

# **Clinical Nuclear Medicine Question Bank**

- 1. NM in Acute Medicine**
- 2. Renal Disorder**
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- 4. CNS & Psychiatric Disorder**
- 5. Tumor Diagnosis & Treatment & PET**
- 6. Bones & joints**
- 7. Thyroid Disorder**
- 8. Lung disorder**
- 9. Liver & GB disorder**
- 10. Heart disorder**
- 11. Infection**
- 12. Miscellaneous**

## ***1. NM in Acute Medicine***

### **Short Question**

1. Assessment of infectious bone lesion with NM technique. ( 10-12/06)
2. Various RPs in emergency room with indication( 10-2005)
3. NM Techniques in Trauma injuries. ( 15-1993)
4. Detection of Deep vein thrombosis. (15-1996)
5. Various RPs used in emergency room with indication(10- May 2005)
6. RPs helpful in the evaluation of patients of road traffic accidents. (10- Dec 2005)

## ***2. Renal Disorder***

### **Long question**

1. Discuss patho-physiology of Renal causes of Hypertension & detail the Radio-nuclide procedure you would undertake to assist in management. ( 25-1995)
2. Discuss the RN techniques in the evaluation of the renal system (25- 1989)

### **Short Question**

1. Radionuclide Procedure for organ transplant assessments. ( 10-12/06)
2. RPs in Kidney transplants( 10-2005)
3. Renal dynamic scan & its indication( 10-2005)
4. Radionuclide assessment in obstructive uropathy. ( 15-1993)
5. NM techniques in evaluation of chronic renal failure. ( 15-1993)
6. Usefulness of renal transit times in various renal disorders. ( 10-1994)
7. Radionuclide studies in the assessment of Renal Transplant complications (15-1995)
8. Radio-nuclide investigations in children with recurrent UTI. ( 10-1995)
9. Describe the principle, procedure clinical utility of captopril scintigraphy in RAS. ( 25-1996)
10. RN studies in renal transplant patients. (15-1996)
11. Radionuclide evaluation of uncontrolled hypertension. (15-1997)
12. NM diagnosis recurrent UTI. (15-1997)
13. RN evaluation o obstructive uropathy. (15-1997)
14. RPs for Renal Transplants (10- May 2005)
15. Renal dynamic scan & its indications (10- May 2005)

16. Role of NM study in renal transplant (10- 2002)
17. Pitfall in diuretic renography. (10- 2002)
18. Anatomy & physiology of kidneys. (10- 2007)
19. Dynamic Renal scintigraphy with <sup>99m</sup>Tc-DTPA & GFR. (10- 2007)
20. How will you proceed to investigate a young hypersensitive patient with the aid of RN investigation? (25- 1990)
21. Renal transplant evaluation by RN study. (15- 1990)
22. Renography & its modifications. (15- 1992)
23. Probe Renography (15- 1992)
24. Captopril Renography (15- 1992)
25. Radionuclide evaluation of Renal transplant rejection (15- 1993)
26. Testicular imaging with RN (15- 1993)
27. GFR estimation using radionuclide technique (15- 1993)

### ***3. GIT***

#### **Long question**

1. Describe briefly the procedure & adv of RN procedures in diagnosis of various GI diseases (excluding Hepatobiliary & pancreatic disorder). (25-1997)

#### **Short Question**

1. GE function studies( 10-2005)
2. Intervention in GI NM procedures( 15-1994)
3. RN investigations in oesophageal pain.(15-1995)
4. Radionuclide detection of ectopic gastric mucosa( 10-1995)
5. Schilling test. (15-1996)
6. Role of NM in GI bleeding disease. (15-1996)
7. GE function studies(10- May 2005)
8. RN imaging of pancreas (10- Dec 2005)
9. RN studies for evaluation of GI bleeding. (10- 2002)
10. Discuss technique of spleen scan. (10- 1989)

What are the indications for spleen scan? Describe the technique of preparation of Cr-51 RBC for spleen scan.

