**Minimizing Healthcare – Associated Infections: A Discrete Event Simulation Study**

# Abstract

Healthcare associated infections (HAIs) are a significant problem for the U.S. healthcare industry, with approximately 1.8 million patients affected at an estimated economic burden of $28-$45 million each year. Catheter-associated urinary tract infections (CAUTIs) are the second most common type of HAI. Beyond the obvious patient care implications, Medicare has discontinued paying hospitals for care related to CAUTIs. The Texas State research team will partner with Scott and White Healthcare to utilize systems modeling and simulation methods to prevent and reduce the incidence of CAUTIs at Scott and White Memorial Hospital. The research will attempt to determine: why current prevention strategies have been unsuccessful in eliminating CAUTIs; the main system factors conducive to the occurrence of CAUTIs; the patient populations more likely to suffer from a CAUTI; and the optimal methods for managing CAUTIs in the healthcare organization. This exploratory study seeks to use novel systems modeling and simulation methods to diagram the current system to understand the problem, collect necessary data, develop an experimental simulation model using multiple CAUTI prevention strategies; and build and validate the computer simulation model in an iterative manner. Should these methods result in a reduction in CAUTIs and improved patient care, external funding to expand the research will be sought. The Agency for Healthcare Research and Quality, as well as the National Science Foundation offer candidate funding opportunities. The application of new methods to address difficult challenges such as HAIs has the potential for positive impact across the healthcare industry.

**Team Members:**

Rodney E. Rohde, PhD, MS, SV, SM(ASCP), MB, Associate Dean for Research, College of Health Professions & Associate Professor, Clinical Laboratory Science

Eduardo Perez, PhD, Assistant Professor, Ingram School of Engineering, Industrial Engineering Program

Susan H. Fenton, PhD, RHIA, FAHIMA, Assistant Professor, Health Information Management