

You have 24 vertebrae in your spinal column. Two are special enough to be individually named.

Your atlas (C01) and axis (C02) are very important vertebrae. Without them, head and neck movement would be impossible.

Let's take a look!

The atlas and axis are the most superior bones in the cervical vertebrae.

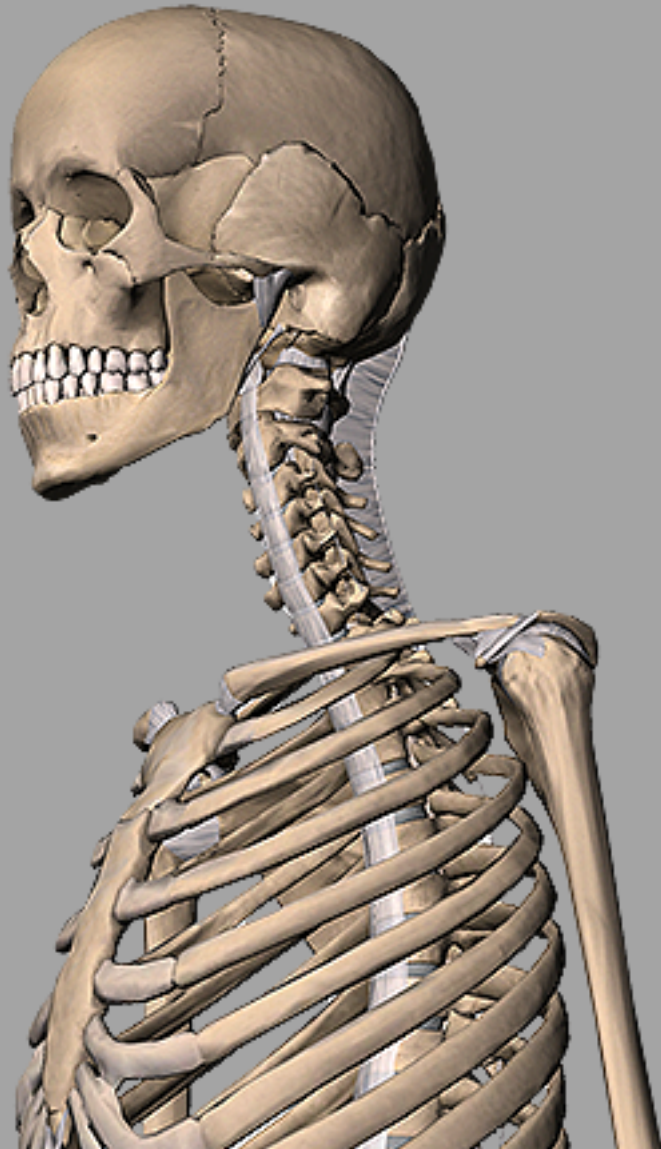
The atlas is the top-most vertebra, sitting just below the skull. The axis is below it.

Together, the atlas and axis support the skull, facilitate head and neck movement, and protect the spinal cord.

[Think of the atlas and axis as best buds for life. You will never find one without the other.]



There are many types of vertebral joints, but the atlas and axis form the only craniovertebral joints in the human body.



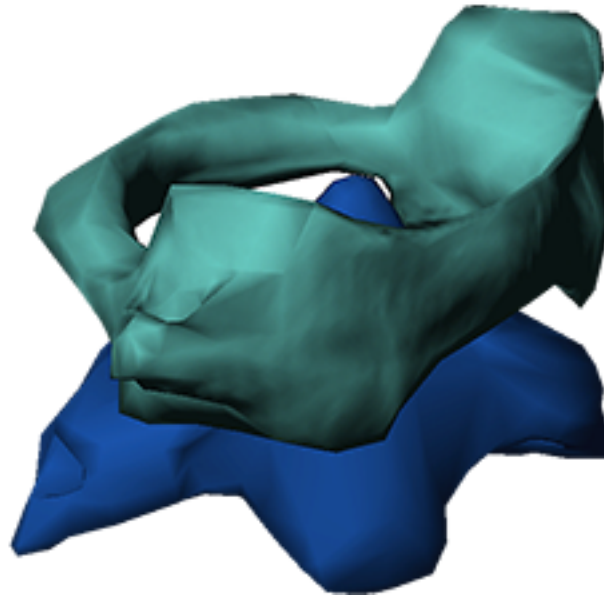
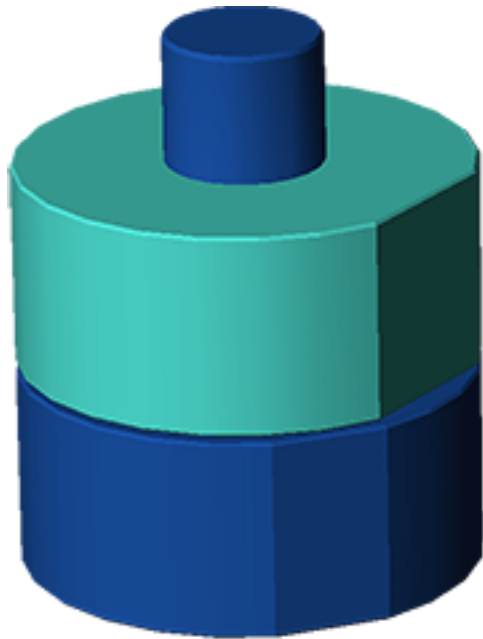
A craniovertebral joint is a joint that permits movement between the cervical vertebrae and the neurocranium.

