Toward Minimum Practice Standards in Clinical Medical Physics:

Response to an increasing focus on reducing medical errors and validating professional competence

Per Halvorsen, MS, DABR, FACR, FAAPM
October 2014
Outline

- How we got here:
  - The national (and international) focus on medical errors and quality in health care
  - Federal legislative initiatives
  - State regulatory changes / legislation
  - Private insurance companies
- Professional society initiatives including AAPM
  - Medical Physics Practice Guidelines
- Next steps?
The national/international focus

- Past 2 decades → focus on medical errors and healthcare quality (adverse incidents, studies by US and European government-supported groups).

- Result: increased concern with verifying the quality of healthcare delivery and healthcare professionals’ competence.
The Institute of Medicine

- In 2000, the NAS-sponsored Institute of Medicine published its first book in a series on healthcare quality, titled “To err is human”.
The Institute of Medicine

- Concluded that ≈98,000 patients die each year as a result of medical errors.

- Two key recommendations:
  1. Standardize procedures
  2. Regularly validate professional competence.
The IAEA

Part 3: Analysis of causes and contributing factors

• Analysis of a collection of other incidents and accidental exposures

• The role of “near misses”

• Are there recurring themes or patterns in the “lessons learned”? 
Increased media focus

THE RADIATION BOOM
Radiation Offers New Cures, and Ways to Do Harm

By WALT BOGDANICH
Published: January 23, 2010

As Scott Jerome-Parks lay dying, he clung to this wish: that his fatal radiation overdose — which left him deaf, struggling to see, unable to swallow, burned, with his teeth falling out, with ulcers in his mouth and throat, nauseated, in severe pain and finally unable to breathe — be studied and talked about publicly so that others might not have to live his nightmare.

Sensing death was near, Mr. Jerome-Parks summoned his family for a final
March 16, 2005
Mr. Jerome-Parks’s medical physicist ran a series of tests on the equipment. All of them showed that the collimator was wide open, and the hospital realized that a serious overdose of radiation had been administered.

February 2007
After two years of declining health, including loss of sight, hearing and balance, Mr. Jerome-Parks, 43, died of his radiation injuries.
CT brain perfusion overexposures

The Center for Devices and Radiological Health (CDRH) issued an alert in regards to high dose levels used in head CT perfusion studies at a hospital in Southern California(1). Over 200 patients apparently received excess radiation during these time-lapse (repeated) CT studies of the head. Subsequently, similar incidents have been identified at two other hospitals in Southern California and potentially in other locations as well. Early investigations of these incidents revealed a misunderstanding of some of the automated dose selection features on the scanner, and this led to an estimated 8 fold increase in radiation to the patient. This was discovered when a number of the patients experienced some temporary hair loss (epilation) and skin reddening (erythema).

This incident apparently resulted from a lack of adequate training of CT technologists, and perhaps an overreliance on the use of preselected CT protocols. There is no
Philadelphia VA Medical Center’s Terminated Cancer Treatment Program

UNITED STATES SENATE
COMMITTEE OF VETERANS’ AFFAIRS

Field Hearing on Philadelphia VA Terminated Cancer Treatment Program

June 29, 2009, 10:00 AM

Philadelphia VA Medical Center

Click Here to Listen to Part 1 of the Hearing

Click Here to Listen to Part 2 of the Hearing
A Pinpoint Beam Strays Invisibly, Harming Instead of Healing

By WALT BOGDANICH and KRISTINA REBELO

The initial accident report offered few details, except to say that an unidentified hospital had administered radiation overdoses to three patients during identical medical procedures.

It was not until many months later that the full import of what had happened in the hospital last year began to surface in urgent nationwide warnings, which advised doctors to be extra vigilant when using a particular device that delivers high-intensity, pinpoint radiation to vulnerable parts of the body.

Marci Faber was one of the three patients. She had gone to Evanston Hospital in Illinois seeking treatment for pain emanating from a nerve deep inside her head. Today, she is in a nursing home, nearly comatose, unable to speak, eat or walk, leaving her husband to care for their three young daughters.
American Association of Physicists in Medicine

Statement of Michael G. Herman, Ph.D., FAAPM, FACMP
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 morning and thank you for the opportunity to testify today on Medical Radiation Issues.

