1. Which artery is dissected most commonly following arteriography by femoral route-

a) >Celiac trunk

b) >Superior mesenteric artery

c) >Inferior mesenteric artery

d) >Gastroduodenal artery

Correct Answer - C
Inferior mesenteric artery *[Ref: American Journal of Roentgenology 130:455-460, March 1978*
Arterial dissection in arteriography can occur either during the femoral puncture (common) or during catheter manipulation.
Most common artery dissected during femoral puncture is external iliac artery, so overall the most common artery dissected during arteriography is - *the external iliac artery.*
The arteries mentioned in the question are dissected due to catheter manipulation during their super selective angiography. According to a table given in the article mentioned in the reference above- highest percentage of dissection is seen in- Inferior mesenteric > gastroduodenal > celiac trunk > superior mesenteric
According to the above article the most common artery dissected during catheter manipulation is - *internal iliac artery* (not mentioned in the option)

2. **Regarding contrast radiography which among the following is FALSE?**

a) Ileum is featureless

b) Colon has haustrations

c) Jejunum is feathery

d) Distal part of duodenum has a cap

Correct Answer - D

The first part of the duodenum has the duodenal cap or bulb and not the distal part.
The first part of the duodenum is visible as a triangular shadow on barium studies and is called duodenal cap.
The small intestine contains mucosal folds known as plicae circulares or valvulae conniventes that are visible on barium studies and help in the distinction between small intestine and colon.

Valvulae conniventes are more prominent in the jejunum giving the **'feathery appearance'** on barium. These mucosal folds are gradually reduced distally giving a **'featureless'** appearance of distal ileum.

In the colon, mucosal pattern is best evaluated with double contrast examination. Normal colon mucosa is thin, smooth and straight essentially featureless except for the haustral markings.

In the rectum, there are three prominent folds called the valves of Houston. In a partially collapsed rectum colums of Morgagni may be seen in the distal portion.

3. **Unenhanced CT scan showing Central dot sign is characteristically seen in:**

a) Primary sclerosing cholangitis

b) Liver Hamartoma

c) Caroli's disease

d) Polycystic liver disease

Correct Answer - C

Central dot sign is a characteristic feature of Carolis disease.
On enhanced CT and MRI, central dot sign is indicated by the presence of tiny dots with strong enhancement within dilated intrahepatic ducts reflecting intraluminal portal vein radicles.

- Ultrasound is the best initial imaging study it shows irregular dilatation of the large intrahepatic ducts.
- Cholangiography shows diverticulum like sacculi of intrahepatic bile ducts of varying size, shape and distribution.
- Hepatic scintigraphy with Tc 99m diethyl IDA shows typical beaded appearance of dilated intrahepatic bile ducts.

4. All are pure beta emitters except:

a) Yttrium-90

b) Cobalt

c) Strontium-90

d) Samarium-153

Correct Answer - D
D i.e. Samarium-153
Pure beta 63) emitters (radionuclides) are *phosphorus-32, strontium-90, Yttrium-90 and tritium-30Q.* Whereas *Samarium-153 & Rhenium-186 are mixed /3 and y emittersQ.*
Systemic radionuclide therapy for bone metastases and pain include ^{89}Sr, ^{32}P, $^{186}Rhand\ 153SaQ.$ Phosphorus-32 the first agent to be used is now rarely used b/ o risk of myelo suppression, pancytopenia & acute leukemia. Strontium-89 decays by 3 emission to yttrium-89 with a half life of 50.6 days (13 energy 1.46MeV). It is quickly taken up by mineral material of bone b/o chemical similarity to calcium and b/o extremely little y radiation patient is not a radiation hazard to family members & hospital staff. **Samarium-153** is a artificial radionuclide that emits $_{R}$ **particles** of 0.81 MeV (20%), 0.71 Mev (30%), 0.64 MeV (50%) and **gamma photons** of 103 KeV (28%). It has a short half life of 46.3 hours and is chelated with EDTMP to produce bone seaking complex.
Rhenium-186 emits particles of 1.07 MeV and a 137 KeV gamma rays. It has a short half life of *3.8 days* and is chelated with *HEDP* to produce bone seeking complex.

5. All are used to diagnose protein losing enteropathy except:

a) Tc albumin

b) Tc dentran

c) In-transferrin

d) Tc-seclosumab & Tc Fab

Correct Answer - D

D i.e. Tc seclosumab & Tc Fab

- ^{99m}Tcantimyosin Fab fragments are *specific markers of myocyte damageQ* with a sensitivity of 95%. It is taken up only in acute infarct with decreasing intensity as the infarct heals.

- Infarct avid imaging (hot spot imaging) of *myocardial infarction,* uses radionuclide agents such as ^{99m}Tcpyrophosphate (standard), ^{99m}Tc*tetracycline,* ^{99m}*Tc-glucoheptonate,* **^{99M}TC***antimyosin Fab fragment,* 203Hgchlormerodrin, 18F- sodium fluoride, ^{111}Indium antimyosin (murine monoclonal antibodies to myosin).

- **^{201}Thallium chloride** used for nonavid infarct imaging (cold spot imaging) is the radionuclide *agent of choice to assess myocardial viability and to study myocardial perfusion* for acute MI. ^{201}T1uptake depends on *quality of regional perfusion and viability of myocardial cells with cellular integrity of Na/K pump.* So it is used in coronary artery disease & acute MI. Cold defects at rest may represent transient ischemia in unstable angina. However, it cannot distinguish between recent & remote infarction.

