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# Impact of a Physician-in-Triage Process on Resident Education

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**Introduction:** Emergency department (ED) crowding negatively impacts patient care quality and efficiency. To reduce crowding many EDs use a physician-in-triage (PIT) process. However, few studies have evaluated the effect of a PIT processes on resident education. Our objective was to determine the impact of a PIT process implementation on resident education within the ED of an academic medical center.

**Methods:** We performed a prospective cross-sectional study for a 10-week period from March to June 2011, during operationally historic trended peak patient volume and arrival periods. Emergency medicine residents (three-year program) and faculty, blinded to the research objectives, were asked to evaluate the educational quality of each shift using a 5-point Likert scale. Residents and faculty also completed a questionnaire at the end of the study period assessing the perceived impact of the PIT process on resident education, patient care, satisfaction, and throughput. We compared resident and attending data using Mann-Whitney U tests.

**Results:** During the study period, 54 residents and attendings worked clinically during the PIT process with 78% completing questionnaires related to the study. Attendings and residents indicated “no impact” of the PIT process on resident education [median Likert score of 3.0, inter-quartile range (IQR): 2-4]. There was no difference in attending and resident perceptions ( $p$ -value =0.18). Both groups perceived patient satisfaction to be “positively impacted” [4.0, IQR:2-4 for attendings vs 4.0, IQR:1-5 for residents,  $p$ -value =0.75]. Residents perceived more improvement in patient throughput to than attendings [3.5, IQR:3-4 for attendings vs 4.0, IQR:3-5 for residents,  $p$ -value =0.006]. Perceived impact on differential diagnosis generation was negative in both groups [2.0, IQR:1-3 vs 2.5, IQR:1-5,  $p$ -value = 0.42]. The impact of PIT on selection of diagnostic studies and medical decision making was negative for attendings and neutral for residents: [(2.0, IQR:1-3 vs 3.0, IQR:1-4,  $p$ -value =0.10) and (2.0, IQR:1-4 vs 3.0, IQR:1-5,  $p$ -value =0.14 respectively].

**Conclusion:** Implementation of a PIT process at an academic medical center was not associated with a negative (or positive) perceived impact on resident education. However, attendings and residents felt that differential diagnosis development was negatively impacted. Attendings also felt diagnostic test selection and medical decision-making learning were negatively impacted by the PIT process. [West J Emerg Med. 2014;15(7):902–907.]

## INTRODUCTION

Emergency department (ED) crowding and operational constraints are common in countries across the globe. ED crowding occurs when the demand for services outstrips available resources within a health system – routinely

impacting the patient care. Patients often wait for hours before being seen by a provider, or wait to be transferred to an inpatient hospital bed after ED care is provided – not merely an inconvenience but rather a degradation in the quality of care, patient safety, staff morale, patient satisfaction, and

cost of care.<sup>1-5</sup> In 2006, the Institute of Medicine highlighted the near breaking point of the U.S. emergency care system citing crowding as a systemic sign of failure – an institutional problem that goes well beyond the ED.<sup>6</sup>

Since that report, many high-impact solutions have been developed and tested to assuage ED crowding.<sup>7-12</sup> One such solution is a provider in triage (PIT) to improve front-end ED patient flow. This provider (physician or advanced practice clinician) performs a brief initial assessment and initiates necessary testing and treatment directly in the triage space when patients cannot be immediately placed in a main ED treatment area bed. The goal of the PIT process is to increase the efficiency and timeliness of initial patient contact with a licensed medical provider. Patients with only minor complaints can often be discharged directly after this evaluation in triage. For more ill patients, triage physician interventions are initiated – assuming a bed is not immediately available, and patients are placed in a waiting room queue until an ED bed is assigned. Once the patient is bedded to the ED, a comprehensive evaluation is performed, usually by a different provider. The PIT concept can be expanded into a “team triage” concept where an emergency physician, nurse, registrar, technician, and scribe, or some variation thereof, initiate an initial evaluation and treatment of a patient on presentation to the ED. Prior studies have demonstrated that a PIT process increases patient satisfaction, decreases the number of patients who leave without being seen (but perhaps not those leaving without completion of treatment or AMA), and in some settings decreases total length of stay (LOS).<sup>16-22</sup>

