NMED-230L: NUCLEAR MEDICINE LABORATORY II

Cuyahoga Community College

Viewing: NMED-230L : Nuclear Medicine Laboratory II

Board of Trustees:
2014-06-19

Academic Term:
Fall 2020

Subject Code
NMED - Nuclear Medicine Technology

Course Number:
230L

Title:
Nuclear Medicine Laboratory II

Catalog Description:
Continued application of lab practices of a Nuclear Medicine Technologist including experimentation with radiopharmaceutical and instrumentation principles. Emphasis on radiation safety, practicing quality assurance, and instrumentation.

Credit Hour(s):
1

Lecture Hour(s):
0

Lab Hour(s):
2

Requisites

Prerequisite and Corequisite
NMED-1301 Nuclear Medicine Procedures I and NMED-130L Nuclear Medicine Laboratory I and NMED-1501 Radiation Physics and NMED-1603 Nuclear Radiopharmacy and Pharmacology; and concurrent enrollment in NMED-2301 Nuclear Medicine Procedures II.

Outcomes

Course Outcome(s):
Perform duties of a nuclear medicine technologist in compliance with state and federal regulations and professional standards.

Objective(s):
1. Demonstrate competency for radiopharmacy and quality control procedures.
2. Perform and interpret radiopharmacy quality control for radiopharmaceuticals.
3. Calculate and prepare a radiopharmaceutical kits for various nuclear medicine procedures.
4. Receive and prepare radioactive packages for transport in compliance with State and Federal regulations.
5. Demonstrate professionalism and teamwork while carrying out the functions of a Nuclear Medicine Technologist.

Course Outcome(s):
Complete and critically analyze lab experiments as they apply to nuclear medicine precedures.

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. Utilize Nuclear Medicine instruments and perform quality assurance testing.
2. Perform generator elution and practice quality control on eluate.

3. Perform and interpret radiopharmacy quality control for radiopharmaceuticals.
4. Calculate and prepare a radiopharmaceutical kits for various nuclear medicine procedures.

Methods of Evaluation:

1. Quizzes
2. Lab competencies
3. Homework assignments
4. Lab competency exams
5. Lab projects

Course Content Outline:

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1. Proper receipt of radiopharmaceuticals with Technetium
   a. Radiation Safety Procedures
      i. As Low as Reasonably Achievable (ALARA)
      ii. Postings and trigger limits
      iii. Nuclear Regulatory Commission policies
      iv. Occupational Safety and Health Administration Policies
   b. Ordering a dose
   c. Incoming and outgoing packages
   d. Survey packages
   e. Wipe Testing
   f. Storage and Decay
   g. Disposal
   h. Recording Keeping
2. Handling Radioactive Waste
   a. Survey Packages
   b. Wipe Testing
   c. Storage and Disposal
   d. Return to Radiopharmacy
   e. Record Keeping
3. Practice elution of a generator
   a. Elution techniques
   b. Radionuclide impurity
   c. Radiochemical impurity
   d. Chemical impurity
   e. Biological and Sterility testing
   f. Yield Calculations
4. Prepare a radiopharmaceutical kit with 99m-Technetium
   a. Aseptic and safe handling techniques
   b. Calibrating a dose
   c. Dose calculations and adjustments
   d. Quality control
   e. Disposal and record keeping
   f. Decontamination process/spilt kit usage review
5. Injection Techniques
   a. Aseptic Technique
   b. Needle gauge discrimination
   c. Patient Dose adjustments
   d. Utilization of mannequin arm and hand veins
6. Quality Control and Calibration of Instrumentation with radioactive sources
   a. Gas Filled Detectors
      i. Dose Calibrator
      ii. Geiger Mueller Survey Meter
   b. Scintillation Detectors

i. Well Counter
ii. Thyroid Uptake Probe
iii. Gamma Camera

7. Instrumentation Experimentation with radioactive sources
   a. Gas Filled Detectors
      i. Dose Calibrator
      ii. Geiger Mueller Survey Meter
   b. Scintillation Detectors
      i. Well Counter
      ii. Thyroid Uptake Probe
      iii. Gamma Camera
8. Interpretation of camera persistence scope
   a. Collimator Manipulation
   b. Shielding and Distance variations
   c. Usage of phantoms

Resources

Bolus, N., & Glasgow, K.W., (Eds.). (2018) *Review of Nuclear Medicine Technology (5th Ed.)*, Reston, VA: Society of Nuclear Medicine and Molecular Imaging.

Lee, K.H. (2015) *Basic Science of Nuclear Medicine: Bare Bone Essentials* , Reston, VA: Society of Nuclear Medicine and Molecular Imaging.

Mettler, F., & Guiberteau, M. (2019) *Essentials of Nuclear Medicine Imaging (7th ed.)*, Philadelphia, PA: Elsevier.

Saha, G. (2018) *Fundamentals of Nuclear Pharmacy (7th ed.)*, Cham, Switzerland: Springer International Publishing.

Watersham-Rich, K., & Gilmore, D. (2016) *Nuclear Medicine and PET/CT Technology and Techniques (8th ed.)*, St. Louis, MO.; Elsevier.

Wells, P. (2011) *Practical Mathematics in Nuclear Medicine (2nd ed.)*, Reston, VA: Society of Nuclear Medicine and Molecular Imaging.

Ziessman, H.A., O'Malley, J.P., & Thrall, J.H. (2014) *Nuclear Medicine: The Requisites (4th ed.)*, St. Louis, MO: Elsevier.

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