Protein losing enteropathy is a group of gastrointestinal & non gastrointestinal disorders with excessive protein loss into the gi tract resulting in hypoproteinemia & edema in absence of either proteinuria or defect in protein synthesis (eg liver cirrhosis). The

proteinuria or defect in protein synthesis (eg liver cirrhosis). The protein loss into git may be due to?

1- Exudation through ulcerative lesion eg UC, gi carcinoma & peptic ulcers;

2- Altered permeabitily through nonulcerated mucosa eg menetrier's disease and ;

3- Lymphatic dysfunction eg d/t enlarged lymph node or primary lymphatic disease. The diagnosis is suggested by *peripheral edema,* low serum albumin & globulin leves (both), in absence of kidney & liver disease (selective loss almost excludes the diagnosis). *Relative lymphopenia (d/t loss of lymphocytes via lymphatics)* may also occur.

Protein loss in **GIT is documented and established** by administration of radionuclide labeled proteins and its quantification in stools during a 24-or 48-hr period. Radionuclides that are tried include 1111ndium (In) chloride, ^{111}1n-transferrin **^{99m}Tc-albumin** (HSA = human serum albumin), ^{99m}T*chuman immunoglobulin,* **^{99M}TC**dextran, ^{131}1polyvinyl pyrrolidone, ^{125}Ipolyvinyl pyrrolidone,^{125}I albumin, 51Cr chromic chloride, ^{51}Cr-albumin and a-1 antitrypsin clearance. Broadly you can remember that *albumin, dextran, transferrin and ar antitrypsin (all* proteins) lobelled with 99m-rc /min/ **1251 /1311 ^{51}Cr**are used to detect protein losing enteropathy.

6. Epidermoids can be differentiated from arachnoid cyst on MRI by:

a) Contrast enhancement

b) Smooth margins

c) Restricted diffusion

d) CSF signal on FLAIR

Correct Answer - C
C i.e. Restricted diffusion
Epidermoids can be differentiated from arachnoid cyst characteristically by hyper-intense diffusion weighted images because of restricted diffusion of epidermoid cystQ. FLAIR and proton images are less specific than DWI.

7. Cavernous hemangioma is characterized by:

a) Reticulated popcorn like configuration

b) Well defined nidus

c) Well defined arterial feeder

d) Phlebectasis

Correct Answer - A
A i.e. Reticulated popcorn like configuration
T2 gradient echo MRI is the investigation of choice for identification of cavernous angioma (cavernous hemangioma or cavernoma), which typically demonstrates a mass characterized as *popcorn in appearance (mulberry shaped lesion)Q.*

8. All are true about thymus swelling except:

a) Widening of mediastinum on X-Ray

b) Sharp border with shail like appearance

c) Steroid administration reduces size of swelling

d) Shift of trachea on X-ray

Correct Answer - D

D i.e. Shift of trachea on X Ray

Prominent but normal thymus is the *most common pseudotumor of anterior mediastinum.* On imaging anterior mediastinal tumors displace the trachea and oesophagus posteriorly and laterlly in a contradistinction to a *normal enlarged thymus which does not displace adjacent structuresQ*

Thymic Tumors

Normal Thymus Gland

It is the *commonest cause of mediastinal abnormality in infants* and is usually seen as *triangular soft tissue mass projecting to one side* (usually right) of mediastinum.

It may *disappear during severe neonatal infections, or after major surgery corticosteroid treatmentQ,* but may reappear following recovery from illness.

Thymus gland is completely absent in *Di-George's syndrome,* an immune deficiency disease involving T lymphocyes. It is seen as *a triangular arrow head or bibbed structure* in children and young adult patients on CT but undergoes fatty involution in adults & elderly.

Enlargement of thymus gland can be d/t *thymoma, thymic hyperplasia, thymic carcinoma, lymphoma, thymo lipoma, carcinoids & germ cell tumors & thymic cysts.*

Thymic Hyperplasia

Although uncommn & rare, it is the most common anterior

Although uncommon & rare, it is the most common anterior mediastinal mass in paeditric age group.

The most common association of thymic hyperplasia is mysthenia gravis (65%) and **thyrotoxicosis** (eg *Grave's disease,* treatment of hypothyroidism etc. Other associations include *Addison's disease, acromegaly, SLE, RA,* and after stress atrophy, where the thymus gland initially atrophies in patients on chemotherapy, or corticosteroid treament, irradiation, stress, severe illness (burns) or after treatment for Cushing's disorder and then becomes larger than its previous normal size (i.e. enlarges) once the treatment is stopped or stress **is** ended. The phenomenon is called **rebound thymic hyperplasia.** It is differentiated from recurrent malignant disease on the basis of a *known reason for rebound and presence of normal shaped enlarged thymus*

Rarely cause visible enlargement, but when it does, both lobes are enlarged, *usually uniformly with a diffuse symmetrical enlargment.* Radiological signs include.

