



Conference of Radiation Control Program Directors, Inc.

# NEWSBRIEF

[www.crcpd.org](http://www.crcpd.org)

A Partnership Dedicated to Radiation Protection

February 2008

## Message from Chairperson Debbie Gilley



“A ship in a harbor is safe, but that is not what ships were built for,” has always been a favorite quote of mine. CRCPD’s reputation as a leader in Radiation Protection is becoming even more evident as 2008 unfolds. There are increasing opportunities for our members to participate in the national and international radiation protection fields. Articles in this newsletter demonstrate current and potential activities of CRCPD members making a difference in the radiation protection profession. Recapping January activities and opportunities should begin with the Board of Directors. I cannot say enough about these outstanding individuals who joined me in a sailing adventure. They have with short notice represented our organization with integrity and professionalism. Thanks to each and every one of them and to their states who have allowed them to participate.

Communication with our members, partners and the public is more and more important as we use technology to share and receive information. The Board has created a Public Information Committee to help us craft our message and to be a leader in disseminating accurate information. We are fortunate to have a great committee, resource personnel and advisors. Our goal is to provide states with information that they can use to tailor their message, much like the “Image Gently” campaign. (See the “Image Gently” article elsewhere in this issue) Look for more CRCPD information that our members can use in the future.

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Speaking of messages, radon has been in the news lately with January being Radon Action Month. I had the pleasure of presenting the CRCPD Radon Hero Award to Kevin Stewart from the Pennsylvania American Lung Association, and attending a round table discussion of the Radon Resistant New Construction recommendations. Joining me for the kick-off festivities

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## Chairperson's Message

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## Greetings from Your Executive Director



Ruth E. McBurney, CHP

were Clark Eldredge, Florida Radon Ranger General, Mike Pyles, Pennsylvania Radon Manager and Dale Dorschner, Minnesota Indoor Air Unit Supervisor. It was a very lively discussion between the builders, professional association and government sector. I enjoyed spending time with the “experts” in the field of testing, mitigation and prevention of exposure to radon. Kudos goes to all of the E-25 committee, led by Bill Bell, Chair, (MA) and Environmental Council Chair, Jim McNees (AL).

Wish all of you safe sailing in 2008. *Debbie*



### “Image Gently™” Pediatric Campaign Underway

Educates Providers of Pediatric Imaging on the Need to “Child-Size” Radiation Dose

On January 22, 2008, the charter members of the Alliance for Radiation Safety in Pediatric Imaging—the Society for Pediatric Radiology, the American College of Radiology, the American Society of Radiologic Technologists, and the American Association of Physicists in Medicine—launched the highly anticipated Image Gently campaign, a national initiative that will educate providers of pediatric imaging care about the importance of “child-sizing” radiation doses. CRCPD joined the Alliance in October as an affiliate organization. The program fits well within the mission of CRCPD in reducing unnecessary exposure to radiation.

The campaign’s central message is that children may be more sensitive to radiation received from medical imaging scans than adults, and that cumulative radiation exposure to their smaller bodies could, over time, have adverse effects. Therefore, radiologists who perform imaging exams on children are being urged to:

- “Child-size” the scan: this often reduces the amount of radiation used
- Not overscan:
  - Scan only when necessary
  - Scan only the indicated region
  - Scan once; multi-phase scanning (pre- and post-contrast, delayed exams) is rarely helpful
  - Be a team player
  - Involve medical physicists to monitor pediatric CT techniques
  - Involve technologists to optimize scanning

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## Message from Executive Director

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### Image Gently *[Continued]*

During the campaign's rollout phase, the message will focus on computed tomography (CT) scans. In 2006, U.S. physicians performed approximately 4 million pediatric CT scans — triple the number from five years ago. CT is a powerful modality that continues to replace more invasive and costlier non-CT techniques, but as technology evolves, the Image Gently campaign will help to ensure that medical protocols for pediatric imaging are keeping pace.

"CT is a great imaging modality that has revolutionized medical practice and saved countless lives, but it's also among the higher dose examinations we perform," said Donald P. Frush, M.D., Chair of the ACR Pediatric Radiology Commission. "We want to ensure that children are imaged using kid-sized, not adult-sized, radiation doses."

"A national campaign is important," said Marilyn Goske, M.D., Chair of the Alliance for Safety in Pediatric Imaging and Chair of the Board of Directors of the Society for Pediatric Radiology. "Medicine evolves; as we increase our knowledge, we have to change our practice."

Radiologic technologist Allen Croat, R.T. (R)(CT), Chair of ASRT's CT Chapter, said the campaign's message is needed. "Technologists are the ones who are actually imaging these children, so we welcome the campaign's emphasis on the ALARA format: As Low as Reasonably Achievable. We have to be protocoling our patients with our radiologists and imaging only what is necessary for the diagnosis."

The campaign's "radiation matters" theme drives home two fundamental concepts. One, more imaging is usually not better, and two, the effects of pediatric imaging last a lifetime. Correct dosage is key, Frush said. "Just as the appropriate dose of an antibiotic given to a child differs from the dose given to an adult, a small child needs a much smaller radiation dose than an adult."

The focus on children makes sense. "The relative risk to a young pediatric patient is higher compared to a 70-year-old adult because the child typically has a much longer lifespan after being imaged," said James M. Hevezi, Ph.D., medical physicist and Chair of the ACR Commission on Medical Physics. An overdose by medicine may produce obvious, immediate symptoms, but radiation is an invisible medium whose effects from overdose might not be seen for years.

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## Message from Executive Director

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### Image Gently *[Continued]*

Frush sees radiologists as having a special duty to young patients. “They entrust their care to their parents and to us as health care providers. We need to guard their welfare. We don’t know what’s going to happen, but at age 40 or 50 they may need a dozen or more CT scans. If they were scanned five scans as a kid, that’s a cumulative dose that doesn’t go away.”

The Image Gently™ campaign will target three audiences, Goske said. The first are radiologists, medical physicists and technologists who primarily work in adult hospitals or imaging centers and who image children as a very small part of their patient volume. Second, it will target referring ER physicians, pediatricians, pediatric orthopedists and other physicians. Last, and once the medical core is educated, the campaign will reach out to parents.

Radiation exposure is a serious matter, but Frush and Goske counsel perspective. All medical procedures entail some degree of risk, they said. Studies have repeatedly shown CT to be highly accurate and have a positive impact on patient care.

### How Can CRCPD Members Be Involved?

During the January 23, 2008, CRCPD Board of Directors meeting, the Board assigned the production of a poster or brochure concerning pediatric CT to the Committee on Public Information, with input from the Task Force on CT. The information materials will be available for radiation control program staff to distribute during inspections of CT facilities. Other target audiences will be identified as well. Once the information is ready for distribution, a notice will be sent to the membership.

