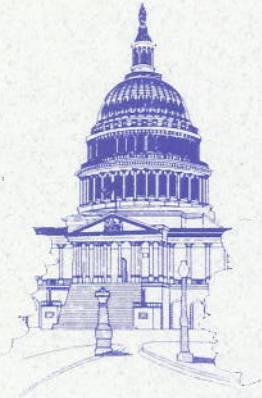


ACCE News

Vol. 7, No. 3 - May 1997

Clinical Engineers On the Hill

Francine Reibman



The ACCE Government Relations Committee focus will be on our Nation's Capital in June as members visit congressional offices. The importance of clinical engineering in curing what ails our health care system will be stressed. ACCE will volunteer its expertise as a resource to members of Congress. See Letter to your Congressman, Page 4, this issue. See President's Message on Page 2.

Congressmen will receive an information packet including an issue of *ACCE News* and the newly created brochure, "What's a Clinical Engineer."
Continued on Page 4.

Clinical Engineering Week

Last month during National Engineering Week in health care facilities across the country, effective demonstrations showed the great importance of clinical engineering in managing health care technologies. Michigan and the District of Columbia were the sites of two particularly successful programs that celebrated the contributions clinical engineers are making to society and to health care in particular.

Continued on Page 4.

Advanced Workshop

Washington, DC, is the site of the Advanced Clinical Engineering Workshop presented by ACCE. Five, half-day sessions will focus upon the topics most critical for the clinical engineer in today's health care environment. Topics are described below.

- * *Assess, Acquire, & Manage Technology*
- * *Understanding the New Healthcare Market*
- * *Hazard Reduction and Quality Improvement*
- * *Best Clinical Engineering Business Practices*
- * *Technology Trends: EMC, CGMP, Telemedicine*

Continued on Page 3.

Teleconferences '97

The ACCE Teleconference Series for 1997 began on April 17. This year's series of lunchtime lectures on critical issues in clinical engineering continues the tradition of high quality, informative presentations by the world leaders. See this issue of *ACCE News* (Page 9) for registration information and the schedule of lectures and speakers.



Attendees at Last Year's ACCE Annual Meeting Agree to Meet in 1997

ACCE Annual Meeting in Nation's Capital

ACCE will hold its Annual General Meeting on Tuesday, June 10, 1997, in Washington, DC. Come at 6 PM to the wine and cheese reception immediately prior to the meeting. The meeting is set for 7 PM at the Sheraton Washington Hotel. Hear all the good news about the strong growth of our College and of all the exciting initiatives in full swing. Learn how ACCE's new Government Relations Committee is representing you to our legislators. Applaud the recipients of the Advocacy Awards. Meet old friends and make new ones. Tell the Board Members and your colleagues about your ideas and your concerns.

American College of Clinical Engineering

ACCE News

ACCE Mission

1. To establish a standard of competence and to promote excellence in Clinical Engineering Practice.
2. To promote safe and effective application of Science and Technology to patient care.
3. To define the body of knowledge on which the profession is based.
4. To represent the professional interests of Clinical Engineers.

President's Message

I stand in admiration of the volunteerism espoused and practiced by other Presidents, particularly Ford, Carter, and Clinton. They picked up trash in Philadelphia this past weekend to make the point that we ought to give a little more of ourselves for the public good.



Frank R. Painter

This is a particularly painful time to ask people accustomed to an easier way of life to give up time, time in which they could be working for more money so that they can keep their heads above water. Pressures at work, the kind of work where someone pays you money for your efforts, have never been greater; yet you hear this President asking you to volunteer to support your profession. Speak at a high school career day, visit Congressional offices, speak to the news media, give \$25 so that a financially-strapped clinical engineer can join ACCE, write an article advocating clinical engineering, help Joe Dyro with the newsletter, serve on a committee. The possibilities are many. Believe me, it will pay off. Maybe not today, maybe not tomorrow, maybe not even directly to you, but it will make this world a better place in which to live. I am proud to say that ACCE members are giving a great deal of themselves. We have made a lot of progress this year and much remains to be done. Read all about what volunteers are doing for clinical engineering. Read *ACCE News*.

Want to help? Give me a call or get my ear at the Annual Meeting in June. Thanks for your support.

ACCE News

ACCE News is the official newsletter of the American College of Clinical Engineering (ACCE).

ACCE News is a benefit of ACCE membership; nonmembers may subscribe for \$50. To subscribe call (516)751-7244.

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Vision 2000	Mo Kasti
Nominations	Thomas J. Bauld
Education	James O. Wear
International	Alan Levenson
Inter-Society	Yadin David

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Letters to the Editor

In his article, *Vision 2000*, which appeared in the March 1997 *ACCE News*, Dave Dickey correctly indicates that one of the Vision 2000 projects within the "Marketing/Public Relations" group is to compile a listing of success stories and accomplishments of ACCE members within their organizations.

However, Dickey then describes the evils of outsourcing hospital-based clinical engineering departments, claiming that outsourced clinical engineering programs are more expensive than in-house departments. Care should be taken not to conclude from Mr. Dickey's remarks that one of Vision 2000's goals is to provide ammunition for in-house staff to defend against outsourcing. In my view, it was inappropriate for Dave to use *Vision 2000* to express his views about outsourcing.

BRIAN.PORRAS@she.sprint.com

Concerning Dave Dickey's piece on *Vision 2000*, I think *ACCE News* should be a forum for expressing opinion but ACCE is not in the business of supporting in-house programs. The market has changed! The ACCE board should print a clarification of its position of no support!! What do you think???

Mo Kasti

Amazing!! Someone actually responded? Funny, how the only response is from those who work for companies that sell (or work for) outsourced CE programs!! Amazing!!!! And to think that what we hear from the membership is a major concern for the growing number of CE's losing their jobs, being displaced by outsourced companies, or are being downsized by reengineering.

My comments were not intended to develop a statement of ACCE's position on in-house vs. outsourced CE programs, but are simply my thoughts on the issue, as I firmly believe in-house is more cost effective. If in-house or out-sourced CE programs can't supply their membership with real life examples on what they do to benefit their institutions, then both models are guilty of neglect! By the way, so far I have received only one example of cost savings and clinical impact of clinical engineering. It was submitted by an in-house program.

Dave Dickey CLLJ88A@prodigy.com

ACCE Workshops

From Page 1

Assess, Acquire, & Manage Technology

This 4-hour course gives you the tools needed to manage the life cycle of medical technologies. Topics include: Value of Technology Assessment to Health Care Providers, Components of Technology Assessment, Capital Acquisition Processes, Service/Asset Management, and Expansion of Program into Non-Traditional Areas.