1. **Wave sign** is a rippled thymic contour (border) d/t indentation by *anterior rib ends.*
2. **Notch sign** is indentation at the junction of thymus with *heart.*
3. **Sail sign** is a *triangular density projection* from superior mediastinum on one or both sides.
4. Shape change with respiration & position

Thymoma

It is the *most common tumor of thymus in adults and most common primary tumor of anterior mdidastinum in adultsQ.*

Most (90%) thymomas arise in *upper anterior mediastinum* usually anterior to ascending aorta, lying on the right ventricle outflow tract and pulmonary artery.

It is rare under 20, extremely unusual below 15 and usually presents at *50 year age* (earlier in those who present with mysthenia gravis)

Thymoma is often asymptomatic 50% but can also present with mysthenia; red cell aplasia, hypogammaglobulinemia. About 10-25% mysthenics have thymoma and 25-50% of thymoma patients have mysthenia gravis.

It may cause *mediastinal wideningQ* and displacement of heart and great vessels posteriorly (but not trachea)-in benign cases; and *can*

invade mediastinal fat & pleura in invasive malignant variety.
It may be undetectable on chest x-ray when small, indicating the need of CT (which is **investigation of choice & most sensitive).**
Thymomas give rise to *asymmetrical focal swelling* which appear as well defined round or oval soft tissue mass projecting to one side of anterior mediastinum. It may contain punctate or curvilinear calcification and areas of low attenuation d/t cystic degenration. MRI is also useful for diagnosis.

Thymic Carcinoid

It presents with *cushing's syndrome (d/t ACTH serection), hyperparathyroidism and inappropriate ADH secretion.* Radiographic & CT features resemble thymoma

Thymolipoma

Can grow to a very large size before discovery and,being soft, mould themselves to the adjacent mediastinum and diaphragm, mimicing cardiomegaly or lobar collapse.
Very large soft tissue mass with less radiographic density than expected for its size, which alters it shape on respiration indicates thymolipoma

9. The most recent advance in noninvasive cardiac output monitoring is use of:

a) PA catheter

b) Thermodilution technique

c) Echocardiography

d) Electrical impedance cardiography technology

Correct Answer - D
D i.e. Electrical impedance cardiograph technology
- PA catheter & thermodilution technique are invasive procedure.
- Echo is noninvasive old technique to measure cardiac output
- Recent noninvasive advance to measure C.O. is electrical impedance Cardiographs technology.

10. Best test to determine etiology of SAH

a) Enhanced CT

b) Unenhanced CT

c) Intra arterial digital Substraction Angiography

d) MRI

Correct Answer - C
C i.e. Intra arterial digital Substraction

- Once dx is done by CT Scan; digital substraction angiography (DSA) is done to determine etiology.
- *DSA is most sensitive & best inv. for determining etiologyQ.*
- Now DSA is being replaced by noninvasive methods as MRA (MRI - angiography) & CTA (CT - Angiography).

11. Calcification of the intervertebral disc is present in:

a) Maple syrup urine disease

b) Homocystinuria

c) Ankylosing spondylitis

d) Achondroplasia

Correct Answer - C
Ans. Ankylosing spondylitis

12. All of them use non-ionizing radiation, *except:*

a) Ultrasonography

b) Thermography

c) MRI

d) Radiography

Correct Answer - D
Ans. Radiography

13. A neonate presents with congestive heart failure, on examination enlarging fontanellae, bruit on auscultation, on USG shows midline hypoechoeic lesion, most likely diagnosis:

a) Malformation of vein of galen

b) Aqueduct stenosis

c) Arachnoid cyst

d) Medulloblastoma.

Correct Answer - A
Ans. Malformation of vein of galen

14. Which among the following is not a risk factor for contrast-induced nephropathy?

a) Diabetic nephropathy

b) High osmolar agent

c) Obesity

d) Dehydration

Correct Answer - C
Ans. C
Side effects of iodinated contrast material are:

- Idiosyncratic – Anaphylactoid reaction. They are **complement-mediated** reactions and **not IgE**. The patient develops bronchospasm and hypotension.
- Dose-dependent side effect – Contrast-induced nephropathy and seen especially with high osmolar agents.

Contrast-induced nephropathy:

- The patient has non-oliguric transient nephropathy and occurs due to **tubular damage**. It is defined as the impairment of renal function and is measured as either a **25%** increase in serum **creatinine** from baseline or **0.5 mg/dl** increase in absolute value, **within 48-72hrs** of intravenous contrast administration.

Risk Factors for Contrast Medium-Induced Nephropathy:
Patient-related:

- eGFR < 60 mL/min/1.73 m2 before intra-arterial administration
- eGFR < 45 mL/min/1.73 m2 before intravenous administration

In particular in combination with:

- Diabetic nephropathy
- Dehydration
- Congestive heart failure (NYHA grade 3–4) and low LVEF

- Recent myocardial infarction (
- Intra-aortic balloon pump
- Peri-procedural hypotension
- Low hematocrit level
- Age over 70
- Concurrent administration of nephrotoxic drugs
- Known or suspected acute renal failure

Procedure-related:

- Intra-arterial administration of contrast medium
- High-osmolality agents
- Large doses of contrast medium
- Multiple contrast medium administrations within a few days
- If the patient is on Metformin and is having de-arranged RFT, then before giving contrast agent metformin should be stopped since it can precipitate lactic acidosis

15. Anorchia best diagnosed by:

a) USG

b) SPECT

c) CT

d) Laparoscopy

Correct Answer - D
Ans. Laparoscopy

16. Lactating women with painful breast, 1st investigation to be done should be:

a) USG

b) Mammography

c) CT

d) MR1

Correct Answer - A
Ans. USG

17. Radiologically, increased pulmonary blood flow is indicated by the following *except:*

a) Descending pulmonary artery diameter> 16 mm

b) Kerley b lines

c) Diameter of peripheral arteries > 2 accompanying bronchiole

d) > 6 blood vessel in outer 1/3''

Correct Answer - B
Ans. Kerley b lines

18.

