

Content Manual

American Board of Nuclear Medicine

I. Basic Science

A. Biochemistry, Molecular Biology and Pharmacology

1. Biochemistry
2. Cellular and Molecular Biology
 - a. Optical
 - b. Radionuclide
3. Drug testing and clinical pharmacology
4. Pharmacokinetics and pharmacodynamics

B. Computer Science

1. Hardware
 - a. CPU
 - b. Data Storage
 - c. Network
 - d. Other
2. Image processing (filters, etc)
3. Other
4. PACs (Picture archiving, and communication systems)
5. Programming

C. Instrumentation

1. Electronics
 - a. Analog to digital converters
 - b. Count rate meters
 - c. Other
 - d. Pulse amplifiers
 - e. Pulse-height analyzers
2. Imaging
 - a. Artifacts
 - b. Collimators
 - c. Computed tomography
 - d. Dual x-ray absorptiometry (DEXA)
 - e. Film
 - f. Gamma scintillation camera
 - g. Monitors
 - h. MRI
 - i. Optical
 - j. Other

- k. Positron emission tomography (PET)
- l. Quality Control
- m. Single photon emission computed tomography (SPECT)
- 3. Non_imaging_radiation_detectors
 - a. Dose calibrator
 - b. Gamma well counter
 - c. Gamma/Beta surgical probes
 - d. Liquid scintillation counter
 - e. Other
 - f. Radiation monitoring devices
 - g. Scintillation probe
 - h. Whole-body counter
- D. Physics and Mathematics
 - 1. Mathematics
 - a. Bayes' theorem
 - b. Cost-Effectiveness Analysis
 - c. Counting statistics
 - d. Math Basics
 - e. Other
 - f. ROC Curves
 - g. Statistics
 - h. Tracer Kinetics
 - 2. Physics
 - a. Interaction of radiation with matter
 - b. Other
 - c. Principles of Radiation Detection
 - d. Radiation units
 - e. Radioactive decay
 - f. Structure of matter
- E. Radiation biology and protection
 - 1. Biological effects of radiation exposure
 - a. Carcinogenic effects
 - b. Deterministic Effects
 - c. Mutagenic effects
 - d. Relative Biological Effectiveness
 - e. Teratogenic effects
 - 2. Dosimetry
 - a. CT
 - b. Nuclear Medicine
 - c. Other
 - 3. Other
 - 4. Radiation accident management
 - 5. Radiation protection
 - 6. Regulations

- a. FDA
- b. NRC
- c. Other

F. Radiopharmaceuticals

- 1. Adverse Events
- 2. Formulation
- 3. Kinetics
- 4. Other
- 5. Production of radionuclides
- 6. Quality Control
- 7. Radiopharmacy

II. Cardiovascular

A. Anatomy

1. CT
2. Other

B. Aneurysm

C. Atherosclerosis

D. AV Fistula

E. Heart

1. Artifacts
2. Congenital
3. Coronary artery disease
 - a. CT Coronary Arteriography
 - b. Diagnosis
 - c. Infarct/myocardial viability
 - d. Ischemia/Stunning/Hibernating myocardium
 - e. Normal
 - f. Other
 - g. PET
 - h. Preoperative evaluation
 - i. Response to therapy/Interventions
 - j. Risk stratification and prognosis
 - k. Stress Testing
4. ECG interpretation
5. Exercise physiology
6. Extracardiac findings
7. Extracardiac findings
8. Gated Blood Pool
 - a. Ejection Fraction Cardiac
 - b. Ejection Fraction Oncology
 - c. Other
 - d. Pericardial Effusion
 - e. Wall Motion
9. Inflammatory and Infectious
10. Metabolic
 - a. Amyloidosis
 - b. Chemotherapy toxicity
 - c. Normal
 - d. Other
 - e. Sarcoidosis
11. Neoplasms

