NMED-2950: NUCLEAR MEDICINE FIELD EXPERIENCE II

Cuyahoga Community College

Viewing: NMED-2950: Nuclear Medicine Field Experience II

Board of Trustees:
2018-01-25

Academic Term:
2018-01-16

Subject Code
NMED - Nuclear Medicine Technology

Course Number:
2950

Title:
Nuclear Medicine Field Experience II

Catalog Description:
Supervised sessions in nuclear medicine department with specific assignments and case studies to include math problems and instrumentation. Clinical rotations through variety of specialty areas including nuclear medicine studies of various patient age groups (pediatrics/geriatric) and pathologies.

Credit Hour(s):
4

Lecture Hour(s):
1

Other Hour(s):
576

Other Hour Details:
Field Experience: 544 hours of experience at a clinical site per semester (average of 36 hours per week)

Requisites

Prerequisite and Corequisite
NMED-2940 Nuclear Medicine Field Experience I or departmental approval.

I. ACADEMIC CREDIT

Academic Credit According to the Ohio Department of Higher Education, one (1) semester hour of college credit will be awarded for each lecture hour. Students will be expected to work on out-of-class assignments on a regular basis which, over the length of the course, would normally average two hours of out-of-class study for each hour of formal class activity. For laboratory hours, one (1) credit shall be awarded for a minimum of three laboratory hours in a standard week for which little or no out-of-class study is required since three hours will be in the lab (i.e. Laboratory 03 hours). Whereas, one (1) credit shall be awarded for a minimum of two laboratory hours in a standard week, if supplemented by out-of-class assignments which would normally average one hour of out-of-class study preparing for or following up the laboratory experience (i.e. Laboratory 02 hours). Credit is also awarded for other hours such as directed practice, practicum, cooperative work experience, and field experience. The number of hours required to receive credit is listed under Other Hours on the syllabus. The number of credit hours for lecture, lab and other hours are listed at the beginning of the syllabus. Make sure you can prioritize your time accordingly. Proper planning, prioritization and dedication will enhance your success in this course.

The standard expectation for an online course is that you will spend 3 hours per week for each credit hour.

II. ACCESSIBILITY STATEMENT

If you need any special course adaptations or accommodations because of a documented disability, please notify your instructor within a reasonable length of time, preferably the first week of the term with formal notice of that need (i.e. an official letter from the Student Accessibility Services (SAS) office). Accommodations will not be made retroactively.
For specific information pertaining to ADA accommodation, please contact your campus SAS office or visit online at http://www.tri-c.edu/accessprograms. Blackboard accessibility information is available at http://access.blackboard.com.

Eastern (216) 987-2052 - Voice
Metropolitan (216) 987-4344 – Voice. (216) 987-4048 – TTY.
Western (216) 987-5079 – Voice. (216) 987-5117 – TTY.
Westshore (216) 987-3900 – Voice. (216) 987-4048 – TTY.
Brunswick (216) 987-5079 – Voice. (216) 987-5117 – TTY.
Off-Site (216) 987-5079 - Voice

III. ATTENDANCE TRACKING

Regular class attendance is expected. Tri-C is required by law to verify the enrollment of students who participate in federal Title IV student aid programs and/or who receive educational benefits through other funding sources. Eligibility for federal student financial aid is based in part on enrollment status. Students who do not attend classes for the entire term are required to withdraw from the course(s). Additionally, students who withdraw from a course or stop attending class without officially withdrawing may be required to return all or a portion of their financial aid based on the date of last attendance. Students who do not attend the full session are responsible for withdrawing from the course(s).

Tri-C is responsible for identifying students who have not attended a course before financial aid funds can be applied to students’ accounts. Therefore, attendance is recorded in the following ways:

- For in-person and blended-learning courses, students are required to attend the course by the 15th day of the semester (or equivalent for terms shorter than five weeks) to be considered attending. Students who have not met all attendance requirements for in-person and blended courses, as described herein, within the first two weeks or equivalent, will be considered not attending.
- For online courses, students are required to login at least two times per week and submit one assignment per week for the first two weeks of the semester, or equivalent to the 15th day of the term. Students who have not met all attendance requirements for online courses, as described herein, within the first two weeks or equivalent, will be considered not attending.

