ACCE News

Newsletter of the American College of Clinical Engineering

See [page 11](#) for mentoring news

In this Issue:

President's Message

There's a lot of exciting things going on with ACCE. I'll highlight those and then discuss a recent article that I hope will start a conversation.

First I'd like to welcome our newest Fellow member - Jennifer Ott. I've known Jennifer for many years as a fellow CE in St. Louis, Co-CCE test taker (written and oral) and via mutual ACCE and HTF activities. She is a consummate professional and well deserving of this membership. Please join me in congratulating her.

Next, I hope you have noticed that our website has been updated. It took a lot of work by a lot of volunteers, plus a real yeoman's effort by Suly and Duane (our webmaster). I also want to thank Awarepoint for their sponsorship of the update and their patience while we went through the process.

Ilir Kulloli and Don Morge have resigned from the ACCE Board. I want to personally thank them for their support during the previous Board and this one. It's always a tough decision; you've made a commitment to support ACCE. But life has a way of unfolding that doesn't follow our plans. I remember several years ago I became a state public outreach coordinator for a non-profit. Midway through my term, it became apparent that my health needed more attention. So I thought about it and decided it was best for me to resign the position. Interestingly, it opened an opportunity for someone else. From there she has advanced in that organization to where she is now Missouri's delegate to the national organization. These things always work out.

With that, Jim Panella has taken on the treasurer duties and Mariana Hu of ABM has agreed to become our new Secretary. Please welcome them on board and consider volunteering to become President-elect - While Jim Keller's duties include finding Board candidates, let any Board member know if you're interested.

I tend not to jump on soapboxes much, but this is my column, so I can do this occasionally. I recently read an article on human factors and HTM called "The Next Patient Safety Frontier" by Vicki Lewis, a Human Factors Engineer.

https://www.linkedin.com/pulse/next-patient-safety-frontier-vicki-r-lewis

She emphasizes 7 steps to help resolve medical technology usability issues. Some of these steps seem obvious and hopefully all of us are doing. Some others seem, well, less achievable (my first thought was 'fruitless').

Step 1: Recognize the Problem

President's Message continued

Step 2: Talk with and Listen to the End Users

Step 3: Track and Record Calls, Highlight Usability Problems

These all seem obvious to me, and hopefully, to you. There are many reasons for those 'No problem found' issues, and rarely are they the end user's fault. As technical people we understand the equipment - clinicians are not techies, they are patient focused. Medical equipment user interfaces should be as easy (really, easier) to use as a smart phone. And the user manuals should be written for clinical users, not the technical writers as influenced by the company's attorneys.

Step 4: Report

Some of the challenges I've seen is that hospital staff have little ability to provide effective feedback on usability post-deployment. They have no mechanism to tell designers what they find; their only contact is local service, which is often a dead end. Also, the MedWatch program is not much real use. It's not worth the time from actual work to fill out the fairly awful form and the FDA typically only identifies statistical results and not specific incidents. Finally, all of this doesn't help the user now - any changes will be in the next generation of equipment, which we may or may not purchase.

Step 5: Ask for Products that Have Been Tested or Pay for Testing.

This sounds wonderful. How many of us have the resources (time and money) to pay for a lab to test usability? How many believe that your healthcare system is willing to wait months for thorough, independent, usability testing of, for example, five different infusion pumps. Finally, when we ask the vendor if their device has been tested for usability, would they say 'No'?

Step 6: Seek Information, Ask for Help

Step 7: Share Your Story

I completely agree with 6 and 7. There are many resources for us to use. The AAMI conference often has a session on human factors. Our ACCE teleconferences have presented on this in the past and will certainly do so again (especially if you ask for this topic). As for sharing our story, absolutely! We must share what we find, with our peers, our management, the manufacturers.

To be fair, the author recognizes these can be challenges. She concludes, and I agree - we need to start somewhere. If you aren't at least doing steps 1 through 3, why not? What can we do to make reporting usability issues easier and more effective? Has someone been following step 5? I don't know of anyone myself. Have you shared what you find with the rest of us? The newsletter editors always want articles. We have space on our Facebook page and now, blogspace as well.

ACCE has many opportunities for your contributions including the following::

Blog: As part of our new website ACCE now has a blog! This is an opportunity for all of you with social media chops to get your voice heard and contribute. It doesn't need to be much - please submit something. Ismael Cordero will be helping with our social media efforts, so please feel free to contact him if you have any questions.

By-Laws: As the Membership Committee worked on new member applications, they found that that section of our By-Laws needed updating, badly. Looking further, we discovered that our by-laws hadn't been updated for over 10 years. At the January Board meeting, we decided to form a task force to review and update the by-laws. Jim Wear is willing to be part of the taskforce, but we need more members and a Chair. Please let us know if you'd like to help this effort.

As always, thanks for your support.

Paul Sherman

President@accenet.org

ACCE Job Website Job Postings

For posting job opportunities, please contact Dave Smith at advertising@accenet.org

View from the Penalty Box

Entering a new year always brings some glimmer of hope that things will get better. But we then we turn on the news to see that the chance of a peaceful world is about the same as the Cubs winning the World Series. I am not sure who said it, but there is a quote that goes like this, "peace can only be attained when the love of power is overcome by the power of love". Take a few seconds and think about that quote and its impact on your life and your problems.

