

Modified Triage to Rapidly Refer Patients from Emergency Department to Urgent Care

Danny Y. Ruano

Under Supervision of

Marilyn Miller

Second Reader

Jana Goodwin

Clinical Site Representative

Lauren Schroeder

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Author Note

Danny Y. Ruano

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Correspondence regarding this article should be sent to dannyruano@umaryland.edu

Abstract

Problem: An academic medical center Emergency Department (ED) has a problematic referral process to their Urgent Care (UC) creating disruptions in referrals, delays in patient care, and an overcrowded ED waiting room. Overcrowding and long wait times are correlated with increased mortality, nosocomial infections, and violence. In 2021, this ED's average wait time was 61 minutes and the left without being seen rate was 18%, whereas the UC's wait time was only four minutes. ED Nurse Practitioners (NPs), the sole decision makers for referral, only referred 12% of patients in 2021. **Purpose:** The purpose of this quality improvement project was to implement a NP quick triage to rapidly refer patients to the UC to decrease wait times, allow more access to care, and minimize crowding in the ED waiting room to provide proficient and safe care.

Methods: Data was collected weekly over 15 weeks. The ER Measures Tool was developed and utilized to determine the percent of ED patients eligible for UC referred, time to UC provider, and length of stay (LOS). Changes were monitored through run charts. **Results:** Findings suggest the implementation of a NP quick triage can result in rapid, safe, and appropriate referral of patients to the UC. On average 31% of eligible patients were referred, which was higher than the pre-implementation rate of 30%. Findings also suggest NP quick triage did not affect time to provider and LOS. Factors that influenced referrals included patient complexity, availability and communication of the NP and triage nurse, experience of staff, and staffing issues. **Conclusions:** Findings suggest referral rates can be improved with a NP quick triage intervention, but LOS and referral rates are also influenced by complexity of patients, staffing numbers, communication, and experience of healthcare staff.

Keywords: triage, wait times, referral, emergency department, urgent care, length of stay

Modified Triage to Rapidly Refer Patients from Emergency Department to Urgent Care

The ED, prior to project implementation, was experiencing increasing patient wait times and crowding in the waiting room due to their triage and referral system to their UC. This is a patient health and safety risk. The lack of a formal process was causing patients to wait hours to be triaged and caused a lack of transfers and increased LOS for patients. It was evident from observations, interviews with staff, and data gathered that wait times and overcrowding needed to be addressed. Long wait times cause an unnecessary inconvenience to UC eligible patients. They also promote overcrowding of the ED waiting area, which causes an even greater check-in to provider time. Overcrowding and long wait times have been correlated with delayed treatment, 20-30% increased mortality, increased LOS, readmissions, nosocomial infections, increased number of patients who leave without being seen by a provider, increased violence, decreased privacy, and decreased patient satisfaction (Yarmohammadian et al., 2017; Savva & Tezcan, 2019). Failing to act can result in these factors affecting the patient's health, staff satisfaction and safety, and hospital reimbursement and reputation. Action is needed due to worsening overcrowding and increased wait times in EDs, primarily caused by high utilization, demonstrated by over 130 million ED visits in the United States (CDC & NCHS, 2021).

The ED project site had low satisfaction for the arrival process (3/10), long wait times (61 minutes average), and had a high left without being seen rate (18%). Of note, in 2021 12% of patients were referred to the UC where the wait time was only four minutes. The main root cause of delayed referrals at this site was the current informal referral process. The Emergency Severity Index (ESI), which consists of a five-level triage algorithm, is the leading triage system in the United States used to identify critical patients in the ED (Emergency Nurses Association, n.d.). ESI requires a comprehensive complete triage (Gilboy et al., 2020). Chart and

observational data demonstrate that triage takes 5-10 minutes per patient with the ESI. Afterwards, the NP can assess the patient and send them to the adjacent UC if appropriate. Unfortunately, due to provider availability this might take 30 minutes or may just not occur. This delays the time to care due to waiting to be triaged, the time it takes to triage the patient, and then the time to wait for an ED provider. Other root causes include ESI use prior to referral, staff time available, time and effort required for policy change, patient refusal of a referral to UC, reluctance to change, staffing shortage, lack of knowledge of triage process from staff and leadership, the COVID-19 pandemic which has increased ED utilization, decreased staff, and occupied admission rooms, and other causes displayed in Figure 1.

The purpose of this Doctor of Nursing Practice (DNP) quality improvement (QI) project was to implement and evaluate a nurse-led program utilizing a NP quick look triage occurring in conjunction with or immediately after the RN ESI triage for the early identification and referral of eligible UC patients in the ED. This process utilized streaming, which involves assigning patients based on characteristics, such as acuity, to refer patients to care location for specified level of care, such as the UC (De Freitas et al., 2018).

Available Knowledge

The proposed evidence-based solution, based on an integrative literature review (Table 1 & 2) and root causes, was to implement a NP quick triage process to identify and refer eligible patients to the UC. Studies have demonstrated that an abbreviated triage by qualified personnel is comparable to validated comprehensive triage systems (Betz et al., 2016; Gardner et al., 2018). Betz et al. (2016) concluded chief complaint and observation was the minimal data required for an appropriate triage. Streaming patients has been found to decrease wait times, LOS times, and left without being seen rates (De Freitas et al., 2018; Gardner et al., 2018; Morreel et al., 2021).