The atlanto-occipital joint (pictured) connects the atlas to the occipital bone. It flexes the neck, allowing you to nod your head.

The atlanto-axial joint connects the axis to the atlas. It permits rotational movement of the head.



The atlanto-axial joint is a compound synovial joint. This pivot joint allows for rotation of the head and neck.



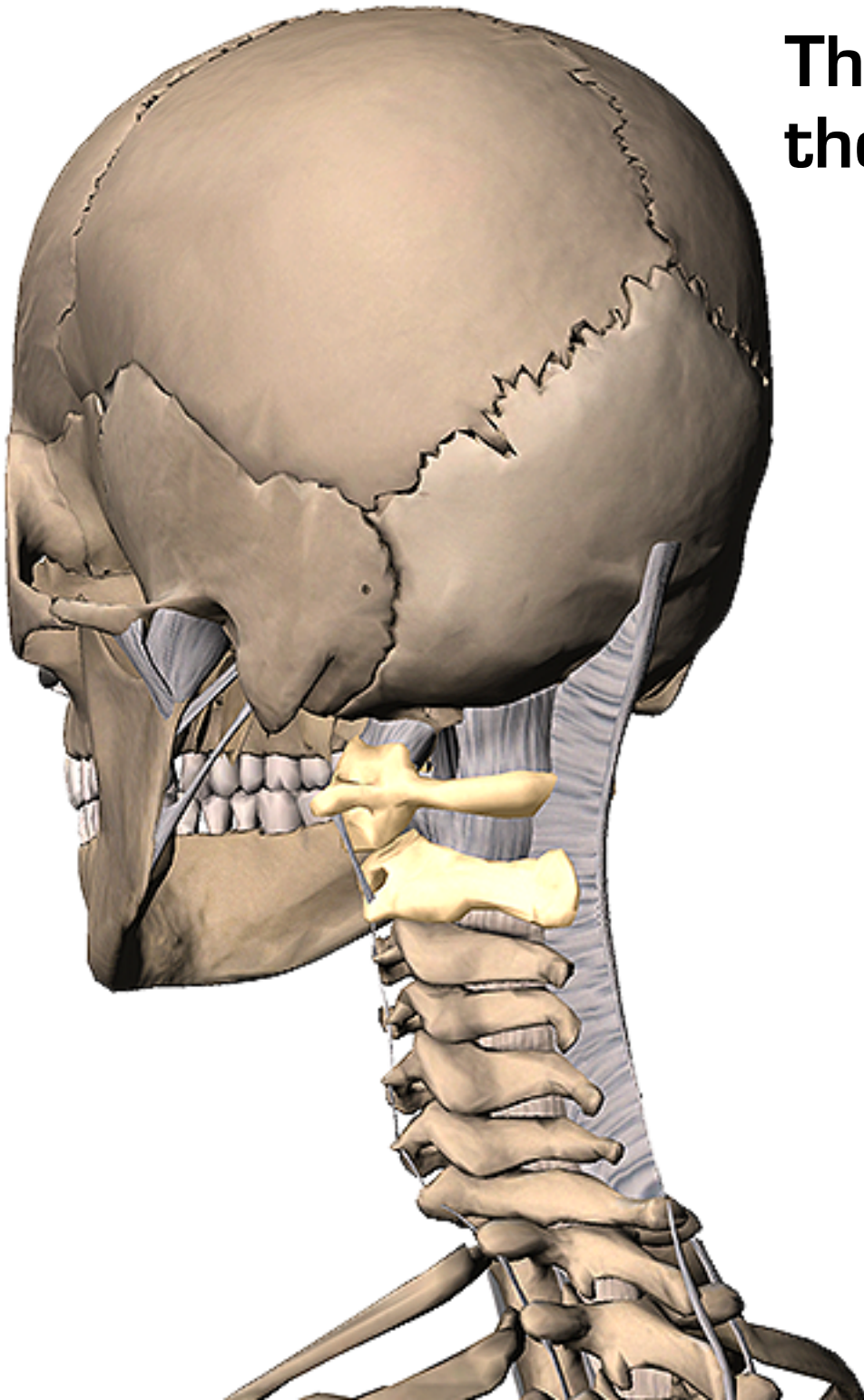
Watch this joint in
action!