It is my pleasure to be here representing the American Association of Physicists generally as the AAPM. AAPM is a scientific and professional organization
Congressional focus – of the unhelpful kind...

RADIOACTIVE ROULETTE:

How the Nuclear Regulatory Commission’s Cancer Patient Radiation Rules Gamble with Public Health and Safety

A report by the Staff of Edward J. Markey (D-MA)
Chairman, Subcommittee on Energy and Environment
Energy and Commerce Committee
U.S. House of Representatives
March 18, 2010

EMBARGOED UNTIL THURSDAY MARCH 18, 2010
12:01 AM
F.D.A. to Increase Oversight of Medical Radiation

By WALT BOGDANICH and REBECCA R. RUIZ

The federal Food and Drug Administration said Tuesday that it would take steps to more stringently regulate three of the most potent forms of medical radiation, including increasingly popular CT scans, some of which deliver the radiation equivalent of 400 chest X-rays.

With the announcement, the F.D.A. puts its regulatory muscle behind a growing movement to make life-saving medical radiation — both diagnostic and therapeutic — safer.

Last week, the leading radiation oncology association called for enhanced safety measures. And a Congressional committee was set to hear testimony Wednesday on the weak oversight of medical radiation, but the hearing was canceled because of bad weather.
Regulation of devices is not enough:

Most are process failures resulting from inadequate SOPs, staffing, resources:

ICRP Publication 86

Table 3. Classes and frequencies of accidental exposure in radiotherapy

<table>
<thead>
<tr>
<th>Accidental exposures in external beam therapy</th>
<th>No. of cases</th>
<th>Percentage of cases (rounded)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Equipment problems</td>
<td>3</td>
<td>6.5</td>
</tr>
<tr>
<td>Maintenance</td>
<td>3</td>
<td>6.5</td>
</tr>
<tr>
<td>Calibration of the beams</td>
<td>14</td>
<td>30</td>
</tr>
<tr>
<td>Treatment planning and dose calculation</td>
<td>13</td>
<td>28</td>
</tr>
<tr>
<td>Simulation</td>
<td>4</td>
<td>9</td>
</tr>
<tr>
<td>Treatment set-up and delivery</td>
<td>9</td>
<td>20 (**)</td>
</tr>
<tr>
<td>Total</td>
<td>46 (*)</td>
<td>100</td>
</tr>
</tbody>
</table>
Federal legislation

- CARE bill: Current House and Senate versions are identical – progress being made toward passage in this session.

- Charges the Secretary of HHS to implement regulations to enforce a minimum education and training standard for clinical professionals in imaging and radiotherapy
“SEC. 355. QUALITY OF MEDICAL IMAGING AND RADIATION THERAPY.

“(a) Establishment of Standards.—

“(1) In general.—The Secretary, in consultation with recognized experts in the technical provision of medical imaging and radiation therapy services, shall establish standards to ensure the safety and accuracy of medical imaging studies and radiation therapy treatments. Such standards shall pertain to the personnel who perform, plan, evaluate, or verify patient dose for medical imaging studies and radiation therapy procedures and not to the equipment used.
“(3) Regulations for delivery of or payment for services.—Not later than 36 months after the date of enactment of this section, the Secretary shall promulgate the regulations described in subsection (h). The Secretary may withhold the provision of Federal assistance as provided for in subsection (h) beginning on the date that is 48 months after the date of enactment of this section.
The Alliance for CARE

- American Association of Medical Assistants
- American Association of Medical Dosimetrists
- American Association of Physicians in Medicine
- American Registry of Radiologic Technologists
- American Society of Radiologic Technologists
- Association of Educators in Imaging and Radiologic Sciences
- Association of Vascular and Interventional Radiographers
- Cardiovascular Credentialing International
- Joint Review Committee on Education in Cardiovascular Technology
- Joint Review Committee on Education in Diagnostic Medical Sonography
- Joint Review Committee on Education in Radiologic Technology
- Joint Review Committee on Education Programs in Nuclear Medicine Technology
- Nuclear Medicine Technology Certification Board
- Section for Magnetic Resonance Technologists of International Society of Magnetic Resonance in Medicine
- Society of Nuclear Medicine-Technologist Section
- Society for Radiation Oncology Administrators
- Society for Vascular Ultrasound
- Society of Diagnostic Medical Sonography
- Society of Invasive Cardiovascular Professionals
Medicare Improvements for Patients and Providers Act of 2008:

