

The Impact of a Nurse Practitioner in Emergency Department Triage

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Abstract

This project explores the impact of placing a nurse practitioner (NP) in emergency department (ED) triage. Emergency departments are faced with a growing volume of patients and improvements are being made to increase the efficiency of the ED. Many EDs are looking to the beginning of a patient's care in the ED to create a more efficient process. This includes the implementation of nurse practitioners in triage to perform the medical screening exam (MSE) and begin placing orders for patients. Three local emergency departments have implemented the use of a nurse practitioner in triage and their data is being compared against the literature. The data collected from these EDs included the time-to-triage, door-to-provider, left without being seen (LWBS), and length of stay. After comparing the data collected to the literature, it was shown that the use of a nurse practitioner in triage is effective in improving the triage process and the patient's stay in the emergency department.

The Impact of a Nurse Practitioner in Emergency Department Triage

Emergency Departments (ED) nationwide, have steadily shown an influx of patients seeking primary care services. According to the CDC, in 2018 there were 145.6 people who visited the ED compared to 2015 when 136.9 people visited the ED. This influx of patients leads to overcrowding, resulting in increased wait times, more patients leaving without being seen (LWBS), and increased length of stays. To address this growing problem of overcrowding and limited resources, emergency departments are finding more creative ways to help decrease patient wait times and improve throughput. One area of potential improvement is evaluating the current reception and triage system of the emergency department. Triage is where a patient is assigned an emergency service index (ESI) level 1-5 based on various factors (See Figure A). According to the Agency for Healthcare Research and Quality, a patient with an ESI level 1 is the most urgent and ESI level 5 is the least urgent. Introduction of a Nurse Practitioner (NP) in triage has been shown in many facilities to decrease door to provider times and improve timeliness of ancillary services like radiology and laboratory tests. The NP can place orders for the patient based off their assessment, decreasing the amount of time a patient spends waiting for results, while also waiting for the ED providers initial contact and evaluation. In some instances, the test results will have been posted even before the provider sees the patient, providing the clinician with a clearer clinical picture on their initial examination of the patient.

Purpose

The purpose of this project is to evaluate the effectiveness of having a nurse practitioner in triage, and the impact that will have on wait times and length of stay in a local emergency department.

Literature Review

Using PubMed, Science Direct, and ProQuest, online database searches were conducted utilizing the phrases “emergency department triage system”, “emergency department nurse practitioner triage”, and “emergency department triage system improvement”. The search was then narrowed down to articles published in the past decade. From there, nine articles were selected that were concerned with the improvement of a patient’s stay in the emergency department. Each article explored a new method to improve various measures of the emergency department. Most of these articles began their improvement process with the beginning of the emergency department stay, which is the reception and triage process.

The first article selected (Carter, Pouch, & Larson, 2014) explored the impact that emergency department overcrowding has on patient outcomes. The authors evaluated previous studies through Medline search engine and used exclusion criteria to narrow their selection. After evaluating the remaining articles, 11 were selected for the data collection. It found that overcrowding causes higher mortality rates among those admitted to the hospital and those who are discharged. Overcrowding has also been shown to increase the number of patients who leave without being seen due to the longer wait times. Overall, overcrowding is a major concern for the safety of patients and needs to be addressed.

A second article (Reinhardt, 2017) evaluated problems with triage at a local hospital to improve the time to triage, time to provider, and rate of patients who left without being seen. Overcrowding puts a larger responsibility on nurses in triage to accurately identify patients who need immediate care. Solutions to improving the triage process included ensuring prompt triage of patients with chief complaints that could be higher in acuity. It was also suggested that patients who were waiting for room placement should be reassessed at least every 30 minutes.

Another article (Nailon et al, 2015) explored one solution to resolve ED crowding and the negative consequences that result from crowding by implementing the use of a “greeter nurse”. The authors specifically tracked the amount of time it took for a patient to arrive from triage, time to be placed for evaluation by a nurse, time to be seen by a provider, time from ST-Elevation Myocardial Infarction (STEMI) arrival to electrocardiogram (ECG), and time from STEMI patient arrival to cardiac catheterization laboratory. These metrics were first obtained in 2011 as a baseline. Next, a greeter nurse role was stationed at the registration desk where patients checked into the ED. The greeter nurse would quickly evaluate the patient and determine if the patient required immediate care. In the years following this implementation an improvement in the time-sensitive metrics was noted.

