Quality Improvement in the Emergency Department: A Project to Reduce Door - to-Electrocardiography Times

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Abstract

The American Heart Association and Joint Commission recommend obtaining an EKG for patients who present to the Emergency Department with chest pain or atypical myocardial infarct symptoms within 10 minutes of arrival (Maliszewski, et al., 2020). Barriers to meeting this standard include large number of patients presenting with chest pain at one time, crowding, inadequate triage flow, and lack of knowledge regarding the 10-minute door to EKG time (Maliszewski, et al., 2020). The project site has a protocol on what chief complaints qualify for an immediate EKG. While the triage nurse may know which patients need an EKG there is no process in place to identify these patients in their electronic record. Research has demonstrated that technicians will often wait for the EKG symbol to pop up on the computer screen indicating that the physician has ordered an EKG (Maliszewski, et al., 2020). This QI project examined if door to EKG times improved in an acute care hospital after 3 weeks of executing a nurse driven protocol for obtaining an EKG based on the patient's chief complaint. Door to EKG time was analyzed using a paired t-test ran through SPSS. Mean door to EKG times were compared for 3 weeks prior to the project and for the 3 weeks the quality improvement project was implemented. The mean door to EKG time pre-project was 17.56 minutes and 18.45 minutes during the project. The probability (p) value was 0.544 which is greater than 0.05 indicating that there wasn't a significant difference in door to EKG times with the implementation of the QI project. ED boarding hours, patient volume, and acuity were all higher during the QI phase of this project. When considering these limitations, the QI project likely had a positive impact on door to EKG times.

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The most common cause of death worldwide is ischemic heart disease (Thanavaro, et al., 2021). The rate of mortality has decreased partly due to timely percutaneous coronary intervention (PCI) for ST-segment elevation myocardial infarction (STEMI) (Thanavaro, et al., 2021). Primary Heart Attack Centers (PHAC) are hospitals accredited through the joint commission that provide guideline – directed medical therapy (GDMT) (Jacobs, et al., 2021). Specific data is analyzed every two years to ensure the hospital is meeting the performance measurements and providing GDMT. GDMT includes a 12-lead EKG performed and interpreted within 10 minutes of patient's arrival at the emergency department (ED) to assess for cardiac ischemia or injury (Association, 2022).

The Project Site

The project site is a level 1 ED with 31 monitored beds (System, 2022). The project site is in an urban area that is located less than three miles from the Las Vegas Strip (System, 2022). It is an accredited PHAC through the joint commission (System, 2022). In 2021, the emergency departments project site had 44,833 patient visits. They had 42,261 in 2020 and 55,486 in 2019 (Yost, EKG Event Times Log, 2022). In 2021, 36% of the patients who checked into the ED required an EKG. In 2020, 38% of the patients required an EKG and in 2019, 36% required an EKG (Yost, EKG Event Times Log, 2022).

Cardiac Cath Laboratory. The project site is accredited through the American College of Cardiology (ACC) making it a "Chest Pain Center with Primary PCI (System, 2022)." To hold

this accreditation, the facility must offer percutaneous coronary intervention (PCI) 24 hours a day, 7 days a week (System, 2022).

Guidelines of Care in the Emergency Department Policy. The project site has a policy titled "Guidelines of Care in the Emergency Department" which includes when a 12 lead EKG is indicated based on the patient's chief complaint (Appendix A). The nurse driven policy states that patients who check in with abdominal pain (older than 35 years), syncope, near syncope, dizziness, chest pain, allergic reactions/ if associated with chest pain, altered level of consciousness, suspected cerebral vascular accident, dyspnea, and gastrointestinal bleed need to have an EKG completed within ten minutes of arrival. The policy was developed to quickly identify those patients who present with typical and atypical heart attack symptoms, and to meet the guidelines established by the American Heart Association and the Joint Commission (AHA/ TJC) (Association, 2022) The project cite is excellent in meeting door to EKG times for patients presenting with ST-Elevated myocardial infarctions but doesn't currently meet the guideline established by the AHA/TJC for patients who are experiencing a Non-ST-Elevated Myocardial Infarction (NSTEMI) (Association, 2022).

Performance Measurements

The "Guidelines of Care in the Emergency Department Policy" is in place to quickly identify those patients who may be experiencing a STEMI or NSTEMI at the time of arrival. The project sites average door to EKG time in 2019 was 69 minutes. In 2020 it was 66 minutes, and 65 minutes in 2021 (Yost, EKG Event Times Log, 2022). The project site needs to decrease their door to EKG times to meet the current AHA/TJC guideline of a door to EKG time of less than 10 minutes (Association, 2022).

Door to EKG times

Health care systems continually strive to improve door to EKG times (Jacobs, et al., 2021). An EKG is the initial diagnostic indicator of a STEMI and NSTEMI and delay in obtaining an EKG adversely affect patient treatment, door to balloon times, and thus patient outcomes (Thanavaro, et al., 2021).

The AHA/TJC recommend obtaining an EKG for patients who present to the ED with chest pain within 10 minutes of arrival (Maliszewski, et al., 2020). Barriers to meeting this standard include large number of patients presenting with chest pain at one time, crowding, inadequate triage flow, and lack of knowledge regarding the 10-minute door to EKG time (Maliszewski, et al., 2020). Triage flow typically consists of patients being triaged by a nurse and communication between the nurse and technician that the patient needs an EKG. Miscommunication, emergencies, interruptions, and crowding can all interfere with the flow and therefore delay the time it takes to obtain an EKG.

Electronic Medical Record. With the emergence of electronic medical records and computer inputted orders this technology can be used to assist in obtaining a timely EKG on patients presenting to the ED with chest pain. Research has demonstrated that technicians will often wait for the EKG symbol to pop up on the computer screen indicating that the physician has ordered an EKG (Maliszewski, et al., 2020). Hospitals, such as the project site, have nurse driven protocols that allow them to order an EKG when patients present with chest pain, shortness of breath, syncope, and other chief complaints depending on the organization. The expectation is that the EKG is completed even before the patient is seen by a medical provider.

Proposed Improvement

Triage nurses are trained and skilled to identify the acuity of a patient and what tests the doctor is likely to order for diagnosis and disposition. If technicians acknowledge that they are waiting for an order for an EKG, one could propose that if the triage nurse orders the EKG at the time of triage, it would be visualized and completed, limiting delays. The flow and layout of the emergency room would determine who is responsible to complete the EKG but the visualization on the tracking board would identify how many patients are waiting for an EKG. The clinical supervisor, manager, director, unit secretary, and all ED personnel would have a visualization of which patients need an EKG and resources can be shifted to complete them within the 10-minute time frame established by the AHA / TJC. A study by Maliszewski et al., implemented this as a quality improvement project at a level one urban academic medical center and they decreased EKG times by 7 minutes. (Maliszewski, et al., 2020). This is a quality improvement project that could potentially benefit other emergency rooms and improve patient outcomes.

PICOT. Will door to EKG times improve in an acute care hospital after 3 weeks of executing a nurse driven protocol for obtaining an EKG based on the patient's chief complaint?

Literature Review Search Methods

This literature review examined research for a quality improvement project to improve door to EKG times. Various academic journals were explored using both Jay Dexter Library, The American Heart Association, and The Joint Commission. Various databases searched including EBSCO Host, CINAHL complete, PUB MED, Cochrane Library, and Joanna Briggs Institute EBP. The criteria used for the search were peer reviewed, full text articles from 2017 to 2022. Key words searched included: improving door to EKG times, NSTEMI, STEMI, and emergency

room triage. Articles were filtered to include peer reviewed articles, article with full text, and articles published in the last 5 years.

Review Synthesis

There is well documented evidence that improving door to EKG times improves door to balloon times in patients experiencing a STEMI. PCI facilities are audited annually to ensure that they are meeting door to EKG times of less than 10 minutes and door to balloon times of less than 90 minutes for optimal patient outcomes. The AHA and Joint Commission have established guidelines for NSTEMI patients. The current guideline states NSTEMI patients should also receive a door to EKG time of less than 10 minutes (Association, 2022). Literature supports that crowded emergency rooms have challenges meeting the AHA and Joint Commission guideline which is consistent with the project site choose for this quality improvement project.

Factors Affecting Door to EKG Times. The literature supports that many emergency rooms have difficulties meeting door to EKG times of less than 10 minutes. Barriers to meeting door to EKG times include large numbers of patients presenting at one time, inadequate triage workflow, lack of knowledge regarding the 10-minute goal, and inadequate staffing (Maliszewski, et al., 2020). In addition to limitations associated with the facility layout, patient flow, and resources, patient demographics can influence delayed door to EKG times. Females and patients presenting with atypical symptoms have been reported to have delayed EKG times when compared to males and patients presenting with chest pain (Fertel, et al., 2020). Patients with a history of CAD have also been shown to have shorter door to EKG times. A study examined door to EKG times for patients admitted to the ED for a cardiac evaluation when grouped according to a history of coronary artery disease (hCAD) and no history of coronary

artery disease (no hCAD) (Heger, et al., 2021). They did a retrospective analysis of 1101 patients and found that patients who had a history of CAD had a door to EKG time of 20 minutes vs. 22 minutes for patients who had no history (Heger, et al., 2021).

