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Improving Emergency Department Patient Flow through Operations Decision Models

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Dr. Mark P. Van Oyen has served as an Associate Professor of Industrial and Operations Engineering (IOE) at the University of Michigan since 2005. His core interests focus on the analysis, design, control, and management of operational systems, with emphasis on healthcare, service operations, and supply chains and how they can be designed for greater performance, flexibility, and resilience. His research also contributes to applied probability and the design and control of queueing networks. His awards include 2011 first and second prizes from the POMS College of Healthcare Operations Management, the 2010 Pierskalla Award, IOE Dept. Faculty of the Year for 2008-9, ALCOA Manufacturing Systems Faculty Fellow, a best paper award from IIE Transactions, and Researcher of the Year from Loyola University Chicago's School of Business. He has served as Associate Editor for Operations Research, Naval Research Logistics, and IIE Transactions and Senior Editor for Flexible Services & Manufacturing. He was a faculty member of the Northwestern Univ. Sch. of Engineering (1993-2005) and Loyola Univ. of Chicago's Sch. of Bus. Admin. (1999-2005). He has received grants from the National Science Foundation (NSF), Office of Naval Research (ONR), EPRI, ALCOA, General Motors, and the VA. In industry, he was a researcher with GE Corporate R&D as well as an analysis and simulation engineer with Lear Siegler's Instrument & Avionic Sys. Div.

Dr. Steven L. Kronick is a Clinical Assistant Professor in the Department of Emergency Medicine at the University of Michigan Health System (UMHS) as well as Director, Advanced Cardiac Life Support, and Associate Service Chief, Emergency Department. His specialty is emergency medicine, with clinical and research interests in observation medicine and advanced cardiac life support. Kronick received his MD from the University of Texas, Houston with residencies at the University of Michigan and Henry Ford Hospital. He joined UMHS as a faculty member in 1989.

Crisis level overcrowding conditions in Emergency Departments (ED's) have led hospitals to seek out new patient flow designs to improve both responsiveness and safety. One approach that has attracted attention and experimentation in the emergency medicine community is a system in which ED beds and care teams are segregated and patients are "streamed" based on predictions of whether they will be discharged or admitted to the hospital. In this discussion, we use a combination of analytic and simulation models to determine whether such a streaming policy can improve ED performance, where it is most likely to be effective, and how it should be implemented for maximum performance.

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