At the conclusion of the first two weeks of a semester or equivalent, instructors report any registered students who have "Never Attended" a course. Those students will be administratively withdrawn from that course. However, after the time period in the previous paragraphs, if a student stops attending a class or wants or needs to withdraw, for any reason, it is the student’s responsibility to take action to withdraw from the course. Students must complete and submit the appropriate Tri-C form by the established withdrawal deadline.

Tri-C is required to ensure that students receive financial aid only for courses that they attend and complete. Students reported for not attending at least one of their registered courses will have all financial aid funds held until confirmation of attendance in registered courses has been verified. Students who fail to complete at least one course may be required to repay all or a portion of their federal financial aid funds and may be ineligible to receive future federal financial aid awards. Students who withdraw from classes prior to completing more than 60 percent of their enrolled class time may be subject to the required federal refund policy.

If illness or emergency should necessitate a brief absence from class, students should confer with instructors upon their return. Students having problems with coursework due to a prolonged absence should confer with the instructor or a counselor.

IV. LEARNING OUTCOMES ASSESSMENT

Occasionally, in addition to submitting assignments to their instructors for evaluation and a grade, students will also be asked to submit completed assignments, called ‘artifacts,’ for assessment of course and program outcomes and the College’s Essential Learning Outcomes (ELOs). The artifacts will be submitted in Blackboard or a similar technology. The level of mastery of the outcome demonstrated by the artifact DOES NOT affect the student's grade or academic record in any way. However, some instructors require that students submit their artifact before receiving their final grade. Some artifacts will be randomly selected for assessment, which will help determine improvements and support needed to further student success. If you have any questions, please feel free to speak with your instructor or contact the Learning Outcomes Assessment office.

V. CONCEALED CARRY STATEMENT

College policy prohibits the possession of weapons on college property by students, faculty and staff, unless specifically approved in advance as a job-related requirement (i.e., Tri-C campus police officers) or, in accordance with Ohio law, secured in a parked vehicle in a designated parking area only by an individual in possession of a valid conceal carry permit.

As a Tri-C student, your behavior on campus must comply with the student code of conduct which is available on page 29 within the Tri-C student handbook, available athttp://www.tri-c.edu/student-resources/documents/studenthandbook.pdf. You must also comply with the College's Zero Tolerance for Violence on College Property available athttp://www.tri-c.edu/policies-and-procedures/documents/3354-1-20-10-zero-tolerance-for-violence-policy.pdf

Outcomes

Course Outcome(s):
Follow compliance with hospital policies and procedures for the successful completion of clinical training and professional preparedness.
Objective(s):
1. Show professional ethical behavior at all times with patients, hospital personnel, college staff and visitors.
2. Perform department charting of patient medical care with demonstrated efficiency.
3. Know how to route patients to and from their destination within the hospital.

Course Outcome(s):
Apply health care and related services with respect for the patient’s dignity and age-specific needs without bias based upon personal attributes, nature of the disease, sex, race, creed, religion or socio-economic status by meeting standards of a nuclear medicine technologist.

Essential Learning Outcome Mapping:
Critical/Creative Thinking: Analyze, evaluate, and synthesize information in order to consider problems/ideas and transform them in innovative or imaginative ways.
Cultural Sensitivity: Demonstrate sensitivity to the beliefs, views, values, and practices of cultures within and beyond the United States.
Written Communication: Demonstrate effective written communication for an intended audience that follows genre/disciplinary conventions that reflect clarity, organization, and editing skills.

Objective(s):
1. Recognize emergency patient conditions and initiate first aid and basic life support procedures.
2. Exhibit respect for patient confidentiality, understanding patient’s rights, and compliance with all HIPPA regulations.
3. Explain and discuss the appropriate use of restraints when patient condition or age necessitates.

Course Outcome(s):
Adhere to professional standards for a nuclear medicine technologist.

Essential Learning Outcome Mapping:
Critical/Creative Thinking: Analyze, evaluate, and synthesize information in order to consider problems/ideas and transform them in innovative or imaginative ways.

Objective(s):
1. Apply effective communication skills as expected of a health care professional.
2. Practice and discuss effective patient care during nuclear medicine procedures.
3. Show proficiency by successfully completing examinations during clinical experiences from the following categories: imaging procedures, non-imaging procedures, radiopharmacy procedures, quality control procedures, and patient care.
4. Adequately complete patient history and evaluate for appropriateness of testing ordered.
5. Contact ordering physician or Nuclear Medicine Staff if questionable before proceeding to injecting and scanning.
7. Identify and interpret nuclear medicine requisitions and/or prescriptions.