In a recent newspaper article here in the Boston area they talked about the re-admit rates at all the hospitals, they ranged from none, (suggest creative counting of days by those hospitals), to about a 2% level. Our local hospital where both my wife and I recently had surgeries had the highest rate in the state. I was at a loss to think of why such a rate occurred at this hospital and came up with one possible answer. There is too much data collection and too little listening to patients. Is it fact or fiction? I'm not sure but I am leaning towards fact based on my stay there and follow up care. Everyone seemed to be concentrating on the screen rather than looking at the patient, There also might have been some selective listening to the patient and subtle signs of a problem were missed. Data collection is needed, probably useful for the long term but the caregivers have to listen and react to the patients as they are the reason that we have jobs. Always put the patient first!

Being physically limited with what I can do for the past few weeks I spent a lot of time cleaning out my files, and wondering why I kept most of the items. Like so many engineers I kept a lot of information that I was going to use on the next design or problem. But when that design or problem came up, technology had advanced so much that the saved data was useless. But I still saved it. Some of it was more than 30 years old when it hit the shredder. I used the shredder so I could not have second thoughts on keeping the material. The recycle people were very happy with all the paper.

Take some time and thin out your paper data stash. If you are really adventurous start cleaning out the computer too. We need to use the same techniques to clean out our "procedures" of all those that no longer work or do not pertain to modern medical devices, I had protocols from the early 70's that probably had not been used since the early 80's. It is time to get rid of the useless. Unfortunately, we will have to wait until 2016 to clear out Congress but we can look forward to doing that cleaning too.

The next step in moving forward will be cleaning out the boxes of cables, components, hardware and test devices that are no longer useful. My father, who had a very limited education, often said to my mother, a well-educated teacher, that "Sh*t expands to fill the space allotted to it". She was a collector of "I might need this someday" and it took days to clean the house out after her death. As engineers we have that same tendency to say "I will keep this as I may need it someday". Take my advice. Throw it away if you have no near-term need for it.

The grandsons are doing well this hockey season. The oldest one is a co-captain of his high school team, the leading scorer and had a "Gordie Howe" in one of his games. For those of you who do not know, a Gordie Howe is a goal, assist and fight in the same game. I never had one, as I only had 5 goals in 7 years, but I had plenty of fights. The younger one is a smart player but is inconsistent and not aggressive. However, he is only 12. I never expect him to get a "Gordie" but he will score a few goals.
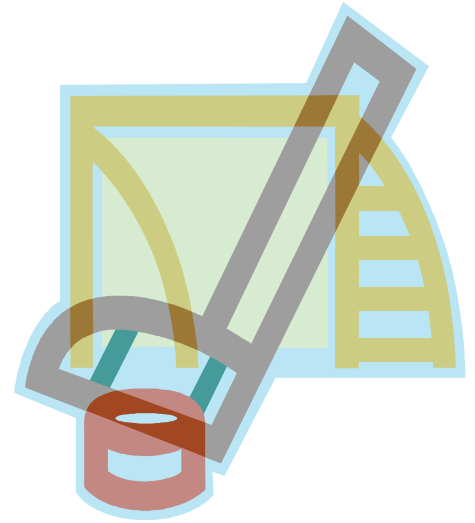
In closing, I would like to ask all of you to get involved with the various aspects of our profession and healthcare in general. As engineers we are better prepared than others in the hospitals to develop the technology-related costs for procedures as we know what is required for each procedure. As engineers we are better prepared to put together the capital budgets as we know what technology is failing, what is coming and what we should wait on. As engineers we are better prepared to help the medical staff utilize the new devices. Unfortunately the in-service education sessions that many vendors provide is not what is needed nor is much of the training done by the hospital in-service trainers. As engineers we are better prepared to point out potential problems with devices or procedures that may lead to legal actions. So let us all follow the advice of that great pundit Alfred E. Neuman who once said "After all is said and done, there's always a lot more said than done". But we follow Larry the Cable Guy with "Get 'r done". Please keep doing what we do best and share your wins and losses so we all can learn.

Dave Harrington

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Perspectives from ECRI Institute:

Maintenance Efficiency and Infusion Pumps

We know that infusion pumps are the most common devices in hospitals. We've all heard the expression "Pump it up" (made even more famous by the singer Elvis Costello with his song of that title in 1978). Surprisingly, many Health Technology Management (HTM) departments are "pumping up" the maintenance of their infusion pumps by inspecting them too frequently. Don't do that! Review your manuals and your work orders and see if you can set a longer maintenance interval for them.

Although 21st century infusion pumps are much more software-driven, pump hardware hasn't changed substantially. In the latest survey published in Biomedical Instrumentation and Technology (Sept/Oct 2014), "Maintaining Infusion Pumps" is the third highest medical device challenge.

Let's review what can be done to prevent pump failures and other problems and what we typically do to detect them. We call these activities Inspection and Preventive Maintenance (IPM).

Main IPM activities for Infusion Pumps

- Electrical Safety (grounding resistance and touch current). ECRI recommends that you only need to perform these tests for acceptance inspections or following a major electrical system repair. They don't need to be performed during routine IPM.

- Physical integrity (chassis and housing). Look at the general condition of the unit. Common problems include cracks in the case and other physical damage.

- Flow rate. Although out-of-spec flow rate delivery is exceedingly rare and there is probably nothing that you can do to prevent it, ECRI still recommends that it be checked when you perform an IPM.

- Alarms. Check alarms including occlusion and air in line alarms.

- Drug libraries and software updates. Make sure that your software and drug libraries are up to date.

- Batteries. Replace batteries as needed (that is your only true "PM" task).

Some pump manufacturers report a "Mean Time Between Failure" (MTBF) of over 4 years. ECRI's experience is that the majority of problems are detected by the self-test feature of the unit and by users and cleaning personnel rather than during IPMs

For these and other reasons, you would think that most hospitals would extend the IPM interval to as long as reasonably possible. But we see that isn't always true. In ECRI Institute's BiomedicalBenchmark™ we receive a summary of the IPM interval and time and the repair frequency and time for all devices in a hospital's inventory. Below is a table illustrating some of the inspection intervals for infusion pumps from our database.