Understanding the New Healthcare Market

Managed Care / HMO / PPO / IPA / UM / Levels of Care? Learn what these terms mean for your growth as a clinical engineer in the new health care environment. Topics to be covered include: Introduction to Managed Care, Reimbursement Practices, Managed Care Products, and the Role of Clinical Engineering in the New Market.

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Hazard Reduction and Quality Improvement

Clinical Engineers and other technology management professionals deal almost daily with risk management issues. Technology managers need to have a good understanding of risk management processes to ensure that legal exposure to health care providers is minimized. Taught by an experienced, hospital-based risk manager, this 4-hour course provides a rigorous introduction to device-related risk management. Topics to be covered include: Incident Investigation, Relationships Between Risk Managers and Clinical Engineering, Developing a Risk Management Process, Starting QI/Benchmarking Programs, and Integration into the Hospital QI Process.

Best Clinical Engineering Business Practices

With health care providers emphasizing the importance of a business perspective on their operations, so too must clinical engineering professionals run their operations from a business perspective. Those that do not will not survive in this era of downsizing and re-engineering. This 4-hour course provides the tools needed for technology managers to operate their equipment management programs as competitive businesses. Topics to be covered include: Strategic Planning, Marketing Clinical Engineering Services, Accounting/Managerial Finance, Developing a Business Plan, Outsourcing Trends, and Multi-Vendor Service.

Technology Trends: EMC, CGMP, Telemedicine

Everything a clinical engineer would want to know about these hot topics: clinical engineering controls for managing electromagnetic interference, telemedicine, CGMP.

The Workshop is scheduled to complement other conferences and thus affords the opportunity to save on travel costs. The Workshop is immediately before the AAMI Annual, the ACCE General Meeting, and the FDA/AAMI EMC Conference.

The venue will be the Pan American Health Organization, 2nd Floor Conference Room, Regional Office of the World Health Organization, 525 Twenty Third Street, NW, Washington, DC 20037. Conference facilities were arranged by ACCE member, Eng. Antonio Hernandez, who is PAHO Regional Advisor for Health Services Engineering and Maintenance.

Housing is available Tuesday night, June 3rd - Tuesday night, June 10th, 1997, at George Washington University Dormitory, 1900 S. Street, Washington, DC, 20037, approximately 4 blocks from PAHO. The cost is \$45 Single/day and \$27/day per person, Double Occupancy. GWU contact-on-site room registration is Christina Huszcza, (202) 994-6688. We are known by GWU as the PAHO Group

Note that this housing is available through the Workshop and the AAMI Program at this low rate!

Close of Workshop Registration is Friday, May 16, 1997. Reserve your place now. See advertisement on page 16 for registration information.

 See back page for details

ACCE News

On the Hill

From Page 1

With the formation of the ACCE Government Relations Committee (GRC), clinical engineering, through ACCE, is making its public debut in the health care planning and government policy arena. Working in conjunction with the ACCE Advocacy Committee, the GRC will focus on initiating dialogue with key government officials in an effort to raise public awareness. For more information, call Francine Reibman at (201)763-6525.

The following letter has been sent to Congressional Offices in anticipation of the June visits.

Letter to Your Congressman



April 28, 1997

The Honorable Alfonso D'Amato
520 Hart Senate Office Building
Washington, DC 20510-3202

Dear Senator D'Amato:

The American College of Clinical Engineering (ACCE) may be America's best kept secret in the health care field. Our members are highly experienced engineers and technology managers who work in hospitals and medical facilities. They are involved in every aspect of medical instrumentation in the clinical environment, from design and evaluation to applications and maintenance.

As a professional organization, ACCE has a civic duty to provide its expertise to the public sector. As Congressional Committees and Administrative Panels on health care problems convene to address concerns and seek ways to improve the quality of health care delivery, our members' expertise will aid your fact finding and data acquisition. We offer our assistance to you and your staff. ACCE members can provide an experienced perspective on health care technologies and their effectiveness in the acute, subacute, and long-term clinical environments, including the expanding home care and outpatient areas.

ACCE is a not-for-profit organization of clinical engineering professionals dedicated to the improvement of health care through the development, application and management of safe, efficacious, and cost effective technology.

We will be contacting your office in the near future to arrange a meeting to discuss ways our members can become involved in the government process of improving health care delivery.

Yours truly,

Frank Painter, President

American College of Clinical Engineering
5200 Butler Pike
Plymouth Meeting, PA 19462-1298
Office (610) 825-6067 BBS (610) 825-9284

Clinical Engineering Week

From Page 1

National Engineers Week, Michigan Style

Tom Bauld

Clinical Engineers and Biomedical Technicians organized a variety of new events this year to celebrate Michigan Clinical Engineering and Biomedical Technology Week.

The celebration was sponsored by the Michigan Society for Clinical Engineering (MSCE). Under the leadership of Thomas Bauld from the University of Michigan Health System and Habib Tannir of the William Beaumont Hospital, the Committee developed new and innovative events that included keynote speeches, hospital celebrations, and community outreach to high school youth. Tom enlisted the support and participation of MSCE members, local high school counselors, University of Michigan undergraduate and graduate engineering students, the leaders and members of the local chapter of the National Society of Black Engineers (NSBE), and Scouting Explorer Advisors to work together on this major celebration of clinical engineers and biomedical technologists.

The Committee members were Suzanne Nash, Charles Udano, Roger Zielinski, Dale Lewis, and Steve Henning. Their work resulted in high quality, significant events which received a great response. Tom and Habib are members of the American College of Clinical Engineering (ACCE), which has promoted celebrations of National Engineers' Week for several years. Tom also promoted National Engineers' Week through the American Institute for Medical & Biological Engineering (AIMBE), a national organization representing colleges and universities, professional societies, device manufacturers, and distinguished individuals.

Official and impressive proclamations of support were received from Mayors Dennis Archer of Detroit, Ingrid Sheldon of Ann Arbor, and Dennis G. Cowen of Royal Oak and from Michigan's Governor John Engler.

There was excellent participation in the school visitation program. Twenty-one MSCE members along with twelve members from the University of Michigan chapter of NSBE teamed up. NSBE is the professional society with the lead responsibility for National Engineers Week this year. Groups of clinical engineers, biomedical equipment technicians, and engineering college students visited four high schools in Detroit and two in Ann Arbor. Besides talking about their careers and educational requirements, the groups demonstrated the use of portable physiological monitors loaned by local SpaceLabs and Protocol representatives. Students were hooked up to the monitors for recordings of their ECG, blood pressure, and oxygen saturation. Many of the students attending from Huron High School were also members of a very successful Mentoring Program assisted by forty staff members of the University of Michigan Hospital. A unique perspective was added to the school visits because of the participation of Advisors from the Engineering Explorer Post sponsored by the Black & Veatch Engineering Company.