- Signed into law in July 2008
- Requires practice accreditation for the “advanced imaging” modalities which includes CT, MR, and Nuclear Medicine
- Does not include x-ray, fluoroscopy, sonography, or anything in radiation oncology
- Does not apply to hospitals
Accrediting bodies under MI PPA:

- American College of Radiology
- Intersocietal Accreditation Commission
- The Joint Commission
- RadSite (new)

**The Problem/Concern**

- All have different requirements for personnel - AAPM is on record indicating concern with not requiring board certification for medical physicists
Possible national solution:

- US Congress follows MI PPA’s lead and requires accreditation for all imaging and radiation therapy services in order to receive federal dollars (MediCare).

- ASTRO, ACR and AAPM have committed to strengthening accreditation programs
Launching a significantly enhanced practice accreditation program and beginning the development of additional accreditation modules specifically addressing new, advanced technologies such as IMRT, SBRT and brachytherapy.
ACR’s position:

ACR Calls for Mandatory Accreditation of All Advanced Imaging and Radiation Oncology Providers

The ACR believes Congress should expand the current MIPPA accreditation requirements for advanced imaging to include radiation therapy. In addition, the accreditation mandate should apply to all facilities, including hospital settings. Furthermore, the accrediting of these imaging and radiation therapy procedures should only be conducted by those accrediting bodies with experience and expertise in the area for which they are accrediting.
AAPM’s position:

### Professional/Education/Science Policies

<table>
<thead>
<tr>
<th>POLICY NUMBER</th>
<th>POLICY NAME</th>
<th>POLICY DATE</th>
<th>SUNSET DATE</th>
</tr>
</thead>
<tbody>
<tr>
<td>PP 27-A</td>
<td>Accreditation of imaging and radiation therapy facilities</td>
<td>4/19/2013</td>
<td>12/31/2018</td>
</tr>
</tbody>
</table>

**Policy source**

The American Association of Physicists in Medicine (AAPM) believes that accreditation of imaging and radiation therapy services by nationally recognized accrediting programs serves the best interests of patients. AAPM supports conditioning healthcare payments on accreditation status after an appropriate time interval for facilities and accrediting programs to complete the accreditation process. Accreditation must specify qualifications and roles for personnel, including a Qualified Medical Physicist as defined by Professional Policy PP 1.
State regulations

- Professional Licensure or registry.
- More states are implementing strong definitions of a QMP, with Board certification the only pathway.
- CRCPD SSRs incorporate QMP definition
State regulations

State Regulations and Licensure

- **Licensure**
- **Registration**
- **Licensure Target State**
- **None or No Information**

*View state info below for any current registration requirements*
(C) **Training for External Beam Radiation Therapy Authorized Users**  The registrant for any therapeutic radiation machine subject to 105 CMR 120.436 or 120.437 shall require the authorized user to be a physician who is certified in:

1. Radiology or therapeutic radiology by the American Board of Radiology; or,
2. Radiation oncology by the American Osteopathic Board of Radiology; or,
3. Radiology, with specialization in radiotherapy, as a British "Fellow of the Faculty of Radiology" or "Fellow of the Royal College of Radiology"; or,
4. Therapeutic radiology by the Canadian Royal College of Physicians and Surgeons.

(D) **Training for Qualified Medical Physicist for Radiation Therapy**  The registrant for any therapeutic radiation machine subject to 105 CMR 120.436 or 120.437 shall require the Qualified Medical Physicist to:

1. Be registered with the Agency, under the provisions of 105 CMR 120.026, as a provider of radiation services in the area of calibration and compliance surveys of external beam radiation therapy units; and,
2. Be certified by the American Board of Radiology in:
   a. Therapeutic radiological physics; or
   b. Roentgen-ray and gamma-ray physics; or
   c. X-ray and radium physics; or
   d. Radiological physics; or,
3. Be certified by the American Board of Medical Physics in Radiation Oncology Physics; or,
4. Be certified by the Canadian College of Medical Physics.
NEW YORK STATE DEPARTMENT OF HEALTH
BUREAU OF ENVIRONMENTAL RADIATION PROTECTION

EXTERNAL BEAM & BRACHYTHERAPY
QUALITY ASSURANCE PROGRAM AUDIT FORM

**Purpose:** To provide licensees and registrants with a standard form for documenting compliance with the audit requirements contained in 10 NYCRR 16, Section 16.24.

