

## Department of Industrial and Systems Engineering

**Dr. Susan Hallbeck, PE, CPE**

“HUMAN FACTORS ENGINEERING IN HEALTHCARE”

Monday, February 4, 1:50 – 2:40

4002 Emerging Technologies Building



**Abstract:**

Ergonomics in healthcare explores how human beings interact with patients, equipment, facilities, and environments. The emphasis is on the human element and how the design of objects and environments influence people, decisions, and safety. The intensity of the personal interactions makes the healthcare industry different from other industries. Healthcare is all about people: patients and their families and friends, and the healthcare professionals and staff. In implementing human factors and ergonomics concepts in healthcare, one has be cognizant of the challenges, the roles people have in the system, and the issues in maintaining a system.

This presentation will showcase the breadth of applications that industrial engineering and ergonomic knowledge can impact. Dr. Hallbeck will discuss a series of her healthcare research projects:

- design and testing of laparoscopic surgical tools,
- redesign of hospital crash cart medication drawers,
- a decision aid for assigning blood thinners upon admission for hospital patients
- ergonomic evaluation of medical jobs/tasks such as intubation, central venous catheterization and minimally invasive surgery.
- comparison of surgical team stress performing 4-port or single port laparoscopic gallbladder surgery
- positioning for prone spinal surgery patients
- usability of single port laparoscopic tools
- design and usability of a home healthcare heart-rate monitoring system

Dr. Hallbeck will also highlight several more conventional industrial ergonomics projects such as evaluation of a walk-behind lawn mower, comfort during automobile driving and usability of signage for wayfinding.

**Bio:**

Dr. Susan Hallbeck, PE, CPE is currently a Senior Associate Consultant performing research in the Center for the Science of Healthcare Delivery at Mayo Clinic in Rochester, MN. She is a Professor in Industrial Engineering in the department of Mechanical and Materials Engineering at the University of Nebraska-Lincoln with a courtesy appointment in Surgery at the University of Nebraska Medical Center. She served as engineering lead for the VA Engineering Resource Center at the Nebraska-Western Iowa Veterans Health Administration Medical Center. She performed research at the Swedish National Institute for Working Life and The Netherlands Organization for Applied Scientific Research in the Quality of Worklife, Ergonomics and Innovation Department. She is the director of the Innovative Design and Ergonomic Analysis Laboratory. She serves on the Executive Council of the Human Factors and Ergonomics Society, is a board member for the NIOSH Heartland Occupational Safety and Health Center and was previously chair of the International Ergonomics Association Ergonomics Quality in Design committee. She is an associate editor of *IIE Transactions on Healthcare Systems Engineering*. Her research interests include user-centered design, usability and ergonomic evaluation with special emphasis on healthcare engineering, patient safety and surgical tools. She has over 150 peer-reviewed publications. Dr. Hallbeck earned her PhD from Virginia Tech, her MS from Texas Tech and her BS from Iowa State University, all in Industrial Engineering.