

# The Impact of Involving a Senior Emergency Physician in the Triage Process

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**Abstract—** **BACKGROUND:** Emergency Department (ED) overcrowding has been demonstrated in several studies to be associated with undesirable effects such as longer waiting times, reduced patient satisfaction, and, most importantly, poor patient outcomes. Furthermore, long waiting times for walk-ins result in more complaints and patient dissatisfaction than illness management itself, with the majority of issues arising as a result of real and perceived waiting periods before being seen by the doctor.

**AIM:** We set out to investigate whether introducing a senior emergency physician into the triage system would reduce waiting time, door-to-decision time, and door-to-doctor time, as well as increase patient satisfaction across the ED.

**METHOD:** This was an interventional pre-post study that utilised retrospective data to evaluate the effect on ED throughput of triage by senior emergency physicians. We aimed to measure its impact on waiting time, door-to-decision time, and door-to-doctor time, along with ED patient satisfaction.

**RESULTS:** Patient satisfaction, the overall assessment of treatment received during the visit, increased, from 74.975 to 77.425, and the likelihood of patients recommending the ED increased from 71.36 to 75.21. Operational metrics revealed a considerable drop in door-to-decision time (admit or discharge) of 46 minutes and 3 seconds, as well as a 1 minute and 21 second reduction in time from door to doctor (arrival to first provider).

**CONCLUSION:** The mixed results hint at an effective but iterative process of enhancing patient flow and experience in the ED through senior physician triage.

**Index Terms—** Evidence-Based Emergency Medicine; Emergency Room Visits; Emergency Treatment; Triage.

## I. INTRODUCTION

One of the primary variables tracked in the emergency department (ED) as a proxy measure of timeliness and service quality is the waiting time for consultation [1]. Crowding happens in the ED when the demand for emergency services exceeds the ability to deliver care within an acceptable time period [2]. Overcrowding has been noted in multiple studies and was linked to negative side effects such as longer waiting times, lower patient satisfaction, and, most critically, poor patient outcomes. It was also linked to inadequate and delayed resuscitation in septic patients, delayed analgesia administration, increased mortality in community-acquired pneumonia patients, increased risk of adverse outcomes in patients presenting with chest pain, incorrect medication administration, and overall increase in morbidity and mortality [3-12].

Long waiting times for walk-ins, meanwhile, generate more complaints and patient dissatisfaction than disease management itself, with the majority of difficulties and dissatisfaction arising as a result of real and perceived waiting times before being seen by a doctor. In most hospitals, standard triage entails the patient first registering with the registration clerk, receiving a ticket number, and then waiting to be called into triage. The triage nurse questions the patient about their complaint and past medical history, and then measures their vital signs. Thus, the patient faces an initial wait for triage, a second wait for the consultation room, and, if an X-ray is required, a further wait for treatment and release. How much better would it be if these distinct delays could be

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reduced to one or two, especially in simple cases? [13,14].

An area of special interest has been the exploration of the use of advanced providers in triage to aid ED throughput and reduce risk exposure for patients. Numerous organisations have investigated the influence of triage liaison physicians (TLPs) on the Committee on Medicare and Medicaid Services (CMS)' numerous quality indicators, the most relevant to the emergency department being ED Length of Stay (ED-LOS) and Left Without Being Seen (LWBS). There have been prior systematic reviews and meta-analyses of the influence of TLPs on ED-LOS and LWBS. Those of Rowe *et al.* and Abdulwahid *et al.* comprised investigations from various hospital settings in different nations, and the results in both studies were too varied to make decisive conclusions [15,16].

Several investigations are currently underway in the United Kingdom regarding the see-and-treat system. The primary premise of see-and-treat, as supported by the British Association for Accident and Emergency Medicine and the Royal College of Nursing, is allowing the first clinician or practitioner who sees the patient to properly assess, treat, and release those with minor complaints. More than 160 of England's 202 accident and emergency departments are currently testing or implementing some form of see-and-treat system to treat patients with minor illness or injuries [17]. However, widespread adoption of this system and the production of shorter waiting times for treatment, as well as the extra staff requirements (many departments fail to perceive the benefit of placing a senior emergency physician in the triage area and some cannot afford the luxury of doing so), have yet to be fully evaluated; initial reports show some effect, while others have said that it creates a major drain on senior physicians by taking them away from front-line cases. Healthcare workers, on the other hand, report higher morale when waiting rooms are emptier, even if the number of patients has not decreased [17].

