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At a recent conference on the physician's role in patient safety, a physician asks during a break-out session, "I hear all this talk about human factors, but where do you find these people?" At another conference, a nurse stands up and reports she recently completed a root cause analysis workshop but found it confusing because the instructor used engineering terms and didn't relate it to health care. An HFES member walks up to the microphone after a patient safety luncheon presentation and asks, "When is human factors going to be taken seriously?"

Past issues of the *HFES Bulletin* (May and October 2000) have reported on significant early events in the patient safety movement and have raised serious questions about the incorporation of systems thinking beyond the surface-level cachet it confers. Although a handful of respected human factors/ergonomics (HF/E) professionals have participated in these events and conferences, there is clearly a need for a deeper, broader, and more substantive HF/E involvement in the patient safety movement.

Both the health care and HF/E research communities need to venture beyond their own traditional boundaries of expertise and acquire new perspectives and technical knowledge, as noted by Woods (2000). As the differing perspectives of our conference participants indicate, the need for better communication and fuller collaboration cannot be overstated. In light of these concerns, in this article we describe research areas at the Agency for Healthcare Research and Quality (AHRQ) of potential interest to HFES members, address funding opportunities, and point the reader to some relevant Web sites.

AHRQ is the federal agency responsible for expanding the nation's knowledge base in patient safety by funding multidisciplinary teams in a variety of settings, populations, and research areas. High-priority research areas include (a) effective learning from errors, (b) the epidemiology of errors, (c) informatics, and (d) the impact of systems and cultures.

Learning from Errors

Effective learning from errors has been facilitated in the aviation, petrochemical, nuclear power, and radiopharmaceutical industries by safety reporting systems that include not only actual events but also close calls. With respect to patient safety, the potential is high for learning from reporting systems (e.g., Battles & Shea, 2001). At the same time, there is a delicate balance between mandatory reporting systems that ensure public accountability and voluntary reporting systems that promote mutual trust, openness, and learning.

It is important that reporting systems have clear intent and purpose, involve the user in their design, don't add to already constrained workloads of frontline personnel, provide sufficient information, protect confidentiality, and eliminate identifying

Research on Medical Error Gaining Momentum

*By Kerm Henriksen &
James B. Battles,
AHRQ*

Happy Holidays from HFES!

characteristics. What is out there? What works and what doesn't? How do we get data into reporting systems, how do we ensure a workable level of data standardization, and how do we prevent these systems from becoming data graveyards? What sort of data get disseminated to frontline personnel, to health care decision makers, to the patient, or to family members of individuals that have been harmed by medical error?

Epidemiology of Errors

A clearer picture of the epidemiology of errors is also needed. Much of what we know comes from large hospital-based studies on the prevalence of inpatient injuries (Brennan et al., 1991; Leape et al., 1991). Errors are more likely to occur in higher-risk areas (e.g., emergency and operating rooms and intensive care units), with older patients who require complicated care, and with prolonged stays in the hospital (Bogner, 1994; Weingart, Wilson, Gibberd, & Harrison, 2000). What limited knowledge we have about the prevalence, types, and causes of medical error is primarily reflective of the care for adults in acute settings. Even less is known about medical error in other settings, such as rural areas and among underserved populations (e.g., minorities, older persons).

Another obstacle to arriving at a better understanding of medical error is the lack of a standard nomenclature or taxonomy for medical error. The absence of such a taxonomy makes it difficult to identify, report on, analyze, and characterize the prevalence, types, and causes of errors and close calls. HF/E professionals have experience with these challenges.

Potential of Informatics

The availability of new, sophisticated therapeutic agents – some with narrow margins of effectiveness and safety – is exploding. Settings in which complex procedures are delivered have become more diverse. As complex treatment options continue to arise in system settings with limited standardization and few safeguards, unanticipated errors are bound to occur.

(continued on page 4)

Education and Training Survey

The HFES Education and Training Committee is developing a Web-based survey to assess the education and training needs of the HFES membership. A link to the survey will be sent via e-mail around the end of this year. If you have specific E&T ideas or needs that may help in the development of this survey, please e-mail them to Nancy Cooke, cooke@crl.nmsu.edu.



