges

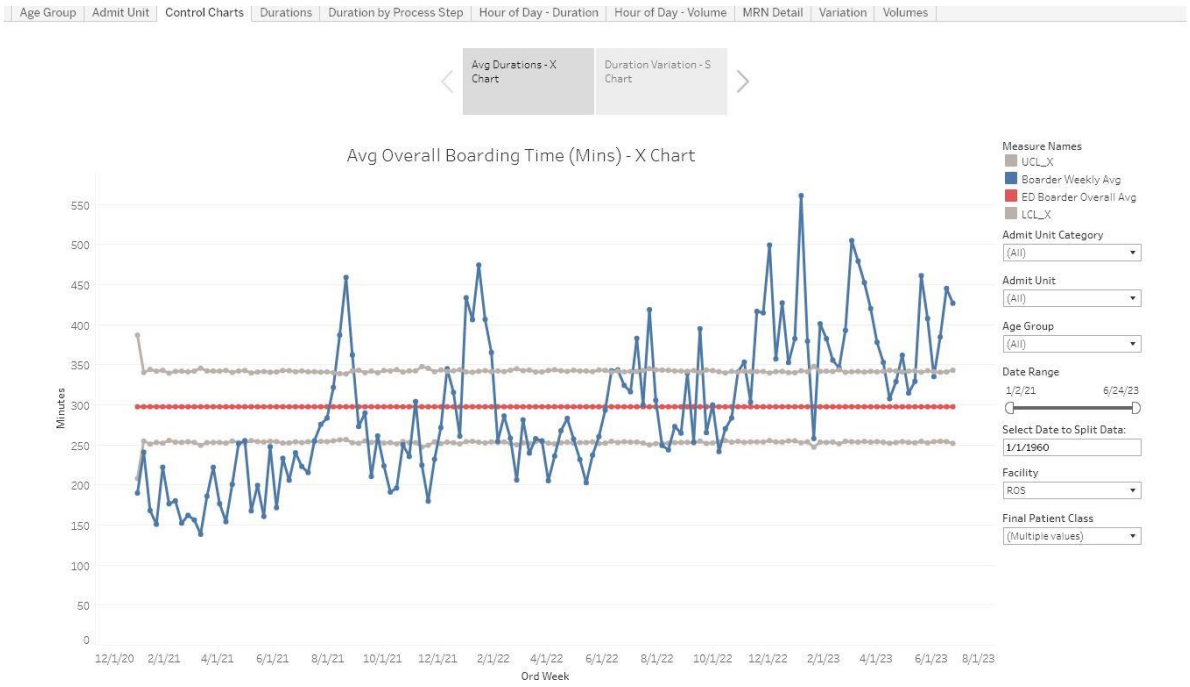
Appendix I



Appendix J



Appendix K


Age Group
Admit Unit
Control Charts
Durations
Duration by Process Step
Hour of Day - Duration
Hour of Day - Volume
MRN Detail
Variation
Volumes
Avg Durations - X Chart
Duration Variation - S Chart
Avg Overall Boarding Time (Mins) - X Chart
Minutes
550
500
450
400
350
300
250
200
150
100
50
0
12/1/20
2/1/21
4/1/21
6/1/21
8/1/21
10/1/21
12/1/21
2/1/22
4/1/22
6/1/22
8/1/22
10/1/22
12/1/22
2/1/23
4/1/23
6/1/23
8/1/23
Ord Week
Measure Names
UCL_X
Boarder Weekly Avg
ED Boarder Overall Avg
LCL_X
Admit Unit Category
(All)
Admit Unit
(All)
Age Group
(All)
Date Range
1/2/21
6/24/23
Select Date to Split Data:
1/1/1960
Facility
ROS
Final Patient Class
(Multiple values)

UNIVERSITY OF SAN FRANCISCO | School of Nursing and Health Professions

University of San Francisco
CNL Final Project Rubric

Student Name: Anne Rochelle Taco
Project Title: Emergency Department to Medical Telemetry Bed Flow Optimization