To the best of our knowledge, no systematic review has explicitly investigated the effectiveness of incorporating a senior physician into a triage system to alleviate the consequences of ED overcrowding. Despite nurse triage being widely adopted as the

standard strategy in most hospitals globally, there is mounting concern among policymakers regarding its adequacy in addressing the escalating issue of ED crowding worldwide [18]. The impact of introducing seniors into triage remains largely unexplored in international literature, and no research has been conducted on this topic within Saudi Arabia.

As indicated above, we set out to assess whether patient triage undertaken by senior emergency physicians would reduce the waiting time, door-to-decision time, and door-to-doctor time, as well as improve patient satisfaction throughout the emergency department.

## II. MATERIALS AND METHODS

### *Study Design and Setting:*

This was an interventional pre-post study that utilised retrospective data to evaluate the effect on ED throughput of triage by senior emergency physicians.

The study was conducted at the adult emergency department of the tertiary hospital of a large medical city, with an annual ED visit volume of approximately 57,700, and received the Institutional Review Board (IRB) approval number 23-476.

We hypothesise that assigning an emergency consultant to the triage unit will reduce waiting times, shorten the time to initial physician contact and diagnostic testing, and increase patient satisfaction.

### *Intervention:*

The introduction of an emergency consultant as a triage strategy was initiated on January 1, 2023. Our study timeline included the period from Quarter 4, 2021 to Quarter 2, 2023.

Upon initiation of the project, an attending emergency consultant was present in the triage unit seven days a week, over two eight-hour shifts per day: from 10:00 a.m. to 6:00 p.m. and from 6:00 p.m. to 2:00 a.m. The time frame for these shifts was extrapolated from previous data that measured peak ED crowding times.

It was the duty of the emergency consultant to assess patients after initial evaluation by the triage nurse, and then to allocate and re-direct them to the appropriate areas (either the main section of the ED or the fast track for definitive treatment and completion of diagnostic workup), recognising any life-threatening conditions and meeting patients'

needs, discussing their concerns, and explaining their conditions to increase patient satisfaction. The position of triage physician was an additional post to the existing staffing model.

*Study Period:*

All patients presenting to the ED from Quarter 4, 2021 to Quarter 2, 2023 were eligible for inclusion in the study. We extended our investigation back to the last quarter of 2021 to better capture the changes in the triage model and to reduce variabilities that may represent confounders.

*Data Collection:*

Data were collected using a survey conducted by a third party. This survey is known as the Consumer Assessment of Healthcare Providers and Systems (CAHPS) and is a valid and reliable tool that identifies and measures essential components of patient-centredness and engagement, used in a variety of settings such as inpatient, medical practice clinics, and home health care. The CAHPS survey examines the frequency of certain healthcare delivery behaviours such as communication, responsiveness, discharge instructions, etc. [19]

To study the effect of physician triage on the entire day, rather than a 16-hour period, data from the entire 24-hour day were analysed.

*Data Analysis:*

Our study utilised Stata Version 17 as the data analysis software. The variables recorded were: door-to-doctor time (arrival to first provider), door-to-decision time (admit or discharge), waiting time (door to room), patient satisfaction scores (quantitative) and various aspects of patient experience and perception (qualitative).

*Quantitative Variables:*

Door-to-doctor time, door-to-decision time, waiting time and patient satisfaction scores through the use of a Consumer Assessment of Healthcare Providers and Systems (CAHPS) survey tool, were all presented as average times and scores before and after the intervention.

*Qualitative Variables:*

Qualitative variables related to patient satisfaction and experience were presented using a Consumer Assessment of Healthcare Providers and Systems (CAHPS) survey tool.

We calculated the average times and scores of the participants’ answers, both before and after the intervention.

