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DISCIPLINE = BS - (RAD)

SUBJECT = CT - PROCEDURES

SUBMITTED TO = MAM - MAHEEN

* QUES NO 4:-

Write the patient positioning and examination protocol for the CT procedure advised for tarsal coalition.

* ANSWER :-

* CT MUSCULOSKELETAL - ANKLE:-

* Indications:-

Tarsal coalition, talus or calcaneal pathology, ankle joint pathology and loose bodies.

* Patient Preparation or patient Positioning:-

⇒ Patient lying in supine position, feet first.

⇒ Lower extremity of interest extended on foot holder (or box) with foot perpendicular to table.

⇒ Opposite leg should be bent at knee and placed out of scan range.

⇒ Ankle/foot is immobilized.

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* Imaging protocol: (Ankle/
Foot 2mm (0.5mm))

Pre-Head only if recent
severe headaches (to R/O
subarachnoid bleed) Post-CE
Head.

Scan Slice Thickness	0.5mm x 64
Pitch	Detail
kV	120
mA	250
Rotation Time	0.5 s

* Scan range:-

Start	2cm below base of skull
End	Mid head
Plane	Parallel to base of skull

* Contrast :-

Single-phase contrast injection protocol.

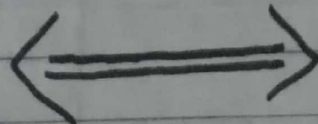
Phase 1	XX ml @ 4-5ml/s
Phase 2 (Saline)	50ml @ 4-5ml/s

$XX = (\text{Scan time} + 10) \times \text{injection rate}$

SURE Start in Manual mode at the level of the start of the scan. Trigger the helical scan as soon as contrast is seen.

* Image Reconstruction:

2/2mm	CTA Brain
Volume	CTA Brain



* QUES 5 :-

Which CT angiography procedure should be performed for investigating coronary artery disease (CAD). Explain the complete protocols for that CTA?

* ANSWER :- CT-vascular-CTA cardiac is used for investigation of CAD.

* CT Vascular - CTA Cardiac :-

* Indications :-

Investigation of Coronary artery disease, assessment of coronary stents.

* Patient Preparation or Positioning :-

⇒ Patient lying in supine position, feet first.

⇒ ECG dots placed on chest, arms above head.

* Imaging protocol: [Cardiac CTA (0.5mm)] :-

Scan slice thickness	0.5mm x 64
Pitch	Determined by SURE Cardio™
kV	120
mA	400
Rotation time	Determined by SURE Cardio

* Scan Range :-

Start	Caxion
End	Below apex of heart
Plane	Straight gantry

* Contrast :-

Single-phase contrast injection protocol.

Phase 1	XX ml @ 4-5 ml/s
Phase 2 (Saline)	50 ml @ 4-5 ml/s

- $XX = (\text{Scan time} + 10) \times \text{Injection rate}$
SURE Start on descending aorta at level of pulmonary trunk, Trigger at 180 HU.

* Image Reconstruction:-

Use ImageXact to determine the optimal phase for motion-free images.

Volume	Cardiac CTA
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* QUESTION 3:-

A patient was presented with the exacerbated chronic lower back pain in the sacral region with irradiation to the back of the left leg, producing -----
----- Identify the CT examination performed and explain the complete protocol for that examination?

* ANSWER:-

⇒ The examination which is performed in these indications is CT Musculo-skeletal - Lumbar Spine.

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* CT Musculoskeletal - Lumbar Spine :-

* Indications:-

Lower or Low Back Pain (LBP),
Sciatica, femoral neuralgia
and spinal canal stenosis.

* Patient preparation or patient positioning:-

⇒ Patient lying in supine position,
feet first.

⇒ Then placed sponge under
knees.

⇒ Can be scanned in lateral
decubitus.

⇒ If the patient was unable
to lie supine then the
patient is positioned in
prone or patient lying in
prone position.

* Imaging protocol: (Lumbar Spine 3mm (0.5mm)] [Lrg Lumbar Spine 3mm (0.5mm)] :

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Scan Slice Thickness	0.5mm x 64
Pitch	Detail
kV	135
mA	SURE Exposure 3D High Quality
Rotation Time	1.0S (1.5s)

* Scan range:-

Levels specified, otherwise

Routine L2-S1

IF patient < 30 years old, then
L3-S1 unless specific symptoms
@ L2-3.

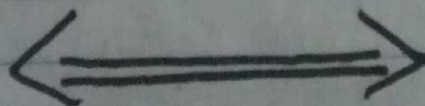
Start	Above 1 pedicle of L2
End	Below S1 (increase scan range to obtain sufficient data for MPRs for L5-S1 disc).

* Image reconstruction:-

3/3mm	Spine Thoracic-lumbar
3/3mm	Bone standard
Volume	Spine Thoracic lumbar

* Reformatting:-

Use spine program in MPR.



* QUESTION 2 :-

Patient of age 45 years has complaint of anosmia, which CT procedure is performed in such case and explain the complete protocol for that examination.

* ANSWER :- The CT procedure used for anosmia is CT Head and Neck - Sinuses.

* CT Head and Neck - Sinuses:

* Indications:-

Sinusitis, polyps, post-nasal drip, fracture facial bones, anosmia.

→ If clinical indication is anosmia reconstruct 5/5mm axial sections, ^{SURE IQ} - Soft Tissue Standard, and be sure to check anterior cranial fossa for lesions. (Requires post-contrast head study).

