



## **American Association of Physicists in Medicine**

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On Behalf of the American Association of Physicists in Medicine (AAPM)  
Before the Subcommittee on Health of the House  
Committee on Energy and Commerce  
February 26, 2010**

Chairman Pallone, Ranking member Deal and members of this distinguished committee, good morning and thank you for the opportunity to testify today on Medical Radiation: an Overview of the Issues.

It is my pleasure to be here representing the American Association of Physicists in Medicine, known generally as the AAPM. AAPM is a scientific and professional organization, founded in 1958, composed of nearly 7000 scientists whose clinical practice is dedicated to ensuring accuracy, safety and quality in the use of radiation in medical procedures such as medical imaging and radiation therapy. We are generally known as medical physicists and are uniquely positioned across medical specialties due to our responsibility to connect the physician to the patient through the use of radiation producing technology in both diagnosing and treating people. The responsibility of the medical physicist is to assure that the radiation prescribed in imaging and radiation therapy is delivered accurately and safely. As such, our members are deeply saddened by the tragic events recently reported.

The use of medical radiation occurs in radiology and radiation oncology practices with millions of people receiving that radiation to their benefit annually. Patients and the public may see the results of medical radiation, but few understand how it is done. Each patient procedure is a complex multi-system process, in which each system involves a combination of technology and human actions. To make the process work requires the coordination and participation of teams of human beings: physicians, medical physicists, dosimetrists, radiation therapists, radiologic technologists, information system engineers, linear accelerator and other vendor related engineers, nursing and support staff – all of these individuals and all of their effort must be focused on the treatment of each patient.

Although rare, medical errors can be devastating. We all wish that no one ever made a mistake, even more so, no event that could injure another person. But errors still can and do occur due to a combination of unlikely events occurring sequentially or simultaneously, many times under unusual circumstances that involve the complex systems in the delivery of this type of medical care.

One of the primary goals of the AAPM is the identification and implementation of improvements in patient safety for the medical use of radiation in imaging and radiation therapy. We do this through our association's activities and in cooperation with other societies such as the American Society for Radiation Oncology (ASTRO) and the American College of Radiology (ACR). I would like to mention some of the steps we have taken, and continue to take to increase safety for our patients.

- The AAPM participates in the development of procedures and guidelines for the safe, efficacious implementation and utilization of existing, new and advanced technologies. This

includes developing cooperative technical standards with the ACR and performing new technology/procedure assessment with ASTRO.

- The AAPM is a founding member of the Image Gently Alliance for radiation safety in pediatric imaging and of the new Image Wisely Campaign for safer imaging in adults.
- The AAPM produces many detailed scientific, educational and practical reports for technology and procedures for medical imaging and radiation therapy. These reports include specific processes for radiation dose measurement and calibration, quality assurance and peer review. These reports are presented in educational forums at national and regional meetings and are also publicly available.
- The AAPM has initiated a comprehensive review of existing reports and recommendations to identify areas for improvement.
- The AAPM provides medical physics guidance to the Intersocietal Accrediting Commission (IAC) and cooperates with the ACR accrediting program. We intend to reach out to the newly designated accrediting body for advanced imaging modalities, the Joint Commission.
- The AAPM initiated (over 40 years ago) and provides oversight of the Radiological Physics Center in Houston, Texas, which is federally funded to provide medical physics and quality review support to the National Cancer Institute (NCI) and national clinical trials groups.
- The AAPM accredits national dosimetry calibration laboratories, which provide accurate calibration of field instruments used by medical physicists to determine clinical dose levels.
- The AAPM has been a leader and partner in guiding and facilitating improved system connectivity and communication in the medical information environment, specifically as it relates to accurate information transfer during procedures that use medical radiation.
- The AAPM provides education on medical errors, error analysis and reduction and responds rapidly to needs in the area of technical quality and safety. For example:
  - The special Quality Assurance meeting held in 2007, together with ASTRO and NCI;
  - A Computed Tomography (CT) Dose Summit is occurring in April, 2010 to address CT dose protocol consistency; and
  - A Safety in Radiation Therapy meeting to include treatment team members, manufacturers, government agencies, and patient interest groups is planned for June 2010.