While a PIT process can reduce crowding, its applicability at academic medical centers, which balance the missions of patient care and education, is unclear because of concerns regarding its impact on resident education. At present, few peer-reviewed studies have looked at the relationship between crowding and resident education. However, none have focused on the interventional impact on resident education related to having a PIT process in place.<sup>23</sup> Therefore, the primary objective of this study is to determine the impact of a PIT process on ED resident education as measured by resident and attending perception while recognizing the balance of patient care and resident education. Secondary measures, including perceived quality of care, patient satisfaction, throughput and others were included.

## METHODS

We performed a prospective cross-sectional study over a 10-week period from March to June 2009, at Wake Forest Baptist Medical Center (WFBMC). WFBMC is a Level I Trauma Center, burn center, and academic tertiary care facility located in Winston-Salem, NC. The ED has an annual volume of 104,000 patient visits per year with thirty-four adult beds during the study period. It also has a three-year emergency medicine (EM) residency training program with fifteen residents per year currently. This study was institutional

review board approved.

During the ten-week study period a PIT process was piloted at WFBMC ED. The focus of this pilot project was to assist in the initial evaluation and care needs of those patients presenting during times of ED over-capacity. The PIT team consisted of an ED physician, ED nurse, and ED technician or nursing assistant. They provided initial medical screening examinations for all patients awaiting care in the Adult Acute Care area of the ED when beds were not immediately available. Initiation of laboratory tests and/or radiographic images and concurrent documentation were provided while the patient awaited ED bed availability.

All EM residents and faculty were aware of the PIT process pilot and the desire to address ED crowding but were not made aware of the research objectives. Only attending physician volunteers participated in the PIT. All providers continuing patient care from the PIT during the pilot received a study questionnaire at the end of the study period. The questionnaire was secure, anonymous, and was completed online using SurveyMonkey. Following completion of the online questionnaire, we collated responses and created a secure electronic database, which could only be accessed by study investigators.

Questionnaire respondents were asked to evaluate the impact of the PIT process on resident education, quality of patient care, patient throughput, and patient satisfaction. All definitions were provided in an educational session prior to the survey dissemination. All answers were recorded on a 5-point Likert scale: (1-5) with 1 being negative, 3 no impact, and 5 being positive. Resident education was further delineated into these common process steps: history, physical examination, differential diagnosis development, testing and treatment, medical decision making, documentation, consultation, and disposition decision.

We analyzed data from each questionnaire item in two ways: 1) in aggregate and 2) separately for attending and resident physicians. Given the non-parametric nature of the data, we calculated median and IQR to describe questionnaire responses. Mann-Whitney U tests were used to compare questionnaire responses of residents versus attendings. We calculated descriptive statistics for patient satisfaction survey responses, including median and IQR. Statistical analysis was performed using SAS 9.2 (SAS Institute, Cary, North Carolina).

## RESULTS

During the study period 54 residents and faculty were identified as having worked a shift in which the PIT was operational. The questionnaire (Figure) was completed by 42/54 physicians, a response rate of 78%. Level of training of the respondents included EM First-years (19.0%), Second-years (21.4%), Third-years (16.7%), and faculty (42.8%) (Table 1).

There was no perceived impact of PIT on resident

Question 1: We just completed our physician-in-triage (PIT) Pilot Project. Did you work clinically during a shift in which the PIT was operational? (If YES, survey continued)

Question 2: What is your current level of training? (1<sup>st</sup>, 2<sup>nd</sup>, 3<sup>rd</sup> year resident, attending)

Question 3: Based on your perception, the PIT pilot had the following impact on:

	Strongly negative	Negative	No Impact	Positive	Strongly positive
Resident education					
Quality of patient care					
Patient satisfaction					
Patient throughput					

Question 4: Based on your perception, what impact did the PIT pilot have on the following areas of resident education?