A patient of RTA with injury over chest and limbs has low sp 02. M mode US of right upper part of chest shows stratosphere sign. What is the diagnosis?

a) Haemothotax

b) Pneumothorax

c) Cardiac tamponade

d) Pulmonary embolism

Correct Answer - B
Ans. Pneumothorax

19. Full form of FAST?

a) Focused abdominal sonography for trauma

b) Focused assessment by sonography for trauma

c) Focussed assessment by sonography and tomography

d) Fast assessment by sonography and trauma

Correct Answer - B
Ans. Focused assessment by sonography for trauma

- FAST stands for **Focused assessment with Sonography for trauma.** It is a **rapid diagnostic examination** to assess patients with potential thoracoabdominal injuries.
- Performed **within 2-4 minutes.**
- **Sequentially surveys** for the presence or absence of blood in the **pericardial sac**, the Right Upper Quadrant (**RUQ**), Left Upper Quadrant (**LUQ**), and **pelvis.**
- 4 ‘Ps’ are evaluated in sequence: Pericardial sac → Perihepatic region → Perisplenic region → Pelvis.
- **FAST** also stands for **Focussed abdominal sonography for trauma.** However, since FAST is not only used to assess abdominal injuries but also to assess haemopericardium in cases of pericardial injuries, the expansion "**Focussed assessment with sonography for trauma**" is preferred.

20. A 14 year old obese child is referred from an endocrinologist for painful limping of hip.Which of the following investigation is least useful in this clinical setting?

a) CT

b) USG

c) MRI

d) X-ray PBH

Correct Answer - B
Ans. USG
Slipped Capital Femoral Epiphysis (SCFE):
Age: Adolescence, during period of rapid growth (l 1-16 years)
Patients are either overweight (fat) and sexually immature
Presents with tendemess at Scarpa's triangle with slight limitation of flexion
USG can detect early slip by demonstrating joint effusion and step.
CT is useful in demonstrating closure of the proximal femoral physis assessment of severity of residual deformity, and
penetration ofhipjoint by fixation device.
Tc-99 scan show increased uptake in capital femoral physis in SCFE, decreased uptake within epiphysis is highly specific
for AVN.

21. Symptomatic spinal injury without any radiological evidence most commonly found in:

a) Children

b) Elderly

c) Teenagers

d) Young adults

Correct Answer - A
Ans. Children

22. Which of the following is true regarding the principle of use of MRCP

a) Intraluminal dye is used to create the three dimension view of the structures

b) Dye is instilled percutaneously first then MRI is used

c) Use of heavily T2-weighted image without contrast to create the three dimensional image of the biliary tree using MIP algorithm

d) Use of systemic Gadolinium as a contrast agent to create the three dimensional image of the biliary tree

Correct Answer - C

Ans. c. Use of heavily T2-weighted image without contrast to create the three dimensional image of the biliary tree using MIP algorithm

- MRI cholangiography and MRI cholangiopancreatography (MRCP) are imaging techniques used to evaluate the biliary system.
- Heavily T2-weighted images are used to provide an overview of the biliary system and pancreatic duct.
- O " hspace="11" height="590" align="left" width="49">Excellent diagnostic-quality images are obtainable, with high sensitivity and specificity for evaluation of biliary duct dilation, strictures, and intraductal abnormalities.
- Magnetic Resonance Cholangiopancreatography:
- The basic principle of MRCP is to use T2-weighted images, in which stationary or slowly moving fluid, including bile, is high in signal intensity; all the surrounding tissues, including retroperitoneal fat and the solid visceral organs, are lower in signal.
- MR-specific techniques for obtaining cholangiographic images include two-dimensional and three-dimensional sequences, breath-hold or non–breath-hold techniques, and respiratory gated

techniques.

- MRCP plays an important role in imaging benign disorders of the biliary and pancreatic system, and it is part of a comprehensive imaging evaluation of malignancies of the biliary system.
- MRCP is noninvasive, eliminating the morbidity associated with ERCP or PTC.
- An additional advantage of MRCP includes visualization of the extrabiliary anatomy, allowing for exclusion or inclusion of alternative diagnoses.
- Surgical clips may create an artifact known as susceptibility, which may obscure the region of interest by producing areas of signal void. This artifact may mimic a stone, so caution must be used in evaluating MRCP images in postoperative patients to avoid a false-positive diagnosis.
- MIP (Maximum Intensity Projection) Algorithm:
- CE FAST (Fourier-acquired steady state) or FSE (Fat spinal echo) require image processing with a maximum intensity projection (MIP) algorithm, allowing rotation of summed image and display of the cholangiogram to best advantage.