STEMI vs. NSTEMI. STEMI diagnosis accounts for 30% of ACS patients and a NSTEMI diagnosis accounts for 70% of ACS patients (Bhatt, Lopes, R., & Harrington, R., 2022). This literature supports that most ACS patients fall into the category of NSTEMI which is the category of ACS patients that aren't receiving timely EKG's (Bhatt, Lopes, R., & Harrington, R., 2022). It is also reported that chest pain is the most common presenting symptom in ACS patients and affects approximately 79% of men and 74% of women. However, 40% of men and 48% of women present with nonspecific symptoms (Bhatt, Lopes, R., & Harrington, R., 2022). Females are known to have atypical presentations when experiencing an ACS. Research has supported that females and atypical presenations are associated with a higher prevelance of delays in door to EKG times (Fertel, et al., 2020). Vetrovec published a literature review that supports the importance of early recognition of patients experiencing an NSTEMI (Vetrovec, 2019). Patients experiencing an NSTEMI are often misdiagnosed and are at significant risk of early and late adverse outcomes. The literature review also reported that 70% of patients who present with ACS are diagnosed with a NSTEMI (Vetrovec, 2019). The authors also reported that the incidence of STEMI has declined over the last 10 years while the incidence of NSTEMI has not (Vetrovec, 2019). Vetrovec's literature review supports nurse driven protocols which are needed to quickly assess and determine if a patient needs an EKG. Nurse driven protocols such as the one at the proposed project site are in place to identify STEMI and NSTEMI. His literature review also reports less than half of patients experiencing an NSTEMI have chest pain, making it

necessary for nurses to recognize atypical symptoms and obtain an EKG when those symptoms are identified (Vetrovec, 2019).

Nurse Driven EKG protocols. Given the large percentage of patients presenting with nonspecific symptoms and a diagnosis of NSTEMI, EDs need to have established protocols to improve door to EKG times. Studies that implemented modifications to the triage process to improve door to EKG times have demonstrated decreased door to EKG times. A study by Chih-Kuo, 2019, examined 214 patients who experienced a STEMI (Chih-Kuo, Shih-Wei, M., Ming-Hsien, L., Chen, H., & Wang, C., 2019). From the sample, 109 patients arrived before the triage process was modified and 105 patients arrived after the modification (Chih-Kuo, Shih-Wei, M., Ming-Hsien, L., Chen, H., & Wang, C., 2019). The triage process in this study was modified by initiating a nurse driven protocol which included relocating the EKG machine and technicians to the triage area. The patients who arrived after the implemented change had a higher percentage of EKG times less than 10 minutes compared to the control group. This study suggests that a nurse driven protocol improves door to EKG times (Chih-Kuo, Shih-Wei, M., Ming-Hsien, L., Chen, H., & Wang, C., 2019).

A retrospective study that examined door to EKG times after an implementated “cardiac triage” program also demonstarted decreased door to EKG times (Hung, Jen-Long, T., Kuo-Hsin, L., & Chao-Sheng, C., 2021). Implementated change consisted of the ED patients being directed to the triage area where the triage nurse would identify possible ischemic cardiac symptoms. The nurse would label the patient with a red tag on their bedside or wheelchair and place their medical records in a red designated box. The triage nurse would then inform the ED physicians of the patients presence and the ED physician ordered an EKG. The primary outcome of the study was the median door to EKG times for STEMI diagnosis patients was reduced from

5 minutes to 4 minutes. There was also a reduction in overall door to EKG times. After the implementation of the cardiac triage program, 95% of patients received an EKG in less than 10 minutes compared to 78% prior to the implementated change.

Overall research supports that the implementation of a nurse driven EKG protocol does improve door to EKG times. The system and layout of the protocol is dependent on the layout of the facility, staffing, triage flow, and physician preference.

Conceptual Framework for the Project

The conceptual framework used for this project is a Plan-Do-Study-Act (PDSA). PDSA "is a pragmatic method of testing implementation initiatives that advocates learning and adaptation from one cycle to the next, so a larger-scale implementation is more likely to be effective (Young, et al., 2018). PDSA is a conceptual framework that was developed by W Edwards Deming who is known as the father of quality improvement (Best & Neuhauser, D., 2005).

W Edwards Deming. Deming was born in 1900 in Sioux City, Iowa (Best & Neuhauser, D., 2005). After completing his studies at Yale, he accepted a position studying the effects of nitrogen on crops with the United States Department of Agriculture (Best & Neuhauser, D., 2005). Early in his career he began to study quality improvement. He accepted a job in 1939 with the Census Bureau where he applied statically analysis to increase productivity and decrease costs, which resulted in faster census results (Best & Neuhauser, D., 2005). In 1943, he began teaching a series of 8 weeks courses for industries involved in war production efforts. The PDSA cycle was developed at this time. These courses taught statistical process control for understanding variation and PDSA cycles for generating new organization knowledge (Best &

Neuhauser, D., 2005). His efforts resulted in reduced waste and improved quality of wartime production (Best & Neuhauser, D., 2005).

Deming's Connection to Healthcare. Deming suffered an injury and became a patient in the intensive care unit (Best & Neuhauser, D., 2005). He observed that the nurses were working as hard as they could but were defeated and discouraged by the broken system, they were working in. Like other organizations he had applied his PDSA model to, he saw a need in healthcare. Deming's PDSA model has been expanded on but remains a conceptual framework for quality improvement in the healthcare setting.

PDSA. The PDSA model is a way to test a change that is implemented. The model involves going through four steps which guides the thinking process while evaluating the outcomes, improving on them, and testing them again (Quality, 2022). PDSA support rapid learning so the results can support whether the change worked. PDSA are best for small tests which helps ease the fear of change and assist in overcoming resistance to change (Quality, 2022).

This conceptual framework was chosen because PDSA aligns wells with models for decision making in complex systems who processes are non-linear and unpredictable (Eboreime, Olawepo, J., Banke-Thomas, A., & Ramaswamy, R., 2021). Emergency departments are non-linear and unpredictable. Patient acuity, staffing, time of day, ED volume, etc. continually change the dynamics of an emergency department.

Plan. The plan phase consists of outlining what the quality improvement project will consist of and what will be tested (Quality, 2022). The purpose of this phase is to plan a change. To implement the DNP project, a literature review will be conducted. The purpose of the

literature review is to identify solutions to improve door to EKG times. The literature will also identify which resources are needed and how the implemented change could benefit the project site. The current policy on EKG protocols will be reviewed to identify if a nurse driven protocol is currently in place at the project site. The triage nurses and clinical supervisors will be interviewed to identify challenges in obtaining an EKG. The information obtained will be organized and a meeting consisting of the chief nursing officer (CNO), assistant chief nursing officer (ACNO), emergency department director, cath lab director, and the stemi / stroke coordinator will be scheduled to present the departments current door to EKG times. AHA's guideline of 10 minutes or less will be discussed along with current challenges and obstacles in meeting the goal of less than 10 minutes. The "Guidelines of Care in the Emergency Department" policy will be reviewed identifying and outlining suggested changes to the nurse driven EKG policy for patients presenting with atypical ACS symptoms. In addition, the PICOT question will be presented with the suggested change to the current triage process to improve door to EKG times.

Do. The Do phase is when the plan created from phase 1 is executed and set in motion (Quality, 2022). During this phase observations are made with consideration on whether the plan needs to be modified. The Do phase is when the plan is implemented. The Do phase for the quality improvement project will begin with an education phase. During this time, ED staff will be educated daily during shift change huddles. Education will consist of current door to EKG times at the project site, the AHA guidelines, the implemented change with a start and end date, and the benefits that staff and patients will have if the project site can meet the AHA guideline. Questions will be answered, and staff will be given the opportunity to discuss concerns with the implemented change. After a week of education is completed, the implemented change will

occur over a 4-week period. During this time the triage nurse will place an order in the EMR for an EKG based on the nurse's triage and assessment of the patient. Patients presenting with abdominal pain (older than 35 years), syncope, near syncope, dizziness, chest pain, allergic reactions/ if associated with chest pain, altered level of consciousness, suspected cerebral vascular accident, dyspnea, and gastrointestinal bleed will have an EKG completed within ten minutes of arrival.

