NMED-2700: NUCLEAR MEDICINE RESEARCH METHODS

Cuyahoga Community College

Viewing: NMED-2700 : Nuclear Medicine Research Methods

Board of Trustees:
January 2020

Academic Term:
Fall 2020

Subject Code
NMED - Nuclear Medicine Technology

Course Number:
2700

Title:
Nuclear Medicine Research Methods

Catalog Description:
Basic types of scientific and clinical research, research methods, and the components of a research study. Requires the research, review, discussion, and analysis of current research related to the field of nuclear medicine and advanced molecular imaging.

Credit Hour(s):
1

Lecture Hour(s):
1

Requisites

Prerequisite and Corequisite
NMED-2600 Molecular and Fusion Imaging and NMED-2660 Nuclear Medicine Therapy.

Outcomes

Course Outcome(s):
Describe the overall process of clinical research, including the roles of various external organizations, as it relates to nuclear medicine.

Objective(s):
1. Explain the components of various research study designs.
2. Differentiate between qualitative and quantitative research.
3. Describe the process of regulatory compliance as it relates to nuclear medicine research.
4. Define the roles of various organizations involved in the process of clinical research.
5. Discuss the ethical and legal issues related to clinical research.
6. Discuss the roles and importance of various members of a research team.
7. Discuss clinical trial classification and phases.
8. Describe the process for creating a scientific abstract, research paper, and publishing research findings.

Course Outcome(s):
Discuss current clinical trials and promising research in the field of nuclear medicine and molecular imaging.

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. Analyze current clinical trials and research in the field of nuclear medicine and molecular imaging.
2. Discuss clinical trial classification and phases.
3. Describe the process for creating a scientific abstract, research paper, and publishing research findings.

Methods of Evaluation:

1. Participation
2. Journal summaries
3. Presentation
4. Worksheets
5. Quizzes
6. Research paper

Course Content Outline:

1. Methods of Conducting Research
    a. Determining a research topic
    b. Qualitative versus Quantitative
    c. Research study designs
    d. The five steps of the research process
    e. Methods of collecting data
    f. Analyzing data
    g. Process of regulatory compliance in nuclear medicine
2. Ethical and legal principles of research
    a. Institutional Review Board
    b. Independent Ethics Committee
    c. Value and validity
    d. Fair subject selection
    e. Favorable risk-benefit ratio
    f. Independent review
    g. Informed consent
    h. Misconduct
    i. Fraud
    j. Consequences of misconduct and fraud
    k. Food and Drug Administration Regulations
    l. Health Insurance Portability and Accountability Act (HIPAA) and research participants
    m. Radiation safety considerations for research subjects
    n. Clinical research from the patients perspective
3. Business of clinical research
    a. Clinical study budgets
    b. Clinical trial agreement
    c. Research personnel and their role
        i. Coordinator/project leader
        ii. Clinical pharmacist/radiopharmacist
        iii. Statistician
        iv. Auditor
        v. Clinical investigator
        vi. Clinical research associate/monitor
        vii. Data manager
        viii. Medical officer
        ix. Medical writer
        x. Regulatory affairs personnel
4. Current clinical research in Nuclear Medicine
    a. Historical research studies and their contribution to the field
        i. Investigational new drug
        ii. Government sponsorship
        iii. Industry sponsored research

iv. Classification of phases 0-IV
v. Animal studies
    1. Current trials and research
    2. Human clinical trials
    3. Application of a new drug
    4. The importance of proper patient monitoring
    5. Effective patient communication
    6. Evaluating patient data
    7. Current trials and research
vi. Therapy research
vii. Adverse Event
viii. Serious Adverse Event (SAE)
    1. Reporting
    2. Data Safety Monitoring Boards (DSMB)

5. Writing and Publishing in the health professions
    a. Creating an abstract
    b. Types of presentations
    c. Writing a research paper
    d. Citations
        i. Publishing and copyrights
        ii. MLA format
        iii. APA format

Resources

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

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

Lee, K.H. . (2015) *Basic Science of Nuclear Medicine: Bare Bone Essentials*, 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.)*, Philadelphia, PA: Elsevier.

Resources Other

Journal of Molecular Imaging

Society of Nuclear Medicine and Molecular Imaging, Journal of Nuclear Medicine

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Key: 3260