11. Adrenal imaging. (10- 1989)

12. <sup>99m</sup>Tc-RBCs scan for GI bleeding protocol. (10- 2007)
13. RN evaluation of GI bleeding. (15- 1990)
14. Nuclear technology in diagnosis of duodeno-gastric reflux. (15- 1991)
15. GE scintigraphy (mention the clinical indications & other modalities used in the diagnosis). (15- 1991)
16. RN investigations of GI bleeding (15- 1992)
17. Technique of imaging Meckles Diverticulam (15- 1992)
- 18.

#### **4. CNS & Psychiatric Disorder**

##### **Short Question**

1. NM in management of patient of epilepsy. ( 10-12/06)
2. RPs for SPECT brain imaging( 10-12/06)
3. Functional Brain imaging with SPECT( 10-2005)
4. Enumerate various RPs for SPECT brain studies indicating their clinical utility. (15-1994)
5. RPs for regional cerebral blood flow studies( 15-1994)
6. Acetazolamide intervention. ( 10-1994)
7. Brain SPECT in epilepsy(15-1995)
8. Utility if SPECT cerebral flow studies. (15-1995)
9. Imaging in CSF rhinorrhoea. (15-1996)
10. Neuro-receptor imaging. (15-1996)
11. Newer brain scanning agents. . (15-1996)
12. Nero imaging SPECT RPs. (15-1997)
13. <sup>210</sup>Tl in brain imaging (15-1997)
14. Functional brain imaging with SPECT (10- May 2005)
15. Evaluation of hydrocephalus (10- Dec 2005)
16. RN imaging studies in Epilepsy. (10- 2002)
17. Cerebral perfusion SPECT study – procedure for <sup>99m</sup>Tc HMPAO & ECD. (10- 2007)
18. RN for regional cerebral blood flow study. (15- 1991)
19. Blood Brain Barrier. (15- 1991)

20. PET Brain imaging. (15- 1992)

## **5. Tumor Diagnosis & Treatment**

### **Short Question**

1. Radionuclide technique for breast malignancy. ( 10-12/06)
2. RPs in diagnosis & FU of neuro-endocrine disorders. ( 10-12/06)
3. Apoptosis Imaging ( 10-12/06)
4. Tumour imaging agents( 10-2005)
5. Breast Cancer & nuclear technique( 10-2005)
6. Discuss somatostatin receptor scintigraphy ( 15-1994)
7. MIBG scintigraphy. ( 10-1994)
8. Ga-67 in sarcoidosis. ( 10-1995)
9. Tumor seeking RPs. (15-1996) (15-1997)
10. MIBG in nuclear imaging and therapy. (15-1997)
11. Somatostatin receptor scintigraphy. (15-1997)
12. Evaluate the uses of <sup>67</sup>Ga in clinical medicine. Give a brief account of its production in India. (25-1997)
13. Tumor imaging agents (10- May 2005)
14. Breast cancer & Nuclear technique (10- May 2005)
15. RPs for infection/inflammation imaging (10- Dec 2005)
16. Tumor seeking RPs in routine Gamma camera imaging (10- Dec 2005)
17. Radio-immuno therapy(10- Dec 2005)
18. Radio-labelled MIBG in nuclear imaging & therapy (10- 2002)
19. Role of Radio-labelled monoclonal Ab as therapeutic agents. (10- 2002)
20. Sentinel imaging (10- 2002)
21. Radionuclide treatment of neural crest tumor (10- 2002)
22. Role of NM procedures in staging of malignant disorder. (10- 1989)
23. RN used in therapy of tumor. (10- 2007)
24. Radio-labelled monoclonal Ab. (15- 1990)