**Background:** The New York State Sanitary Code, Chapter I, Part 16, Ionizing Radiation, requires New York State Department of Health Licensees to conduct audits of their radiation therapy quality assurance programs (10 NYCRR 16.24). Specifically, 16.24(a)(4) states the required frequency and type of audits which are to be conducted. Licensees have two options: 1) **external audits must be conducted every 12 months** by radiation therapy physicists possessing the qualifications specified in 10 NYCRR 16.122 and physicians who are active in the practice and type of radiation therapy conducted by the licensee or registrant, or, 2) the licensee or registrant can **conduct internal audits at intervals not to exceed 12 months and have an audit performed by the American College of Radiology or a program found equivalent by the Department, at intervals not to exceed five years.**
Accreditation - Private insurers: BCBS MA

<table>
<thead>
<tr>
<th>Policy #: 396</th>
<th>Posted: 3/11/08</th>
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</table>

**Title**

Radiation Therapy

*There is no medical policy on this subject.* Radiation therapy is covered to the extent that this type of service is generally covered by each member’s benefit design. *The following billing guidelines are brought to you by Blue Cross Blue Shield of Massachusetts, for informational use.*

**Definitions**

**Free-standing Radiation Oncology Facility:** a non hospital setting that is accredited by either the Joint Commission on the Accreditation of Healthcare Organizations (JCAHO) or the American College of Radiology (ACR) in accordance with the BCBSMA conditions of participation.
Senate Bill No. 1237

CHAPTER 521

An act to add Sections 115111, 115112, and 115113 to the Health and Safety Code, relating to public health.

[Approved by Governor September 29, 2010. Filed with Secretary of State September 29, 2010.]

LEGISLATIVE COUNSEL'S DIGEST

SB 1237, Padilla. Radiation control: health facilities and clinics: records. Under existing law, the State Department of Public Health licenses and regulates health facilities and clinics, as defined. Under existing law the Radiation Control Law, the department licenses and regulates persons that use devices or equipment utilizing radioactive materials. Under existing law the department may also require registration and inspection of sources of ionizing radiation, as defined. Violation of these provisions is a crime.

This bill would, commencing July 1, 2012, require hospitals and clinics, as specified, that use computed tomography (CT) X-ray systems for human use to record, if the CT systems are capable, the dose of radiation on every CT study produced during the administration of a CT examination, as specified. The bill would require the dose to be verified annually by a medical physicist, as specified, unless the facility is accredited.

This bill would, commencing July 1, 2013, require facilities that furnish CT X-ray services to be accredited by an organization that is approved by the federal Centers for Medicare and Medicaid Services, an accrediting

State laws:
ASTRO-AAPM: Patient safety

Special Article

Improving patient safety in radiation oncology

William R. Hendee PhD\textsuperscript{a}, Michael G. Herman PhD\textsuperscript{b,*}

\textsuperscript{a}Medical College of Wisconsin, Rochester, Minnesota
\textsuperscript{b}Department of Radiation Oncology, Mayo Clinic, Rochester, Minnesota

Received 5 November 2010; accepted 12 November 2010

Abstract: Beginning in the 1990s, and emphasized in 2000 with the release of an Institute of Medicine report, health care providers and institutions have dedicated time and resources to reducing errors that impact the safety and well-being of patients. However, in January 2010, the first of a series of articles appeared in The New York Times that described errors in radiation oncology that grievously impacted patients. In response, the American Association of Physicists in Medicine and the American Society for Radiation Oncology sponsored a working meeting entitled "Safety in Radiation Therapy: A Call to Action." The meeting attracted 400 attendees, including medical physicists, radiation oncologists, medical dosimetrists, radiation therapists, hospital administrators, regulators, and representatives of equipment manufacturers. The meeting was co-hosted by 14 organizations in the United States and Canada. The meeting yielded 20 recommendations that provided a pathway to reducing errors and
Special Article