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Roger Zielinski, the Past President of MSCE, made a significant contribution to WDET, a Detroit Public Radio station. By donating, he became a Day Sponsor and was able to record a congratulatory announcement for local Biomedical Technicians and Clinical Engineers which was read over the air eight times that day.

MSCE, with the financial support of many local vendors, was delighted to bring Joseph McClain, MS, Chief of the Clinical Engineering Section of the Walter Reed Army Hospital, to the Detroit area. Joe gave two inspirational keynote speeches, one at

William Beaumont Hospital and the second at the University of Michigan Hospital on *The Past, Present and Future of Clinical Engineering*. Joe is a member of the American College of Clinical Engineering and is the Chair of the Clinical Engineering section of the American Society for Healthcare Engineering. His presentation was covered by a staff reporter from the Michigan Daily and a feature ran in the paper the following day.

Two hospitals, William Beaumont and the University of Michigan, held major celebrations to demonstrate the achievements of their staff and their contributions to the healthcare team. Coincidentally, William Beaumont's Clinical Engineering Department celebrated their tenth anniversary, while the University of Michigan's Biomedical Engineering Department celebrated their twentieth anniversary. There were special meals, laboratory visits, equipment expos, posters, notices in hospital publications, recognition from senior administrators, and flyers on the tables in the cafeteria. At the University of Michigan, the staff of the Rehabilitation Engineering Department participated with the Biomedical Engineering Department. The Rehab Engineers and their graduate student interns demonstrated a variety of assistive devices and made a major contribution to the expo as well as the school visits.

A special celebration was the annual Gold Award Dinner sponsored by the Engineering Society of Detroit. There, Roger Zielinski received the 1997 MSCE Award of Excellence for his leadership and continued contributions to improving the organization. MSCE Board Members and the Clinical Engineering Week Co-chairs were there along with Roger's wife, Irene. Special guests included Joe McClain and Kiyok Foy who attends the Golightly High School and the Martin Luther King High School in Detroit. Golightly is the only technical high school in the area with a biomedical technology program, and Kiyok is one of their top students.

Overall, everyone was extremely pleased with the MSCE celebration this year. Getting out with the students was a new and gratifying experience. It helped spread the enthusiasm and job satisfaction of engineers and technicians involved in healthcare.

You can find out more about this year's events and stay in touch with plans for next year by accessing the web site for Engineers Week at <http://www.eweek.org>. Planners are anxious to hear about your successful events and ideas for next year.

The Washington Hospital Center Celebrates Clinical Engineering Week in a Big Way

Caroline Campbell, Ghaleb Nasr, John D. Hughes, Jr.

Preparations for Clinical Engineering Week celebrations begin early at the Washington Hospital Center (WHC). Efforts to coordinate vendor, government, and hospital-wide recognition of the talent that resides in the Biomedical Engineering Department began in December. ACCE members within the Department petitioned the Honorable Mayor Marion Barry to declare February 16-22 as Clinical Engineering Week in the District of Columbia. Other members of the Grassroots team were encouraged to do the same. The declaration incorporated ACCE's definition of a clinical engineer, specified the benefit of utilizing clinical engineering skills to the patient population



Attendees at the ESD Gold Award Banquet

(left to right) Dale Lewis, George Awaad, Charles Udanoh, Kiyok Foy, Joe McClain, and Bryanne Patail.

photo by Tom Bauld



**ACCE Members Congratulate Physio-Control's Zielinski
(l. to r.) Joe McClain, Habib Tannir, Zielinski and Tom Bauld**

photo by Tom Bauld

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in the District, and identified that this week is celebrated in conjunction with the American College of Clinical Engineering. The declaration was granted and is now proudly posted in the reception area of the Biomedical Engineering Department.

Due to recent limitations on the use of hospital lobby space, a traveling display of technology was brought to all equipment-intensive areas within the Hospital Center. The display was interactive, allowing clinical equipment users to test their troubleshooting skills to identify faulty leads and cables. Pens, cups,

hats and the like which were donated by equipment vendors were awarded as prizes to participants. During the exhibits, a new Problem Report Form was introduced which prompts equipment users to provide detailed problem descriptions.

Vendors showed their support of the recognition effort by sponsoring lunches and lectures for the Biomedical Engineering staff. WHC also recognized the staff through sponsorship of a formal, catered breakfast in the Hospital's Private Dining Room. The Hospital President and Senior Vice President of Patient Care Services, along with the other Department Heads in the Materials and Biomedical Technology Management Division were invited to the breakfast. Each staff member was presented with a lapel boutonniere and a custom-made hat bearing the name of the hospital and department. Following breakfast, the staff was split into two teams for a game of "Biomedical Engineering Jeopardy". Game questions covered such areas as JCAHO Standards, equipment inclusion criteria, and life safety requirements. The team winning this heated competition was awarded prizes, again donated by supportive vendors.

This second annual celebration of Clinical Engineering Week at the Washington Hospital Center provided yet another opportunity for the department to advertise the benefits of clinical engineering services and to advocate our profession. It also provided an opportunity for the department to reflect on our accomplishments for the past year and to recognize each staff member's contribution to the department's and the institution's success.



Washington Hospital Center Clinical Engineering Staff

photo by Guido Villacres

ACCE Board Highlights

March 19, 1997

Jennifer C. Ott

President Painter called the meeting to order. The minutes of the January 22, 1997, Board meeting were approved.

President's Report

Painter announced that the ACCE Annual Meeting will be on Tuesday, June 10, at 6 PM. The Executive Committee will meet Sunday night. The Board of Directors will meet Monday evening over dinner. President Painter reported the difficulties presented by AAMI President Miller in establishing direct communication channels. Nevertheless, ACCE will continue its attempts to work with AAMI in areas of mutual interest. An FDA request for experts was discussed. Outgoing Board members were asked to prepare reports on procedures, tasks, and essential information that their respective positions entail.

First Vice President Report

Ira Tackel described the progress of the Advanced Clinical Engineering Workshops in San Diego and Washington, DC.

Second Vice President Report

Mo Kasti reported that Stan Trojanowski via e-mail sent a lengthy questionnaire to ACCE members for creating a master database on member activities. Stan will send a revised questionnaire via U.S. postal service to all ACCE members. Mo

reported a slow start in achieving annual objectives. Government Relations Committee will go to the Hill in June for Congressional office visits. See *Letter* on Page 4.

Secretary's Report

Jennifer Ott reported that she has ACCE brochures and will send them to whomever needs them. All ACCE members will be listed on the ACCE homepage. Those wishing not to be listed can contact Ott. She acknowledged the generous support of ECRI in producing the brochure, "What's a Clinical Engineer."