Course Outcome(s):
Use safe operation of imaging and ancillary equipment under the supervision of a registered nuclear medicine technologist and/or physician.

Essential Learning Outcome Mapping:
Critical/Creative Thinking: Analyze, evaluate, and synthesize information in order to consider problems/ideas and transform them in innovative or imaginative ways.
Information Literacy: Acquire, evaluate, and use information from credible sources in order to meet information needs for a specific research purpose.

Objective(s):
1. Explain how to prepare the room and equipment prior to beginning each nuclear medicine procedure.
2. Demonstrate proficiency in operating nuclear medicine equipment.
3. Recognize variance in patient's body habitus and/or patient's pathological conditions and demonstrate the proper imaging adjustments to accommodate anticipated imaging expectations.

Course Outcome(s):
Practice proper radiation protection and safety techniques at all times and comply with ALARA standards.
Objective(s):
1. Demonstrate ability to perform quality control of nuclear medicine equipment, explain the safe limits of operation, and report malfunctions to the proper authority.
2. Describe the roles the nuclear medicine technologist, radiologist and physicist roles have within the nuclear medicine department.
3. Explain and differentiate radiation safety limits for both patients and a radiation safety worker.
4. Determine proper biohazard signage of areas that handle radiation and/or bodily fluids.

Course Outcome(s):
Produce quality images of all nuclear procedure(s) with the use of technique guides, positioning skills, computers, nuclear medicine instrumentation, and ancillary devices.

Essential Learning Outcome Mapping:
Critical/Creative Thinking: Analyze, evaluate, and synthesize information in order to consider problems/ideas and transform them in innovative or imaginative ways.

Objective(s):
1. Demonstrate competency in quality control procedures.
2. Describe how to produce quality images using correct imaging equipment parameters.
3. Evaluate and critique nuclear medicine images/results as to their quality and demonstrate ability to correct for miscalculations/positioning accuracy.
4. Correctly administer radiopharmaceuticals via proper route of administration to the patient.

Course Outcome(s):
Use a team approach in assisting the radiologist or Nuclear Medicine Technologist in the handling, selection, dosage and quality control in preparation, administration and disposal of radiopharmaceuticals.

Essential Learning Outcome Mapping:
Written Communication: Demonstrate effective written communication for an intended audience that follows genre/disciplinary conventions that reflect clarity, organization, and editing skills.

Objective(s):
1. Properly select, prepare and determine if a radiopharmaceutical meets quality control measures prior to administration to the patient.
2. Demonstrate the steps to dispose of and store radioactive materials.
3. Demonstrate the steps to dispose of and store biohazard materials.

Course Outcome(s):
Review case studies of a variety of Nuclear Medicine procedures.

Essential Learning Outcome Mapping:
Critical/Creative Thinking: Analyze, evaluate, and synthesize information in order to consider problems/ideas and transform them in innovative or imaginative ways.
Information Literacy: Acquire, evaluate, and use information from credible sources in order to meet information needs for a specific research purpose.
Written Communication: Demonstrate effective written communication for an intended audience that follows genre/disciplinary conventions that reflect clarity, organization, and editing skills.

Objective(s):
1. Discuss clinical and practical application of the procedures in Nuclear Medicine.
2. Perform accurately procedures required of a Nuclear Medicine Technologist, including the computer analysis.
3. Determine if the reported result is the proper conclusion given the information that is presented.

Course Outcome(s):
Use a team approach in assisting the Radiologist or CT Technologist in the patient preparation, quality control, positioning, imaging and processing of CAT scan studies in preparation of the Nuclear Medicine Technology Certification Board (NMTCB) national registry.

Objective(s):
1. Accurately prepare the CT patient in regards to contrast administration, contraindications of study, medicinal contraindications, proper pregnancy precautions and renal impairment identification.
2. Understand and participate in the quality control processes necessary within a working CT department, under the direct guidance of a registered CT technologist.
3. Position patients accurately for a basic CT scan under direct supervision of a CT technologist.
4. Perform accurately and under direct supervision of a registered CT technologist any basic CT scan.
5. Process accurately and under the direct supervision of a registered CT technologist any basic CT scan.
6. Observe any biopsies and special procedures performed by a registered CT technologist.
7. Upon completion of the CT rotation, the student will be able to correctly identify major structures, label and process images, describe and analyze any basic CT scan they participated in acquiring.