Study. The study phase is when the results of the implemented plan are analyzed (Quality, 2022). This is the phase where the results determine if the goal was achieved and what was learned from the plan. The study phase for the quality improvement project will consist of analyzing door to EKG times. Mean EKG times will be compared three weeks prior to the implementation of the project to three weeks after implementation.

Act. The act phase of the cycle is where conclusions are drawn and one determines if the implementation worked or not (Quality, 2022). If the implementation did not work this is the time to determine what to do differently on the next cycle. If it does work, this is the opportunity to determine how to make it a practice. The goal of this quality improvement project is to decrease door to EKG times. If mean door to EKG time improve with the implementation of the DNP project, the hospital's policy and procedure will be amended to reflect the nurse driven EKG protocol.

In the timeframe of five weeks after implementation of the DNP Project, the following objectives will be achieved:

1. Decrease door to EKG time to 10 minutes or less in patients presenting with ACS.
2. Implement a nurse driven protocol to guide a multidisciplinary approach for triage staff.

3. Provide staff education during the staff meeting which will include poster guides in the breakroom and triage desk outlining the nurse driven EKG protocol.
4. Update new hire onboarding education to include training on the nurse driven EKG protocol.

Project Setting. The project site is a level 1 Emergency Department (ED) with 31 monitored beds (System, 2022). The ED is in an urban area that is three miles from the Las Vegas Strip (System, 2022). The project site is an accredited primary heart attack center through the American Heart Association and Joint Commission (Association, 2022). The project site is in an urban area that is located less than three miles from the Las Vegas Strip (System, 2022). The project site is an accredited PHAC through the joint commission (System, 2022).

ED Volume. In 2021, the emergency departments project site had 44,833 patient visits. They had 42,261 in 2020 and 55,486 in 2019 (Yost, EKG Event Times Log, 2022). In 2021, 36% of the patients who checked into the ED required an EKG. In 2020, 38% of the patients required an EKG and in 2019, 36% required an EKG (Yost, EKG Event Times Log, 2022).

Population of Interest. The population of participants in this quality improvement project includes the emergency department (ED) nurses, ED technicians, ED clinical supervisors, ED director, chief nursing officer, Stemi / stroke coordinator, and patients presenting with acute coronary syndrome symptoms. The direct population will be ED nurses who hold a minimum of an associate degree and ED technicians who hold a minimum of a phlebotomy and EKG certification with most of the technicians holding a paramedic certification. The Indirect population will include patients' who check in with atypical acute coronary syndrome symptoms.

Inclusion criteria. Patients presenting with abdominal pain (older than 35 years), syncope, near syncope, dizziness, chest pain, allergic reactions/ if associated with chest pain, altered level of consciousness, suspected cerebral vascular accident, dyspnea, and gastrointestinal bleed will be included as subjects.

Exclusion criteria. Patients who are transferred from another facility because they will have an EKG from the transferring facility and be excluded as patients.

Stakeholders. The stemi / stroke coordinator, the ED Director, and the chief nursing officer. The Stemi / Stroke coordinator is vested in reducing door to EKG times because they are reported annually in the PHAC accreditation survey. The ED director is vested in the project because she reports metrics to the corporate facility and door to EKG times is not a current metric that is being met. The chief nursing officer is also vested. She is the supervisor of the ED director and is engaged in improving patient care and meeting the organizations metrics.

Interventions. The following interventions will be implemented for this quality improvement project.

Education. Education for the staff will begin on October 17th. Education will occur during day shift and night shift huddles on October 17th, 19th, 21st, 25th, and 27th. The staff will be educated that all patients presenting with abdominal pain (older than 35 years), syncope, near syncope, dizziness, chest pain, allergic reactions/ if associated with chest pain, altered level of consciousness, suspected cerebral vascular accident, dyspnea, and gastrointestinal bleed will have an EKG completed within ten minutes of arrival. Education will also consist of current door to EKG times at the project site, the AHA guidelines, the implemented change with a start and end date, and the benefits that staff and patients will have if the project site can meet the AHA

guideline. Questions will be answered, and staff will be given the opportunity to discuss concerns with the implemented change.

Interventions. The triage nurse will place an EKG order in the patient's electronic health record at the time of triage when they identify a patient who presents with acute coronary syndrome symptoms (see, Appendix D). Inputting an order into the EHR generates a heart symbol by the patients name on the tracking board. The tracking board is a list of all patients in the ED, showing their location, pending tests, diagnosis, and disposition. All ED staff have the tracking board on their computers on wheels. The ED director, unit coordinator, and clinical supervisor will monitor the tracking board and direct resources to triage to complete the EKG within 10 minutes. The ED technician in triage and the triage nurse will also utilize the overhead paging system to communicate with the staff when resources need to be directed to triage to complete EKG's.

Project Planning Team. The ED director's role is to approve the intervention and support the education and implementation of the QI project. The ED clinical supervisor's role is to support the project and direct and lead the team for timely completion of the EKG. The STEMI coordinator's role is to provide data requested for the QI project. The ED staff's role is to be educated and support the QI project by following the implemented interventions.

Resources. The following resources will be used for this quality improvement project.

Data on mean door to EKG times. The STEMI coordinator manually inputs monthly data on door to EKG times for all patients with ICD diagnosis codes for STEMI and NSTEMI. The door to EKG times is determined by the patient's arrival time in Cerner to the time at the top of the EKG printout. The mean door to EKG data is submitted through data warehouse and AHA

GWTC CAD monthly. The data that will be used in this study will be obtained through the STEMI coordinator. She will extract door to EKG time for all patients with an ICD code 10 121.4 which is a NSTEMI.

Timeline. Staff education will occur between October 17th through October 27th as outlined above. The proposed intervention will occur October 31st through December 5th. Data analysis will occur December 5th through December 7th.

Tools. The following tools will be used during the quality improvement project.

PowerPoint Presentation. The PowerPoint presentation will be developed by the project lead and approved by the ED director and STEMI coordinator (see Appendix, B).

Current Policy. The current policy titled "Guidelines for Care in the Emergency Department" will be available as a resource for nurses to identify which patients met the criteria for the implementation of a nurse driven EKG protocol (see Appendix, A).

Mean Door to EKG Times. Data extracted from the patient's EHR which is calculated from the time the patient checks in from their EHR to the time at the top of the EKG printout.

Data Collection Plan

Door to EKG time for all patients with an ICD code of 121.4 (NSTEMI) will be manually inputted into SPSS. Patients will be identified as Pt 1, 2, 3 etc. so no names or identifying information will be utilized. Door to EKG times for all patients with an ICD code of 121.4 will be manually inputted for 3-weeks pre intervention and during the 3 weeks of intervention for the quality improvement project.

Ethics / Human Subjects Protection

Currently at the project site, mean door to EKG time for NSTEMI patients is being manually entered monthly into the American Heart Association GWTG- CAD program and Joint Commission database. The data being used for this quality improvement project is mandated to report for accreditation. No human subjects are being used in this project. Touro University Nevada doesn't require IRB for QI projects. The project site does not require IRB or QI committee. The project was registered through the Touro Research committee.

Data Analysis Plan

Door to EKG Time. Mean door to EKG times will be analyzed using a paired t test. The mean probability value (p) will be analyzed for statistical significance to determine if there was a decrease in door to EKG time in patients presenting with ACS. If the (p) value is less than 0.05 then there is a significant difference in the mean door to EKG time pre and post intervention. Paired t-test is used to compare means, it is assumed there is an approximately normal distribution for the differences pre intervention and post intervention (Pallant, 2020). All data will be manually inputted and analyzed through IBM SPSS software. No names will be extracted from the chart so the participants privacy will be maintained.

Nurse Driven Protocol. If the data supports a reduction in door to EKG times a nurse driven protocol will be implemented to guide a multidisciplinary approach for triage staff. Analysis of implementation of the protocol will include hospital approval and publication by 1/1/23.

Education. The staff will be educated during the staff meeting which will include poster guides in the breakroom and triage desk outlining the nurse driven EKG protocol. Analysis of

this objective will include a signed competency from every ED tech and nurse who has been trained in triage. All clinical supervisors, managers, and ED director will have a signed competency on file.

New Hire Onboarding. Update new hire onboarding education to include training on the nurse driven EKG protocol. New hire education consists of HealthStream Learning (LMS) modules that are completed within the first 4 weeks of orientation. An LMS module will be created and published my education to be assigned to all new hires in the ED. Analysis of the success of this intervention will be determined if the module is created and published by 1/1/23.