Device	Interval Recommended by the Manufacturer	Intervals reported in Biomedical-Benchmark™ (months)
Model A	Per Hospital Policy	6, 12, 24
Model B	Per Hospital Policy	4, 12
Model C	Annual	12

According to the latest requirements published by The Joint Commission and the Center for Medicare and Medicaid Services, infusion pumps can be on the hospital's "alternative equipment maintenance/management" (AEM) program. That means that you may elect to use an IPM interval that is longer than the one recommended by the manufacturer. Both organizations say that Clinical Engineers and/or BMETs are qualified to determine the maintenance interval. Sometimes even the manufacturer is recommending that your hospital select
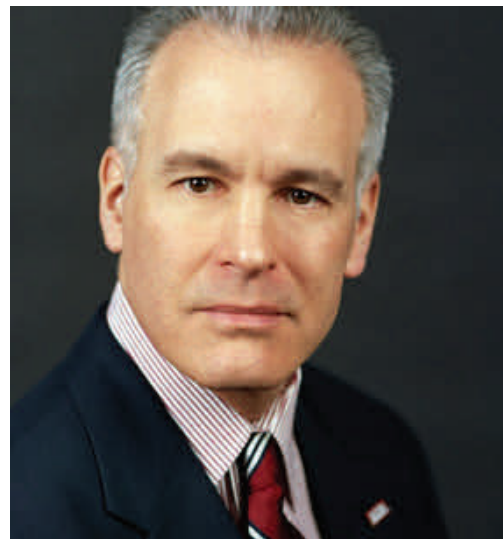
Jonathan Gaev , MS BME, CCE, has worked at ECRI Institute for over 20 years, and is currently the Business Line Manager for ECRI Institute's Biomedical-Benchmark™ which helps improve the efficiency of Health Technology Management departments.

the interval!

Why doesn't everyone select the longest interval that they believe is safe? I suspect that "busyness" is a powerful force. Since the technology itself hasn't changed much, hospitals are probably just going along with the intervals that they established years ago. A more effective approach would be to take an "evidence-based maintenance" view. Review the service manual to see what the manufacturer recommends, look at your maintenance records to see what problems have been reported and then determine what your IPM can do to address those problems. You also could inspect a sample of your pumps each year if you are uncomfortable about extending the inspection interval for all of them.

ECRI Institute encourages you to take a fresh look at your maintenance practices for infusion pumps and to make a careful decision on how to maintain them efficiently. We have a great team of infusion pump experts who would be glad to help. Please share your thoughts and experiences with us.

Jonathan Gaev

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AAMI Update

Humidity Levels in the OR

How should healthcare delivery organizations tackle the complex challenge of setting appropriate relative humidity (RH) levels in the operating room (OR)? A group of professional healthcare and sterilization organizations has studied this question and has recommendations on how to assess the risks associated with this question, especially as it relates to the impact on sterile supplies and electro-medical equipment.

"Healthcare facility leaders should think about whether lower humidity levels are desirable and appropriate in their facility—and the answer may vary depending on the climate where the facility is located, the services offered, and the products and equipment used in their location," the organization say in a joint communication released last month.

Concerns in the field about appropriate humidity levels in the OR, equipment, and regulations related to them prompted a meeting this past fall at AAMI headquarters in Arlington, Va., involving multiple stakeholders. A joint statement was developed in the wake of that meeting. Its goals are to ensure that patients are protected through the safe use of equipment and that resources for installation, energy, and ongoing maintenance are used efficiently.

"Many healthcare delivery organizations are choosing to lower their humidity levels," said AAMI President Mary Logan. "Doing so can affect the shelf life and integrity of sterile supplies. This document provides points facilities should keep in mind as they think about lowering humidity levels."

The communication provides background on the issue and explains why some medical supplies cannot tolerate the lower RH levels. Manufacturers of these supplies want to support the HDOs in expanding the RH range, but they cannot change their products overnight, according to the statement.

"It will take some time for manufacturers to modify products and/or packaging to accommodate or verify the lower minimum RH, complete testing requirements for these typically regulated products , and

have those products available for HDOs," according to the communication. It advises HDOs to follow the product's instructions for use or contact the manufacturer if they cannot find an answer to their question.

The communication, which is available at www.aami.org/news/2015/Humidity_in_OR_Joint_Communication_to_HDOs_January_2015.pdf, includes considerations for preparing for lower humidity levels, including whether checking the IFU for existing inventory of supplies used in the OR and what level of humidity the heating, ventilating, and air conditioning system can maintain.

Report on Ventilator Technology Urges Enhanced Culture of Safety

Fostering an enhanced culture of safety is a necessary condition for addressing challenges with ventilator technology, according to a report from AAMI. The report, *Creating a Culture of Safety, Priority Issues from the 2014 AAMI/FDA Summit on Ventilator Technology*, sheds light on the complex challenges associated with the use of ventilator technology and sets forth a series of ideas for addressing them.

More than 160 multidisciplinary stakeholders attended the AAMI/ FDA Summit on Ventilator Technology, which was held Sept. 16–17, 2014, in Herndon, VA. Participants and presenters at the summit shaped a vision of a safer and more effective environment of care for patients who depend on ventilators—remarkable, life-saving equipment that could be even better.

The summit report describes six "clarion themes" that will be vital to achieving this vision. Patients and the entire healthcare community would benefit from:

1. Clear, standardized language for mechanical ventilation and ventilation modes, used broadly and consistently to improve patient care and enhance clinical information.