- a. Benign
- b. Malignant

12. Other

13. Transplantation

14. Valvular heart disease

F. Other

G. Peripheral vascular disease

H. Physiology

I. Quantitation

J. Radiation Dose

K. Radiopharmaceuticals

L. Thombosis (SVC obstruction)

M. Vessels

N. Vessels

1. Aneurysm

2. Atherosclerosis

3. Other

4. Thrombosis (SVC obstruction)

III. Endocrine

A. Adrenal

1. Adenoma
2. Carcinoma
3. Hyperplasia
4. Other
5. Pheochromocytoma

B. Anatomy

1. CT
2. Other

C. Neuroendocrine neoplasms

1. Adenoma
2. Carcinoid
3. Carcinoma
4. Neuroblastoma
5. Other

D. Other

E. Pancreas

1. Other

F. Parathyroid

1. Adenoma
2. Carcinoma
3. Hyperplasia
4. Other

G. Physiology

H. Pituitary

1. Adenoma
2. Carcinoma
3. Diabetes Mellitus
4. Hyperplasia

I. Quantitation

J. Radiopharmaceuticals

K. Thyroid

1. Carcinoma
 - a. Other
 - b. Treatment
2. Congenital
 - a. Inherited metabolic disorder

- b. Lingual thyroid
 - c. Other
- 3. Hyperthyroidism
 - a. Factitious
 - b. Graves' disease
 - c. Nodular goiter
 - d. Other
 - e. Therapy
 - f. Thyroiditis
- 4. Hypothyroidism
- 5. Neoplasms
 - a. Benign: Diffuse Goiter, Nodules
 - b. Malignant
 - c. Other
- 6. Other

IV. Gastrointestinal

A. Anatomy

1. CT
2. Other

B. Biliary

1. Bile leaks/fistulas
2. Biliary dyskinesia
3. Biliary Obstruction
4. Biliary reflux (enterogastric reflux)
5. Cholecystitis
 - a. Acalculous
 - b. Acute
 - c. Chronic
 - d. Gallstones
 - e. Other
6. Cholestasis
7. Congenital
 - a. Biliary atresia
 - b. Choledochal cyst
 - c. Other
8. Motility Disorders
 - a. Biliary dyskinesia
 - b. Other
 - c. Sphincter of Oddi Dysfunction
9. Neoplasm
 - a. Benign
 - b. Malignant
10. Normal
11. Other

C. Colon

1. Bleeding
2. Infection/Inflammatory
3. Motility disorder
4. Neoplasm
 - a. Benign
 - b. Malignant
5. Other
6. Ulcerative Colitis

D. Congenital

E. Esophagus

1. Bleeding
2. Gastroesophageal reflux
3. Infection/Inflammatory
4. Motility disorder
5. Neoplasm
 - a. Benign
 - b. Malignant
6. Other

F. Liver

1. Benign Neoplasm
 - a. Focal nodular hyperplasia
 - b. Hemangioma
 - c. Other
 - d. Hemangioma
2. Chemotherapy infusion pumps
3. Cirrhosis
4. Fatty Liver
5. Hepatocellular disease
6. Hepatomegaly
7. Infection/Inflammatory
8. Malignant
 - a. Biliary
 - b. Hepatocellular
 - c. Metastatic
 - d. Other
9. Other
10. Transplantation

G. Other

H. Other

I. Peritoneum

1. Ascites
2. Infection/Inflammatory
3. Leveen shunt patency/obstruction
4. Lymphadenopathy
5. Neoplasm
 - a. Benign
 - b. Malignant
6. Other

J. Physiology

K. Quantitation

L. Radiopharmaceuticals

M. Salivary Glands

N. Small bowel

1. Benign
2. Bleeding
3. Crohn's disease
4. Malignant
5. Meckel's diverticulum
6. Motility disorder
7. Neoplasm
8. Other

O. Spleen

1. Accessory spleen
2. Infection/Inflammatory
3. Neoplasm
 - a. Benign
 - b. Malignant
4. Other
5. Other
6. Splenic infarct
7. Splenomegaly
8. Splenosis

P. Stomach

1. Bleeding
2. Motility disorder
3. Neoplasm
 - a. Benign
 - b. Malignant
4. Other

V. General

A. Patient Safety

1. Communication

B. PET/CT clinical

VI. Genitourinary

A. Anatomy

1. CT
2. Other

B. Bladder

1. Infection
2. Neoplasms
 - a. Benign
 - b. Malignant
3. Other
4. Vesicoureteral reflux

C. Gynecological

1. Cervical
 - a. Benign Neoplasms
 - b. Infection
 - c. Malignant Neoplasms
 - d. Other
2. Other
3. Ovarian
 - a. Benign Neoplasms
 - b. Infection
 - c. Malignant Neoplasms
 - d. Other
4. Uterine
 - a. Benign Neoplasms
 - b. Infection
 - c. Malignant Neoplasms
 - d. Other
5. Vaginal
 - a. Benign Neoplasms
 - b. Infection
 - c. Malignant Neoplasms
 - d. Other

