What Is Cross-Sectional Anatomy?

Worksheet

Cross-sectional anatomy is the study of body structures as seen in two-dimensional slices (axial, coronal, sagittal), matching how CT and MRI scanners actually image the body.

Questions

1. In standard radiological convention, an axial CT slice shows the patient's right side on which side of the image?

A) The image's left side
B) The image's right side
C) The image's top
D) The image's bottom

2. Which plane divides the body into anterior and posterior sections?

A) Axial
B) Sagittal
C) Coronal
D) Oblique

3. The transpyloric plane, a key axial landmark, is located at which vertebral level?

A) T12
B) L1
C) L3
D) L5

4. Why is cross-sectional anatomy considered essential for reading CT and MRI?

A) Because scanners only produce 3D holograms
B) Because these modalities generate images as sequential 2D slices
C) Because it replaces the need for any anatomy knowledge
D) Because it only applies to bone imaging

5. A CT abdomen protocol uses 5-mm axial slices from T12 to L5. At which vertebral level do the pylorus, pancreatic neck, and renal hila typically appear together?

6. On an axial brain MRI slice at the level of the lateral ventricles, a structure sits at the midline between the two ventricles. What is it and how do you confirm it on the image?

7. A radiologist compares a coronal chest CT slice to a sagittal slice of the same patient. Which plane better shows the relationship between the aortic arch and the trachea?

8. Define: What is an axial (transverse) plane?

9. Define: What is a coronal plane?

10. Define: What is a sagittal plane?

Answer Key

1. A) The image's left side - By convention, axial images are viewed as if facing the patient, so the patient's right appears on the image's left.

2. C) Coronal - The coronal (frontal) plane separates the body into front (anterior) and back (posterior) parts.

3. B) L1 - The transpyloric plane lies at the L1 vertebral level, marking the pylorus, pancreatic neck, and renal hila.

4. B) Because these modalities generate images as sequential 2D slices - CT and MRI scanners acquire and display data as stacked 2D slices, so interpreting them requires cross-sectional anatomy knowledge.

5. The transpyloric plane sits at the L1 vertebral level. At this level in an axial slice you expect to see the pancreatic neck anteriorly, the pylorus of the stomach, and both renal hila posterolaterally. Use this landmark level to orient quickly in an unlabeled abdominal CT.

6. The septum pellucidum is the thin midline structure separating the two lateral ventricles. Confirm by checking symmetry: it should appear as a straight, centered line on the axial slice equidistant from both ventricular horns. Track it on adjacent coronal slices, where it appears as a thin vertical sheet below the corpus callosum.

7. The sagittal plane, particularly a slice through the midline-to-left chest, best shows the aortic arch arching over the left main bronchus and its proximity to the trachea. The coronal plane is better for comparing left and right lung fields side by side. Choosing the right plane for the clinical question is a core cross-sectional anatomy skill.

8. A horizontal slice dividing the body into superior and inferior parts - the standard CT/MRI slice.

9. A vertical slice dividing the body into anterior and posterior parts.

10. A vertical slice dividing the body into left and right parts.