Diagnosis-Group-Specific Transitional Care Program Recommendations for Thirty-Day Rehospitalization Reduction

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   Abstract: Thirty-day rehospitalization rate is an important measure reflecting the overall performance of health systems. Recently   transitional care programs have been initiated to reduce avoidable rehospitalizations. These programs are behavioral medicine interventions and typically non-drug based. The intervening nurses follow up patients after the hospitalization to manage issues to reduce the risk of rehospitalizations during health care transitions. As rehospitalization is a complex process that depends on many factors, it is unlikely that these interventions are effective for all patients across a diverse population. Therefore we consider individualized treatment rules (ITRs) aimed at maximizing overall treatment effectiveness. We investigate our approach in a setting where patients are divided into two diagnosis related groups, medically complicated and uncomplicated. Such division is crucial for the success of the program because intervening medically complicated patients requires much more efforts from the nurses. In addition the intervention effects can greatly vary between the two groups. Therefore, we consider group-specific recommendation rules that can account for scale differences in treatment effects but allow possible similarity of the estimated ITRs. Computation is realized by morphing our problem into solved forms and a wrapper R package is developed for our proposed treatment recommendation framework. We conducted extensive evaluation through both simulation studies and analysis of a TC program.