25. Describe the role of NM in oncology with special mention on recent trends.  
(25- 1990)
26. RN in the Rx of bone secondaries & hepatocellular Ca. (15- 1991)
27. Extra-myocardial applications of Thallium-201 isotope (15- 1992)
28. <sup>131</sup>I MIBG scintigraphy (15- 1992)
29. Somatostatin scintigraphy (15- 1993)

### **PET & PET RPs**

#### **Long question**

1. Discuss the recent development in PET in particular reference to RPs.( 25-1994)

#### **Short Question**

1. Clinical application of Non- FDG scintigraphy. ( 10-12/06)
2. Gives an account for non –fluoridal PET RPs( 10-12/06)
3. Discuss the role of <sup>18</sup>F-FDG PET imaging in oncology. ( 15-1994)
4. PET studies in Tumor imaging. (15-1995)
5. Clinical uses of positron emitters. (15-1996)
6. PET in oncology (10- May 2005)
7. Radiotracer for PET (10- Dec 2005)
8. <sup>18</sup>F-FDG (15- 2004)
9. Cyclotron produced RPs. (15- 2004)
10. <sup>18</sup>F-FDG imaging- principle & role in clinical application (10- 2002)

### **6. Bones & joints**

#### **Long question**

1. Describe the clinical usefulness of a RN bone scan. Briefly outline its Limitation. Mention the conditions producing cold spot in a bone scan. (25- 1990)

#### **Short Question**

1. Assessment of infectious bone lesion with NM technique. ( 10-12/06)
2. Palliation of bone pain with Radionuclide( 10-12/06)
3. characteristics of radionuclides for bone palliation( 10-12/06)
4. Radio-isotopes in mets bone palliation ( 10-2005)
5. Radio-isotopes in Radiation synovectomy( 10-2005)
6. Radionuclide therapy in intractable bone pain. ( 15-1993)

7. Indication & RPs used for bone marrow imaging. (15-1995)
8. RN therapy for palliation of bone pain. (15-1995)
9. Bone scan in reflux sympathetic dystrophy syndrome. ( 10-1995)
10. Value of <sup>32</sup>P in NM. (15-1996)
11. Sensitivity & specificity of bone scanning. (15-1996)
12. Non neoplastic bone scintigraphy. (15-1997)
13. Radio-isotopes useful for metastatic bone palliation (10- May 2005)
14. Radio-isotopes useful for Radiation synovectomy (10- May 2005)
15. P-32 in NM(10- Dec 2005)
16. Discuss & role of radiosynovectomy in crippling arthritis. (10- Dec 2005)
17. Causes of intraosseus MDP uptake in bone scanning. (10- Dec 2005)
18. Role of RN in bone palliation. (10- Dec 2005)
19. Radiation synovectomy (15- 2004)
20. Role of Radionuclide in bone palliation (10- 2002)
21. Discuss technique used in the evaluation of non metastatic skeletal disorder. (10- 1989)
22. Bone densitometer study. (10- 1989)
23. Indications of Bone scan. (10- 2007)
24. Flare phenomenon. (10- 2007)
25. The variation in Bone scan quality using the same RPs(15- 1992)

## **7. Thyroid disorder**

### **Long question**

1. Discuss the details NM procedures in management of Differentiated thyroid function ( 25-1995)
2. Write in brief the various modalities of treatment available for thyrotoxicosis. Discuss the role of <sup>131</sup>Iodine therapy in magement of thyrotoxicosis( 25-1996)
3. Mr “A” 30 yrs old reported to you a solitary thyroid nodule of 6 months. How will you investigate the case? Describe the management of a case mixed Papillary & Follicular Ca thyroid. (25- 1992)
4. Discuss the immunopathology & management of Graves’ infiltrative ophthalmopathy. (25- 1993)

