

# **RADIATION THERAPIST**

## **Description of the Profession:**

Radiation Therapy is the art and science of treatment delivery to individuals to restore, improve and enhance performance, diminish or eradicate pathology, facilitate adaptation to the diagnosis of malignant disease and to promote and maintain health. The major focus of radiation therapy is the delivery of prescribed dosages of radiation to individuals from radiation sources. The radiation therapist's concern is with those factors that influence radiation dose delivery, individual well being, and responsiveness to treatment as well as those factors that serve as barriers or impediments to treatment delivery.

The practice of radiation therapy is performed by competent radiation therapists who deliver care to the patient in the therapeutic setting and are responsible for the simulation, treatment planning and administration of a prescribed course of radiation therapy. Radiation therapists assume direct responsibility for the well being of the patient preparatory to, during and following the delivery of daily treatment. Additional related settings where radiation therapists practice include education, management, industry and research.

## **Job Summary**

- Applies ionizing radiation in the treatment of patients under the direction and upon the prescribed treatment plan of a Radiation Oncologist (MD) to pediatric, adolescent, adult and geriatric patients.
- Renders patient care that requires a high degree of responsibility and technical skills to insure the proper treatment and well being of the patient.
- Assesses patients medical and emotional needs on a daily basis, notifies physicians and nursing staff of any changes.

## **Job Qualifications**

1. Must be a graduate of an accredited School of Radiation Therapy.
2. Must be registered and certified by the American Registry of Radiologic Technologists (ARRT).
3. Must be licensed by the state of Florida as a Radiation Therapy Technologist (each state has different licensure requirements).
4. Must have the ability to make independent decisions using critical thinking and perform responsibilities under stressful situations.
5. Meets technical standards.
6. Must possess oral and written communication skills.

## **Responsibilities and Standards of the Registered Radiation Therapist**

1. Deliver a planned course of radiation therapy while maintaining daily records and documenting technical details of the treatment administered.
2. Provide patient care and comfort essential to radiation therapy procedures. Observe the clinical progress of the patient undergoing radiation therapy, observe the first signs of any complication, and determine when treatment should be withheld until a radiation oncologist may be consulted.
3. Be knowledgeable of the function and utilization of equipment/treatment accessories and be able to detect equipment malfunctions, report same to the proper authority, and know the safe limits of equipment operation.
4. Simulate and plan a prescribed course of treatment as well as construct immobilization and beam directional devices as needed for treatment.
5. Be knowledgeable of and participate in brachytherapy procedures.
6. Apply the principles of various treatment methods and protocols while performing treatment planning procedures and verifying mathematical accuracy.
7. Apply the rules and regulations for radiation safety, detect any radiation hazards, and provide for appropriate public safety in the event of a radiation accident.
8. Assist the physicist in calibration of equipment and quality assurance.
9. Participate in patient educational procedures and follow-up programs.
10. Communicate effectively in the medical environment and function as a team member in a radiation oncology department.
11. Perform multi-skilled tasks exercising independent judgment and critical thinking in the technical and patient care performance of imaging/therapeutic procedures.
12. Participate in professional activities and continuing education to promote continued professional and personal growth.

## Contacts

The registered radiation therapist works closely with radiation oncologists (physicians specializing in radiation oncology), medical oncologists (physicians specializing in chemotherapy), and medical physicists, dosimetrists, radiographers, registered nurses, lab technologists, social workers, various clerical staff, students, and patients. Some contact with service engineers and medical supply technical representatives.

## Working Conditions

1. Pleasant inside environment.
2. Occasional low level of radiation exposure during routine work.
3. Much standing and walking.
4. Frequent lifting and moving of equipment/supplies/patients.
5. Exposure to blood and body fluids.
6. Assisting patients continuously.
7. Standard 40 hour, Monday through Friday work week with possibility of some overtime work, including on call or weekends.

## Technical Entrance Standards

Specific entrance standards for the program include physical capabilities, mental/emotional capacity and communication ability.