2. Shared understanding of biocompatibility expectations for ventilator technology—and a safer, clearer, faster path to market.

3. Clinicians who are consistently trained, competent, and certified to care for ventilated patients and operate the ventilators they use.

4. Integrated devices and systems, including alarm systems, that provide clinicians with comprehensive, actionable information about ventilated patients.

5. Intuitive and consistent user interfaces that make it easy to set up and operate ventilators in clinical and nonclinical settings.

6. A strong and transparent culture of cooperation, coordination, and collaboration in which shared information spurs improvements in the safety and outcomes of mechanical ventilation.

As described by Anya Harry, branch chief of the FDA Center for Devices and Radiological Health Respiratory Devices Branch in the summit report, work is needed to improve patient safety and outcomes, including:

- Balancing adequate gas exchange and avoiding lung injury associated with positive airway pressure and oxygen exposure

- Minimizing the duration of mechanical ventilation with protocol-driven, spontaneous breathing trials and autonomous weaning functionality

- Improving visual and auditory alarm signal functionality

The ventilator technology event marked the sixth time that AAMI and the FDA have collaborated on a summit focusing on an important issue in healthcare technology. Previous summits have tackled medical device interoperability, clinical alarm management, reprocessing, home healthcare, and infusion system safety.

Survey: Networked Systems Continue to Challenge HTM Professionals

Healthcare technology management (HTM) professionals face a number of challenges as they make sure the equipment they maintain provides safe and effective care. A recent survey, which includes responses from 195 hospitals across the United States, reveals what problems keep them up at night.

Ensuring that networked devices and systems work properly topped the list of medical device-related challenges, according to the results of a survey commissioned by

Healthcare Technology Foundation News

The Healthcare Technology Foundation (HTF) is off to a good start for 2015. Here are a few of our key activities:

Alarms Update

The alarms group is in full swing. The chairperson is Izabella Gieras and includes members Tobey Clark, Jennifer Ott, Nancy Pressly, Marcia Wylie, Tony Easty, Tom Bauld, Marge Funk, Paul Coss, and Yadin David. They have been diligently working on a safety brochure for the public involving a general overview of clinical alarm systems. They even engaged a patient safety advocate to ensure that proper language is being used. The goal is to release the brochure in the first quarter of 2015.

HTF board members Yadin David, Marge Funk and Tobey Clark will be presenting a session at the World Congress, see link below, on Alarms: Challenges, Strategies & Clinical Management. They will address such objectives as:

1. Understanding the problem of alarm fatigue and its impact on patient safety.

2. Identifying effective strategies for alarm management.

3. Discussing attitudes and practices related to clinical alarms as revealed in the Healthcare Technology Foundation's national surveys.

HTF in the News

HTF Board member Tony Easty, Senior Scientist, University Health Network, Toronto General Hospital, is the Co-Chair of World Congress on Medical Physics & Biomedical Engineering http://wc2015.org/. Tony is also on the Scientific Committee of this triennial international program. In addition to the alarms session mentioned above, Yadin David and Tobey Clark will be presenting in other sessions at this global event (see article on page 11).

Barrett Franklin, Acting Deputy Network Director, VA New England, was featured in the AAMI News Volunteer Spotlight http://www.aami.org/publications/AAMINews/Jan2015/Volunteer_Spotlight.html. Barrett has been an active HTF board member since August 2013.

Paul Sherman, ACCE President, http://accenet.org joined HTF as an Advisory Board Member following his election. Paul recently left the Veterans Administration after 24 years and is now Technical Program Manager, IHE PCD.

Board members Izabella Gieras and Yadin David were featured interviewees by 24x7 Magazine in the January 2015 issue http://www.24x7mag.com/2014/12/the-year-ahead-in-healthcare-technology-management/ regarding their expectations and predictions for the year ahead for healthcare technology management.

The first CE-IT Community Town Hall of 2015 - Future Trends of Healthcare Technology - took place on January 29th featuring HTF board members Izabella Gieras (Huntington Memorial Hospital) and Marcia Wylie (Scripps Health). The session addressed topics such as medical device integration, standards, staffing models to support future needs, alarm management, consumer medical devices, medical device security, and mobile health apps.

Karen Giuliano will be participating in the National Coalition for Infusion Therapy Safety being held by the AAMI Foundation's Healthcare Technology Safety Institute (HTSI). This is a two-year initiative with a kick-off in March. HTF will also be a supporting organization for this initiative.

HTF will be a cosponsor of the spring AAMI Horizons which will focus on risk assessment in healthcare technology. More information will be shared in the future. HTF is always excited to work with AAMI on healthcare technology safety endeavors!

HTF Expert Panels

HTF hosted its first Expert Panel. It was a fun and rewarding experience for those who participated. We hope to cultivate this concept further. This is a fast and affordable resource for companies or organizations to gain valuable insight from a number of healthcare technology thought leaders at one time. Expert panels are qualitative in nature, and differ from focus groups in that they are not blind research studies with groups of potential customers. Please contact us for further information.

Be sure to visit the HTF website, www.thehtf.org to see our programs and resources. While you are there, feel free to hit the DONATE NOW button. We will accept them at any time and they are always tax deductible!

Tobey Clark, President HTF

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Journal of Clinical Engineering Subscriptions for ACCE Members

ACCE members receive a discounted subscription to the Journal of Clinical Engineering for only $99! (Originally $222). You must login to the ACCE website to view the code. Then visit LWW.com to enter code.

The Clinical Engineering Hall of Fame

Now that it has been 25 years since the inception of ACCE, we have a story to tell that the outside world needs to know.

