Exam Questions DIA 2017/2018

Exam questions of Diagnostic imaging consist of the general part, the special part and of the clinical problems.

A single question from each question group will be randomly assigned to the student.

When answering questions from a special section, it is important to list the examination modalities, the diagnostic procedure and the basic pathology.

In the part of clinical problems examiners will assess the correct indication of investigative methods for solving the clinical problem, the accuracy of the methods and contraindications.

I. General section – radiology and nuclear medicine.

1. Radiography and X-rays - principle, radiation load, indications, contraindications
2. Fluoroscopy - principles, radiation exposure, indication, contraindication
3. Ultrasound imaging principles - principle, basic indications
4. CT imaging principles - principle, basic indications, contraindications
5. MR imaging principle - principle, basic indications, contraindications
6. Angiography and DSA principles- principle, basic indications
7. Interventional Radiology - division, meaning the method, spectrum of procedures
8. Contrast Agents for X-ray Examination - principle, examples of use, side effects
9. Contrast agents in Ultrasound and MR imaging - principles, examples of use, side effects
10. Adverse reactions following administration of contrast agents, their prevention and treatment
11. Digitization in radiology and nuclear medicine - principles, the ability to store and share images, 3D reconstruction (various types), virtual imaging**,** and image transmission and archiving
12. Detection of ionizing radiation - interaction with matter - ionizing radiation detectors - shielding, electronic evaluation apparatus
13. Radioactive conversion - alpha, beta-, beta +, gamma
14. Nuclear medicine measuring instruments - scintillation probe, scintillation camera
15. Imaging techniques in nuclear medicine - scintigraphy static and dynamic, planar and tomography - principles, practical use
16. Emission Tomography - SPECT, PET (principles and practical application of methods) PET preparation of the patient, radiopharmaceuticals
17. Radiopharmaceuticals - definition, pharmaceutical forms, requirements for radiopharmaceuticals, their control
18. Sources of radionuclides - principles of nuclear reactor, accelerators and generators (practical examples of radionuclides)
19. The hybrid imaging systems (SPECT / CT, PET / CT, PET / MR) - principles, practical use
20. Radiation load, dosimetry, protective equipment in nuclear medicine

II. Special section- the position of imaging techniques in the diagnostic algorithm

1. Headache
2. Stroke
3. Head and neck trauma
4. Hypogastrium pain
5. Epigastrium pain
6. Pancreatitis
7. Expansion in the abdominal cavity
8. Peritoneal irritation
9. Renal colic
10. Hematuria
11. Polytrauma
12. Shortness of breath
13. Chest pain
14. Lower limb pain
15. Lymphadenopathy
16. Injury of the esophagus
17. Enteritis and colitis
18. Elevation of obstructive enzymes
19. Acute back pain
20. Scrotal pain

III. Radiology - Special section

1. Traumatology - axial skeleton - diagnostic methods, types of fractures
2. Traumatology - long bones - diagnostic methods, types of fractures
3. Traumatology - Specifics of childhood (types of fractures, abused child)
4. Imaging of the esophagus - diagnostic methods, basic pathology
5. Heart imaging- diagnostic methods, basic pathology
6. Chest - possibilities of different diagnostic methods
7. Imaging possibilities of non-traumatic diseases of the skeleton – basic pathology
8. Imaging possibilities of soft tissue diseases (trauma, inflammation, tumors) - diagnostic methods
9. Tumors of the lung, pleura and mediastinum expansion - diagnostic methods
10. Chest imaging - specifics of childhood
11. Imaging of the arterial system - diagnostic methods, basic pathology
12. Imaging of the venous system - diagnostic methods, basic pathology

13. Imaging of digestive tract - diagnostic methods, basic pathology
14. Liver imaging - diagnostic methods, basic pathology (focal and diffuse lesions)
15. Gall bladder and biliary tract imaging - diagnostic methods, basic pathology
16. Pancreas imaging - diagnostic methods, basic pathology
17. Gastrointestinal tract imaging - childhood specifics
18. Uroradiology - diagnostic methods, basic pathology
19. Head and neck imaging incl. imaging methods in dentistry - diagnostic methods, basic pathology
20. Neuroradiology - specifics of childhood
21. Imaging of spinal cord - diagnostic methods, basic pathology
22. Breast imaging
23. Interventional diapeutic (diagnostic-therapeutic) procedures of the vascular system
24. Interventional diapeutic (diagnostic-therapeutic KE) procedures of the urinary system
25. Interventional diapeutic (diagnostic-therapeutic) procedures of the gastrointestinal system
26. Intervention diapeutic (diagnostic and therapeutic) procedures of the central nervous system -
27. Interventional Oncology – spectrum of methods and their practical use
28. Percutaneous drainage of collection and abscesses - principles, examples of pathological conditions suitable for drainage
29. Imaging of sex organs in men and women - diagnostic algorithm, basic pathology
30. Gynecology and obstetrics imaging - diagnostic algorithm, basic pathology

IV. Nuclear medicine - special section

1. Palliative treatment of bone metastases with radionuclides, clinical significance
2. Special features in children's examination - application of radiopharmaceuticals, amount of applied substance, differences in organ distribution
3. Diagnosis with 99m Tc-MIBI
4. Bone scintigraphy, the importance of hybrid methods in focal bone leasions - principle, radiopharmaceuticals, methods of clinical significance
5. Radiation synovectomy, principle, clinical use
6. Diagnosis using 123 I - MIBG, clinical use
7. Perfusion and ventilation scintigraphy and ventilation - principle of the method, radiopharmaceuticals, indication and evaluation
8. Scintigraphy of the esophagus, radionuclid diagnosis of functional gastrointestinal disorders, clinical significance, indication
9. Myocardial perfusion - principle, radiopharmaceuticals, stress tests
10. Radioisotope flebography and evidence of pulmonary embolization
11. Detection of bleeding into GIT and ectopic gastric mucosa

12. Dynamic Cholescintigraphy - Principle, Radiopharmaceuticals, Evaluation, Indication and Differential Diagnosis of Cholestasis Causes
13. Radionuclide diagnosis of gastro-entero pancreatic tumors
14. Dynamic renal scintigraphy - principle, radiopharmaceuticals, indications
15. Diagnostic options for prostate cancer and its metastases by nuclear medicine, including PET
16. Possibilities of using radionuclide methods in endocrinology
17. Diagnosis and therapy of thyroid disease, thyroid carcinoma - differences in diagnostic and therapeutic procedures - Thyroid scintigraphy, the use of radioiodine for diagnostic and therapeutic purposes
18. Possibilities of Nuclear Medicine in epileptology , neuroreceptor scintigraphy in CNS (DaTSCAN) - principle, examples of receptors and importance in practice
19. Brain perfusion scintigraphy - conditions for application and importance of the method for clinical practice
20. Diagnosis of sentinel nodes by radionuclides
21. Radionuclide lymphography
22. PET in oncology - indications, contraindications, diagnostic methods of nuclear medicine in oncology and comparison with other imaging methods
23. Nuclear Medicine Therapy - 131 I-MIBG, Receptor Analogs and Antibodies
24. Determination of brain death by radionuclides and comparison with other imaging methods
25. Diagnosis of inflammation by nuclear medicine methods and comparison with other imaging methods