A pivot joint is made by the end of one articulating bone rotating in a ring formed by another bone and its ligaments.

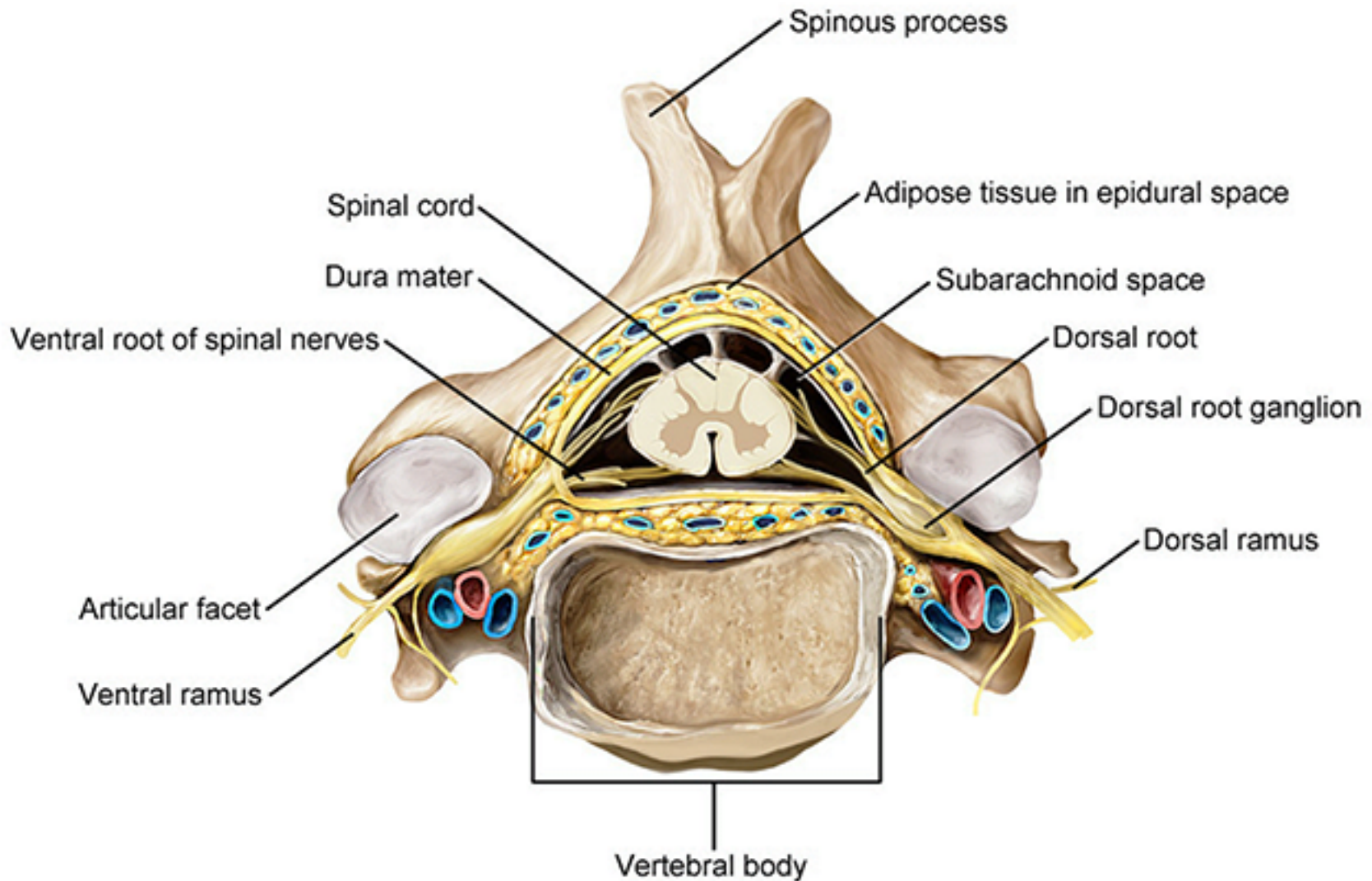
The atlas and axis are part of the seven cervical vertebrae.

