

Nuclear Medicine Advanced Associate

Examination Content Outline

- I. Patient Care (Assessment, Management and Education)
 - a. Patient Based Decision Making
 - i. Patient and family education
 - ii. Patient history and physical examination
 - iii. Evaluation of Diagnostic and Laboratory Results
 - 1. Cardiac function and myocardial injury
 - 2. Hepatic function
 - 3. Pulmonary function
 - 4. Renal function and electrolytes
 - 5. Thyroid function
 - 6. Parathyroid function
 - 7. Complete Blood Count (CBC)
 - 8. Blood glucose
 - 9. Pregnancy tests (HCG)
 - iv. Identify and implement a plan of care
 - 1. Order and administer sedation
 - 2. Alternative options
 - v. Administration into existing catheters or routes
 - a. VP shunts
 - b. Central lines
 - c. Intra thecal
 - d. Intra arterial
 - vi. Establish additional routes of administration
 - a. Urinary catheter
 - b. Feeding tube
 - c. Rectal
 - d. Subcutaneous port
 - e. Intradermal
 - vii. Monitor vital signs and physiologic parameters
 - viii. Evaluate the need for contrast media
 - b. Systems Based Practice
 - i. Medical/Legal/Professional/Government/Regulatory
 - 1. Standards for Informed Consent
 - 2. Elements of written directives
 - 3. HIPAA
 - 4. Medical events and incidents
 - ii. Quality Assurance and Management
 - 1. Patient safety
 - c. Patient Emergency Management
 - i. Provide supportive medical management
 - 1. Advanced life support
 - 2. Blood glucose management
 - 3. contrast media reactions
 - 4. allergic response
 - 5. adverse response
- II. Clinical Procedures
 - a. Cross sectional imaging anatomy
 - b. Pathophysiology
 - c. Patterns of biodistribution for radiopharmaceuticals
 - d. Identify and/or assess for each diagnostic procedure:
 - i. Indications and Contraindications
 - ii. Patient preparation
 - iii. Existing correlative examinations

- iv. Complications
- v. Limitations
- vi. Appropriate Radiopharmaceutical
- vii. Radiopharmaceutical dose range
 - 1. Adjustment for patient size and age
- viii. Route of administration
- ix. Imaging technique
- x. Image quality and need for additional imaging
- xi. Quantitative data analysis
- xii. Need for pharmacological interventions in nuclear medicine procedures (Appendix B-
Adjunctive Drugs)
- xiii. Need for complementary/correlative diagnostic imaging procedures
- e. Analyze Results
 - i. Assess image quality and other associated data
 - 1. Adequacy
 - 2. Artifact
 - 3. Incidental findings
- f. Therapy
 - i. Identify and/or assess for each therapeutic procedure:
 - 1. Indications and Contraindications
 - 2. Patient preparation and informed consent
 - 3. Existing correlative examinations
 - 4. Complications
 - 5. Limitations
 - 6. Appropriate Radiopharmaceutical
 - 7. Radiopharmaceutical dose range
 - 8. Route of administration
 - 9. Dosimetry and dosimetric consequences
 - 10. Patient release requirements
 - 11. Need for complementary/correlative diagnostic imaging procedures
- g. Nuclear Cardiology Stress Testing
 - i. Indications and Contraindications to stress testing
 - ii. Physiologic measures of stress capacity/performance
 - iii. Treadmill operation
 - iv. Patient assessment and monitoring
 - v. Isometric exercise protocols
 - vi. Pharmacologic stress protocols
 - vii. ECG
 - viii. Acquisition
 - ix. Rate calculation
 - x. Normal and abnormal rhythms
 - xi. Heart blocks
 - xii. Indicators of ischemia and infarction
 - xiii. Identification of significant cardiac events during stress test
 - xiv. Interpretation
 - xv. Interventions
 - xvi. Endpoints

Appendix A Procedures- Diagnostic & Therapy

III. Diagnostic and Therapeutic Pharmaceuticals

- a. Knowledge of drug characteristics:
 - i. Mechanism of action
 - ii. Indications of use
 - iii. Contraindications
 - iv. Appropriate management of adverse events and/or side effects

- v. Appropriate follow-up and monitoring of pharmacologic effects
- vi. Drug toxicity
- vii. Cross reactivity of similar medications
- b. Special considerations for contrast media agents:
 - i. Premedication
 - ii. Hydration status
 - iii. Renal status
 - iv. Diseases of concern
 - v. Incompatible medications
 - vi. Allergies
 - vii. Appropriate management of adverse events and/or side effects
 - viii. Conflicts with other procedures (e.g. another contrast procedure)
- c. Methods to reduce medication errors
- d. Evaluating and reporting adverse drug events
- e. Pharmacology

Appendix B- Adjunctive Drugs

Appendix C- Radiopharmaceuticals

Appendix D- Contrast Agents

IV. Radiation Safety and Radiobiology in Clinical Practice

- a. Radiation Safety
 - i. Understanding of absorbed dose principles
 - 1. Knowledge of critical organ versus total body effective dose equivalent
 - 2. Typical values from routine nuclear medicine procedures
 - 3. Typical values from CT
 - a. Diagnostic versus attenuation correction
 - b. Pediatric versus adult
 - c. Dose units
 - ii. Methods to reduce patient exposure
 - iii. Methods to reduce occupational exposure
- b. Radiobiology
 - i. Cell Growth and Division
 - ii. Radiosensitivity of cells
 - iii. Effects of radiation
 - 1. Deterministic effects versus stochastic effects
 - 2. Background radiation
 - 3. Dose-response relationships
 - 4. Skin effects
 - 5. Acute radiation syndrome
 - 6. Local tissue damage
 - 7. Hematological effects
 - 8. Carcinogenesis
 - 9. Fetal effects
 - 10. Genetic effects
 - 11. Fertility effects
 - iv. Dosimetry calculations
 - 1. Fetal calculations
 - 2. Organ calculations
 - 3. Whole body calculations