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 **Paper Radiological positioning.**

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**Ans question no 1:**

**OPG:-**

**An OPG is stand for (Orthopantomogram),**

**is a scan that gives a panoramic view of your jaw and teeth. The scan can provide information on wisdom teeth, bone loss, orthodontic assessment, jaw trauma, dental pain, or be used as part of a general dental check-up.**

**Position of Patient and Image Receptor:-**

**Any bulky clothing and radio-opaque objects, such as jewellery, dentures or hearing aids should be removed from the imaged area.The equipment is brought to the start position and careful explanation is given to the patient.A 15 30 cm image receptor is used on many machines; however, Direct Radiography (DR) technology may be utilized on newer equipment. The patient walks into the machine, holding the handles and adopting a ‘skiing’ position.The head is tilted downwards until the Frankfort plane is parallel with the floor and the machine height adjusted to allowthe patient to bite into the bite block, with upper and lower incisors withinthe grooves. The chin should be placed on the rest.Ensure the patient is not rotated by ensuring the sagittal plane light runs down the middle of the face. Close the head restraints.The patient is asked to place their tongue on the roof of their mouth to reduce the air shadow and is asked to keep still for 20 seconds. The exposure is taken. Observe the patent carefully.Direction and Centring of X-ray BeamThe antero-posterior light should be centred distally to the upper lateral incisor. This allows optimal positioning of the ‘focal trough’, the zone of focus outside of which the anatomical detail becomes blurred.**

**Essential Image CharacteristicsCorrect anatomical coverage, which should include the entire mandible and temporo-mandibular joints.**

**There should be good contrast and density between the enamel and dentine. The anatomical detail should be clearly defined with optimal resolution if the focal trough has been carefully placed in position.Edge-to-edge incisors.No removable metallic foreign bodies.No evidence of movement unsharpness.**

**No evidence of positioning errors, including rotation and errors within the occlusal plane (both external edges of the rami should be parallel to each other).The spinal shadow should be minimized.The air shadow at the roof of the mouth should be minimized if the tongue was placed correctly.**

**Additional ConsiderationsProblems can occur with producing an optimal image with this technique, due to a number of factors, including patient movement and positioning errors. It is essential that the patient is able to co-operate and stay still for up to 20 seconds for a successful examination to take place.**

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**Ans question no 2:-**

 **Lumber spine:-**

**The lumbar spine which consists of five vertebrae. It is utilised in many imaging contexts including trauma, postoperatively, and for chronic conditions.**

**LUMBAR SPINE ANTERO-POSTERIOR:-**

**Position of Patient and Image ReceptorThe patient lies supine on the Bucky table, with the median sagittal plane coincident with, and at right-angles to, the midline of the table and Bucky.The anterior superior iliac spines should be equidistant from the tabletop.The hips and knees are flexed and the feet are placed with their plantar aspect on the tabletop to reduce the lumbar arch and bring the lumbar region of the vertebral column parallel with the image receptor.The image receptor should be large enough to include the lower thoracic vertebrae and the sacro-iliac joints and is centred at the level of the lower costal margin.The exposure should be made on arrested expiration allowing the diaphragm to move superiorly. The air within the lungs would otherwise cause a large difference in density and poor contrast between the upper and lower lumbar vertebrae.**

**Direction and Centring of X-ray BeamDirect the central ray towards the midline at the level of the lower costal margin (L3).**

**Essential Image Characteristics**

**The image should include from T12 down to the bottom of the sacro-iliac joints.Rotation can be assessed by ensuring that the sacro-iliac joints are equidistant from the spine.The exposure used should produce a density such that bony detail can be discerned throughout the region of interest.**

**LUMBAR SPINE LATERAL VIEW:-**

**Position of Patient and Image ReceptorThe patient lies on their side on the Bucky table. If there is any degree of scoliosis, then the most appropriate lateral position will be such that the concavity of the curve is towards the X-ray tube.The arms should be raised and resting on the pillow in front of the patient’s head. The knees and hips are flexed for stability.The coronal plane running through the centre of the spine should coincide with, and be perpendicular to, the midline of the Bucky. The image receptor is centred at the level of the lower costal margin.**

**The exposure should be made on arrested expiration.This projection can also be undertaken erect with the patient standing or sitting.**

**Direction and Centring of X-ray BeamDirect the central ray at right-angles to the line of spinous processes and towards a point 7.5 cm anterior to the thirdlumbar spinous process at the level of the lower costal margin.**