23. Phase of the Cell cycle which is most sensitive to radiation

a) G,S

b) GI, G2

c) G,M

d) GO, G1DEXA scan

Correct Answer - C
Ans. c. G_2M

24. Stereotactie surgery is used for treatment of

a) Brain tumor

b) Lungs carcinoma

c) Cervix cancer

d) Renal carcinoma

Correct Answer - A
Ans. a. Brain tumor

25. Bracket calcification on skull X-ray is seen in

a) Tuberous sclerosis

b) Sturge-Weber Syndrome

c) Corpus callosum lipoma

d) Meningioma

Correct Answer - C
Ans. c. Corpus callosum lipoma

26. A 8-year old child was injected contrast in hand for CECT chest. Immediately he developed swelling in the arm which gradually increased. After 4 hours, there was numbness and pain, and he was not allowing the doctor to flex the hand. Pulse is present. What should be done?

a) High dose prednisolone

b) Arterial thrombectomy

c) Immediate fasciotomy

d) Angiography

Correct Answer - C

Ans. c. Immediate fasciotomy

Immediate development of swelling in the arm after contrast injection with numbness and pain is higly suggestive of compartment syndrome due to extravasation of contrast medium. Best treatment is immediate fasciotomy, so that contrast medium and fluid can be drained and patient can be relieved

Extravasation of Contrast and Compartment Syndrome

- Extravasation of contrast is a possible complication of imaging studies performed with contrast
- Most cases of subcutaneous extravasation occur due to small volumes of extravasation of contrast causing swelling and localized erythema, that is rapidly resolved
- If larger volumes are extravasated, extensive tissue and skin necrosis may occur. Compartment syndrome is a very rare

complication

- Acute compartment syndrome occurs when the tissue pressure within a closed muscle compartment exceeds the perfusion pressure and results in nerve and muscle ischemie[Q]
- It typically occurs subsequent to a traumatic event, most commonly a fracture[Q]

Clinical Features:

- Classic features: Pain (bursting sensation), altered sensibility and paresis (or more usually, weakness in muscle contraction).
- Ischemic muscle is highly sensitive to stretch.
- If the limb is unduly painful, swollen or tense, the muscles (which may be tender) should be tested by stretching

Diagnosis:

- Confirmation of the diagnosis can be made by measuring the intra-compartmental pressure.

Treatment:

- Emergency fasciotomy[Q]

27. Stereotactic radiotherapy is used in

a) Miliary tuberculosis

b) Stage I lung carcinoma

c) Lymphangitis Carcinomatosa

d) Carcinoma base of tongue with positive lymph nodes

Correct Answer - B
Ans. b. Stage I lung carcinoma

28. Which of the following is a non-Iodine containing contrast?

a) Gadolinium

b) Visipaque

c) Iopamidol

d) Diatrozoate

Correct Answer - A
Ans. a. Gadolinium

29. Maximum radiation exposure occurs in

a) Bone scan

b) X-ray

c) MRI

d) CT scan

Correct Answer - D
Ans. d. CT scan
Maximum radiation exposure occurs in CT scan among the given options.

30. A person has an injury in the forefinger with glass and it is suspected that he has a retained piece of glass in his finger. What is the first investigation you will do?

a) MRI

b) CT scan

c) Plain radiograph

d) Ultrasonography

Correct Answer - C

Ans. c. Plain radiograph

'Plain **films** can be clinically beneficial in locating glass foreign bodies in deep wounds with or without exploration.'

Glass Foreign Body

- Patients with glass embedded *in a* wound are more likely to report the sensation of foreign bodies.
- In patients with sensation of foreign body, superficial wounds that have been adequately explored do not require radiography.
- Plain films can be clinically beneficial in locating glass foreign bodies in deep wounds with or without explorationQ
- In patients without sensation, the history can guide the decision for further investigation.
- All glass is radiopaque; however, there is limited ability for radiography to detect glass fragments smaller than 2 mm.
- Glass is inert and can be left in place if it is difficult to locate or remove.

31. Which of the following is the investigation of choice for evaluation of acute head injury?

a) NCCT Head

b) CECT Head

c) MRI Braind

d) PET scan

Correct Answer - A
Ans. a. NCCT Head
'The non-contrast CT scan of the head is an extremely useful diagnostic tool in the setting of new focal neurologic deficit, decreased mental status, or trauma. It is rapid and almost universally available in hospitals in the United States. Its sensitivity allows for the detection of acute hemorrhage. A contrast-enhanced CT scan will help show neoplastic or infectious processes. In the current era, contrast CT generally is used for those patients who cannot undergo magnetic
'MRI provides excellent imaging of soft tissue structures in the head and spine. MRI angiograms can detect stenosis of the cervical carotid arteries or intracranial aneurysms >3 mm in diameter. MR1 venograms can assess the dural venous sinuses for patency or thrombosis.

32. A patient taking 120 ml alcohol everyday since last 12 years is brought to the hospital by his wife and is diagnosed to have alcohol dependent syndrome. Which of the following drug should be avoided in the management?

a) Phenytoin

b) Di sulfiram

c) Naltrexone

d) Acamprosate

Correct Answer - B
Ans. b. Disulfiram
Disulfiram should not be used in alcohol dependent patients as it can cause severe disulfiram-ethanol reaction.