Through the joint efforts of the various organizations, information on the need and methods for “child-sizing” pediatric CT examinations can get to the radiology, pediatric medicine, and emergency medicine communities.



## Election of CRCPD Board of Directors Officers

The two Board positions for which CRCPD seeks new officers are for Chair-Elect and Member-at-Large. **The candidates for Chair-Elect are Adela Salame-Alfie, Ph.D. and Terry Lindsey. The candidates for Member-at-Large are Earl Fordham, CHP, and Karen Farris.**

Ballots were mailed February 25nd and are due back by March 17th to be counted. The ballots will be counted at the OED on March 18th. Once the results are calculated, the Board will verify the results and the candidates will be notified. The Office of Executive Director will post the names of the new incoming officers on the CRCPD Website and inform the membership via email.

Per the CRCPD Bylaws, the current Director and Associate Members are eligible to vote for the election of Board Officers. The candidates elected will be YOUR elected representatives to carry out the business of YOUR professional association. The newly-elected officers will become Board members at the National Conference on Radiation Control at the second business meeting.

### About the Candidates for Chair-Elect



#### **Adela Salame-Alfie, Ph.D. (New York)**

Adela is currently the Assistant Director of the Division of Environmental Health Investigations at the New York State Department of Health. As Assistant Director she oversees the technical and administrative issues of the Bureau of Environmental Radiation Protection and Environmental Exposure Investigation (which deals mostly with hazardous waste sites). Prior to that appointment,

she worked in the Bureau of Environmental Radiation Protection for over 14 years, serving as the Director for the last five years. In this capacity, she was responsible for the technical and management oversight of approximately 40 people in the areas of radioactive materials, radiation producing equipment, environmental radiation/radon and radiological emergency

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## About the Candidates for Chair-Elect

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### **About Adela Salame-Alfie, Ph.D.** *[Continued]*

response. Prior to becoming the Bureau Director, she was mostly involved in the investigation of contaminated sites and radiological emergency response.

Adela obtained her Master's and Ph.D. degrees in Nuclear Engineering from Rensselaer Polytechnic Institute in Troy, NY. She has a BS in Energy Engineering from the Universidad Autonoma Metropolitana in Mexico City, Mexico.

Adela is Chair of the Committee responsible for the preparation of the pocket guide and Handbook for Responding to a Radiological Dispersal Device [HS/ER-2/previously HS-5]. These CRCPD documents have been referenced by many prestigious organizations, including the National Council of Radiation Protection and Measurements (NCRP), American Society of Testing and Materials (ASTM), Health and Human Services (HHS), etc.

As a result of this work, the Committee received the CRCPD Board of Directors Award for Outstanding Achievement in the Field of Radiation Protection in 2006. The Committee's next major activity is to sponsor a joint CRCPD/CDC roundtable to bring together state and local public health officials and radiation control program staff to discuss ways to strengthen communications

Adela is a member of the Health Physics Society, and she is a member of several national committees, including NCRP's SC4-2, which is charged with the development of guidance for quick assessment of internal contamination; and ASTM E54.02 Committee, which is responsible for drafting the Proposed Practice Standard for Radiological Emergency Response currently undergoing final review.

Adela and her staff are also involved in a training program designed specifically for local health departments to provide tools they can use to develop their radiological emergency response plans using activities the county health departments have been doing as a result of other (non-radiological) preparedness activities.

Adela is deeply committed to ensuring only the finest of her leadership and management skills will be dedicated to supporting the mission and vision of CRCPD and its members, and will be honored to receive your vote in the upcoming election.

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## About the Candidates for Chair-Elect

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### **Terry D. Lindsey (Oregon)**

Terry Lindsey has been the Manager of the Radiation Protection Services (RPS) section in the Oregon Public Health Division since 2001. The section currently is authorized 23 FTE with a \$4 million biennial budget.

Terry is interested in serving the CRCPD in a leadership or support role to continue the excellent work of the CRCPD. He is interested in working to improve Federal/State partnerships and understanding.

He also supports greater CRCPD involvement in exchange programs with the IAEA and assistance to developing nations to set up radiation protection programs to properly secure radioactive materials worldwide.

Terry's background and education includes receiving an undergraduate degree in Natural Science; nine years of service in the U.S. Navy in Washington, D.C., Naples, Italy and Augsburg, Germany (Cryptology); and completion of a Master's degree in Education from Boston University.

Terry has been involved in radiation protection training, inspections and program oversight since 1979 and served as the Radiation Control Program manager in North Dakota prior to accepting a position in Oregon in 1992.

During the past two years, Oregon RPS staff conducted an internal Top to Bottom program review and restructured the Oregon Radiation Protection Services organization to streamline management and provide opportunities for growth through the use of lead worker positions with technical expertise in specific program areas. The lead workers gain management experience and the programs benefit from the technical knowledge base to provide guidance to new licensing and inspection staff members.

Some recent Oregon RPS program issues/accomplishments include: updating of rules to be compatible with NRC regulations; successful passage of two bills in the 2005-2007 legislative session to increase fees ~30% for the first time in 14 years; full participation and training of staff for the October 2007 Federal TopOff 4 RDD exercise in Portland, Oregon; recent positive IMPEP review to move the

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## About the Candidates for Chair-Elect

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## About the Candidates for Member-at-Large

### About Terry D. Lindsey *[Continued]*

Radioactive Materials Licensing program off of heightened oversight to program monitoring until the next IMPEP review.

Terry would be honored to serve in any capacity on the CRCPD Board. He would also like to give back to the CRCPD for the many benefits they have provided to all members. Some of these benefits include: learning opportunities for state staff through involvement in rule development and standards; excellent training opportunities through partnerships with AAPM and ACR for emerging technologies; improved communications with Federal and industry stakeholders; greater involvement with our international partners through IAEA work and exchange opportunities; better access to the NRC Commission and involvement of at least one Commissioner at conferences; establishment of important links amongst member state staff members that help improve programs nationwide through the use of proven concepts and methods.

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### Earl W. Fordham, CHP (Washington)

Earl Fordham is a Certified Health Physicist (initially in 1996 and most recently re-certified in 2004). He is also a professional engineer in the state of Washington (Mechanical Engineer). He has Bachelor of Science degrees from Washington State University (ME, 1995) and the U.S. Naval Academy (Physics, 1980). He has worked in the radiation industry since joining the active US Navy and serving on board nuclear submarines in the 1980s. While serving in the

Navy, Earl qualified as a Nuclear Engineer to oversee nuclear plant operations. He was also qualified as a Quality Assurance inspector.