D. Other

E. Ovaries

F. Physiology

G. Physiology

1. CT

H. Prostate

1. Benign Neoplasms

- 2. Carcinoma
 - a. Other
 - b. Prostate
 - c. Therapy
- 3. Infection
- 4. Other
- I. Quantitation
- J. Radiopharmaceuticals
 - a. Malignant
- K. Renal
 - 1. Congenital
 - a. Crossed renal ectopia
 - b. Duplicated Collecting System
 - c. Horseshoe kidney
 - d. Other
 - e. Pelvic kidney
 - f. Polycystic
 - 2. Cysts
 - 3. Infections
 - a. Abscess
 - b. Cysts
 - c. Other
 - d. Pyelonephritis
 - 4. Neoplasms
 - a. Benign
 - b. Malignant
 - 5. Obstruction
 - 6. Other
 - 7. Parenchymal Renal Disease
 - a. ATN
 - b. Other
 - 8. Quantification
 - 9. Quantitation
 - 10. Safety
 - 11. Transplantation
 - a. ATN
 - b. Drug toxicity
 - c. Leak - urinoma
 - d. Lymphocele
 - e. Obstruction
 - f. Other
 - g. Rejection
 - 12. Vascular
 - a. Infarcts

- b. Other
- c. Renal vein thrombosis
- d. Renovascular hypertension

L. Scrotal/Testicular

- 1. Benign
- 2. Inflammatory_and_Infection
 - a. Epididymitis
 - b. Orchitis
- 3. Malignant
- 4. Neoplasms
- 5. Other
- 6. Varicocele
- 7. Vascular/Torsion

M. Ureter

VII. Musculoskeletal

A. Anatomy

1. CT
2. Other

B. Artifact

C. Bone

1. Arthroplasty
2. Benign Neoplasms
 - a. Fibrous dysplasia
 - b. Hemangioma
 - c. Hypertrophic Osteoarthropathy
 - d. Osteoid osteoma
 - e. Other
 - f. Paget's disease
3. Congenital
 - a. Osteochondroses
 - b. Other
 - c. Syndromes
4. Degenerative disease
5. Flouride
6. Hematological
 - a. Myelofibrosis
 - b. Other
 - c. Sickle Cell disease
7. Inflammatory and Infection
 - a. FUO
 - b. Osteomyelitis
 - c. Other
 - d. Prostheses
8. Inflammatory and Infectious
 - a. Enthesopathy
 - b. Osteomyelitis
 - c. Other
9. Malignant Neoplasms
 - a. Effects of radiation and chemotherapy
 - b. Metastatic
 - c. Other
 - d. Primary
10. Metabolic
 - a. Endocrine

- b. Hypertrophic Osteoarthropathy
 - c. Osteoporosis
 - d. Other
- 11. Other
- 12. Trauma
 - a. Abuse
 - b. Avulsion injury
 - c. Contusion
 - d. Fracture
 - e. Other
 - f. Shin splint
 - g. Slipped capital femoral epiphysis
- 13. Vascular
 - a. Bone infarct
 - b. Disuse
 - c. Osteonecrosis
 - d. Other
 - e. Reflex sympathetic dystrophy
- D. Joints
 - 1. Arthritis
 - a. Infectious
 - b. Inflammatory
 - c. Osteoarthritis/Degenerative
 - d. Other
 - 2. Bursitis
 - 3. Other
- E. Physiology
- F. Quantitation
- G. Radiopharmaceuticals
- H. Soft tissue
 - 1. Enthesopathy
 - 2. Fasciitis
 - 3. Heterotopic Bone/Myositis ossificans
 - 4. Malignant effusions
 - 5. Muscle
 - 6. Other
 - 7. Renal
 - a. Other
 - 8. Tumor uptake