Gardner et al. (2018) determined this included sites with independent NPs. Furthermore, streaming has been shown to be safe and carries few risks for patients being misallocated to the wrong stream (De Freitas et al., 2018; Gardner et al., 2018; Kim et al., 2015; Morreel et al., 2021). This evidence supports decreasing wait times and overcrowding through modifying the triage process and streaming patients.

Rationale

The QI framework chosen to ensure an appropriate approach to the problem and facilitate intervention implementation was the Promoting Action on Research Implementation in Health Services (PARIHS) model (Figure 2). The PARIHS model is based on years of QI experience, is commonly used in nursing, and is validated. The model asserts that the success of a project is based on clarity and manipulation of three dynamic cyclical factors of evidence, context, and facilitation (Rycroft-Malone et al., 2008). These components were all utilized during planning to ensure appropriate strategies were used for the appropriate execution of the intervention. The nature of the evidence includes clinical and patient experience or needs and research. This relates to the interventions since, while there was adequate but not plentiful scientific research, clinical and patient needs were expressed, which were utilized to ensure buy-in for the project. Context, also known as environment, includes cultures, values, leadership, evaluation ability, and receptiveness to change. This concept summarizes the organizational attributes that were continuously evaluated to ensure sustainability. Facilitation involves holistic purpose, the role of enabling others, skills, and attributes. These strategies support intervention functions, such as the skills of NPs and enabling patients to seek holistic care at the UC.

Methods

Context

The project setting was a 54-bed ED in a large academic medical center. Only one or two triage nurses were present each shift due to a staff shortage. A NP was seated next to triage. The UC is 200 feet from the ED, is part of the same healthcare system, and all patients receive a medical screening exam mitigating Emergency Medical Treatment and Active Labor Act concerns. The UC is open from 8am to 8pm on weekdays. EPIC charting software was utilized for data collection of the number of patients referred, their wait times, and their LOS.

Intervention

Quick triage entails the ED NP utilizing the chief complaint, a visual assessment, and the registered nurse (RN) triage to decide if referral to the UC is appropriate (Figure 3). This formal process reduces the time from arrival to the decision to refer and increases referral rates. The NP was prompted to incorporate the intervention by monitoring patients in triage or by requests from the triage RN. Decisions were facilitated through use of the ESI triage algorithm. If a patient's acuity was low, then the patient was referred to UC. If not eligible, then the patient remained in the ED. The intervention was feasible and only required a few minutes of training through an in-service to ED staff. Actions to prevent participant exclusion included providing the intervention to all patients when the NP was available.

This project utilized the strategies and tactics of the ABCDE (accountability, buy-in, collaboration, communication, changes in structure, data, education) model (Bingham & Main, 2010 & Powell et al., 2015). Accountability was accomplished by the quality improvement team leader (QI-PL) being present on the unit and having in person meetings with every staff member involved. Buy-in was pursued by utilizing opinion leaders, providing incentives such as candy,

and by providing evidence and initial positive data. Collaboration and communication were accomplished through in person staff communication, scheduled weekly meetings, and ad hoc emails, phone calls, and video calls. Data was consistently monitored, collected, analyzed, and shared to show progress and the need for the intervention. The education via the lesson plan was successful, with appropriate teach-back, and ongoing spot training for new hires through weekly site visits. Education by the QI-PL was sustained by engaging providers through reminders. Project implementation involved education to eligible NPs via 15-minute in-service and an algorithm handout that discusses the triage quick look triage process. Current staff supported the intervention due to the potential improved outcomes and decreased staff workload.

Measures

Measures were selected to evaluate the planning, interventions, and outcomes of the intervention. The main structure goal was that 100% of eligible ED NPs will be trained and competent with the quick triage process within 1 month, measured by dividing the number of quick triage trained NPs by the number of NPs eligible for quick triage training. The main process goal was that 100% of eligible patients will receive a quick triage. Eligible patients were defined as ED patients with a low acuity of ESI 4 or 5. The percentage of eligible patients who received a quick triage was calculated by dividing the number of quick triaged patients by the number of patients eligible. This showed if the practice was being changed. Outcome goals were that 100% of patients eligible for UC and referred with the quick triage process will have decreased time to UC provider and LOS. Times were recorded by EPIC timestamps and compared to historical data. Cost contextual elements were monitored by management but were negligible due to minimal structure changes and the lack of variation in reimbursement since both departments are a part of the same medical system. Data was inputted into the self-

developed ER Measures Tool in REDCap (See Appendix). ER Measures (Table 3) included the percent of ED patients eligible for UC referral who receive the intervention, their time to UC provider, and LOS.

The impact of the intervention was assessed through analyzing descriptive quantitative statistics (frequencies, percentages, means, medians) to draw inferences, with run charts to illustrate change during implementation. Data was examined to assess for significant variation patterns such as shifts, trends, runs, or astronomical points to determine causes of variation and if outcomes were due to the intervention. Validity and reliability of the data was ensured by collecting data weekly when all charting was due, by double-checking, and by comparing data with an EPIC consultant who utilized Clarity software to ensure there were no missing or duplicated encounters.

Ethical Considerations

The project was conducted under a Non-human Subject's Research determination from the Human Research Protections Office of the UMSOM Institutional Review Board. The QI-PL was certified with Collaborative Institutional Training Initiative and Health Insurance Portability and Accountability Act (HIPAA) training that was utilized during the project. Privacy and confidentiality measures included viewing EPIC data on a private password-secured hospital computer in a private area with data entered without gathering of protected health information in REDCap's secure, HIPAA compliant, password-protected server, only accessible to the QI-PL and faculty. Utilization of principles of justice, beneficence, and nonmaleficence protected patients from harm. The initiative posed no threat of harm, was inclusive, and conducted with honesty and integrity. No conflicts of interest were identified.