Results

Door to EKG Times. Mean door to EKG times were compared for 3 weeks prior to the QI implementation and for the 3 weeks the quality improvement project was implemented. The project was originally designed to analyze door to EKG times for patients who were categorized with an ICD code for NSTEMI. When the data was extracted, there was only two patients' pre-QI project and one during the project that met criteria. There wasn't sufficient data to analyze because the QI project was designed to exclude patients transferred from another facility. In addition, patients coded with a NSTEMI diagnosis, who are transported by emergency medical services, report the time of the first EKG as the one performed in the field by the paramedics. The door to EKG time on these patients was a negative number so these patients needed to be excluded too. When patients who were transferred from another facility and patients who arrived by EMS were eliminated, only 3 patients' door to EKG times met the criteria for the QI project. This was insufficient data for statistical analysis.

Inclusion Criteria. The QI project was designed to improve door to EKG times for patients presenting with atypical myocardial infarct symptoms. The project sites nurse driven

policy states that patients who check in with abdominal pain (older than 35 years), syncope, near syncope, dizziness, chest pain, allergic reactions/ if associated with chest pain, altered level of consciousness, suspected cerebral vascular accident, dyspnea, and gastrointestinal bleed need to have an EKG completed within 10 minutes of arrival. Door to EKG times were extracted for patients who presented with one of these chief complaints for 3 weeks before the QI project implementation and for 3 weeks during the project. 494 patients met the criteria before the project and 569 during the project.

Paired T-Test Results. The data was analyzed using a paired t-test ran through SPSS. Mean door to EKG times were compared for 3 weeks prior to the project and for the 3 weeks the quality improvement project was implemented. The mean door to EKG time pre-project was 17.56 minutes and 18.45 minutes during the project. The probability (p) value was 0.544 which is greater than 0.05 indicating that there wasn't a significant difference in door to EKG times with the implementation of the QI project.

Assumptions. Assumptions that were made using the paired t-test for analysis was that the door to EKG time is normally distributed and measured on an incremental level which was time in minutes and seconds. It is also assumed that the door to EKG times were sampled independently. The data was exclusively included based on the patient's chief complaint which aligned with the nurse driven protocol. The participants of this study did not interact with each other or know that their door to EKG time was being included in this quality improvement project.

Limitations. There were limitations to this project which could have negatively impacted the results. Limitations included increased ED volume, increased ED boarding hours, PHAC certification status, staffing, and project site uncertainty.

Volume. The pre-project period was 10/4/22-10/30/22. The project period was 10/31/22 – 12/5/22. Daily average patient volume was higher during the project phase. Daily volume was 5.5% higher during the QI project compared to pre-project. In addition, there were 75 more EKG's done during the QI project phase indicating a higher acuity of patients presenting to the ED.

ED Boarding Hours. Average daily ED boarding hours were 274.14 hours before the QI project. During the QI project the daily ED boarding hours increased to 443.41 hours. ED boarding hours increased by 61.79% during the QI project phase (Yost, Program Manager and Emergency Prepardness Coordinator, 2022).

Patient volume and ED boarding hours both contribute to ED overcrowding. Emergency Department (ED) overcrowding affects patient care. Overcrowding of ED's occurs when the need for emergency services exceeds available resources for patient care (Rasouli, Esfahani, A., & Farajzadeh, M., 2019; Rasouli, Esfahani, A., & Farajzadeh, M., 2019). Research has shown that ED boarding is one of the most important factors of ED overcrowding (Boudi, et al., 2020). Timely completion of an EKG is one of the resources that can be affected by ED overcrowding.

Primary Heart Attack Center. The project site is a Primary Heart Attack Center (PHAC) who is accredited through the joint commission to provide guideline – directed medical therapy. The contract between the project site and the interventional cardiology group were not renewed resulting in the closure of the cardiac cath lab and cardiovascular surgery during the QI

project at the project site. EMS is notified of what services are offered at acute care hospitals and thus ceased transporting patients potentially needed cardiac intervention during the quality improvement project.

Staffing. Compliance to the nurse driven protocol was limited during night shift. The night shift nursing staff consist of 90% new grad nurses (Yost, Program Manager and Emergency Prepardness Coordinator, 2022). The project sites policy states that a nurse must have one year of ED experience to work in triage (see Appendix, F). The hospital has not been able to adhere to this policy due to a lack of staffing and a large influx of newly graduated nurses. A lack of experience on night shift could have affected compliance to the policy.

When staffed properly there are two clinical supervisors for day shift and two for night shift. Night shift has an open clinical supervisor position. Nurses are being put in the position to fill in until the position is permanently filled. These nurses who are filling in aren't given the same access to information such as emails, meetings, and huddle notes which could limit the adherence to the nurse driven protocol due to lack of knowledge and reinforcement.

Project Site. The project site is also in a state of uncertainty. A new sister facility is opening in late 2023 and no official announcements have been made regarding what will happen with the project site. There are rumors the project site will be closing but no official announcements have been made. State inspectors, corporate employees, and administrators have been touring the facility. In the past, administration is very informative about the purpose of their visit so the staff can be complaint and assist as needed. Silence has created frustration and resentment amongst the staff because there is no disclosure on the future state of their employment. It is difficult to say whether this affected the results of this project. One could

propose that a lack of commitment to an organization decreases performance and adherence to policies.

Interpretation of Results. This study doesn't align with current literature which shows that nurse driven protocols and modified triage flow improve door to EKG times. Research supports that barriers to meeting door to EKG times include large number of patients presenting with chest pain at one time, crowding, inadequate triage flow, and lack of knowledge regarding the 10-minute door to EKG time (Maliszewski, et al., 2020). This quality improvement project addressed one of these potential barriers which was lack of knowledge regarding the 10-minute door to EKG time. The project site is affected with inadequate triage flow, crowding, and large number of patients presenting with chest pain at a time. These obstacles could have been bigger barriers and thus the proposed intervention for this QI project wasn't effective.

The door to EKG times were not significantly different after the QI project was implemented. Patient volume, ED boarding hours, and number of EKG's was much greater during the QI project. Further research is needed, but it would be interesting to know if the EKG times were lower if the two phases of the project had equal boarding hours, patient volumes, and number of EKGs completed. Considering the project site was treating and holding such a larger number of patients and was able to maintain their current door to EKG times is an indicator that the QI project was successful. Future research is needed examining if nurse driven protocols or improved triage flow have more of an impact on door to EKG times. The results of this study may have not measured potential long term impact.

Conclusion

Emergency Departments are continually trying to find a way to meet patient care with limited resources. ED's around the country are overcrowded and struggling to meet healthcare metrics. Quality improvement projects are one way to share evaluation processes to determine if there is a more effective way to deliver patient care. Based on the limitations of this project, it cannot support or refute if the implementation of a nurse driven protocol improves door to EKG times. A duplicate project in a controlled environment should be considered for future research.

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Appendix A

SiteImageID_2669_3_8%7c6%7c2669%7c1%7c3%7c	**POLICY** **Title: Guidelines of Care in the Emergency Department**		
Location: Desert Springs Hospital		**Policy Number:**	**Page: 1 of 6**
Department of Document Owner: EMERGENCY ROOM.			
Original Effective Date: 03/01/2016		**Last Review Date:**	**Last Revision Date: 03/2019**
Section: Emergency Department			

I. Purpose:

To establish nursing standards of care for the Emergency Department. The Nursing Care Guidelines for Emergency Department is intended to be used in conjunction with the Standards of Professional Performance of Emergency Nursing to describe the care a patient will receive in the emergency department.

II. Policy:

Registered nurses working in the emergency department will use the Nursing Care Guidelines of Emergency Department as a standard of care for the emergency department patients.

Safety Policy: Patient Identification

1. The nurse will ensure that the patient has a name band placed so that the patient can be positively identified according to hospital policy.
2. Patients will be identified per DSH Patient Identification policy.
3. Patients with allergies will have an allergy band applied. In addition, allergies will be identified in the patient's electronic medical record.
4. The nurse will protect the patient from infection and cross contamination by adhering to the DSH General Infection Control Criteria.
5. Defibrillators, crash carts, and intubation boxes, and blanket warmers will be checked every shift.
6. Tag any equipment requiring repair and notify biomedical engineering for further evaluation.
7. A hand off at the bedside will occur at shift change using the IMAP format.
8. Staff will abide by the National Patient Safety Goals as established by The Joint Commission.

Rooms

The following supplies and equipment must be available in every room:

1. Suction canister, connective tubing, and yankauer.
2. Monitor leads and wires.
3. BP cuffs (adult and large).
4. Nasal cannula, oxygen Flow meter, and oxygen nipple adapter (christmas tree).
5. Linen, gown, sheet, and pillow.

Triage Policy: Emergency Department Triage

1. All patients presenting to the emergency department will have an initial triage assessment performed by the RN.

2. The RN will assign the patient an ESI level following the triage assessment.
3. The patient will then be directed to an open chair/bed in the appropriate section of the emergency department depending upon ESI level.
4. If all treatment areas are full, the triage level will be used to prioritize the order in which patients will be seen and treated.