Earl worked most of his 25+ year career in the operational health physics area. Much of his early career was as a Navy submarine engineering division officer, where he had daily responsibility for nuclear plant operations and personnel radiation control. His civilian career includes operations at the Fast Flux Test Facility in Washington, oversight of waste operations at the Hanford Low-

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## About the Candidates for Member-at-Large

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### **About Earl W. Fordham, CHP** *[Continued]*

Level Radioactive Waste disposal site, and licensing and inspecting the processing of waste at a radioactive waste broker. While in these positions, he investigated numerous radioactive material incidents that utilized the practices and principles (e.g., dose reconstructions) critical to health physics. He provided unique timely guidance based upon his health physics knowledge and engineering background.

Earl joined the CRCPD in the early 1990s and advised the E-5 Committee on low-level radioactive waste issues. He is currently a member of the G-53 Committee on Public Information on Radiation Protection and the Health Physics Society's Government & Society Relations Committee. Until recently he served on the G-56 Task Force (Enhancement of State Radiation Control Personnel) and as CRCPD's Liaison to both the American Academy of Health Physics and the Health Physics Society.

In 2002 Earl became a Regional Director for the State of Washington's Radiation Control Program. He develops and coordinates critical policies having extensive impacts on State of Washington program operations. He directs and integrates the work of four groups: environmental monitoring & assessment, emergency preparedness, waste management, and radioactive air emissions, state-wide. He assesses radiological events for public impact and dispatches personnel for observations and surveys. He represents the Department of Health on advisory committees, including the Hanford Advisory Board. He oversees a \$5 million budget.

He is professionally active in the Health Physics Society at the local and national level. In the past he has been the Treasurer on a non-profit board overseeing nearly a \$1 million budget and the Chair of a separate non-profit board. He is also a Lion's Club Past President.

Earl married Bette-Jo in 1990. They have two children, Jesse and Chelsea, and live in West Richland, Washington.

Earl considers CRCPD a valuable asset. He have served CRCPD and is willing to serve as a Board member if elected.

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## About the Candidates for Member-at-Large

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### **Karen Farris (Massachusetts)**

Karen is the Mammography/Healing Arts Supervisor for the Massachusetts Department of Public Health's Radiation Control Program. Karen conducts mammography inspections for both the state (Massachusetts has their own specific mammography regulations) and the FDA MQSA program. She also conducts state inspections of x-ray registrants, participates in nuclear power plant exercises, and handles all of the x-ray related consumer complaints.

In addition, Karen is part of the department's emergency response team for radiological incidents and has assisted in updating the x-ray and mammography regulations. Karen has also made presentations at various mammography training seminars in Massachusetts and last year traveled to Taiwan to speak at a workshop on quality assurance and conducting mammography inspections.

Karen received her Bachelor of Science degree in Professional Arts with an emphasis on Health Care from St. Joseph's College of Maine. She has been with the Radiation Control Program for 14 years.

Karen has been an active member of the CRCPD for many years. She has served on the NEXT Committee as a member and is currently an advisor. Karen served as the Breast Cancer Organizations Liaison. She is currently a member of the Mammography Committee which she started out as an advisor and has also served as chairperson.

Karen has seen how the CRCPD is dedicated to offering support to the states, provide training opportunities to its members, and is a great resource in the field of radiation protection/safety and wishes to be a part of the organization by serving as Member-at-Large.



## NCRP 2008 Annual Meeting

By Debra McBaugh (WA)

### National Council on Radiation Protection and Measurements 44th Annual Meeting, April 14 - 15, 2008 Bethesda North Marriott Hotel & Conference Center

This year the meeting will cover a topic of interest to many of us in the radiation business – what effects low doses of radiation have on us. The program is titled Low Dose and Low Dose-Rate Radiation Effects and Models. Not only are there some good papers and speakers coming, but there is no registration fee charged for this meeting.

As stated in the press release, the meeting will feature presentations by international experts on the topics of (1) molecular, cellular, tissue, and laboratory animal studies on the effects of exposure to low-dose and low dose-rate radiation, (2) results of epidemiological studies on human health effects of low radiation doses in occupational, medical and other exposure scenarios, and (3) potential impacts of these findings on future regulatory guidance and public health policy.

The 32nd Lauriston S. Taylor Lecturer will be Dade Moeller and he will be talking about issues related to Yucca Mountain. Jill Lipoti, one of CRCPD's former chairs and currently a member of NCRP, is also on the program. She will provide introductory remarks for the session Low-Dose Radiation Effects, Regulatory Policy and Impacts on the Public. Her remarks are titled What Would It Take to Promote or Require a Change in Regulations? To look at the full program and to register, go on line at [www.ncrponline.org](http://www.ncrponline.org).



## CRCPD Annual Meeting May 19-23, 2008

### 40th National Conference on Radiation Control

The 2008 National Conference will be at the Greensboro Marriott, 304 North Greene Street, Greensboro, North Carolina 27401.

For all of the information about the conference, go to [www.crcpd.org/2008annualmeeting.asp](http://www.crcpd.org/2008annualmeeting.asp). Online registration is not available yet, but should be soon. Registering by mail or fax is available now. [[Link to registration form](#)]

The website will reflect updates and changes. Abstracts will be posted as they are received. You can check to see who is going to be exhibiting. If you have questions, the website will direct you to the correct person. Want info about the spouse program? Check the website. What about the Mammography Continuing Education course? Check the website!



## HPS Membership Offer

### Special Half Price HPS Membership Offer for CRCPD Members

During his presentation at the 2007 CRCPD Annual Meeting in Spokane, Health Physics Society (HPS) President Brian Dodd made an offer to CRCPD on behalf of the HPS Board of Directors. The offer is as follows, as quoted directly from his presentation:

- Special, one time, limited offer...
- For CRCPD members only!
- Join HPS before the end of 2008

The HPS Board of Directors reaffirmed this offer at its meeting in January 2008.

This means that if you are not currently a member of HPS and would like to join, you may do so for \$35 for the first year of membership if you join before the end of calendar year 2008. The membership application and process are found at the HPS web site at [www.hps.org](http://www.hps.org).



## Analysis of Radionuclides in Water for Incident Response

By Ronald G. Fraass, Director  
National Air and Radiation  
Environmental Laboratory  
U.S. Environmental  
Protection Agency

The Environmental Protection Agency has published a new document for use by laboratory staff and responders to prioritize and analyze water samples following a deliberate release of radioactive material into the environment. Copies, provided by EPA, are being sent by CRCPD to each state for their use.

The document is titled: *Radiological Laboratory Sample Analysis Guide for Incidents of National Significance—Radionuclides in Water*. It is EPA document 402-R-07-007. The guide provides flow charts for three different scenarios.

