How to Localise Your View on an Axial MRI Brain Scan

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There are several methods and anatomical landmarks that can help you determine the **depth and specific level within the brain** when looking at an **axial scan**. Here are some key points to consider:

Familiarise with anatomical landmarks

- **Supratentorial Structures:** Look for the cerebral hemispheres, lateral ventricles, basal ganglia, thalamus, pineal gland, and corpus callosum.
- **Infratentorial Structures:** Identify the cerebellum, brainstem, fourth ventricle, and cisterna magna.

Identify key axial planes

- **High Axial Scans:** At the level of the high convexity, you will see the superior aspects of the frontal and parietal lobes.
- **Ventricular Level:** The lateral ventricles and the third ventricle become visible.
- **Basal Ganglia Level:** Caudate nucleus, lentiform nucleus (putamen and globus pallidus), and thalamus are evident.
- **Midbrain Level:** Tectum, tegmentum, cerebral peduncles, and superior cerebellar peduncles.
- **Pons Level:** Basis pontis, middle cerebellar peduncles, and fourth ventricle.
- **Medulla Level:** Pyramid, olives, and the decussation of the pyramids.

Use proportions and symmetry

- **Proportions:** The relative size of anatomical structures can give clues about the level. For example, the size and shape of the lateral ventricles vary along their length.

- **Symmetry:** Look at midline structures (e.g., falx cerebri, third ventricle) and bilateral symmetry (e.g., temporal lobes, basal ganglia).

Look for specific features in calvarium, gyri, sulci, and ventricles

- **Calvarium:** The calvarium (skull cap) can be a reference point; the higher the slice, the more calvarium you see.
- **Gyri and Sulci:** The pattern of gyri and sulci varies at different levels and can be a useful landmark.
- **Ventricles:** Their appearance changes significantly along the rostrocaudal axis.

Combine with coronal and sagittal Views

- Use coronal and sagittal reconstructions to confirm the exact depth and level of a structure seen in the axial plane.

Practice

Consistent practice and reviewing annotated atlases of brain imaging can significantly enhance your ability to quickly identify the level of an axial scan.

Example Illustration

When you see the **lateral ventricles** in an axial scan:

- **Anterior Horns:** You are in a higher level within the frontal lobe.
- **Trigone (where the body, posterior, and inferior horns meet):** You are in a more central location.
- **Posterior and Inferior Horns:** You are at a lower level, closer to the occipital and temporal lobes.

Learn neuroanatomy for neuropsychologists

We have put together an excellent list of links to the best neuroanatomy learning resources - these include labelled MRI brain scans. You may also be interested in our distinguishing frontal/parietal from frontal/temporal lobes on brain MRI article.