Greetings!

Time flies. This is the crossroad of my tenure as President between two annual meetings, Rhode Island and Portland. I am trying to establish administrative calendars for the next six months. First I would like to appoint Larry Dauer to chair the Nominating Committee for the upcoming elections. This year we will elect next President-elect and Secretary/Treasurer for two section terms, and two board members for three section terms. Second I would like to see a regular election take place earlier than previously practiced so that we will know the results and possibly meet our next leadership at the annual meeting in Oregon. Third I will prepare an annual report (July 2006-June 2007) before the annual meeting this year.

General timeline is as follows:

- February 2007: establishment of nomination committee for the elections
- March 2007: identify all nominees for the vacancies
- April -May 2007: e-voting and results
- June 2007: Plan a section board meeting at Portland
- July 2007: Formal section meeting and transfer of Presidency to Larry Dauer at the annual meeting
- June 2007: Annual Section Report by Yoshizumi

There are also many happenings in the next few months. You may want to pay a special attention on the NCRP Annual Meeting in April (www.ncrponline.org). I plan to set up a MHP section board meeting in Portland this year so that we all can get together and know each other.

In this newsletter, I am very excited to receive an interesting article from Mike Stabin, Past-President. I am also pleased to post an article from Larry Dauer, President-Elect on challenges and opportunities before us.

In this issue, Giao Nguyen, Editor, introduced some of our board members to us. Hope to see you all at the annual meeting.
The Times They Are A’Changin…
M. Stabin, PhD, Vanderbilt University, Nashville, TN

Interesting changes are underway in the area of internal dosimetry for nuclear medicine studies, particularly in therapeutic applications. It is nearly time to move on from the traditional “stylized” phantoms used for decades to standardized dosimetry. The models of adults\(^1\), children\(^2\) and pregnant women\(^3\) have worked very well for three decades; will soon be replaced by a new series of realistic, image-based models. New models of the adult male and female were developed from images of individual subjects by the group at the Forschungszentrum für Umwelt und Gesundheit (GSF) in Germany\(^4\). These models of pediatric and pregnant female subjects are based on non-uniform rational B-splines (NURBS), will complete the phantom “family” and be implemented in the next release of the OLINDA/EXM dose assessment software\(^5,6\).

It is a logical conclusion that patients given radiopharmaceuticals for therapy deserve the same individualized attention and optimization of their radiation therapy as do patients treated with external sources of radiation. However, many physicians continue the use of a standard amount of activity (or activity per kg of body weight or m\(^2\) of body surface area). The 1997 Euratom Directive\(^7\) mandated the use of patient-individualized therapy planning for radiopharmaceuticals, and many European centers are following this mandate. Our European colleagues are clearly in the lead in the important and developing field of patient-individualized dosimetry. The United States will hopefully begin to follow this lead in the near future, both in science and legislation, but we will obviously be playing catch-up for some years to come.

Traditional concepts of the average absorbed dose to a whole organ or tumor in predicting radiation effects continue to be challenged by evidence that processes taking place at the cellular and subcellular level, including the “bystander effect”, are important to the prediction of radiation effects on biological systems. Boyd et al.\(^8\) compared the induction of such bystander effects by external beam photon radiation with effects from exposure to \(^{131}\)I-MIBG, \(^{123}\)I-MIBG \(^{211}\)At-MABG and found that “Potent toxins are generated specifically by cells that concentrate radio halogenated MIBG. These may be LET dependent and distinct from those elicited by conventional radiotherapy.” Kishikawa et al.\(^9\) published fascinating results that showed a marked difference in the bystander effect in an in-vivo animal model, depending on whether the effect was caused by \(^{123}\)I or \(^{125}\)I Auger electrons. They lethally irradiated human adenocarcinoma cells with these nuclides, then mixed them with unirradiated cells, and injected them in the anterior flank of nude mice. They found an ‘inhibitory’ bystander effect with the \(^{125}\)I system, but a ‘stimulatory’ bystander effect with the \(^{123}\)I system (i.e. greater cell growth than in controls)! From this they concluded that “These findings call for the re-evaluation of current dosimetric approaches for the estimation of dose–response relationships in individuals after radiopharmaceutical administration…”