Vital Signs Policy: Patient Vital Signs

1. Vital signs will be obtained upon presentation, every 4 hours, and as indicated by clinical condition and/or interventions.
2. Vital signs include: BP, HR, RR, and O2 Sat.
3. Temperature every 4 hrs (Temp > 101F, check every 1 hr). No axillary temperatures.
4. Sick children (vomiting, diarrhea, febrile, change in mental status) under age of 3 require a rectal temperature.
5. Vital signs will be obtained within 30 minutes of discharge or transfer.

Weights

1. Patients over 18 may state their height and weight except when exact weight is required for pharmacological treatment and monitoring of fluid status.
2. Patients under 18 must have a measured height and weight.
3. All infants will be weighed without clothing or diaper.

Assessment

1. The basis of all care delivered in the ED is an accurate and appropriate initial assessment.
2. A focused system assessment will be completed and documented upon presentation and with changes in condition based on the chief complaint and symptoms.
3. Focused assessment will be performed every 4 hours and prn.
4. Critically ill patients will receive a head to toe assessment after initial stabilization, then every 4 hours, and prn.

Chest pain Policy: Chest Pain Center Guidelines

1. The initial EKG will be performed, read, and documented by the ED physician within 10 minutes.
2. The EKG will be available to the provider for reference at all times.
3. The emergency physician or any physician can initiate a Code STEMI.
4. Any patient who develops symptoms of ACS would immediately be assessed following the ACS algorithm.

EKG (12-lead)

Indications:

1. Abdominal pain-older than 35 years of age
2. Syncope
3. Near Syncope
4. Dizziness
5. Chest pain-needs to be shown to the physician within 10 minutes
6. Allergic reaction/suspected-if associated with chest pain
7. Altered LOC
8. Suspected CVA

9. Dyspnea/Resp infection/SPO2 <92
10. GI bleed

Stroke Policy: Code White

1. Code White will be implemented anytime there is a suspicion a patient is experiencing stroke/neurological event.
2. NIHSS will be completed within 15 minutes of calling Code White.
3. Screening for possible thrombolytic administration will be done per Code White protocol.
4. If thrombolytic is contraindicated, the Code White will end and the patient will continue to receive care.
5. The phlebotomist or RN will obtain labs as noted on the Code White form.
6. Stat head CT, chest X-ray, and EKG will be done.
7. The CT scan results will be read by the radiologist and called to the ED physician within 45 mins of the patient's arrival or the initiation of Code White.

Pain Management Policy: Pain Management

1. Assess for pain during initial assessment.
2. Documentation of the patient's pain shall include the following:
    a. Location of pain
    b. Pain intensity and pain scale
    c. Quality of pain
    d. Onset of pain
    e. Duration of pain
    f. Aggravating factors and/or alleviating factors
3. If a patient reports pain, a pain reassessment needs to follow after every intervention. The intervention must be documented and repeated until acceptable relief is accepted or assessed.
4. Perform pain reassessment after medication administration.
    a. Within 30 mins if medication given was IV.
    b. Within an hour if the medication given was PO.
5. Patients receiving narcotic pain medication must be observed in the ED for 30 minutes after injection for adverse effects.
6. Patients will be informed they must have a driver to take them home.

Nutrition

1. All ED patients are on NPO status unless a diet is ordered by a physician.
2. The nurse will advocate for a diet when appropriate.

Do Not Resuscitate Policy: Withholding and Withdrawing Life Support

1. Focus on a Family-Centered End of Life Care if death is imminent.
2. Contact Nevada Donor Network for consultation.
3. Prepare family for what to expect throughout the dying process.
4. Ensure privacy and cultural consideration for the family as appropriate.
5. Offer bereavement resources (e.g., TIPS, hospice, list of funeral homes and support groups).

Patient/family education:

1. Education of the patient/family is a collaborative process involving nurses, physicians, and other disciplines. The education process begins on presentation and continues until discharge.
2. Teaching needs are assessed by an RN continuously with regards to patient and/or family's knowledge, level of understanding, skills, and resources available to meet health care needs of the patient.

Discharge

1. The patient and /or caregiver will be provided with written discharge instructions as indicated to include home prescriptions, medication information, equipment, and supplies as ordered by provider at time of discharge.
2. Patient/family will be able to demonstrate a competent skill level for using any new equipment, device, and/or supplies prior to discharge.
3. The patients will secure their own transportation home.

Visitors

1. Visitors and family will be allowed to visit without restriction in the main ED at the discretion of the primary RN caring for the patient.
2. Children under 16 years of age will not be allowed to visit in the emergency room unless approved by the clinical supervisor.

In-patient Transfer

1. Patient will be transported to the nursing unit safely as soon as the bed is assigned.
2. Telemetry signal and reading needs to be verified prior to leaving the ED.
3. ICU patients will be escorted by an RN for any transport.
4. Any patient admitted to med-tele status or higher must have a patent IV in place before being transported out of the emergency department to the floor.
5. ICU patients are to be monitored using a Zoll defibrillator when being transported (i.e., patient room, radiology, Cath lab).

Medication Administration Policy: Medication Administration

1. All first doses of medication administered will be monitored for appropriate clinical effects and adverse reactions documented.
2. Administer medications as ordered by physician and in a timely manner (30 minutes before or after scheduled time ordered).
3. Always verify right patient, right medication, right dose, right route, and right time.
4. The Wand (Scanner) is to be used during medication administration.
5. Vasoactive Infusions:
    - Calculations are to be based on the patient's actual weight.
    - Document infusion rate and dose (mcg/kg/min or mcg/min) every 1hr and with changes prn.
    - Vasopressors:
        - It is recommended that vasopressors are infused through central lines.
        - If peripheral site must be used, the catheter should be in a large vein with blood return before starting infusion. Site condition must be checked and documented hourly.

POLICY

5

DESERT SPRINGS HOSPITAL MEDICAL CENTER
A Member of The Valley Health System

Title:

Location:	**Policy Number:**	**Page: 1 of 51**
Department of Document Owner:		
Original Effective Date: April 2004	**Last Review Date:** 07/2021, 09/2018, 08/2015, 01/2014, 07/2012, 04/2010, 05/2007, 01/2005	**Last Revision Date:**
Section: Emergency Room		

Specimen Collection Policy: Specimen Collection Guidelines for Laboratory Samples

1. Cerner PPID Device is required for all specimen collection, unless in a downtime or emergent situation.
2. Failure to collect the sample using PPID or to attach the appropriate patient labels to the sample collected will result in the sample not being acceptable for testing by the laboratory.
3. Any sample deemed unacceptable will be issued for recollection unless sample type is deemed irretrievable by laboratory standards.
4. No specimens will be collected if the ID band is absent or not physically attached.

IVs and Tubing Changes Policy: IV Therapy

1. Label ALL IV bags and tubing with time and date to be changed.
2. Amiodarone: use low-sorb tubing and filter. Use central line if available.
3. Replace tubing used to administer Propofol, Cleviprex, and other lipid based medications every 6-12 hours depending upon its use, per manufacturer's recommendations.
4. All Luer lock access ports should have an alcohol impregnated protector cap (Swab Cap) attached and a new one placed after each access.
5. Replace all field started PIVs within 24 hours of admission.
6. IV sites with abnormal findings will be discontinued and restarted at another site.
7. Peripheral venous catheters monitoring:
    a. Every 2 hours if it is being used for continuous infusion.
    b. Every 4 hours if not being used for continuous infusion.

Blood and Blood Products Policy: Administration of Blood and Blood Components.