Results

The structure goal, of 100% of ED NPs being trained and determined competent with the quick triage process within one month, was achieved after all 9 NPs assigned to the unit were trained. The schedule was monitored for new staff to ensure all NPs were trained to implement the intervention resulting in two more NPs being trained in weeks nine and ten resulting in a total of 11 NPs trained.

Findings indicate the process goal of the implementation of a NP Quick Triage resulted in increased rapid referral of patients to the UC. Increased referral percentages demonstrate utilization of the intervention suggesting the implementation plan was effective (See Figure 4). On average 31% of eligible patients were referred, which was higher than the pre-implementation rate of 30%. The range of referral rates were 14.8% to 42.5%. During the intervention, 359 patients were referred out of 1164 eligible patients. There was an increase in referrals after sharing data from week one and two with NPs following week three, increased presence of the QI-PL in the triage and NP area during week seven, and after poster use demonstrating intervention results in week nine indicating that the intervention tactics were effective. No patterns in the data such as shifts, trends, runs, or astronomical points were observed. This signifies that variation was common cause without significant variation in data.

The data shows that outcome goals of time to provider and LOS were not affected by Quick Triage (See Figure 5 & 6). Time to UC provider increased slightly from five minutes prior to implementation to seven minutes after implementation. The range was four to nine minutes. LOS for patients referred to the UC with the intervention ranged from 34 to 80 minutes with an average of 52 minutes, which was similar to the baseline. No special cause variation was found (No shifts, trends, runs, or astronomical data points observed), which signifies that variation was

common cause without significant data variation. Observations during visits and reports from staff suggest that crowding in the ED waiting room was not significantly changed during implementation.

Relevant contextual elements associated with the ability to rapidly refer patients included patient complexity, availability of NP and triage RN, communication, and staffing issues of experience and shortages. NPs stated they always utilized the intervention with consistency, when possible, otherwise the patient was seen in the ED. No other system changes or unintended consequences, such as benefits, facilitators, barriers, problems, failures, or costs encountered and associated with the intervention were recognized to explain the variation in the data.

Discussion

Findings demonstrated the implementation of a NP quick triage can result in rapid, safe, and appropriate referral of patients to the UC. Impact of findings to the system include identifying tactics that improved rates and factors that influenced referral such as patient complexity, availability of NP and triage RN, and staffing issues, which limited the intervention implementation. No other major impact was observed for the organization, staff, or patients. A financial analysis demonstrated no significant cost/ benefit based on contextual cost elements monitored by management. This was likely due to the minimal structure changes, the lack of variation in reimbursement since it is the same system, and the minimal changes in outcomes.

Results compared to literature were congruent with the conclusion that rapid referral was safe and causes few misallocations of patients (De Freitas et al., 2018; Gardner et al., 2018; Kim et al., 2015; Morreel et al., 2021). The results did not find similar results in decreased wait times, LOS, and left without being seen rates (De Freitas et al., 2018; Gardner et al., 2018; Morreel et al., 2021). Reasons for these differences in time and the left without being seen rates are likely

due to complexity of patients staffing, and experience of healthcare staff. In staff interviews it was stated that recent patients presenting for care have tended to be more acutely ill requiring less urgent patients, such as the urgent care eligible patients, to wait. Staff confirmed that they have a large number of homeless patients compared to other facilities who frequently leave before being seen. Staff turnover was found to be an issue as 50% of the nursing staff changed during the course of the project. This created shortages and unfamiliar new staff, which caused a delay in throughput. Administration also changed but this was not identified as a contributor to outcomes. No factors that might have limited internal validity such as bias or imprecision in the project design, methods, measurement, or data were found.

Conclusions

A conclusion based on findings suggests referral rates can be improved with a NP quick triage intervention, but LOS and referral rates are also influenced by complexity of patients, staffing, and experience of healthcare staff. Implications for practice include that the identification that referral rates can be improved with a NP quick triage intervention, but wait times, LOS, and referral rate are also influenced by complexity of patients, staffing, communication, and experience of healthcare staff. This data and project create a starting point for other projects to address the clinical problem of triage and referral. By examining these variables, a program or intervention can be developed that improves patient quality, safety, and outcomes.

Strengths of the project include utilizing a framework and evidenced based tactics to determine effective strategies in the department. Spread of the intervention to other facilities will be accomplished through dissemination of this QI project at conferences, poster days, and through publishing. Sustainability will be maintained through incorporation of the intervention

into new employee orientation and champions and their continued use of the ABCDE model and proven beneficial strategies.

Future QI initiative includes targeting influential factors, examining outcomes such as patient satisfaction, utilizing computer prompts, including licensed practical nurses (LPNs) as stakeholders and in educational sessions, and utilizing a quick look LPN/RN to provide earlier identification for referrals and/or implementing RN triage for these UC eligible patients when staffing improves. Due to the short implementation time frame, it was challenging to determine if the variation was common cause or a special cause. Run charts did not demonstrate special cause variation but there were factors that could have affected the outcomes of the intervention during implementation such as the patient population and staff turnover. A longer period of implementation when these factors returned to the usual levels might have demonstrated an effect. Evaluation with continued collection of measures is necessary to further improve this program. This will be accomplished with a champion who will assume the task of leading this intervention.