These vertebrae have a few unique features:

- They are the smallest of the vertebrae.
- C01—C06 have three foramina: one vertebral and two transverse.
- The protrusion that can be felt at the back of the neck is the nonbifid spinous process of C07.



The atlas and axis, like the rest of the vertebrae, protect the spinal cord and give passage to its dorsal and ventral roots.



All right.

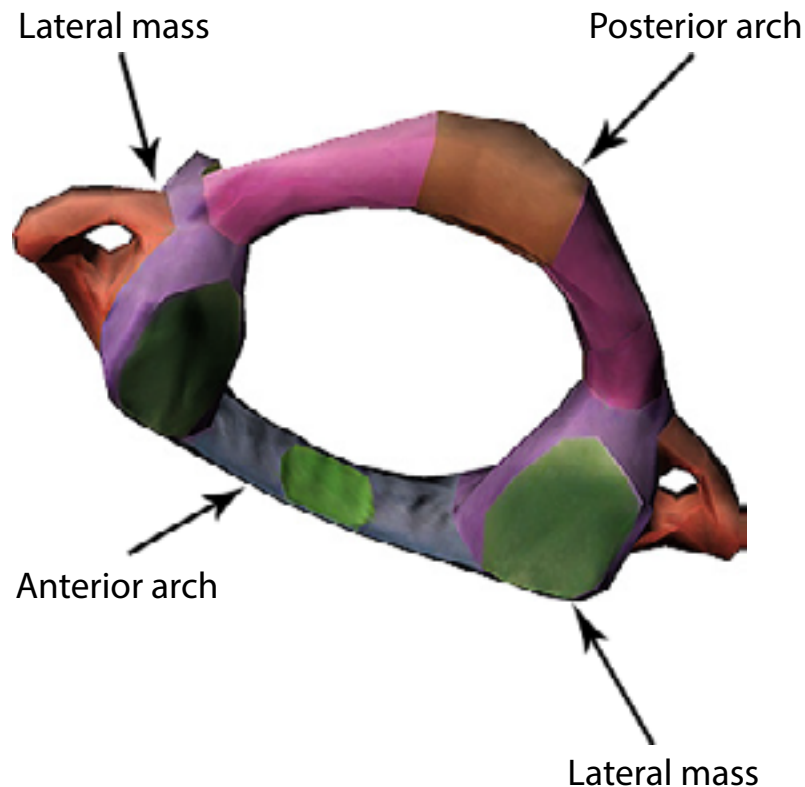
Let's take a break and review.

- ● The atlas and axis are the most superior vertebrae. ● ●
- ● They form a pivot joint, which allows you to turn your head and neck. ● ●
- ● The atlanto-axial joint connects the atlas to the axis. ● ●
- ● They are part of the vertebral column, which supports the peripheral nervous system. ● ●