The Clinical Engineering Hall of Fame (abbreviated as CE-HOF) is a recognition program and virtual museum established by ACCE with the purpose of celebrating the application of engineering and managerial skills to support and advance patient care through technology, and honoring the individuals who made extraordinary contributions to this effort.

Current ACCE Advocacy Awards continue to play an important role in our profession; they are "inward facing toward the profession"; this new program is "outward facing" to the wider public.

The CE-HOF honors the work of these founders of medical technology and CE in a formal way. The CE role in healthcare is not understood by the wider public, so CE-HOF is important.

By recognizing the visionaries, leaders, and luminaries who helped to create and advance the CE profession, ACCE believes the CE-HOF can help the society at large to appreciate the essential role of these professionals within the healthcare environment. Without highly qualified, motivated, and dedicated CE professionals, it would be impossible to deploy technology safely and cost-effectively to prevent and diagnose diseases, as well as treat and rehabilitate patients in any part of the world.

In addition, the CE-HOF allows students and others who are interested in exploring clinical engineering as a profession to understand and appreciate the challenges and rewards in pursuing this career.

Nomination Eligibility Requirements

Who: Any person, alive or deceased, who has made outstanding and notable contributions to Clinical Engineering, or to the evolution and advancement of Clinical Engineering, can be nominated for the CE-HOF, regardless of age, sex, race, nationality, residency, education level, years of experience, and membership within ACCE (i.e., non-ACCE members are acceptable).

Unlike most ACCE awards, a person cannot be inducted to CE-HOF based on a single achievement, extended period of service, or any contribution that can be considered as normal and expected from his or her employment or assignment. Furthermore, none of the accomplishments presented to support the nomination can be less than 10 years old, so it is clear that those accomplishments stood the test of time.

Criteria: For an individual to be eligible for induction consideration, the contributions made by the candidate must meet one or more of the following criteria:

Impact: The contribution has significantly impacted the development or growth of CE and continues to demonstrate relevance to the profession's continual advancement and evolution.

Influence: The contribution has significantly influenced: i) the work of others in the field; ii) the healthcare industry; iii) society at large, regardless of country or region of the world.

Innovation: The contribution has challenged the status quo and entrenched misconceptions with original thinking/creativity through: i) introduction of new concepts, methods, or tools; ii) removal or reduction of obstacles; or iii) enhancement of safety and reliability of medical equipment.

Reach: The contribution has significantly impacted large amount of current and prospective CE professionals, clinical users, regulatory authorities, patients, and society at large.

Nominations Committee (NC): A CE-HOF NC has been created and Bylaws written and approved. Co-Chairs are David Harrington and Jennifer Ott, with other members Jim Wear, Binseng Wang, and George Johnston. Tom Judd is facilitator and alternate. The NC was established for the purpose of reviewing nominations and selecting deserving candidates for voting by the entire ACCE membership.

Nominations Process: Individuals or organizations interested in nominating a candidate to the CE-HOF must complete a two-page form and provide clear and concise evidence of the accomplishments that justify the nomination to the CE-HOF Nomination Committee by March 31, 2015 for consideration for induction in the following year. At least three letters of support from well-known clinical engineering professionals are expected (to be garnered by the Nominator and sent in by March 31.)Extensive evidence to support the nomination is expected. Self-nomination is not acceptable, but multiple nominations for the same candidate are accepted (for later consolidation by the Nomination Committee). The completed nomination form and supporting material should be sent to the CE-HOF Nomination Committee, care of the ACCE Secretariat.

Nominations Review: The NC shall review all nominations received by the deadline to determine whether the nominees meet the minimum required eligibility criteria as described above. Each year, the Committee shall select a small number of candidates for subsequent voting by the entire ACCE membership.

Voting Procedure

The candidates screened by the NC will be submitted to vote by the entire ACCE membership eligible to vote (i.e., individual, fellow and emeritus members). A minimum of 75% of votes received is required for induction into the CE-HOF.

Non-winners: Candidates who did not receive 75% of the votes are allowed to be nominated again two more times only.

Induction and Recognition: Each year, the inductees voted by ACCE membership will be announced at the ACCE annual assembly (or awards ceremony) and via official ACCE publications and website. No mone-

From the Editor's Desk: HIMSS-IHE Connectathon

Recently, I had the opportunity to participate as a "monitor" and attend the week-long IHE Connectathon in Cleveland, Ohio. For the first time the venue was at Cleveland's convention center and the new HIMSS Global Center for Health Innovation. Being from California, Cleveland in the winter was an experience. As one of the other Connectathon monitors said, "… it's a great place to be stuck **indoors** for a week testing medical device interoperability".

The Connectathon is in its thirteenth year and is the technical prelude to the HIMSS and AAMI conferences Interoperability Showcases as well as an opportunity for vendors to showcase their development of IHE compliant products. With Meaningful Use and all the emphasis on Healthcare IT, interoperability has become a de-facto, if not regulatory, industry mandate for hospitals and device manufacturers. On the Connectathon floor this year, over 500 engineers and IT staff representing over 100 companies and organizations, were working on interoperability, sending and/or receiving data from previously registered partners, in some cases their competitors, using a variety of IHE profiles and use cases.

This quick review of the Connectathon will cover two quite different parts of

interoperability: The primary reason I was there was to work as an independent, volunteer monitor testing compliance of IHE PCD (patient care devices) profiles. I also attended a one-day, high-level conference focused on nationwide data sharing using IHE protocols.