Treasurer's Report

Bryanne Patail reported a slight surplus over budget projections at this time. Plans were enacted to find members lost but not forgotten.

Membership Committee

Binseng Wang, interim Chair, presented seven members for membership and one for fellow status. See *In the News and On the Move*, this issue Page 7. Members whose membership lapses must pay a \$10 re-instatement fee. Candidate membership fee is \$25.

Education Committee

Jim Wear announced the final schedule and financial details of the ACCE Teleconference Series for 1997 (see page 9).

Advocacy Committee

George Johnston reported lackluster response to CE week promotion. Notable exceptions were found in Washington, DC

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and Michigan. See *Clinical Engineering Week*, this issue Page 1. See *1997 Advocacy Awards Announced* on Page 8.

Webmaster Report

Bruce Morgan reported that more links have been added to the ACCE website.

Grass Roots Network

Tom Bauld will form a local ACCE Chapter in Michigan. Levenson has been given the nod to make telephone contact with the Network.

Newsletter

Newsletters continue to be sent on schedule. The March 1997 issue went to 600 clinical engineers. Those sent to non-ACCE members described advantages of membership.

AIMBE Report

Tom Bauld and Joe Dyro attended the AIMBE Annual Event earlier in the month. See report on page 12.

ASHE Liaison Report

Tom Bauld indicated that ACCE will continue to develop the ASHE/ACCE meeting in Florida this November.



On The Move and In the News

ACCE Welcomes New Members

Congratulations to the following clinical engineers who were accepted to membership in ACCE:

- Michael D. Banas
- Ted Cohen
- Mary Ann Kelly
- Rachel Mercado
- Nicola Pinto
- Ira Soller
- Charles Wickens

Shepherd is ACCE Fellow

Marvin D. Shepherd achieved Fellow status in ACCE. Marv, a founder member of ACCE and former Secretary, is a well-known clinical engineering consultant. He is author of the highly regarded *Shepherd's System for Medical Device Incident Investigation & Reporting*. A Professional Engineer, Marv is widely published and a popular speaker on medical device safety.



Marvin Shepherd

Clinical Engineering Profiles

Francine Reibman

There are few people who are as dedicated to their field as Francine L. Reibman is to clinical engineering. From the very beginning, Ms. Reibman's career has demonstrated a love of technology. As the Associate Director of the National Student Lobby and later part of the House Select Committee on Aging in Washington, D.C., Ms. Reibman dealt with legislation pertaining to medical care and device reimbursements. This led to her membership in the Carter/Mondale/Ford White House Transition Team, where she evaluated legislation relating to health care. Her experience in the field led many medical device companies to consult her in their dealings with the government.

However, Ms. Reibman soon realized that she "wanted to work with [her] hands." As a result, she spent some time as a field service engineer and technical support specialist for Mennen Medical. She quickly rose through the ranks, and was soon setting up clinical engineering departments throughout New Jersey, as well as running her own department at UMDNJ/University Hospital.

Despite this busy schedule, Fran did find time to pursue other interests. She is taking courses toward a Ph.D., and is quite involved with the Boy Scouts. In fact, one of the joys of her life is her thirteen year old son, who is thinking of following in the footsteps of his mom and becoming an engineer.

Now, as President of Health Management Affiliates/Electro-diagnostic Testing and Chair of the Government Relations Committee of ACCE, Ms. Reibman continues her commitment to clinical engineering. Clinical engineering is much more than just biomedical engineering, she says, and that fact needs to be recognized and appreciated. Clinical engineers play vital roles in the hospital environment, as they are the technology managers—the ones who bring new technology into use. Therefore, she stresses, there is a need for a standardized curriculum for a clinical engineering degree, as well as a licensing process. With Ms. Reibman as an advocate, there is no doubt that these objectives will be realized.



Francine L. Reibman



ACCE News

Meetings

EMC and EMBS Chapters Meet at Touro

The Long Island and New York Chapters of the Electromagnetic Compatibility and Engineering in Medicine and Biology Society met on February 26, 1997, at Touro College Institute of Biomedical Engineering and Rehabilitation Services to hear John Plump of Magnetic Resonance Equipment Corp. Plump discussed the reasons for physiological monitors and the types of sensors used in the MRI environment. He gave a demonstration of a fiber optic pulse oximeter sensor and ECG monitor. Bob Berkowitz, currently enrolled in the Touro Clinical Engineering Masters program, coordinated the event.



ACCE Members Morgan (r.) and Dyro (2nd from r.) hear Berkowitz (l.) make a point. Plump (4th from r.) listens and Gilchrist (3rd from r.) is convinced.

1997 Advocacy Awards Announced

George I. Johnston

Although the awards nominations this year were few, they continue to be of top quality in the mission of advocating clinical engineering. Our esteemed judges this year were Dennis Autio, Eben Kermit, Fran Reibman, and Marvin Shepherd.

This year's **Professional Achievement Award** goes to Tom O'Dea for his article in the *Journal of Clinical Engineering*, *Protecting the Immunocompromised Patient*. One of our judges remarked, "This is an exceptionally good example of an activity meeting the criteria for the Achievement Award," i.e. identifying unique functions, roles, activities, duties and responsibilities of clinical engineers. Tom's expertise in both engineering and biology uniquely qualified him (as it does clinical engineers in general) to address, analyze and provide solution guidelines for the problems of the immunocompromised patient. Tom's actions, assuming initiative outside of what are considered

traditional clinical engineering bounds, represent exactly the goals ACCE had in mind when establishing these awards: **BREAK THE BOUNDS OF TRADITION AND IN SO DOING PROMOTE (ADVOCATE) THE PROFESSION OF CLINICAL ENGINEERING!**

The **Professional Development Award** goes to Ira Tackel, recognizing his papers *Non-Traditional Support: Patient TV System* and *Biomedical Equipment Service - An International Incentive?* The presentations were made in two clinical engineering sessions of the AAMI 31st Annual Meeting. Ira's activities also are excellent examples of work that promotes awareness of clinical engineering among other health care professionals and the general public. Too often clinical engineering departments reject technical responsibilities beyond traditional technology areas, i.e. limit themselves and their exposure to that of local medical equipment maintainers. By undertaking non-traditional activities and roles Ira has made health professionals aware of the varied expertise and valuable support clinical engineering can provide.

Each winner will receive a plaque, \$200, a one-year subscription to the *Journal of Clinical Engineering* and a polo shirt bearing the ACCE logo. Now is the time for each of you to start planning for next year's award. Remember, annual awards are based on activities conducted in the previous calendar year. A nomination form and description of the development and achievement awards is included in this issue. Get busy; help promote clinical engineering; and possibly reward YOURSELF!