	Strongly negative	Negative	No impact	Positive	Strongly positive
Patient rapport	0	2	4	2	0
History taking	0	2	4	2	0
Physical examination	0	1	6	1	0
Generating differential diagnoses	0	4	1	2	1
Selecting diagnostic studies	0	4	2	2	0
Medical decision making	0	4	2	1	1
Documentation	0	1	5	2	0
Consultation	0	0	5	3	0
Disposition decisions	0	2	4	2	0
Faculty teaching	0	1	4	3	0

**Figure.** Questionnaire.

**Table 1.** Questionnaire response rate by Emergency Medicine participants in physician-in-triage study.

Physician	Participants
First-year residents	8
Second-year residents	9
Third-year residents	7
Attendings	18

education between the attending and resident survey respondents [3.0 (2-4) vs 3.0 (2-4), p-value =0.18]. Residents perceived the quality of care to be better while attending perceived no difference, but this was not statistically significant [3.0 (2-4) vs 4.0 (3-4), p-value =0.22] (Table 2). Both groups perceived patient satisfaction to be positively impacted [4.0 (2-4) vs 4.0 (1-5), p-value =0.75] although residents perceived the overall patient throughput to notably

improved [3.5 (3-4) vs 4.0 (3-5), p-value =0.006]. Perceived impact on the components of patient care was negative in both groups for differential diagnosis generation [2.0 (1-3) vs 2.5 (1-5), p-value =0.42] and attendings perceived the impact on selection of diagnostic studies and medical decision making to be negative [2.0 (1-3) vs 3.0 (1-4), p-value =0.10] and [2.0 (1-4) vs 3.0 (1-5), p-value =0.14] respectively (Table 3).

## DISCUSSION

In this study, a PIT process improved the ED providers' perception of patient satisfaction without negatively impacting the overall perception of resident education at an academic medical center. This result is significant, because academic medical centers have a bipartite mission to provide high-quality patient care while simultaneously delivering an excellent educational experience for trainees. Our results, suggest that a PIT process can be implemented at academic

**Table 2.** Attending and resident perceived impact of physician in triage on resident education, quality of care, patient satisfaction and throughput.

	Attending (median/IQR)*	Resident (median/IQR)*	p-value
Resident education	3.0 (2-4)	3.0 (2-4)	0.18
Quality of care	3.0 (2-4)	4.0 (3-4)	0.22
Patient satisfaction	4.0 (2-4)	4.0 (1-5)	0.75
Patient throughput	3.5 (3-4)	4.0 (3-5)	0.006

\*Likert scale: 1-5 with 1 = strongly negative impact, 5 = strongly positive impact.

**Table 3.** Attending and resident perceived impact of physician in triage on patient rapport, history taking, physical exam, differential diagnosis, diagnostic ordering, medical decision making, documentation, consultation, disposition, and faculty teaching.

	Attending (median/IQR)*	Resident (median/IQR)*	p-value
Patient rapport	3.0 (3-4)	3.0 (2-4)	0.26
History	3.0 (2-3)	3.0 (2-4)	0.22
Physical exam	3.0 (2-3)	3.0 (2-4)	0.38
Differential diagnosis	2.0 (1-3)	2.5 (1-5)	0.42
Diagnostic studies	2.0 (1-3)	3.0 (1-4)	0.10
Medical decision making	2.0 (1-4)	3.0 (1-5)	0.14
Documentation	3.0 (3-4)	3.0 (2-4)	0.86
Consults	3.0 (3-4)	3.0 (3-5)	0.023
Disposition	3.0 (3-4)	3.0 (2-5)	0.63
Faculty teaching	3.0 (2-3)	3.0 (2-4)	0.083

\*Likert scale: 1-5 with 1 negative impact, 5 positive impact.

medical centers to improve patients' ED satisfaction without compromising the residents' or attendings' perceptions of the educational mission.

Prior to this study, no investigations looked at the effect of a PIT process on the education of residents in an academic ED. The results of our study directly address some of the criticisms against PIT in a teaching institution. Many educators believe that a PIT process decreases residents' opportunities to develop an unbiased differential diagnosis. They are concerned that testing and interventions ordered by the physician in triage prior to the assessment will bias resident assessments and short-circuit learning. In addition, because the initial evaluation documentation may be completed before the resident evaluates the patient, some are concerned the resident's focus may shift from a more complete patient care process to a disposition-only focus. Furthermore, some purport that the PIT process may disrupt and negatively impact the resident-attending educational processes already in place.

