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Public Policy Matters: U.S. Health Care Bill Mandates Accessible Diagnostic Equipment

By Daryle J. Gardner-Bonneau

H.R. 3590, the Patient Protection and Affordable Care Act, recently signed into law, contains many provisions; one that involved significant efforts on the part of several HFES members amends Title V of the Rehabilitation Act of 1973 to add a new section that mandates the establishment of standards for accessible medical diagnostic equipment. In this short article, I address the content of the legislation, what it means for health care, and how this legislative mandate was achieved.

The amendment to the Rehabilitation Act of 1973 requires that within 24 months of the date of enactment, the Architectural and Transportation Barriers Compliance Board (a.k.a. the United States Access Board), in consultation with the U.S. Food and Drug Administration (FDA), shall “promulgate regulatory standards setting forth the minimum technical criteria for medical diagnostic equipment used in (or in conjunction with) physician’s offices, clinics, emergency rooms, hospitals, and other medical settings.” These standards “shall ensure that such equipment is accessible to, and usable by, individuals with accessibility needs, and shall allow independent entry to, use of, and exit from the equipment by such individuals to the maximum extent possible.” These standards are to cover a variety of equipment, including examination tables and chairs, weight scales, mammography equipment, and x-ray machines used for diagnostic purposes by health care personnel.

This provision in the U.S. health care reform bill addresses a long-standing need of patients with disabilities but will, at the same time, address the needs of many older adult patients who, though not defined specifically as having disabilities, may have mobility issues that affect their ability to access these types of equipment. The accessibility needs of health care professionals who use this medical equipment in their practices are also subsumed under this provision.

The path to success in getting this provision into the legislation was through the combined effort of researchers, industry representatives, standards developers, advocacy groups, and

legislators. One of the key groups involved was the Rehabilitation Engineering Research Center on Accessible Medical Instrumentation (RERC-AMI), which is funded by the National Institute on Disability and Rehabilitation Research.

RERC-AMI collected data documenting the extent of the accessibility problem and worked with manufacturers (including Midmark, an examination table maker) to demonstrate that design improvements were possible in the instrumentation. A fall 2005 RERC-AMI workshop on this topic resulted in the publication of a book, *Medical Instrumentation: Accessibility and Usability Considerations* (2007). In addition, a number of articles on the work of the RERC were published in *Ergonomics in Design* (Gardner-Bonneau & Kailes, 2010; Lemke & Winters, 2008) and other publications (e.g., Story, Schwier, & Kailes, 2008). Finally, the new Association for the Advancement of Medical Instrumentation (AAMI) standard, ANSI/AAMI HE-75: 2009, *Human Engineering – Design of Medical Devices*, includes Section 16 (Accessibility considerations) that was heavily influenced by this work as well.

We can expect to see significant new technical standards in this area as the FDA and the U.S. Access Board work to implement this provision of the health care bill during the coming months.

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Health Care Bill...

(continued from page 1)

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Daryle Gardner-Bonneau is an HFES Fellow and principal of Bonneau and Associates, a human factors consultancy in Portage, Michigan.

INSIDE HFES

HFES in the Social Network Sphere

By Anthony D. Andre, James P. Beno, & Lois Smith

If you're not already engaged in the HFES LinkedIn or Facebook social networks, or following the Society on Twitter (HFES), you may be missing some interesting posts, discussions, debates, and job announcements about human factors/ergonomics.

The HFES LinkedIn group has more than 1,700 members to date. And that's not all: Technical groups, local and student chapters, and National Ergonomics Month also have a LinkedIn presence – and there are bound to be more. There's even a group devoted just to junior faculty in HF/E!

You can also follow the Society via Facebook and Twitter and be up to date on all news related to HFES. Furthermore, these sites create a great forum for discussion and debate on various topics of interest to our membership.

- On www.linkedin.com join the group “Human Factors and Ergonomics Society (HFES).”
- On www.facebook.com join and become a fan by searching on “HFES.”
- Follow the Society at www.twitter.com/hfes.



2010 Annual Meeting on Twitter and Facebook

At this year's Annual Meeting in San Francisco, the Host Committee will be using Facebook and Twitter to communicate conference news and information, provide a forum for discussion, and share photos and videos from the event.

The Host Committee will be tweeting via the special meeting Twitter account, “hfes2010.” Attendees can follow this account to keep up-to-date with late-breaking news from the host committee.



- Stay informed about upcoming events and room changes.
- Share thoughts on the keynote address or technical sessions.
- Exchange tips on great lunch spots, nightlife, etc.
- Find out where people are meeting for social activities.