In the first scenario, the goal is to rapidly identify and determine the concentration of radionuclides in water samples to assess whether the contamination poses an immediate threat to human health and warrants protective actions.

The second scenario goal is to assess whether a given water sample is potable based upon drinking water standards. In both of the first scenarios, radioactive contaminants are presumed to be initially unknown.

The third scenario presumes that contaminants are known and therefore a shortened version of the first two methods

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## Analysis of Radionuclides in Water for Incident Response *[Continued]*

can be applied to expedite the analysis process. Standardized analytical schemes and appropriate quality objectives will ensure that radioanalytical data will be of known quality for intended response decisions.

The document is available electronically on the NAREL website at <http://www.epa.gov/narel/reports/WaterReport%20Final%20%20w%20Cover%201-16-08.pdf>. Questions about the document may be sent to Dr. John Griggs, US EPA Office of Radiation and Indoor Air, National Air and Radiation Environmental Laboratory, 540 South Morris Ave, Montgomery, AL 36115; Phone 334 270-3450; email: [Griggs.John@epa.gov](mailto:Griggs.John@epa.gov).



## Tritium Exit Signs Present a Challenge in Handling and Disposal

By Ruth E. Mcburney, CHP  
CRCPD Executive Director

Exit signs pointing the way out of buildings and airplanes probably have saved many lives during emergencies since being required by state laws in the 1930s. However, exit signs require proper handling and disposal to protect public health and the environment, especially those containing the radioactive material tritium.

While the benefit of tritium exit signs is that they glow even when they have no electrical power or batteries, they also must be isolated from other wastes during disposal, since they may and often do contaminate scrap metal from demolition sites. For this reason, tritium exit signs are regulated by the Nuclear Regulatory Commission, and proper disposal of the signs is required once they are no longer used.

While many large commercial and government entities are aware of the requirements for use and disposal, many small businesses are unaware of the NRC requirements, leading to the improper disposal of tritium exit signs in industrial or municipal landfills, or worse, their being sold over the Internet.

An estimated 2 million tritium exit signs have been sold in the U.S. The number of signs in use now and where they are located is unknown, given that there is limited tracking of the purchase, use, or disposal of the signs and that tritium exit signs have a usable life ranging from 10 to 20 years.

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## Tritium Exit Signs

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### Tritium Could Cause Both Health Risks and Economic Costs and Liabilities

Should a tritium exit sign—which contains tritium-filled glass tubes—break, its contents could pose a risk to those located in the near vicinity. They could be exposed to tritium gas or tritiated water from the tritium that has escaped into the environment.

Cleaning up tritium after an accident could be costly, especially for small businesses. Worker or public exposure to tritium also could present unwanted and unnecessary liabilities. In addition, tritium may leak from landfills where signs have been illegally disposed, and could compromise the safety of drinking water sources.

### EPA Responds to Concerns about Mismanagement of Tritium Exit Signs

EPA has developed an online training course providing detailed instructions on best practices for the handling and disposal of tritium exit signs in response to the lack of awareness on the part of facility owners, management, and maintenance personnel.

The course contains easy-to-follow, step-by-step guidelines on using and disposing of tritium exit signs, as well as the rationale for why proper use and disposal is so important. To access the training online, go to [www.trainex.org](http://www.trainex.org) and search for “Tritium Exit Signs, responsible management.”

EPA is currently conducting outreach among targeted audiences to increase awareness about the problems associated with tritium exit signs and the advantages of training on the proper use and disposal of tritium exit signs. EPA is encouraging, where appropriate, the use of alternative technologies.

The targeted audience for the training includes state and local officials; school facility managers; operators of public places including hotels, malls, dorms, and theaters; and green building designers.



## CRCPD Working Group & Liaison Activities



### Alliance for Quality Medical Imaging and Radiation Therapy (Alliance)

By Albert V. Orlandi, (NJ), H-13 Committee Chairperson

Thank you for allowing me to represent the CRCPD during the Alliance meeting on January 14-16, 2008, in Jacksonville, Florida. A total of 51 representatives from the two Founding Members, 18 Alliance Members, and the four Consulting Organizations (which included the CRCPD) were in attendance. The following is a summary of major meeting discussions and outcomes:

1. The meeting started with a review of an unresolved issue from the October 2007 meeting regarding Programmatic vs Regional Accreditation. As written in the draft regulations, the minimum standard of education for several categories requires graduation from a school that is either regionally accredited (i.e., accreditation that is awarded to all programs within a college/university) or programmatic accredited (i.e., accreditation awarded to the individual program within the school).

The majority of the members expressed concern that this issue has divided the Alliance and there is need to refocus its efforts back to its primary purpose (i.e., the passage of the Consistency, Accuracy, Responsibility, and Excellence in Medical Imaging and Radiation Therapy (CARE) bills (H.R. 583 and S1042)). The Alliance decided to defer any future work on the draft regulations and to unanimously focus its efforts on the passage of the CARE Bills.

2. Some members discussed their efforts in promoting the CARE Bills. Most impressive was the work of the Society of Diagnostic Medical Sonography, which published a very nice booklet entitled "Quality Sonograms."
3. The ASRT discussed the collaborative efforts of the Alliance for Radiation Safety in Pediatric Imaging (Note: CRCPD is a member) to soon launch the "Image Gently" campaign. Image Gently is designed to lower radiation exposure to pediatric patients through targeted education of the public, physicians, technologists, and physicists.
4. The results of the Alliance's November 2007 "Contact Congress" event were discussed. Many calls were made to

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## Working Group Activities *[Continued]*

### Alliance for Quality Medical Imaging and Radiation Therapy

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senators and representatives. However, there were no new cosponsors of the Senate bill and only four new cosponsors of the House bill.

5. The American Society of Radiologic Technologists' (ASRT) lobbyists discussed the current status of both bills. Both are optimistic that these bills can be passed in an election year. H.R. 583 remains in the Committee on Energy and Commerce. There are 128 cosponsors of the bill. S1042 remains in the Committee on Health, Education, Labor and Pensions. There are 22 cosponsors. The lobbyists stated that in communications with Health Legislative Aides, there are many others in support of these bills.
6. The ASRT spoke of its "RTs in DC" project in March 2008, where radiologic technologists will visit their Senators and Representatives on Capitol Hill regarding the CARE Bill.
7. The Alliance is planning a second "Contact Congress" event with the Alliance members calling Senators the week of 1/20/08 and House Representatives the week of 1/27/08. The main focus is to call the members on the committees since neither committee has considered the bill. It is hoped that many calls will get the committee members and chairpersons to discuss the bills.
8. Many members spoke in support of a public campaign to increase public awareness regarding the need for minimum standards and encourage the public to call Congress in support of the CARE bills. No action was taken.