- **Physical Capabilities**
  - ✓ Students must be able to make and report visual observations, differentiate between shades of black, white and gray, work in subdued lighting and read and carry out verbal and written orders. (Eyesight must be 20/40 or corrected to that level.)
  - ✓ Students must be able to hear blood pressure, breath sounds, and verbal orders and during emergencies hear alarms or distress calls from patients. (Hearing must be corrected to no more than 50% loss.)
  - ✓ Students must be able to palpate patients for positioning, take pulses and determine body temperature.
  - ✓ Students must possess physical ability and stamina enabling them to withstand an eight hour period of standing and/or to move quickly and, at times, continuously.
  - ✓ It is often necessary to lift, move or support patients and/or equipment of greater size and weight than self. Therefore, strength of back, legs and arms, and the ability to use proper body mechanics are necessary for the safety of both patient and students.
- **Mental/Emotional Capacity**

Students must be able to think clearly, critically and logically, to make valid and ethical judgments and act effectively in stressful situations. An ability to perceive events realistically, think rationally and function independently in routine or emergency situations. When in the judgment of clinical or didactic faculty, it is necessary that this ability be determined by a certified psychologist or psychiatrist.
- **Communication Ability**

Students must be able to communicate observations to others in a clear, concise manner in both oral and written forms. In the judgment of the clinical supervisors, the student must be able to speak and interact effectively with patients and members of the health care team.

Students will be given the opportunity to request reasonable accommodations to meet these entrance standards.

## HMC Radiation Therapy Educational Program Curriculum Design

This program of study is designed to provide education on radiation oncology topics for radiographers, registered nurses and/or other allied health professionals meeting the prerequisite coursework identified in the program brochure. The curriculum is specifically designed to build upon a foundation of knowledge. To validate this assumption, the satisfactory completion of prerequisite college course work is defined **a grade of "C" or better** and tests and review sessions are provided in the curriculum within the Review of Basics course. Didactic and clinical hours are required for the completion of the program. The average clock hours per semester for both didactic and clinical is 40 hours per week (16 +24). The clock hours for both class and clinical per semester vary so a didactic class and clinical rotation schedule is provided at the beginning of the program. Any revision to either schedule are discussed with the students, and then distributed in written form. All didactic and clinical education course work is competency based. Students are provided with a list of the competencies that must be completed with an 85 average prior to graduation.

Completion of the program requires fifteen (15) months. Students are permitted vacation from classes and clinical for one week in December/January and June/July as well as the following holidays: New Year's, Martin Luther King, Presidents, Good Friday, Memorial, Independence, Labor, Thanksgiving, Christmas. The program courses and descriptions are as follows:

### Coursework and Descriptions

#### Review of Basics

The course content is designed to assess (assessment tests) and review the student's knowledge retention of general pathology, radiographic imaging, patient care, and radiation biology & protection. Fundamental principles, concepts and terminology will be reviewed. This review will fortify the foundation of knowledge for transition to radiation therapy concepts and principles.

#### Introduction to Radiation Therapy

The course is designed to provide the student with an overview of the foundations in radiation therapy and the practitioner's role in the health care delivery system. Principles, practices and policies of the educational program & health care organization, principles of radiation and health safety and professional responsibilities of the radiation therapist will be discussed and examined. Orientation clinical labs are provided that cover treatment machine and simulator operation and room setup, basic positioning and workplace hazards (departmental MSDS, mold room safety, radiation safety). The student will attend the Halifax Medical Center employee orientation program (2-day) and complete a Department of Radiation Oncology Orientation checklist with the Clinical Coordinator. The standards of care, law, ethical standards and competence in radiation therapy practice will also be examined.

#### Radiation Therapy Physics I and II & Lab-Calibration & Quality Assurance

The courses are designed to present basic principles of radiation protection and safety for the radiation therapist. Radiation health and safety requirements of federal and state regulatory agencies, accreditation agencies and health care organizations are incorporated.

The courses will also provide the student with a review of basic physics and radiation physics, knowledge of the properties of electromagnetic and particulate radiation that will include details of production, interactions, treatment units, and measurement of radiation, along with radiation protection principles of external beam and brachytherapy. The types and construction/operation of various types of radiation therapy equipment will also be discussed along with the principles of brachytherapy. Special treatment modalities in radiation therapy will also be discussed.

