Exam Questions DIA 2023/24

Exam questions of Diagnostic imaging consist of radiology and nuclear medicine parts and of the clinical problems.
A single question from each question group will be randomly assigned to the student.
When answering questions from a section of radiolohy and nuclear medicine, 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.

1. 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
21. Liver lesion - diagnostic methods, basic pathology (focal and diffuse lesions)

2. Radiology section

1. Radiography and X-rays - principle, radiation load, indications, contraindications, DICOM, PACS
2. Fluoroscopy - principles, radiation exposure, indication, contraindication
3. Ultrasound imaging principles - principle, basic indications
4. CT imaging principles - principle, basic indications, contraindications, 3D reconstruction (various types)
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. Traumatology - axial skeleton - diagnostic methods, types of fractures
12. Traumatology - long bones - diagnostic methods, types of fractures
13. Traumatology - Specifics of childhood (types of fractures, abused child)
14. Imaging of the esophagus - diagnostic methods, basic pathology
15. Heart imaging- diagnostic methods, basic pathology
16. Chest - possibilities of different diagnostic methods
17. Imaging possibilities of non-traumatic diseases of the skeleton - degenerative changes and inflammations of the spine - basic pathology
18. Imaging possibilities of soft tissue diseases (trauma, inflammation, tumors) - diagnostic methods
19. Tumors of the lung, pleura and mediastinum expansion - diagnostic methods
20. Chest imaging - specifics of childhood
21. Imaging of the arterial system - diagnostic methods, basic pathology
22. Imaging of the venous system - diagnostic methods, basic pathology
23. Imaging of digestive tract - diagnostic methods, basic pathology
24. Gall bladder and biliary tract imaging - diagnostic methods, basic pathology
25. Pancreas imaging - diagnostic methods, basic pathology
26. Gastrointestinal tract imaging - childhood specifics
27. Uroradiology - diagnostic methods, basic pathology
28. Head and neck imaging incl. imaging methods in dentistry - diagnostic methods, basic pathology
29. Neuroradiology - specifics of childhood
30. Imaging of brain and spinal cord - diagnostic methods, basic pathology (especially tumours, inflammation)
31. Breast imaging
32. Interventional diapeutic (diagnostic-therapeutic) procedures of the vascular system
33. Interventional diapeutic (diagnostic-therapeutic KE) procedures of the urinary system
34. Interventional diapeutic (diagnostic-therapeutic) procedures of the gastrointestinal system
35. Intervention diapeutic (diagnostic and therapeutic) procedures of the central nervous system
36. Interventional Oncology – spectrum of methods and their practical use
37. Percutaneous drainage of collection and abscesses - principles, examples of pathological conditions suitable for drainage
38. Imaging of sex organs in men and women - diagnostic algorithm, basic pathology
39. Gynecology and obstetrics imaging - diagnostic algorithm, basic pathology

3. Nuclear medicine section

1. Detection of ionizing radiation - interaction with matter - ionizing radiation detectors - shielding, electronic evaluation apparatus
2. Radioactive transformation - alpha-, beta-, beta+, gamma - importance for diagnosis and therapy
3. Measuring instruments in nuclear medicine - scintillation probe, scintillation camera
4. Imaging methods in nuclear medicine - static and dynamic scintigraphy, planar and tomography - principles, differences, practical applications
5. Emission tomography - SPECT, PET (principles and differences of methods and practical use), PET - patient preparation, radiopharmaceuticals
6. Radiopharmaceuticals - definition, dosage forms, requirements for radiopharmaceuticals, their control

7. Radionuclide sources - principles of nuclear reactors, accelerators and generators (practical examples of radionuclides)
8. Hybrid imaging systems (SPECT/CT, PET/CT, PET/MR) - principles, practical applications
9. Radiation load, dosimetry, protective equipment in radiology and nuclear medicine, special features in the examination of children
10. Palliative treatment of bone metastases with radionuclides, clinical significance. Radiation synovectomy, principles of the method, clinical use
11. Bone scintigraphy, importance of hybrid methods in bone lesions - principle, radiopharmaceuticals, methods, clinical significance
12. Diagnosis and therapy with MIBG, radiopharmaceuticals, clinical use
13. Perfusion and ventilation scintigraphy of the lungs - principle of the method, radiopharmaceuticals, indications and evaluation, phlebography
14. Myocardial perfusion - principle, radiopharmaceuticals, stress tests
15. Detection of GIT bleeding and ectopic gastric mucosa
16. Dynamic cholescintigraphy, dynamic scintigraphy of the oesophagus, radionuclide diagnosis of functional GIT disorders - principles, radiopharmaceuticals, indications
17. Radionuclide diagnostics and therapy of gastro-entero-pancreatic neuroendocrine tumours
18. Renal scintigraphy - principles, radiopharmaceuticals, indications
19. Possibilities of radionuclide diagnosis and therapy in prostate cancer and its metastases
20. Radionuclide diagnosis of hyperthyroidism and its therapy with radioiodine. Detection of parathyroid adenoma or hyperplasia.
21. Diagnosis and therapy of thyroid cancer - differences in diagnostic and therapeutic procedures, use of radioiodine for diagnostic and therapeutic purposes
22. Possibilities of nuclear medicine in the diagnosis of neurodegenerative diseases - neuroreceptor diagnostics using SPECT (DATscan), PET (FDG, imaging of amyloid plaques)
23. Examination of brain perfusion by SPECT - conditions for application and importance of the method for practice, use of SPECT and PET in epileptology.
24. Sentinel lymph node diagnosis using radionuclides
25. Lymphoscintigraphy
26. PET/CT in oncology - indications, contraindications, oncological diagnostics by nuclear medicine methods and comparison with other imaging methods
27. Determination of brain death by radionuclides and comparison with other imaging methods
28. Diagnosis of inflammation by nuclear medicine methods, and comparison with other imaging methods