Association of Emergency Department and Hospital Operation Characteristics on Elopements and Length of Stay

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Study Objective
As CMS core measures in 2013 began to compare Emergency Departments (EDs) on treatment time intervals, especially length of stay (LOS) and patients who leave before treatment complete (LBTC), it is important to identify ED and hospital characteristics associated with these metrics.

The objective of this study is to assess differences in operational metrics by ED and hospital characteristics to better understand how processes can be improved and optimize care at all ED settings. This is the first national study to look at both ED and hospital metrics over six years.

Methods
The Emergency Department Benchmarking Alliance (EDBA) has collected yearly ED operational metrics since 2004 from EDs across the United States. Participation in the EDBA is voluntary.

Data from 2004 to 2009 were merged with the American Hospital Association’s Hospital Database to include hospital metrics that may have an impact on ED throughput. ED overall median LOS and LBTC were the outcome variables, and a linear mixed model was used to assess the association between outcome variables and ED and hospital characteristics while accounting for correlations among multiple observations within each hospital.

Table 1: Descriptive Statistics of Study Cohort Hospitals

Table 2: Mixed-effects linear regression

Results
A total of 462 EDs from 2004 to 2009 were included in the analysis with 889 observations over the 6 years. Higher volume EDs are associated with higher LBTC and LOS compared with EDs having annual visits <20,000.

A higher percentage of EMS arrivals is also associated with a higher LBTC and LOS with the exception of ≤10% EMS arrivals and LBTC. For-profit hospitals had a lower LBTC and LOS compared to not-for-profit hospitals (1.9% and 153.2 minutes vs. 2.8% and 181.5 minutes, respectively).

EDs located in teaching hospitals demonstrated higher rates of LBTC and greater LOS. Other predictors were found to have an impact on only LBTC rates or LOS but not both. Higher inpatient bed occupancies were associated with a higher LOS. Increasing admission percentages were positively associated with overall LOS for EDs where admission percentages were greater than 10% (p<0.001).

Having an urgent care center affiliated with the hospital was associated with an increase in the LOS (12.22, 95% CI 3.23–19.26, p=0.01). EDs seeing relatively higher percentages of pediatric patients had decreased LOS.

Conclusions/Implications
Higher volume EDs are associated with higher LBTC rates and LOS, and for-profit hospitals have better statistics in these metrics compared with their not-for-profit counterparts. As CMS benchmarks are implemented in the future, it is important to appreciate that hospitals have different baselines for performance that may be more tied to volume and capacity, and less with quality of care.