New skills for medical physicists that transcend all work environments

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Conflict of Interest

• Research grant: GE
• Research grant: Siemens
• Advisory board: medInt Holdings

Overarching need and presuppositions

What is medicine?

Discerning and intervening in the health state of the patient with sufficient accuracy, precision, and safety for definitive clinical outcome

Healthcare is about the patient, not the particularities of the techniques – techniques are valued to the extent they benefit the patient
Reality check 1: Clinical practice

Heterogeneous, Compounded, Complex

- Varying technologies
- Varying technical parameters
- The patient factor
  - limited dynamic adaptation of to the patient
- The human factor
- Competing interests
- Shrinking reimbursements

Reality check 2: Cultural shifts in healthcare

Evidence-based medicine
  Practice informed by science

Precision medicine
  Personalization of care in quantification terms

Comparative effectiveness - meaningful use
  Enhanced focus on actual utility

Value-based medicine
  Scrutiny on safety, performance, consistency, stewardship, efficiency (leanness), ethics

Drive towards high-quality, consistent, patient-centric, evidential, precise, safe healthcare

What is the role of medical physics?

Innovative precision care through clinical application of physical sciences
Why precision care needs medical physicists?

• Our unique skillset
• Our unique perspective
• Our ethical mandate
  – Optimum care needs purposeful contribution of medical physics

Medical physics practice settings

– The clinic
– The academy
– The industry
– The government
– Research organizations
– Professional organizations
– ...

Multiple practice settings, one overarching goal

Advancing Human Health
Universal attributes of medical physicists

- Traits
  - Knowing how to BE
- Skills
  - Knowing what to Do

Traits
Knowing how to BE

Attributes that (should) transcend skills and practice

Dealing with the subject:
1. **Scientist** in discovery AND application
   - Scholarship: evidence-based, methodical pursuit
   - Quantitation: measurement, numerical orientation
   - Innovation: agency of advancement
     - better understanding, practice solutions, care delivery,
     - technological solutions, education, regulations

Dealing with the setting:
2. **Context-aware**:
   - Dual-vision: Myopic and systemic visions
   - Dual-calling: scholar AND healthcare provider
Traits
Knowing how to BE

Attributes that (should) transcend skills and practice

Dealing with the goal:
3. Service-oriented
   Care: Care and customer mindset
   Clinic: Ultimate clinical application

Skills
Knowing what to Do

• Technical competency
  – The canon of medical physics subspecialties
    • Therapy, brachy, IMRT, ...
    • Imaging, MR, Mammo, data analytics, ...
    • ...
  – Practice-based skillsets
    • Grant writing, Accreditation process, FDA rules, ...

• Administrative competency

Administrative competency

• Dealing with people
• Dealing with projects
• Dealing with finances
• Dealing with constraints and voids (ethics, regulations, self)
• Core skills:
  1. Effective communication
  2. Emotional and trait intelligence
  3. Leadership in visioning
  4. Management in orchestrating
Medical Physics 3.0

initiative to define and practice sustainable excellence in medical physics

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

Medical Physics 3.0 offering at AAPM'17

MedPhys3.0 Booth

Symposium
Wednesday, 4 Season 2 (SAM Sessions)
10:15 AM:   MP3.0 in design
1:45 PM:    MP3.0 in practice
Conclusions

• Competent and effective medical physics is about quality patient care
• Competent and effective medical physics practice is more than “doing medical physics”
• 3 universal traits:
  – Science, context, service
• 4 universal administrative skills:
  – Communication, management, leadership, emotional/trait intelligence