

## FORAMINA OF SKULL: SKULL SESSION

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The skull is rigidly structured to protect the brain but has many foramina (openings) for passage of nerves (nn.), arteries (aa.) and veins (vv.); knowledge of the foramina of the skull is ESSENTIAL to understanding head and neck anatomy. The foramina are listed below according to how one can view them on a skull. Each entry indicates the bone the foramen is in, the areas it connects and structures that pass through it; many foramina are doubly listed as they can be seen from the inside or outside of the skull.

### INTERIOR OF SKULL

1. Olfactory foramen - located in cribriform plate of ethmoid bone in anterior cranial fossa; connects anterior cranial fossa and nasal cavity; contains branches of Olfactory nerve (fila olfactoria) (I).
2. Optic foramen and canal - located at base of Lesser wing of sphenoid bone in middle cranial fossa; connects middle cranial fossa to orbit; contains Optic nerve (II) and Ophthalmic artery.
3. Superior Orbital fissure - located between Greater and Lesser wings of Sphenoid bone in Middle Cranial fossa; connects middle cranial fossa and orbit; contains Oculomotor (III), Trochlear (IV), Abducens (VI) nerves and Ophthalmic division of Trigeminal nerve (V1) and Ophthalmic veins.
4. Carotid canal - located in temporal bone; connects base of skull to middle cranial fossa (opening of Carotid canal in middle cranial fossa called Foramen Lacerum); contains Internal carotid artery and Sympathetic Plexus surrounding artery.
5. Foramen rotundum - located in Greater wing of Sphenoid bone; connects middle cranial fossa and Pterygopalatine fossa; contains Maxillary division of Trigeminal nerve (V2).
6. Foramen ovale - located in sphenoid bone; connects middle cranial fossa and infratemporal fossa; contains Mandibular division of V (V3) and Accessory Meningeal artery (when present).
7. Foramen spinosum - located in sphenoid bone; connects middle cranial fossa and infratemporal fossa; contains Middle meningeal artery and Nervus spinosus (from V3).
8. Internal auditory meatus - located in temporal bone; connects posterior cranial fossa to Inner ear and (via facial canal) Stylomastoid foramen; contains Facial (VII) and Vestibulocochlear (VIII) nerves.
9. Jugular foramen - located in temporal and occipital bones; connects posterior cranial

fossa and base of skull; contains Internal Jugular vein, Glossopharyngeal (IX), Vagus (X) and Accessory (XI) nerves.

10. Hypoglossal canal - located in occipital bone; connects posterior cranial fossa and base of skull; contains Hypoglossal nerve (XII).

11. Foramen magnum - located in occipital bone; connects posterior cranial fossa and vertebral canal; contains Spinal Cord (with meninges) and Vertebral arteries and veins.

#### CHART OF FORAMINA FOR SKULL SESSION

<b>Foramen</b>	<b>Contains</b>
Olfactory Foramina	Olfactory nerves (I)
Optic Foramen (canal)	Optic nerve (II), Ophthalmic artery (from Internal Carotid artery)
Superior Orbital Fissure	III, IV, V1 (Ophthalmic division of Trigeminal nerve), VI; Ophthalmic veins
Foramen Rotundum	Maxillary division of Trigeminal nerve (V2).
Foramen Ovale	Mandibular division of V (V3) and Accessory Meningeal artery (when present)
Foramen Spinosum	Middle Meningeal artery and Nervus Spinosus
Carotid canal	Internal carotid artery and Sympathetic plexus surrounding artery
Internal Auditory Meatus	Facial nerve (VII) and Vestibulocochlear nerve (VIII)
Jugular foramen	Glossopharyngeal (IX), Vagus (X) and Accessory (XI) nerves.
Hypoglossal canal	Hypoglossal nerve (XII)
Foramen Magnum	Spinal cord and Vertebral arteries and veins