If you have any questions or comments, please call me at (609) 984-5891.



## International Activities

By Edgar D. Bailey, Chair  
G-61 International  
Relations and Outreach  
Committee

### CRCPD Members Participate in IAEA Activities

Following are two summaries of recent International Atomic Energy Agency (IAEA) activities in which CRCPD members Jill Lipoti and Ed Bailey were fortunate enough to participate. Both of these were Integrated Regulatory Review Services (IRRS) and involved the African nations of Uganda and Kenya.

For those of you who may be unfamiliar with the IRRS program, it is an IAEA program for providing evaluations of a nation's radiation control program. It is very similar to the Integrated Materials Performance Evaluation Program (IMPEP) conducted here in the United States. Unlike IMPEP, IRRS covers all sources of radiation, including x-ray and all radioactive materials. IRRS is the outgrowth of the former Radiation Safety and Security Infrastructure Appraisal (RaSSIA) of the IAEA.

When I asked Jill to provide a short write-up of her experiences, she responded immediately with the story below. I am very appreciative for her help and enthusiastic response. It is hoped that the international work of CRCPD members can be published in future issues of the Newsbrief. I know of at least two other CRCPD members who have recently completed international projects. If they let me know about them, you will be able to read about them soon.

I think you will find the experiences Jill and I had were "the same but different." I hope these summaries will encourage you to become involved in the international outreach efforts of the CRCPD.

### Uganda



By Jill Lipoti, Ph.D. (NJ)

The IAEA sponsored an IRRS for Uganda the week of October 15-19, 2007. I was pleased to be selected as team leader, with team members Cynthia Heinberg (representing the IAEA), Tom Ryan (from Ireland), and Teadros Gebremichael (from Ethiopia). The plane trip from New Jersey to

Uganda took 20 hours, and had stops in Amsterdam and Nairobi before landing in Entebbe.

Our contact in Uganda, Michael Kiza, met Cynthia and me at the airport and we had about an hour's drive to Kampala. Arriving at our hotel, we made arrangements to meet with the whole team

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## International Activities *[Continued]*

### Report on Uganda *[Continued]*

on Sunday for a day of sightseeing, planning for our report, and adjusting to the time difference.

Uganda has a population of about 30 million people. English is the official language. The life expectancy is only 52 years. Women have an average of 6.8 children. The literacy rate is 66%. It is estimated that between 2 and 7% of the population has HIV/AIDS. Uganda has substantial natural resources, including fertile soils, regular rainfall, and sizable mineral deposits of copper and cobalt. Agriculture is the most important sector of the economy, employing over 80% of the work force. Coffee accounts for the bulk of export revenues.

The team spent Sunday getting to know each other and Kampala. We visited the Kasubi Tombs and learned about the Bugandan people, who speak Lugandan. We spent some time in a market for native goods. We learned that the Ugandan population is 42% Roman Catholic, 42% Protestant, and 12% Muslim.

On Monday, we began our work. We had an entrance meeting, and started using the questionnaire to elicit the information we would need for our report. The Ugandan radiation control program is based on an Atomic Energy Decree passed in 1972 and signed by General Idi Amin Dada, President. It established:

- An atomic energy control board
- A chief radiation safety officer with authority to enter and inspect
- Licenses for possession of rad material
- Dosimetry services
- Enforcement—fine of 2000 shillings or imprisonment for up to 6 months.

To put this in perspective, I paid 1000 shillings for a small bottle of water each day for brushing my teeth. Maybe 2000 shillings was a lot in 1972, but it is not a deterrent in today's Uganda.

Uganda has recognized the need to update the radiation control program, as well as to encourage the establishment of nuclear power reactors. Bill Number 17, Atomic Energy Bill, 2007 has been drafted and is expected to be considered by Parliament before the end of the year. If passed, it would establish an independent regulatory body with authority to:

- Set fees
- Promulgate regulations and guidance

*[Continued on next page]*

## International Activities *[Continued]*

### Report on Uganda *[Continued]*

- Issue, amend, suspend, or revoke authorizations
- Periodic systematic safety review
- Enter and inspect
- Enforce
- Respond to emergencies
- Cooperate with other relevant authorities.

If passed, this will represent a vast improvement in the authority of the radiation agency.

We arranged to visit Makerere University, to see the facilities available for radiation protection work. Dr. Kisolo, a physics professor with teaching and research duties, was the sole inspector for the entire country. He had a registry of about 280 sources, but he had no transportation to go out of the capitol city to inspect them. His laboratory consisted of two sodium-iodide detectors, but there was a lack of equipment for x-ray inspection, neutron detection, or response to emergencies.

We also visited Mulago Hospital. It contained one Co-60 radiation therapy source (decayed 2 half-lives) for the entire population of Uganda. There was also a Cesium source and a strontium eye applicator. The Cesium source was used to treat cervical cancer and required the patient to remain in the treatment bed for 12 hours at a time. The oncologist told us that 80-90% of the people in the waiting room would die because the waiting list was so long that the treatment was mostly palliative.

The nuclear medicine facility only had access to Tc-99, but wanted to expand to additional sources. The main reason for not being able to expand the diagnostic and treatment options was that trained individuals were needed to oversee the work, equipment was needed, and regulatory oversight was lacking.

Each day we would work through the questionnaire with the Ugandan authorities in the time they had available to spare for us. Then, in the evening after dinner, the team would get together and work on our report. Sometimes we worked together and other times we divided the work among three groups so that we could maximize our report-writing. We would assemble the pieces and together craft our conclusions and recommendations.

As team leader, I was fortunate to have extremely knowledgeable and productive team members. All of us were motivated to finish the report and provide a thorough picture of the Ugandan

*[Continued on next page]*

## International Activities *[Continued]*

### Report on Uganda *[Continued]*

radiation control program, along with recommendations for improvement. We found that we were in agreement the majority of the time, although our Myers-Briggs scores were quite diverse. We even talked about using Myers-Briggs as a way to put together an IAEA review team to ensure that all perspectives are considered.

On Wednesday evening, as we examined Bill Number 17, we found that the regulatory body consisted of three individuals who met quarterly. There was no mechanism for them to delegate responsibility for inspection and enforcement to radiation protection officers. We wanted to communicate what we considered a flaw in the legislation to the chief attorney.

So on Thursday morning, as my team worked to complete our report, I went to the Attorney General's office with our Ugandan contact. The attorney was grateful for our careful review and made notes to craft an amendment that could be introduced on the floor to address the implementation difficulty. As we were walking back to the office where my team was working, the Ugandan counterpart suddenly asked if I knew my way back—he had urgent business to attend to and needed to take a taxi. Bravely (but naively) I walked back alone on the streets of Kampala. I reached the building unharmed, but only in retrospect did I realize that this was a risky behavior on my part.

