EXAMINATION CONTENT OUTLINE

(Revised 2012)

Following is a detailed outline of the nine major content areas of the examination, with an indication (in parentheses) of the approximate percentage of the examination devoted to each area:

I. PHYSICS AND INSTRUMENTATION (11 - 12%) (12% in Recertification Examination)
   A. Basic physics as applied to clinical imaging (e.g., isotope decay, decay modes, high energy imaging)
   B. Interactions of radiation with matter
   C. Gamma cameras, collimation, and equipment quality control procedures
   D. Attenuation correction, including transmission and CT methods

II. RADIOPHARMACEUTICALS (7 - 8%) (8% in Recertification Examination)
   A. Radiotracer kinetics and characteristics of SPECT agents
   B. Radiotracer kinetics and characteristics of PET agents
   C. Generators
   D. Red blood cell tagging

III. RADIATION SAFETY (10 - 11%) (10% in Recertification Examination)
   A. Radiopharmaceutical receiving, handling, monitoring, and containment
   B. Handling radiopharmaceutical spills and waste
   C. Dose calibrator and survey instruments quality control of procedures
   D. Dosimetry and Medical Internal Radiation Dose (MIRD)
   E. Radiation exposure and ALARA principle
   F. Governmental regulations

IV. NUCLEAR CARDIOLOGY DIAGNOSTIC TESTS AND PROCEDURES/PROTOCOLS (15 - 16%) (15% in Recertification Examination)
   A. Appropriate use criteria
   B. Absolute and relative contraindications to stress testing
   C. Patient preparation procedures
   D. Pharmacologic stress agents
   E. Exercise and pharmacologic stress protocols
   F. Imaging protocols (e.g., rest/stress, stress/rest, thallium-reinjection, viability)
   G. Image acquisition (e.g., equilibrium RNA, gating, SPECT, PET, attenuation correction)
   H. Image processing (e.g., filtering, reorientation, reconstruction, motion correction, attenuation correction, quality control)
   I. Artifacts (e.g., attenuation, motion, instrumentation error, reconstruction error) and causes of false-positive and false-negative results
   J. Quality assurance of interpretation
   K. Quantitative aids to interpretation

V. GENERAL CARDIOLOGY AS IT RELATES TO IMAGE INTERPRETATION (10 - 11%) (10% in Recertification Examination)
   A. Unique characteristics of patient subgroups (e.g., patients with diabetes, elderly patients, male vs. female patients, patients with congenital heart disease)
   B. Physiology of stress testing, ECG and clinical parameters at rest and with stress
   C. Measurements of left ventricle systolic and diastolic function
   D. Valvular disease, cardiomyopathy, hypertension, congestive heart failure, myocarditis

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Oct 2015
E. Coronary anatomy and pathophysiology
F. Medical therapy, coronary angiography, percutaneous coronary intervention, and coronary bypass surgery
G. Alternative diagnostic techniques (Echo, MRI, coronary calcification, cardiac CT angiography)
H. Bayes' theorem, pre- and post-test likelihood, sensitivity, specificity, and referral bias
I. Cost-effectiveness of diagnostic tests and principles of outcome studies

VI. RISK STRATIFICATION (10 - 11%) (10% in Recertification Examination)
   A. Coronary artery disease
   B. Unstable angina
   C. Acute myocardial infarction
   D. Acute chest pain
   E. Candidates for noncardiac surgery
   F. Special populations (e.g., diabetes, chronic renal disease, women)
   G. Evaluation post-therapy (e.g., medical therapy, revascularization)
   H. Evaluation post-chemotherapy

VII. MYOCARDIAL PERFUSION IMAGING (19 - 20%) (20% in Recertification Examination)
   A. Perfusion imaging with technetium-99-labeled tracers and thallium-201
   B. PET perfusion imaging
   C. Relationship of perfusion abnormalities to clinical, hemodynamic, ECG and exercise parameters
   D. Relationship of perfusion abnormalities to coronary anatomy
   E. Combined function-perfusion imaging

VIII. VENTRICULAR FUNCTION IMAGING (8 - 9%) (9% in Recertification Examination)
   A. Rest equilibrium radionuclide ventriculography (planar and SPECT), including volume measurements and systolic and diastolic function
   B. ECG-gated SPECT myocardial perfusion imaging
   C. Effect of arrhythmia on ECG gating
   D. Implications of ventricular function testing for clinical management

IX. MYOCARDIAL VIABILITY (5 - 6%) (6% in Recertification Examination)
   A. Thallium-201 imaging
   B. Technetium-99m imaging
   C. FDG imaging
   D. Outcome data related to myocardial viability
   E. Relationship to other imaging methods (e.g., echo, MRI)