1. Use Cerner Bridge for administering blood products.

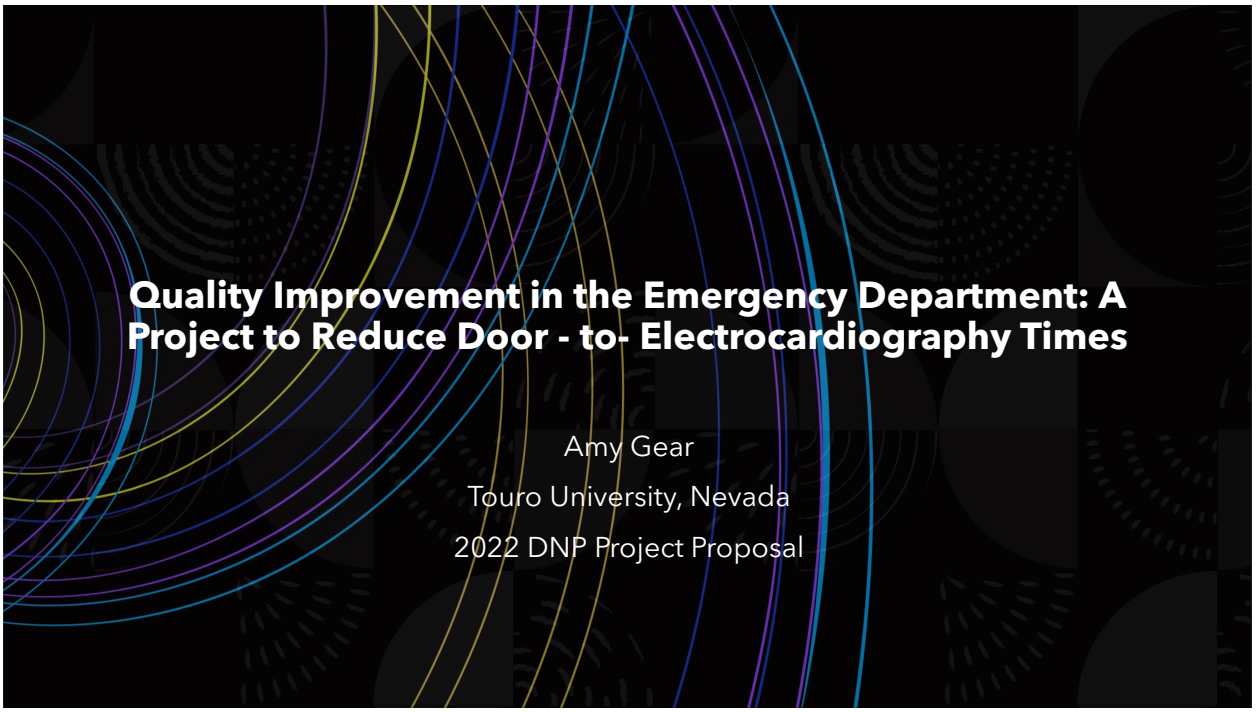
Skin Care Policy: Skin Integrity Management (Wound Care)

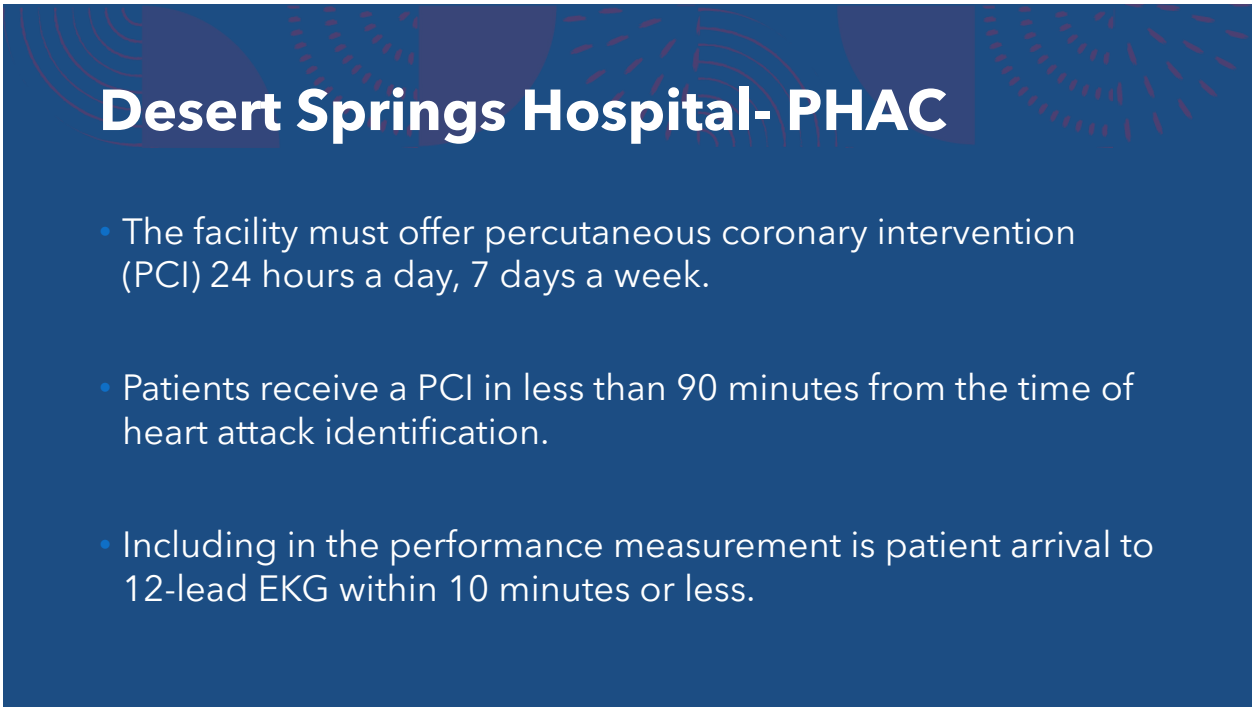
1. Patients from facilities will be assessed for skin breakdown prior to admission to hospital.
2. Photograph wounds on admission and consult Wound Care.

Restraints Policy: Restraints and Seclusion

1. When restraints are initiated without an order by a licensed independent practitioner, a trained nurse in the usage of restraints initiates the restraints based on the assessment that justifies the use of restraints. In these emergency application situations, the order must be obtained either during the emergency application of restraints or immediately (within a few minutes) after the restrain has been applied.
2. Non-violent restraints
    - Ongoing assessment and monitoring of the patient is documented every 2 hours and prn.
    - The order for non-violent restraints must be renewed every 24 hours.
3. Violent/Self destructive
    - The patient shall be monitored every 15 minutes while in restraints by RN/assigned trained staff.
    - The orders for violent/self-destructive restraints must be renewed every 4 hours on an adult patient.

Appendix B


Quality Improvement in the Emergency Department: A Project to Reduce Door - to- Electrocardiography Times
Amy Gear
Touro University, Nevada
2022 DNP Project Proposal


Desert Springs Hospital- PHAC
• The facility must offer percutaneous coronary intervention (PCI) 24 hours a day, 7 days a week.
• Patients receive a PCI in less than 90 minutes from the time of heart attack identification.
• Including in the performance measurement is patient arrival to 12-lead EKG within 10 minutes or less.

Policy Titled "Guidelines of Care in the Emergency Department"

- Abdominal pain (older than 35 years)
- Syncope
- Near syncope
- Dizziness
- Chest pain
- Allergic reactions/ if associated with chest pain
- Altered level of consciousness
- Suspected cerebral vascular accident
- Dyspnea
- Gastrointestinal bleed

"Must have an EKG performed, read, and documented by the ED physician within 10 minutes of arrival."

Current Door to EKG Times

Year	ED Visits	EKG Ordered	Door to EKG Time
2019	55,486	20,097 (36%)	69 min
2020	42,261	15,444 (36%)	66 min
2021	44,833	17,290 (38%)	65 min

Obstacles

- Large number of patients presenting at one time
- Crowding
- Inadequate triage flow
- Lack of knowledge regarding the 10-minute door to EKG time

Maliszewski et. al., 2020.

Triage Nurse

- Current BLS, ACLS, & PALS Certification
- One year experience in Emergency Nursing
- Six months experience at DSH ED.
- Annual attendance of ESI education and assessment
- Annual reassessment of triage competency via evaluation and skills evaluation.