For me, the Connectathon was a new opportunity to continue my long-term interest in medical device and IT connectivity and interoperability. Most of the week, I was part of a group of "monitors" whose job was to assess the testing done by the device manufacturers using the IHE PCD domain profiles. The PCD domain covers medical devices including physiological monitors, ventilators, infusion pumps, pulse oximeters, anesthesia machines and more, most of which were represented at Connectathon. For example, company X wants to test its infusion pump integration, so it teams with an EMR company, or one of the middleware companies, and connects its networked infusion pump to its server and, in turn, to an EMR product from company Y. (IHE requires the test partners to be from different companies.) After the test partners feel the test is ready for verification, they enter it onto a work-list and it is then selected by one the PCD monitors for testing. The testing consists of everything from using a NIST (National Institute of Science and Technology) test tool specially developed to test PCD IHE compliance of the HL-7 data

streams, to actually observing tests, to reviewing and discussing the tests with the company engineers, to reading HL-7 code. Fortunately for me, as a monitor rookie, most of the time the NIST test tool took care of the HL-7 details so I did not have to spend too much time reading HL-7 code. Also, several experienced monitors, including some of the NIST staff that worked on test tool development, were part of our team, so, we had a great deal of expertise readily available to answer all of our questions.

The Connectathon environment is rather unique. In our day jobs, many of us in Clinical Engineering spend a lot of time dealing with medical device marketing and sales staff. At the Connectathon we were working directly with the engineers who are designing and making these products work, with no marketing or sales activity going on. The work was very collaborative, with competitors working together side-by-side to complete the testing and solve problems right when they occur. For example, on Monday afternoon, at the beginning of the testing, it initially surprised me how many of the tests did not complete or were only able to be "partially verified" (i.e., sent back for problems to get fixed). Subsequently, even on the first day, I was able to indicate a problem with one of the tests and it was fixed and retested and re-verified all by the end of the first day. I don't have the exact statistics, but a few hundred PCD tests were completed during the week. There may have been a few (not many) disappointed folks whose tests did not pass or were withdrawn, but most likely, they received feedback information to help them improve their IHE development efforts for next time.

In my "day job", we have several integrated systems, and it has become somewhat routine for devices to send real-time HL-7 patient data with one way communication (not necessarily IHE compliant) from a medical device (e.g. physiological monitor) to the EMR, either with or without an interface engine or middleware product in the middle. Examples include physiologic monitoring via central stations, physiologic monitors via middleware, and anesthesia machines. We have several other integration projects planned for the future and, hopefully, using

More than 500 engineers, and their computers, gather to connect their medical devices and applications at the 2015 IHE Connectathon in Cleveland Ohio

Connectathon

IHE PCD profiles these can be completed more quickly and more efficiently using fewer resources than the integrated systems we have already implemented.

I was also very interested in progress on some of the newer IHE PCD profiles including::

Alarms (note: IHE now calls alarms alerts): Several companies and devices (e.g. monitors, infusion pumps) can now send and receive alarm information using the ACM and IPEC profiles. This will make it easier to collect and distribute secondary alarm and alert information.

Infusion pumps: Several infusion pump companies have working infusion pump documentation (sending data from infusion pumps to the EMR). A longer term project prototype was demonstrated whereby a pump vendor and a middleware company showed a Samsung Galaxy handheld device as the end-user tool connected to a server enabling an infusion pump medication order to automatically program the infusion pump (nurse validation of the pump program was required before the medication is delivered).

Others demonstrations of interest include the first implementation of the MEM and MEMLS profiles from a CMMS vendor. This allows utilization, location and device status information (e.g. battery needs recharging) to be automatically sent to a CMMS or other device-related information system.

On Wednesday of Connectathon week I had the opportunity to attend a one-day IHE conference with several speakers including interesting presentations at a very high level starting with the CMIO from the Cleveland Clinic, Martin Harris MD, and ending with ONC interoperability manager Erica Galvey. From my perspective, their theme was sharing of relevant healthcare data in a safe, secure and confidential manner across divergent heath systems, perhaps with different

companies' EHRs, and across communities, states and the entire US. Both a patient focus and a population focus (e.g. registries) are important. Some interesting tidbits (with my comments in parenthesis) include:

- Walgreens is the largest provider of vaccines in the US. (so how do you get vaccine information into the patients "home" EMR?)

- 80-90% of health determination is NOT related to healthcare (in other words, your heredity, diet, exercise, economic situation, environment, smoking habits etc, are much larger determinations of your overall health than your healthcare)

- US nationwide interoperability will take 10 years or more to implement

Very little was said about healthcare cost containment other than Dr. Harris pointing out that specialty surgeries (e.g., knee and hip surgeries) can be performed at lower costs using "CarePaths" in very experienced teams doing large numbers of procedures……. (seems like cost is by far the biggest challenge, and what else is new).

Ms. Galvey discussed the just-released ONC draft "shared nationwide interoperability roadmap" (see http://www.hhs.gov/news/press/2015pres/01/20150130a.html) which is now open for public comment. It contains three key themes about healthcare data: Collect, Share, Use. She stressed that this draft ONC document emphasized the "Share" component. While there are currently disparate systems that share documents, (e.g. using the IHE CDA profile), my understanding is that this endeavor standardizes the data *fields* in a sufficient manner so that data can be shared at the field level. For example, when I receive a flu vaccine at Walgreens, and I approve the release of the information, Walgreens can send that data to my "home" healthcare provider; not as a written report, but just the relevant vaccination fields (e.g. flu vaccine, vaccination date etc) with my matching demographic information in order to automatically load the vaccination data into my "home" medical record. There are a number of technical and political challenges to this vision of nationwide interoperability including the need to normalize field definitions among disparate systems (that's where IHE can help) and normalizing differing regulations between

the states among other political and social challenges.