III. RESULTS

A total of 2566 patients were enrolled in the study. The average door-to-decision time decreased by almost 45 minutes, as shown in Table 1, suggesting expedited treatment decisions for both admitted and discharged patients. Additionally, post-intervention surveys (Table 2) revealed an increase in patient-perceived comfort in the waiting area, courtesy of nurses, overall care ratings, and likelihood of recommending the emergency department. The line graph in Figure 1 demonstrates the shifts in patient perception across various healthcare interactions before and after the intervention; the graph tracks several key areas of change in patient experience, notably the waiting time before being brought to the treatment area. Other noteworthy, though smaller, improvements include nurses’ attention to needs, doctors’ concern for patient comfort, and overall ED cleanliness. Interestingly, despite efforts to improve waiting times, there was a slight increase in the average door-to-room time post-intervention.

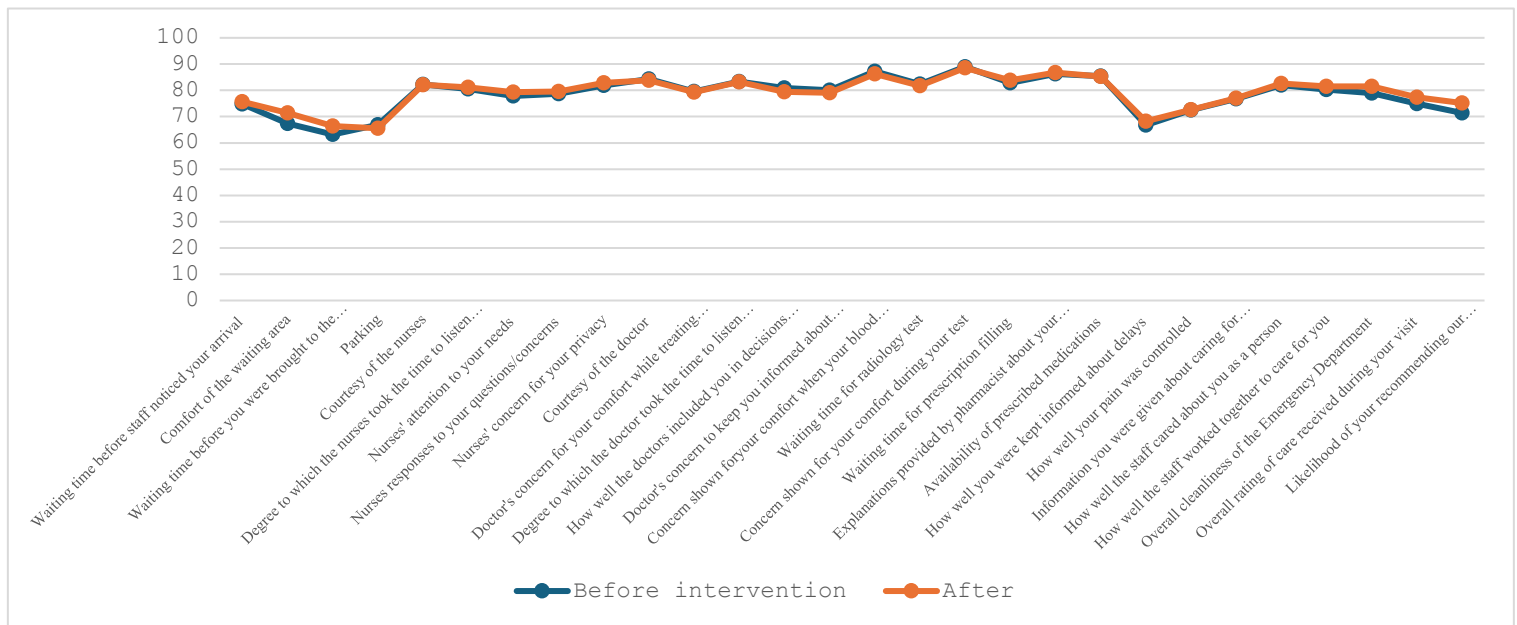
**Table 1.** Variables and average times before and after intervention