* Patient Preparation:-

→ Patient lying in supine position, head first, taking care to position head symmetrically

→ Always ask if patient has had previous surgery and when it was performed and document.

* Imaging protocol: (Sinuses HCT - 5mm (0.5mm)):

Scan Slice Thickness	0.5mm x 64
Pitch	Detail
KV	120
mA	150
Rotation Time	0.5s

* Scan range :-

Start	Below maxillary sinuses
End	Above frontal sinuses
plane	Parallel to hard palate

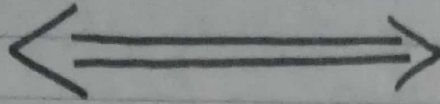
* Image Reconstruction:-

5/5mm	Bone sharp
Volume	Bone sharp

* Reformatting :-

Multiview	Coronal	Sagittal
Plane	Perpendicular to hard palate	Perpendicular to hard palate
Start	Anterior to frontals	Medial wall of left orbit
End	Posterior to sphenoids	Medial wall of right orbit
Thickness	2mm	2mm
Spacing	2mm	2mm

If the patient is not straight, reformatting may need to be performed manually to ensure correct anatomical position.



* QUES 1:-

In which circumstances is liver triphasic examination performed? what is the general protocol for liver triphasic examination.

* ANSWER:-

* TRIPHASIC CT SCAN:-

* Reasons:-

- ⇒ Triphasic CT scan is a good non-invasive tool and can be used as first line imaging modality for differentiating benign and malignant focal liver lesions.
- ⇒ Benign lesions like haemangioma can be reliably differentiated from malignant liver lesion, therefore unnecessary biopsies can be avoided.
- ⇒ A CT scan of the liver may

be used to distinguish between obstructive and non-obstructive jaundice.

⇒ Another use of CT scans of the liver and biliary tract is to provide guidance for biopsies and aspiration of tissue from the liver or gallbladder.

⇒ A CT scan of the liver and biliary tract may be performed to assess the liver or gallbladder and their related structures for tumors and other lesions, injuries, bleeding, infections, abscesses, unexplained abdominal pain, obstructions or other conditions particularly when another type of examination, such as X-rays, physical examination and ultrasound is not conclusive.

* CT Body - Liver (Hypervascular):

* Indications :-

Rule out/follow up liver for hypervascular metastases from the following:

- 1) Primary liver tumors
- 2) Renal cell carcinoma, leiomyosarcoma, thyroid tumors, carcinoid and other

neuroendocrine tumors.

3) Melanoma and breast (may be hypovascular).

4) Pancreatic islet cells tumors, GIST (gastrointestinal stromal cell tumor).

* Patient Preparation:-

→ 4-hr fast

→ Positive oral contrast 60/45/30/15 min prior, remainder immediately prior to scan.

→ H₂O may be suitable alternative (750 mL, 30 min prior, 250 mL immediately prior to scan).

→ Patient lying in supine position, feet first.

* Imaging Protocol: (2 Phase Liver 5mm (d. 5mm))

Lxg 2 Phase Liver 5mm (1mm)

Scan Slice Thickness	0.5mm x 64 (1mm x 32)
Pitch	Standard
KV	120
mA	SURE Exposure 3D standard
Rotation Time	0.5s (0.75s)

* Scan range:-

	Arterial Phase	Portal venous phase
Start	Top to higher hemidiaphragm	Top of higher hemidiaphragm
End	Iliac crests	Below ischium
Plane	straight gantry	straight gantry

* Contrast:-

Volume	70-120ml (depending on patient weight)
Rate	4ml/s
Delay	SURE Start ^{4M} , 180HU in abdominal aorta + 10s Portal Venous @ 65s fixed delay

* Image Reconstruction:-

5/5mm	Body standard Axial
Volume	Body standard volume

* Reformatting:-

	Coronal	Sagittal
Multiview		
Start	Posterior	Left
End	Anterior	Right
Thickness	4mm	4mm
Spacing	4mm	4mm

* CT Body - Liver (Hypovascular)* Indications:-

→ Rule out/follow up liver for hypovascular metastases from the following:

- 1) Primary adenocarcinoma in digestive tract (esophagus, stomach, colon and rectum), pancreas or lung
- 2) Squamous cell carcinoma (head and neck, lung, anus).

3) Lymphoma

* Patient Preparation:-

- 4-hr fast
- Positive oral contrast 60/45/30/15min prior, remainder immediately prior to scan.
- H₂O may be suitable alternative (750ml 30min prior, 250 ml immediately prior to scan).

* Imaging protocol: [Abdomen 5mm (0.5mm)] [Lrg Abdomen 5mm (1mm)]:

Scan Slice Thickness	0.5mm x 64 (1mm x 32)
Pitch	Standard
kV	120
mA	SURE Exposure 3D standard
Rotation Time	0.5s (0.75s)

* Scan Range:

Start	Above higher hemidiaphragm
End	Below Ischium
plane	Straight gantry

* Contrast:-

Volume	70-120ml (depending on Pt. weight)
Rate	2-4ml/s
Delay	65-70s

* Image reconstruction:

5/5mm	Body standard Axial
Volume	Body standard volume

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* Reformatting:-

Multiview	Coronal	Sagittal
Start	Posterior	Left
End	Anterior	Right
Thickness	4mm	4mm
Spacing	4mm	4mm

