

# **Hong Kong Association of Medical Physics**

## **Certification of Medical Physicists**

### **Professional Assessment**

#### **Guide to Candidates**

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# Chapter 1

## **Professional Assessment System and Format**

### **1.1 Introduction**

Under the Hong Kong Association of Medical Physics (“HKAMP”) professional certification scheme, medical physicists are certified to be competent by virtue of their education and training to practice medical physics independently, safely and professionally. A certified medical physicist carries the title Certified Medical Physicist (“CMPHy”). A CMPHy is able to assume personal responsibility for the research, development and application of medical physics in support of the delivery and development of clinical and/or health services. The professional qualities of a CMPHy include technical and scientific expert (a problem solver), communicator, collaborator/team member, manager, scholar/teacher/mentor, and developer/researcher. His/her work is predominantly intellectual and varied, and requires the exercise of original thought and judgment and the ability to supervise the scientific, technical and administrative work of others.

### **1.2 The Assessment System**

Under the HKAMP certification system, a medical physicist who meets the requirements as defined in Chapter 2 below can become certified upon satisfactorily passing a professional assessment. The purpose of the Professional Assessment (“PA”) is to determine if the applicant is competent to practice independently in a particular specialty of medical physics. In the assessment, the candidate shall demonstrate to a Professional Assessment Panel that he/she has acquired the competence to perform professionally from planning, execution to reporting on at least 60% of the medical physics tasks listed under the core competencies of that particular specialty in Appendix 1 (each sub-category and category without sub-category carries equal weighting). Professional assessment is being offered to candidates practicing in the following specialties:

- (i) Radiotherapy Physics
- (ii) Imaging Physics
- (iii) Engineering Physics
- (iv) Health Physics

### **1.3 Format of Assessment**

The professional assessment is conducted in a form of interview which normally lasts for one hour. During the interview, the candidate must satisfy the Professional Assessment Panel that he/she has acquired the required proficiency and competence in the specialty of medical physics in which he/she is applying for certification. The interview is meant to be a verification rather than a knowledge testing process.

### **1.4 Deadline of Assessment**

An applicant can only be certified if he/she is able to pass the professional assessment within 5 years after the end of the year of his/her completing the Hospital Authority (“HA”) Resident Physicist Training Program or passing parts I and II of the HKAMP Certification Examination. This 5 year deadline applies to the first and any repeated attempts on the professional assessment. The candidate shall ensure that the application form and relevant documents detailed in Chapter 2 below are delivered to the Secretary of Examination Committee on or before the deadline of the application for the PA. The deadline is announced by the Examination Committee and can be found in <http://www.hkamp.org>.

## Chapter 2

### **Application Requirements and Procedures**

#### **2.1 General Requirements**

An applicant applying for the Professional Assessment shall have satisfied the following requirements:

- (i) Being a full-time practicing medical physicist at the time of submitting an application; and
- (ii) Having successfully completed the HA Resident Physicist Training Program or passed both Parts I and II of the HKAMP Certification Examination; and
- (iii) On the day of submitting an application, having been practicing as a physicist in the relevant specialty of medical physics in one or more centres under the supervision of a Certified Medical Physicist of the same specialty of the applicant for a duration of not less than two years full-time equivalent after completing the HA Resident Physicist Training Program or passing the certification examinations as defined in (ii) above. During this period the applicant shall have had hand-on experience on at least 60% of the tasks listed under the relevant specialty in Appendix 1 (each sub-category and category without sub-category carries equal weighting, the appendix can be used as a check list); and
- (iv) Being a full member of HKAMP; and
- (v) Having passed the minimum period of time before re-taking assessment recommended by the last Professional Assessment Panel if the applicant has attempted and failed the last PA.

#### **2.2 Submission of Portfolio**

The applicant shall submit a softcopy of portfolio of his/her work in pdf format ( max 100 pages, double sides & double line spacing ) together with the application form or 8 weeks before the examination to the Secretary of Examination Committee, Hong Kong Association of Medical Physics, which includes the following information:

- (i) A completed “Scope of Assessment” check list in Appendix 1
- (ii) A log book for the period of supervised professional practice
- (iii) Samples of major or important works/projects
- (iv) Record of all activities on continued professional development and education.

The portfolio must be countersigned by the applicant’s supervisor, who is a Certified Medical Physicist of the same specialty of the applicant, to certify the integrity of their contents. The countersigned portfolio means that the accuracy of the information given in the portfolio, the correctness of quantity of works performed, the standard of the presentation are endorsed by the Certified Medical Physicist. The applicant is responsible for letting his/her supervisors know their obligations when certifying the portfolio. A maximum of 20% of professional examination marking will be assigned to the quality of the portfolio.

