Annals of Emergency Medicine

Volume 52, Issue 4, Supplement, Page S80 (October 2008)

Impact of computerized physician order entry on Emergency Department patient length of stay

Spalding SC, Mayer PM, Ginde AA, Lowenstein SR, Yaron M.

Objectives: Emergency Department (ED) length of stay (LOS) is an important measure of practice efficiency and a critical determinant of patient satisfaction. In this study we sought to determine if implementation of a computerized physician order entry (CPOE) system reduced ED patient LOS for discharged patients.

Methods: Patient LOS was analyzed in an urban, university-affiliated ED 17 months before and 12 months after the introduction, on July 1, 2006, of CPOE into our ED information system (Picis PulseCheck®). Patients who were discharged from the ED were included in the primary analysis. Patients who left without being seen, were admitted or triaged to other hospital areas were excluded. LOS was defined as the time from triage to discharge from the ED. ED LOS was also calculated for admitted patients as a measure of crowding. Patient demographics and other covariates that were likely to affect LOS were measured, including: mode of patient arrival; physician and nurse staffing; daily ED census; and daily admission rate. Clinical significance was evaluated by the difference in means and proportions before and after CPOE implementation. Multiple linear regression analysis was used to measure the independent association between CPOE implementation and LOS, after controlling for covariates.

Results: Data for 71,188 patients were collected from February 2005 to June 2007. Patients discharged from the ED totaled 49,175 and were thus included in the data analysis. There were 28,687 patients discharged before and 20,488 patients discharged after CPOE implementation. No clinically significant differences in age, gender, race or daily admission rate before and after CPOE implementation were found. The ED daily census decreased from 83 to 78 patients per day (difference -5.2 [95%CI, -5.0 to -5.3]) after CPOE implementation, and the percentage of ambulance arrivals increased from 7.3% to 9.5% (difference +2.2% [95%CI, 1.7-2.7%]). LOS for discharged patients decreased from 198 to 168 minutes (difference of -30 [95%CI, -28

to -33] minutes). In contrast, LOS for admitted patients increased from 405 to 441 minutes (difference +36 [95%CI, 26 to 46] minutes). After controlling for all demographic and clinical covariates, CPOE implementation maintained an independent inverse association with LOS for discharged patients (β= -23 [95%CI, -26 to -19]).

Conclusion: In this academic ED, implementation of a CPOE system was associated with a clinically significant decrease in LOS among patients who were discharged from the ED, despite an increase in LOS for admitted patients. Replacing paper-based written and verbal orders with more timely computerized orders and real-time reporting of test results, may explain this favorable effect.