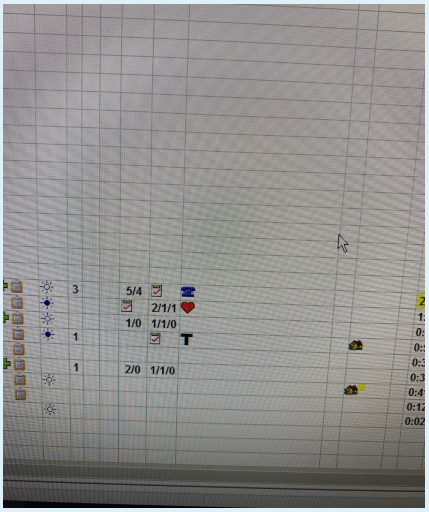
DSH ED Triage

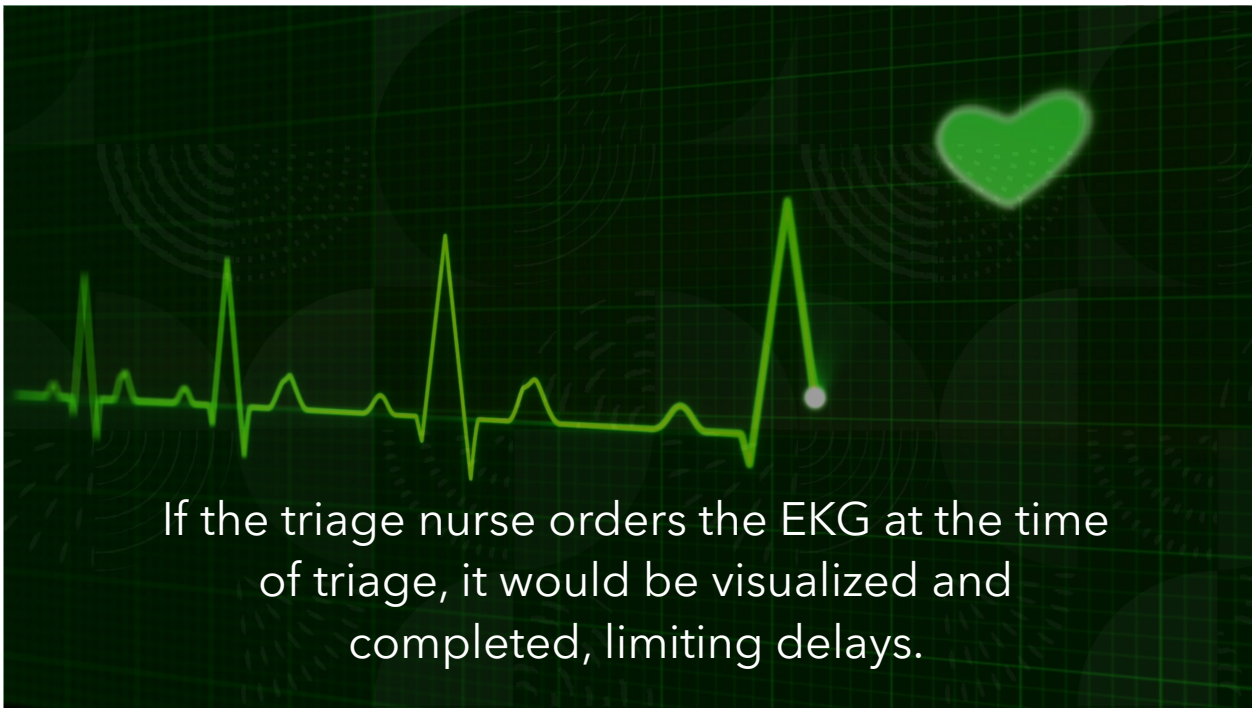
Walk in traffic- Triaged by an assigned triage RN

EMS traffic- Triaged by a clinical supervisor or relief charge RN

Cerner

Research has demonstrated that technicians will often wait for the EKG symbol to pop up on the computer screen indicating that the physician has ordered an EKG (Maliszewski, et al., 2020).





Quality Improvement Project Proposal

- For 2-3 weeks initiate the triage RN implementing the already existing nurse driven EKG protocol.
- Have them place EKG order in Cerner at time of triage.
- Evaluate if door to EKG times improve.

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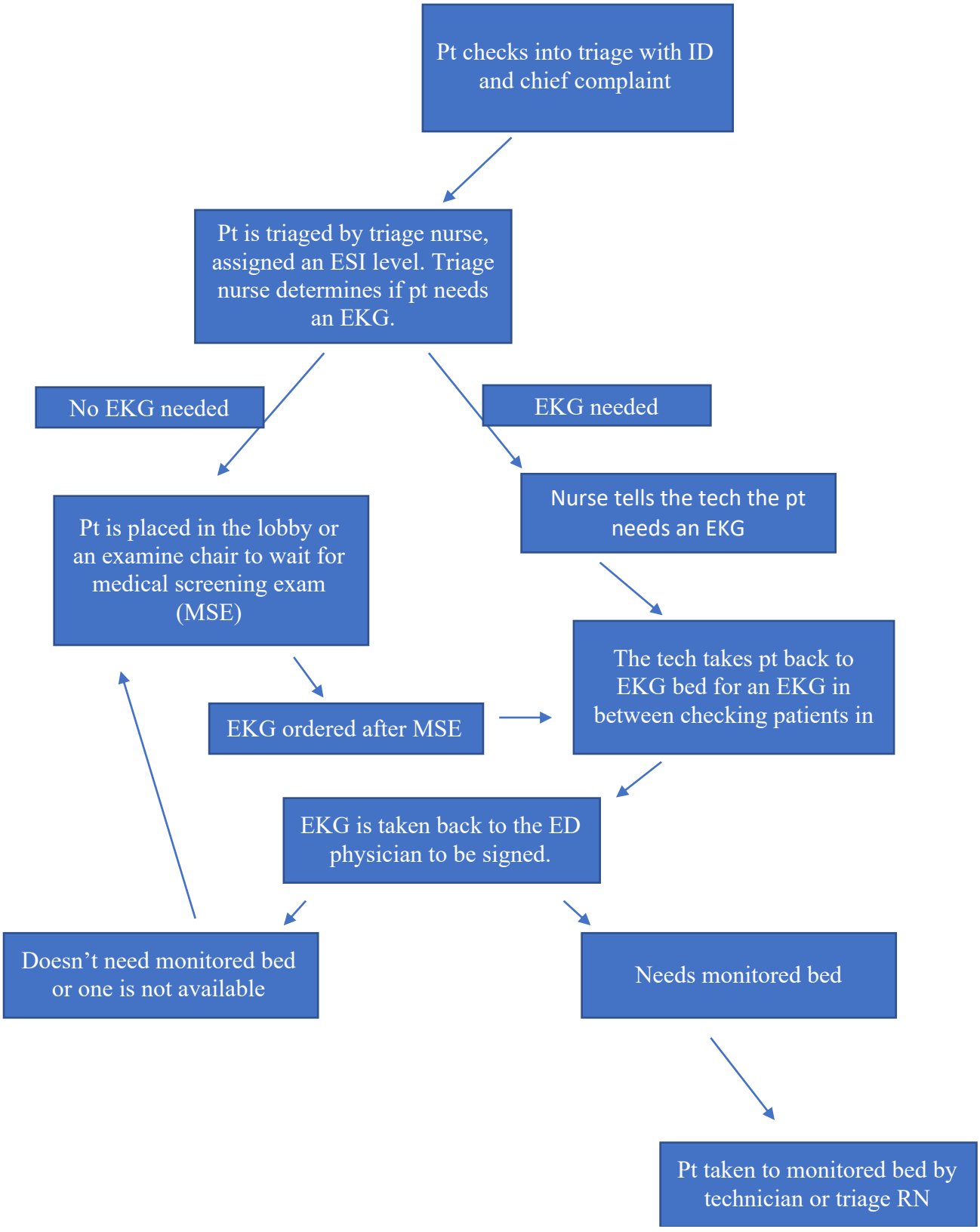
Yost, R. (2022, March 29). EKG Event Times Log. (A. Gear, Interviewer)