**Now let's review some
bony landmarks.**

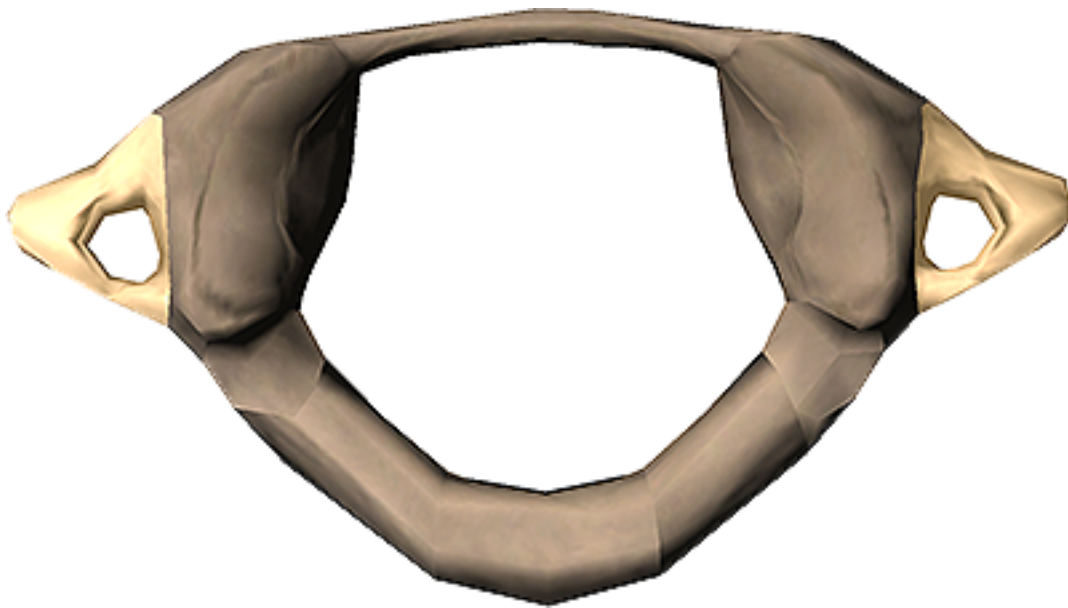
The atlas (C01) is the first of the cervical vertebrae.

Unlike the other vertebrae, the atlas does not have a body or a spinous process.



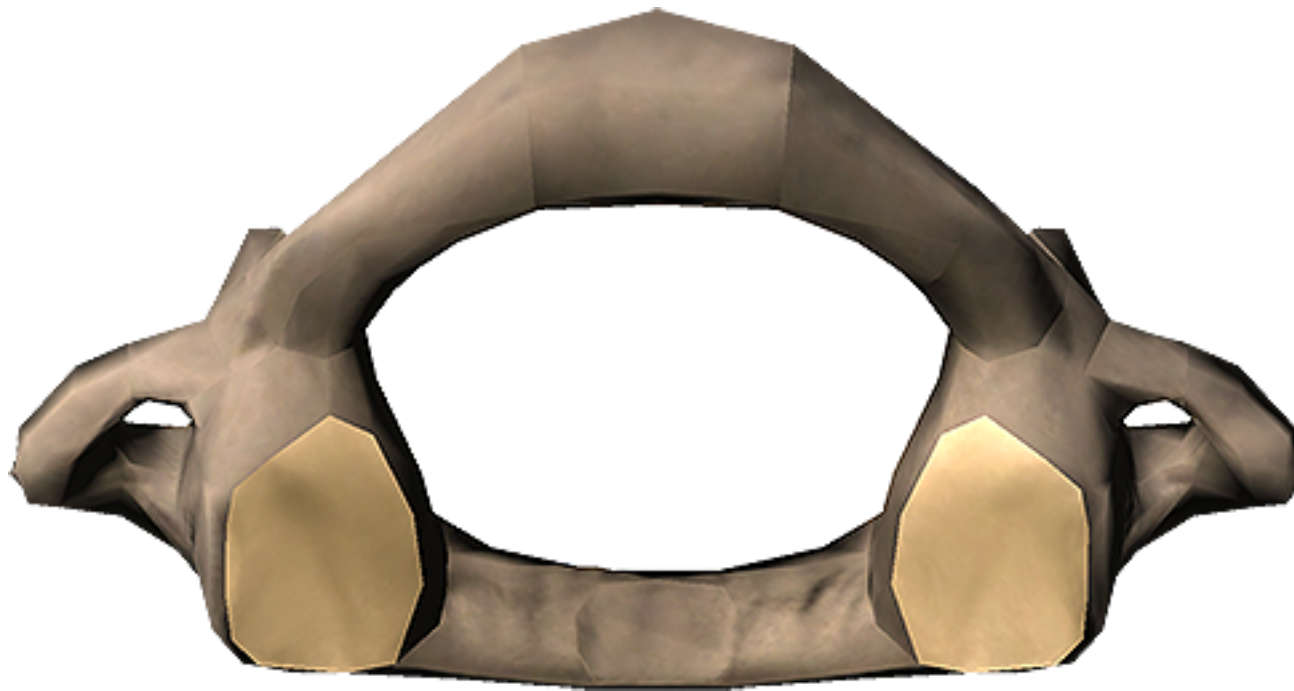
It is ringlike and consists of an anterior and posterior arch, and two lateral masses.

