International Medical Physics Certification

But what else is needed for International acceptance?

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Global Short Supply

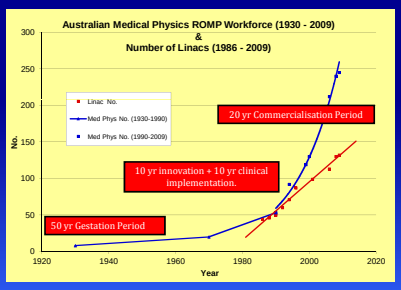
Most countries have a shortage of qualified medical physicists due to there being:

1. A general lack of understanding of their role and needs;

1. Insufficient government and health authority support and;

Global Short Supply

3. Significant growth in the use of complex medical technology.



Recent Workforce Reviews

Publications:

UK - IPEM

- Institute of Physics and Engineering in Medicine, *Training Prospectus for Medical Physicists and Clinical Engineers in Health Care.* http://www.ipem.ac.uk/docimages/2440.pdf

Europe - EFOMP

- Edualdo T. and Olsen K., Physica Medica, XX. 2009,1-5, *The European Federation of Oganisations for Medical Physics. Policy Statement No. 12: The present status of medical physics education and training in Europe. New perspectives and EFOMP recommendations.*

Recent Workforce Reviews

Publications:

USA – AAPM

- American Association of Physicists in Medicine, Report No. 197 (2009)- *Academic Program Recommendations for Graduate Degrees in Medical Physics, (2009);*

Aust./NZ - ACPSEM

- Oliver L., Fitchew R., Drew J., *Requirements for radiation oncology physics in Australia and New Zealand,* Australas. Phys. Eng. Sci. Med. 2001, 24(1), 1-18.

Recent Strategies

Hendee, 2007 recommended:

1. To work independently, the medical physicist should be accountable to their peers, clinical colleagues and the public.

1. Clinical expertise should be confirmed by examination with certification issued by an authorized Certifying Body.

- Hendee W. R. and Mower H. W., Med. Phys., 33, 3327-3332, 2006. *A time of opportunity in the education of medical physicists: report of a multi-organizational summit on the education of medical physicists.*
- Hendee W. Phys. Med. Biol. Website, March 2007. *Educating medical physicists: an ongoing challenge.*
- International Organization for Medical Physics, *The Medical Physicist: Role and Responsibilities, Policy Statement No. 1,* (2009). http://www.iomp.org

Recent Strategies

- Recent EFOMP, IAEA and IOMP publications provide important future directions to establish International strategies that standardize the requirements for certified medical physicists (CMP).
- IOMP established international guidelines for an education and clinical training program;
  - International Organization for Medical Physics, *Basic requirements for education and training of Medical Physicist, Policy Statement No. 2,* (2010).

Training, Education and Certification

IAEA publications:

- International Atomic Energy Agency, *Clinical Training of Medical Physicists Specializing in Radiation Oncology Physics,* IAEA, Vienna, Austria.
- International Atomic Energy Agency, *Clinical Training of Medical Physicists Specializing in Diagnostic Radiology,* IAEA, Vienna, Austria.
- International Atomic Energy Agency, *Clinical Training of Medical Physicists Specializing in Nuclear Medicine,* IAEA, Vienna, Austria.

International Certification

i. IOMP recommended that a Certified Medical Physicist should complete a final, overall examination:
Wu R. K., IOMP Professional Relations Committee, *International Medical Physics Certification Board,* http://www.impcb.org

ii. IOMP formed the International Medical Physics Certification Board (IMPCB) and;

i. is progressing towards establishing 'International Certification'

International Certification

- The IAEA and IOMP activity has catalyzed significant improvements in establishing a more consistent international training and education program;
- Many more countries have introduced their own national certification programs.

Why have International Certification?

The aim is to have:

1. education, training and certification with a common standard for all countries.
2. International recognition to practice as a certified medical physicist.

Some Difficulties

- Can Certification be truly International?
- How can National Certification Bodies assess a program from another country?
- Are there limitations to consider?

Some Difficulties

The quality of certified graduates depends on the:

- complexity of the health care facilities;
- professional support by government;
- adequacy of the CMP workforce providing the education, trainee supervision and;
- the standard set in the final certification examinations.

Difficulties of International Certification

- EFOMP review (2009) reported that education, training, supervision, and certification varied in European countries due to a wide range of reasons.

Edualdo T. and Olsen K., Physica Medica, XX. 2009,1-5, *The European Federation of Oganisations for Medical Physics. Policy Statement No. 12: The present status of medical physics education and training in Europe. New perspectives and EFOMP recommendations*

Difficulties in International Certification

Starkschall (2009):

i. Impractical to have an individual certifying body from one country to examine all other countries;

ii. A common written exam may be possible but different countries have different capabilities and expectations for their certification standard;

Starkschall G., J. of Appl. Clin. Med. Phys., vol. 10, no. 1., Editorial, 2009. *International certification of medical physicists.*

Difficulties in International Certification

iii. Controlling the future work of an individual is a significant responsibility and;

iv. It requires proper governance and examination consistency.