Safety considerations for IMRT: Executive summary

Jean M. Moran PhD\textsuperscript{a,*}, Melanie Dempsey MS\textsuperscript{b}, Avraham Eisbruch MD\textsuperscript{a}, Benedick A. Fraass PhD\textsuperscript{c}, James M. Galvin DSc\textsuperscript{d}, Geoffrey S. Ibbott PhD\textsuperscript{e}, Lawrence B. Marks MD\textsuperscript{f}

\textsuperscript{a}Department of Radiation Oncology, University of Michigan, Ann Arbor, Michigan
\textsuperscript{b}Department of Radiation Sciences, School of Allied Health Professions, Virginia Commonwealth University, Richmond, Virginia
\textsuperscript{c}Department of Radiation Oncology, Cedars-Sinai Medical Center, Los Angeles, California
\textsuperscript{d}Department of Radiation Oncology, Thomas Jefferson University Hospital, Philadelphia, Pennsylvania
\textsuperscript{e}Radiation Physics, UT M.D. Anderson Cancer Center, Houston, Texas
\textsuperscript{f}Department of Radiation Oncology, University of North Carolina, Chapel Hill, North Carolina

Received 19 April 2011; accepted 27 April 2011
Radiation Therapy Safety: The Critical Role of the Radiation Therapist

Teresa C Odele, BA, ELS, and Natasha Rosier, MHA, MBA, R.T.(R)(T)
for the ASRT Education and Research Foundation Health Care Industry Advisory Council
Subcommittee on Patient Safety and Quality in Radiation Therapy

- Staffing levels - min 2 / linac
- Training / credentialing
- Error reporting
- Accreditation
- Checklists / Time-outs
AMERICAN ASSOCIATION OF PHYSICISTS IN MEDICINE
PROFESSIONAL POLICY:
PROCESS FOR CREATION, APPROVAL, AND REVISION OF
MEDICAL PHYSICS PRACTICE GUIDELINES

INTRODUCTION
The American Association of Physicists in Medicine (AAPM) has long advocated a consistent level of medical physics practice, and has published many guidelines and position statements toward that goal, such as Science Council Task Group reports related to calibration and quality assurance, Education Council and Professional Council Task Group reports related to education, training, and peer review, and Board-approved Position Statements related to the scope of practice, physicist qualifications, and other aspects of medical physics practice. Despite these concerted and enduring efforts, the profession does not have a clear and concise statement of the acceptable practice guidelines for routine clinical medical physics. As accreditation of clinical practices becomes more common, Medical Physics Practice Guidelines (MPPGs) will be crucial to ensuring a consistent benchmark for accreditation programs.

The AAPM will lead the development of MPPGs in collaboration with other professional societies. The MPPGs will be freely available to the general public. Accrediting organizations, regulatory agencies and legislators will be encouraged to reference these
TG reports vs MPPGs

*TG reports are:*  
- Intended to be technical reference for medical physicists – compendia of the known science on a topic.  
- Written by a core group of subject-matter experts  
- Reviewed by subject-matter committee and approved by one Council
TG reports vs MPPGs

*MPPGs are:*

- Developed following a structured process to become consensus practice guidance documents
- Developed with cross-Council participation
- Open for review/comment by ALL members
- Intended to be adopted by regulatory agencies and accrediting entities
- Updated regularly – sunset dates / revision #
- Freely available to ALL – not just AAPM
2. Vision

The AAPM will lead the development of MPPGs in collaboration with other professional societies. The MPPGs will be freely available to the general public. Accrediting organizations, regulatory agencies and legislators will be encouraged to reference these MPPGs when defining their respective requirements.

3. Scope

MPPGs are intended to provide the medical community with a clear description of the **minimum level of medical physics support** that the AAPM would consider prudent in all clinical practice settings. Support includes but is not limited to staffing, equipment, machine access, and training. These MPPGs are not designed to replace extensive Task Group reports or review articles, but rather to describe the recommended minimum level of medical physics support for specific clinical services.
MPPG development process

1. Subcommittee on Practice Guidelines oversees the process, includes members from TPC, IPC and GRAC.

2. Unique TG formed for each MPPG, with broadly representative membership

3. Common framework for all MPPGs

4. Other organizations invited to participate

5. Drafts reviewed by all Councils and by ALL members through Open Comment period

6. Final approval by Professional Council

7. Publication in JACMP
MPPG framework

- Staffing needs, qualifications, and responsibilities clearly described
- Required resources and equipment
- Staff training and validation methods
Initial MPPGs