**Short Question**

1. Work-up, treatment of thyrotoxicosis pregnant lady. ( 10-12/06)
2. Therapy of hyperthyroidism( 10-2005)
3. Intervention NM in dysthyroid assessment. ( 15-1993)
4. Diagnosis & managements of Medullary Ca thyroid. ( 15-1994)
5. Thyroid function in children- indication and contra-indication. ( 10-1994)
6. Describe patho-physiology of Dyshormonogenic goiter & role of NM in the diagnosis. (15-1995)
7. Hypothyroidism following 131-I therapy in thyrotoxicosis. ( 10-1995)
8. Hashimoto's thyroiditis. (15-1996)
9. Thyrotoxicosis with decreases RAIU. (15-1997)
10. Thyroid auto antibodies. (15-1997)
11. Chernobyl disaster & thyroid cancer. (15-1997)
12. Therapy of Hyperthyroidism (10- May 2005)
13. Thyroid stunning(10- Dec 2005)
14. Whole body iodine 131I scan (15- 2004)
15. Iodine metabolism (10- 2002)
16. Thyrotoxicosis with low thyroid radio-iodine uptake. (10- 2002)
17. Medullary Ca thyroid. (10- 1989)
18. Drugs causing decreased uptake of radioactive iodine in thyroid glands. (10- 2007)
19. Radio-iodine therapy for thyrotoxicosis. (15- 1990)
20. RN in the management of medullary Ca thyroid. (15- 1991)
21. Iodine 123(15- 1991)
22. Mrs "M" 35 yrs old mother of two children is loosing weight continuously for the last 3 months. How will you investigate her? (25- 1992)
23. Discuss in detail isotopic therapy in thyrotoxicosis? (15- 1993)
24. Discuss etiology, clinical manifestation & investigations of salient thyroiditis (15- 1993)
- 25.



## **Para- Thyroid disorder**

### **Short Question**

1. Parathyroid imaging (15- 2004)
2. Hyper-parathyroidism- 99mTc-sestamibi imaging. (10- 2007)
3. RN imaging of parathyroid glands(15- 1992)

## **8. Lung Disorder**

### **Short Question**

1. PIOPED criteria for pulmonary embolism & its drawbacks. ( 10-12/06)
2. Discuss the Adv & limitations of various RPs used in Lung ventilation imaging (15-1994)
3. Role of NM procedures in the diagnosis of Pulmonary embolism (15-1995)
4. Role of NM in diagnosis of pulmonary embolism. (15-1996)
5. Anatomy of lung segments & their relevance to lung scintigraphy. ( 10-1996)
6. Aerosol imaging of the lungs. (15-1997)
7. Describe the anatomical & physiological features of the respiratory system & the NM technique useful in its evaluation. (10-1997)
8. Enumerate the criteria for evaluating pulmonary embolism (10- Dec 2005)
9. Pulmonary embolism & NM (10- 2002)
10. Modified PIOPED criteria for pulmonary embolism diagnosis- high & intermediate probability. (10- 2007)
11. RN study of Lung. (15- 1990)
12. The technique of aerosol ventilation technique (15- 1992)
13. RN imaging in pulmonary thrombo-embolism in patients of obstructive pulmonary disorder(15- 1993)
14. Radio-respirometer (15- 1993)
15. Pulmonary embolism diagnosis (15- 1993)

## **9. Liver & GB disorder**

### **Long question**

1. Describe the mechanism of localization of RPs used for hepatic studies & discuss the indication of hepatic imaging. ( 25-1996)

### **Short Question**

1. Scope of NM in neonatal hyper bilirubinemia ( 10-12/06)
2. Augmented cholescintigraphy. ( 15-1993)
3. NM techniques in Rt upper quadrant pain. (15-1993)
4. Discuss the assessment of functioning hepatocytes & hepatic blood flow with radionuclide techniques( 15-1994)
5. Augments cholescintigraphy. ( 10-1994)
6. Pharmacodynamics of Hepato-biliary RPs. (15-1995)
7. Radionuclide scanning in diagnosis of hepatic hamangioma. ( 10-1995)
8. Comparative merits of hepatobiliary scinti-imaging & USG studies. (15-1997)
9. RN intervention in biliary tract (10- Dec 2005)
10. Compare properties of phytate & sulphur colloid. (10- Dec 2005)
11. Radio-labelled colloid & its uses. (15- 2004)
12. Hepato-biliary scintigraphy(15- 2004)
13. Discuss technique used in the evaluation of jaundice. What are the mechanisms of localization? (10- 1989)
14. Hepatobiliary imaging. (15- 1990)
15. Radio-isotopic evaluation of hepatic SOL (15- 1992)