2001 HFES Fellows and Awardees Honored

At a ceremony and banquet held October 10, 2001, at the 45th Annual Meeting, the Society recognized significant contributions to the field by honoring new Fellows and award recipients.

The newly elected HFES Fellows are Richard S. Jensen, associate professor, Department of Aerospace Engineering, Applied Mechanics, and Aviation, Ohio State University, Columbus, Ohio; Arnold M. Lund, director of user experience, Sapient, Denver, Colorado; and Betty Mae Sanders, president and CEO, Humanomics Corporation, Houston, Texas. Robert W. Proctor, professor of psychological sciences, Purdue University, West Lafayette, Indiana, was elected Honorary HFES Fellow.

The **Liberty Mutual Award**, sponsored by the Liberty Mutual Group and the International Ergonomics Association, was given to Peter A. Hancock, University of Central Florida, and Selma N. de Ridder, a graduate student at the University of Minnesota. The award recognized their paper, "Behavioral Accident Avoidance Science: Understanding and Assessing Response in Accident Incipient Conditions."

Raja Parasuraman of the Catholic University of America, Anthony J. Massalonis of MITRE Corporation, and Peter A. Hancock of the University of Central Florida received the **2001 Jerome H. Ely Human Factors Article Award** for their paper, "Fuzzy Signal Detection Theory: Basic Postulates and Formulas for Analyzing Human and Machine Performance" (Volume 42, No. 4, Winter 2000).

The recipient of the **2001 Distinguished International Colleague Award** was Holger Luczak of Aachen University of Technology, Germany. A respected contributor to ergonomics education, practice, and research, Luczak has served as president of the German Ergonomics Society and as chair of the International Ergonomics Association Science and Technology Committee.

The Society presented the **2001 Paul M. Fitts Education Award** to Robert J. Beaton, an associate professor at the Virginia Polytechnic Institute & State University. Beaton has dedicated



*New HFES Fellows
Arnold Lund (left) and
Betty Sanders (right).*



*Liberty Mutual/IEA
Award winners Selma N.
de Ridder (left) and
Peter Hancock (right).*



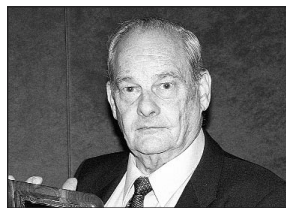
*Ely Award winners Raja
Parasuraman (left),
Anthony Massalonis (center),
and Peter Hancock (right).*



*Distinguished Foreign
Colleague Award recipient
Holger Luczak.*



*Fitts Education Awardee
Robert Beaton.*



*Lauer Safety Award winner
George Peters.*



*Chapanis Best Student
Paper Award winner
Robert A. Willis.*

himself to working directly with his students and to developing and upgrading courses in displays and controls and in general human factors.

George A. Peters, Peters & Peters, Santa Monica, California, was recognized with the **2001 A. R. Lauer Safety Award** for his many achievements in enhancing safety in traffic, the workplace, medicine, and the environment through the application of human factors principles, theory, and communication.

Robert A. Willis of the University of Virginia received the **Alphonse Chapanis Best Student Paper Award** for his paper, "Effect of Display Design and Situation Complexity on Operator Performance."

Mihriban Whitmore, NASA Johnson Space Center, Houston, Texas, was granted this year's **Alexander C. Williams, Jr., Design Award** for an outstanding application of empirically determined principles to the design of the Spacelab Glovebox and associated crew restraints.

The **Jack A. Kraft Innovator Award** was given to Charles J. Lloyd, president of Visual Performance, Inc., Xenia, Ohio. The award recognizes Lloyd's unique work in illumination applied to automotive, aircraft, and space systems.

The **2001 Best Ergonomics in Design Article Award** was



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Williams Design Award recipient Mibriban Whitmore.