Variable	Average before	Average after
Door to doctor (arrival to first provider)	25 minutes and 55 seconds	24 minutes and 34 seconds
Door to decision (admit or discharge)	270 minutes and 16 seconds	224 minutes and 13 seconds
Waiting time (door to room)	18 minutes and 4 seconds	22 minutes and 33 seconds

**Table 2.** Pre- and post-intervention results

<b>Questions</b>	<b>Before</b>	<b>After</b>	<b>Difference</b>
Waiting time before staff noticed your arrival	74.815	75.715	+ 0.9
Comfort of the waiting area	67.405	71.445	+ 4.04
Waiting time before you were brought to the treatment area	63.2	66.435	+ 3.235
Parking	66.89	65.56	- 1.33
Courtesy of nurses	82.265	82.17	- 0.095
Degree to which the nurses took time to listen to you	80.55	81.12	+ 0.57
Nurses' attention to your needs	77.885	79.37	+ 1.485
Nurses' responses to your questions/concerns	78.72	79.505	+ 0.785
Nurses' concern for your privacy	81.835	82.845	+ 1.01
Courtesy of the doctor	84.325	83.81	- 0.515
Doctor's concern for your comfort while treating you	79.54	79.305	- 0.235
Degree to which the doctor took time to listen to you	83.315	83.185	- 0.13
How well the doctors included you in decisions about your treatment	80.89	79.46	- 1.43
Doctor's concern to keep you informed about your treatment	80.08	79.08	- 1
Concern for your comfort when your blood was drawn	87.255	86.205	- 1.05
Waiting time for radiology test	82.37	81.78	- 0.59
Concern for your comfort during your test	88.995	88.545	- 0.45
Waiting time for prescription filling	82.885	83.795	+ 0.91
Pharmacist's explanations about your prescription	86.31	86.74	+ 0.43
Availability of prescribed medications	85.38	85.33	- 0.05
How well you were kept informed of delays	66.76	68.26	+ 1.5
How well your pain was controlled	72.535	72.65	+ 0.115
Information you received about caring for yourself at home (e.g., taking medications,	76.77	77.01	+ 0.24

getting follow-up medical care)			
How well the staff cared about you as a person	81.98	82.57	+ 0.59
How well the staff worked together to care for you	80.33	81.47	+ 1.14
Overall cleanliness of the Emergency Department	79.005	81.545	+ 2.54
Overall rating of care received during your visit	74.975	77.425	+ 2.45
Likelihood of your recommending our Emergency Department to others	71.36	75.21	+ 3.85



**Figure 1.** Patients' perception before and after intervention

IV. DISCUSSION

The concept of doctor triage is not new. Napoleon Bonaparte's head surgeon, Baron Dominique Jean Larrey, was described as the first to perform triage on the battlefield [20]. Recent research has addressed the subject of triage, with the common goal of improving service by lowering waiting or processing times [21]. In the study by Jin *et al.*, a moderate improvement in ED length of stay was observed. However, they studied the effect of senior physician triage during only one shift per day, from 1:00 PM to 9:00 PM, over

9-week period. Their study was conducted in a Level I trauma centre, and their baseline mean length of stay was 266 minutes [22]. Partovi *et al.* performed a similar intervention in a county-owned university hospital in the U.S. and found that ED length of stay was reduced by a mean of 82 minutes ( $p= 0.005$ ) [23]. In the present study, the introduction of a senior emergency physician to the triage system saw a nuanced effect on both patient experience and operational metrics. While we observed a modest decrease in admission and discharge time, the waiting time before being roomed increased. With regard to

the time from arrival to first provider, there was no significant difference between the pre-intervention and post-intervention periods. Patient satisfaction improved in specific areas, notably the perception of waiting area comfort, nurse attentiveness, and overall care received. This, coupled with an increased willingness to recommend the ED, aligns with a heightened sense of care and connection from the patient's perspective. Small declines were noted in perceived physician courtesy and concern for patient comfort – potential consequences of higher physician workload or the need to streamline processes. Interestingly, these declines occurred despite improved overall care ratings, underscoring the importance of examining qualitative patient feedback. It appears that patients may value the expertise and authority of a senior physician, leading to greater satisfaction, even at the expense of some aspects of personalised care.