## **10. Heart Disorder**

### **Long question**

1. Discuss the current status & prospects of radionuclide evaluation in IHD. ( 25-1993)
2. Describe briefly the sources of the technical error in <sup>201</sup>Tl myocardial stress study.  
Compare and contrast the various RPs used for myocardial viability. (25-1994)
3. Discuss NM diagnosis in evaluation of chest pain in a 50 yrs old man. (25-1997)
4. Write an essay on PET imaging with reference to choice of isotope for Nuclear cardiology. (25- 2002)

5. Discuss the recent advance in Nuclear technology in the evaluation of coronary artery disease. (25- 1991)

**Short Question**

1. Tracer in use for MPI( 10-12/06)
2. RPs for Cardiac metabolism assessment( 10-2005)
3. Clinical utility of myocardial viability study( 10-2005)
4. Cyclotron produced RPs for evaluation of myocardial damage( 15-1993)
5. Discuss the role 99mTc- Sestamibi in NM ( 15-1994)
6. Discuss ambulatory Lt ventricular function monitoring with Radionuclide techniques( 15-1994)
7. Ejection fraction assessment of the Lt Ventricle by RN techniques. Causes of over & under estimation ( 10-1994)
8. Dobutamine 201Tl imaging. (15-1995)
9. Newer RPs in Nuclear cardiology work-up. (15-1995)
10. Radionuclide ventriculography in cardiomyopathy. ( 10-1995)
11. RPs in myocardial imaging. (15-1996)
12. Coronary artery anatomy in relation to MPI. ( 10-1996)
13. Outline the clinical uses of cardiac RN imaging. ( 25-1996)
14. Myocardial imaging agents. (15-1997)
15. RPs for cardiac metabolism assessment (10- May 2005)
16. Clinical utility of Myocardial viability study (10- May 2005)
17. A NM lab to be planned for efficient performance of nuclear cardiology practice. Enumerate instruments & accessories needed with main specification (10- May 2005)
18. RPs for Myocardial viability evaluation (10- Dec 2005)
19. Pharmacological stress MPI. (10- Dec 2005)
20. Compare & contrast 201Tl & 99mTc-labelled MPI agents. (15- 2004)
21. Isotopic diagnosis of viable myocardium. (10- 2002)
22. Non arteriosclerotic causes of myocardial perfusion effects. (10- 2002)
23. Interpretation of myocardial perfusion gated SPECT studies. (10- 2002)
24. Coronary artery- applied anatomy in NM practice. (10- 2002)
25. Role of Nuclear cardiology in IHD & infarct managements. (10- 1989)
26. Preparation of 99mTc-Sestamibi. (10- 2007)

27. MPI with 99mTc-MIBI SPECT acquisition & reconstruction parameter. (10- 2007)
28. MUGA scan. (15- 1990)
29. 210-Tl myocardial imaging in CAD. (15- 1991)
30. Infarct & scintigraphy in acute & subacute MI. (15- 1991)
31. Myocardial imaging agents. (15- 1992)
32. MUGA in CAD (15- 1992)
33. Adenosine Thallium Myocardial scintigraphy (15- 1992)
34. RN evaluation of myocardial viability in IHD (15- 1993)
35. Recent advances in NM procedure to study coronary blood flow (15- 1993)