We finished our report on Thursday evening and Irene Batebe, a chemical engineer in the Energy Ministry in Uganda, printed it out for us to present to the Minister and Permanent Secretary the next morning. Irene was a very studious and motivated individual who was working on her Master's degree online with a Swedish University.

We left that evening to celebrate completion of our report at the Haandi Indian Restaurant in Kampala. After a few "Nile Special Beers" at dinner, and many toasts to our team, Tom Ryan said that he had brought a "wee dram" with him to continue our celebration. Whether it was the intensive work that we put in on the report, the grim radiation control picture that we depicted, the difficulties that we had worked through during the week or just the general compatibility of the members of the team – I rarely felt such a sense of camaraderie. I know that we will be friends for life, after the bonding experience of an IAEA mission.

On Friday, we presented our report to Mr. Kabagambe Kaliisa and the Honorable D'Ujanga Simon. We received some Ugandan

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## International Activities *[Continued]*

### Report on Uganda *[Continued]*

presents that were lovely. Then we left for an afternoon of R&R on a boat trip on Lake Victoria to Ngamba Island—a refuge for chimpanzees established by Jane Goodall.



I have lots of pictures and lots of great memories of Uganda. I also have a “list.” We made a list of the things we will remember that are unique to our team and unique to our mission. I’m proud to be the originator of the “list,” and it is a tradition that I hope to continue if asked to go on more missions.



Of note were the Maribu storks that inhabit the city. They are about 5 feet tall, and live in trees in the median of the roads. The first time I saw one in flight, I thought it was a Pterodactyl. I knew I was not in New Jersey any longer!

### Republic of Kenya

Edgar D. Bailey, P.E., CHP, Pflugerville, Texas

My trip to Kenya began on a rather inauspicious note. As I was leaving home to go to the airport to begin my flights to Nairobi, Kenya, the telephone rang and rather than answer it I let the answering machine take the call. It was from the airline saying that my flight from Austin to Washington, D.C., had been cancelled. Figuring there was nothing I could do on the telephone that I could not do at the airport, I continued to the airport. As it turned out, I was put on another airline for my trip to Washington (albeit with a change of planes at Dallas/Fort Worth). I arrived at Dulles within 30 minutes of when I had been scheduled to arrive originally.

From then on the flights went like clock work for the rest of the trip. I mention this because it illustrates a point that all of us who have participated in these overseas adventures have said, “If you want to do this kind of work, you must be FLEXIBLE.”

As I read Jill’s story of her trip I was struck with how similar our two IAEA missions were, but also how different they were.

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## International Activities *[Continued]*

### Report on Kenya *[Continued]*

Of course the first similarity was that they were both IAEA IRRS's. Like Jill's team there were four members. In addition to myself (who also served as the Team Leader), the team was made up of Cynthia Heinberg representing IAEA, Dr. Stephen Fennell from the Radiological Protection Institute of Ireland (yes, another Irishman), and Irma Zakarauskiene from the Radiation Protection Centre of Lithuania. Cynthia had flown straight from Uganda to Kenya after spending a week with Jill on the IRRS Ugandan mission. Cynthia, Stephen, and I arrived in Nairobi at various times on Saturday, October 20, 2007. Irma arrived early the next morning.

The nations of Uganda and Kenya have many similarities also. They are both located in Eastern Africa, both were former British Protectorates that became independent nations in the 1960's, the official language in both countries is English, both have similar HIV/AIDS rates, and both are predominately Christian (Kenya 80%).

Kenya has a population of over 37,000,000 people. Life expectancy is 55 years. Women have an average of 4.8 children. Kenya historically and currently is the regional hub for trade and finance in East Africa. Nairobi, the capital city and principle financial and banking center, is a modern, cosmopolitan city, although there are numerous shanty towns or slums scattered in and around this city of 3,000,000 people and what seemed like twice that number of cars. Although there were wide streets and highways, the traffic congestion was worse than Los Angeles and the driving worse than Rome. Nairobi was the site of the al-Qaida bombing of the U. S. Embassy on August 7, 1998, which killed 225 people and injured over 5,000.

The port city of Mombasa (~1,000,000 people) serves as the primary port for East Africa. With this major port and its network of highways, Kenya serves as a transit nation for much of the goods coming into and leaving the other nations in East Africa.

From reading Jill's description of her visit to Uganda and what I will relate later on, one may get the impression that IAEA work is all fun and games, but let me assure you it is not. Each mission requires a lot of hard work and long hours. To give one an idea of what work is involved, I will give an outline of the work schedule that was associated with my visit to Kenya.

On the Sunday before the work week began, the team met for over two hours to get acquainted, go over the task at hand, learn the

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## International Activities *[Continued]*

### Report on Kenya *[Continued]*

IRRS process, review the available information and data about Kenya, and learn the expectations of the IAEA with regard to our efforts.

On Monday and each succeeding day for the rest of the week, the team was picked up at our hotel around 8:00 a.m. and driven to the agency's offices. Once there we interviewed managers and staff of the program and reviewed documents and records until 1:00 p.m. We would take a break of about an hour for lunch, which was normally at a fast food place or pizzeria (although one day a manager in the radiation control program was able to get us in for lunch at the Nairobi Club, an institution that was founded during the British Colonial Period).

Following lunch we would return to the offices and continue our reviews until shortly after 5:00 p.m. After being driven back to our hotel, we would take a short break before gathering to have dinner (usually in the hotel dining room). Following dinner we would meet for about two hours as a team to discuss the findings of the day before going our separate ways to write up our portion of the report for the day. On Thursday night the entire team worked together until 2:30 a.m. on Friday morning finalizing the draft report for presentation on Friday. In addition to time in the office, on a couple of the afternoons we also made field visits to users' facilities in the Nairobi area.

Now a little bit about the radiation control program in Kenya. I think that you will see that the program in Kenya has a great many differences from the program Jill described for Uganda.

The Kenyan radiation control program is under the Radiation Protection Board (RPB). The Chief Radiation Protection Officer (CRPO) who heads up the program is also the Secretary to the Board. Joel Kamande, the CRPO, had done graduate work in medical physics at the University of Wisconsin in addition to his other education and training. Mr. Kamande manages a staff of 24 Radiation Protection Officers (RPO) in addition to support staff. The RPB anticipates adding ten RPOs in the near future and increasing that the number of RPOs up to a total of 90 RPOs within the next five years. The additional staff will be used primarily for surveillance at border points and waste management programs.