References
\(^7\) http://www.bnsa.bas.bg/eurolex/31997L0043_en.pdf
Challenges or Opportunities?
A Few Current Issues in Medical Health Physics
Lawrence T. Dauer, PhD, CHP

The Cheyenne have a saying that goes something like this: “a good soldier is a poor scout.” I know that there is some truth to this proverb in my own professional life. We in the medical health physics arena are typically so busy soldiering along in our daily battles (dealing with operational issues, crazy researchers, and administratum) that we never get the chance to take the afternoon to climb up a tree and get a good scope of the landscape and the greater war. What are the current and future challenges (or should we call them opportunities) we are wrestling with? Although my scouting is a bit rusty, here is a glimpse of just a few of the issues from the heights.

Defining an Experienced Radiation Safety Officer
NRC revised 10 CFR Part 35, Medical Use of Byproduct Material on April 24, 2002 (67 FR 20249). The revision contained new training and experience (T&E) requirements for individuals to become authorized as an RSO, authorized medical physicist, authorized user, and/or authorized nuclear pharmacist. The new requirements identified three pathways for an individual to become authorized: certification by a specialty board recognized by the NRC, alternate pathway based on T&E, or identification of an individual’s listing on existing NRC or Agreement State license (a type of grandfathering for those already listed on licenses). Although there have been some slight rule changes and date extensions, as currently written, the rules do not recognize individuals certified by a board that was listed in Subpart J of the old regulations prior to October 24, 2005. In other words, individuals certified by the American Board of Health Physics (ABHP) would not meet the T&E requirements to be an RSO on a medical license by virtue of certification alone. This issue has been addressed on a broader scope by a petition for rulemaking filed by E. Russel Ritenour on behalf of the AAPM (FR Vol 71 No 211, 11-1-2006) and in a supporting letter from HPS President, Brian Dodd (12-29-06). In essence, the societies are requesting that the NRC recognize individuals that were certified prior to October 24, 2005, even if they have not been formally named as an RSO on a previous or existing license. Stay tuned.

Big Brother and Increased Controls
Big brother or big bully? The headline screams: “Hot” patients setting off radiation detectors (ScientificAmerican.com; 1-28-07). Big brother is definitely watching our diagnostic and therapeutic patients. With residual activity remaining in patients for hours to months, it is clear we need to ensure that we inform patients of the increased probability that they might setoff alarms (and give them documentation to assist them during that event). We also have the responsibility to work with government and private agencies that are implementing new ‘homeland security’ detection equipment to assist them in developing appropriate response procedures. Some questions that come to mind might include: can a terrorist intake nuclear medicine themselves, makeup a letter or wallet card, and proceed to blow themselves up as a living ‘dirty bomb’? Will all of these detectors make us safer in the long run?

We also have the biggest brother, the NRC, now requiring ‘increased controls’ for certain quantities of concern (NRC, 12-1-2005). For many in medical health physics this may include blood bank irradiators, research irradiators, multiple- or co-located high dose rate brachytherapy sources and other sources. The increased controls may be difficult to push through hospital administration (including physical barriers, background checks, etc.). These issues are particularly difficult in academic research environments or joint institutions with large numbers of post-doctorate researchers.

We can surely expect more from big brother in the future.

Keeping up with Technology and Increased Volume
In 2004, Fred Mettler noted that “a major issue has been rapid development of new technologies and the lack of regulations and standards to keep up” (HPS 87(3):289-292, 2004). His words continue to ring true. We now have an explosion of new technology in many areas including: complex fluoroscopy interventional procedures, cardiology imaging, multislice CT machines, new brachytherapy procedures using liquid isotopes, digital detectors replacing film, intra-operative electronic brachytherapy, etc. In
addition, radiology and nuclear medicine patient volumes continue to rise with 18.4 million plus diagnostic and therapeutic procedures involving radioisotopes procedures per year (IMV Medical Information Division, 2004) and over 60 million CTs performed in 2006 alone (Hayes, August. In: DiagnosticImaging.com. 2006). We now have systems that record patient ‘dose’, but exactly when should doses be recorded in the patient’s record? What dose is representative? Each of these technologies brings along specific other questions of patient safety, dosimetry, workload increases, shielding concerns, etc.