Other interesting comments came from the audience including one person (from a major medical device company) questioning whether it was necessary and appropriate to be sending all the medical device data or whether that was "flooding the EHR" with data of no, or limited, clinical value.

Back to the Connectathon floor, I witnessed examples of where MORE data was being proposed to be sent. One was a company testing sending pulse oximetry data once per second for some experimental algorithms under development (that's about 86,000 data points per day!). There was also a very interesting demonstration of waveform data from a BIS (EEG monitor) being sent to an EMR (again a very large amount of data) using the new IHE PCD WCM profile.

In my opinion, some very important clinical research needs to be completed to help determine appropriate "filter and discard" (my terms) algorithms since some of this data is not needed at all (think data fatigue, similar to alarm fatigue). Some of this data is very time sensitive and has a large amount of clinical value at the time it was collected, and for a very short time thereafter, but may not have much value later (e.g. repetitive stable vital signs). And some of this data needs to be clipped or edited at the source or soon afterwards (e.g. relevant video clips during MIS surgery or endoscopy procedures.) Medical device and IT vendors need clinical guidance (research) to guide them in determining what to leave out. It is not only a case of "memory is cheap, so let's keep everything", but the large amount of data "clogs" networks, storage and worse, can make the user interface more difficult to navigate to locate clinically important information.

In closing, IHE PCD is the future of medical device integration and provides an outstanding opportunity to show how clinical engineers can work to improve healthcare. If you want to learn a lot about integration, I definitely recommend volunteering to work the Connectathon. For more information, contact Paul Sherman, IHE PCD program chairman and ACCE president.

Ted Cohen, Co-Editor ACCE News

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AAMI Update continued

AAMI. The survey, the results of which appear in the September/October issue of AAMI's *BI&T* (*Biomedical Instrumentation & Technology*) journal, found that 62% of those surveyed rate the networking issue as "challenging" or "extremely challenging." Meanwhile, 52% name integrating data into electronic health records as their top concern. Maintaining infusion pump systems (44%) came in at number three.

The results reflect those seen in previous AAMI-commissioned surveys, indicating that there are no easy solutions for these ongoing complex problems. Other challenges making the list are cybersecurity, device incident reporting, recalls, spectrum and wireless management, battery management, endoscope management, and nonhospital devices being brought in by patients.

Human Factors Engineering for Processing Medical Devices

Human factors engineering principles play a huge role in the proper processing of medical devices. To help in the development of clear and consistent instructions for use (IFU) and education and training guides for processing equipment, AAMI has unveiled a new technical information report.

Intended for medical device manufac-turers, the document is called AAMI TIR55: *Human factors engineering for processing medical devices*.

"Medical device processing is performed by and is dependent on humans, and therefore human factors engineering needs to be considered in the design of the various elements of processing," according to the document.

In the section dealing with IFU, the document recommends using text and images in close proximity to improve comprehension. Also, instructions should be in a text that is easy to read and simplifies jargon. In addition, the document recommends starting sentences with action verbs when describing steps, breaking down each into separate bullet points.

"TIR55 provides information not available in other AAMI documents and will assist the medical device manufacturer in designing a device, creating IFU, and providing education, training, and competency assessment tools so sterile processing can more effectively and efficiently clean and sterilize medical devices," said Martha Young, president at Martha L. Young, LLC, who provides sterilization solutions for healthcare. AAMI Staff

Welcome New Members

We welcome our newest members approved by Membership Committee.

Name	Class	Job Title	Company	Country
Alexandre Her-mini	Individual	Professor/researcher	University Federal Itajuba & UNI-CAMP	Brazil
Jun Yoshioka	Individual	Clinical Engineer	Yamagata University Hospital	Japan
Frederico Martin Graciá	Candidate	Electronic Engineer	Universidad Tecnologica Nacional - FRM	Argentina
Jorge Leonardo Castellanos Irias	Individual	Manager	Seijiro Yazawa Iwai Honduras, SA	Honduras
Beluh Mabasa	Individual	Staff	Ministry of Health	Indonesia
Timothy Anton Okhai	Individual	Lecturer	Tshwane University of Technology	South Africa
Jeff Short	Institutional-Associate	Manager, Biomedical Engineering	University of Michigan Health System	Michigan/USA
Jan Andrysek	Institutional-Associate	Associate Director	University of Toronto/Institute of Biomaterials & Biomedical Engineering	Canada

Jennifer Ott, ACCE's Newest Fellow

Congratulations to Jennifer Ott, MS, CCE, FACCE, the latest ACCE member to be inducted to Fellow status. Jennifer is a project planner at NorthStar Management Company and a long-serving officer and Secretary of the Healthcare Technology Foundation (HTF).

World Congress on Medical Physics & BME

Canada is proud to host the next IUPESM World Congress on Medical Physics and Biomedical Engineering (IUPESM WC 2015), to be held at the Metro Toronto Convention Centre, June 7 – 12, 2015. The Canadian Medical and Biological Engineering Society (CMBES) and the Canadian Organization of Medical Physicists (COMP) have joined forces to host this international event. The Congress is sponsored by the International Union of Physical & Engineering Sciences in Medicine (IUPESM) and its member organizations, the International Organization for Medical Physics (IOMP) and the International Federation for Medical and Biological Engineering (IFMBE). The Congress will also serve concurrently as the annual meetings for both CMBES and COMP in 2015.

The IUPESM World Congress attracts biomedical engineers and physicists from around the globe. IUPESM World Congress 2015 offers an exceptional opportunity to showcase the breadth and calibre of biomedical engineering and medical physics from around the world. The Congress em-braces all aspects of biomedical engineering and medical physics and welcomes everyone who is working in these fields or has an interest in them.