**Essential Image Characteristics**

 **The image should include T12 downwards, to include the lumbar sacral junction.Ideally, the projection will produce a clear view through the centre of the intervertebral disc spaces, with individual vertebral endplates superimposed.The cortices at the posterior and anterior margins of the vertebral body should also be superimposed.The imaging factors selected must produce an image density sufficient for diagnosis from T12 to L5/S1, including the spinous processes.**

**UMBAR SPINE OBLIQUE VIEW:-Position of Patient and Image ReceptorThe patient is positioned supine on the Bucky table and is then rotated 45 degrees to the right and left sides in turn.The hips and knees are flexed and the patient is supported with a 45-degree foam pad placed under the trunk on the raised side.The image receptor is centred at the lower costal margin.**

**Direction and Centring of X-ray BeamDirect the vertical central ray towards the midclavicular line on the raised side at the level of the lower costal margin.**

**Essential Image CharacteristicsThe degree of obliquity should be such that the posterior elements of the vertebrae are aligned in such a way as to show the classic ‘Scottie dog’ appearance.**

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**Ans question no 3:-**

**KNEE – ANTERO-POSTERIOR**

**Position of Patient and Image Receptor**

**For computed radiography (CR), an 18 24-cm image receptor is generally used.The patient is either supine or seated on the X-ray table, with both legs extended.The affected limb is rotated to centralize the patella between the femoral condyles, and sandbags are placed against the ankle to help maintain this position. The image receptor should be in close contact with posterior aspect of the knee joint, with its centre level with the upper borders of the tibial condyles.**

**Direction and Centring of X-ray BeamCentre 2.5 cm below the apex of the patella through the joint space, with the central ray at 90 degrees to the long axis of the tibia.**

**Essential Image Characteristics The patella must be centralized over the femur. The distal third of femur and proximal third of tibia are included.**

**Additional ConsiderationsThis projection can also be undertaken in the erect position.**

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**Ans question no 5**

**Part A:-**

**Importance of kvp and mAs:**

**kVp controls the property called "radiographic contrast" of an x-ray image (the ratio of transmitted radiation through regions of different thickness or density). Each body part contains a certain type of cellular composition which requires an x-ray beam with a certain kVp to penetrate it.**

**The mAs (milliampere seconds) determines the number of x-rays produced per unit time and the number of x-rays reaching the film determines the degree of blackening of the film. The type of film or screen system being used.. Increasing kVp increases the penetrating power of the x-ray beam.**

**Part B:-**

**Pelvis (AP view)**

**The AP pelvis view is part of a pelvic series examining the iliac crest, sacrum, proximal femur, pubis, ischium and the great pelvic ring. It is of considerable importance in the management of severely injured patients presenting to emergency.**

**PELVIS – ANTERO-POSTERIOR**

**Position of Patient and Image ReceptorThe patient lies supine with their median sagittal plane perpendicular to the tabletop.The midline of the patient must coincide with the centred primary beam and table Bucky mechanism.To avoid pelvic rotation, the anterior superior iliac spines must be equidistant from the tabletop.The limbs are slightly abducted and internally rotated to bring the femoral necks parallel to the image receptor.**

**Direction and Centring of X-ray BeamCentre in the midline, with a vertical central beam to the centre of the image receptor.The centre of the image receptor is placed midway between the upper border of the symphysis pubis and anterior superior iliac spine for the whole of the pelvis and proximal femora. The upper edge of the image receptor should be 5 cm above the upper border of the iliac crest to compensate for the divergent beam and to ensure that the whole of the bony pelvis is included.**

**Essential Image Characteristics**

**Iliac crests and proximal femora, including the lesser trochanters,should be visible on the image.No rotation. The iliac bones and obturator foramina should be the same size and shape.**

**Additional Considerations**

**At first visit and trauma cases, gonad protection is usually omitted,however local protocols can vary. It is used on follow-up images**

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**Ans question no 4:-**

**The skull x ray is done mostly for the traumatic head injuries. The x-ray allows the doctor to diagnose the problem.**

**A skull x-ray is done to examine the bones of the skull, including the facial, nose, and sinuses.**

**There are various x-rays which are performed for the skull but as this is a traumatic condition that's why the doctor will prescribe the following x-rays for the skull**

**X-RAYS:**

**1. Traumatic Protocol:**

**• Skull - AP**

**• Skull - Horizontal Ray Lateral.**

**2. Supplementary views:**

**Skull – Submentovertex.**

**Skull - Townes.**

**After this, once the results arrive, then the doctor will decide furthermore examinations like CT scan or MRI should be done or not.**

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 **THANK YOU;**

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