Kraft Innovator Award winner Charles Lloyd.

presented to Inge Fryklund, Organization for Security and Cooperation in Europe, for her article, "Human Factors in Parking Enforcement" (Volume 8, No. 2, Spring 2000).

The recipient of the **Arnold M. Small President's Distinguished Service Award** was Neville Moray, professor emeritus, Department of Psychology, University of Surrey. The award was given in recognition of Moray's outstanding contributions to the advancement of the human factors profession and the Society over his entire career. ☒

EXECUTIVE COUNCIL

Annual Executive Council Meeting Report

At its October 5-7 meeting in Minneapolis, the HFES Executive Council devoted a full day to long-range planning and two days to budget and policy issues. Below is a summary of the actions taken at that meeting.

Long-Range Planning

Executive Council members continued discussion of the HFES Strategic Plan, noting the many completed goals established in 1996. The group focused on developing new vision and mission statements that reflect the Society's focus for the next 10 years. Work continues within Council, committees, chapters and technical groups. A draft revision of the Strategic Plan will be considered at the midyear 2002 Council meeting, with the goal of approving a final plan at the Annual Meeting.

Chapters

Two new student chapters were approved: California State University, Long Beach, and University of Michigan.

Education and Training

Education and Training Committee Chair Nancy Cooke's requested support of an extensive survey to determine members' educational needs (see page 1). In addition, HFES will conduct an experimental satellite seminar on cognitive task analysis sometime during 2002. This effort will be coordinated by Mark Lee. Details will appear in a future issue of the *HFES Bulletin*.

Membership

New members and changes of membership status were approved as follows: 86 full Members, 56 Associates, 114 Affiliates, 141 Student Affiliates; 7 Associate to Member, 12 Affiliate to Member, 1 Transitional Associate to Member, 11 Affiliate to Associate, and 2 Student Affiliate to Transitional Associate.

Operating Rules

A number of recommendations by a task force of the Corporate Activities Subcouncil for modifications in the HFES Operating Rules were approved. These changes reflect current practice and include rules governing the submission of proposed amended bylaws to the membership, assignment of duties to the Executive Director that were formerly those of the Parliamentarian, committee types, and administrative matters carried out by central office staff.

Outreach

Following the success of the 2001 MESA Summer Camp (see the September *HFES Bulletin*), Council endorsed the Membership Committee's recommendation to fund the camp in 2002. Also approved was a budget request by the Diversity Committee to exhibit at two minority conferences to promote HFES membership.

Council has voted to continue funding for the EurekaAlert Web site service for dissemination of HFES press releases, listings in the *Yearbook of Authorities and Spokespersons* and National Press Club Directory, and collaboration with a professional public relations firm to develop press releases about "hot" issues that have human factors/ergonomics implications.

Communications/Publications

Council approved the Communications Subcouncil's recommendation to eliminate one issue of the *HFES Bulletin* to align with the three-year practice of combining two summer issues.

Budget proposals were approved for the production, when completed in draft and final form, of four new HFES standards: HFES 100 (computer workstations), HFES 200 (software guidelines), HFES 300 (anthropometry), and HFES 400 (guidelines for writing product instructions). Updates on the pending release of these publications will appear in future issues of the *HFES Bulletin*.

On the recommendation of the Communications Subcouncil, a reduced rate for renewals of On-Line Consultant Directory listings was approved. Individuals may renew for \$100 and companies for \$200.

2001 and 2002 Budgets

Council approved a dues increase for 2002 of \$25 for Members, Associates, and Affiliates and \$5 for Student Affiliates. The increase is aimed at bolstering dwindling Society reserves caused by the current economic downturn. It will be supplemented by across-the-board cuts in all categories of Society expenses. To ensure that dues are keeping pace with inflation, annual increases beginning in 2003 will correspond to the U.S. Consumer Price Index.

