

General Job Description

The essential responsibility of a medical dosimetrist is to generate a clinically acceptable treatment plan, utilizing clinical knowledge including, but not limited to, anatomy and physiology; radiation biology and oncology; radiation safety and protection; mathematics; and radiation therapy techniques, physics and technology. The medical dosimetrist is expected to communicate with the radiation oncologist during the treatment planning process and participates in communicating the plan to the medical physicist and the radiation therapy technologist for implementation. The medical dosimetrist must maintain a commitment to a high degree of accuracy, attention to detail, and safety. The medical dosimetrist must use critical thinking skills when performing radiation treatment planning, plan evaluation, recognizing and resolving equipment problems and treatment discrepancies.

Qualifications and Certification

As a member of the radiation oncology team, the medical dosimetrist has knowledge of the overall characteristics and clinical relevance of radiation oncology in the management of cancer or other disease processes, with special expertise in radiation therapy treatment planning.

It is expected that an individual will hold themselves qualified to practice in medical dosimetry only when the knowledge and skills to perform dosimetric tasks has been established. An individual shall be considered eligible to practice independently if they are certified by the medical dosimetrist Certification Board (MDCB). Effective as of 2017, all United States candidates are required to have a Baccalaureate Degree and be a graduate of a medical dosimetry educational program accredited by the Joint Review Committee on Education in Radiologic Technology (JRCERT) in order to sit for the MDCB exam.

Radiation oncology is a rapidly changing and technologically advanced field. It is imperative that the medical dosimetrist maintain a level of expertise through both continuing education and training to keep up with the changes, and advancements in the field of radiation therapy. Once certified, the dosimetrist is personally and professionally responsible for the maintenance of certification according to the guidelines established by the MDCB.

Responsibilities

1. Design a treatment plan by means of computer and/or manual computation with optimal beam geometry to deliver a prescribed radiation dose and spare critical structures in accordance with the radiation oncologist's prescription.
2. Identify and contour normal and dose-limiting structures by utilizing images from one or more data sets. Assumes proficiency in image registration with various image data sets to include CT, MRI and PET.
3. Create and transfer reference images and localization markers for portal verification and treatment delivery to include DRRs, CBCTs and other IGRT methods, as specified.

4. Supervise, perform, or assist in simulations and tumor localization using specified imaging modalities including, but not limited to CT, MRI, and PET.
5. Supervise, perform, or assist in the planning and implementation of the fabrication of compensation filters, custom shields, wedges, and other beam modifying devices.
6. Supervise, perform, or assist in the planning and implementation of the production of molds, casts, and other immobilization devices.
7. Communicate with the radiation therapist(s) and assume an advisory role in the implementation of the treatment plan including: the correct use of immobilization devices, compensators, wedges, field arrangement, and other treatment or imaging parameters.
8. Perform calculations for the accurate delivery of the prescribed dose, document all pertinent information in the patient record, and verify the mathematical accuracy of all calculations by an approved method.
9. Provide assistance and technical support to the medical physicist, in radiation safety and protection, qualitative machine calibrations, quality assurance of treatment plans and radiation oncology equipment.
10. Operate and perform quality assurance, under the direction of the medical physicist, on the treatment planning system(s).
11. Supervise, perform, or assist in the application of specific methods of patient and/or beam dosimetry as directed by the medical physicist.
12. Assist in brachytherapy procedures by performing treatment planning and dose calculations.
13. Utilize radiation monitoring devices to measure radioactivity and perform assays.
14. Teach applied aspects of medical dosimetry to students, radiation therapists and residents.
15. Participate in clinical research.
16. Participate in continuing education.
17. Participate in quality improvement processes.

Skills

1. Knowledgeable in the areas of anatomy, physiology, clinical oncology, radiobiology, radiation physics, and radiation safety.
2. Expertise in the technical aspects of radiation oncology and medical physics to develop optimal treatment plans which include multi-modality (MR, PET) imaging for use in rigid and deformable registration, respiratory gating, and daily assessment of CBCT for dose tracking and possible treatment adaptation.
3. Knowledgeable in health care informatics-including the resources, devices, and methods to acquire, store and retrieve data. Tools include computers and software such as Word, Excel, and PowerPoint as well as clinical guidelines, current medical terminology, information, and communication systems.
4. Possess good communication and interpersonal skills to facilitate the exchange of information with patients, family members, and the radiation oncology treatment team as well as outside entities.
5. Demonstrates high level critical thinking and problem-solving skills, to include the ability to make quick evaluation and decisions for on-line adaptive responsibilities.
6. Works independently, but in collaboration with the radiation oncologist and medical physicist.
7. Demonstrates working knowledge of radiation safety principles and practices as well as current rules and regulations of the Nuclear Regulatory Commission and other regulatory agencies.
8. Exhibits the ability to interpret criteria and develop treatment plans as defined by relevant

treatment protocols.

9. Displays mathematical skills including algebra, trigonometry, and introductory calculus.
10. Knowledgeable in conducting clinical research including collecting data, implementing a study, and writing papers for publication.
11. General understanding of scripting across various programming languages.