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

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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

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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

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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

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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

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Why precision care needs medical physicists?

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

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Medical physics practice settings

- The clinic
- The academy
- The industry
- The government
- Research organizations
- Professional organizations
- …

Multiple practice settings, one overarching goal

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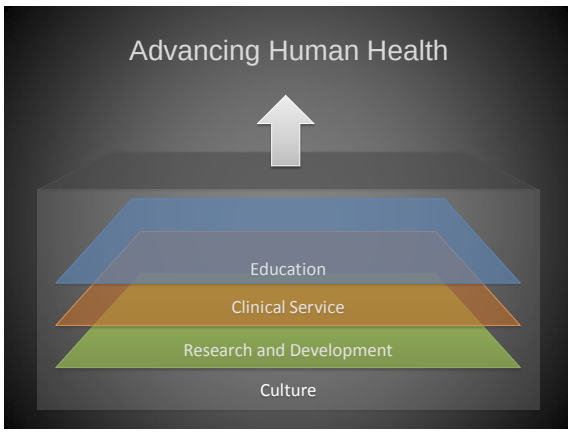

Universal attributes of medical physicists

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

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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

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Traits
Knowing how to BE

Attributes that (should) transcend skills and practice

Dealing with the setting:

2. **Context-aware:**
   - **Dual-vision:** Myopic and systemic visions
   - **Dual-calling:** scholar AND healthcare provider

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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

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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

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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**

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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

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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**

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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

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