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### 53rd Annual Meeting

Grand Hyatt Hotel  
San Antonio, TX  
October 19-23, 2009

HCTG Website  
<http://hctg.hfes.org>

## Healthcare and Human Factors in the news

It is an exciting time to be involved with human factors and ergonomics (HF/E) in the field of healthcare.

**Item #1:** The President of the United States has the identified technology and healthcare as part of the new administrations agenda.

*Employ Science, Technology and Innovation to Solve Our Nation's Most Pressing Problems*

21st-century technology and telecommunications have flattened communications and labor markets and have contributed to a period of unprecedented innovation, making us more productive, connected global citizens. By maximizing the power of technology, we can strengthen the quality and affordability of our health care, advance climate-friendly energy development and deployment, improve education throughout the country, and ensure that America remains the world's leader in technology. Barack Obama and Joe Biden will:

\* Lower Health Care Costs by Investing in Electronic Information Technology Systems: Use health information technology to lower the cost of health care. Invest \$10 billion a year over the next five years to move the U.S. health care system to broad adoption of standards-based electronic health information systems, including electronic health records.

Source:  
<http://www.whitehouse.gov/agenda/technology/>

**Item #2:** Wal-Mart Launches E-Health Program

Wal-Mart launches Dossia, an employee-driven, digital health records initiative, to help contain health-care costs

Source:  
[http://www.businessweek.com/magazine/content/08\\_49/b4111058887668.htm](http://www.businessweek.com/magazine/content/08_49/b4111058887668.htm)

**Item #3:** The Institute of Medicine's recent recommendation that more steps are needed to ensure safer conditions for patients and trainees in teaching hospitals has proved controversial.

Issued by the IOM's Committee on Optimizing Graduate Medical Trainee (Resident) Hours and Work Schedules to Improve Patient Safety, the recommendation comes five years after the Accreditation Council for Graduate Medical Education (ACGME) imposed the first set of national work hour limits for residents in all specialties.

In this new IOM report, the recommendation to further adjust resident work hours is intended to accomplish three objectives: "to prevent fatigue when possible by giving regular opportunities for recovery sleep; to lessen fatigue when residents work extended shifts or night shifts; and to give training hospitals some flexibility in scheduling to provide residents the intensive, in-depth patient care experiences while enhancing a culture of patient safety and health care quality," said Michael M.E. Johns, MD, chair of the IOM committee and chancellor of Emory University in Atlanta.

Source:  
<http://www.endocrinetoday.com/view.aspx?rid=36856>

## How to Select an Electronic Health Record System

*How to Select an Electronic Health Record System that Healthcare Professionals Can Use*

By Robert M. Schumacher, Ph.D.,

Jayson M. Webb, Ph.D., Korey R. Johnson, M.S., User Centric, Inc.

In recent years, Electronic Health Records (EHRs) have been promoted by industry and government as a means of improving patient care and controlling costs. However, actual adoption of EHRs has been lower than expected due to general resistance related to implementation costs, security, privacy, and systems integration. Recent studies have shown, however, that many of these adoption barriers pale in comparison to basic usability and productivity concerns. Simply put, healthcare professionals have found many EHRs too difficult to use.

Why has EHR usability remained an issue even as more organizations deploy these systems? To explore this topic, User Centric inspected dozens of publicly available Requests for Proposal and procurement guidelines for EHRs to learn how usability was addressed.

This inspection revealed that EHR usability was overlooked or only marginally mentioned in nearly all of the documents. Only three documents discussed usability or user experience in any substantive way. Thus, there was a gap between the need for improved usability in EHRs and a lack of usability criteria in the EHR procurement cycle.

To bridge this gap, User Centric proposes an approach for specifying usability requirements and assessing EHR systems relative to these requirements. The User Centric white paper, "How to Select an Electronic Health Record System the Healthcare Professionals Can Use," identifies a five-step process for specifying and measuring the usability of EHR systems. These steps are intended to help guide selection of an EHR that meets the criteria for high levels of effectiveness, efficiency, and subjective satisfaction among healthcare providers. User Centric believes that EHR systems selected in this manner are more likely to be adopted, meet the needs of their users, and reduce the chance of usability-related abandonment.

A link to the complete article is available on the Healthcare TG website.