Alcohol sensitizing drugs (Deterrent agents)

Disulfiram[Q]	Sulfonylureas (especially Chlorpropamide[Q]
Citrated calcium carbimide (CCC)	Cephalosporins:
Metronidazole[Q]	Cefoperazone[Q]
Nitrafezole[Q]	Moxalactam[Q]
Methyltetrazolethiol	Cefamandole[Q]

33. Puff of smoke appearance on cerebral angiography is seen in:

a) ACA aneurysm

b) Cavernous sinus thrombosis

c) Moyamoya disease

d) Vein of Galen malformation

Correct Answer - C
Ans. c. Moyamoya disease

- **Moyamoya disease** is an idiopathic, non inflammatory, non atherosclerotic progressive vasculo-occlusive disease involving the circle of Willis, typically the supraclinoid internal carotid arteries.
- **Small abnormal net-like vessels proliferate giving the characteristic "puff of smoke" appearance on direct angiography.** CTA and MRA is not always able to demonstrate this appearance on account of lower flow and spatial resolution.

34.

A 7-year old patient p. its with headache, paralysis of upward gaze, loss of ilOtt perception and accommodation, nystagmus and failure of convergence. CT scan showed homogenous hyperdense lesion above the sella and in the posterior part of the third ventricle. MRI showed that the lesions were homogenous and isointense on T1 weighted imaging, and isointense onT2 weighted imaging with intense contrast enhancement. The most likely diagnosis is:

a) Teratoma

b) Germinoma

c) Dermoid

d) Choroid plexus carcinoma

Correct Answer - B
Ans. b. Germinoma
Central Nervous System Germinoma
Intracranial germinomas are a type of germ cell tumor
Predominantly seen in pediatric population
Tend to occur in the midline, either at the pineal region (majority) or along the floor of the third ventricle or suprasellar
region
. MC tumor of pineal region
Clinical Features:

Clinical Features:
. Presentation depends on location, with the compression of tectal plate leading to obstructive hydrocephalus and
Parinaud syndrome
Parinaud syndrome
. Parinaud syndrome is one of the most common presentation in CNS germinomaa
. Seen in for 34-50% of casesa
. It is due to compression on the tectum.
. The syndrome comprises paralysis of upward gaze, loss of light perception and accommodation,
nystagmus, and failure of convergenceo,
Diagnosis:
. MRI is excellent in delineating tumor anatomya and may suggest specific tumor type
. Germinomas are homogeneous and show isointensity or slightly low signal intensity on Tl-weighted
images, and isointensity or high intensity on T2-weighted images

35. A patient presents with cough and fever. On X-ray examination, a homogenous opacity silhouetting the right heart border with ill-defined lateral margins is seen. What would be the most probable diagnosis?

a) Pneumonia affecting medial zone of right middle lobe

b) Pneumonia affecting superior zone of right lower lobe

c) Loculated pleural effusion

d) Pneumonia of anterior zone of right middle lobe

Correct Answer - A

Ans. a. Pneumonia affecting medial zone of right middle lobe

Homogeneous paracardiac opacity in right lung, near right cardiac silhouette with ill-defined lateral border is suggestive of pneumonia affecting medial zone of right middle lobe.

Silhoutte sign is very useful in localizing lung lesions as all structures forming cardiac silhouette (heart border, ascending, descending aorta, aortic knob and hemidiaphragm) are in contact with a specific portion of lung.

Silhoutte Structure	**Lung Portion in Contact**
Ascending aorta, upper right heart border and upper pole of hilum	Anterior segment of right upper lobe
Right heart border	Right middle lobe
Aortic knob	Apical portion of left upper lobe (posterior)

Upper left heart border	Anterior segment of left upper lobe
Left heart border	Lingula (anterior)
Anterior hemidiaphragm	Lower lobe (anterior)
Position of oblique fissure is best index of lower lobe volume	

36. Which of the following is not seen on ultrasound in acute pyelonephritis?

a) Grossly enlarged kidney

b) Focal area of hypoechogenecity

c) Perinephric collection (pus in the perinephric space)

d) Increased vascularity

Correct Answer - D
Ans. d. Increased vascularity
In acute pyelonephritis, Color and power Doppler evaluation typically shows decreased perfusion in the affected parenchyma, which has been attributed to arteriolar vasoconstriction and interstitial edema in response to bacterial infection.
Features of Pyelonephritis on Ultrasound

- Particulate matter in the collecting system
- Gas bubbles (emphysematous pyelonephritis)
- Abnormal echogenicity of the renal parenchyma
- FocaUsegmental hypoechoic regions
- Diffuse or focal enlargement of the kidney, sometimes with a mass-like lesion
- Color and power Doppler evaluation typically shows decreased perfusion in the affected parenchyma, which has been attributed to arteriolar vasoconstriction and interstitial edema in response to bacterial infection.

37. A 70 years old female is on treatment withAlendronate for 7 years for osteoporosis. Now she complains of pain in right thigh'at is the next investigation to be performed?

a) DEXA scan

b) X-ray

c) Serum vitamin D levels

d) Serum alkaline phosphate levels

Correct Answer - B
Ans. b. X-ray
The pain in right thigh in a 70 years old female, who is on treatment with alendronate for 7 years for osteoporosis might be due to femoral shaft fracture.
Plain X-rays showed a characteristic picture consisting of a transverse or short oblique fracture line, lateral cortical thickening, and medial spiking.
Spontaneous femoral shaft fracture after long-term alendronate:

- Alendronate is used as first-line treatment for osteoporosis in postmenopausal women worldwide.
- The evidence supporting its benefit in reducing the risk of fragility fracture among this high-risk group is well established.
- Due to its mechanism of action, there were concerns about potential reduction in bone turnover, repair of microdamage and hence reduced bone toughness and increased risk of fractures with long-

term use.