Interestingly, some others' findings contradict prior research that suggests a consistent reduction in waiting times with physician-led triage [24, 25]. Our study's increase in initial waiting times may be an outlier. Furthermore, while Rowe *et al.* identified significant heterogeneity in outcomes across studies, our observed dip in physician courtesy and patient involvement scores is also unusual [24]. A possible explanation is that senior physicians focusing on rapid triage assessment might unintentionally sacrifice elements of bedside manner in prioritising efficient patient sorting. However, the increases in overall care ratings and likelihood of recommending the ED indicate improved satisfaction despite certain changes in patient-physician dynamics. This highlights the need for nuanced studies exploring how differing triage models balance timeliness with the patient-centredness of interactions.

This study has some limitations. Due to the interventional pre-post study design, there is a risk that outcomes may have been influenced by confounding variables such as seasonality, staff morale, or other initiatives that may have played a role alongside the triage adaptation. Additionally, the study only examined a triage model involving a part-time senior physician, leaving the impact of full-scale implementation uncertain. Additionally, patient

feedback, while valuable, carries inherent subjectivity. Lastly, a lack of process analysis obscures whether the senior physician modified the triage decision-making itself, which would have impacted resource allocation and contributed to the changes observed.

The findings of this study warrant further exploration to optimise the impact of senior physician-led triage. Future research should investigate extended periods of physician cover, conduct multi-site studies for broader insights, and analyse the reasons behind heterogeneous wait time trends. It should also incorporate structured qualitative feedback from patients and providers to understand complex perception changes, and consider refined study designs (e.g., randomised controlled trials) for stronger causal inference. Such investigations, along with ethical and cost-effectiveness analyses, are crucial in order to tailor senior physician-led triage models for maximum benefit to patient experience and emergency department efficiency.

## V. CONCLUSION

The integration of a senior emergency physician into the triage system shows promise in improving patient satisfaction and streamlining operations. It is crucial to address the issues raised while acknowledging the complexity of such intervention. The reduction in door-to-decision times is an important result, while other effects of the intervention suggest that process adjustments may be necessary for optimal results. The mixed outcomes point toward an impactful, yet iterative, process of optimising patient flow and experience in the ED with senior physician triage. Further research is essential to refine the integration process for improved results in this specific ED, as well as for wider application in other settings.

## VI. REFERENCES

- 1- America I of M (US) C on Q of HC in. Crossing the quality chasm: A new health system for the 21st century. National Academies Press (US), 2001.
- 2- Boyle A, Higginson I, Smith S, et al. Crowding in emergency departments. 3rd edition. The College of Emergency Medicine. 2014.