International CE Directory

The Clinical Engineering Division of the International Federation for Medical and Biological Engineering is preparing the Second Edition of *Clinical Engineering Worldwide*, a directory of clinical engineers around the world. Most ACCE members are listed in the first edition. To add to or update your currently listed information or to add your name to the directory please complete the questionnaire enclosed with this issue of *ACCE News*. The deadline has been extended to May 31, 1997. Copies of the first edition may be obtained at a nominal cost by contacting Joe Dyro at 516-751-7244.



News From China

Tang DongSheng

I still remember what you (Joe Dyro) said at the ACCE Advanced Clinical Engineering Workshop (ACEW) in Beijing, November 1995. You said "in two years, you can connect with the internet." It became true today.

ACCE News

On Christmas day, I sent a simple best wishes to you from my friendly computer and received your return letter quickly. I'm very sorry to reply so late. In this period I had replaced my home computer and connected to internet. The price of a PC here has dropped, but compared with our income it's still expensive. So my new pentium PC was assembled by myself. It has taken some time. There were some problems with my ISP.

1996 was a busy year for me. Our hospital, The 301 Hospital, in Beijing installed two new Toshiba diagnostic X-ray imaging tables, one new GE MRI system, and more then 30 other medical devices. About 2000 service calls were handled by our medical engineering center. Presently a new Philips cadiodiagnostic system arrived, ready to be installed. A PET system will be received this month. We face much work in the coming year.

In September last year, the 3rd China Clinical Engineering Academic Meeting was held in Hangzhou. More than 300 people joined the meeting. At the meeting, I introduced the development of clinical engineering of which you spoke in the ACEW. All of the participants were very interested.

At the beginning of this year, China Clinical Engineering Net on China on line was set up by our department. We had a meeting attended by more than 30 medical departments in Beijing in which we introduced the Net. We intend to provide more information about clinical engineering in the future. It is a pity that we use a Chinese version; you cannot read this on your computer.

I have other good news to tell you. I have become a senior member of the Chinese Electrical Association at the end of last year.

dongsheng.tang@bj.col.co.cn and tangds@hotmail.com

ACCE Teleconferences 1997

James O. Wear

The ACCE Teleconference Series for 1997 is listed below:

Date	Topic and Speaker
April 17	What is the future of clinical engineering? <i>ACCE Vision 2000 Proponents</i>
May 15	Financial analysis of operations <i>Binseng Wang</i>
June 19	What does it take to perform in-house radiology? <i>Larry Carnall, RSTI</i>
July 17	More opportunities for clinical engineers <i>Ira Tackel</i>
August 21	Marketing your services within and outside your health care organization <i>Frank Painter</i>
September 18	Development of a capital expenditure committee <i>Jennifer C. Ott</i>
October 16	Building teamwork between CE staff and maintenance staff <i>Tom O'Dea</i>
November 20	Preparation of RFPs for outsourcing clinical engineering services <i>Bill Betts</i>

The cost for up to four ACCE members at a single site is \$125 per course or \$900 for the series. Additional attendees will be charged \$10 per course. ACCE will accept checks, credit cards, and purchase orders. POs can be sent by way of fax to the attention of Jim Wear (501)771-1775. For further information on the Series, e-mail at wear.james@forum.va.gov or call me at (501)370-6618.

Web Trappings

B.J. Morgan

Many of you may have found that the ACCE website was down for a significant period of time during March. This was due to major power problems with the campus building which houses the server. This has been repaired and future server outages should be rare. You may have also noticed a new graphic at the bottom of some of the pages. All new and updated web pages are checked to comply with the HTML 3.2 specification. The World Wide Web Consortium is the official standards organization for the web and has adopted HTML 3.2 as the latest standard. Many browser developers, however, such as Netscape™ and Microsoft™, have decided that they should determine the standard. To maintain maximum compatibility with all users, vendor specific features are not used. Unfortunately, no browser at this time is 100% HTML 3.2 compatible. Web pages are checked with several browsers before uploading them to the server. If you experience problems viewing any of the ACCE web pages, please e-mail me at the address below with the specific problem encountered, web browser being used and your operating system.

I have receive a number of complaints recently that some links from the ACCE Home Page were not accessible. I checked out each complaint and was unable to find any problem with the server. I believe that the problems reported are a result of extremely high web traffic and may be occurring anywhere from the client's ISP to the server. I will continue, however, to see if anything can be done at the server end. If you experience an inability to connect with any of the ACCE web pages I should appreciate an e-mail with as much information as possible, such as date and time, page(s) involved, number of retries, hardware and software being used, ISP name, whether or not you were able to ping the server and any traceroute information.

Remember, the ACCE web site is a service for ACCE members. Comments and suggestions are welcome. Please send them to jmorgan@ibm.net.



ACCE News

ASHE Adopts CE Definition

Joe McClain

During the ASHE Board meeting Joe McClain brought-up for a vote that ASHE recognize the ACCE Definition of a Clinical Engineer. In 1992 ACCE established this as the officially recognized definition. A unanimous vote agreed that ASHE recognizes the ACCE Definition of a Clinical Engineer. ASHE joins other national and international organizations whose membership includes clinical engineers, e.g., IFMBE, CEMBS, and ICC, in adopting the definition.

Congratulations to all ACCE members in this outstanding contribution to the field.

8493-8346-3, was published in 1995 by CRC Press, Inc. in cooperation with IEEE Press. To order contact <http://www.crcpress.com> or e-mail at orders@crcpress.com.



The Clinical Engineer's Bookshelf

Joseph F. Dyro

A review of *The Biomedical Engineering Handbook*

ACCE founding member, Professor Bronzino, aided by nearly 300 biomedical engineers, produced a substantial work that will become the standard desk reference for biomedical engineers for the next decade. The 19 well-written and informative sections into which the book is divided cover a broad range of issues in biomedical engineering. The *Handbook* is an essential desk reference for all clinical engineers as well. Eleven sections are of direct value to clinical engineers. The 113-page section on Clinical Engineering contains the following chapters: Clinical engineering: Evolution of a discipline; Management and assessment of medical technology; Risk factors, safety, and management of medical equipment; Career opportunities for clinical engineers; Clinical engineers as innovators and product developers; Clinical engineering program indicators; Quality improvement and team building; Clinical engineering coordinated services; A standards primer for clinical engineers, Regulatory and assessment agencies; and Clinical engineering issues in developing countries. Eight of the authors contributing to this section are ACCE members. The other ten sections pertinent to clinical engineers are entitled: Physiologic systems; Bioelectric phenomena; Biomedical sensors; Imaging; Medical instruments and devices; Biological effects of nonionizing electromagnetic fields; Prostheses and artificial organs; Rehabilitation engineering; Human performance engineering; and Medical informatics. The *Handbook* should serve as the first tome clinical engineers consult when researching these issues. The remaining sections of the *Handbook* comprehensively treat areas that some clinical engineers will find of relevance such as biomechanics, biomaterials, biomedical signal analysis, biotechnology, tissue engineering, physiologic modeling, artificial intelligence, and regulations.

