

## SEMINAR SERIES

Department of Quantitative Analysis and Operations Management  
College of Business, University of Cincinnati

# **Optimization of Surgery Delivery Systems**

**Dr. Brian Denton**

**Edward P. Fitts Department of Industrial & Systems Engineering,  
North Carolina State University**

**MONDAY, October 29, 2007**

**2:00 – 3:30 p.m.**

**218 Lindner Hall**

Scheduling systems are used in many industries to increase the utilization of resources, match workload to available capacity, and smooth the flow of customers through a service system. They are also important for healthcare delivery where applications include scheduling of patients to outpatient clinics and the design of operating room schedules. In this talk I will discuss stochastic optimization models for scheduling surgeries at outpatient clinics and hospitals. I will discuss three related problems. The first involves setting individual procedure start times for a single operating room (OR) given uncertainty in the duration of procedures. The objective of this problem is to minimize three competing criteria: patient and OR team waiting time, OR idle time, and overtime. The second problem involves the allocation of surgeries across multiple ORs with the goal of balancing the fixed cost of opening ORs with the expected cost of total overtime. The third problem involves setting optimal arrival times for patients to an outpatient surgical suite comprising multiple activities including: intake processes, surgery, and recovery. For each problem I will describe the mathematical model, structural properties, methodologies employed, and sample numerical results based on real data to illustrate the impact of the model.

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Dr. Brian Denton is an Assistant Professor at North Carolina State University in the Edward P. Fitts Department of Industrial & Systems Engineering. Previously he has been a Senior Associate Consultant at Mayo Clinic in the College of Medicine, and a Senior Engineer at IBM. His primary research interests are in optimization under uncertainty as it relates to industry applications in health care delivery, medical decision making, supply chain planning, and factory scheduling. He completed his Ph.D. in Management Science, his M.Sc. in Physics, and his B.Sc. in Chemistry and Physics at McMaster University in Hamilton, Ontario, Canada.

For more on the QAOM seminar series contact Uday Rao ([uday.rao@uc.edu](mailto:uday.rao@uc.edu)).

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