## Featured Lab

The Systems Engineering Initiative in Patient Safety (SEIPS)

The SEIPS ([http://cqpi.engr.wisc.edu/seips\\_home](http://cqpi.engr.wisc.edu/seips_home)), housed within the Center for Quality and Productivity Improvement at the University of Wisconsin-Madison, is a multidisciplinary initiative applying systems engineering, human factors engineering, and quality engineering approaches to improving patient safety. The following are highlights for 2008-2009:

- SEIPS is a member of the University of Wisconsin School of Medicine and Public Health's Institute for Clinical and Translational Research Community Academic Partnership program (ICTR). (<http://ictr.wisc.edu/>)
- Professor Pascale Carayon and Associate Professor Ben-Tzion (Bentzi) Karsh have received a new 2-year \$494K contract from AHRQ to develop toolkits to aid in small and medium sized primary care practices in analyzing and redesigning workflows when implementing Health Information Technology.
- Associate Professor Karsh has received a new 3-year \$850K grant from AHRQ to test an intervention to reduce information chaos during primary care of the elderly. The randomized controlled field trial will involve over 2,200 patients throughout Wisconsin.
- Associate Professor Tosha Wetterneck, MD, MS, was awarded a K08 grant from AHRQ for conducting a prospective risk assessment on medication management in transitions of care.
- Assistant Professor Enid Montague was awarded a KL2 scholarship to conduct research on the relationship between interpersonal trust and trust in medical technologies in Obstetric work systems.

- Associate Professor Doug Wiegmann was awarded an ICTR pilot grant to conduct research on how teamwork and communication among surgical teams impacts their ability to manage errors and interruptions during cardiac surgery.
- Graduate student Richard Holden and Associate Professor Karsh were awarded Best Paper in Human Factors by the International Medical Informatics Associate for their paper "A review of medical error reporting system design considerations and a proposed cross-level system research framework". Human Factors, 49(2), 257-276.
- Professor Carayon served as a member of the IOM committee on resident duty hours. The IOM recently published their report, "Resident Duty Hours: Enhancing Sleep, Supervision, and Safety". (<http://www.iom.edu/?ID=60449>)
- The 2009 SEIPS Short Course – Extended Part I on Human Factors and Sociotechnical Systems Engineering, will be held July 13-16, 2009 at the University of Wisconsin-Madison Lowell Center. ([http://cqpi.engr.wisc.edu/shortcourse\\_home](http://cqpi.engr.wisc.edu/shortcourse_home))
- Associate Professor Karsh joined Ross Koppel, Ph.D. of the University of Pennsylvania and David Lobach, Ph.D. of Duke as presenters for the October 2008 National Web Conference on Use of Clinical Decision Support and Impact on Workflow, Sponsored by AHRQ.

## Upcoming Conferences

### 12th Annual Applied Ergonomics Conference

March 23-26, 2009 - Grand Sierra Resort, Reno, NV. Presented by the Institute of Industrial Engineers. Members of HFES, a participating organization, are entitled to discounted registration.

### Internet User Experience Conference 2009

March 30-April 2, 2009 - Washtenaw Community College, Ann Arbor, MI. Presented by the Michigan Usability Professionals' Association and the Washtenaw Community College Internet Professional Program. Discounts are available to HFES members.

### CHI 2009: The 27th Annual CHI Conference on Human Factors in Computing Systems

April 5-9, 2009 - Boston, MA. Presented by the Association for Computing Machinery SIGCHI.

### 2009 AMIA Spring Congress

May 28 – 30 - Walt Disney World Swan Hotel in Orlando, FL. Presented by the American Medical Informatics Association

## HCTG OFFICERS

### Chair

Jacob Seagull, PhD  
University of Maryland  
[jseagull@smail.umaryland.edu](mailto:jseagull@smail.umaryland.edu)

### Program Chair

Ayse P Gurses, PhD.  
Johns Hopkins University  
[agurses1@jhmi.edu](mailto:agurses1@jhmi.edu)

### ListServ Moderator/Manager

Stephanie Guerlain, PhD  
University of Virginia  
[guerlain@virginia.edu](mailto:guerlain@virginia.edu)

### Webmaster (\*\*NEW OFFICER\*\*)

Adam R. Shames  
Design Science  
[adam@dscience.com](mailto:adam@dscience.com)

### Newsletter Editor

Michelle L. Rogers, PhD.  
Drexel University  
[michelle.rogers@ischool.drexel.edu](mailto:michelle.rogers@ischool.drexel.edu)

*If you want your **lab** or **HFES student chapter** featured here, please send an email to Michelle Rogers at [michelle.rogers@ischool.drexel.edu](mailto:michelle.rogers@ischool.drexel.edu)*



## Technology, Patient Care and Worker Safety

*Technology, Patient Care and Worker Safety*  
By Susan L. Murphey BS, CECD

Mobile computing systems known as Computers on Wheels (COWs) or Workstations on Wheels (WOWs) are becoming commonplace in patient care areas as more and more hospitals convert to electronic charting. However, with the myriad of product choices on the market, it is difficult to know how to best serve the population of users with a system that will accommodate both their technological and ergonomic needs. Unfortunately, these expensive purchases are often made by the hospital information technology (IT) department with no input from either the frontline worker or an ergonomics specialist. As a result, the equipment is neither user friendly or ergonomic. Failure to consider the workflow and ergonomic impact of point-of-care computer systems and their set ups often results in inconsistent clinical use and dissatisfaction among workers. Workarounds necessitated by cumbersome (technological) processes affect productivity, and quality of work due to inconsistent methodologies. From an ergonomic standpoint, awkward or hard-to-use equipment limits the worker's ability to perform at their best. Planning should start well in advance of the capital equipment purchase, and include input from IT, the end-user, and an ergonomics specialist.