In print (JACMP):
- Imaging: CT protocol management and review
- Therapy: Linac-based imaging

In journal review:
- Safety Checklists
- Physicist Supervision (residents etc)
- TPS dose model QA
Initial MPPGs

Subcommittee on Practice Guidelines
- bookmark this page (bookmarks show under "My AAPM" in the menu to left)

Committee Website | Wiki Lite | Wiki Full | Directory: Committee | Membership

Email You may send email to this group now using gmail or outlook.
- or -
You may save the address 2014.zSPG@mail.aapm.org
to your local address book. This alias updates hourly from the AAPM Directory.

Charge Click here for committee charge.
Approved Date(s) Start: 11/20/2007
Committee Keywords: SPG

Board of Directors [Status]
+ Professional Council [Status]
+ Clinical Practice [Status]
+ SC on Practice Guidelines [Status]

TG230 Medical Physics Practice Guideline Task Group #3: The Development, Implementation, Use and Maintenance of Safety Checklists for [Status]
TG243 - MPPG #4 Practice Guideline on Definition of Supervision [Status]
TG244 - MPPG #5 Treatment Planning System Commissioning and QC/QA [Status]
TG257 - MPPG #6 Selection of a Patient Dose Monitoring System [Status]
TG259 - MPPG #7 Medical Physics Extenders [Status]
TG265 - MPPG #8 Minimum Practice Requirements for Linac QA [Status]
# Medical Physics Practice Guidelines

<table>
<thead>
<tr>
<th>Introduction</th>
<th>Vision</th>
<th>Scope</th>
<th>Guidelines</th>
</tr>
</thead>
</table>

**Published Guidelines**


4. Implementation Guidelines

a. Minimum required resources and equipment

i. Staffing

Approximate time requirements needed for implementation, maintenance and quality assurance of each IGRT program type (per each IGRT system) are provided below. Estimates are provided as general reference values only, and are not intended to justify site-specific staffing models or physics time for specific billing codes. “Acceptance/commissioning” includes all activities needed for IGRT program implementation, including documentation. “Documentation” refers to creation of a formal commissioning report, and drafting of policies and procedures specific to clinical use and routine quality assurance of IGRT (including creating QA forms and templates). “Ongoing support” includes all activities needed for maintenance of an established IGRT program (e.g., routine quality assurance, troubleshooting, upgrades, service/repairs).

1. Two-dimensional MV imaging systems
   • Acceptance/Commissioning/Documentation: 18–36 hours
   • Ongoing support: 25–50 hours annually

2. Two-dimensional kV imaging systems
   • Acceptance/Commissioning/Documentation: 18–36 hours
   • Ongoing support: 25–50 hours annually

3. Three-dimensional MV imaging systems
   • Acceptance/Commissioning/Documentation: 18–36 hours
   • Ongoing support: 100–125 hours annually

4. Three-dimensional kV imaging systems
   • Acceptance/Commissioning/Documentation: 18–36 hours
   • Ongoing support: 100–125 hours annually

ii. Equipment

Quality assurance phantoms and tools must provide reliable values of the measured parameters and can be used to judge whether tolerance criteria have been achieved. In many cases, manufacturers of IGRT systems provide quality assurance phantoms which can be used for quality assurance purposes. In-house and commercial phantoms specifically designed for IGRT are also available and, when coupled with automated
**TABLE 1.** Recommended minimum practices for commissioning and QA of an IGRT system.