The approved revised 2001 budget is shown below:

Income	
Membership	\$ 595,500
Membership Services	\$ 64,250
Communications/Publications	\$ 411,925
Annual Meeting	\$ 120,468
HFES Institute	\$ 7,800
Miscellaneous	\$ 15,950
Total Income	\$1,215,893
Expenses	
Membership Services	\$ 123,822
Publications	\$ 426,541
Administrative	\$ 621,895

HFES Institute	\$ 50,577
Committees and Officers	\$ 60,450
Annual Meeting	\$ 73,736
Interorganizational	\$ 16,762
Total Expenses	\$1,373,783
2001 Surplus	-\$ 157,890

Council approved the following budget for 2002:

Income	
Membership	\$ 650,625
Membership Services	\$ 65,100
Communications/Publications	\$ 431,825
Annual Meeting	\$ 147,275
HFES Institute	\$ 94,500
Miscellaneous	\$ 8,500
Total Income	\$1,397,825
Expenses	
Membership Services	\$ 94,150
Publications	\$ 343,900
Administrative	\$ 601,552
HFES Institute	\$ 67,250
Committees and Officers	\$ 52,415
Annual Meeting	\$ 62,000
Interorganizational	\$ 16,640
Total Expenses	\$1,237,907
2002 Surplus	\$ 159,918



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ANNUAL MEETING

HFES 2001 45th Annual Meeting Wrap-Up

By *Thomas J. Smith*
General Chair, HFES 2001 45th Annual Meeting

The HFES 45th Annual Meeting convened at the Hilton Minneapolis Hotel & Towers and Minneapolis Convention Center on October 8–12. Host for the meeting was the HFES Upper Midwest Chapter.

The meeting was highly successful. Host Committee members received favorable comments from many attendees that this was one of the more enjoyable meetings on record. This success reflects a team effort on the part of the central office and the meeting planner (with new meeting innovations such as e-mail registration confirmation), coupled with dedicated planning and organizational efforts by Host Committee members. One disappointment was registration (about 1050), which apparently suffered somewhat from the triple whammy of September 11, the war in Afghanistan, and an economic downturn early in the year. A consequence was cancellation of all social tours and some technical tours due to low enrollment.

The meeting received a strong launch with the presidential address by Bill Howell, who challenged attendees to consider a “shared philosophy,” as opposed to the “unique discipline” paradigm as a means of attracting new members and moving the profession and the Society forward. The subsequent keynote address by Charles Jeffress, Assistant Secretary of Labor for OSHA under President Clinton, offered the perspective that federal regulations and standards pertaining to ergonomics should continue to play a key role in national workplace health and safety policy.

Another meeting highlight was the last-minute organization, with cooperation of the Technical Program Committee, of a special panel session chaired by Peter Hancock and Bill Howell devoted to human factors issues related to counterterrorism and airline security, prompted by the events of September 11.

Host Committee members devoted more than 1200 hours of their time to planning and organizational efforts for the 45th Annual Meeting, a tribute to their dedication to hosting a successful and rewarding meeting.



Research on Medical Error (continued from page 1)

To address some of these problems, the use of computerized information applications has attracted considerable attention. Little is known about the impact of informatics on reducing errors outside the computerized physician order entry and clinical decision support areas (Bates, 2000). What is the potential for new sources of error with computerized applications? As one investigator put it, “If you want to mess up big time, use a computer.” Errors that are opaque to frontline personnel, such as those buried in data files or software code, are created far from the point of patient care. Yet they cascade downstream, going undetected for long periods, having the potential to harm hundreds of patients (Henriksen, Kaye, Jones, Morisseau, & Serig, 1995).

Similar opaque, latent errors also occur in laboratory settings,

affecting hundreds of patients (Goldberg, 2001). Because of the complex and unpredictable manner in which contributory factors to health care delivery errors interact, much more needs to be known about the full array of variables likely to exert their effects.

Systems Thinking and Cultural Change

Understanding the impact of systems as well as organizational and professional cultures in reducing error and improving patient safety is another crucial area. In nonmedical industries, organizations that succeed in improving safety have designed systems to protect against human shortcomings through the use of automation, simplification, standardization of equipment and functions, simulation techniques, practice guidelines and protocols, and

teams that employ shared mental models. Error reduction and improved safety becomes institutionalized.