Starkschall G., J. of Appl. Clin. Med. Phys., vol. 10, no. 1., Editorial, 2009. *International certification of medical physicists.*

Proposed Strategy

i. The IOMP and IAEA consider seek funding for a cooperative assignment that will oversee an International Certification Body to audit and assess National Certification Programs.

Proposed Strategy

ii. The International Certification Body should arrange:

- assessments to audit and grade national medical physics certification programs (similar to the IAEA Medical Physics audit).

IAEA TECDOC 1543, 2007, *On-site visits to radiotherapy centres: medical physics procedures. quality assurance team for radiation oncology (QUATRO).*

Proposed Strategy

iii. National Certification Programs should be externally assessed and graded prior to registration by an International Certification Board .

The International Certification Board

Role:

1. Prescribe an international minimum standard;
2. Ensure programs in all countries progress to the common international standard;
3. Assess and grade National Certification Programs;

The International Certification Board

4. Ensure that certified medical physics graduates obtain a satisfactory level of education, clinical training and expertise to work independently and;
5. Maintain a Register of Grades awarded to Countries (or Regions) for their National Certification Program.

Implement an International Register

The IOMP and IAEA would:

1. Utilise the International Medical Physics Certification Board (IMPCB).
1. Delegate IMPCB to oversee the work of a Panel to audit, assess and grade National (or regional) Bodies responsible for a Medical Physics Certification program.

Implement an International Register

IMPCB would:

- Establish an Audit and Certification Panel (ACP);
- Establish a pool of experienced, peer-reviewed experts for ACP to work for the IMPCB activities;

Implement an International Register

ACP examiners would:

I. Have experience as a certification examiner;

II. Practice in countries with a broad range of equipment and have a well-established certification program;

III. have leading expertise in clinical medical physics for the relevant specialty;

IOMP Baseline Standard

1. An approved bachelor's degree in physics or an equivalent degree in a relevant physical or engineering science subject and;
2. An accredited postgraduate program at a master's or higher degree level in medical physics and;
1. An accredited clinical competency training program as a resident or supernumerary and;

IOMP Baseline Standard

4. Not less than 2 years full-time equivalent clinical training, under supervision of:
   i. a CMP specialized in the same sub-field or
   ii. a qualified professional with a level of experience and expertise equivalent to that of the CMP;
5. Complete certification with final examination and;
4. Be subject to re-certification and/or a CPD program after certification.

Assessment of National Certification Programs

Assessments would:

- be voluntary;
- graded relative to:
  i. IOMP baseline standard and;
  ii. the standard and quality of each component in the program.
- allow for minor variations in training schemes.

Suggested Grade System - ***Grade AAA***

- IOMP baseline (1-6) are satisfied.
- All components are a high quality level.
- The audit indicates that trainee medical physicists:
  - receive their training on high quality equipment,
  - use up-to-date methods,
  - have a sufficient number of CMP providing direct supervision and;
  - the training period is well in excess of 2 years.

Suggested Grade System - ***Grade AAA***

- The trainee medical physicists:
  - publish in peer reviewed journals and;
  - present their work at approved conferences as part of their training.
- Random assessment of CMP graduates indicate a high quality of:
  - training in hospitals and:
  - pass standard in the final certification examination.

Suggested Grade System - ***Grade AA***

- Items 1-6 are satisfied except that part(s) of the overall Certification may be considered:
  - of a lower quality level or
  - may require further strengthening to achieve a high quality standard;
- Training activities in research, publishing and presentation of papers is not evident.

Suggested Grade System - ***Grade A***

- Items 1-5 are satisfied and similar in content to Grade AA;
- Is of a satisfactory quality but requires strengthening in one or a number of the training and education components or;
- Does not have a CPD program.

Suggested Grade System - ***Grade BBB***

- Items 1-5 are satisfied and similar to Grade A;
- One or more of the certification components are not to a satisfactory level.

Suggested Grade System - ***Grade BB***

- Items 1-5 are similar to Grade BBB;
- The university courses and/or hospitals training programs are not accredited by a National Authority;
- The training and final certification examination are inadequate and;
- Requires expert assistance and funding to improve the program.

Suggested Grade System - ***Grade B***

- The grade level is similar to Grade BB but;
- The program has no final certification examination and/or CPD program.

Suggested Grade System - ***Grade B***

- Other indications of shortcomings include:
  - a large proportion of medical physicists receiving 'on-the-job' training,
  - insufficient training,
  - insufficient CMP (or equivalent experience) available to train and supervise trainee medical physicists and
  - limited availability of modern technology, techniques and support infrastructure.

