

DO&IT Seminar Series

<http://www.rhsmith.umd.edu/doit/events/seminars.aspx>

Speaker: Sean Barnes, PhD

Date: Thursday, February 23, 2012

Time: 2-3:30 pm

Location: Room 2505

Title: Exploring the Effect of Network Structure and Healthcare Worker Behavior on the Transmission of Hospital-Acquired Infections

Abstract

We investigate the transmission of infectious diseases in hospitals using a network-centric perspective. Patients who share a healthcare worker are inherently connected to each other and those connections form a network through which transmission can occur. The structure of this network can be a strong determinant of the extent and rate of transmission. We also explore the effects of healthcare worker behavior, including sharing patients and incorporating the ability for healthcare workers to infect each other. Finally, we experiment with how patient turnover can affect transmission dynamics in a patient network under the influence of the other effects. Our results show that all of these factors can affect transmission significantly, and that this model can be used to provide additional insight to hospital administrators who are looking to improve their ability to control infections.

Bio

Sean Barnes recently defended his dissertation, entitled 'An Agent-Based Modeling Approach to Reducing Pathogenic Transmission in Medical Facilities and Community Populations', in December 2011 at the University of Maryland. His graduate program was Applied Mathematics and Scientific Computation in the Department of Mathematics. His work has been published in the INFORMS Journal on Computing, Infection Control and Hospital Epidemiology, and the INFORMS Winter Simulation Conference Proceedings. He previously studied Aerospace Engineering at the Georgia Institute of Technology, where he received his Bachelor's and Master's degrees. His research interests include healthcare applications, modeling and simulation, complex systems, data visualization, and scientific computing.