<table>
<thead>
<tr>
<th>Procedure</th>
<th>Tolerance</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Acceptance Testing and Commissioning</strong></td>
<td></td>
</tr>
<tr>
<td>Procedure</td>
<td></td>
</tr>
<tr>
<td>Customer acceptance procedures</td>
<td></td>
</tr>
<tr>
<td>TPS integration</td>
<td></td>
</tr>
<tr>
<td>OIS integration</td>
<td></td>
</tr>
<tr>
<td>Establish routine QA baselines</td>
<td></td>
</tr>
<tr>
<td>QA documentation</td>
<td></td>
</tr>
<tr>
<td><strong>Routine Quality Assurance</strong></td>
<td></td>
</tr>
<tr>
<td>Procedure</td>
<td>Tolerance</td>
</tr>
<tr>
<td><strong>Daily</strong></td>
<td></td>
</tr>
<tr>
<td>Safety/interlocks</td>
<td>Functional</td>
</tr>
<tr>
<td>Imaging-treatment isocenter coincidence (SRS only)</td>
<td>1 mm</td>
</tr>
<tr>
<td>Positioning/repositioning (SRS only)</td>
<td>1 mm</td>
</tr>
<tr>
<td>Imaging-treatment isocenter coincidence (SBRT only)</td>
<td>2 mm</td>
</tr>
<tr>
<td>Positioning/repositioning (SBRT only)</td>
<td>2 mm</td>
</tr>
<tr>
<td><strong>Weekly</strong></td>
<td></td>
</tr>
<tr>
<td>Imaging-treatment isocenter coincidence (non-SRS/SBRT)</td>
<td>2 mm</td>
</tr>
<tr>
<td>Positioning/repositioning (non-SRS/SBRT)</td>
<td>2 mm</td>
</tr>
<tr>
<td><strong>Semi-annually</strong></td>
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<tr>
<td>Image scaling</td>
<td>2 mm</td>
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<tr>
<td><strong>Annually</strong></td>
<td></td>
</tr>
<tr>
<td>Imaging dose</td>
<td></td>
</tr>
<tr>
<td>2D MV</td>
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</tr>
<tr>
<td>2D kV (static imaging mode)</td>
<td>± 1 cGy of baseline value</td>
</tr>
<tr>
<td>2D kV (fluoroscopy mode)</td>
<td>± 3 mGy of baseline value</td>
</tr>
<tr>
<td>All 3D imaging modes</td>
<td>± 1 cGy/min of baseline value</td>
</tr>
<tr>
<td>Image quality</td>
<td>Baseline value</td>
</tr>
<tr>
<td>2D (spatial resolution, contrast)</td>
<td></td>
</tr>
<tr>
<td>3D (uniformity, spatial resolution, contrast)</td>
<td></td>
</tr>
<tr>
<td><strong>Upgrade/Repair/Service</strong></td>
<td></td>
</tr>
<tr>
<td>Verify / Reestablish QA baselines (as appropriate)</td>
<td></td>
</tr>
</tbody>
</table>

*SRS = stereotactic radiosurgery; SBRT = stereotactic body radiation therapy.*
Medical Physicist Assistants: An inevitable consequence of the broader trend toward extenders in healthcare?
III. QUALIFICATIONS AND RESPONSIBILITIES OF PERSONNEL

The medical physicist may be assisted by other properly trained individuals in obtaining test data for performance monitoring. These individuals must be properly trained and approved by the medical physicist in the techniques of performing the tests, the function and limitations of the imaging equipment and test instruments, the reasons for the tests, and the importance of the test results. The tests will be performed by or under the general supervision of the medical physicist, who is responsible for and must review, interpret, and approve all data and provide a signed report.
SUBCHAPTER 22 QUALITY ASSURANCE PROGRAMS FOR MEDICAL DIAGNOSTIC X-RAY INSTALLATIONS

7:28-22.1 Purpose, scope and applicability

(a) The purpose of this Subchapter is to increase protection to the public and radiation workers from unnecessary exposure to radiation and to reduce the occurrence of misdiagnosis caused by faulty equipment and operator error.

(b) This Subchapter establishes requirements for the development and implementation of quality assurance programs to ensure that registrants of diagnostic x-ray equipment who perform diagnostic x-ray procedures in the healing arts achieve consistent high quality imaging and improve diagnosis while reducing unnecessary radiation to the patients and workers. This Subchapter further establishes certain responsibilities of registrants of radiation sources used in the practice of diagnostic radiology. This Subchapter also establishes the qualifications and training requirements for medical physicists, medical physicist assistants and qualified individuals designing or implementing quality assurance programs in accordance with this subchapter. Certification requirements and associated fees are also established for medical physicists and medical physicist assistants.
(c) Only a person who holds a valid Certificate issued by the Department in accordance with N.J.A.C. 7:28-22.13(a), meets one of the criteria contained in (c) 1 through 5 below and also meets criterion 6 below may perform the duties of a "qualified medical physicist assistant in radiography":