**Methods of Evaluation:**
1. Site supervisor evaluation
2. Written tests
3. Competency performance evaluations
4. Professional/ethical evaluations
5. Basic technical evaluations
6. Completion of all clinical requirements
7. Case studies

**Course Content Outline:**
1. Hospital protocols and departmental policies
   a. Clinical site handbook
   b. Radiology information system
   c. Film library
2. Effective communication skills
   a. Patient communication
      i. Identify and assess patient condition
      ii. Verify and explain procedure
      iii. Safety
      iv. Comfort and cooperation
   b. Patient clinical history
   c. Communication with radiologists, nuclear medicine technologists and staff
3. Nursing procedures for nuclear medicine
   a. Standard (universal) precautions for patients and self
   b. Monitor, observe and respond to patients
   c. Provide general patient care as needed
      i. CPR
      ii. Vital signs (BP, pulse, respiration, temperature)
      iii. Venipuncture
      iv. O2 administration
4. Clinical rotations (pediatric, geriatric, adult):
   a. Respiratory
      i. Perfusion
      ii. Ventilation or aerosol
      iii. Quantitative
   b. Skeletal system
      i. Planar - static
      ii. Planar - whole body
      iii. SPECT
      iv. Three-phase
   c. Cardiovascular
      i. Cardiac first pass
      ii. Gated blood pool studies
      iii. Myocardial perfusion - stress/rest or rest/stress SPECT and/or planar
      iv. Myocardial perfusion gated with SPECT
      v. Positron emission tomography
   d. Abscess and infection
      i. Gallium
      ii. Tagged leukocytes
      iii. Positron emission tomography
   e. Central nervous system
i. Brain - planar  
ii. Brain - SPECT  
iii. Brain - dynamic  
iv. Cisternography - routine  
v. Cisternography - CSF leak  
vi. Positron emission tomography  
f. Endocrine/exocrine  
i. Thyroid - scan  
ii. Thyroid - metastatic survey  
iii. Parathyroid  
g. Gastrointestinal  
i. Biliary function  
ii. Gastroesophageal reflux  
iii. Gastric emptying  
iv. GI bleeding  
v. Meckel’s diverticulum  
h. Liver/spleen  
i. Planar  
ii. SPECT  
iii. Hemangioma  
i. Genitourinary  
i. Renal - dynamic perfusion  
ii. Renal - sequential imaging  
iii. Testicular  
iv. Cystography  
j. Tumor/antibody  
i. Gallium  
ii. Monoclonal antibodies  
iii. Breast  
iv. Lymphoscintigraphy  
v. Positron emission tomography  
k. Miscellaneous  
i. Shunt studies  
l. Non-imaging procedures  
i. Thyroid uptake  
ii. Schilling’s test  
iii. Therapeutic - palliative bone  
iv. Therapeutic - thyroid (excluding dose administration)  
v. Emerging nuclear medicine therapies  
m. Fusion imaging  
i. SPECT/CT  
ii. SPECT/MR  
iii. PET/CT  
iv. PET/MR  
5. Equipment operation  
a. Radiation safety and protection for self, patient and others  
b. Room preparation  
c. Equipment preparation and configuration  
d. Process images  
i. Daylight  
ii. Computed imaging  
e. Image quality and evaluation  
f. Medical informatics  
6. Radiopharmaceutical protocols  
a. Radiation safety  
i. Major spills  
ii. Minor spills  
b. Preparation and handling
i. Selection
ii. Dosage
iii. Quality review
c. Administration and recording
7. Quality control
   a. Gamma camera
   b. Dose calibrators
   c. Well counters/uptake probes
d. Survey meter
8. Case studies of nuclear medicine procedure

Resources


American Registry of Radiologic Technologists (ARRT). “Competency Requirements for Nuclear Medicine Technology”

American Registry of Radiologic Technologists (ARRT). “Content Specifications for the Examination in Nuclear Medicine Technology”

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