ORGANIZATION OF MEDICAL PHYSICS ASSOCIATES OF CANADA (OMPAC)

MEDICAL PHYSICS ASSOCIATES TRAINING GUIDELINES

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Contents

1. Introduction

The medical physics support group plays a significant role in most cancer centers. Working under the supervision of medical physicists, their responsibilities vary from center to center and include: commissioning and quality assurance (QA) of treatment machines and computerized treatment planning systems, clinical service, radiation safety and research and development. Currently, the medical physics support group is divided into 3 levels: physics assistant, physics technician and physics associate but historically there have been a number of names associated with the position. This document is intended to provide a summary of the education, training and resource requirements for entry-level positions. This document also proposes a more suitable title for each level in the career structure.

2. Career Structure

Junior Medical Physics Associate (JMPA)

Clinical training of a JMPA normally is completed within 1 year. Successful completion of the training should include competency of all routine clinical procedures (outlined in section3) full completion of an approved field relevant project (outlined in section 4). Training will conclude with a peer review.

Entry Requirement

- Minimum Bachelor of Science in Physics or related discipline.

Medical Physics Associate (MPA)

A MPA has shown to be a competent staff member who can participate independently in the full range of clinical service, research, and educational activities. A successful candidate should also possess the knowledge and experience to develop or assist in developing quality assurance policy and procedures.

Entry Requirements

- Bachelor of Science in Physics or related discipline with a minimum of 5 years of clinical experience in a Cancer Centre as a JMPA.
- Completion of the Medical Physics Associate peer review exam.

Senior Medical Physics Associate (SMPA)

A SMPA is a Medical Physics Associate that has shown leadership in the department and holds an outstanding record in clinical service.

Entry Requirements

- M.Sc. in physics or a related discipline and 5 years clinical experience or; B.Sc. in Physics or related discipline with a minimum of 10 years of clinical experience in a Cancer Centre as a Medical Physics Associate.
- Deep understanding of the physics of QA and commissioning measurements and must be capable of designing QA procedures for new features on treatment machines, equipment and treatment technique.

3. Medical Physics Associate Position Description

Position Summary

- MPAs support the work of the radiation therapy department through the application of scientific and technological skills and expertise. They are engaged in clinical service, and assist with education and research.

Position Responsibilities

- Assist with the commissioning and calibrating of physics equipment used in the radiotherapy department.
- Perform accelerator output measurements
- Optical and mechanical inspection of all radiotherapy machines
- Day-to-day implementation of quality assurance programs related to radiation therapy and imaging equipment.
- Development of quality assurance procedures under the direction of, and in collaboration with medical physicists.
- Maintenance of logbooks and records of the quality assurance program, patient dosimetry(TLD, OAL, MOSFET,etc.), equipment calibration, brachytherapy source inventories, etc.
- Calibration of brachytherapy sources.
- Calibration, maintenance, and use of patient dosimetry equipment.
- Day-to-day responsibilities in the radiation safety program under the direction of the local radiation safety officer.
- Collection of data for use by medical physicists for licensing, research, and clinical purposes.
- Maintain proficiency in current physical laboratory techniques and standards.
- Ensure compliance with operational, safety, and QA standards set by national organizations such as CPQR, HARP and CNSC.
- Assist in implementing new techniques.

- Ship, receive, and safe handle of radioactive sources.
- Maintain the inventory of physics laboratory equipment and radiation measurement devices.
- Demonstrate techniques and best practices to physics residents, students, physicists, and visitors.
- May develop and write procedures and policies of clinical relevance.
- May include technical supervision of JMPA or students.
- Responsibilities and duties as assigned.

Reports to

- A MPA reports to the Head of the Department of Medical Physics, and/or other medical physicists as required.

4. Training of Medical Physics Associates

Training Program Objective

The objective of the MPA training program is to provide a guideline for the requirements necessary to ensure a competent MPA. Upon completion of the training period and a peer-review, the MPA should be able to work independently in the daily operation of a radiation therapy quality assurance program.

Qualifications

To secure a position as a Medical Physics Associate Trainee (MPAT), the applicant must have a minimum of a bachelor of science in physics or a related discipline.

Training Program Structure

I. Length

The length of the training is a minimum of 1 year and is a "Competency Based Learning" program. This allows the individual to develop a broad knowledge of all aspects of the quality assurance program and allows sufficient time for collaborative and independent project work. The training period should be divided to include a training component described in section 5(I) and a project component as described in section 5(II).