All tweets from the Host Committee will be tagged with “#hfes2010,” and attendees are encouraged to tag their tweets with “#hfes2010” as well. By following the “#hfes2010” tag on their mobile Twitter client or laptop, attendees and organizers can have a group discussion during the event.

In addition to Twitter, the host committee has created a Facebook fan page for “HFES 2010.” This will be linked with the “hfes2010” Twitter account. Become a fan of the page to follow Host Committee communication and network with attendees.



- Publish photos and videos from the conference.
- See a list of Annual Meeting events, or add yours to the list.
- Share what's on your mind, or start a discussion.

Become a fan of the [2010 Annual Meeting Facebook Page](#).

Lead, Don't Just Follow

Social networking sites put a powerful outreach tool into the hands of every HFES member. Rather than just reading posts and adding comments, think about posting news and information about your work and its potential to make a difference.

Suggestions and Acknowledgments

As we focus on increasing our social networking capabilities, we welcome your suggestions for the establishment of new social networking opportunities and for useful ideas on how to best support and operate our current endeavors.

The Society thanks Deepti Sood for her important role in establishing the HFES LinkedIn group and for graciously permitting HFES to adopt its ownership. We also thank the California State University, Long Beach, Student Chapter for having the foresight to create the Twitter account “HFES” and for graciously permitting HFES to use it as our official Twitter name.

Anthony D. Andre is president-elect of HFES and a member of the HFES Collaborative Technologies Task Force. He is also chair of the 2010 HFES Host Committee. James P. Beno is vice-chair of the 2010 HFES Host Committee and a member of the Collaborative Technologies Task Force. Lois Smith is HFES communications director and may be reached at lois@hfes.org

JCEDM Editor Candidates Sought

By C. Melody Carswell, Publications Committee Chair

The term of the current editor of the *Journal of Cognitive Engineering and Decision Making* will expire at the end of 2010, and HFES is seeking candidates for the position.

The *JCEDM* editor's term is four years (2011–2014), with the possibility of two additional two-year terms. The incoming editor will be asked to work with the outgoing editor in the latter part of 2010, so on each end of the tenure there will be a few months of overlap to enable a smooth transition.

Desirable candidates should have prior experience working with authors of scientific research, including a demonstrated ability to communicate sometimes unwelcome news with consideration, tact, and diplomacy. They should also be able to coordinate the activities of professional staff and volunteers involved in the review and publication process. Candidates should be active researchers in the area of cognitive engineering and decision making and should be able to demonstrate familiarity with a wide range of research on this topic.

Administrative support for the manuscript review process is provided by staff at the HFES central office in Santa Monica. The Society's publications staff also performs production editing of the journal. Questions about these functions may be directed to Communications Director Lois Smith (310/394-1811, lois@hfes.org).

If you are interested in being considered for the *JCEDM* editorship, [view the instructions](#) on the HFES Web site. Please forward a current curriculum vitae, a letter of interest, your responses to the questions posted at the Web site, and two professional or personal recommendation letters. Submissions should be sent via e-mail to Lois Smith and are required by **June 15, 2010**. The HFES Publications Committee will conduct telephone interviews with qualified candidates in July and make a recommendation to the Executive Council in September.

JCEDM Discount for CEDM-TG Members Extended

By David B. Kaber, Chair, Cognitive Engineering and Decision Making Technical Group

Just ending its third year of publication, the *Journal of Cognitive Engineering and Decision Making (JCEDM)* is a specialty journal from HFES geared specifically toward the interest areas of members of the Cognitive Engineering and Decision Making Technical Group (CEDM-TG). *JCEDM* focuses on research that seeks to understand how people engage in cognitive work in real-world settings and on the development of systems that support that work. It features research on human cognition and the application of this knowledge to the design and development of system interfaces, automation aids and other support systems, training programs, personnel selection devices, and coordination environments for people who work in teams or groups. View titles and abstracts of all papers published in *JCEDM* [here](#).

Special Offer for CEDM-TG Members

The CEDM-TG is making a very special offer available to TG members on new subscriptions to *JCEDM* in 2010. If you are a nonstudent member, the CEDM-TG will provide a one-time subsidy for your 2010 subscription, reducing the online subscription price from \$90 to just \$60 for the year. (The print price has not changed; for 2010, a print subscription for HFES members is \$100.) The subsidy is capped at \$5,000, and this is a first-come, first-served offer.

The online subscription rate for HFES Student Affiliate members who have not previously subscribed is just \$30. This reduced price represents a savings of \$60 off the current online subscription rate. (The print price has not changed; for 2010, a print subscription for HFES members is \$100.)