Plain X-rays:

- Plain X-rays showed a characteristic picture consisting of a transverse or short oblique fracture line, lateral cortical thickening, and medial spiking.

38. Best noninvasive investigation to check for viability of myocardium is:

a) FDG-18 PET CT

b) MIBG scintigraphy

c) Echocardiogram

d) Thallium scintigraphy

Correct Answer - A
Ans: A. FDG-18 PET CT
(Ref Harrison 19/e p270 e4, 18/e p1846).

- Best noninvasive investigation for myocardium viability check = FDG-18 PET CT

Viable myocardium:

- Non-contracting ischemic myocardium at rest.
- Has full potential to recover its function (On self or on revascularization).

PET:

- **Gold standard for assessment of myocardium viability.**
- Identifies ischemic or hibernating myocardium in 10-20% of fibrotic or infracted regions.
- Uses thallium & technetium labeling.
- **Positron-emitting tracer F-18 fluorodeoxyglucose (FDG) assesses myocardial glucose metabolism – Hence an indicator of myocardial viability.**

Evaluation methods of myocardial viability:

- Mainly in ischemic cardiomyopathy patients.
- Myocardial perfusion imaging (with SPECT or PET) combined with metabolic imaging (i.e., fluorodeoxyglucose I FDGJ PET).

Excellent alternative:

- Thallium-201 SPECT imaging (hospitals lacking PET scanning).

39. Patient with history of tachyarrhythmias is on implantable cardioverter defibrillator. He develops shock. Best method to know the position and integrity of ICD is:

a) CECT

b) MRI

c) USG

d) Plain radiograph

Correct Answer - A
Ans: A. CECT
(Ref Hurst 's The Heart 13/e p1050)
Plain radiograph:

- Best method to know ICD position & integrity.

ICD Lead dislodgement:

- Radiographically visible.

- Significant increase in pacing threshold /decline in electrogram amplitude.

40. Expansion of the contrast filled space in myelography is seen in:

a) Intramedullary tumor

b) Intradural extramedullary tumor

c) Spinal dysraphism

d) Extradural tumor

Correct Answer - A
Ans: A. Intramedullary tumor
(Ref Sutton 6/e p254: Neurology in Clinical Practice 4/e Vol I p579)
Myelography:

- Expansion of contrast filled space (i.e. subarachnoid space) – Any intramedullaty extradural lesion (meningioma).
- Sometimes filling defect causing “meniscus sign” demonstrable.

Levels of Block in Myelography

Site	Typical Appearance
Extradural block	• Feathered appearance
Intradural Extramedullary block	• Meniscus sign • Widening of ipsilateral subarachnoid space
Intramedullary block	• Widening of the cord • Trouser leg appearance

41.

Which of these is not a part of catatonia?

a) Akathisia

b) Ambivalence

c) Ambitendency

d) Akinesia

Correct Answer - A
Ans: A. Akathisia
(Ref Kaplan and Sadock 11/e p329, 871; Niraj Ahuja 7/e p59).
Akathisia:

- Not a part of catatonia.
- Characterized by a subjective & objective sense of restlessness, anxiety & agitation.

Ambitendency:

- Example of negativism.
- Considered an ambivalence form.

Ambivalence:

- Sign of Schizophrenia.

42. Which of the following is the least useful for diagnosis of Spondylolisthesis?

a) **CT**

b) MR

c) X-ray lumbar spine- AP view

d) X-ray lumbar spine- Lateral view

Correct Answer - C

Ans. c. X-ray lumbar spine- AP view (Ref Tureks 6/e p503; Maheshwarl 3e/p 237; Wolfgang 7/e p 228-29, 206; Sutton 7/e p/66'

- Although for imaging of spondylolisthesis usually all are done, AP view appears to be least useful of these choices. On AP view, spondylolisthesis can show a sign called Napolean Hat sign. The lateral view is useful in detecting spondylolisthesis; it may demonstrate the pars defect.
- Spondylolisthesis is forward slip of one vertebrae upon another; so it is best viewed (or seen earliest) in sagittal images of spine i.e. lateral and oblique X-ray of spine and saggital and axial views of CT and MRI[Q]

43. A middle aged female presents with slowly progressive weakness of lower limbs, spasticity and recent onset hesitancy of Micturition. On neurological examination there is evidence of dorsal myelopathy. MRI scan of spine reveals middorsal intradural contrast enhancing mass lesion. Diagnosis is:

a) Intradural lipoma

b) Dermoid cyst

c) Meningioma

d) Epidermoid cyst

Correct Answer - C
Ans. c. Meningioma (Ref. Harrison 19/e p602, I 8/e p3388; Chapman 4/e p431; Sahicton /9/e p 1888- 1889; Schwa/17 9/e p1540- I 541: Bailey 26/e p614, 25/e p633)
Diagnosis in a middle aged female with slowly progressive weakness of lower limbs, spasticity and recent onset hesitancy of micturition with evidence of dorsal myelopathy and middorsal intradural contrast enhancing mass lesion on MRI is meningioma.

