

THE EFFECT OF AN ELECTRONIC DOCUMENTATION SYSTEM ON THE TRAUMA PATIENT'S LENGTH OF STAY IN AN EMERGENCY DEPARTMENT

Authors: Dimitrios Zikos, PhD, MSc, RN, Marianna Diomidous, PhD, and Vassiliki Mpletsa, RN, MSc, PhD, Athens, Greece

CE Earn Up to 9.0 CE Hours. See page 521.

Introduction: Electronic patient records are important for quality health services and efficient patient data management. In emergency care, saving valuable time during patient care is of great significance. One out of two fatalities due to trauma occur half an hour after the injury. The aim of this study was to investigate the potential effect of an electronic trauma documentation system on the length of stay in an emergency department.

Methods: A 2-year observational study was conducted in the emergency department of a university hospital located in central Greece. The purpose was to compare 3 length-of-stay parameters with and without the use of an electronic documentation system. Ninety-nine trauma patients were monitored with the use of the electronic system, whereas 101 patients were monitored with a paper-based method (control group).

Results: Statistical analysis using independent-samples *t* tests indicated that the time between admission and completion of

the planned care was significantly lower in the electronic documentation patient group (100 ± 92 minutes) than in the control group (149 ± 29 minutes) ($P < .01$). A similar effect was found on the total ED length of stay (127 ± 93 minutes in electronic documentation group vs 206 ± 41 minutes in control group, $P < .01$) and the time between completion of care and discharge from the emergency department (26 ± 10 minutes in electronic documentation group vs 57 ± 23 minutes in control group, $P < .01$).

Discussion: We investigated 3 length-of-stay parameters and found that all were lower with the use of the electronic documentation system. This finding is important regarding the quality of trauma patient care because saving time during the first hours after the injury may determine the outcome of the trauma patient.

Key words: Electronic documentation system; Trauma patients; Time; Length of stay

There is a wide recognition of the need to introduce electronic health (e-health) services in hospitals. The integrated and standardized administration of patient information with the use of e-health record systems

has been shown to assist health professionals in obtaining readily available information at any time and in any place.^{1,2}

Moreover, in emergency care settings, such as the emergency department, saving valuable time is of the essence.³ In particular, in the case of trauma patients, the time parameter is of utmost importance because a significant portion of trauma patient deaths in Greece occur within a half hour after the injury.⁴ The integration of Advanced Trauma Life Support (ATLS) in electronic systems, as well as adequately trained ATLS personnel, will enhance trauma patient care because ATLS is widely accepted as the standard of care for initial assessment and treatment in trauma centers.⁵ In addition, nursing-specific programs, such as the Advanced Trauma Care for Nurses course, provide the required knowledge and evidence-based nursing skills for the management of multiple trauma. Knowledge sources such as the "Clinical Practice Guidelines (CPGs)," published by the Emergency Nurses Association, are systematic evidence-based

Dimitrios Zikos is Research Associate, Health Informatics Laboratory, Faculty of Nursing, University of Athens, Athens, Greece.

Marianna Diomidous is Assistant Professor, Public Health Department, Faculty of Nursing, University of Athens, Athens, Greece.

Vassiliki Mpletsa is Research Associate, Health Informatics Laboratory, Faculty of Nursing, University of Athens, Athens, Greece.

For correspondence, write: Dimitrios Zikos, PhD, MSc, RN, 3620 Hoya Dr, Ste 128, Arlington, TX 76015; E-mail: dimitriszikos@gmail.com.

J Emerg Nurs 2014;40:469-75.

Available online 21 January 2014

0099-1767

Copyright © 2014 Emergency Nurses Association. Published by Elsevier Inc. All rights reserved.

<http://dx.doi.org/10.1016/j.jen.2013.10.008>

ED practice recommendations.⁶ These recommendations eventually should also be integrated into existing and new e-health documentation systems.

