The Vision and Components of **Medical Physics 3.0** Practice

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What is Medical Physics 3.0?

Re-envisioning the role of medical physics in modern medicine

Medicine is discerning and intervening in the health state of the patient with sufficient accuracy, precision, and safety for a definitive clinical outcome.

Healthcare is about the patient, not the particularities of the techniques. Techniques are valued to the extent they benefit the patient.

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Cultural shifts in healthcare

Evidence-based medicine (Practice informed by science)

Precision medicine (Personalization of care in quantitative terms)

Meaningful use (Enhanced focus on actual utility)

Value-based medicine (Scrutiny on safety, performance and ethics)

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What is the role of medical physics in all of this?

How should medical physicists add value?

How should medical physicists reposition themselves?

How should medical physicists live up to their potential?

Are we as medical physicists already doing this?

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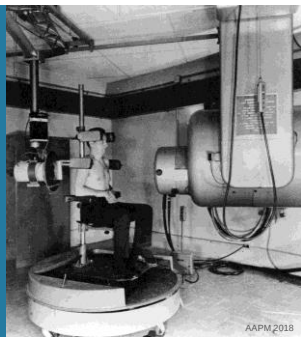
Medical Physics 1.0

Design technologies with superior performance

Ensure intrinsic performance of equipment

Ensure accurate therapeutic dosimetry

Claim compliance and accreditation



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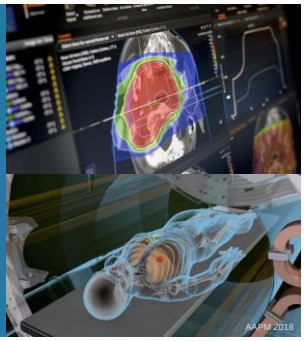

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Medical Physics 3.0

A way to build on previous success

An initiative to define and practice sustainable excellence in medical physics

A set of trajectories to grow, express, and enact the value of medical physics in advancing health

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Foundations of Medical Physics 3.0

Re-visiting our roots and re-envisioning our desired contributions to quality healthcare

Asking the question of whether we are fulfilling our potential, and if not, how can we

Seizing opportunities to engage proactively and meaningfully in patient care

Growing and building upon the unique skills of medical physicists

Advertising?

Marketing?

Call to Action!

To position physicists to have the competence and the confidence to fulfill their unique calling: scientific agents of precision, innovation, and value in the development and practice of medicine.

What would help us attain and sustain a MP3.0 practice?

7 groupings of efforts/initiatives

Aimed at overcoming constraints

- Smart Tools
- Smart Practices
- Smart Practitioners
- Smart Expansion
- Smart Advocacy
- Smart Grassrooting
- Smart Regulations

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Smart Tools

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What do they do:

- Make practice of Medical Physics 3.0 possible and sustainable
- Promote automation and efficiency
- Connect science and research to the clinic
- Leverage industry, entrepreneurs, and the market

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Why do we need them:

- MP3.0 asks us to do more (breadth and depth)
- Need to reduce time/effort for existing duties
  - Without sacrificing precision, accuracy, quality, safety, or compliance
- Without this ability, MP3.0 is not possible (short term) or sustainable (long term)

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What they are:

- Documents, templates
- Hardware
- Software, databases, apps
- Websites, online modules
- Audio, podcasts, videos
- Books, manuals, electronic references

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How do we get them:

- Identify novel and interesting projects published as new science
- Connect with vendors to commercialize
  - Large established vendors
  - Small startups
- Goal: any medical physicist can buy, even if they can't build it on their own
- Broad availability benefits the vendor and the clinic
- Tech transfer/licensing provides $$ support to researchers for future work

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Two early concepts:

1. AAPM Working Group on Translational Medical Physics:
   - Monitor journals and trade press for new useful developments
   - Actively engage inventors and industry partners to convert science projects into commercial products
   - Build long-term relationships to support continued translation without ongoing AAPM "brokering"
2. AAPM-hosted MedPhys KPI database and dashboard:
   - Tool for tracking self/group KPI's for clinical performance and productivity
   - Similar to other efforts (e.g. registries)
   - "Crowdsource" development of what KPI's really reflect quality and efficient practice

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Your turn: Table Discussions

1. What Smart Tools do you already have and use?
   How could AAPM help you share them?
   What would make sharing them worthwhile for you?
2. What Smart Tools do you want or need?
   How could AAPM help you find them?
3. What could AAPM do to encourage and enable everyone to develop, use, and share Smart Tools in their day-to-day work?
4. What risks/concerns do you see in promoting the growth and proliferation of Smart Tools?

