

# Foramen magnum

(Latin: “great hole”) is a large opening in the [occipital bone](#) of the [cranium](#). It is one of the several oval or circular apertures in the base of the [skull](#) (the foramina), through which the [medulla oblongata](#) enters and exits the skull vault.

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FM contains several critical neuroanatomical and vascular structures. The neural structures include the cerebellar [tonsils](#), inferior [vermis](#), [fourth ventricle](#), caudal aspect of the [medulla](#), lower cranial nerves (CNs) (IX–XII), rostral aspect of the [spinal cord](#), and upper cervical nerves (C-1 and C-2). CN IX through CN XI arise as a series of rootlets along the anterior medulla, with the spinal component of the CN XI arising midway between the anterior and posterior spinal rootlets of the [spinal cord](#). The spinal accessory rootlets coalesce and ascend rostral to join the CN IX, X, and the cranial portion of the CN XI. Together, these nerves exit the [skull](#) through the [jugular foramen](#). CN XII exits the medulla more anteriorly than the other lower CNs and passes anterior to the ipsilateral vertebral artery (VA) on its course to the hypoglossal canal, located within the superior and anterior-most portion of the occipital condyle <sup>1)</sup>.

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Apart from the transmission of the medulla oblongata and its membranes, the foramen magnum transmits the vertebral arteries, the anterior and posterior spinal arteries, the [membrana tectoria](#) and [alar ligaments](#). It also transmits the spinal component of the accessory nerve into the [cranial fossa](#).

Anatomical landmarks can reliably guide an endonasal anteromedial condyle resection. Minimal condyle resection is required to widen lateral access at the Foramen Magnum, which minimizes the risk of craniocervical instability <sup>2)</sup>.

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Foramen Magnum Area (FMA) and posterior cranial fossa volume (PCFV) are constitutionally smaller in girls at birth ( $P \leq .02$ ) and suggest that a sex-related difference in the FMA is related to earlier closure of anterior interoccipital synchondroses in girls ( $P = .01$ ) <sup>3)</sup>.

Since intraoccipital synchondroses close earlier in [Crouzon syndrome](#), from early life on their foramen magnum is smaller compared with controls. Within Crouzon patients, the presence of cerebellar tonsillar herniation could not be related to foramen magnum size <sup>4)</sup>.

## Foramen magnum decompression

### [Foramen magnum decompression](#)

<sup>1)</sup>

Jurinovic P, Bulicic AR, Marcic M, Mise NI, Titlic M, Suljic E. Foramen Magnum Meningioma: a Case Report and Review of Literature. Acta Inform Med. 2016 Feb;24(1):74-7. doi: 10.5455/aim.2016.24.74-77. Epub 2016 Feb 2. PMID: 27041817; PMCID: PMC4789635.

<sup>2)</sup>

Wang WH, Abhinav K, Wang E, Snyderman C, Gardner PA, Fernandez-Miranda JC. Endoscopic Endonasal Transclival Transcondylar Approach for Foramen Magnum Meningiomas: Surgical Anatomy and Technical Note. *Neurosurgery*. 2015 Nov 3. [Epub ahead of print] PubMed PMID: 26540354.

3)

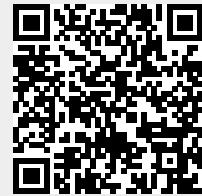
Coll G, Lemaire JJ, Di Rocco F, Barthélémy I, Garcier JM, De Schlichting E, Sakka L. Human Foramen Magnum Area and Posterior Cranial Fossa Volume Growth in Relation to Cranial Base Synchondrosis Closure in the Course of Child Development. *Neurosurgery*. 2016 Jun 23. [Epub ahead of print] PubMed PMID: 27341342.

4)

Rijken BF, Lequin MH, de Rooi JJ, van Veelen ML, Mathijssen IM. Foramen magnum size and involvement of its intraoccipital synchondroses in Crouzon syndrome. *Plast Reconstr Surg*. 2013 Dec;132(6):993e-1000e. doi: 10.1097/PRS.0b013e3182a8077e. PubMed PMID: 24281646.

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