The book can serve as a textbook in an academic biomedical engineering program. I have used it in a physiological signal acquisition and analysis course and a medical instrumentation course.

Congratulations to Dr. Bronzino for bringing such a valuable and affordable handbook to the biomedical engineering community. The book is a bargain. The \$135 buys 2862 pages. That amounts to about 4 cents a page or about \$5 a section. The *Handbook*, ISBN 0-

How Well Do You Know Electronics?

Robert L. Morris, PE, CCE

There are two general preconceptions that prevent us from solving problems effectively: (1) we have more knowledge contained in our brain than we actually use; and (2) we usually have more information than needed. That may sound contradictory but much in life bears it out. The real trick in solving problems is to sift through what you know and to simultaneously review the available facts to reduce the problem to essentials. Most people stop at their first solution or do not question assumptions. I give you the following example of a problem that appears difficult but is really very simple if you use effectively what you almost certainly know. The idea for this problem came to me while trying to fix a failed electromagnet that was used by some ophthalmologists to remove ferrous particles from the eye.

You are given the following: 1 ea. transformer (115 VAC primary, 6.3 VAC secondary); 6 ea. 100 μ F, 30V, aluminum electrolytic capacitors; 2 ea. 100 Ω , 1W resistors; and 2 ea. 15K Ω , 1W resistors. Design and construct a DC power supply using no additional components.

This is a problem I often give to students when teaching problem solving and/or troubleshooting. It forces some serious thinking. No student has ever solved it without more hints than already given above, yet a solution is obvious once you see it.

Give it a try. I will mail a certificate to the first person to provide me with a correct solution. Your name will also be published in the next issue of *ACCE News*. There are several different correct solutions. Darn, I gave you another hint. Those whom I have told about this problem before are not eligible for the certificate.

One more hint and a caution. DO NOT try breadboarding the circuit until you are certain that you have a solution. It could be hazardous.



Product Review

Clinical Engineering Improvement Tools™

Joseph F. Dyro

Authored by two leaders in the clinical engineering field, Manny Furst and Dave McKinney, *Clinical Engineering Improvement Tools™ (CEIT™)* is divided into three modules: Assessment Tools, Part I; Assessment Tools, Part II, and Process Improvement. Handsomely packaged in a tabbed three-ring binder, the 179-page process improvement system features a comprehensive collection, 75 pages, of surveys, checklists, spreadsheets, graphs, forms, reports and processes, all well-constructed and easily adapted to your particular situation. All sixteen spreadsheets are contained on three 3 1/2" diskettes. Either Microsoft® Excel® or Lotus® 1-2-3® running under Windows 3.1 is required. The spreadsheets cover budget, productivity, employee statistics, customer satisfaction, equipment inventory, risk assessment, contract inventory, contract assessment, and scheduled preventive maintenance intervals. Questionnaires and surveys cover institutional and departmental profiles, skills assessment, customer satisfaction, JCAHO readiness, SMDA compliance, environmental risk assessment, and staff knowledge. *Tools* can be used by hospital staff, consultants, independent service organizations to identify strengths and weaknesses, establish improvement goals, develop a strategic plan and monitor progress.

Two additional modules, Benchmarking and Peer comparison and advanced improvement tools and will be released during 1997.

ACCE member, Professional Engineer, and Certified Clinical Engineer, Dr. Furst, is internationally recognized for achievements in productivity, cost effectiveness, management, quality and customer satisfaction. Dave McKinney, CCE, with over 28 years experience directing clinical engineering departments, is a leader in quality improvement processes. The authors provide solid rationale for their *Clinical Engineering Improvement Tools™*. Let there be no question that self examination is *de rigueur* for all healthcare organization functional units. The product is highly relevant to every clinical engineer. Relevance is heightened in those organizations committed to self improvement. The processes described will continue to be applicable to departmental improvement in many years to come. Furst and McKinney have thought of everything in this versatile improvement system. In reading the text and utilizing the spreadsheets and other forms, one gets the sense that Furst and McKinney are standing at your shoulder encouraging you on your improvement quest. I have had the privilege of attending the first and most of the following Annual Cost Effectiveness and Productivity Conference organized by Furst. CEIT™ is a distillation of over ten years of hard work and practical results emerging from the Conference.

Using an AST Bravo 486 running Excel v. 5.0 under Windows 3.1, I had no problem accessing, utilizing and printing all Excel spreadsheets. Installation was trivial. The CEIT™ instructions are clear and concise. The performance improvement concept is easy to comprehend, especially with solid rationale presented at each step.

I agree with the authors when they state that (The Tools) *assist in identifying and quantifying the existing operating cost for the in-house program*. Institutions are presently keen on the out-sourcing of non-core services. Clinical engineering departments are expending considerable resources in the generation of Requests for Proposals (RFP) ostensibly so that an independent service organization (ISO) can bid on work being performed in-house. ISO bids are typically compared to that of the in-house service provider. The CEIT™ makes the burden of RFP preparation easier with the Section, Contract Management, in particular, aiding in this process.

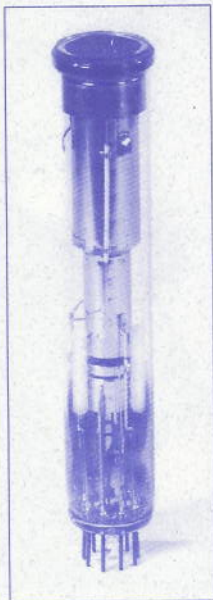
Ready-made forms save a great deal of time especially if the terminology and categories are relevant to those used in the institution. Some modifications may be necessary, however. Medical device terminology may differ from that currently being used by your institution; for example, *lights, neonatal, phototherapy* is used for what other organizations would describe as *phototherapy units, hyperbilirubinemia*. Categories and terminology may not exactly match that used in all institutions; but this is not surprising considering the wide range of institutions. Completing the forms will not be easy and will require hard work to gather the data. So be prepared to make a serious commitment to the program.