#### **2.3 Application Procedures**

- (i) Application form as shown in Appendix 2 should be used. The form is downloadable in <http://www.hkamp.org>.
- (ii) Each application shall be supported by a Proposer and a Supporter; both of them being Certified Medical Physicist and Full Member of the HKAMP with one of them being the direct supervisor of the applicant.
- (iii) A crossed cheque made payable to “Hong Kong Association of Medical Physics Limited” for the amount as indicated below, being the assessment fee, shall be submitted with the application form. The fee is non-refundable.  
Assessment fee : HK\$4,500

- (iv) Documentary proof of meeting the general requirements stated in Section 2.2 above shall be submitted with the application form.
- (v) The completed application form together with the assessment fee and supporting materials should be sent to the Secretary of the Examination Committee at the address below:

Mr. Alvin Li  
Medical Physics Department, G/F  
North District Hospital,  
9 Po Kin Road, Sheung Shui, NT

- (vi) The application will be assessed by the Examination Committee. Eligible applicant will be invited to sit for the Professional Assessment in writing.
- (vii) The Professional Assessment Panel performing the assessment has the right of final interpretation with regard to the contents and requirements stated above, as well as of the final decision on the result of assessment.
- (viii) The applicant shall submit a softcopy of portfolio of his/her work in pdf format ( max 100 pages, double sides & double line spacing ) together with the application form or 8 weeks before the examination to the Secretary of Examination Committee, Hong Kong Association of Medical Physics.

## **Appendix 1      Scope of Assessment**

### **(A) Core Competencies in Radiotherapy Physics:**

- 1 Physics aspects of operation and application of:
  - (a) Megavoltage accelerator based external beam delivery equipment, e.g. linear accelerator, tomotherapy machine, cyberknife.
  - (b) Afterloading brachytherapy delivery system
  - (c) Superficial X-ray therapy unit
  - (d) Conventional treatment simulator
  - (e) CT simulator or planning CT scanner
  - (f) Treatment planning computer system
  - (g) Radiation dosimetry and beam data acquisition equipment
- 2 Equipment management
  - (a) Maintenance arrangement
  - (b) Acquisition and procurement
- 3 External beam radiation dosimetry
  - (a) Electron and photon beam dosimetry measurement
  - (b) Dose calibration
  - (c) Beam data measurement
  - (d) Processing, transfer and verification of radiation beam data to treatment planning system
- 4 External beam treatment planning and dose calculation, treatment simulation and verification
- 5 Physics, dosimetry and QA of special external beam treatment techniques, including
  - (a) External electron and photon beam dosimetry measurement
  - (b) SRS/SRT
  - (c) TBI
  - (d) IMRT
  - (e) IGRT
- 6 Patient dosimetry, including in vivo measurement using ionization chamber, TLD, film, diode detectors and calculation
- 7 Quality assurance of radiotherapy equipment as listed in (1) above, including
  - (a) Acceptance testing
  - (b) Commissioning
  - (c) Periodic quality control
- 8 Brachytherapy dosimetry, treatment planning and delivery, quality assurance
- 9 Therapeutic applications of unsealed radioisotopes, dosimetry and quality assurance
- 10 Custody and management of radioactive sources and wastes
- 11 Preparation of sealed and unsealed radioisotopes for therapeutic applications, including
  - (a) Calibration
  - (b) Testing
  - (c) Periodic quality control
- 12 Radiation safety and protection, including:
  - (a) Radiation safety and emergency measures in radiotherapy
  - (b) Compliance with local legislative and licensing requirements, code of practice and local rules
  - (c) Room shielding design and calculation for radiotherapy equipment and facilities
  - (d) Optimization
  - (e) Risk assessment
- 13 Testing and calibration of radiation monitors
- 14 Radiation monitoring and survey
- 15 Radiotherapy network system management and administration
- 16 Research and development techniques
- 17 Statistics skills
- 18 Training and teaching skills
- 19 Professional ethics
- 20 Professional development and management skills
  - (a) Professional awareness
  - (b) Communication skills
  - (c) General management
  - (d) Quality management
  - (e) Information technology