1. Is currently ARRT certified in general radiography or holds a current New Jersey license as a diagnostic radiologic technologist and has five years of experience as a practicing diagnostic technologist, one year of which shall include performing quality control tests on radiographic equipment;

2. Is currently ARRT certified in both general radiography and in quality management with three years of experience as a practicing diagnostic radiologic technologist;

3. Has a bachelors degree from an accredited college or university in biology, chemistry, radiation sciences, physics, engineering or mathematics and four years of technical experience performing quality control tests on radiographic equipment in the field of radiological health;

4. Has a master's degree or a doctorate degree from an accredited college or university in radiological health, radiation sciences, physics, chemistry, environmental sciences, engineering or a related field and two years of technical experience performing quality control tests on radiographic equipment in the field of radiological health; or
**Supervision / MPAs**

*Board of Directors approved motion:*

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<th>Action Item: BE IT MOVED: That the AAPM work to develop an appropriate policy and guidance related to the role, training and supervision of Medical Physicists Assistants (MPAs) in supporting clinical medical physics work under the supervision of a Qualified Medical Physicist. Such guidance shall included, but may not be limited to:</th>
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<td>1. Developing a Medical Physics Practice Guideline on supervision for MPAs and other support staff (lead: Professional Council).</td>
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<td>2. Developing an AAPM Position Statement on the appropriate role, training and supervision of MPAs (lead: Professional Council).</td>
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<tr>
<td>3. Interacting with regulatory and licensing bodies and with other professional societies to advocate for the AAPM's position related to the appropriate role, training and supervision of MPAs (lead: Administrative Council).</td>
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<td>4. Developing the educational curriculum for MPAs (lead: Education Council).</td>
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Motion was seconded and approved; 31 yes, 0 no, 1 abstain.
Supervision / MPAs

*Draft language for TX licensure hearings:*

The Medical Physicist Assistant (MPA) is an individual who has completed relevant didactic education (Bachelor’s or higher college degree from an accredited college or university and/or certification as a Radiologic Technologist or Radiation Therapist), and has attained practical clinical medical physics knowledge through documented specific training and technical experience in a program supervised by a QMP. The MPA performs tasks to support the efficiency of a QMP in the professional practice of medical physics. In all such circumstances, the MPA must be appropriately supervised and the range of tasks must be carefully defined by a QMP who is certified in the same subfield of practice. Levels of supervision provided (personal, direct, or general) will vary depending on the specific task, experience of the MPA and professional judgment of the QMP supervisor. All medical physics tasks performed by the MPA must be reviewed in a timely manner, and reports must be co-signed by the QMP supervisor, who assumes full responsibility and liability for the submitted content.

Under consideration by the AAPM is: (1) the number of MPAs that may be supervised by an individual QMP, and (2) the categories of advanced tasks/procedures that require direct or personal supervision. The overall intent of this position statement and future Medical Physics Practice Guideline is to enhance the safety of patient care through the provision of high-quality medical physics services in a cost-effective manner.
Supervision

- Strong precedent in medicine – CMS has defined 3 levels of supervision: general, direct, personal.

- AAPM’s Professional Policy 18 incorporates the CMS supervision levels for medical physics – will be replaced by two MPPGs:
  - MPPG #4 defines supervision for residents and other "QMP-track physicists"
  - MPPG #7 will define supervision for support personnel such as Medical Physicist Assistants.
Path forward?

- Minimum standards for practicing clinical medical physics will likely have the force of regulation in most states within a decade.

- Major components:
  - Minimum education & training requirements
  - Board certification
  - Supervision of delegated tasks
  - Peer review at regular intervals
  - Continuing professional development (MOC)

- Error prevention programs will gain more prominence.
How do we respond?

If we (AAPM) do not define our profession, others will do it for us.
How do we respond?

Current efforts:

- QMP & Scope of Practice
- Licensure / registration with strong template
- ASTRO/ACR/IAC/TJ C – strong accreditation
- Develop Medical Physics Practice Guidelines
- Work with CRCPD (SSRs) & FDA (devices)
- RO-ILS
- Congress:
  - CARE bill for Training & Education standards
  - Tie Medicare funding to accreditation