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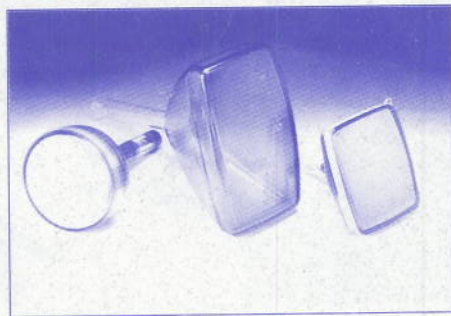
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CEIT™ focuses on biomedical equipment maintenance, the so-called *bread and butter*. The product recognizes, however, that clinical engineering will encompass what are termed *value added services*. Such services for example would include device design, technology management, and process engineering. Knowing what services a department provides is the beginning of the successful implementation of an improvement program. Success of the program will be quantifiable in financial terms, customer satisfaction and in risk reduction.

Typographical, formatting and spelling errors were minimal and did not detract from the ease of use or understanding of the CEIT™. In the section on staff knowledge interview, a *survey* was referred to as a *spreadsheet*. I would like to have seen more illustrations of the use of graphics than the one example in the sample Safety Committee Report.

Each of the three modules costs \$460. ACCE, ASHE and AAMI members receive a 10% discount. Volume discounts are available. If the CEIT™ were simply a textbook or a reference work the cost would be prohibitively high. However, anyone seriously committed to improvement either by self motivation, organizational imperative or both must utilize this product. Preparing surveys, reports, and spreadsheets from scratch would be prohibitively time and financial resource intensive. I seriously doubt that even an experienced clinical engineer would be able to approach the excellent quality of this product which in reality is a serious, complete course in clinical engineering improvement. What are you waiting for? Tapping into the 50 years of cumulative clinical engineering experience of two of the best CEs in the field is a bargain at twice the price. *Clinical Engineering Improvement Tools™* is a product of IMPTECH Improvement Technologies. For more information contact IMPTECH at P.O. Box 42102, Tucson, Arizona 85733; 520-745-1411; -2459 fax.

Clinical Engineering Improvement Tools™ is the first in a series of *Improvement Tools™*. Other *Improvement Tools™* will follow in the areas of Facilities Engineering, Hazardous Materials and Waste Management and Safety Management. A License Agreement limits the product to a single user at a single site. Technical support? is provided for 90 days at no cost. Additional software is available to machine read the various survey forms. IMPTECH will provide user-specific bar-coded survey forms at no cost.

AIMBE Annual Event

Joseph F. Dyro and Thomas Bauld

The Sixth Annual Event of the American Institute of Medical and Biological Engineering, Washington, DC, March 1-4, featured Bioengineering, Innovation, and the Law. Challenging topics of biomaterials availability, the assessment of diagnostic technologies, and the controversy over biological material as intellectual property were addressed.

On March 2, Bauld represented ACCE at the Council of Societies Meeting while Dyro represented Touro College at the Academic Council meeting. AIMBE Fellows Bauld and Dyro then attended the Open Forum, a workshop on developing communication techniques

for promoting the profession. The Burness Communication workshop lead by President Andrew Burness gave practical tips for working with the media and presented several keys for articulating an effective message. Burness gave the media's definition of news:

- * something different today than yesterday
- * surprising, unexpected, counter-intuitive
- * the first, biggest, most comprehensive
- * raises new issues, problems, solutions
- * linked to what's already in the news
- * exciting to your neighbor

United States Senator William H. Frist (R-TN) gave the Plenary Address on *Bioengineering and the 105th Congress*. Senator Frist was elected to the Senate in 1994 placing his career as a heart and lung transplant surgeon on hold. His interest in bioengineering is keen as demonstrated by his introduction of an amendment calling upon the Public Health Service to report on action taken as a result of HHS' 1995 report on bioengineering research. He chairs the Public Health and Safety Subcommittee. Senator Frist's five-point action plan follows:

1. Educate the public to the positive image of biomedical engineering
2. Educate members of Congress
3. Actively solicit and cultivate the Press
4. Write op-ed pieces, give bioengineering briefings, visit Congressmen
5. Develop a resource book of whom to call to get information to the news media



ACCE President Bauld (r.) presents Senator Frist with the latest issue of ACCE News

William R. Brody, M.D., Ph.D., President of Johns Hopkins University, presented the Keynote Address, *Biomedical Engineering Opportunities in an Era of Managed Care*. MIT electrical engineer, President Brody was director of radiology and professor of biomedical engineering and electrical and computer engineering at The Johns Hopkins University. He served as Provost of University of Minnesota Academic Health Center. He presented seven areas of

ACCE News

opportunity and challenge for biomedical engineers:

1. Health care management organizations
2. Technology assessment
3. Quality measures
4. Information systems in medicine: the electronic medical record
5. Technologies for increasing quality while reducing costs
6. Standardize treatment, avoid complications, systems engineering
7. Education



Dr. Dyro and President Brody discuss clinical engineering opportunities

Three Sessions on Monday dealt with (1) product liability, (2) assessment of diagnostic medical technologies, and (3) biological matter as intellectual property. Session 1 focused on biomaterials availability. Session 2 considered the more rigorous acceptance criteria for new medical diagnostic technologies today. Technologies are required to satisfy the demand for accountability by impacting positively on health outcomes and cost-effectiveness. Council of Societies Chairman, Dr. William Hendee of the Medical College of Wisconsin discussed considerations in assessment such as quality [studying the process and measuring the outcome]; expense [costs and savings]; (3) access [patient access to care]; and (4) acceptance. The impact of diagnostic technologies on outcomes is difficult to quantify, in part because diagnosis and final health outcomes are separated by several health care stages, including treatment and care during recovery. The third session touched upon the importance of intellectual property protection for medical and biological inventions as well as discussing some of the ethical, economic, and scientific issues related to patenting of biological matter. In a late-afternoon ceremony, Dr. Bauld was inducted along with 45 other distinguished biomedical engineers into the Council of Fellows. Attendees visited the office(s) of their U.S. Senators and/or House of Representatives on the last day of the Event.

Informal discussion with attendees assured Bauld and Dyro that clinical engineering is poised to have a significant, positive impact on health care technologies and upon the system for delivering them

effectively to the people. Fellows of AIMBE encouraged more clinical engineers to become involved at the policy making levels of the profession.

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Urgent NFPA 99 Advocacy Issue

Joseph P. McClain

The American Society for Healthcare Engineering Advocacy Committee has an urgent request for our chapter's assistance. Over the next two weeks they need us to review NFPA 99 to determine if there are any specific sections, issues or suggested changes that ASHE should be submitting to the NFPA in June 1997. As you may know, the NFPA is updated every 3 years. The recommendations that we make now, if accepted, will be published in the 1999 standard. This is our opportunity as professionals to improve this highly valuable reference document.