**(B) Core Competencies in Imaging Physics:**

- 1 Physics aspects of operation and application of
  - (a) General and fluoroscopic X-ray systems
  - (b) Mobile X-ray unit
  - (c) Digital radiography system
  - (d) Computed radiography system
  - (e) Mammography system
  - (f) Ultrasound systems
  - (g) Cardiovascular and/or angiographic imaging system
  - (h) MRI system
  - (i) CT system
  - (j) SPECT and/or PET systems
  - (k) Image distribution and PACS systems
  - (l) Screen film systems and film processing
- 2 Equipment management
  - (a) Maintenance arrangement
  - (b) Acquisition and procurement
- 3 Quality assurance of imaging equipment as listed in (1) above, including
  - (a) Acceptance testing
  - (b) Commissioning
  - (c) Periodic quality control
- 4 Image/data acquisition, processing and analysis
- 5 Image/data management
- 6 Patient dosimetry, including in vivo measurement using ionization chamber, TLD, film, diode detectors and calculation
- 7 Radiation safety and protection, including:
  - (a) Radiation safety and emergency measures in diagnostic radiology
  - (b) Compliance with local legislative and licensing requirements, code of practice and local rules
  - (c) Room shielding design for diagnostic radiology equipment and facilities
  - (d) Optimization
  - (e) Risk assessment
  - (f) Compliance with ICRP requirements and recommendations
- 8 Testing and calibration of radiation monitors
- 9 Radiation monitoring and survey
- 10 MRI safety
- 11 Preparation of radioisotopes for imaging applications, including
  - (a) Calibration
  - (b) Testing
  - (c) Periodic quality control
- 12 Custody and management of radioactive sources and wastes
- 13 Research and development techniques
- 14 Statistics skills
- 15 Training and teaching skills
- 16 Professional ethics
- 17 Professional development and management skills
  - (a) Professional awareness
  - (b) Communication skills
  - (c) General management
  - (d) Quality management
  - (e) Information technology

**(C) Core Competencies in Engineering Physics:**

- 1 Competencies in applied engineering
  - (a) Principles, concepts and design of radiological equipment
  - (b) Multi-engineering knowledge and skills in electrical, electronic, mechanical, hydraulic, pneumatic, microwave, vacuum engineering
  - (c) IEC standards requirements of radiological equipment
  - (d) Acceptance testing of equipment in compliance with relevant performance and safety standards

- (e) Equipment safety aspect in terms of radiation, electrical, mechanical hazards
- (f) Quality Assurance and Preventive Maintenance Inspection
- (g) Practical Equipment Maintenance experiences
- (h) Building services engineering (desirable)
- 2 Competencies in applied physics
  - (a) Principles of linear accelerator physics including electromagnetic theory, optics, vacuum, radiation physics, etc.
  - (b) Principles of diagnostic X-ray physics including X-ray production, image quality, etc.
  - (c) Principles of radiation measurements including beam energy, beam uniformity, absorbed dose calibration, radiation survey, leakage radiation assessment, use of radiation instruments, etc.
  - (d) Principles of treatment planning, patient dosimetry, and treatment QA (desirable)
- 3 Competencies in professional standing
  - (a) Independent, interdependent and self-learning skills
  - (b) Problem solving and creative thinking skills
  - (c) Interpersonal and teamwork skills
  - (d) Communication and training skills
  - (e) Project management skills
  - (f) Technical management and advisory skills
  - (h) Health and safety skills

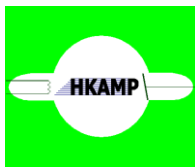
**(D) Core Competencies in Health Physics:**

- 1 A knowledge and understanding on the topics referred to in Appendix B, Syllabus for Part II Advanced Health Physics
- 2 A detailed understanding of the Radiation Ordinance and Code of Practice for Radiation Safety in HA Hospitals together with a knowledge of Department of Health guidance on radiation health issues
- 3 Knowledge of operational radiation protection methods, especially
  - (a) Interpretation and application of radiation protection data
  - (b) Work supervision and radiological measurements
  - (c) Control procedures for work involving the potential for significant radiation exposure
- 4 The ability to give adequate and competent advice to all stakeholders, including employers, workers, patients and any other affected members of public on radiation protection and safety, especially regarding compliance with the Radiation Ordinance, Code of Practice on Radiation Safety in HA Hospitals, Department of Health guidance on radiation health issues and international standards and guidelines on radiation protection



**Appendix 2**

**Application form  
for Professional Assessment**



# Hong Kong Association of Medical Physics

## Application for Professional Assessment

**General Information:** See section 2.3 in “Guide to Candidates”

Assessment fee: HK\$4,500

Eligible applicant will be notified by mail of the date, time and venue of the Professional Assessment.

### **A. Personal Information**

#### **Personal Particular**

Surname	<input type="text"/>	Prof /Dr /Mr /Mrs /Ms *
Other Names	<input type="text"/>	
Identity No.	<input type="text"/>	HKID / Passport No.*
Postal Address	<input type="text"/>	
E-mail Address	<input type="text"/>	
Day Time Contact Tel. No.	<input type="text"/>	Fax No. <input type="text"/>

### **B. Academic Qualification**

#### **Professional Training**

HA Resident Physicist Training Programme	Yes / No*	Yr Completed	<input type="text"/>
HKAMP Certification Examination	Part I	Yes / No*	Yr Completed <input type="text"/>
	Part II	Yes / No*	Yr Completed <input type="text"/>

### **C. Present Employment**

#### **Information on Current Employment.** (Please give details on separate sheet if necessary.)

Employer	<input type="text"/>
Postal Address	<input type="text"/>
Job Title	<input type="text"/>
Major Responsibilities:	<input type="text"/>
Date of Employment [dd-mm-yy]	<input type="text"/> - <input type="text"/> - <input type="text"/>

\* delete as appropriate