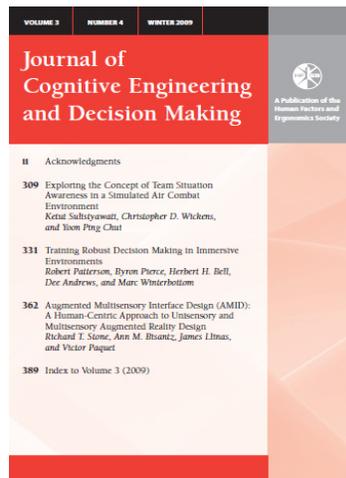
To take advantage of the discount, contact Member Services (membership@hfes.org, 310/394-1811, fax 310/394-2410) for a special order form. Payment by check or credit card starts your 2010 subscription.

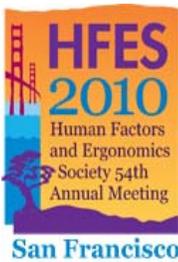
Join CEDM-TG Today!

Membership in the Cognitive Engineering and Decision Making Technical Group is just \$6. Joining is easy – just fill out the [online application](#) or [download the printable application form](#).

Submit Your Work

Submissions to *JCEDM* are welcome. You can upload your paper any time from any location on any platform at the [JCEDM submission site](#).





Mark your calendar!

Human Factors and Ergonomics Society
54th Annual Meeting

September 27 – October 1, 2010
San Francisco, California USA

Bookmark hfes.org for regular updates

Contributors Sought for 3rd Annual Works-in-Progress Forum

By Rebecca A. Grier & G. Susanne Bahr, Session Cochairs



September 27–October 1, 2010
San Francisco, California USA

This is a call for contributors for an alternative-format session to be conducted at the HFES 54th Annual Meeting in San Francisco. “How Would You Test This? Test and Evaluation Works in Progress Forum” provides an opportunity for three contributors to describe HF/E work in progress that contains a test and evaluation component and gain valuable feedback that can be incorporated into their efforts. For audience members,

it provides an opportunity to offer feedback in their areas of expertise – feedback that has a near-term chance of being utilized because the work under discussion is not yet complete!

Potential contributors must submit a 350-word abstract that explicitly specifies the applied or research objective, measurement methods, and what you wish to ask the audience. The work in progress may reflect any HF/E topic as long as there is an assessment component.

Submissions are due no later than 5:00 p.m. Eastern Standard Time on **June 10**, so don't delay! Submit your abstract via e-mail to Session Cochairs Rebecca Grier, rebecca.grier@gmail.com and G. Susanne Bahr, gbahr@fit.edu. Phone questions are welcome at 202/781-1442 (Rebecca) or 321/674-8104 (Susanne). Please refer to Proceedings of the HFES 53rd Annual Meeting (2009) for an [example](#).

Author's Kit Online

The author's kit containing instructions for uploading final proceedings papers is [now available](#). If your paper was accepted, you should have already received an acceptance notification from the program chair of the technical group to which you submitted your paper. Production-ready papers are due no later than 11:59 p.m. Pacific time on **Wednesday, June 30**.

The author's kit includes formatting and layout instructions, page limits, graphics embedding, copyright and clearance requirements, and uploading instructions. Also included is information about the Alphonse Chapanis Best Student Paper Award, presentation time limits, requests for audiovisual equipment, and information for student volunteers.

CEDM-TG Annual Meeting Student Award

By David B. Kaber, Chair, Cognitive Engineering and Decision Making Technical Group

To help enable students to participate in the HFES 2010 Annual Meeting in San Francisco, the Cognitive Engineering and Decision Making Technical Group will award five students up to \$700 each, up to a maximum of \$3,500. To be eligible, students must (a) be a full-time student (undergraduate or graduate) at the time of the HFES Annual Meeting, September 27–October 1, 2010; (b) be a member of HFES; and (c) have a submission accepted to the CEDM-TG program.

Awards will be prioritized on the basis of student need for support, including the number of sources and amount of funding a student has already received (or will receive) for participation in the Annual Meeting.

Application Requirements

Students wishing to apply for an Annual Meeting award must [complete an application](#) and submit it along with the following attachments:

- Curriculum vitae or résumé (maximum of 2 pages)
- Proposed budget for participation in the Annual Meeting
- One-page essay identifying reasons for seeking an award and an explanation of how attendance at the meeting will enhance your academic experience
- Proof of paper acceptance by the CEDM-TG
- Letter of recommendation for an Annual Meeting award from your academic adviser (one page)
- CEDM TG Student Annual Meeting Award Endorsement Form

Send the application and attachments via e-mail to CEDM-TG Secretary-Treasurer Karen Feigh, (karen.feigh@gatech.edu) no later than **May 31, 2010**.