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Table 1

Evidence Review Table

Citation: Betz, M., Stempien, J., Wilde, A., & Bryce, R. (2016). A comparison of a formal triage scoring system and a quick-look triage approach. <i>European journal of emergency medicine : official journal of the European Society for Emergency Medicine</i> , 23(3), 185–189. https://doi.org/10.1097/MEJ.0000000000000239					JHNEBP Level and Quality II-B prospective quasi-experimental study with consistent results
Purpose/ Hypothesis	Type of Evidence Research Design	Sample – Population, Size, Setting	Intervention/ Procedures	Primary Outcome/ Measures	Results/ Conclusions
Purpose: determine reliability of triage nurses' triage scores utilizing a simple quick-look method based on observation and chief complaint compared to a commonly used, resource-intensive, comprehensive five-level triage system (CTAS) Hypothesis: None stated	Research Multicenter observational study	Sampling Technique: Convenience sampling of patients in two urban tertiary-care hospital EDs Eligible Participants: 496- All patients during study period Excluded: None Accepted: 496 Control: NA Intervention: Patients were triaged by quick look and then by standard five-level triage system Power analysis/Achieved: None stated Group Homogeneity: Not stated	Control Protocol: triage score based on comprehensive five-level triage system Intervention Protocol: triage scores based simply on observation and chief complaint Treatment Fidelity: High-randomized selection of nurses carrying out intervention with inability to change scores after assignment Strengths: Well-designed methods with	Dependent Variable: Agreement between scores DV Measure: κ scores were calculated and weighted between scores.	Statistical Results: Percent agreement between the quick-look and CTAS method was 84.5%- scores were moderately high. Treatment effect: None Stated Conclusions: assigning triage scores to ED patients using only chief complaint and observation were statistically comparable to scores assigned utilizing a resource-intensive,

			large sample size Weaknesses: Did not include power analysis and analysis of patient demographics		comprehensive triage system,
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Citation: De Freitas, L., Goodacre, S., O'Hara, R., Thokala, P., & Hariharan, S. (2018). Interventions to improve patient flow in emergency departments: an umbrella review. <i>Emergency medicine journal : EMJ</i> , 35(10), 626–637. https://doi.org/10.1136/emered-2017-207263	JHNEBP Level and Quality II-B systematic review consisting of RCTs and quasi-experimental studies with reasonably consistent results
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Purpose/ Hypothesis	Type of Evidence Research Design	Sample – Population, Size, Setting	Intervention / Procedures	Primary Outcome/ Measures	Results/ Conclusions
Purpose: analyze existing evidence on the interventions that improve patient flow in EDs Hypothesis: None stated	Systematic review of RCTs and quasi-experimental studies	Sampling Technique: systematic literature search for flow processes in EDs Eligible Participants: 623-systematic reviews studies with RCTs and quasi-experimental studies from 2006-2017 in the ED with intervention for throughput Excluded: 610-focused on diseases, not generalizable, qualitative, theoretical studies,	Control Protocol: ED without streaming & fast track Intervention Protocol: streaming & fast track Treatment Fidelity: Stated as medium to low Strengths: Multiple articles with large sample sizes in different geographic locations.	Dependent Variable: waiting time, LOS, patients leaving the ED without being seen DV Measure: time and counts	Statistical Results: Streaming decreased wait times by 31 minutes and LOS by 9.5 minutes. Fast track decreased wait times by 24.5 minutes, LOS by 27 minutes, and left without being seen times. Treatment effect:

		<p>opinions, editorials, commentary</p> <p>Accepted: 13</p> <p>Control: NA</p> <p>Intervention: streaming, fast track</p> <p>Power analysis/Achieved : Not indicated</p> <p>Group Homogeneity: Not stated</p>	<p>Weaknesses: Lack of evidence for support of streaming and fast track</p>		<p>moderately strong</p> <p>Conclusions : streaming can decrease LOS and referral to fast-track systems improved wait times, LOS, and left without being seen rates.</p>
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<p>Citation: Gardner, R. M., Friedman, N. A., Carlson, M., Bradham, T. S., & Barrett, T. W. (2018). Impact of revised triage to improve throughput in an ED with limited traditional fast track population. <i>The American journal of emergency medicine</i>, 36(1), 124–127. https://doi.org/10.1016/j.ajem.2017.10.016</p>					<p>JHNEBP Level and Quality II-C Prospective quasi-experimental study with insufficient sample size</p>
Purpose/Hypothesis	Type of Evidence Research Design	Sample – Population, Size, Setting	Intervention/ Procedures	Primary Outcome/ Measures	Results/ Conclusions
<p>Purpose: measure the impact of a revised triage process with rapid referral of low acuity patients to nurse practitioner</p> <p>Hypothesis: None stated</p>	<p>Research Prospective, open-label, pilot study</p>	<p>Sampling Technique: Convenience sampling in ED during 2-week period</p> <p>Eligible Participants : Adult patients not likely to require intensive evaluations</p> <p>Excluded: 5227</p> <p>Accepted: 120</p>	<p>Control Protocol: NA</p> <p>Intervention Protocol: referral of low acuity patients to nurse practitioner</p> <p>Treatment Fidelity: Low due to inclusion and exclusion criteria for the expanded triage area being intentionally not prescriptive</p> <p>Strengths: Data collected demonstrates</p>	<p>Dependent Variable: time to provider, ED LOS, and LWBS</p> <p>DV Measure: time and counts</p>	<p>Statistical Results: Time to provider decreased from a median (IQR) of 42 (16, 114) to 27 (12.4, 81.5) minutes ($p < 0.01$) and ED LOS from 290 (194.8, 405.6) to 257 (171.2, 363.4) minutes ($p < 0.01$) for all patients not admitted and not requiring a consult. LWBS</p>