Aviation is an industry frequently cited as having successfully embedded an underlying focus on safety. Other nonmedical examples include Motorola and General Electric, each of which has committed to a six-sigma level of quality.

Bringing about cultural change in health care is not without obstacles, however. Tort and contract law act as significant barriers to blame-free reporting (Liang, 1999). A well-known example is the system design work of anesthesiologists who have reduced the rate of errors in the operating room seven- to tenfold (Eisenberg, 2000).

Other efforts involving significant cultural change have been spearheaded by the Veterans Health Administration and some hospitals and clinics. Isolated successful examples, however, stand in stark contrast to the pervasive cultural change that is needed if preventable medical errors are to be identified, understood, and eliminated nationwide.

Research Funding at AHRQ

To help address these challenges, AHRQ recently initiated a comprehensive and coordinated research program for centers of excellence, developmental centers, medical error reporting systems, clinical informatics, working conditions (i.e., effects of sleep deprivation, shiftwork, staffing), and dissemination and education practices. The centers of excellence are best described as multidisciplinary research engines that have a strong track record and where the potential is high for producing research that can be translated into practice. Because patient safety research is in its infancy and there are few extant centers of excellence (three were funded), there also is a need to create new research engines.

AHRQ is funding 18 developmental centers where the intent is to support new multidisciplinary teams to build capacity and expand the nation's knowledge base in patient safety across a diversity of settings, populations, and research areas. Ideally, in three years, the developmental centers will have matured sufficiently to serve as centers of excellence. Other research teams have been funded for medical error reporting systems, clinical informatics, working conditions, and dissemination and education, representing \$50 million awarded in fiscal year 2001; this funding will continue for three to five years. A listing of successful applicants and their projects can be found at www.abrq.gov.

Depending on whether one was successful in the recent round of competitive funding, the prospects for funding at AHRQ look either very good or bleak. HF/E professionals are represented on these teams. Arguments can be made for greater representation, greater general awareness, and greater networking with the health care community. At the same time, the agency strives for program balance among a wide array of disciplines, research areas, patient populations, and settings.

The outlook for further increases in the AHRQ patient safety budget is difficult to predict. For those interested in AHRQ's regular grant program, there are dissertation, small research, small conference, and health services research grants, among others. Information can be found under the "funding opportunities" link at www.abrq.gov. The smaller grants are typically less competitive but still require quality applications.

The momentum that is building for expanding patient safety research and the resulting knowledge base extends well beyond any single agency or organization. Other federal agencies with strong interests in medical error and patient safety include the Food and

Drug Administration, Centers for Disease Control and Prevention, Center for Medicare and Medicaid Services, Department of Defense, and Veterans Health Administration. The National Patient Safety Foundation does some limited funding. Foundations such as The Robert Wood Johnson Foundation, The Commonwealth Fund, California HealthCare Foundation, The Aetna Foundation, and the Jewish Healthcare Foundation also sponsor research.

To coordinate the government's efforts to improve patient safety, the Quality Interagency Coordination Task Force (QuIC) was established in 1998. We strongly recommend the QuIC Task Force (at www.quic.gov), where researchers can gain access to the National Summit on Medical Errors and Patient Safety Research and examine testimony given by Bruley (2000), Woods (2000), and others.

Another worthwhile site is www.abrq.gov/clinic/ptsafety. It hosts *Making Health Care Safer: A Critical Analysis of Patient Safety Practices* – an evidence-based report on patient safety practices that includes several chapters of interest to HF/E professionals (e.g., "Refining the Performance of Medical Device Alarms," "Crew Resource Management and Its Applications in Medicine," and "Simulator-Based Training and Patient Safety").

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FLASH!

Happy Holidays to you and yours from the HFES staff.

Deadline for receipt of 2002 Dues: January 15, 2002.

Deadline for nominating candidates for Fellow: February 1, 2002.

Deadline for submitting 46th Annual Meeting Proposals: February 20, 2002.

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