Quantifying the impact of discharge timing on access to inpatient beds in hospitals

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In this talk, I will discuss an ongoing collaborative research project with Baystate Medical Center (BMC, Springfield MA). While the project has many aims, I will focus the *inpatient discharge timing problem* at and its impact on patient waiting time in hospitals. By discharge timing we mean how the number of patient discharges varies by the hour of the day. Using a year’s worth of empirical data on patient admission and discharge patterns, diagnostic categories, inpatient length of stay (LOS) values, and bed capacities of the various units we create a discrete event simulation model to abstract key features of hospital-wide patient flow. We then use the model to quantify the impact of discharge timing on timely access to inpatient beds. Timely access is measured in two ways: 1) by the average non-value added waiting time spent by a patient in the Emergency Department (ED), Post Anesthesia Care Unit (PACU) or other locations after her physician has made a request for an inpatient bed; and 2) the average number of patients waiting for an inpatient bed (queue length). Preliminary results of our model suggest that it is possible to improve timely access by (1) changing the hourly distribution of discharges; and (2) expanding the usual hours of discharge by 2 hours or more. We discuss the implications of these results for hospitals.

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