# **Temporal bone**

The temporal bones are situated at the sides and base of the skull, and lateral to the temporal lobes of the cerebrum.

The temporal bone supports that part of the face known as the temple and houses the structures of the organ of hearing. The lower seven cranial nerves and the major vessels to and from the brain traverse the temporal bone.

## Divisions

The temporal bone is externally divided into squamosal, petrous, mastoid, tympanic, and styloid parts.

## Petrous part of the temporal bone

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The squamous part encloses mainly the temporal lobe and is connected to the sphenoid bone and parietal bones anteriorly and posterosuperior respectively. The mastoid part is usually well pneumatized and separated from the suboccipital bone posteriorly through the occipitomastoid suture.

Superiorly from the parietal bone and squamous part through the parietomastoid suture and supramastoid crest respectively; and anteriorly it is connected with the external auditory canal through the spine of Henle.



The squamous, mastoid and petrous parts are all of them related with these posterior transpetrosal approaches in different degrees.

## Imaging

The development of new imaging techniques coupled with new treatment algorithms has created new possibilities in treating temporal bone diseases.

Magnetic resonance (MR) diffusion-weighted imaging in cholesteatomas and skull base epidermoids, whole-body molecular imaging in paragangliomas of the jugular foramen, and MR arterial spin labeling perfusion for dural arteriovenous fistulas and arteriovenous malformations <sup>1</sup>.

A 3D temporal bone model was created with assistance of computer graphic designers and published online. Its educational value as a teaching was tool was assessed by querying 73 neurosurgery residents at four institutions and was compared to that of a standard, two-dimensional (2D) temporal bone resource. Data was collected via a survey and significance amongst responses was analyzed via a univariate chi-square test.

The survey response rate was 37%. Greater than 90% of residents preferred to study with the 3D model compared with the 2D resource and felt that the 3D model allowed them understand the anatomy more realistically (p = .001). Moreover, greater than 90% of residents believed that reviewing the 3D model prior to an actual surgery could lead to improved operative efficiency and safety (p = .001).

This study demonstrates the utility of a novel, 3D temporal bone model as a teaching tool for neurosurgery residents. The model contains accurate anatomic structures and allows user interaction via a virtual, immersive environment<sup>2</sup>.

## **Temporal bone fracture**

#### Temporal bone fracture

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2)

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