The Health Information and Management Systems Society reported in a 2007 database study that 77% of U.S. hospitals were utilizing computers on wheels. [1] Work areas utilizing COWs include emergency departments, operating rooms and recovery areas, surgical and coronary intensive care units and a wide array of primary and multi-specialty care areas such as pediatrics, orthopedics, infusion centers and outpatient clinics. The work tasks interfaced with COWs or WOWs include point-of-care charting, electronic medication recording, order entry, and telemedicine of medical imaging information. The electronic transmission of medical data provides the opportunity for easy remote access to information critical for patient care improving both patient safety and the speed at which care can be delivered. Improved documentation has become even more critical with the introduction of the 2008 Medicare rules tying nursing care and

documentation to reimbursement.

While the intent of these technological advancements was purported to be increased accuracy and efficiency of clinical care delivery, caregivers have been slow to embrace the new technology as a solution to their already over-burdened work day. In fact, KLAS Research reports that most nurses believe that portable devices used at the bedside are lacking in practicality and usability. [2] Frustrations range from lack of basic knowledge or training in computer skills, to lack of adjustability or ergonomic features, to risks for unreliability inherent in the technology itself. Suddenly the initial enthusiasm for the new technology has become dampened by a cumbersome system that detracts from direct patient care and leaves the worker hurting as a result of awkward postures sustained in using the equipment.

The greatest success comes with collaborative effort and planning on the part of all stakeholders involved with the application and use of the systems. Lessons have been learned since the initial introduction of point-of-care (POC) mobile electronic device technologies, but there is still much more to learn. Early on, COWs/WOWs were often purchased without proper understanding of how the implementation of electronic record keeping would influence the workflow of the end-user, altering existing care models and practices, without any input from those affected. Newer generations of purchasers are recognizing the need to include staff input with IT requirements in order to improve the adoption rate of new devices, and the return on investment. However, in many cases, the advance planning still lacks the input of an ergonomics specialist. Assessing the needs of the worker from a comfort and ease-of-use perspective is often overlooked, and has significant impact on the acceptance, safety and efficiency of new equipment. Consideration of the human factors side of ergonomics ensures successful application of technology by providing balance between the human and the environment. Numerous reports of failed efforts to introduce technology designed to improve workload and direct patient care point to a lack of input from the worker and an ergonomic specialist. Difficulties such as large carts with cumbersome designs, unpredictable battery life and lack of adjustability result in non-compliance and abandonment of equipment.

In order to adequately consider all aspects of usability, a COW/WOW purchasing planning committee should include the following stake holders:

- Chief Information Officer
- IT specialist
- End-user staff member(s)
- Product specialist
- Ergonomics/Work Safety specialist

Risk factors for work-related musculoskeletal disorders (WRMSDs) have long been recognized to be associated with computer use. Many ergonomic problems associated with computer workstations involve the shoulder, elbow, forearm, wrist, and hand, primarily as a result of risk factors associated with awkward postures, repetition and overuse conditions. Other clues to WRMSD can be found by reviewing injury logs or worker's compensation claims for conditions such as carpal tunnel syndrome, tendinitis, tenosynovitis, epicondylitis, and low back pain, although problems are often noted in less specific terms, such as "hand pain". It should be noted that a lack of reporting should not deter the investigation for risk factors. Healthcare workers typically underreport, either because of concerns of negative repercussions or as a result of what is casually known as "Florence Nightingale syndrome", i.e., an uncompromising commitment to the needs of the patient. They notoriously put the patient's comfort first, ignoring their own health needs. While admirable, this tendency to ignore their own physical and psychological stressors can have detrimental long term effects. Safety teams and managers can often find clues to underlying WRMSD issues by reviewing sick time patterns, internal employee health documentation, OSHA 300 logs or by conducting their own internal employee symptom survey.

Careful evaluation of workflow and tasks supported by COW/WOW use must be made prior to purchasing equipment. Part of this investigation should include the anthropometrics of the staff using the workstations and the flexibility requirements necessary to accommodate a full range of workers, including both seated and standing use, if applicable. A collaborative, analytic approach to introducing mobile, point of care technology can significantly enhance the success of the program. [3] Integrating electronic medical record (EMR) plans with input from the end user and ergonomics specialist provides the platform for successful adoption, translating to improved compliance, quality of patient care, return on investment and efficiency. Utilizing a workflow and comfort-based selection process enables a facility to leverage these technologies successfully, critical

to maintaining the fiscal viability of an organization in these tough economic times.

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