Accreditation of Education and Professional Standards of Medical Physicists

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IAEA International Conference on Advances in Radiation Oncology, Vienna, 20-23 June 2017
Outline

- Why professional certification of medical Physicists?
- Why international accreditation of medical physicists certification boards?
- Why international accreditation of medical physics educational programme?
- What is the current status?
Quality & Safety in Medicine

All patients deserve the best available medical service within the framework of their healthcare system. Hence,

- Healthcare professionals should perform their duties to the best of their ability & professional judgement within resource constraints
- They should be appropriately qualified to perform their duties
Accuracy Requirement in Dose Delivery in RT

Radiation dose at D represents the optimal balance between local tumour ablation and an acceptable incidence of side effects or complications.

In general, dosimetry error exceeding 5% could affect treatment outcome.

Medical Physicists play a key role in ensuring dose accuracy.
IAEA/WHO TLD Dosimetry Audit on External Beams

8000 radiotherapy machines in 120 countries audited during 1969–2009, about 50% of the machines were found incorrectly calibrated (>5% dose error)- i.e. about 50% of the patients treated were given significantly wrong dosage.

Source: J. Izewska, IAEA
Situation improved since 1990. Currently there are still more than 10% of the IAEA audit RT machines failed to meet the 5% accuracy requirement

Source: J. Izewska, IAEA
Safety in Radiation Medicine

Medical radiation incidents reported in both developed & developing countries. Many might not have been reported.
## Radiation Accidents Involving Medical Use

(UNSCEAR 2008 Report, Volume II, Annex C)

### Table 10. Numbers of deaths and early acute health effects due to radiation accidents

Based on published information; excludes malicious acts and nuclear testing

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<tr>
<td>Accidents at nuclear facilities</td>
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<tr>
<td>13 deaths</td>
<td>42 early effects</td>
<td>123 early effects</td>
<td>2 early effects</td>
<td>187 early effects</td>
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<td>34 deaths</td>
<td>3 deaths</td>
<td>61 early effects</td>
<td>6 deaths</td>
<td>9 deaths</td>
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<td>Industrial accidents</td>
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<tr>
<td>0 deaths</td>
<td>8 early effects</td>
<td>61 early effects</td>
<td>51 early effects</td>
<td>119 early effects</td>
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<td>3 deaths</td>
<td>6 deaths</td>
<td>6 deaths</td>
<td>9 deaths</td>
<td>9 deaths</td>
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<td>Orphan source accidents</td>
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<tr>
<td>7 deaths</td>
<td>5 early effects</td>
<td>98 early effects</td>
<td>205 early effects</td>
<td>308 early effects</td>
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<td>19 deaths</td>
<td>16 deaths</td>
<td>16 deaths</td>
<td>42 deaths</td>
<td>42 deaths</td>
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<td>Accidents in academic/research work</td>
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<tr>
<td>0 deaths</td>
<td>2 early effects</td>
<td>22 early effects</td>
<td>5 early effects</td>
<td>29 early effects</td>
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<tr>
<td>0 deaths</td>
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<td>0 deaths</td>
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<tr>
<td>Accidents in medical use</td>
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<tr>
<td>Unknown</td>
<td>Unknown</td>
<td>470 early effects</td>
<td>153 early effects</td>
<td>623 early effects</td>
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<tr>
<td>4 deaths</td>
<td>42 deaths</td>
<td>46 deaths</td>
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International Organization for Medical Physics
Some Underlying Causes Identified by IAEA

Main causes of accidents:
• Poor QA
• Inadequate staff training (including medical physicist)
• ...

IAEA Recommendations
• Qualified medical physicists
• ...

- But what defines “Qualified”?
IAEA Definition of a MP in Clinical Environment

IAEA International Basic Safety Standard 2014:

“A health professional with specialist education and training in the concepts and techniques of applying physics in medicine and **competent to practice independently** in one or more of the subfields (specialties) of medical physics.”

What are the requirements to become a clinically qualified medical physicist who is competent to practice independently?
What qualifications are required?

Medical physicists, as health professionals, should be educated and clinically trained in a similar manner as other health professionals such as medical doctors, pharmacists, etc.
International Guidance Documents on Requirements for Clinically Qualified Medical Physicist

IOMP guidance document (www.iomp.org):
- IOMP Policy Statement No. 2 (Basic Requirements for Education and Training of Medical Physicists)

IAEA guidance documents (www.iaea.org):
- IAEA HHS No. 25 (Roles and Responsibilities, and Education and Training Requirements for Clinically Qualified Medical Physicists)
- IAEA TCS No. 56 (Postgraduate Medical Physics Academic Programmes). This document has incorporated the IOMP Model Curriculum and is endorsed by IOMP.
IOMP Requirements

1 Education requirements:
   • A degree in physics or equivalent academic degree
   • A master’s degree in medical physics or equivalent academic degree in a physical science subject

2 Professional training requirements:
   • > 2 years supervised clinical training on specialty of MP practice in the form of formal residence

3 Professional certification + CPD
Assessing & Qualifying MP in Healthcare - IOMP Recommendations

- Education and clinical training programmes for MP should be subject to independent assessment
- A system for accreditation of MP education programmes should be established in every country
- A system of professional certification and/or registration should be established in every country to qualify MP to practice
- Accreditation/certification should be conducted by an independent board operated by a national professional organization
The Role of International Accreditation Boards

- Provide standards and guidance to national certification or accreditation boards
- Assist national professional organizations to set up national certification or accreditation boards
- Audit or accredit national certification boards to ensure equivalent standards as specified by IOMP are used
- Conduct professional certification of individual MP in countries where setting up of national certification boards is not feasible
- Accredit medical physics education and clinical training programmes
International Medical Physics Certification Board (IMPCB)

- President & Chair of Board of Directors– Prof. Colin Orton
- Established in 2010 as an independent organization (IOMP is the Principle Supporting Organization)
- Objective: Accredit national MP certification programmes and certification of individual MP in accordance with IOMP guidelines
- The first national MP certification boards accredited by IMPCB were carried out during 2015.
- Certification of individual MPs from countries where national boards do not exist is being planned for 2017
The IOMP Accreditation Board

- Chairman: Professor John Damilakis
- Objective: Accreditation of
  - Academic degree programmes in medical physics
  - Medical physics education institutions
  - Professional medical physics training centres
  - CPD events in medical physics
- Pilot accreditation exercise in 2016- accreditation of the ICTP master’s programme in medical physics
- Accreditation of academic programmes open to application in 2017
Acknowledgement

Professor John Damilakis, Chairman of IOMP Education & Training Committee and Chairman of IOMP Accreditation Board for his valuable input.
Thank you!