Following this letter you will find a table of contents to the existing document. For your convenience I have marked the chapters of potential concern to your profession. (FM = Facility

ACCE News

Management; CE = Clinical Engineering; SM = Safety Management; EV = Environmental Management and PDC = Plant Design and Construction or Architectural Issues). Please note that chapters 12 through 18 should be reviewed by all.

To prevent any unnecessary delays please forward your comments to Mr. Britton Berek, preferably by e-mail (bberek@aha.org or bberek@ix.netcom.com) or by Fax 312-422-4571. You may also call Mr. Berek in Chicago at 312-422-3833 for any further information.

NFPA 99 Table of Contents

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14.	Clinic Requirements (ALL)
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16.	Nursing Home Requirements (ALL)
17.	Limited Care Facility Requirements (ALL)
18.	Electrical and Gas Equipment for Home Care (ALL)
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Future Shock - Millennium Clock Kills Medical Devices

Martina O'Brien

Is anyone out there worried about and/or looking into the implications of Year 2000 on the operation of medical equipment? I did a small amount of checking around with various manufacturers. The result? - a wide spectrum of responses ranging from one manufacturer whose equipment is all Year 2000 compliant to others who plan to upgrade some but not all devices. Several responses fell somewhere in between. So my friends, non-upgraded medical devices such as ECG machines will simply die when the millennium arrives. This clinical engineer is concerned also about the impending demise of patient data management systems, syringe pumps, and laboratory analytic instrumentation, just to name a few examples.

Verbum sapiens et caveat vatetudinarium!

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ACCE Membership Campaign

Binseng Wang, binseng@voicenet.com

The following membership information is being provided for your convenience. It is hoped that you will discuss membership in ACCE with your colleagues.

Definition of Clinical Engineer

A clinical engineer is a professional who supports and advances patient care by applying engineering and managerial skills to healthcare technology.

Membership

The three categories of ACCE membership are Individual, Fellow, and Candidate.

An individual member may be advanced to Fellow status in recognition of distinguished service to the profession or achievement in the field of clinical engineering.

Membership Benefits

The ACCE is building a strong profession, a credible profession, a dynamic and a flexible profession. ACCE membership gives you advantages that will enhance your career now in this rapidly changing healthcare environment and for many years to come in the following ways:

- ◆ Access to a network of clinical engineering experts and peers
- ◆ Representation of your interests to legislators, regulatory agencies, and health care professionals
- ◆ Instant access to critical information on the **ACCE web page**
- ◆ Up-to-date information in *ACCE News*, the **only** clinical engineering newsletter
- ◆ Special events and programs such as Advanced Clinical Engineering Workshops and audio-teleconference series
- ◆ Discounts on publications and meeting registrations
- ◆ Opportunities to share your expertise with other professionals

Adopt a Clinical Engineer!

Clinical Engineers around the world look to ACCE for guidance and for information. Many of the fastest growing clinical engineering programs are in third-world developing countries. Resources are so scarce and salaries so low that the cost of ACCE membership is prohibitive. Several ACCE members have supported international colleagues by paying \$25 for a year's ACCE membership. Those who feel so inclined may contact Binseng Wang at binseng@voicenet.com or 1-800-222-4776.

ACCE Lapel Pins

If you never received a lapel pin when you became an ACCE member, please contact Jennifer Ott at 314-577-8018 JCottSLU@aol.com

ACCE News

Calendar of Events

- ◆ AFSM Meeting, May 9-10, San Diego, CA.
- ◆ ACCE Advanced Clinical Engineering Workshop, May 9-11, 1997, San Diego, CA. Info: David Motta at 401-434-1270, ext. 212.
- ◆ Health Tech '97, May 11-14, 1997, San Diego, CA. Contact: David Motta at 401-434-1270, ext. 212.
- ◆ 23rd Canadian Medical and Biological Engineering Conference, May 28-30, 1997, Toronto, Ontario. Contact: CMBEC Secretariat, Bldg. M-55, Rm. 383, Ottawa Canada KiA OR8. Tel: 613-993-1686, fax: 613-954-2216, e-mail: cmbes@nrc.ca.
- ◆ Third Annual International Conference on Healthcare Services, June 1-4, 1997, Chicago, IL. Call AFSM International at 800-333-9786.
- ◆ ACCE Advanced Clinical Engineering Workshop, June 6-8, 1997, Washington, DC. Info: 610-625-6000 x168.
- ◆ AAMI 32nd Annual Meeting & Exposition, June 7-11, 1997, Washington, DC. Call 800-332-2264.
- ◆ Cigar Night, June 7, Washington, DC. Call 516-751-7244.
- ◆ ACCE Annual Meeting, June 10, 1997, Washington, DC. Info: JCottSLU@aol.com.
- ◆ EMC/EMI Solutions for Medical Devices, June 12, 1997, Washington, DC. Call (800)332-2264, x260.
- ◆ RESNA 97, June 20-25, 1997, Pittsburgh, PA. Contact:

Continued on Page 16

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USA



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RESNA, Suite 1540, 1700 North Moore St., Arlington, VA 22209-1903. Tel: 703-524-6686.

- ◆ World Congress on Medical Physics and Biomedical Engineering, September 14-19, 1997, Nice, France. Contact: NICE 97 SEE General Secretary, 48 rue de la Procession, F75724 Paris, CEDEX 15, France. Tel: 33-144-6060, fax: 33-144-4960, e-mail: nice97@univ-paris12.fr.
- ◆ American Society of Biomechanics, 21st Annual Meeting, Sept. 24-27, 1997, Clemson, SC. Call Dr. Gharpuray, Chair: (864)656-5556; -4466 fax; vasanti@ces.clemson.edu.
- ◆ First International Conference on Ethical Issues in Biomedical Engineering, Sept. 28-29, 1997, Clemson, SC.
- ◆ Call Dr. Subrata Saha, Chair: (864)656-7603; (864)656-4466 fax; subrata.saha@ces.clemson.edu.
- ◆ IEEE/EMBS Society 19th Annual International Conference, October 30 - Nov. 2, 1997, Chicago, IL. (714)752-8205; -7444 fax; MeetingMgt@aol.com.
- ◆ International Scientific Meeting on Electromagnetics in Medicine, Nov. 3-5, 1997, Chicago, IL. Sponsored by URSI and IEEE. Information: <http://www.eecs.uic.edu/~emmed>.
- ◆ ASHE/ACCE Medical Technology Management Conference, Nov. 11-15, 1997, Orlando, FL. (312)422-3807; -4571 fax.
- ◆ American Society for Healthcare Engineering: 12th National Conference, Dec. 2-5, 1997, Chicago, IL. Contact: Patti Costello, One North Franklin, Chicago, IL 60606. Tel: 312-422-3807, fax: 312-422-4571.

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