		<p>Control: Recent weeks with similar metrics</p> <p>Intervention: NP referral</p> <p>Power analysis: None stated</p> <p>Group Homogeneity: None stated</p>	<p>viability of intervention</p> <p>Weaknesses: Small sample, lack of evidence of group homogeneity between patients and staff, and lack of prescriptive protocol</p>		<p>decreased from a pre-trial 4.6% to 2.2% ($p < 0.01$)</p> <p>Treatment effect: NA</p> <p>Conclusions: The revised triage intervention was associated with improvements in several ED throughput metrics and a reduction in LWBS.</p>
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<p>Citation: Kim, S. W., Horwood, C., Li, J. Y., Hakendorf, P. H., Teubner, D. J., & Thompson, C. H. (2015). Impact of the emergency department streaming decision on patients' outcomes. <i>Internal medicine journal</i>, 45(12), 1241–1247. https://doi.org/10.1111/imj.12918</p>	<p>JHNEBP Level and Quality III-B Non-experimental cohort study with reliable results</p>
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Purpose/ Hypothesis	Type of Evidence Research Design	Sample – Population, Size, Setting	Intervention / Procedures	Primary Outcome/ Measures	Results/ Conclusion s
<p>Purpose: to determine outcomes of patients misallocated by the ED process of streaming</p> <p>Hypothesis : None stated</p>	<p>Research retrospective cohort study</p>	<p>Sampling Technique: Convenience sampling in one ED over 3 years</p> <p>Eligible Participants: 83,837</p> <p>Excluded: 71-died prior to intervention</p> <p>Accepted: 83,766</p> <p>Control: NA</p> <p>Intervention: Streaming</p> <p>Power analysis/Achieved : Not stated</p>	<p>Control Protocol: NA</p> <p>Intervention Protocol: Triage nurse chooses between a high (admission) or low acuity (discharge) treatment stream after triage</p> <p>Treatment Fidelity: Not described</p>	<p>Dependent Variable: Total and partitioned ED lengths of stay, inpatient LOS, in-hospital mortality and 7- and 28-day unplanned readmission rate</p> <p>DV Measure: propensity</p>	<p>Statistical Results: Total ED LOS did not differ significantly for admitted patients if allocated to the wrong stream (median 7.6 h, interquartile range 5.7–10.6, cf. 7.5 h, 5.3–11.2; $P = 0.34$). The median inpatient LOS</p>

		<p>Group Homogeneity: NA</p>	<p>Strengths: Large sample with many data points collected. Weaknesses : only at one facility and did not describe demographics of staff carrying out streaming.</p>	<p>score matching for comparison</p>	<p>was shorter for those initially misallocated to the discharge stream (1.8 days, 1.1–3.0, cf. 2.4 days, 1.4–3.9; $P < 0.001$). In-hospital mortality and 7- and 28-day readmission rates were not adversely affected by misallocation. When considering patients eventually discharged from the ED, those allocated to the wrong stream stayed in the ED longer than those appropriately allocated (5.2 h, 3.7–7.3, cf. 4.6 h, 3.3–6.4; $P < 0.001$). Treatment effect: Not stated Conclusions: There were no significant adverse consequences for patient initially</p>
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					misallocated by streaming process. Discharge time was slower if they had been allocated to the ED.
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Citation: Morreel, S., Philips, H., De Graeve, D., Monsieurs, K. G., Kampen, J. K., Meysman, J., Lefevre, E., & Verhoeven, V. (2021). Triage and referring in adjacent general and emergency departments (the TRIAGE trial): A cluster randomised controlled trial. <i>PloS one</i> , 16(11), e0258561. https://doi.org/10.1371/journal.pone.0258561	JHNEBP Level and Quality I-A Randomized control trial with consistent and sufficient results
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Purpose/ Hypothesis	Type of Evidence Research Design	Sample – Population, Size, Setting	Intervention / Procedures	Primary Outcome/ Measures	Results/ Conclusions
Purpose: determine safety of diverting a proportion of ED patients to a provider Hypothesis : None stated	Research Randomize d control trial	Sampling Technique: Convenience cluster sampling in one ED over 47 weekends Eligible Participants: 9964 All adult patients Excluded: 1806 patients previously triated or without insurance Accepted: 8158 Control: 1784 Intervention: 6374 Power analysis/Achieved : Not stated Group Homogeneity: similar	Control Protocol: NA Intervention Protocol: Triage nurse referred patients to non-ED provider Treatment Fidelity: Not assessed Strengths: Large sample with many data points collected over long period of time. Weaknesses: only at one facility, lack of parallel intervention and control,	Dependen t Variable: Total proportion of patients assigned to and treated by non-ED provider DV Measure: counts	Statistical Results: 599/6294 patients (9.5%, 95% CI 8.8 to 10.3) were appropriately referred, 24/599 patients (4.0%, 95% CI 2.7 to 5.9) were referred back to the ED with three needing hospitalization . Out of the patients treated by the provider, 2.4% (95% CI 1.7 to 3.4) needed hospitalization .

