

Radioisotope Safety Exam (RISE)

This 70-item exam assesses the candidate's knowledge and skills related to NRC Part 35.290, 35.392, and 35.394 requirements. Those diplomates who meet the training requirements and who pass the RISE receive Authorized User-Eligible (AU-E) on their DR or IR/DR certificates. Sixty items are tested on the Qualifying Exam and 10 on the Certifying Exam. Of the 60 items on the Qualifying Exam, 25 are RISE-specific items, 20 items are selected from the clinical Nuclear Radiology exam, and 15 are Nuclear Physics items. All 10 items on the Certifying Exam are RISE-specific.

Included in this document:

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Domain Critical Concepts

1. Describe radiation protection programs and applicable regulations
 - a. ALARA
 - b. Radiation areas
2. Calculate mathematics of radioactivity measurement
 - a. Units
 - b. Decay
3. Know principles of radiation biology
 - a. Dose
 - b. Effects/cancer risks
4. Understand and apply principles of management of radioactive sources
 - a. Radioactive packages
 - b. Sealed sources
 - c. Record keeping
 - d. Area surveys
 - e. Waste disposal
5. Know regulatory exposure limits and monitoring
 - a. Occupational
 - b. Pregnancy/fetal
6. Describe protocols involving radiopharmaceutical administration
 - a. Record keeping
 - b. Breastfeeding/lactation
7. Understand and apply administrative/practice controls and describe responsibilities
 - a. NRC and agreement states
 - b. Licenses (broad scope)
 - c. Written directives, including oral I-131 NaI
 - d. Radiopharmacy procedures
8. Describe response to radiation accidents/incidents
 - a. Medical events

b. Spills (major & minor)

Domain Blueprint

1. Radiation protection: 5%-10%
2. Mathematics of radioactivity measurement: 10%
3. Radiation biology: 15%
4. Management of radioactive sources: 20%
5. Regulatory exposure limits: 5%-10%
6. Radiopharmaceutical administration: 10%
7. Administrative/practice controls and responsibilities: 20%
8. Radiation accidents/incidents: 10%

Domain Overview

1. Radiation protection
 1. ALARA program
 1. Radiation protection program
 2. Audit program
 3. Operating & emergency procedures (including interventions)
 2. Radiation areas
 1. Restricted area
 2. Public area
 3. Caution signs
 4. Engineering controls
2. Mathematics of radioactivity measurement
 1. Radioactive decay
 2. Radioactive equilibrium
 3. Units of radioactivity
3. Radiation biology
 1. Radiation dose
 1. Absorbed dose
 2. Dose equivalent
 3. Effective dose
 2. Tissue reactions (deterministic effects)
 3. Linear no-threshold effects (stochastic)
 4. Risks of radiation-induced cancer
4. Management of radioactive sources
 1. Managing radioactive packages and exempt quantities
 2. Sealed sources QA/QC
 3. Records of written directives, calibrations, surveys, leak tests, QA/QC, & decay-in-storage
 4. Area surveys

5. Waste management/disposal
5. Regulatory exposure limits
 1. Occupational dose limits for adults & minors
 2. Declared pregnant workers
 3. Public
 4. Embryo/fetus
 5. Respiratory protection
 6. Individual monitoring
 7. Safe use of unsealed license material
6. Radiopharmaceutical administration
 1. Confirming dosage
 2. Patient identity
 3. Record-keeping
 4. Fetal dose
 5. Breastfeeding/lactation precautions & cessation
 6. Administration of prescribed dosage
7. Administrative/practice controls and responsibilities
 1. NRC Authority/Agreement states
 2. Personnel
 1. Technologists
 2. Radiation safety officer (RSO)
 3. Authorized user (AU)
 4. Authorized nuclear pharmacist
 5. Authorized medical physicist (AMP)
 3. Licenses of broad scope: types A, B & C
 4. Written directive (WD)
 5. Oral I-131 NaI therapy safety
 1. Inpatient
 2. Outpatient
 6. Radiopharmacy ("hot lab")
 1. Safe procedures
 2. Thyroid bioassays
 3. Generator systems
 1. Elution
 2. QC
 4. Record keeping
 7. Patient issues
8. Radiation accidents/incidents
 1. Medical events/reportable events
 2. Radiation spills
 1. Major spill
 2. Minor spill