

Superior Temporal Gyrus (STG) Measurement

Original Protocol by: Nancy Honeycutt

Revised by: Harvey Morris and Christina Vaughn 8/16/2000

1. Tilt correct the brain in all three planes and reconstruct image.
2. Locate Heschl's gyrus (HG), which is clearly seen in both the coronal and sagittal views. HG is seen in the coronal and sagittal views as a nodule on the superior side of the STG. In the axial view, HG is a finger-like projection seemingly parallel, but connected to the STG.
3. Measure on sagittal slices, checking coronal slices constantly, and occasionally using the axial view (helpful for clarification of Heschl's gyrus.) In sagittal view, only measure STG from HG to the posterior boundary.
4. Begin at HG and scroll laterally measuring at each slice. When finished, begin again at HG and scroll medially doing the same.

To find **posterior boundaries**:

- a. **Superior boundary**: follow lateral fissure until it ends. The lateral fissure is cupped by the supramarginal gyrus (an arched lobule surrounding the end of the lateral fissure, seen best in sagittal view). In the sagittal view, draw an imaginary "best fit straight line" from the end of the superior portion of the lateral fissure (through the gray matter surrounding the lateral fissure) to the white matter of the supramarginal gyrus.
- b. **Inferior boundary**: use the superior portion of the STG as a guide, and include the gray matter of the STG that follows the parallel sulcus superiorly. Draw an imaginary horizontal line starting from the most superior point of the STG through the parallel sulcus and do not mark superior to this line. Note: If horizontal line does not reach the parallel sulcus include all gray matter inferior to this line. Do not include matter inferior to parallel sulcus.

After measuring the entire posterior portion of the STG in the sagittal view, go to the most posterior point of the STG. Begin scrolling anteriorly in the coronal view.

Scrolling anteriorly through coronal slices, include the superior and inferior portions of STG gray matter that surrounds the white matter of the gyrus. Use the sagittal view as a guide to ensure that all appropriate gray matter in the sagittal view of STG is captured. Parallel sulcus designates the **inferior boundary** of the STG, and runs along most of the gyrus. The lateral fissure serves as the **superior boundary** for the STG.

4. Continue moving anteriorly through coronal slices until insula begins to appear. Locate the most inferior point of the circular insular sulcus. Draw a straight line from this point (as if continuing the sulcus) to white matter. Use this line as a coronal medial boundary. Make adjustments in sagittal view as needed
5. **Anterior boundary**: follow along through the coronal view until the lateral fissure separates the temporal lobe from the rest of the brain (as seen in coronal view). Locate the most anterior coronal slice that shows the junction between the temporal lobe and the rest of the brain. Follow the STG mesially, but do not wrap around the underside of the temporal lobe, rather continue using the circular insular gyrus as a medial boundary and the parallel sulcus as a lateroinferior boundary. Once the lobe has separated on the coronal view, continue to mark the STG, following the white matter mesially. Use the most medial point of the white matter to draw an imaginary line vertically which designates the medioinferior boundary. Do not mark laterally to this line. Once the anterior coronal slice no longer contains white matter, include all of the remaining gray matter.
6. Review in sagittal section.