Another article (Weber, McAlpine, & Grimes, 2011) conducted a study to determine if the mandatory triage system is able to discover the “critical” patients who need to be seen immediately. This study looked at a rural hospital and analyzed the amount of time it took for patients of various acuity levels to have triage completed. The higher acuity patients are to be seen by a provider within a certain time frame and a larger responsibility falls onto the triage nurse to ensure this is completed. At this hospital only about half of the higher acuity patients were triaged within 10 minutes of their arrival which leads to delays in the patient being seen by the provider. After identifying the problem with the timeliness of triage, several suggestions were made to improve the intake process. Some of these suggestions included triaging patients in available treatment rooms which can relieve some of the triage congestion, but can cause all the rooms to be filled for patients of higher acuity. Another suggestion was the use of a physician or midlevel provider in triage.

One article (Falconer, Karuppna, Kiehne, & Rama, 2018) looked at improving the identification of patients with lower acuity levels that may require upgrades of their acuity level after triage. Vital signs play a significant role in determining ESI level for patients and can cause a patient to have a higher or lower acuity level. A patient does not always stay in the same condition they arrived in and if their vitals have deteriorated, it is essential that change is noted so they can receive the proper ESI level and receive the appropriate care. The ED involved in this study created a parallel workflow that would allow vitals to be obtained while the patient was in registration to decrease the amount of time it took for a patient to have their vitals taken.

After review of several articles that discussed the problems associated with triage and recommended improvements, I began reviewing articles that specifically evaluated the use of placing a provider at triage. The first article (Elder, Johnston, & Crilly, 2016) explored the impact of using a physician at triage and implementing the use of a medical assessment unit on the throughput of patients in the ED. A comparative study was conducted with the physician at triage for two weeks, then the medical assessment unit was implemented for the next two weeks, and the final two weeks of the study contained both. Both of these changes on their own showed improvement in decreasing the length of stay for patients, but the combination of the two showed a greater impact than having the physician at triage alone.

One article (Hayden, Burlingame, & Thompson, 2104) sought to improve patient flow by placing a family nurse practitioner (FNP) at triage in efforts to decrease the number of patients that left without being seen (LWBS), door-to-provider time, and overall length of stay. This study broke down the ESI severity by gender and age group of all the patients seen. From there they evaluated the LWBS rate, door-to-provider, and length of stay. These metric were compared before the initiation of a FNP at triage and after the FNP was in triage. The study showed a

significant reduction in door to provider time and an overall decreased trend in length of stay with the use of the FNP in triage.

Another article (Milsten, Klein, Vibhakar, & Linder, 2014) evaluated the impact of having a provider, such as a physician or a physician assistant, in triage to provide screening, obtain vitals, record a brief history, conduct a physical exam, and place orders. For this study a provider was placed for 16 hours of coverage a day in triage and charts were reviewed to calculate the door-to-provider time, and the overall left without being seen rate was calculated. The study wanted to determine if having a provider in triage would impact the number of patients who left without being seen. By the end of the study, it was found that having a provider screen patients in triage effectively lowered the LWBS rate in the ED from 3.1% to 1.7% and decreased the door-to-provider time by 14 minutes.

The final article I reviewed (Pierce & Gormley, 2016) explored the effectiveness of having a “split flow” model where there is a “fast-track” for the lower acuity patients to be seen separately from the higher acuity patients. Another “split flow” model includes the use of team triage where a provider is placed in triage. This study assessed the impact of the split flow model and team triage on a patient’s length of stay. There was a significant improvement in the length of stay of patients when team triage was used in conjunction with the split flow.

The common theme in all these articles was the issue of overcrowding in emergency departments. Each article offered different suggestions to improve them. One suggestion that seemed to have the most impact on the various metrics of the ED was the implementation of a provider, such as a nurse practitioner, in triage.

Methodology

In order to complete this study, in depth research into ED triage was completed using scholastic journals. From there an intervention was identified for further exploration. The intervention chosen was the use of a provider, such a nurse practitioner, in triage. Various nurse managers of emergency departments in Corpus Christi were contacted to plan a meeting. The nurse managers who agreed to participate in this research project provided information on the triage process at that specific hospital. Next, data was collected from two hospitals, Hospital A and Hospital B, of the same hospital system using Microstrategy, a program that pulls data from Meditech and tracks various time measures of patients. Microstrategy can only show data from the past three months which limited the time frame of the data to be collected. The data collected from these meeting included the number of patients seen in a given month, divided by day and night, the time-to-triage, time-to-provider, length of stay, and left without being seen, and the goals for each of these metrics. Another hospital, Hospital C, used a different, unnamed program that was able to show data from a much earlier time than Microstrategy. The data collected from this meeting included the time-to-triage, time-to-provider, left without being seen, and length of stay overall from before the initiation of a provider in triage in July 2015 to current data. No specific goal was identified by the hospital. The data collected from these hospitals was compared against each other and analyzed and compared to the literature.