In addition to the usual radiation regulatory activities (licensing and permitting, inspection, enforcement, and environmental

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## International Activities *[Continued]*

### Report on Kenya *[Continued]*

monitoring), the RPB also provides the personnel monitoring system and the waste management facility for the nation. There is heavy emphasis directed toward the detection and prevention of illicit trafficking in radioactive materials.

The RPB operates from its Headquarters in Nairobi, two regional offices in Mombasa and Kisumu, and a field station at Jomo Kenyatta International Airport in Nairobi. The RPB also has the national waste management facility that is located at a Public Works facility in Nairobi.

There are plans to add an additional regional office in the eastern part of the country by May 2008.



The present Headquarters of the RPB is located in a dedicated building within a huge campus-like area of Nairobi that includes hospitals and other health related facilities, including the University of Nairobi Medical School. The RPB has recently been given a 16 acre tract of land in the Nairobi area upon which to build a new headquarters building, laboratories, and the national waste management facility. The program is in the process of developing waste management regulations and the specifications for a contractor to build the waste management facility.

The RPB issues an authorization (IAEA-speak for license, permit, etc.) for each source of radiation including x-ray units and each shipment of radioactive materials within the country, into or out of the country, or being trans-shipped through Kenya. The RPB also maintains the country's registry of radiation sources, which includes machine-produced radiation sources.

As a part of the IRRS evaluation, team members make site visits with the country's inspectors. The purpose of these visits is to observe the inspectors making a routine inspection. Unfortunately from an evaluation standpoint, our site visits tended to be more of a site tour than an actual inspection.

On the first of our site visits to users of sources of radiation, we walked to the Kenyatta National Hospital, which was within the complex where the RPB is located. Kenyatta is a large multi-storied hospital that serves as the regional medical center for much of eastern Africa. The hospital is a 2,000-bed facility

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## International Activities *[Continued]*

### Report on Kenya *[Continued]*

(although we were told that typically it houses between 3,500 and 4,000 patients each day) with both radiology and nuclear medicine departments.

Although I did not determine the exact number of x-ray machines, there were over 30 different units that were identified. Almost all of the equipment was from Phillips and was fairly new and modern. In addition to the routine radiographic units, the hospital had mammography units, at least two C-arms, CT units, mobile units, and fluoroscopy units. The hospital also had a 16-slice MRI unit. A new therapy accelerator was in the process of being installed to replace an earlier Japanese accelerator that the hospital had never been able to put into use due to technical difficulties.

The radiation therapy center had two Theratron780 cobalt-60 teletherapy units, which operated 24 hours a day, seven days a week. The hospital reported that these two machines provided 120 treatments per day. In addition, they had a Nucletron micro Selection HDR unit and LDR units. The center had three full time medical physicists on staff for treatment planning, dosimetry, and related activities.

In the nuclear medicine department there were thyroid probes and a Mediso Medical Imaging system that had been manufactured in Hungary. Since there are no nuclear reactors in Kenya, all radiopharmaceuticals must be imported and thereby there is a limit on the radioisotopes that are available. Mo-99 generators were obtained from Holland to produce Tc-99m, which was used with kits to compound a large variety of radiopharmaceuticals on site. Iodine-131 and P-32 were obtained from the Union of South Africa. Thyroid disease is quite common apparently in Kenya and the hospital performs four or more I-131 treatments per week.

Our second site visit was to the Ministry of Public Works and its Highway Department, which were located nearby. They use soil gauges and perform industrial radiography in addition to other nondestructive and destructive testing. There were a number of Troxler gauges located in the shop area. For industrial radiography they had several industrial radiography cameras, source changers, and x-ray units. Inside one of the test bays there was an underground storage bunker to store the gauges, cameras, and changers.

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## International Activities *[Continued]*

### Report on Kenya *[Continued]*

Through an agreement with the RPB, this site also presently provides the storage site for the nation's radioactive waste management and storage site. At the time we were there the wastes were being stored in a small separate building at the rear of the site. Also in the process of being put into use were two converted sea/land containers for future storage. These containers are to be moved to the RPB's new site when it becomes operational.

During the time we were in Kenya, we went to two really great restaurants that served the national cuisine of Kenya, nyama chom or barbequed meat. At our Sunday meeting we, of course, planned where we were going for dinner that night. I had read of a restaurant named Carnivore, which I suggested, and when we asked the hotel concierge for suggestions, his first recommendation was the Carnivore. After consulting the internet, where we found that the Carnivore was rated among the 50 best restaurants in the world, we were on our way.

Of course nyama chom is the specialty of the house. Here all of the meats are cooked on long spears over an open fire. The meats included beef, chicken, lamb, pork roast, ham, ostrich, guinea fowl, camel, crocodile, sausage, turkey, liver, kidneys, and more. The waiters walk around with the meat laden spears fresh off the grill and slide off hunks of meat and slices from the larger pieces directly onto your plate. The meal includes ALL the varieties of meat and extra servings of each until you raise the "I Surrender" flag in the middle of the table. Needless to say none of us left hungry.

Later in the week, Joel Kamande, the CRPO, suggested dinner at "a better" nyama chom restaurant at the Safari Park Hotel. This meal included a stage show of native dancers and a band afterwards for the guests to dance. I will not try to say which of the restaurants was better. Suffice it to say they were both fantastic!

All four of us on the IAEA team stayed over an extra day to take in some sightseeing in the Nairobi area. The staff of the RPB put us in touch with a local tourist company, which arranged an all day outing on Saturday. The tour included a drive through the Nairobi National Park, where we saw many African animals in the wild. Among the animals we saw were lions, cheetahs, elephants, mongooses (or is it mongeese?), zebras, giraffes, rhinoceroses, dik-diks, and ostriches.

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## International Activities [Continued]

### Report on Kenya [Continued]



Leaving the Park we went to the Daphne Sheldrick Animal Orphanage in time to see the feeding of the baby elephants. This facility cares for orphaned or injured baby elephants until they can be reintroduced into the wild, a process that takes several years.

Then it was time for lunch at the former farm of Karen Blixen, who wrote the book *Out of Africa*. Lunch was a step back in time into the genteel ways of colonial British Kenya.

Our tour was concluded with a visit to the Giraffe Centre, a facility established to help prevent the extinction of the Rothschild Giraffes and re-establish them in the wild.

Two of us had arranged with the tourist company to extend our stay in Kenya by two additional days and go to the Masai Mara National Reserve. Getting there involved a flight (on a small airplane) of about an hour and landings on three dirt airfields. The last leg of this trip was only five minutes long.



We had been told that we would be sleeping in tents at the Reserve, but I must say that the tents were the first I had ever stayed in that had hot and cold running water with a shower and other bathroom fixtures in the tent. Meals were served with each guest having a place card assigning his/her seating place. Not quite my former idea of camping!