The literature is mixed regarding how the use of e-health records has improved or degraded the quality of ED care. Some of the questions relate to interoperability, patient flow and integration into clinical work, real-time decision support, and the interaction between information technology systems and clinical workflow.⁷ One group of investigators noted that the effect of e-health records in the emergency department may alter nurses' and physicians' work practices, increasing documentation time and causing ED work to become largely stationary, further contributing to reducing patients' interactions with nurses.⁸

Despite the small number of studies comparing the effect of e-health records on ED time-related parameters, there is evidence stressing the importance of reduced ED stay time toward better health outcomes and improved quality of care.^{9,10} There is also evidence that highlights the benefits of integrated e-health record systems, but there is no concrete evidence indicating a relationship between the existence of electronic documentation systems and shorter length-of-stay (LOS) times in an emergency department.

Reduced ED stay times are related to better health outcomes and improved quality of care. Mowery et al⁹ found that during the initial evaluation, the hospital mortality rate increased for each additional hour any patient spent in the emergency department. The ultimate mortality rate for patients who stayed in the emergency department between 4 and 5 hours was 8.3% ($P = .028$), and ED LOS measured in minutes was thus found to be a predictor of death. In another large-scale multivariate study, Kim¹⁰ examined the time from ED arrival to surgery in patients with brain trauma and found that those who underwent craniotomy or drainage of hematoma within 4 hours of arrival had half the likelihood of death compared with patients who underwent surgery more than 4 hours after ED arrival (odds ratio, 0.49; 95% confidence interval, 0.24-0.99).

Reducing the time spent on administrative work is important so that nurses can spend more time with patients.^{11,12} However, although computers automate charting and data collection, there may be an additional time burden spent to enter these data into the computer application. Pierpont and Thilgen¹³ reported that after the installation and use of computers in an intensive care unit, there were important time benefits in gathering and charting data. The required time for the above mentioned tasks was reduced by 14% before the installation of the computer charting system and 24% after the installation of the computer charting system; however the total time remained unchanged because nurses were spending another 10% of their time entering or reviewing data on the computer. Nursing satisfaction is an indicator of quality of care,

whereas minimizing the completion time for the care provision may be crucial for human life.¹⁴⁻¹⁶

The amount of time all ED patients spend in the emergency department after the decision to be admitted has been made (boarding time) is noteworthy in emergency departments of large Greek hospitals and has been associated with negative patient outcomes. Singer et al¹⁷ found that the mortality rate increases with increasing boarding time, from 2.5% in patients with a boarding time of less than 2 hours to 4.5% in patients with a boarding time of 12 hours or more ($P < .001$). The mean hospital LOS also showed an increase with increased ED boarding time ($P < .001$), from 5.6 days (SD, 11.4 days) for patients who stayed in the emergency department for less than 2 hours to 8.7 days (SD, 16.3 days) for those with a boarding time of more than 24 hours. The hospital mortality rate and hospital LOS were associated with length of ED boarding.

All the previously mentioned evidence has been our motivator to design and undertake an observational study to investigate the potential time-related benefits of an electronic documentation system to support trauma patient care.

Methods

SETTING AND SAMPLE

The study took place in an emergency department of a university hospital with a capacity of 950 beds, located in a mid-sized city in central Greece. During the course of the study, a total of 15 to 17 nurses and 6 physicians were working in the emergency department, with 5 nurses and 2 physicians during each shift. According to the Greek Ministry of Health, the total number of hospital ED visits in 2011 was 60,041. The sample consisted of 200 trauma patients who were monitored during the 2-year study period (March 2008 to March 2010). All patients who were admitted to the emergency department for an injury were eligible for inclusion, with the exception of minor injuries causing external incisions. The convenience sample was selected, based on the availability of the research team, whose members were visiting the hospital 2 to 3 times per week. The first group (control, $n = 99$) was documented with the use of a paper-based method during the first year of the study, and the second group (intervention, $n = 101$) was documented with the use of the aforementioned electronic trauma documentation system during the second year of the study. For both groups, we have been documenting a series of patient ED length of stay parameters.

INSTRUMENTATION

To determine whether an electronic recording system based on clinical screening and guidelines for trauma patient care

Download English Version:

<https://daneshyari.com/en/article/2610021>

Download Persian Version:

<https://daneshyari.com/article/2610021>

[Daneshyari.com](https://daneshyari.com)