## **11 Infection & infection Agents**

### **Short Question**

1. Infection imaging Agents( 10-2005)
2. Granulocytes scintigraphy. ( 15-1993)
3. Different techniques of Leucocyte labeling & their clinical utility ( 15-1994)
4. Discuss the various NM strategies used for the detection of Infection/ Inflammation ( 25-1994)
5. Recent advances in imaging of Infective lesions. ( 10-1994)
6. RPs for infection/inflammation imaging (10- Dec 2005)
7. Infection imaging (10- 2002)
8. Briefly mention physical characteristics & mode of production of 67-Ga & its application in scintigraphy in non-malignant. (15- 1991)
9. RN studies on AIDS (15- 1992)
10. RN approach to case of PUO (15- 1992)
11. AIDS evaluation through use of RN imaging (15- 1993)

## **12.Miscellaneous**

### **Long question**

1. As NM specialist you are directed to submit detailed project report for starting NM service in a 300 bedded multispeciality hospital. Discuss how you would proceed & meet the statutory requirements. ( 25-1994)
2. Describe briefly the various modalities of the treatment of Polycythemia Vera & discuss the role of P-32 in its managements. (25- 1989)

3. What are the various NM procedures? Where pharmacological intervention is performed & describes one of the procedures in detail mentioning the concept, pitfall and utility. (25- 1992)

**Short Question**

1. Various RPs in emergency room with indication( 10-2005)
2. Intervention in NM( 10-2005)
3. Clinical utility in Imaging fusion( 10-2005)
4. RBC survival and sequestration studies( 10-2005)
5. NM techniques in in peripheral vascular abnormalities. ( 15-1993)
6. Rx for Polycythemis vera( 10-1994)
7. Image enhancement techniques in Radio-Immunoscintigraphy( 10-1994)
8. Patients has following blood picture
9. Hb:-6 gms, Retic cts:-20%, MCHC:-26%MCV:-105, WBC:-15000, Platelets:-200000,
10. Sr. Bilirubin:-2mg%, Coombs direct:- +ve,
11. Blood film report: - Spherocytosis, anisopoikilocytosis, anisochromia,
12. Discuss how the diagnosis might be elicited using radioactive isotope technique. (15-1995)
13. Role of NM in management of Polycythemia vera. ( 10-1995)
14. Lymphoscintigraphy. (15-1996)
15. Detection of Deep vein thrombosis. (15-1996)
16. Bayes theorem & its application to medical decision making. ( 10-1996)
17. Immunoscintigraphy. (15-1996)
18. The concept of “molecular NM”. ( 10-1996)
19. Deconvolution analysis & its clinical utility. ( 10-1996)
20. Molecular NM. (15-1997)
21. Dacryoscintigraphy. (15-1997)
22. Polycythemia Rubra vera. (15-1997)
23. RBC survival & sequestration studies (10- May 2005)
24. Apoptosis imaging. (10- Dec 2005)
25. Methods of Cr-51 labeling of RBC & causes of poor labeling. (10- Dec 2005)
26. Radio-immuno therapy(10- Dec 2005)
27. Compare & contrast 201Tl & 99mTc-labelled MPI agents. (15- 2004)

28. Factors affecting the outcome of any radiation therapy. (10- 2007)
29. Salient criteria in selecting a work station for NMD. (10- 2007)
30. Radio-labelled monoclonal Ab. (15- 1990)
31. RN study in DVT. (15- 1990)
32. RN imaging in the diagnosis of Lymphocele . (15- 1991)
33. Immunoscintigraphy. (15- 1991)
34. Number of requests for renal scans in a NMD over a period of 10 consecutive months was 400, 375, 420, 450, 410, 390, 470, 425, 385, & 440. Over this period a normal distribution may be assumed.the next month a new gamma camera was installed & the number request rose to 510. Dose this increase represent significant increase? (15- 1991)
35. Radio Immunoscintigraphy. (15- 1992)
36. Radiolabelling of RBCs for diagnosis of hematological disorder(15- 1992)
37. NM technique in endocrine disease (15- 1993)