Award Process

Awardees will be notified and funds made available shortly before the June 30 deadline for final paper submissions. All awards will be made by check to student recipients as gifts to their home institutions. The students' university or college must have an established gift account through which to receive the gift. The student's academic adviser and/or department will be responsible for overseeing disbursement of the award to the student recipient from the gift account. All award funds must be used to support student participation in the Annual Meeting.

All student members with a paper submission accepted to a CEDM-TG technical session are strongly encouraged to apply for this program. Please visit the [CEDM-TG Web site](#) for more information on this and other TG initiatives and activities.

HFES Officer Nomination Process Under Way

By Ronald G. Shapiro, Nominations and Elections Committee Chair

If you are a Full Member or Fellow, you should have already received your HFES nomination ballot for this year's election of officers.

Think about who would make great HFES leaders, ask them if they would like to serve, and, if they agree, include their names on the ballot. If you think *you* would be a great HFES leader, add your own name and then ask your colleagues privately to support your nomination by doing the same. Nominate those individuals who would be willing to contribute the time, energy, and ideas to provide the best Society leadership going forward.

If you missed Past President [Paul Green's article](#) in the January *HFES Bulletin*, you might like to read it before participating in the nominations process. Paul provided excellent recommendations on attributes to look for in potential candidates for HFES leadership positions and what is required from officeholders.

Up to three candidates can be included for each of the offices of president-elect, secretary-treasurer-elect, and Executive Council at-large member. Be sure to sign the back of the return envelope to ensure your ballot is counted, and return the ballot so that it arrives by **May 27**.

Those receiving the most nominations for each office, and who accept their nomination, will be placed on the election ballot, which will be sent to you in July. Every nomination counts!

IEA/Liberty Mutual Medal Call for Applications

By Andrew S. Imada, IEA President

The IEA is accepting applications for the 2010 Liberty Mutual Medal. The IEA/Liberty Mutual Award in Occupational Safety and Ergonomics was instituted in 1998 and recognizes outstanding original research leading to the reduction or mitigation of work-related injuries and/or to the advancement of theory, understanding, and development of occupational safety research.

The award recipient will receive a prize of \$10,000. Applicants need not be a member of the IEA or any of its constituent groups. Relevant disciplines include ergonomics, epidemiology, biomechanics, cognitive and behavioral psychology, design, physiology, medical sciences, economics, and engineering.

To be considered for the Liberty Mutual Medal, the applicant must submit a letter of application and a research paper in the domain of accident prevention, injury reduction, and/or early return to work, including rehabilitation. Details are provided at the [IEA Web site](#).

Persons wishing to be considered for the 2010 prize should submit an application via e-mail, including a cover letter and the paper, to IEA Awards Committee Chair David C. Caple, davidcaple@pacific.net.au, by **May 31, 2010**. Only electronic submissions will be accepted. Applicants will be notified of the results by mid-July.

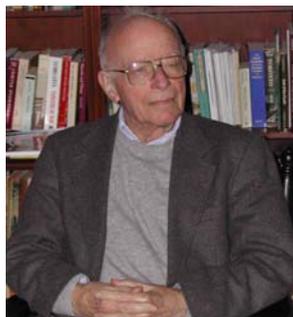
MEMBER MILESTONES

An Interview With HF/E Pioneer John W. Senders

On the occasion of his 90th birthday (February 26, 2010), *HFES Bulletin* Features Editor Pamela Savage-Knepshild asked human factors/ergonomics pioneer and HFES Fellow John W. Senders to share a few thoughts about his remarkable career and to give some advice to the next generation of HF/E researchers and practitioners.

What originally led you to pursue your remarkable career in human factors/ergonomics?

There are really two answers to this question. Answer A is that it was quite by accident. I was production engineer at the National Company in 1941 and ran into a problem with the visual inspection of tuning condensers of U.S. Navy transmitting equipment. The inspectors had to look at arrays of finely divided sheets of aluminum that were the tuning condensers in front of a large illuminated screen behind the inspection table. The inspectors complained about the light, and the process was neither efficient nor reliable: Defects got passed and good stuff got rejected. I found some sheets of colored gelatin plastic sheeting and presented the inspectors with various alternative background lights and invited them to choose. One of



the colored sheets produced a consistent reduction of false rejections, and the inspectors chose it as the best light. I had no idea at all of the actual spectrum presented, nor did it occur to me to look it up anywhere – there was a problem and I solved it. Later, I learned that I had been an unwitting human factors pioneer.