- 3- Pines JM, Hollander JE. Emergency department crowding is associated with poor care for patients with severe pain. *Ann Emerg Med.* 2008;51:1–5.
- 4- Sprivulis PC, Da Silva JA, Jacobs IG, Frazer ARL, Jelinek GA. The association between hospital overcrowding and mortality among patients admitted via Western Australian emergency departments. *Med J Austral.* 2006;184:208–12.
- 5- Richardson DB. Increase in patient mortality at 10 days associated with emergency department overcrowding. *Med J Austral.* 2006;184:213–6.
- 6- Jo S, Kim K, Lee JH, et al. Emergency department crowding is associated with 28-day mortality in community-acquired pneumonia patients. *J Infect.* 2012;64:268–75.
- 7- Kulstad EB, Kelley KM. Overcrowding is associated with delays in percutaneous coronary intervention for acute myocardial infarction. *Int J Emerg Med.* 2009;2:149–54.
- 8- Pines JM, Pollack Jr CV, Diercks DB, Chang AM, Shofer FS, Hollander JE. The association between emergency department crowding and adverse cardiovascular outcomes in patients with chest pain. *Acad Emerg Med.* 2009;16:617–25.
- 9- Kulstad EB, Sikka R, Sweis RT, Kelley KM, Rzechula KH. ED overcrowding is associated with an increased frequency of medication errors. *Am J Emerg Med.* 2010;28: 304–9.
- 10- Sun BC, Hsia RY, Weiss RE, et al. Effect of emergency department crowding on outcomes of admitted patients. *Ann Emerg Med.* 2013;61:605–11.
- 11- Singer AJ, Thode Jr HC, Viccellio P, et al. The association between length of emergency department boarding and mortality. *Acad Emerg Med.* 2011;18(12):1324–9.
- 12- Shin TG, Jo IJ, Choi DJ, et al. The adverse effect of emergency department crowding on compliance with the resuscitation bundle in the management of severe sepsis and septic shock. *Crit Care.* 2013;17(5):R224.
- 13- Travers JP, Lee FC. Avoiding prolonged waiting time during busy periods in the emergency department: Is there a role for the senior emergency physician in triage? *Eur J Emerg Med.* 2006 Dec;13(6):342-8. doi: 10.1097/01.mej.0000224425.36444.50. PMID: 17091056.
- 14- Ooi SB. Emergency department complaints: A ten-year review. *Singapore Med J* 1997; 38:102–107.
- 15- Rowe BH, Guo X, Villa-Roel C, et al. The role of triage liaison physicians on mitigating overcrowding in emergency departments: A systematic review. *Acad Emerg Med.* 2011;18(2):111–20.
- 16- Abdulwahid MA, Booth A, Kuczawski M, Mason SM. The impact of senior doctor assessment at triage on emergency department performance measures: systematic review and meta-analysis of comparative studies. *Emerg Med J.* 2016;33(7):504–13 Jul.
- 17- Emergency services collaborative. Making see and treat work for patients and staff. NHS Modernisation Agency. Available at [http://www.modern.nhs.uk/esc/8196/final%20See\\_%20Treat.pdf](http://www.modern.nhs.uk/esc/8196/final%20See_%20Treat.pdf).
- 18- FitzGerald G, Jelinek G, Scott D, et al. Emergency department triage revisited. *Emerg Med J* 2010;27:86–92.
- 19- Weech-Maldonado R, Carle A, Weidmer B, Hurtado M, Ngo-Metzger Q, Hays RD. The Consumer Assessment of Healthcare Providers and Systems (CAHPS) cultural competence (CC) item set. *Med Care.* 2012 Sep;50(9 Suppl 2):S22-31. doi: 10.1097/MLR.0b013e318263134b. PMID: 22895226; PMCID: PMC3748811.
- 20- Karamouzis K, Perdikakis M, Michaleas SN, Karamanou M. Baron Dominique-Jean Larrey (1766–1842): innovator of the triage. *Acta Chir Belg.* 2024 Jan 2;124(1):66–72.
- 21- Choi YF, Wong TW, Lau CC. Triage rapid initial assessment by doctor (TRIAD) improves waiting time and processing time of the emergency department. *Emerg Med J.* 2006 Apr;23(4):262-5; discussion 262-5. doi: 10.1136/emj.2005.025254. PMID: 16549569; PMCID: PMC2579496.
- 22- Han JH, France DJ, Levin SR, Jones ID, Storrow AB, Aronsky D. The Effect of Physician Triage on Emergency Department Length of Stay. *J Emerg Med.* 2010 Aug;39(2):227–33.

23- Partovi SN, Nelson BK, Bryan ED, Walsh MJ. Faculty triage shortens emergency department length of stay. *Acad Emerg Med.* 2001;8:990–5.

24- Rowe BH, Guo X, Villa-Roel C, et al. The role of triage liaison physicians on mitigating overcrowding in emergency departments: a systematic review. *Acad Emerg Med.* 2011;18(2):111-120. doi:10.1111/j.1553-2712.2010.00984.x. PMID: 21314769.

25- Abdulwahid MA, Booth J, Kuczawski M, et al. Impact of the presence of a senior decision-maker in Emergency Department triage: a systematic review and meta-analysis. *Emerg Med Australas.* 2016 Apr;28(2):149-57. doi: 10.1111/1742-6723.12530.