			and did not describe demographics of staff.		<p>Treatment effect: Not stated</p> <p>Conclusions: ED nurses safely diverted 9.5% of the included patients.</p>
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Table 2

Evidence Synthesis Table

Category (Level Type)	Total Number of Sources/Level	Overall Quality Rating	Synthesis of Findings
Level I - Experimental study · Randomized Controlled Trial (RCT) · Systematic review of RCTs with or without meta-analysis	1 Randomized Controlled Trial- Morreel et al. (2021)	A Morreel et al. (2021) A	Morreel et al. (2021) found that patients from the ED could be safely diverted to adjacent sections to be seen by other providers.
Level II · Quasi-experimental studies · Systematic review of a combination of RCTs and quasi-experimental studies, or quasi-experimental studies only, with or without meta-analysis	2 prospective quasi-experimental studies- Betz et al. (2016); Gardner et al. (2018) 1 systematic review RCTs and quasi-experimental studies- De Freitas et al. (2018)	B Betz et al. (2016); De Freitas et al. (2018) B Gardner et al. (2018) C	Betz et al. (2016) concluded an abbreviated triage using chief complaint and observation were comparable to validated comprehensive triage systems and Gardner et al. (2018) determined utilizing rapid referral to NP after triage decreased time to provider, LOS, and left without being seen patients in pilot study. De Freitas et al. (2018) concluded streaming can decrease LOS and referral to fast-track systems decreased wait times and LOS.
Level III · Non-experimental study · Systematic review of a combination of RCTs, quasi-experimental, and non-experimental studies, or non-experimental studies only, with or without meta-analysis · Qualitative study or systematic review of qualitative studies with or without meta-synthesis	1 non-experimental cohort study- Kim et al. (2015)	B Kim et al. (2015) B	Kim et al. (2015) determined patients misallocated to the wrong stream (high acuity/ admission vs low acuity/ discharge) had minimal related adverse outcomes such as in-hospital mortality and readmission.
Level IV · Opinion of respected authorities and/or reports of nationally			

recognized expert committees/consensus panels based on scientific evidence			
Level V · Evidence obtained from literature reviews, quality improvement, program evaluation, financial evaluation, or case reports · Opinion of nationally recognized expert(s) based on experiential evidence			
Recommendations Based on Evidence Synthesis: Good and consistent evidence to support practice change of quick triage to stream patients to UC			