II. Training Director and Supervisor

The training director should be a medical physicist who is a member of the Canadian College of Physicists in Medicine (CCPM) while the supervisor can be either a medical physicist or a SMPA.

The director and supervisor should be directly involved with the radiation therapy quality assurance program and must dedicate sufficient time to ensuring the adherence to

guidelines of the program. The supervisor is responsible for the day-to-day running of the program, setting trainee's schedules, reviewing progress reports, assessing their satisfactory progress through the program.

Each MPAT should have at least one supervisor who is responsible for the radiation therapy quality assurance program

5. Program Content

A well-rounded training program for Medical Physics Associates should encompass training in the entire quality assurance program and include at least one independent research project.

I. Job specific training

The training allows the MPAT to acquire practical knowledge of each treatment type (i.e. implant brachytherapy, HDR brachytherapy, teletherapy) and the equipment necessary for testing. There are a number of specific tasks, listed below, that should be performed by trainee during the training period.

I. The MPAT should participate in the set up and measurement of a primary calibration of an orthovoltage unit and a dual energy accelerator with electrons. The associate should make all measurements and calculations associated with the appropriate calibration protocol (i.e. IPEMB 1996, TG-51).

II. The MPAT should learn to operate scanning dosimetry equipment and collect a routine set of data for an accelerator for comparison with quality assurance baselines.

III. The MPAT should perform patient dosimeter (TLD, OSL, MOSFET, etc) measurements for various treatment techniques and should be able to calibrate.

IV. The MPAT should be able to perform a complete set of quality assurance measurements on one of the treatment units.

II. Research project

New equipment, procedures and techniques are constantly introduced into the radiotherapy environment. The addition of these new techniques and equipment require some form of testing for reliability of set up, use, or measurement. An associate should be involved in an individual research project associated with either a new technique or new equipment. The project could also be centered around improving an old technique or old equipment.

III. Progress and Final Evaluation

The progress and evaluation of a MPA will be based on the following 3 items.

I. Progress report on an ongoing basis to the supervisor. The report should include a record of all procedures performed to date and any progress made on the research project. The supervisor should provide a review and evaluation of the progress report.

II. Quarterly progress reports completed by both the MPAT and the supervisor and submitted to the program director.

III. Successful completion of a peer review:

   i. The MPAT is eligible for peer-review when the training and research project have been finished. The supervisor and program director will schedule a meeting with the MPAT's co-workers and other medical physicists so that the research project can be presented and the MPAT's practical knowledge can be tested.

   ii. Successful completion of the MPA exam moves the individual to the Junior Medical Physics Associate (JMPA) position.

6. Resource Requirements

In this section resource requirements are addressed in detail.

I. Staff Requirements

There should be designated, certified medical physicist(s) or SMPA for the following tasks and responsibilities.

I. Recruitment and administration

II. Informal tutorials

III. On-the-job training

IV. Supervision of projects

The integrated time commitment has yet to be estimated per year per trainee.

II. Resource Materials

The trainee should have access to sufficient resources to fulfill the requirements in section 5.I.

III. Continuing Education

Candidates should be encouraged to present research at national conferences.

7. Standards for Medical Physics Associate Peer Review

1. PROBLEM SOLVING

Competency Level

- Able to define and characterize a problem and propose a solution.
- Able to determine post service action required.

2. PRESENTATION & COMMUNICATION

Competency Level

- Clear, ordered presentation (introduction, methods, results, conclusions). Grammatically correct.
- Good visual aids (slides, overheads).
- Competent answers to all questions.
- Clear, concise, directed to the listener.

3. CLINICAL PHYSICS

Competency Level

- Several small projects successfully completed.
- Complete exposure to all aspects of clinical radiotherapy physics.
- Competent answers to all questions on general medical physics including the topics of radiation protection, radiation physics, dosimetry, treatment planning and basic clinical oncology.
- Good general knowledge of current medical physics practice and issues.
- Familiarity with common data sources for medical physicists.

4. PRACTICAL SETUP

Competency Level

- Able to perform all required routine setups (i.e. daily, quarterly and semi-annual QA procedures).
- Able to determine if procedures fall within tolerance levels.

5. PLANNING AND ORGANIZATION

Competency Level

- Deadlines met, reports completed on time.
- Judged by a review of the candidate's record at the Centre.

6. INTERPERSONAL SKILLS

Competency Level

- Pleasant, straightforward manner, well groomed.
- Easily integrated into a team.