Course Number and Title: NMT 297 Clinical Internship III w/ CT

Campus Location:
Wilmington

Effective Date:
2018-51

Prerequisite:
NMT 296

Co-Requisites:
NMT 203, NMT 212

Course Credits and Hours:
6.00 credits
0.00 lecture hours/week
32.00 lab hours/week

Course Description:
This course provides advance level clinical application in the field of nuclear medicine. Administration, clinical procedures, equipment operations, and health physics are mastered through supervised hands-on experience. Practicum evaluation of computer techniques and programs is emphasized.

Required Text(s):
Obtain current textbook information by viewing the campus bookstore - https://www.dtcc.edu/bookstores online or visit a campus bookstore. Check your course schedule for the course number and section.

Additional Materials:
Uniform, lab coat, goggles, and film badges Nuclear Medicine Program Policy Manual Allied Health/Science Department Program Student Policy Manual

Schedule Type:
Classroom Course

Disclaimer:
Objectives derived from: Curriculum Guide for Nuclear Medicine Technologists, Wanda Mundy & Gregory Passmore; and Performance and Responsibility Guidelines, Society of Nuclear Medicine

Core Course Performance Objectives (CCPOs):

1. Evaluate and demonstrate the ability to perform all in-vivo and in-vitro nuclear medicine procedures under the direct supervision of a certified technologist. (CCC 2, 3; PGC 1)
2. Evaluate and prepare the patient prior to commencing a procedure. (CCC 1, 2, 3; PGC 1, 3, 4, 6)
3. Assess, interpret, and apply principles of radiation physics using Nuclear Regulatory Commission (NRC) and state regulations in the practice of radiation safety. (CCC 2, 4; PGC 1)
4. Develop, assay, and administer radiopharmaceuticals and pharmaceuticals employing sterile techniques. (CCC 2, 6; PGC 1)
5. Evaluate and practice all quality control and quality assurance procedures on instrumentation prior to a patient's study. (PGC 1, 2)
6. Develop competency in designated assigned techniques and computer analysis. (CCC 3, 6; PGC 1, 2)
7. Develop, compose, and analyze research data. (CCC 1, 2, 3, 4, 5; PGC 3, 4)
8. Describe and demonstrate the computer processing of all nuclear medicine procedures.(CCC 2; PGC 2)
9. Evaluate and perform all computed tomography procedures under the direct supervision of a certified technologist. (CCC 2, 3; PGC 1, 2, 6)

See Core Curriculum Competencies and Program Graduate Competencies at the end of the syllabus. CCPOs are linked to every competency they develop.

Measurable Performance Objectives (MPOs):
Upon completion of this course, the student will:

1. Evaluate and demonstrate the ability to perform all in-vivo and in-vitro nuclear medicine procedures under the direct supervision of a certified technologist.
    1. Differentiate between gross and microscopic anatomy and the relationship among cellular, organ, and tissue physiology.
    2. Identify and choose the correct anatomical organs and structures for procedural positions.
    3. Identify surface landmarks on the body.
    4. Select the appropriate patient positioning for all exam views to correlate with the initial suspected pathology.
    5. Select the correct label, and develop patient films for each procedure.
    6. Evaluate each study for technical mistakes encompassing additional images, and repeat images when necessary.

7. Select and administer the radiopharmaceutical and pharmaceutical to the patient.
8. Assemble all patient films, paperwork, and billing for presentation to the assigned instructor and/or physician.