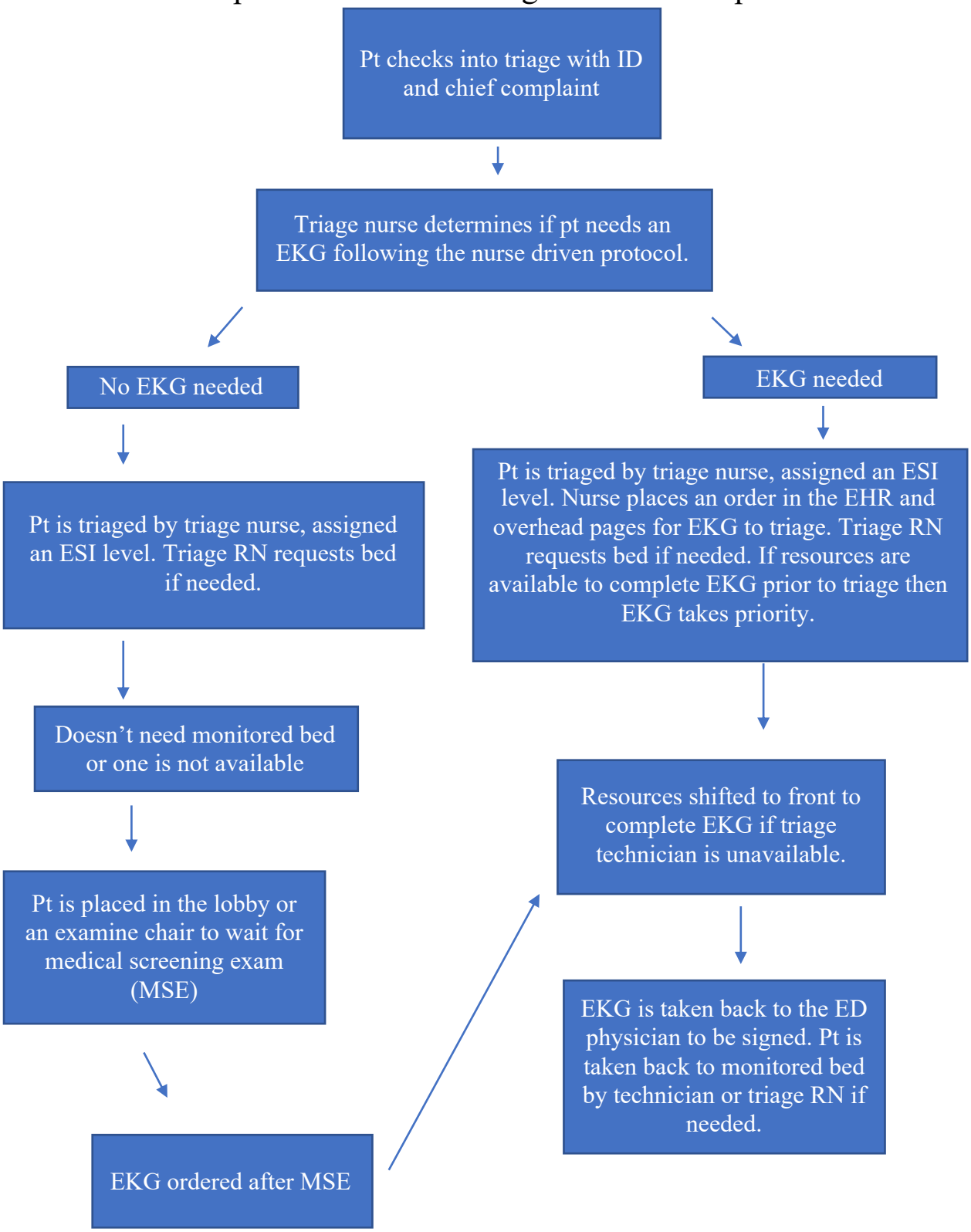
Appendix C

Current Flow from Triage to EKG Completion



Appendix D

Proposed Flow from Triage to EKG Completion



Appendix E

Paired T- Test Results

```
GET DATA
  /TYPE=XLSX
  /FILE='/Users/amygear/Desktop/QI Project Pre Data.xlsx'
  /SHEET=name 'Sheet1'
  /CELLRANGE=FULL
  /READNAMES=ON
  /DATATYPEMIN PERCENTAGE=95.0
  /HIDDEN IGNORE=YES.
EXECUTE.
DATASET NAME DataSet1 WINDOW=FRONT.

SAVE OUTFILE='/Users/amygear/Desktop/Data QI .sav'
  /COMPRESSED.
T-TEST PAIRS=DET WITH DET_A (PAIRED)
  /ES DISPLAY(TRUE) STANDARDIZER(SD)
  /CRITERIA=CI(.9500)
  /MISSING=ANALYSIS.
```

Notes

Output Created		26-DEC-2022 13:43:03
Comments		
Input	Data	/Users/amygear/Desktop/Data QI .sav
	Active Dataset	DataSet1

	Filter	<none>
	Weight	<none>
	Split File	<none>
	N of Rows in Working Data File	569
Missing Value Handling	Definition of Missing	User defined missing values are treated as missing.
	Cases Used	Statistics for each analysis are based on the cases with no missing or out-of-range data for any variable in the analysis.
Syntax		T-TEST PAIRS=DET WITH DET_A (PAIRED) /ES DISPLAY(TRUE) STANDARDIZER(SD) /CRITERIA=CI(.9500) /MISSING=ANALYSIS.
Resources	Processor Time	00:00:00.01
	Elapsed Time	00:00:00.00

[DataSet1] /Users/amygear/Desktop/Data QI .sav

Paired Samples Statistics

		Mean	N	Std. Deviation	Std. Error Mean
Pair 1	DET	17.56	494	17.650	.794
	DET	18.45	494	27.566	1.240

Paired Samples Correlations

		N	Correlation	Sig.
Pair 1	DET & DET	494	.000	1.000

T-Test

Paired Samples Test

		Paired Differences					t	Df
		Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference Lower	Upper		
Pair 1	DET - DET	-.894	32.732	1.473	-3.787	2.000	-.607	493

Paired Samples Test

		Sig. (2-tailed)
Pair 1	DET – DET	.544

Paired Samples Effect Sizes

			Standardizer[a]	Point Estimate	95% Confidence Interval	
					Lower	Upper
Pair 1	DET - DET	Cohen's d	32.732	-.027	-.115	.061
		Hedges' correction	32.757	-.027	-.115	.061

a. The denominator used in estimating the effect sizes.

Cohen's d uses the sample standard deviation of the mean difference.

Hedges' correction uses the sample standard deviation of the mean difference, plus a correction factor.

Appendix F

POLICY

DESERT SPRINGS HOSPITAL MEDICAL CENTER
A Member of The Valley Health System

Title: Emergency Department Triage

Location: Desert Springs Hospital	**Policy Number:**	**Page: 1 of 51**
Department of Document Owner: EMERGENCY ROOM.		
Original Effective Date: April 2004	**Last Review Date:** 07/2021, 09/2018, 08/2015, 01/2014, 07/2012, 04/2010, 05/2007, 01/2005	**Last Revision Date:**
Section: Emergency Room		

PURPOSE

To identify the requirements for triage of patients presenting for care in the Emergency Department (ED)

POLICY

All patients presenting to the Desert Springs Hospital Emergency Department (DSH ED) will have an initial triage assessment performed by a Registered Nurse (RN). Following the triage assessment the RN will assign a triage level to all patients. The patient will then be directed to an open chair/bed in the appropriate section of the ED. If all treatment areas are full, the triage level will be used to prioritize the order in which patients will be seen and treated. DSH ED will use the Emergency Severity Index (ESI) 5-level triage system.

Triage RN's will be designated by the ED Director and meet the following criteria:

- Current BLS, ACLS & PALS Certification
- One year experience in Emergency Nursing
- Six Months experience at DSH ED
- CEN or CPEN Certification (preferred)
- TNCC & ENPC Certification (preferred)
- Attendance of ESI education session and assessment
- Annual reassessment of triage competency via evaluation and skills validation

ED Technician (EDT) facilitates flow and assists the RN with data collection in the triage process. ED Technicians do not assess or make diagnosis. They work under the direction of the triage RN.

PROCEDURE

A. The triage nurse will do a visual and verbal assessment of all patients presented to the ED for care. The triage nurse will complete the portion of the Emergency Department Record designed for the triage notes.
B. If the patient has an actual or potential life threatening event taking place, the triage nurse will communicate with the ED clinical supervisor to allow for immediate placement.
C. The registered nurse will evaluate and categorize each patient upon arrival to the Emergency.
D. Re-evaluation will be determined by the RN based on the patient condition.
Department utilizing Emergency Severity Index, into either:

- resuscitative (Level 1),
- emergency (Level 2),
- urgent (Level 3),
- semi-urgent (Level 4) or
- routine categories (Level 5)

E. Emergency Severity Index (ESI). The following are some examples of types of patients

1. Resuscitative (Level 1) – Requires immediate life-saving intervention: airway, emergency medications, or other hemodynamic interventions (IV, supplemental O2, monitor. EKG or labs do not count) and/or any of the following clinical conditions: intubated, apneic, pulseless, severe respiratory distress, oxygen saturation <90, acute mental status changes or unresponsiveness.

2. Emergent (Level 2) – Major illness or injury. The patient presents with the following criteria:
    - High Risk Situation
    - The patient is confused or lethargic or disoriented
    - Severe pain or distress

3. Urgent (Level 3) - The patient utilizes two or more resources. Resources are:
    - Labs (blood or urine)
    - ECG
    - X-rays
    - CT, MRI, ultrasound, angiography
    - IVF (for hydration)
    - IV or IM or nebulized medications
    - Specialty consultation
    - Simple procedure (1 points): Example - Lac repair, Foley
    - Complex procedure (2 points): Example - Conscious sedation

Please note - the following are ***NOT*** considered resources:

- History & physical by provider
- Point of contact testing-ex. blood sugars
- Saline lock
- Oral medications
- Tetanus immunization
- Prescription refills
- Phone call to PCP
- Simple wound care (dressings, recheck)
- Crutches, splints, slings

4. Semi-urgent (Level 4) - The patient requires one resource as listed above.

5. Routine (Level 5) – The patient requires no resources as listed above.

C. Patient with Cardiac Symptoms – Patients with cardiac symptoms (including but not limited to chest pain, chest discomfort, dyspnea, etc.) will receive an electrocardiogram (ECG) in ***according to AMI standards.*** This ECG will be presented immediately to the attending emergency medicine physician. The Clinical Supervisor will be notified as well.

REFERENCE

1. Emergency Severity Index. Emergency Severity Index, Version 4: Implementation handbook. Retrieved

from http://www.esitriage.org/algorithm.asp on January 9, 2014.