Quality Assurance procedures specific to radiation therapy equipment will be discussed and demonstrated in a lab setting. Calibration procedures for external beam equipment will be discussed and students will participate in the procedures during the actual calibration of equipment as well as in the lab setting. Class demonstrations/labs are incorporated to complement specific content areas and are focused on clinical application and theory.

#### Simulation Principles and Techniques

The course is designed to present the fundamentals of radiographic and CT imaging and processing, simulator design and operation, the use and production of patient immobilization devices, surface and sectional anatomy, and simulation procedures with patient education. Practical application and/or applied technology will also be discussed, examined and evaluated.

### **Oncology Pathology**

The course is designed to provide the student with an in-depth study of new and abnormal development of cells. The processes involved in the development and classification of both benign and malignant tumors and site-specific information on malignant tumors is presented.

### **Radiation Biology**

The course is designed to review the basic concepts and principles of radiation biology. The interactions of radiation with cells, tissues and the body as a whole, and resultant biophysical events will be presented. Discussion of the theories and principles of tolerance dose, time-dose relationships, fractionation schemes and the relationship to the clinical practice of radiation therapy will be discussed, examined and evaluated.

### **Principles and Practice of Radiation Therapy I and II**

The courses are designed to provide an overview of cancer and the specialty of radiation therapy. The medical, biological and pathological aspect as well as the physical and technical aspects will be discussed. The roles and responsibilities of the radiation therapist, the treatment prescription, the documentation of treatment parameters and delivery as well as patient education will also be discussed.

The content is also designed to examine and evaluate the management of neoplastic disease using knowledge in arts and sciences, while promoting critical thinking and the basis of ethical clinical decision making. The epidemiology, etiology, detection, diagnosis, patient condition, treatment and prognosis of neoplastic disease will be presented, discussed and evaluated in relationship to histology, anatomical site and patterns of spread.

### **Treatment Planning I and II**

Treatment planning is a process that involves the determination of treatment parameters considered optimal in the management of a patient's disease. The courses are designed to establish factors that influence and govern clinical planning of patient treatment. Encompassed are the parameters of target volume, dose-limiting structures, treatment volume, dose prescription, dose fractionation, dose distributions, positioning of the patient, treatment machine settings, and adjuvant therapies. In addition, isodose descriptions, patient contouring, dosimetric calculations, compensation and clinical application of treatment beams will be practiced. Optimal treatment planning is emphasized. Stereotactic and emerging technologies are also presented.

### **Quality Management & Operational Issues in Radiation Therapy**

The course is designed to focus on the evolution of quality management programs and continuing quality improvements in radiation oncology. Quality assurance checks of clinical aspects and chart checks, film checks, simulators, and megavoltage equipment will be presented. Continuous quality improvement project development and evaluation and assessment techniques will be emphasized. Human resources issues and regulations impacting the radiation therapist will be examined. Billing and reimbursement issues pertinent to the radiation therapy department will also be presented.

### **Research Project**

Introduction to methods used in scientific and medical research in radiation oncology. A literature review, experimentation, and data analysis will be completed.

### **Comprehensive Review Class**

The course is designed to review curricular content followed by instruction on item writing. The items developed per review will be used as comprehensive review tests for each of the courses in the curriculum.

### **Clinical Education**

The courses are designed to provide sequential development, application, analysis, integration, synthesis and evaluation of concepts and theories in radiation therapy. Through structured sequential assignments in clinical facilities, concepts of team practice, patient-centered clinical practice and professional development shall be discussed, examined and evaluated.



<b>Fourth Semester</b>		<b>Semester Hours</b>
RAT 4249	Principles & Practice of Radiation Therapy III Advanced Techniques	2
RAT 4250	Quality Management & Operational Issues	2
RAT 4900	Comprehensive Review Class	4
RAT 4834	Clinical Education	8 (0,32)

**Total Clock Hours 7/16/07 – 10/3/08 (15-month) 2360 hours**

\*The HMC Radiation Therapy Educational Program is a hospital based certificate program; therefore, college credits are not earned. Equivalent semester credit hours are shown to facilitate colleges and universities that offer credit for such coursework. Semester credit hour equivalence is based on a 16-week semester. Lab credit hour is defined as 2 contact hours; one clinical education credit hour is defined as 4 contact hours per week.