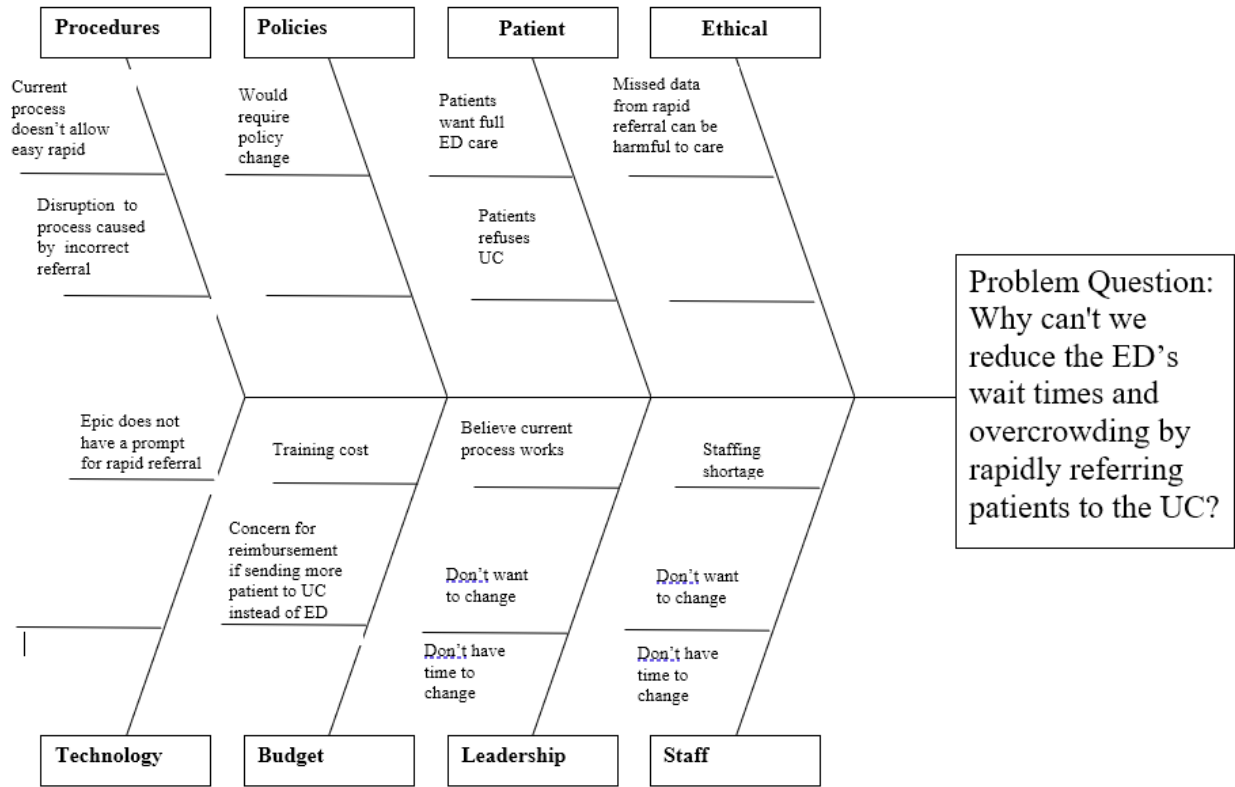
Table 3

Measures and Measurement Plan

PLAN		
Measures		
Project Goals	Measure Pre-Implementation	Measure During Implementation
Structure Goal(s)		
100% of ED NPs trained and determined competent with the quick triage process within 1 month	NA	% of quick triage trained ED NPs compared to ED NPs eligible for quick triage training
Process Goal(s)		
100% of ED patients eligible for UC was receive a quick triage and be referred to the UC.	NA	Numerator: # of ED patients eligible for UC who are quick triaged and referred to the UC Denominator: # of ED patients eligible for UC
Outcome Goal(s)		
100% of ED patients eligible for UC and referred with quick triage process will have decreased time to UC provider	Average time to UC provider for UC patients referred by the ED	Average time to UC provider for UC patients from ED and percent change of pre-implementation and post implementation
100% of ED patients eligible for UC and referred with quick triage process will have decreased LOS times	Average LOS times for UC patients referred by the ED	Average LOS times for UC patients from ED and percent change of pre-implementation and post implementation

Figure 1

Fishbone Diagram of Causes Preventing Rapid Triage to Urgent Care



Root cause is: Current informal process doesn't allow for rapid referral

Proposed solution(s) based on root cause and other causes are: to implement an algorithm to rapidly refer patients eligible for UC