44. Empty Thecal sac sign in:

a) Arachnoiditis

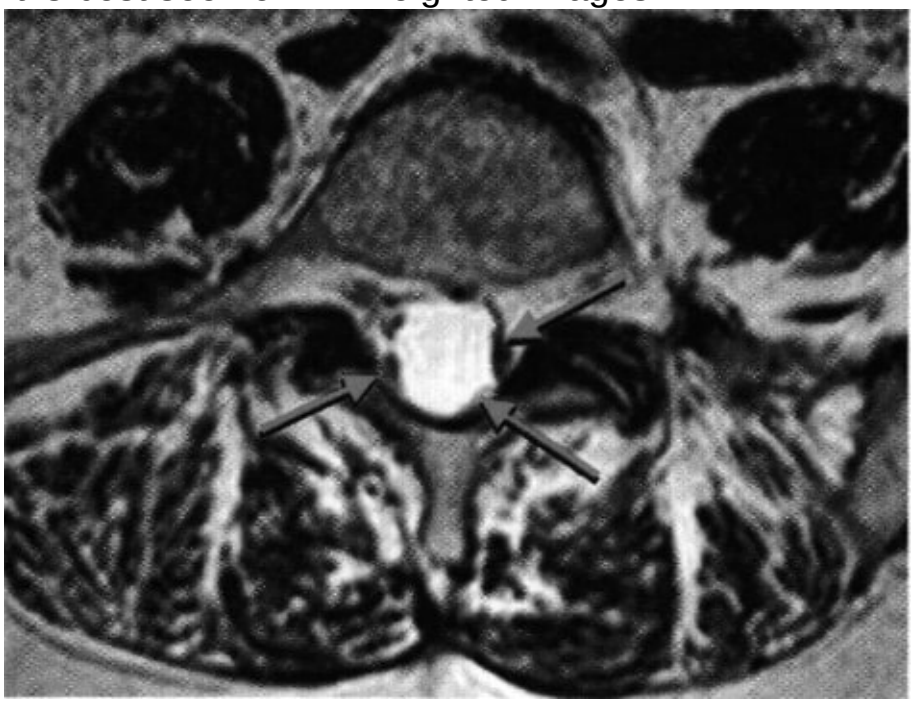
b) Tethered Cord syndrome

c) Vertebral osteomyelitis

d) Discitis

Correct Answer - A
Ans: A. Arachnoiditis

- The empty thecal sac sign or empty sac sign is when the thecal sac appears empty on MRI of the lumbar spine. If the empty thecal sac sign is present, a diagnosis of adhesive arachnoiditis can be made.
- It is best seen on T2-weighted images.



- MRI findings: It can be present throughout the subarachnoid space, it is most easily seen in the lumbar region where the cauda equina

usually floats in ample CSF.

45. Patient with carcinoma endometrium treated with pelvic external beam irradiation to whole pelvis. Which of the following organs is most radiosensitive in the pelvic region?

a) Ovary

b) Vagina

c) Bladder

d) Rectum

Correct Answer - A

Ans: A. Ovary

(Ref Perez and Brady's Principles of Radiation Oncology 6/e p65)

- Among the given options, most radiosensitive organ is ovary >rectum >bladder >vagina.
- (Radiation tolerance dose: Ovary = 2-3 Gy; Rectum = 60 Gy; Bladder = 65 Gy; Vagina = 90 Gy).

46. A patient with pain abdomen for 2 hours presents to the casualty and the following X-ray was obtained. What is the most likely diagnosis?

a) Pneumoperitoneum

b) Subphrenic abscess

c) Pneumomediastinum

d) Amebic liver abscess

Correct Answer - A
Answer-A. Pneumoperitoneum

- MC cause of pneumoperitoneum: Perforation of hollow viscus (leading to release of air from bowel and collection just below the diaphragm)
- Best projection to derhonstrate pneumoperitoneum: Chest X-ray
- If the patient cannot get into an erect position then left lateral decubitus projection is required.
- Patient should be in that position for l0 mina at least for air to rise up.
- By careful technique even 1 ml of air can be detected

47. A young female with history of renal calculi complains of bone pain and abdominal cramps. On investigation, multiple fractures were discovered and serum calcium and PTH was raised. Which of the following will be the best investigation to arrive at a definitive diagnosis?

a) CECT neck

b) Sestamibi scan

c) Radioiodine scan

d) Ultrasound neck

Correct Answer - B
Answer- B. Sestamibi scan
History of renal stones, bone pains and abdominal cramps with history of fractures is highly suggestive of hyperparathyroidism. Most common cause of primary hyperparathyroidism is parathyroid adenoma- Sestamibi scan is the best investigation to delineate parathyroid abnormalities.

48. Find out the picture of radiographic image shown below-

a) Scoliosis

b) Marfans syndrome

c) Osteogenesis imperfecta

d) Klinifelter syndrome

Correct Answer - A
Correct answer: A. Scoliosis
The image shows characteristic **wedged vertebrae** (fused) with **absent ribs** which are suggestive of **congenital** (osteopathic) **scoliosis**.