Suggested Grade System - ***Grade C***

- Similar to Grade B.
- Has significant shortcomings such as:
  - no postgraduate medical physics degree available;
  - no supernumerary positions and only on-the-job training; with no programmed supervision;
  - no final certification;
  - no CPD program and/or;
  - insufficient training courses arranged.

Planning an ACP Program

1. The rate and number of audits and assessments depends on:
   - the program's budget;
   - the extent of the audit;
   - the number of examiners available;
   - the number of countries requiring the audit.

Planning an ACP Program

2. Expert examiners of radiology, radiation oncology and nuclear medicine would be appointed for their individual medical physics specialties.
3. The courses and radiation protection training should cater for all specialties.

Planning an ACP Program

4. Components of the audit include:
   - the university medical physics course and marking;
   - the hospital clinical training;
   - the stringency of the final examination and;
   - the final professional standard of the graduates.

Planning an ACP Program

5. Assessment of all institutions and medical physicists may not be possible.
6. To determine the overall standard, the ACP would need to establish the:
   - assessment criteria and;
   - best means of sampling the National standard.

Planning an ACP Program

7. The number of audits that can be completed in a reasonable time will be limited.
8. The project should be staged over a period of five years:

Planning an ACP Program

8. Stage 1. – Invite countries seeking or considered as Grade AAA levels to apply.
9. Stage 2. – Review the outcome of Stage 1. and determine the average standard for these countries. Invite applications for BBB or higher levels.
10. Stage 3. – Review remaining countries and adopt a strategy to assist the countries in most need.

Discussion

1. Requires a sound business plan after adequate stakeholder consultation.
2. The funding, management and practice of the Audit and Certification Program must be feasible and properly governed by an independent international body.

Discussion

4. Certification standards set by one country may not necessarily be acceptable to another country.
5. An independent international audit would be invaluable when assessing graduates from other certification programs.

Advantages of the Proposal

Independent International grading would:

1. Reduce repetitive work to assess medical physicists trained in another country;
2. Reduce costs incurred by the potential employer, the national professional body, certifying body and the applicant;

Advantages of the Proposal

3. Reduce the time and increase efficiencies in processing these applications;
4. Creates a fairer, more internationally consistent criteria for the assessment of medical physicists certified in another country;
5. The process could then be more appropriately based on some well-established international guidelines.

Advantages of the Proposal

6. Provide advantages and incentives for participating countries;
7. For countries still in the early stages of developing a certification program, an ACP audit helps to highlight areas needing improvement or strengthening;
8. Substantiate the need for financial and/or professional assistance to progress to a higher grade.

Conclusion

ACP graded Certification Programs would:

- Provide an external independent audit;
- assist in streamlining the assessment and setting conditions of approval for certified medical physicists.
- assist the National Certifying Body to establish a fairer, more consistent process.
- establish standard policies for the ACP grades.
- Identify specific needs in countries that require further assistance.

Thank You

Samuel Ernest Figgis, H. R. W. Murphy, D. McDougall, and Frederick J. Martell carried out experiments at the SMB on Saturday evening 18 July 1896, producing 'perfect' negatives of a hand and wrist. A Roentgen Tube and an induction coil giving a two inch spark, the coil being sparked by the SMB's dynamo, were used to obtain these results. The Courier reported that 'the exposure of five minutes was ample' but concluded that 'the length of the exposure will be shortened as experiments proceed.'

The Ballarat Courier reported on 20 July 1896 that: "Thanks to the energy of the staff of The School of Mines, Ballarat, and particularly to Messers F.J. Martell and D. McDougall, the assistance of Rontgen X-rays will soon be available, for the relief of suffering humanity, at this institution."

Mr Martell is an ardent amateur photographer, and Mr McDougall's experience as an electrician has enabled the two gentlemen to carry their experiments on to a perfectly successful issue.

Introduction

- Important areas requiring medical physics services
  - Medical diagnostic imaging for general medicine and;
  - Radiation therapy for cancer patients;
- Most of these early pioneer physicists learnt their expertise on-the-job.

Introduction

- In countries where medical physics was first well established:
  - national professional organizations established policies recommending;
    - postgraduate education in medical physics and;
    - requirements for formal, structured training of medical physicists.

Introduction

Medical physicists now choose to specialize in the main areas of:

- Radiology;
- radiotherapy (or radiation oncology) and;
- nuclear medicine.

Radiation protection is generally common to each of these areas with specialization in the physicist's main work area.

Global Supply

A world shortage of adequately experienced, qualified medical physicists is due to:

- a general lack of understanding of the role;
- Insufficient support by governments and health authorities;
- significant growth in the use of complex medical technology,

Introduction

- The Australian Government provided ACPSEM assistance to establish a training, education and certification program for radiation oncology medical physicists in 2002.
- It was implemented throughout Australia and New Zealand by 2004.

Recent Strategies

- The AAPM and the American College of Medical Physicists held Symposiums to address the lack of training programs in developing or disadvantaged countries.
- to renew discussions and to establish a suitable strategy.