Results

Three hospitals, Hospital A, Hospital B, and Hospital C in the local Corpus Christi area were chosen for this project. Hospital A and B have the same triage process in action. However, Hospital B does not regularly follow the implemented triage process. The triage process for Hospital A and B begins with the use of an emergency department technician or registration at

check-in. The ED tech has some medical knowledge and can identify the patients that may require immediate attention. These hospitals will use a team triage approach, with a nurse and advanced practice provider (APP), such as a nurse practitioner, in triage from 0900 until 0200, from 0200 until 0900 there is only a nurse in triage. The nurse will perform the triage assessment and assign an ESI level for the patient while the APP performs the medical screening exam (MSE) and place orders, such as medications, labs, and/or radiological studies. Once the patient has been assigned an ESI level, they can be placed in one of two destinations: “fast track” if they have a low acuity level (4 or 5), or on the “main side” for the higher acuity levels (1, 2, or 3). If no rooms are available, the patient will be placed in the waiting room until the next room becomes available.

Hospital A routinely follows the triage process and incorporates a “pull to full” strategy where providers will “pull” patients from the waiting room, that are awaiting triage, into treatment rooms. This helps alleviate traffic coming through triage and gets patients to a provider sooner. When “fast track” is full, Hospital A will begin placing patients in empty rooms on the main side regardless of acuity level so there is no delay in the amount of time it takes the patient to see a provider. Conversely, Hospital B does not utilize a “pull to full” approach and has each patient be triaged by the triage nurse and APP. Hospital B will have all “fast track” acuity level patients be placed in “fast track” despite having open “main side” rooms available. This results in unnecessary increased wait times to be seen by a provider.

The data obtained for Hospital A and B were obtained from Microstrategy. Microstrategy allows the past three months to be reviewed and will compare the data overall, day (defined as 0700-1859), and night (defined as 1900-0659). Given that the APP is in triage from 0900 to

Table 2: Hospital B

Overall	Day	Night	Door-to-triage Goal: <5 min			Door-to-provider Goal: <10 min			LWBS Goal: 1%			Length of stay Goal: 4:00		
May 2019 census			10	8	12	28	24	35	2%	1%	2%	4:21	4:21	4:22
4318	2691	1627												
June 2019 census			12	11	13	41	36	51	3%	2%	3%	5:32	5:35	5:26
4339	2767	1572												
July 2019 (as of 7/25) census			11	10	12	36	30	46	2%	1%	3%	4:58	4:55	5:03
3537	2221	1316												

Table 3: Hospital C

	Door-to-triage	Door-to-provider	LWBS	Length of Stay
July 2015	7 min	56 min	6.96%	2:45
June 2019	6 min	21 min	0.69%	1:52

Discussion

Overall, Hospital A was able to meet most of the set goals for door-to-provider, LWBS, and length of stay. The only goal Hospital B was able to meet was the LWBS during the day when there is an APP in triage. Both hospitals were not able to meet the time-to-triage goal, but Hospital A was consistently close to meeting the goal. Hospital A almost always met the door-to-provider goal, the only exception being on nights in June. The data shows that on average, the day has better time metrics which can be attributed to the use of an APP. It is noteworthy to recall that Hospital B does not consistently use an APP in triage which attributes to these increased times.

On the other hand, Hospital C was able to provide data before the initiation of an APP in triage to a time with the use of an APP. Drastic changes were noticed in the door-to-provider time, left without being seen rate, and the overall length of stay. This data was able to provide a clearer idea of the impact a provider has while in triage.

Some limitations of this study are that data can only be collected from the past three months from Microstrategy, this narrows the window and did not allow data to be collected from over a year ago before an APP was used in triage. Another limitation is that the system does not give a true comparison of times with and without the APP in triage because of the allotted time for day and night. Hospital B does not consistently use an APP in triage so a true comparison of these hospitals cannot be conducted.

Conclusion

With the significant growth of APPs and NPs in current years, they are taking on more roles in medicine. APPs can triage and screen patients as they come into the ED and will expedite their overall stay in the ED by placing orders that can be completed before a patient is placed in a room and seen by a provider. Additionally, APPs have more medical knowledge and can better identify patients that are needing immediate attention and can notify a provider to assess that patient sooner. The findings from the local EDs were consistent with the findings in the literature that APPs have a positive impact on the triage process for patients and are effective in reducing wait times and the time the patient spends in the ED.