In this study, there was no perceived impact of PIT on resident-attending education processes. Perhaps this was due to the heightened awareness of the care team that these patients had already been assessed by a physician-in-triage, or that current care processes and dialogue were maintained despite the process change. While not statistically significant, residents believed the quality of care to be better overall while attendings perceived no difference. Both groups believed the PIT process enhanced patient satisfaction based on their interactions when receiving PIT patients. Comments related to this perception resonated with the idea of eliminating delays in the care process and improved communication (including care updates) with the patients through the PIT. The residents also perceived patient throughput to be notably improved, which likely reflected the impact of having orders and perhaps tests completed for prior to the resident evaluation in the ED.

Regarding potential negative impacts from the PIT

process, both groups believed there was a negative impact on differential diagnosis generation – an important skillset for any emergency provider. In addition, attendings perceived the impact on selection of diagnostic studies and medical decision making to also negatively impact the resident education process. However, it was suggested by several providers that perhaps changing the communication process with residents caring for PIT patients would encourage renavigation of differential and care considerations. In doing so, this may assuage some of the educational concerns noted in this study.

Our study demonstrated improved patient satisfaction from a PIT process. Prior to the onset of our study in 2011, there was a relative absence of quality data related to the impact of providers-in-triage, except for anecdotal information from facilities that have reached over-capacity based on system failures. Review of current literature on the topic appropriately recognizes the complex multi-factorial aspects impacting ED crowding and the subsequent impact on access to and quality of patient care. As such, most systems recognize and recommend a system-wide approach to quality, efficient patient care while specific process changes are being piloted or implemented.

Currently, limited data exist in the literature with similar project foci – the educational impact of implementing this operational change.<sup>23</sup> In a study by Partovi et al., the LWBS rate was reduced by 46% with a faculty physician in triage during peak volume and capacity periods.<sup>17</sup> Another showed that placing a physician in triage during similar time periods significantly reduced patient waiting time.<sup>15</sup> In another publication, Choi et al., summarized current data to conclude that having a physician in triage may be an effective intervention for ED crowding under certain circumstances – that require further clarification.<sup>18</sup> However, further analyses appropriately recognized that many of the previously-performed studies were not sufficiently rigorous to support a widespread implementation of the PIT model or one similar to it.

## LIMITATIONS

This study is limited by a small sample size, short duration of the pilot period, and a survey response rate slightly below 80%. This study was isolated to a single academic ED, which may limit generalizability to other academic medical centers. Although the process was uniformly implemented on the days the PIT was in place and participating faculty received the same process training, variances in approach may have influenced the downstream perception of both residents and supervising faculty in the ED. It also does not address the difference between the perceived impact and the actual educational paradigm. The questionnaire was also completed at the end of the study period and therefore may have incurred some recall bias for those only participating at the beginning of the 10-week period. In addition, prior to the start of the study, there were many vocal discussions and established opinions around the PIT concept that may have instilled bias prior to its initiation. Resource limitations in the PIT may have also restricted providers that would otherwise have ordered greater testing upfront. However, all attendings participating in the PIT were voluntary, received equal pre-PIT process education and came from varying perspectives on the PIT concept.

## CONCLUSION

Placing a physician in triage did not negatively impact the perceived resident educational experience. However, while residents didn't perceive the PIT process negatively impacting their educational involvement with attendings, both groups perceived differential diagnosis development was negatively impacted. Attendings also felt diagnostic test selection and medical decision making may be negatively impacted. For academic centers looking to implement a PIT process, ensuring appropriate educational reinforcement of these areas of concern may be helpful.

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*Conflicts of Interest:* By the WestJEM article submission agreement, all authors are required to disclose all affiliations, funding sources and financial or management relationships that could be perceived as potential sources of bias. The authors disclosed none.

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