The Metro Toronto Convention Centre is located right in the heart of downtown Toronto and provides a truly exceptional venue while offering a superb variety of restaurants, accommodation and tourism opportunities close by.

In addition to 19 concurrent tracks, there will be plenary sessions, continuing education sessions with a long list of invited faculty presenting in English, French and Spanish, and a large exhibits area featuring key vendors of health technologies. Clinical Engineering will be well-represented, with its own dedicated track and with a high level of interest from clinical engineers and clinical physicists from many countries. This event is held just once every three years, and so this represents a rare opportunity to connect with colleagues around the globe.

The Congress is co-chaired by David Jaffray (Medical Physics) and Tony Easty (Biomedical Engineering), who are com-mitted to organizing a truly memorable event. Congress planning activities are well underway. Please view our website at http://wc2015.org/ for more information about the Congress. Your active contribution is welcome and we look forward to hosting you in our world-class city of Toronto in 2015.

Tony Easty

Tony.Easty@uhn.ca

HIMSS Showcase Volunteers Needed

Are you thinking of going to HIMSS15 in Chicago in April? Would you like to spend time in the Interoperability Showcase and get free admission to the exhibit hall (and likely to educational programming)? If so, see the volunteer link at http://www.interoperabilityshowcase.org/himss15/volunteer_home.aspx.

If you would like to volunteer for the Showcase, go to the HIMSS volunteer webpage, fill out the volunteer survey form and let Manny Furst (efurst@imp-tech.com) know so he can assign you to the Patient Care Device domain's demonstrations. Possible volunteer roles include: Docent for PCD clinical stories; and demonstrating the benefits of device to CMMS messages including alarms and data that will communicate device condition and status; and also RTLS to CMMS messages. Combined, the device and location data contribute powerfully to safety, workflow, regulatory compliance and financial management.

ACCE Mentor Program Needs Your Help

Are you interested in helping implement the mentoring program for ACCE members? Do you wish to serve as a mentor? If YES, please complete the short survey to give us your feedback on your interest area(s) for this emerging program. While we have a framework for the mentoring program, we lack details such as; how to select mentors and mentees, how to best match mentors with mentees and other questions. For more information, contact Gerald Goodman at mentoring@accenet.org.

To indicate volunteer interest in any ACCE activity, please complete this form.

Advocacy continued

tary award or plaque will be offered. Instead, the recognition will be made in the virtual museum on the ACCE website.

Website: Inductees to the CE-HOF (or their family members, in case of posthumous recognition) will be notified and asked to provide pictures, biography, documents, videos, etc. that will be edited and posted on the CE-HOF web-section within the ACCE website, so the general public, clinical engineering professionals, and aspiring professionals can learn and appreciate the extraordinary contributions made by these pioneers.

Nominations form

2015 Timetable

Nominations period: February 1 – March 31, 2015

NC Review and Voting: April 2015

Announcement of Winners: May 7, 2015

Induction: June 7, 2015 in Denver

Tom Judd, Advocacy Committee Chair

Tom.Judd@gmail.com

ACCE's Newly Designed Website is Launched

Over the past few months, the Website Task Force team, led by Paul Sherman, worked with webmaster, Duane Kamihara to design and reorganize our 10-year-old website. The new website was just launched at the start of the New Year.

ACCE would like to thank the website upgrade Task Force team: Paul Sherman (leader), Joan Brown, Ted Cohen, Ismael Cordero, Suly Chi, Dave Harrington, Antonio Hernandez, Jacob Johnson, Tom Judd, Jim Keller, Ilir Kullolli, Alan Lipschultz, Pratyusha Mattegunta, Jared Ruckman, Dave Smith and James Wear. ACCE would also like to thank Awarepoint for the generous support for this project.

The Task Force began by reviewing each old web page, reorganizing and adding content. Our new site kept all the relevant information and added new content with a modern, new look. With the goal of bringing members together, we added features such as Photos and the ACCE Blog. Board member Joan Brown made the first post to the new blog with an introduction. We encourage you to create your own post in any of the several available categories which include: Career Development, International, and Technology Issues. Just visit the ACCE blog and click on "create a post".

Visit us online often and learn about ACCE History, Volunteer with the various tasks within ACCE, or login and read the complete archive of ACCE Newsletters. If you are submitting articles or ads for ACCE Newsletter, you can find the guidelines online.

The Photos feature is still under construction. If you have photos of any ACCE activities you would like to share, please email them to secretariat@accenet.org along with a description including the date and location of the event.

ACCE Staff

ACCE Calendar

March 12, 2015
Educational Webinar: Career Development for Device Integration

March 20, 2015
Deadline to submit article/advertising for March/April edition of ACCE News

March 26, 2015
CE-IT Town Hall: Collaboration among HTM, IT, clinicians

March 31, 2015
Deadline for Nominations for Clinical Engineering Hall of Fame.

April 12-16, 2015
HIMSS 2015 Annual Conference & Exhibition, McCormick Place, Chicago, IL

April 13, 2015
CE-IT/ACCE Awards Reception, in Chicago

June 5-8, 2015
AAMI 2015 Conference & Exhibition, Denver, CO

June 7, 2015
ACCE Membership meeting at AAMI Conference in Denver

July 11, 2015
Deadline for 2015 CCE exam application for applicants testing outside the US/Canada

August 8, 2015
Deadline for 2015 CCE exam application for applicants testing in the US/Canada

ACCE

AMERICAN COLLEGE OF CLINICAL ENGINEERING

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