Physician Scheduling for Continuity: An Application in Pediatric Intensive Care

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Abstract:

Fragmented care, with its inherent lack of continuity for physicians and patients, is a foremost concern in the inpatient hospital setting where shift-work may soon become the norm due to increased duty hour restrictions. Continuity of care is important for patient satisfaction and potentially patient outcomes. Increased fragmentation means more handoffs of patients from one physician’s care to another, increasing the risk for communication errors possibly placing a patient at risk. Optimized physician scheduling can provide a means of maximizing continuity within the confines of duty hour restrictions, potentially reducing miscommunications during handoffs.

In this paper, we present a modeling and solution approach for assigning physicians to service and call shifts over a one-year period. Our approach is unique in that it seeks to make assignments which maximize continuity by considering expected familiarity among physicians starting each shift. Using a scoring method which measures the familiarity of oncoming physicians at each shift change based on previous days worked, we generate a feasible schedule which scores significantly better with regards to continuity than a manually generated schedule.

Our methods were used to generate a 6-month schedule for attending physicians which has been implemented in a pediatric intensive care unit. This schedule achieves a better continuity score than a manually generated schedule for the same time period, highlighting the usefulness of optimization methods applied to physician scheduling.

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