VIII. Neurology

A. Anatomy

1. CT
2. Other

B. Brain clinical

1. Brain Death
2. Congenital/Neurodevelopment
3. Dementia
 - a. Alzheimer disease
 - b. Diffuse Lewy body disease
 - c. Frontotemporal and lobar degenerations
 - d. Mild cognitive impairment
 - e. Other
4. Dementia Neurodegenerative
5. Epilepsy
 - a. Ictal localization
 - b. Interictal localization
6. Inflammatory and infectious diseases
 - a. Abscess
 - b. Encephalitis
 - c. Other
 - d. Prion (Jacob-Creutzfeldt)
 - e. Toxoplasmosis
 - f. Vasculitis
7. Movement Disorders
 - a. Corticobasal degeneration
 - b. Essential Tremor
 - c. Huntington disease
 - d. Multiple system atrophy/pontocerebellar degeneration
 - e. Other
 - f. Parkinson disease
 - g. Progressive supranuclear palsy (PSP)
8. Neoplasms
 - a. Benign
 - b. Malignant
 - c. Treatment effects
9. Other
10. Psychiatric diseases
 - a. Affective disorder
 - b. Other

- c. Schizophrenia
- 11. Trauma Brain death
- 12. Vascular
 - a. Other
 - b. Stroke
 - c. TIA
- C. CSF Cisternography
 - 1. CSF leaks
 - 2. Normal pressure hydrocephalus
 - 3. Other
 - 4. Shunts
- D. Neurochemistry Neurophysiology
 - 1. Blood-brain barrier
 - 2. Energy metabolism
 - a. Glucose
 - b. Oxygen
 - 3. Flow/metabolism/neuronal functional coupling
 - 4. Molecular neuroimaging markers
 - a. Clinical
 - i. Amyloid deposition
 - ii. Blood flow / perfusion
 - iii. Dopamine terminals
 - iv. Energy metabolism
 - b. Preclinical
 - i. Neurotransmitter receptors
 - ii. Other
 - iii. Transmitter synthesis / storage / reuptake
 - 5. Vascular regulation

IX. Oncology

(includes hematology, infections, lymphoscintigraphy CT)

A. Anatomy

1. CT
2. Other

B. Breast

1. Changes due to treatment
2. Diagnosis
3. Lymphoscintigraphy
4. Metastasis
5. Other
6. Response to Therapy
7. Restaging

C. CT

1. Artifacts
2. Contrast
3. Normal Variants
4. Other
5. Safety

D. Head and Neck (Non thyroidal)

E. Hematologic

1. Other
2. Polycythemia Vera (Blood volumes and therapy)

F. Infections

1. FDG
2. Other
3. WBCs

G. Leukemia

H. Lymphatics

1. Chylous effusion
2. Lymphedema
3. Other

I. Lymphoma

1. Diagnosis
2. Other
3. Response to Therapy
4. Restaging
5. Therapy

- J. Multiple Myeloma
- K. Other
 - 1. Artifacts
 - a. Contrast
 - b. Other
 - 2. Benign Neoplasms
 - 3. Malignant Neoplasms
 - 4. Normal Variants
 - a. Brown Fat
 - b. GU Uptake
 - c. Muscle uptake
 - d. Other
 - 5. Quantitation
 - 6. Safety
- L. Physiology
- M. Quantitation
- N. Radiation Therapy
- O. Radiopharmaceuticals
- P. Skin Melanoma
 - 1. Lymphoscintigraphy
 - 2. Other
- Q. Therapy of Bone Metastasis

X. Pulmonary

- A. Anatomy
 - 1. CT
 - 2. Other
- B. Artifact
- C. CT
- D. Inflammatory and Infection
 - 1. Drug toxicity
 - 2. Granulomatous
 - 3. Granulomatous Disease
 - 4. IPF
 - 5. Other
 - 6. Sarcoidosis
- E. Neoplasms
 - 1. Benign
 - 2. Malignant
- F. Obstructive airways disease
 - 1. Acute
 - 2. Chronic
- G. Other
- H. Physiology
 - 1. Other
 - 2. Right to Left Shunt
- I. Pleural effusions/Peritoneal-pleural shunts
- J. Pulmonary hypertension
- K. Quantitation
 - 1. Lung cancer
 - 2. Other
 - 3. Transplantation
 - 4. Volume reduction
- L. Radiopharmaceuticals
- M. Transplantation
- N. Vascular
 - 1. Other
 - 2. SVC Obstruction
 - 3. Thromboembolism (Pulmonary embolism)