“Image Guided” Medicine
Streaming in from the horizon like a guided missile, one of the big buzz words today is “Image Guided”. We see it applied to image guided interventions, operations, treatment planning, and therapies. This has resulted in new equipment and inventions to assist in the picture-taking frenzy. We now have PET/CT units for oncology, hybrid units for both therapy and radiology (such as LINACS with on board imagers), flat panel ‘walls of knowledge’ in the ORs flashing 3D images, and even cone beam CT units in the dentistry! This rise of image guidance systems brings with it concerns for both patient and staff radiation safety. Radiation therapists are now positioning and molding patients for oncology treatment that have PET isotopes onboard, doses for longer interventional fluoroscopy are increasing, workloads are increasing, and the number of staff now being exposed is growing. Expect this area of medicine to grow rapidly over the coming decade. Will we be able to keep up?

Back to the Future with Radiopharmaceuticals
The potential for monoclonal and newly discovered chemicals tagged with radioisotopes for both diagnostic decision-making and therapeutic treatments is only now being realized in the post- BEXXAR, Zevalin, and 3F8 trials phase. As such, research is hurtling us headlong into a new age of designer radiopharmaceuticals. PET isotope demand may result in the installation of additional cyclotrons and so-called baby-cyclotrons into the hospital and research settings. There is an increased interest in targeted alpha-particle therapy (Mulford, et al., 2005 Jan; 46 Suppl 1:199S-204S), and even talk of using radium once again (Larsen & Bruland, Radium revisited, http://www.bruland.info/PDF/195-202.pdf). Researchers continue to tinker with the chart of the nuclides to develop better imaging and therapies.

Patient Safety and Error Prevention
Sadly, errors continue to be of concern for both diagnosis and treatment modalities (e.g. fluoroscopy injuries, brachytherapy injuries, and external beam injuries). In the few years since the Institute of Medicine issued the report “To Err is Human: Building a Safer Health System” (2000) and estimated that up to 98,000 deaths were due to medical errors, there has been much interest in the public and the media aimed at health care safety, most recently portrayed in the PBS special “Remaking American Medicine” shown in October, 2006 (www.remakingamericanmedicine.org). The JCAHO now issues National Patient Safety Goals (www.jointcommission.org/PatientSafety/NationalPatientSafetyGoals) and expects to see patient safety initiatives in each health care setting. What is the medical health physicist’s role in such programs? How do we ensure training on error prevention techniques occurs and that it includes: self checking, situational awareness, 3-point communication, time outs, peer checking, benchmarking, as well as pre- and post-job reviews?

Robert Baden-Powell once said that “a scout is never taken by surprise; he knows exactly what to do when anything unexpected happens”. So keep soldiering and expect the unexpected. Got a few issues to add? Please share them at medhp-sec@hps1.org.

Please Meet the Executive Council

Dr. William Walker- Board of Directors
Bill is President and Chief Executive Officer of Comprehensive Physics & Regulatory Services, Ltd. (CPRS). CPRS is a pioneer in providing treatment planning services over the Internet from its Pittsburgh office in addition to providing professional therapy physics consulting to cancer treatment facilities in the Mid-Atlantic States.
Bill is a professional medical physicist with 45 years of experience in clinical practice, research and program management. He holds a B.S. in Civil Engineering from the Virginia Military Institute, an M.S. in Radiation Biophysics from the University of Kansas, and a Ph.D. from the University of Florida in Environmental Engineering (Medical Physics). He is certified by the American Board of Health Physics, licensed by the State of Florida as a Therapeutic Radiological Physicist and is a registered Professional Engineer. Bill retired from the U.S. Air Force in 1978 as a Lt. Col. and was the Chief of Medical Physics for a major USAF Medical Center. Following retirement from the Air Force, he headed the US Nuclear Regulatory Commission’s medical and academic licensing program and later was the Radiation Safety Officer and Radiation Safety Program Director for the National Institutes of Health in Bethesda Maryland. He is currently a member of the Advisory Committee for University of Florida’s Department of Nuclear & Radiological Engineering.