While I had been a bit skeptical that I would be very impressed by seeing more animals in the wild, I was over whelmed by the sheer numbers and varieties in Masai Mara. There were literally hundreds of thousands of wildebeest migrating south at the time I was there. Lines of wildebeests stretched for miles as they moved toward the Serengeti Plains. The two of us were driven all over the Reserve in a Land Rover with two guides finding and pointing out birds and animals to us. We saw all of the animals we had seen at Nairobi National Park plus many others and all in much greater numbers.

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## International Activities *[Continued]*

### Report on Kenya *[Continued]*

On our last day in Masai Mara, our guides took us to a Maasai village just outside the Reserve to learn about life among the Maasai and to give them a chance to sell us crafts. The Maasai are a semi-nomadic people who herd cattle, sheep, and goats. Their village was a circular arrangement of small huts made from cow dung and sticks. At night the livestock is herded into the circle of huts to protect them from lions, leopards, and cheetahs in the area. One of things I found extremely interesting was the Maasai diet. They eat only meat, milk, and animal blood; they eat absolutely no fruits or vegetables. They also do not eat any game meat but only the products of their domesticated animals.

After a flight back to Nairobi and the long flights back to Pflugerville, this international “ed-venture” came to an end.

FOOTNOTE: After the announcement of the results of the Presidential election in late December 2007, demonstrations and riots broke out in Nairobi and across Kenya. As of the middle of January 2008, more than 600 people have been killed and many more injured.



## Brachytherapy

By D. Jeffrey Demanes M.D.  
FACRO, FACR, FASTRO

*Dr. Demanes is the Director and Founder of California Endocurietherapy, a specialty practice dedicated to brachytherapy for more than 25 years.*

### Background

The term “brachytherapy” is derived from the Greek word “brachy” meaning short or close. Thus brachytherapy refers to radiation therapy when the source of radiation is placed close to, directly on, or actually into the target. It is distinguished from teletherapy, which refers to radiation coming from a distant source (just as a telescope allows one to view distant objects). This type of radiation therapy employs the use of an external beam. Following the discovery of radium it was soon realized that radioactive material, when placed upon malignant lesions, has a healing effect.

Today, with an array of available radionuclides, brachytherapy is a sophisticated and complex process. Low energy radionuclide sources such as iodine-125, palladium-103, and cesium-137 are used for permanent seed implants whereas high-energy sources such as cesium-137, cobalt-60 and iridium-192 are employed in temporary afterloading brachytherapy. New and better applicator placement techniques and the powerful computers used to calculate complex dosimetry along with the variety of radionuclides have lead to a renaissance of brachytherapy. Virtually any site in the body can be treated, with prostate, breast, head and neck, and gynecological being the most common.

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## Brachytherapy

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### High Dose-Rate Remote Afterloading

High dose-rate (HDR) remote afterloading brachytherapy is rapidly replacing manual loading of temporary brachytherapy sources. HDR involves the robotic delivery of a single small very high activity radiation source located on the end of a cable into a variety of thin hollow applicators. Both the applicator insertion and the HDR remote afterloading are temporary. The patterns of applicator insertion and treatment protocols are varied and complex.

Since HDR uses a high energy and high activity iridium-192 source, the machine and patient must be housed in a shielded vault for the 10-30 minutes during treatment delivery as the source cycles through the applicator. As implied by the name, high doses are given to the patient very quickly compared to permanent low dose-rate brachytherapy. Precision and accuracy are essential components of safe and effective use of such devices. As a result there are considerable training and experience requirements listed in the SSRCR Section.

### Electronic Brachytherapy

The use of an electronic source instead of a radionuclide is a new paradigm in brachytherapy. Known as electronic brachytherapy or EBT, it employs a small X-ray tube to rapidly deliver a dose of radiation. Aside from the electronic radiation source (rather than radionuclide) the most striking difference from HDR in its current form is the relatively low energy (50 kVp) of electronic brachytherapy. The low energy source means that substantially less shielding is needed for medical personnel and EBT eliminates the need for construction of a heavily shielded vault. Consequently, the treatment delivery may be done in a minimally shielded office setting rather a shielded vault.

The current size of the radiation source is larger than in standard HDR brachytherapy. As a first step in clinical applications, EBT is being used to treat breast cancer via a balloon catheter where a somewhat larger bore of the applicator will accommodate the source tube. Since relatively few patients have been treated, the safety and efficacy data is preliminary. It is expected that the results will be similarly good as other forms of brachytherapy, as the modality moves forward with cautious optimism. By analogy with other forms of brachytherapy it is anticipated that the expectations for good results will be achieved. EBT has not yet been tested in other sites or cancers but there are tentative plans for gynecologic applications with the current device. Miniaturization of the source tube would allow a greater diversity of applications.

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## Brachytherapy

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### Regulation: Training and Experience Requirements

Although electronic brachytherapy reduces the facility shielding requirements, it does not minimize the associated risk of radiation injury to the patient, nor to personnel who may be in the room during treatment. It also has its own intrinsic risk of electrical and heat injury that are not major considerations in other forms of brachytherapy. Even more importantly, it does not alter in any way the necessary physician training in radiation therapy and oncology. It is, in effect, low energy, high dose-rate afterloading brachytherapy. The technology brings with it new issues about machine functionality such that the technical (physics and radiation therapy) expertise for using the devices should be no less rigorous than for radionuclide HDR brachytherapy. There is very little room for error per treatment session when the number of treatments is few and the doses delivered are high. As with HDR brachytherapy with Iridium-192, only physicians properly trained in the principles of oncology and the therapeutic use of radiation should be supervising EBT.

### A Consensus Recommendation

The CRCPD has received a communication from a Stakeholders group consisting of major radiation societies (including ASTRO, ACRO, ACR, ABS, and AAPM) recommending that EBT receive all of the care and discretion set forth in the regulations for HDR brachytherapy SSRCR Vol I, X.3 and X.5. They indicated that EBT “should be supervised, delivered, and managed only by physicians who have the same level of training and experience now required for the use of radionuclide high dose-rate remote afterloading brachytherapy devices. Such physicians should work with medical physicists appropriately trained and experienced in high dose-rate brachytherapy. Electronic brachytherapy must be given with a full knowledge of the effects of radiation on tumor and normal tissues, particularly since the radiation effects of electronic brachytherapy on tumor and normal tissues are not well established.”

The CRCPD is viewed as the most authoritative advisory body to make such a recommendation for the State regulatory agencies. It is for the sake of patient and public safety and to maintain the high level of brachytherapy efficacy that electronic brachytherapy should be appropriately studied, deployed, and regulated.

*[Note: The opinion of an individual does not necessarily represent the opinion of CRCPD.]*



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