Reducing Waiting Time in Emergency Departments: Flow Redesign to Harness Operational Triage Information

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Abstract
Our team of Emergency Department (ED) physicians and healthcare operations researchers has used queueing theory and discrete event simulation models of ED patient flow to explore how valuable information collected at triage can be used to redesign the admission and care processes of the ED. In this talk, we first carefully analyze models that quantify the performance of the “Streaming” patient flow design introduced by Flinders Medical Centre that utilizes Admit/Discharge predictions at triage. After identifying serious drawbacks to Streaming, we modify the approach to yield a new “Virtual Streaming” flow design. Simulation testing suggests that Virtual Streaming is a robust policy that is easily implemented and can significantly reduce congestion, as measured by a weighted average of Time to First Treatment and Length of Stay.

Further, we analyze a new complexity-based triage procedure for ED’s that distinguishes relatively simple from relatively complex cases. Using easily implementable class-based priority rules for admission/sequencing, the results suggest that this approach can yield significant decreases in both the Rate of Adverse Events (to capture patient safety) and Length of Stay (to quantify operational efficiency and access).

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A light lunch will be served.