Victoria Morris- Board of Directors
Victoria (Vicki) Morris is currently Radiation Safety Officer for the University of Cincinnati. She received a bachelor’s and a master’s degree in bionucleonics from Purdue University. Vicki began her career as a Health Physics at Purdue University in 1979 and was promoted to Assistant Radiological Control Officer in 1984. Vicki was certified by the American Board of Health Physics in Comprehensive Health Physics in 1986 and took a position as Radiation Safety Officer for Merck, Sharp and Dohme’s West Point facility in 1987. Vicki has been at the University of Cincinnati since 1990. As University of Cincinnati Radiation Safety Officer, she is responsible for the oversight of the University of Cincinnati’s Radiation Control and Safety Program. The program is covered by a broad scope medical license and multiple registrations and includes the multiple campuses of the University of Cincinnati, Cincinnati Children’s Hospital Medical Center and its associated outpatient clinics, Cincinnati’s Shriners Hospital for Children and the Hoxworth Blood Center.

Steven King- Board of Directors
Steve is the Associate Director of Health Physics at the M.S. Hershey Medical Center / the Pennsylvania State University. Steve has worked at Hershey for 24 years and is responsible for diagnostic x-ray equipment, laser safety and laboratory safety. He has a BA in Environmental Biology and MA in Radiation Safety from the State University of New York at Buffalo. He is certified by the American Board of Health Physics, The American Board of Medical Physics and is recognized by the FDA under the MQSA program. He is currently the Chair of the HPS Society Support committee. In addition, Steve serves as Secretary for the American Board of Medical Physics and is on the National Council on Radiation Protection and Measurements SC 4-2 committee.

Dr. William Regits- Board of Directors
Willie is the Senior Manager at Cardinal Health in their Nuclear Pharmacy Services. He is responsible for the regulatory compliance of 160 nuclear pharmacies and 22 PET manufacturing facilities nationwide. Duties include management of licensing, dosimetry, transportation, best practices for safe use, new product development and radiation program development and maintenance. He received his Bachelor of Science in Physics from San Diego State University, a Master of Science in
Radiological Health Physics from San Diego State University, and a PhD Nuclear Engineering/Health Physics from Texas A&M University. Willie has 15 years of Health Physics Experiences, 10 years in Medical Health Physics, and 5 years of experience in nuclear pharmaceutical distribution and manufacturing business. Willie has also been an RSO at a Medical Teaching University in the biomedical research industry.

**John Jacobus- Board of Directors**

I am a senior Health Physicist in the Division of Radiation Safety at the National Institutes of Health (NIH), Bethesda, Maryland. My primary duties involve oversight of radiation safety programs and ensuring regulatory compliance in both the Nuclear Medicine and PET Clinics, and support of our radionuclide therapies. I maintain broad interests in both clinical and therapy medical physics, and provide technical information to other members of the Division of Radiation Safety. I am currently the Chairman of the NIH Radiation Drug Research Committee, and a member of the NIH Radiation Safety Committee.

**Kathleen L. Shingleton: Director Liaison**

Kathleen Shingleton earned a B.S. degree in Biology/Health Physics from Virginia Polytechnic Institute and State University (1979), and a M.S. degree in Radiological Health Physics from San Jose State University (1984). She has been comprehensively certified by the American Board of Health Physics (ABHP) since 1989.

Kathy has been employed by Lawrence Livermore National Laboratory for more than 25 years and is currently the Radiation Safety Section Leader in the Hazards Control Department. In this position, she has responsibility for the institutional radiation protection program as well as administrative and technical responsibility for approximately 42 people. Prior to this assignment (1993-2000), she was the Health Physics Technical Leader/Radiation Safety Subject Matter Expert. In this position, Kathy was responsible for radiological policy development and implementation at LLNL and technical oversight of the health physics program. Previous assignments included support to LLNL’s Plutonium Facility (1989-1993), the Weapons Program (including uranium machine shops, isotopic source and accelerator radiography, x-ray and accelerator research and development programs, etc.), Nuclear Chemistry and the Heavy Elements facility, the Physics Program, and the Health Services (medical) Department. In addition to these responsibilities, Kathy has been an active member of the DOE Emergency Response Program since 1981, where she has held positions of increasing responsibility and is currently filling the role of Senior Health and Safety Advisor.

Kathy is currently a Director of the Health Physics Society and recently completed a 3-year term as the Secretary of the American Academy of Health Physics (AAHP). She has been a member of the American Board of Health Physics Part II exam panel (1997-2001), the ABHP Part I exam panel (1992-1996), and served a 5-year term as chair of the Venues Committee.