

Radioisotope Safety Content (RISC)

These 35 questions assess the candidate's understanding and knowledge related to the safe use of radioactivity in the clinical practice of diagnostic or interventional radiology. The domain encompasses but is not limited to the Nuclear Regulatory Commission (NRC) requirements found in §35.290, §35.392, and §35.394. Twenty-five questions are tested on the Qualifying (Core) Exam and 10 are tested in the Essentials Module on the Certifying Exam. These RISC questions are integral components of each exam; they are scored toward the overall score, not scored separately.

Diplomates who meet the NRC training, experience, and documentation requirements, pass the RISC, and are certified by 12/31/2023 will receive the Authorized User-Eligible designation on their DR or IR/DR certificate.

Included in this document:

[Domain Critical Concepts](#)

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RISC 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)

RISC 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%

RISC Domain Scope

- 1.1 Radiation protection
 - 1.1.1 ALARA program
 - 1.1.1.1 Radiation protection program
 - 1.1.1.2 Audit program
 - 1.1.1.3 Operating & emergency procedures (including interventions)
 - 1.1.2 Radiation areas
 - 1.1.2.1 Restricted area
 - 1.1.2.2 Public area
 - 1.1.2.3 Caution signs
 - 1.1.2.4 Engineering controls
- 1.2 Mathematics of radioactivity measurement
 - 1.2.1 Radioactive decay
 - 1.2.2 Radioactive equilibrium
 - 1.2.3 Units of radioactivity
- 1.3 Radiation biology
 - 1.3.1 Radiation dose
 - 1.3.1.1 Absorbed dose
 - 1.3.1.2 Dose equivalent
 - 1.3.1.3 Effective dose
 - 1.3.2 Tissue reactions (deterministic effects)
 - 1.3.3 Linear no-threshold effects (stochastic)
 - 1.3.4 Risks of radiation-induced cancer
- 1.4 Management of radioactive sources
 - 1.4.1 Managing radioactive packages and exempt quantities
 - 1.4.2 Sealed sources QA/QC
 - 1.4.3 Records of written directives, calibrations, surveys, leak tests, QA/QC, & decay-in-storage
 - 1.4.4 Area surveys
 - 1.4.5 Waste management/disposal
- 1.5 Regulatory exposure limits
 - 1.5.1 Occupational dose limits for adults & minors
 - 1.5.2 Declared pregnant workers
 - 1.5.3 Public
 - 1.5.4 Embryo/fetus
 - 1.5.5 Respiratory protection
 - 1.5.6 Individual monitoring
 - 1.5.7 Safe use of unsealed license material
- 1.6 Radiopharmaceutical administration
 - 1.6.1 Confirming dosage
 - 1.6.2 Patient identity
 - 1.6.3 Record-keeping
 - 1.6.4 Fetal dose
 - 1.6.5 Breastfeeding/lactation precautions & cessation

- 1.6.6 Administration of prescribed dosage
- 1.7 Administrative/practice controls and responsibilities
 - 1.7.1 NRC Authority/Agreement states
 - 1.7.2 Personnel
 - 1.7.2.1 Technologists
 - 1.7.2.2 Radiation safety officer (RSO)
 - 1.7.2.3 Authorized user (AU)
 - 1.7.2.4 Authorized nuclear pharmacist
 - 1.7.2.5 Authorized medical physicist (AMP)
 - 1.7.3 Licenses of broad scope: types A, B & C
 - 1.7.4 Written directive (WD)
 - 1.7.5 Oral I-131 NaI therapy safety
 - 1.7.5.1 Inpatient
 - 1.7.5.2 Outpatient
 - 1.7.6 Radiopharmacy ("hot lab")
 - 1.7.6.1 Safe procedures
 - 1.7.6.2 Thyroid bioassays
 - 1.7.6.3 Generator systems
 - 1.7.6.3.1 Elution
 - 1.7.6.3.2 QC
 - 1.7.6.4 Record keeping
 - 1.7.7 Patient issues
- 1.8 Radiation accidents/incidents
 - 1.8.1 Medical events/reportable events
 - 1.8.2 Radiation spills
 - 1.8.2.1 Major spill
 - 1.8.2.2 Minor spill