Answer B is that I was living in a small town near Dayton, Ohio, in 1950 and wanted to visit the Aero-Med labs at Wright-Patterson Air Force Base. It was just after the Korean war had started, and security was tight – only applicants for jobs could easily get in. I filled out an application for a research position, was sent up to see Walt Grether (whom I had met), and reassured him I did not want to fill the job they had and only wanted to see what the labs were like.

Some few months later, Grether asked me if I would consider becoming the head of the Apparatus Development Section to design experimental equipment. I thought it would be interesting and accepted. The question was, how do they employ an engineer who had never taken a course in engineering? (I had only an A.B. in experimental psychology from Harvard.) A few days later, I

received a notification from the U.S. Civil Service that my application had been processed and I was now qualified as a GS-9 (that was PhD level!) *aviation physiological psychologist*. The lab immediately took me on in that role, but for the engineering job.

I did that for a few months and decided that the Controls Section research was not very well done, so I started doing tracking research on a new gadget I had designed. I was then asked to be head of the Controls Section as well as the Apparatus Developments Section. Then, about 10 months later, a new section on Unusual Environments (G-forces, vibration, high temperatures, and so on) was set up and I was asked to take that also. So I ran three sections until I got bored, and in 1956 became head of the Psychology Branch of the Arctic Aero-Medical Lab in Fairbanks, Alaska. In 1957, Honeywell made an offer I could not refuse, so I moved to Minneapolis to set up a human factors research group.

What do you wish you had learned, or learned in more depth, during your formal education?

Queuing theory. It would have allowed me to leap over about 10 years of experimental fiddling with human use of sampled data.

What do you consider the most valuable lessons that you have learned across the wide breadth of your research, teaching, and applied experience?

Observe your own motor and perceptual experience. Much can be discovered from your own experience. The use of voluntary visual occlusion to measure attentional demand grew from my own experience driving in a rain storm. Play with ideas and things. Look for appropriate mathematical models.

What progress have you seen in HF/E research and application in recent years? What trends (beneficial or not) have you noticed over time?

The technological advances available to the experimenter have changed the way people think. I feel that the ubiquitous computer has made it almost unnecessary to think about the design of experiments. More papers are published, but I do not think that there are more good ideas.

In light of the technological advancements and their associated challenges that have occurred over the course of your career, how can the next generation of researchers and practitioners better address issues in HF/E?

I think that there are some interesting possibilities in studying the relationships between the idiosyncratic logic of users and the equally idiosyncratic logic of the machines they use.

What advice can you give to those just starting out and considering a career in HF/E?

1. Get a good mathematics foundation for whatever program you get into.
2. Read a lot of the early papers and books. There are many unsolved problems embedded therein.
3. Consider repeating some of the classic theories and experiments to see if the results hold up in the new world of computerized everything.
4. For every thousand ideas, give a hundred talks, write ten memoranda and publish one paper. Save the trees!!

Surgical Innovations Conference Highlights HF/E Research

By C. Melody Carswell

Human factors/ergonomics research was featured in a special session at the 6th Innovations in the Surgical Environment Conference, held March 25–26 in Annapolis, Maryland. The conference focused on innovations in surgical visualization, informatics, and simulation environments as these relate to improved safety – for both the surgeon and the patient.

Ulrich Malem reviewed the biomechanical risks of modern surgery and the use of ergonomic interventions to reduce the likelihood of long-term disability for the surgeon. I described the importance of monitoring the surgeon's mental workload in the operating room and discussed current methods for measuring the cognitive demands of typical surgical tasks. Frank Drews described the impact of display design on patient safety and the workload of members of the surgical team, focusing especially on anesthesia displays.

Conference participants were also provided with an opportunity to learn about the specific challenges of wartime deployment of new surgical technologies and procedural innovations via an interactive videoconference with surgeons currently serving in Iraq and Afghanistan.

Readers who are interested in more details about the conference may contact Ivan George (igeorge@smail.umaryland.edu) at the Maryland Advanced Simulation, Training, Research, and Innovation (MASTRI) Center at the University of Maryland Medical Center.

C. Melody Carswell is an associate professor of psychology at the University of Kentucky, where she is also associate director of the Center for Visualization and Virtual Environments.

Anthropometry and Biomechanics Standards Meeting

The U.S. TAG to ISO/TC 159/SC3 (Anthropometry and Biomechanics) will hold its annual meeting on July 22–23, in Yellow Springs, Ohio. Anyone interested in finding out more about this meeting may contact the chair of the U.S. TAG to ISO TC/159/SC3, Robert R. Fox, robert.r.fox@gm.com.

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