2. Evaluate and prepare the patient prior to commencing a procedure.
    1. Demonstrate the proper methods for moving and handling the patient during a procedure.
    2. Demonstrate proper verbal and nonverbal language before, during, and after the patient procedure.
    3. Determine the following vital signs: temperature, respiration, pulse and blood pressure, and tend to the patient's progress throughout the procedure.
    4. Employ emergency procedures when the patient is in distress.
    5. Prepare each patient for the proper IV technique.
3. Assess, interpret, and apply principles of radiation physics using Nuclear Regulatory Commission (NRC) and state regulations in the practice of radiation safety.
    1. Demonstrate wearing whole-body and thermoluminescence dosimeters at all times in clinical restricted and non-restricted areas.
    2. Use appropriate procedural protection techniques to keep radiation exposure to the patient, public, occupational workers, and oneself as low as reasonably achievable (ALARA).
    3. Analyze, practice, and apply all facets of the department's NRC and state radiation licensing requirements and/or restrictions that apply to:
        1. Decontamination and storage
        2. Disposal of radioactivity
        3. Records of radioactive use
4. Develop, assay, and administer radiopharmaceuticals and pharmaceuticals employing sterile techniques.
    1. Demonstrate the correct procedure for the elution of a 99Mo/99mTc generator.
    2. Assay the eluate in the dose calibrator, and record results in the proper radiopharmaceutical log and/or computer.
    3. Determine the concentration of the eluate, and adjust volume to correlate with daily patient schedule.
    4. Demonstrate the proper preparation of each required radiopharmaceutical kit.
    5. Assay each radiopharmaceutical kit and/or unit dose in the dose calibrator.
5. Evaluate and practice all quality control and quality assurance procedures on instrumentation prior to a patient's study.
    1. Define and perform uniformity floods, bar phantoms, sensitivity checks, center of rotation (COR), CHI squares, and full width at half maximum (FWHM) on each scintillation detector.
    2. Evaluate each quality control result.
    3. Describe NRC and state instrumentation regulations.
6. Develop competency in designated assigned techniques and computer analysis.
    1. Identify and choose the correct patient.
    2. Analyze and verify the doctor's orders.
    3. Examine paperwork completed and assess if the paperwork is properly completed.
    4. Practice time, distance, and shielding.
    5. Assist the patient in all their needs.
    6. Set up the patient's name and information into the computer.
    7. Modify the camera to correctly peak for the procedural isotope.
    8. Select the correct procedural protocol, and enter all pertinent information into the computer.
    9. Prepare the patient correctly before beginning the procedure, (empty bladder, sign consent form, start IV, etc.)
    10. Prepare and inject the patient properly, and return radiopharmaceuticals to the hot lab.
    11. Determine if all the appropriate views are taken correctly for the particular study and patient case.
    12. Determine if the camera is correctly aligned for each view (body contour, correct SPECT ellipse, etc.)
    13. Arrange and display images on film/paper correctly.
    14. Label images correctly for all views and times.
    15. Arrange and file the images in the patient's chart.
7. Develop, compose, and analyze research data.
    1. Describe methods for evaluating research data.
    2. Differentiate and apply sensitivity and specificity statistical equations.
    3. Analyze, discuss, and list factors relating to instrumentation, patient demographics, and pathologies.
    4. Write a literature-based research paper.
8. Describe and demonstrate the computer processing of all nuclear medicine procedures.
    1. Develop a filtering and processing portfolio for each single photon emission computed tomography (SPECT) and planar nuclear medicine procedure.
    2. List all matrix sizes, window widths, imaging times, and acquisition parameters for each nuclear medicine procedure.
    3. List and define the data processing operations of imaging displays.
9. Evaluate and perform all computed tomography procedures under the direct supervision of a certified technologist.
    1. Identify surface landmarks on the body.
    2. Select the appropriate patient positioning all exam views to correlate with the initial suspected pathology.
    3. Select the correct label, and develop patient films for each procedure.
    4. Evaluate each study for technical mistakes encompassing additional images, and repeat images when necessary.
    5. Identify contrast material that needs to be administered and the route of administration.
    6. Identify the post processing parameters.

Evaluation Criteria/Policies:
Students must demonstrate proficiency on all CCPOs at a minimal 75 percent level to successfully complete the course. The grade will be determined using the Delaware Tech grading system:

92	–	100	=	A
83	–	91	=	B
75	–	82	=	C
0	–	74	=	F

Students should refer to the Student Handbook - https://www.dtcc.edu/handbook for information on the Academic Standing Policy, the Academic Integrity Policy, Student Rights and Responsibilities, and other policies relevant to their academic progress.

Core Curriculum Competencies (CCCs are the competencies every graduate will develop):

1. Apply clear and effective communication skills.
2. Use critical thinking to solve problems.
3. Collaborate to achieve a common goal.
4. Demonstrate professional and ethical conduct.
5. Use information literacy for effective vocational and/or academic research.
6. Apply quantitative reasoning and/or scientific inquiry to solve practical problems.

Program Graduate Competencies (PGCs are the competencies every graduate will develop specific to his or her major):

1. Integrate principles of theoretical knowledge and demonstrate entry-level skills pertaining to nuclear medicine in-vivo and in-vitro procedures, radiation safety, quality control, quality assurance, NRC regulations, patient care, radiopharmaceutical preparation and administration, instrumentation and medical informatics.
2. Perform all entry-level procedural computer analysis.
3. Exhibit critical thinking and problem solving skills during the practice of nuclear medicine.
4. Abide by the profession’s code of ethics as stated in the American Registry of Radiologic Technologists (ARRT) and Nuclear Medicine Technology Certification Boards (NMTCB).
5. Competently perform all in-vivo and in-vitro procedures.
6. Exhibit verbal, nonverbal, and written communication skills during patient care, research, and professional scope of practice.

Disabilities Support Statement:
The College is committed to providing reasonable accommodations for students with disabilities. Students are encouraged to schedule an appointment with the campus Disabilities Support Counselor to request an accommodation needed due to a disability. A listing of campus Disabilities Support Counselors and contact information can be found at the disabilities services - https://www.dtcc.edu/disabilitysupport web page or visit the campus Advising Center.