

Comparing The Patients' Throughput in An Emergency Department in Tabriz City With International Standards

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Abstract

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Introduction: Emergency department (ED) patients' throughput includes all the processes that patients go through; this study was designed to investigate the patients throughput and the duration of stay in this department.

Methods: In a prospective cross-sectional study, we evaluated the association between workflow process and admission duration in emergency department of Sina hospital of Tabriz from March 20th to July 20th 2011.

Result: We studied 800 randomly selected patients referred to the emergency department between 20th March and 20th July 2011. The mean time duration between first visit and disposition was 64.94 ± 64.7 min (mode= 24min). The most prevalent chief complaint was common cold in which was presented in 448 patients

Discussion: In the management of emergency department, all of parts must work as a member of team and if one of these members has a problem and does not work properly then pass-through will be happen.

Keywords: emergency department, throughput, standards

Introduction

Emergency department (ED) patients' throughput includes all the processes that patients go through from the moment they enter the ED until the determination of their final disposition and indicates the time that the patient should stay in the emergency department.

These processes typically consists of triage/reception, placement in ED beds, initial nursing examination, physician evaluation, diagnostic testing, treatment measures, consultants and determination of final status of the patient¹.

The performance quality of the above mentioned processes can be controlled by some measurements. Measurements include the times needed for each process mentioned above, these also consist of the diagnostic testing turn-around-times (TATs) determined by the time between requesting a diagnostic test and achievement of its result by the physician².

Various studies have been conducted regarding the length of stay in the emergency department and emergency workflow in normal and overcrowded conditions and every factors involved in prolongation of the ED stay such as triage, reception, imaging, laboratory and etc.³⁻¹¹.

In a recent study on the patients' length of stay in the newly founded emergency department in Imam Reza Educational-Medical and Research Center of Tabriz/ Iran, the time between initial reception and first physician visit was investigated¹².

Considering the recent establishment of the technical emergency department in the Sina Educational- Medical Center of Tabriz, and in order to be informed about the management process of the ED patients and comparing it with the international standards to improve the workflow of the patients, this study was designed to investigate the patients throughput and the duration of stay in this department.

Materials and Methods:

In a prospective cross-sectional study, we evaluated the association between workflow process and admission duration in emergency department of Sina hospital of Tabriz from March 20th to July 20th 2011. Patients were randomly entered in

this study. All the patients were visited by emergency medicine specialist or assistant. We measured the intervals between referring, admission, visit, doing nursing process and final disposition. Duration between requested modalities by physician like laboratory tests, X-ray and achieving the results was recorded also, and the data were collected.

Statistical Analysis & Ethical Considerations:

Statistical analysis was performed by SPSS software package version 15.0 for windows (SPSS Inc., Chicago, USA). Quantitative data were presented as mean \pm standard deviation (SD), while qualitative data were demonstrated as frequency and percent (%). All participants have signed a written consent which was kept completely secret, and the study protocol was approved by the Ethics Committee of Tabriz University of Medical Sciences (TUMS), which was in compliance with Helsinki Declaration.

Results:

We studied 800 randomly selected patients referred to the emergency department between 20th March and 20th July 2011. 16 patients were excluded because of leaving ED without prior informing.

376 patients (48%) were male and 408 (52%) were female. The mean age of the patients was 34.37 ± 20.9 years old (1-88 years old) (mode=24). The mean time duration between arrival admission in emergency department was 3.21 ± 6.6 min (mode=5 min).

The mean time duration between first visit and disposition was 64.94 ± 64.7 min (mode= 24min). Laboratory tests were requested for 126 patients, in which mean time duration between request and achievement results was 35.29 ± 23.7 min (mode=30 min). X ray was requested for 104 patients, in which mean time duration between request and achievement results was 33.15 ± 31.1 min (mode= 30min). The most prevalent chief complaint was common cold in which was presented in 448 patients.

88 patients (11.22%) referred to ED with drug intoxication. Intoxicated patients had the longest time of stay in the ED (table 1). 608 (77.5%) patients were discharged after treatment and

144 (18.4%) patients were hospitalized. The remnant 32 patients (4.1%) were referred to other centers for other required modalities or hospitalization

Discussion:

The patients' throughput includes all the process that patients go through from the time they enter the ED until the final disposition and it indicates their length of stay in the ED^{7,13}. The process of workflow in the ED is started by triage and reception and the acceptable time for this process is 5-8 minutes¹⁴.

In research series by Partoiee et al, conducting triage by the physician and targeted application of point of care laboratory tests resulted in significant reduction of waiting time of patients and the overall staying time in the ED and the amount of patients who left the ED without physician visit also decreased significantly but led to significant increasing of medical costs instead^{15,16,17}.

The reception and registration processes are the important stages of the patient throughput which typically should take less than 10-12 minutes from the moment of patient arrival¹⁴.

According to the studies by Gorelick et al, bedside reception of the patients can reduce the patients' length of stay in the ED¹⁸. In our ED, the process of triage and reception is conducted continuously with meantime of 3.21 minutes (mode=5) which is in the acceptable range of mentioned standards. The presence of the nurse on the bedside of the patient and primary examination should not last more than 15 minutes from the time of the non-critical patient entry¹⁹, while in our study the overall mean time was 14.37 minutes (mode=2). However, the time dispersion in this study is different and varies from 0 minutes (at moment of entry) to 160 minutes; because nurses quickly attend for high risk patients in critical situations, but for the non-urgent cases and under conditions such as overcrowding, nursing evaluation would be postponed.

The initial physician evaluation of the critical patients should be conducted by the time from the patient arrival and in case of non-critical patient this should take no longer than 20 minutes¹⁴. In the conducted study, the mean time duration between entry and physician attendance by patient bedside is

7.327 minutes (mode= 0) which indicates that most of the evaluations occurred on the ED arrival.

Other stages of patient throughput in emergency department are the diagnostic testing turn-around-times. Studies on laboratory performance of the 690 hospitals have considered the improvement of the throughput times of the patients associated with the quality of sample management in labs and the rate of sample transfer²⁰.

In some other researches it has been suggested, applying the point of care testing significantly reduce the patients' length of stay in the ED^{21,22,23}. In our study, the lab test TATs was 35.29 minutes (mode= 30) and the mean time of the x-ray TATs was 32.15 min (mode=30). In a center with appropriate facilities and resources, it is expected that the test and x-ray results become available for the physician in less than 30 minutes²⁴.

The maximum predicted length of stay in an ED with satisfactory resources for non-urgent patients without requesting diagnostic tests is 60-70 minutes but a patient receiving laboratory and radiology services requires 90-110 minutes¹. In our study the meantime duration of stay in ED was 64.94 minutes (mode= 25). One of the reasons could be lack of fast-track and lack of appropriate triage. This indicates inefficiency of the emergency department in separating critical from non-urgent patients because the maximum length of stay in our ED is 300 min.

Conclusion:

In the management of emergency department, all of parts must work as a member of team and if one of these members has a problem and does not work properly then pass-through will be happen. Before setting the emergency department, we must consider all of sides and all of pass-through.

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