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Smart Practices

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What do they do:

- Make practice of Medical Physics 3.0 possible and sustainable
- Promote impact of medical physics on patient care
- Connect medical physicist to other caregivers
- Create visibility and recognition of medical physicists
- Contribute to organization in ways medical physics might not have traditionally

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Why do we need them:

- Work can be difficult and stressful
- Medical physics can easily retreat “into the shadows”
- Modern medicine is interdisciplinary
- Modern practice is interdependent
- Excellence in patient care is a team sport!

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What they are:

- “Good Catch” programs
- “State of the Modality” presentations
- Borrowed approaches (Lean, Six Sigma)
- Leading diversity and inclusion
- Interviewing physician resident candidates
- Collaboration with institution leadership to resource the medical physics practice

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How do we get them:

- Identify important strategic needs of department or institution
- Show up and listen
- Engage with physicians, techs/therapists, nurses, and others across the continuum of patient care
- "Speak Out" to share data, findings, and recommendations
- Volunteer for institutional service roles
  - Appreciation and networking

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Two early concepts:

1. Physics Direct Patient Care Initiative:
   - Medical physicist establishes an independent professional relationship with patient
   - Meets with the patient at scheduled appointments to discuss the treatment planning and delivery process
   - Provides the framework for future patient responsibilities and innovations
2. Optimizing Imaging Dose and Quality through Monitoring:
   - Use automation and networking to collect "big data"
   - Apply Six Sigma principles to identify and correct sources of unnecessary variation
   - Reduce variability in quality of patient care (interpretation accuracy)
   - Improve radiologist confidence and efficiency

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Your turn: Table Discussions

1. What Smart Practices do you already employ?
   How could AAPM help you share them?
   What would make sharing them worthwhile for you?
2. What Smart Practices do you want or need to learn or implement?
   How could AAPM help you?
3. What could AAPM do to encourage and enable everyone to develop, use, and share Smart Practices in their day-to-day work?
4. What risks/concerns do you see in promoting the development and sharing of Smart Practices?

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Smart Practitioners

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What do they do:

- Provide leadership within and beyond medical physics
- Create and use smart tools and practices
- Integrate new science and technology (their own and others') into the clinic
- Educate themselves and others
- Strive to continuously learn and improve
- Drive expansion of medical physics to serve new clinical needs

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Why do we need them:

- MP3.0 asks us to do more (breadth and depth)
  - Need to attain (and offer) more expertise without major increase in time, effort, cost of training
- Still need fundamentals too!
- Without these people, MP3.0 not possible (short term) or sustainable (long term)

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Ways you can be one:

- Develop leadership & management skills
- Be the "scientist in the room"
- Share your knowledge: short "how-to" videos (TWYW)
- "Test Drive" unfamiliar technology & procedures
  - Clinical trials
  - Artificial intelligence technology / machine learning
- Make an impact somewhere that medical physics might not traditionally

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How can AAPM support Smart Practitioners:

1. Medical Physics Leadership Academy
   - Ongoing effort to assess needs and deliver training
2. "Journal Science for Busy Clinical People"
   - Video, podcast, blog, or other "digest" format highlighting recent publications with commentary on possible clinical value
3. Build-Your-Own Continuing Education
   - Modular content
   - Ability for individuals to tailor to interests and needs
   - Reviews and ratings from other users to "crowdsource" best quality/impact

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Your turn: Table Discussions

1. What aspects of a Smart Practitioner describe you now?
   How could AAPM help you share them with others?
   What would make sharing them worthwhile for you?
2. What traits of Smart Practitioners do you want or need to develop?
   How could AAPM help you?
3. What could AAPM do to encourage and enable everyone to be Smart Practitioners in their day-to-day work?
4. What risks/concerns do you see in promoting the development of Smart Practitioners?

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