References

- Carter, E. J., Pouch, S. M., & Larson, E. L. (2014). The relationship between emergency department crowding and patient outcomes: A systematic review. *Journal of Nursing Scholarship, 46*(2), 106-115. doi:<http://dx.doi.org/10.1111/jnu.12055>
- Center for Disease Control and Prevention. (2019). FastStats - Emergency Department Visits. Retrieved from <https://www.cdc.gov/nchs/fastats/emergency-department.htm>
- Elder, E., Johnston, A., Crilly, J. (2016). Improving emergency department throughput: An outcomes evaluation of two models of care. *International Emergency Nursing, 25*. 19-26. <https://doi.org/10.1016/j.ienj.2015.07.001>
- Falconer, S. S., Karuppan, C. M., Kiehne, E., & Rama, S. (2018). ED Triage Process Improvement: Timely Vital Signs for Less Acute Patients. *Journal of Emergency Nursing, 44*(6). 589-597. <https://doi.org/10.1016/j.jen.2018.05.006>
- Gilboy, N., Tanabe, T., Travers, D., & Rosenau, A. M., (2011) Emergency Severity Index (ESI): A Triage Tool for Emergency Department Care, Version 4 [PDF file]. (2012 Edition). Rockville, MD: Agency for Healthcare Research and Quality. Retrieved from: <https://www.ahrq.gov/sites/default/files/wysiwyg/professionals/systems/hospital/esi/esihandbk.pdf>
- Hayden, C., Burlingame, P., Thompson, H., & Sabol, V. K. (2014). Improving patient flow in the emergency department by placing a family nurse practitioner in triage: A quality-improvement project. *Journal of Emergency Nursing, 40*(4), 346-351. doi:10.1016/j.jen.2013.09.011

- Milsten, A., Klein, J., Liu, Q., Vibhakar, N., & Linder, L. (2014). Retrospective analysis of quality improvement throughput measures at a high-volume community emergency department. *Journal for Healthcare Quality, 36*(5), 13-25. doi:10.1111/jhq.12014
- Nailon, R. E., Schwedhelm, S., Egan, M. J., Watson, S., Nuss, S. L., & Morris, R. (2015). ED greeter nurse: Transforming triage and improving patient care outcomes. *Journal of Emergency Nursing, 41*(3), 265-267. doi:http://dx.doi.org/10.1016/j.jen.2015.01.009
- Pierce, B. A., & Gormley, D. (2016). Are split flow and provider in triage models in the emergency department effective in reducing discharge length of stay? *Journal of Emergency Nursing: JEN: Official Publication of the Emergency Department Nurses Association, 42*(6), 487-491. doi:http://dx.doi.org/10.1016/j.jen.2016.01.005
- Reinhardt, M. (2017). A Systematic Approach to Evaluation of Performance Deficiencies in ED Triage. *Journal of Emergency Nursing, 43*(4), 329-333.
- Weber, E., McAlpine, I., & Grimes, B. (2011). Mandatory triage does not identify high-acuity patients within recommended time frames, *Annals of Emergency Medicine, 58*(2), 137-141

Figures

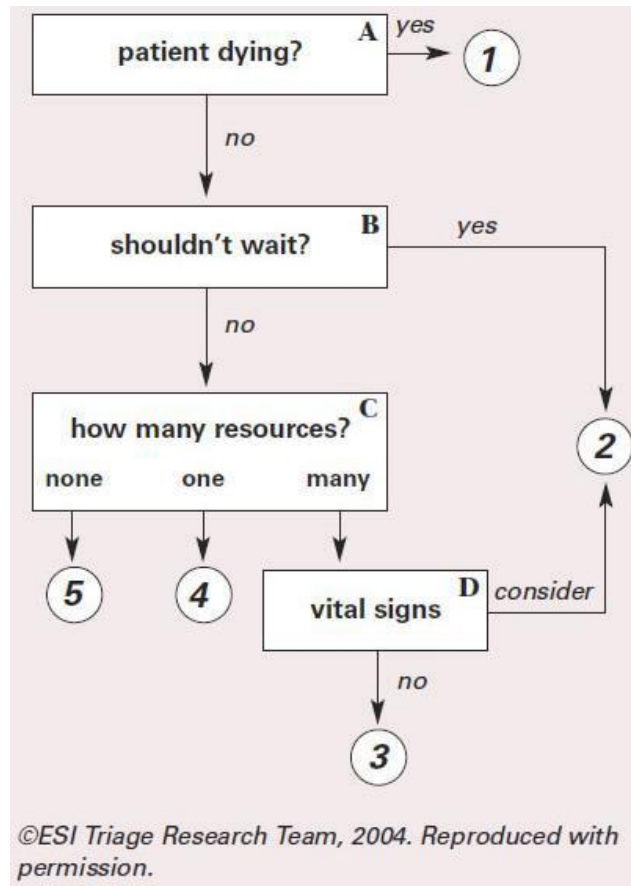


Figure A: Emergency Severity Index Conceptual Algorithm, v. 4. Content last reviewed October 2014. Agency for Healthcare Research and Quality, Rockville, MD. <https://www.ahrq.gov/professionals/systems/hospital/esi/esifig21.html>