Figure 2

PARiHS Framework



Figure 3

Past Process and Intervention Process Maps

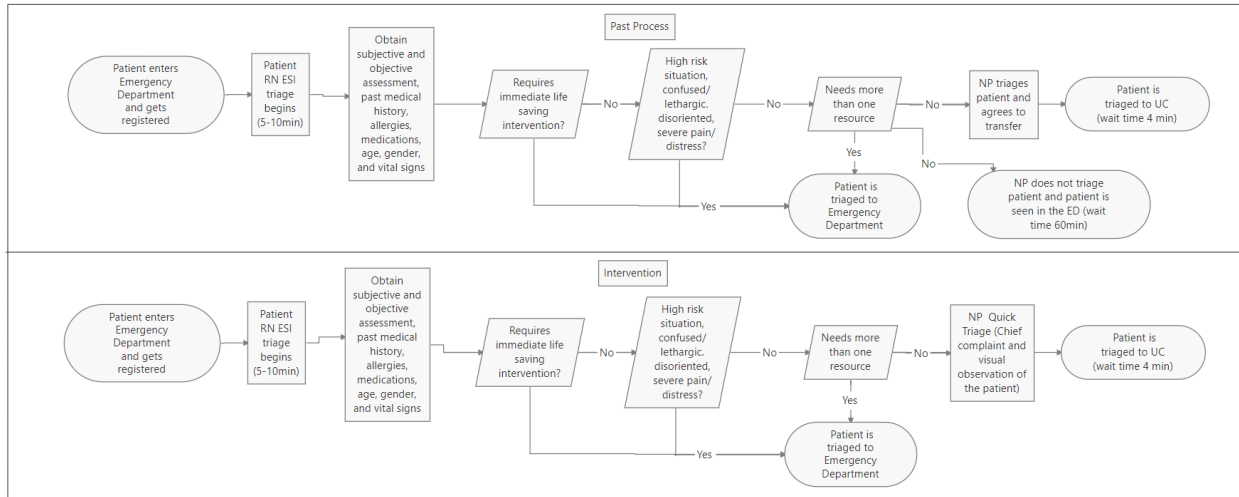


Figure 4

Percent of ED Patients Who Were Quick Triaged and Referred to the UC

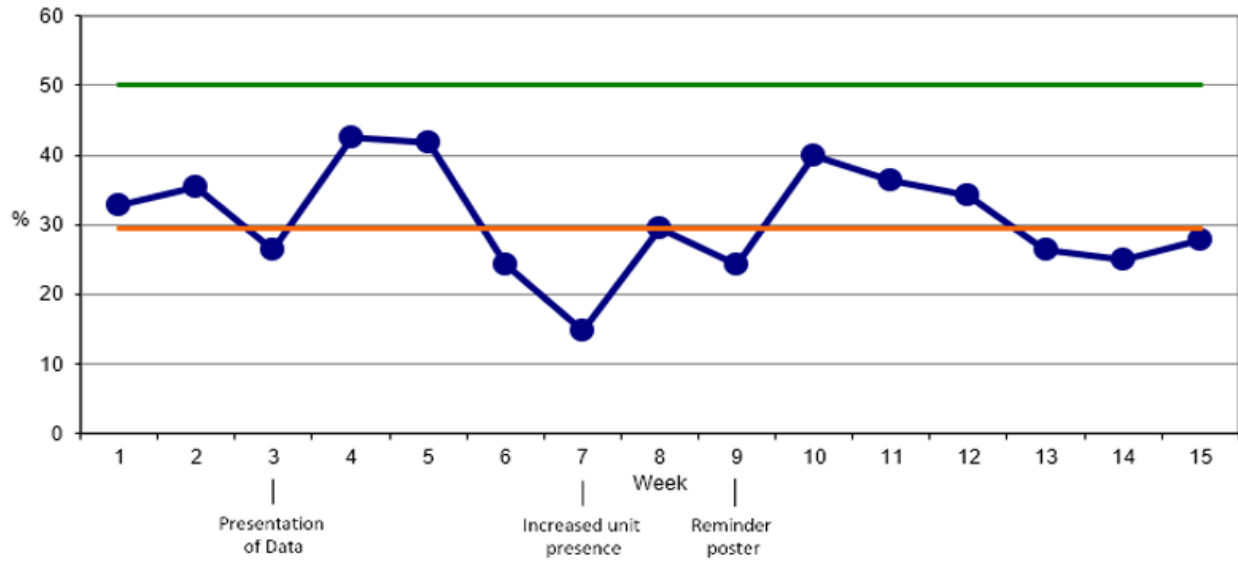


Figure 5

ED Patients Referred to the UC Time to Urgent Care Provider

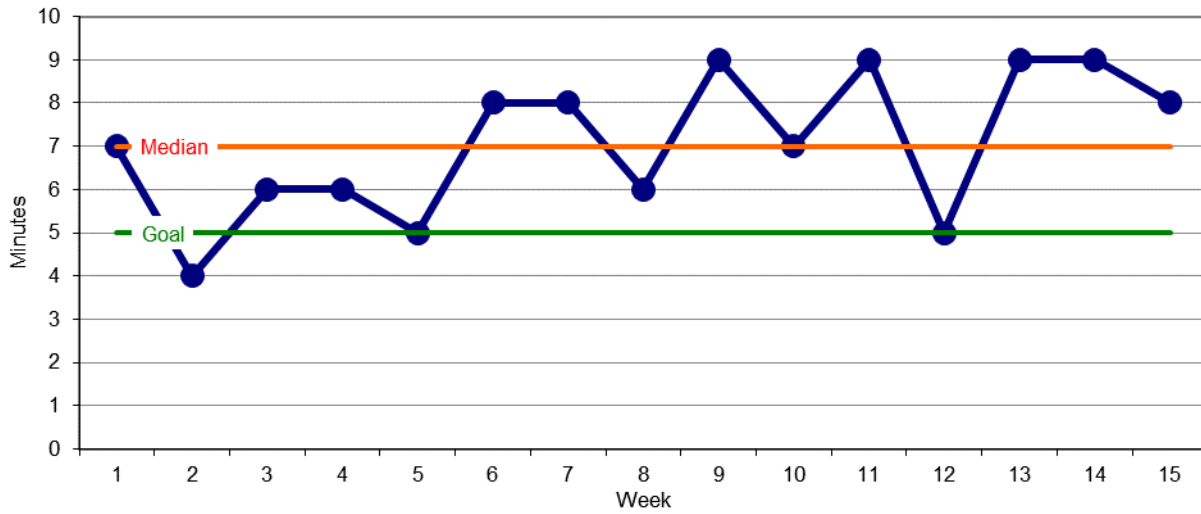
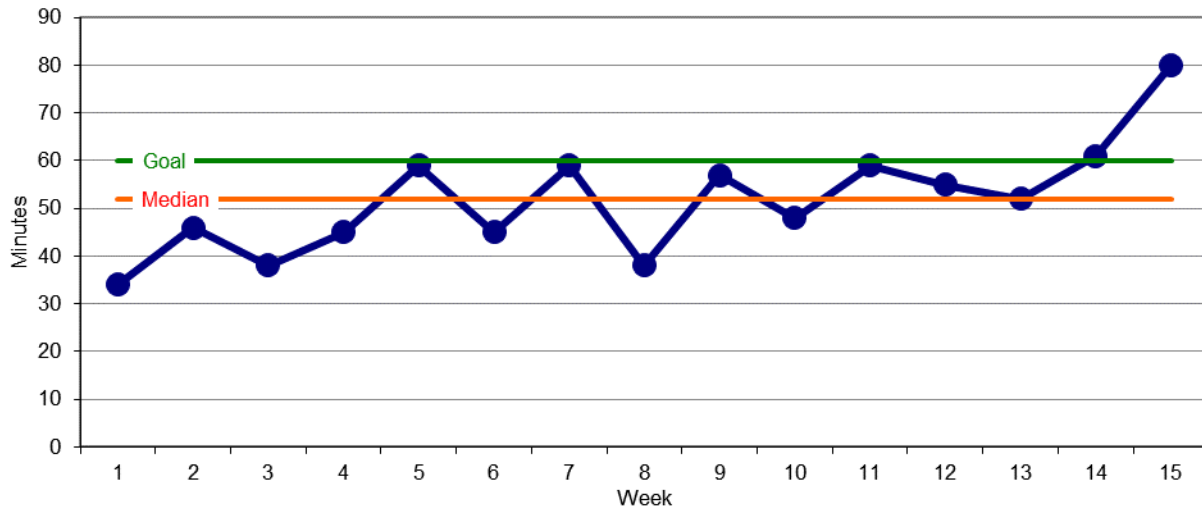


Figure 6

ED Patients Referred to the UC Length of Stay Times



Appendix

REDCap ER Measures Tool

ED Measures

Page 1

- 1) % of ED patients eligible for UC who received a quick triage were referred to the UC. _____
- 2) Average triage time for UC patients from ED _____
- 3) Average wait times for UC patients from ED _____
- 4) Average time to urgent care provider for UC patients from ED _____
- 5) Average length of stay times for UC patients from ED _____