In addition to these activities, AAPM has devoted a substantial part of its energy to the creation and recognition of a position known as Qualified Medical Physicist, or QMP. These physicists have a unique combination of education in the principles of physics, radiobiology, human anatomy, physiology and oncology through a graduate degree, as well as clinical training in the applications of radiation physics to medicine, such as the technologies of medical imaging and treatment delivery, radiation dose planning and measurement, as well as safety analysis and quality control methods. Following this, an individual demonstrates competence in his/her discipline by obtaining board certification (currently offered for ionizing radiation imaging and radiation therapy through the

American Board of Radiology). Certification is a rigorous, multi-year process that requires considerable supervised clinical experience as well as passage of written and oral examinations. The AAPM recognizes a Qualified Medical Physicist for the purpose of providing clinical medical physics services, as an individual who is board-certified in the appropriate medical subfield and has documented continuing education.

All of the efforts mentioned are aimed at providing safer, more accurate and more effective patient procedures using medical radiation and we will continue to work toward achieving the absolute minimum error rate. However, there are some challenges we face in trying to meet these goals:

- While the AAPM has a clear definition of a Qualified Medical Physicist, there is no consistent national recognition of this credential. Medical physicists are licensed in 4 states (TX, NY, FL, and HI) and regulated at widely varying levels in the other 46 states.
- The reports that AAPM (and others) publish have only the force and effect of professional and scientific guidelines.
- There are also no consistent national staffing guidelines for medical physics services nor are there consistent standards established for accrediting practices that utilize medical physics services.

### **Specific Areas of Focus to Improve Patient Safety in the Medical Use of Radiation**

The following are specific areas where much effort has been placed and progress is being made, yet we can and must do more to improve the quality of care and increase patient safety. Together we all (medical radiation team members, professional associations, manufacturers and government) must:

1. Provide robust, consistent, and financially-stable education, training and clinical experience for the Qualified Medical Physicist in clinical practice. To achieve this, we must:
  - continue strong support for the AAPM 2012/2014 initiative, which will meet the goal of requiring every candidate who applies to take the American Board of Radiology medical physics exams to receive structured didactic medical physics education and complete an accredited clinical residency prior to completing the certification exam beginning in 2014 and
  - obtain recognition for medical physics residency programs for Centers for Medicare & Medicaid (CMS) reimbursement equivalent to that of physician residencies.
2. Strive for nationally consistent recognition of the Qualified Medical Physicist and equivalent competency for all medical radiation team members by:
  - passing H.R. 3652, “The Consistency, Accuracy, Responsibility, and Excellence in Medical Imaging and Radiation Therapy Act of 2009”(CARE Act) and specifically requiring that all medical physicists involved in medical imaging and radiation therapy be included in the bill and
  - facilitating consistent implementation of the CARE Act nationally.
3. Provide national practice guidance in radiation oncology and medical imaging based on consensus and consistent minimum quality standards. Standards must:

- recognize qualified individuals; specifically the Qualified Medical Physicist,
  - establish minimum staffing levels,
  - require that Qualified Medical Physicists be involved in the supervision of the processes that determine image quality and patient dose/exposure,
  - define procedure-specific guidance, including explicit process communication within and beyond the medical team, and
  - undergo periodic review with timely amendment or replacement when necessary.
4. Establish a rigorous minimum standard for accrediting clinical practices that specifically includes the oversight of dose and quality assurance for medical imaging and radiation therapy technology. This standard should require that:
- sites have work performed per national practice guidance by qualified individuals with appropriate staffing levels,
  - additional accreditation requirements are established for highly specialized procedures, and
  - practice reviews be performed by qualified individuals.
5. Link Centers for Medicare & Medicaid (CMS) reimbursement to rigorous practice accreditation for all medical imaging and radiation therapy practices to insure steps one through four above are followed.
6. Create a national data collection system to learn from actual and potential adverse events in the medical use of radiation. The system must:
- allow reporting by medical staff and manufacturers and others in a complete and consistent manner,
  - be searchable to identify patterns, risks and corrective actions and to provide education, and
  - require a partnership between all involved (federal and state government, manufacturers, users, patient advocates).
7. Improve the effectiveness of product clinical quality, application and integration review in the regulatory equipment clearance process by partnering with the U.S. Food and Drug Administration (FDA), the International Electrotechnical Commission, (IEC) and manufacturers.

In summary, the AAPM believes that patient safety in the use of medical radiation will be increased through: consistent education and certification of medical team members, whose qualifications are recognized nationally, and who follow consensus practice guidelines that meet established national accrediting standards. We must also learn from our mistakes by collecting and evaluating them at the national level. AAPM has been working directly and in cooperation with other stakeholders for years on some of these issues and we are saddened that some people are injured during what should be beneficial procedures. We believe that more effort on all seven areas of focus, by all of us, working cooperatively, will continue to make the use of medical radiation safer and more effective for the people that need it.

Thank you for the opportunity to talk to you about medical physics and our efforts toward patient safety in the medical use of radiation.