CENTER FOR HEALTHCARE ENGINEERING & PATIENT SAFETY
UNIVERSITY OF MICHIGAN

Providing Better Healthcare Through Systems Engineering: Seminars and Discussions

The Impact of Communication, Coordination and OR Design on Surgical Patient Flow and Safety

Kevin M. Taaffe, PhD

Monday September 23 at 4:30PM in 1123 LBME

Hospitals have introduced information technology to improve the ability of staff to react in a timely fashion, but with mixed success. Hospitals have also continued to build new operating rooms, but advances in patient care and safety are not always evident. In this seminar, we address these two areas of concern regarding day-of-surgery patient flow and safety. Part 1: We describe the development and testing of a mobile application to explore if the use of technology could reduce barriers to communication and coordination on the day of surgery. While staff members in a hospital's perioperative services department perform their work individually, their choices of upcoming tasks depend on data they can either observe or gather verbally in order to maintain patient flow. Without constant communication with members of other departments, staff may inadvertently select lower priority tasks, which is counter-productive to perioperative services as a whole. The developed mobile application, Periop-MLS, provided each department and its members greater visibility of the workflow. To carry out user testing, the researchers integrated a day-of-surgery discrete event simulation model to communicate with the mobile app to provide realistic scenarios. Through trial-runs of Periop-MLS with staff members, the POS department was able to make proactive coordination and communication decisions. Part 2: It is important to design an operating room layout that can not only improve staff and patient safety but also increase efficiency. In this research, we identify those design factors that influence safety and efficiency through reduced clutter, congestion, and staff walking during surgery. A sample of video-taped surgeries from a large academic hospital were studied to understand the movement of surgical staff during surgery. All activities were coded based on location, activity type, and purpose, and then simulation methodology was used to study the different activity types and movement patterns inside the room. Based on OR size, OR shape, operating table orientation, workstation locations, number of staff, number of doors, and surgery type, we provided critical insight to OR managers and researchers as they determine recommendations for OR design elements and inform the design of future operating rooms.

Kevin M. Taaffe, Ph.D., the Harriet and Jerry Dempsey Professor in Industrial Engineering at Clemson University, has 25 years of industry and academic experience. After receiving B.S. and M.S. degrees in Industrial Engineering from the University of Illinois, Dr. Taaffe worked in the transportation logistics industry (American Airlines, Sabre) for eight years, before returning to academia to obtain his Ph.D. from the University of Florida. Dr. Taaffe's research interests include the application of simulation and optimization in healthcare, production, and transportation logistics. In particular, Dr. Taaffe focuses on healthcare logistics problems that range from patient flow to operating room management to clinical space capacity management. Dr. Taaffe has worked with clinicians, administrators, managers, and support staff to identify and solve problems related to the patient and staff experience on the day of surgery. Dr. Taaffe began his career working as a transportation planning consultant, and there is a logical research thrust that has resulted from this experience. He has always enjoyed working on industry-sponsored projects that bridge the gap between theoretical research and application. This academic/industry collaboration is a theme of Dr. Taaffe's interest, as can be seen by his named professorship. Harriet and Jerry Dempsey provided this professorship in an effort to strengthen the research ties between Clemson University and Prisma Health – Upstate. In addition to his academic and research interests, Dr. Taaffe plays an important role in the Institute of Industrial and Systems Engineers (IISE) where he serves as the Senior VP of North American Operations. In this role, he is helping students and professionals get the most out of their professional organization.

1123 LBME is room 1123 in the Ann & Robert H. Lurie Biomedical Engineering Building (LBME). The street address is 1101 Beal Avenue. A map and directions are available at: http://www.bme.umich.edu/about/directions.php.
This seminar series is presented by the U-M Center for Healthcare Engineering and Patient Safety (CHEPS): Our mission is to improve the safety and quality of healthcare delivery through a multi-disciplinary, systems-engineering approach.
For additional information and to be added to the weekly e-mail for the series, please contact genehkim@umich.edu.
Photographs and video taken at this event may be used to promote CHEPS, College of Engineering, and the University.