Characteristic	Reviewer Rating	Comments
Section I: Title and Abstract		PLO 1, 8
Abstract includes the following elements: • Problem • Context • Interventions • Measures • Results • Conclusions	☐ Exceeds expectation xx Meets expectation ☐ Does not meet expectation	Address each heading in the abstract In conclusion, what are the implications for practice based on this project
Section II: Introduction (Why did you start?)		PLO1,2,4,8,9,10
Introduction (Why this improvement topic; impact for patients, system; link to organizational priorities)	☐ Exceeds expectation xx Meets expectation ☐ Does not meet expectation	Overview of the topic
Problem description (Describe the setting; summarize current knowledge about the problem as it relates to the setting: metrics that matter, benchmark data, baseline data and current performance)	☐ Exceeds expectation xx Meets expectation ☐ Does not meet expectation	What is the quality gap?
Available knowledge (PICO question; synthesis of exiting literature and evaluation table)	☐ Exceeds expectation xx Meets expectation ☐ Does not meet expectation	This section has 5 parts 1. PICO question 2.Search Strategy 3.Synthesis of your evidence. 4.Level and quality of your evidence- strong or weak? 5.How will it guide project See addendum for more detail
Rationale (conceptual framework or theory used to guide the project)	☐ Exceeds expectation xx Meets expectation ☐ Does not meet expectation	1.Describe theory 2.Describe how it will guide your project

Specific project aim	☐ Exceeds expectation xx Meets expectation ☐ Does not meet expectation	Specific Project aim
Section III: Methods (What did you do?)		PLO 1,2,3,4,5,6,7,8,9,10,11
Context Microsystem assessment, IHI culture assessment, SWOT analysis, ROI plan, communication plan	☐ Exceeds expectation xx Meets expectation ☐ Does not meet expectation	1.Summary of key findings from microsystem assessment-population, staff, procedures, IHI culture assessment 2.Brief description of SWOT analysis. 4.Summarize the ROI for the project
Intervention Description of changes to test	☐ Exceeds expectation xx Meets expectation ☐ Does not meet expectation	1.Describe intervention. 2.If multiple interventions, list them
Study of the intervention Measurement strategy	☐ Exceeds expectation xx Meets expectation ☐ Does not meet expectation	1.Describe the measurement strategy 2.Briefly list PDSA cycles and how they were used to refine the intervention
Measures Family of measures	☐ Exceeds expectation xx Meets expectation ☐ Does not meet expectation	List the family of measures: Outcome measure Process measure Balancing measure
Ethical considerations	☐ Exceeds expectation ☐ Meets expectation xx Does not meet expectation	1. Provide a reflection of the project as it relates to the Jesuit values and the American Nurses Association Ethical Standards. 2.Include QI wording: This project has been approved as a quality improvement project by faculty using QI review guidelines and does not require IRB approval.
Section IV: Results		PLO 1,2,3,8,11
Outcome measure results	☐ Exceeds expectation ☐ Meets expectation xx Does not meet expectation	1.Describe outcome results-analysis. 2.Were the results expected? 3.If not, why not?
Section V: Discussion		PLO 1,2,3,7,8,9,10,11
Summary	☐ Exceeds expectation	1.Current performance

Key findings, lessons learned, what contributed to the successful change	xx Meets expectation ☐ Does not meet expectation	2.Did the intervention work? 3.If not, what are the next steps?
Conclusions Usefulness of the work, sustainability, potential for spread, implications for practice	☐ Exceeds expectation Meets expectation Xx Does not meet expectation	1.How will the project impact practice? 2.What are the sustainability plans? 3.If the intervention did not work what are some of your thoughts about why and next steps? 4.What are the implications for others who face the same issues?
Section VI: References		1,2,8,12
	☐ Exceeds expectation xx Meets expectation ☐ Does not meet expectation	
Section VII: Appendices		1,2,8,12
Appendices include all • IRB Non-research determination form • Evaluation Table • Charter (Aim, Background, Measures, Driver Diagram, Sponsors, Team, Measurement Strategy., Timeline) • PI Tools: Process map; SWOT analysis, Run chart • Cost benefit Analysis • Budget • All materials for implementation and evaluation	☐ Exceeds expectation ☐ Meets expectation ☐ Does not meet expectation	Project charter and measurement strategy Include any tools developed

Summary of Recommendations:

☐ **Accept**

☐ **Accept with minor revisions**

☐ **Accept with Major Revisions**

XX **Do not accept**

Reviewer's name David Ainsworth, DNP

Reviewer's signature: *David Ainsworth, DNP*

Directions for the Paper
1.Here are the sections of the paper that should be placed in APA level-one headings. (**Centered, Boldface, Uppercase and Lowercase Headings**).
Abstract
Introduction
Problem description
Available knowledge
Rationale
Aim
Context
Intervention
Study of the Intervention
Measures
Ethical Considerations
Outcome Measure Results
Summary
Conclusions
References
Appendices