The transverse processes of the atlas serve for attachment of muscles that assist in rotating the head.



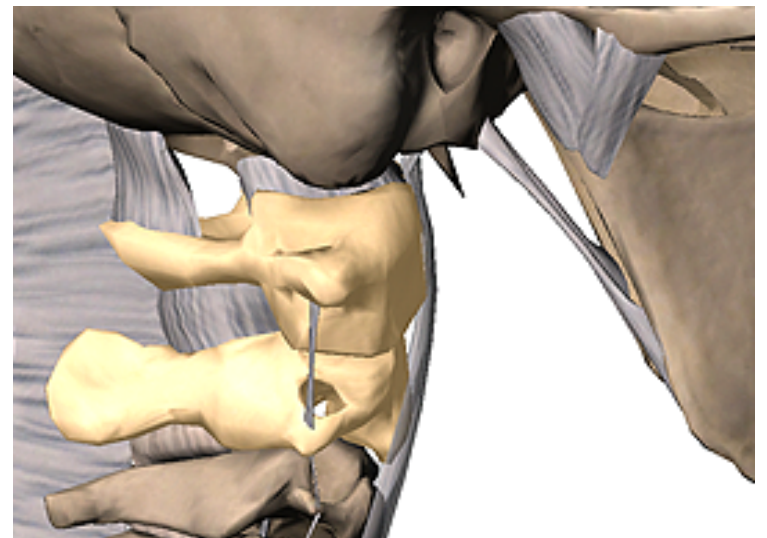
The obliquus capitis superior, obliquus capitis inferior, and splenius muscles attach to the processes.

The holes in the processes, or foramina, give passage to the vertebral artery and vertebral vein.

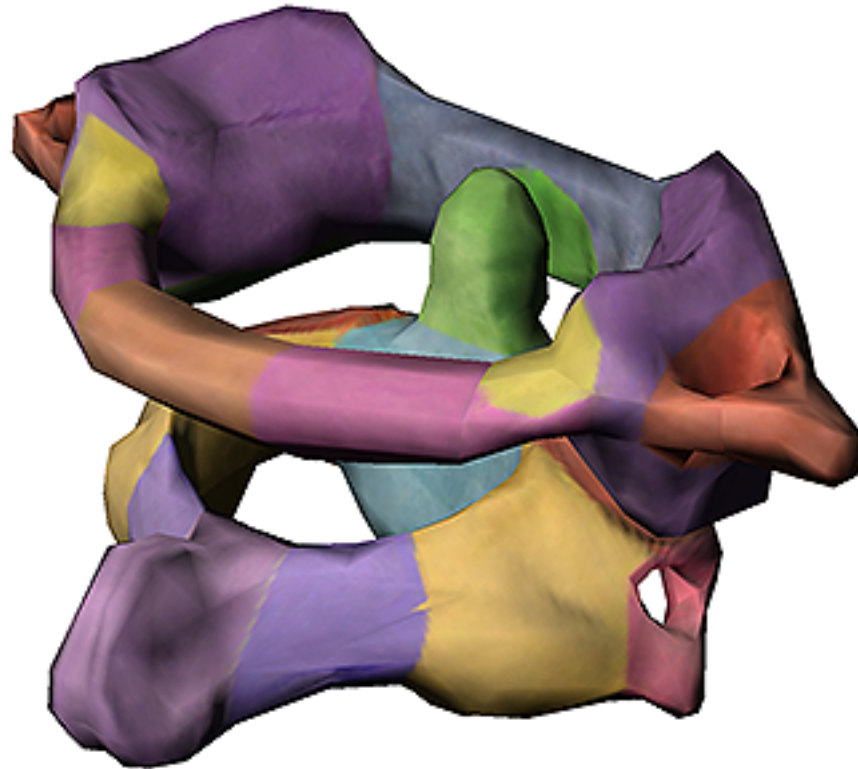


The inferior articular processes serve as the site for articulation with the axis.

The inferior articular processes are flat and circular in shape, and permit the rotatory movements of the head.

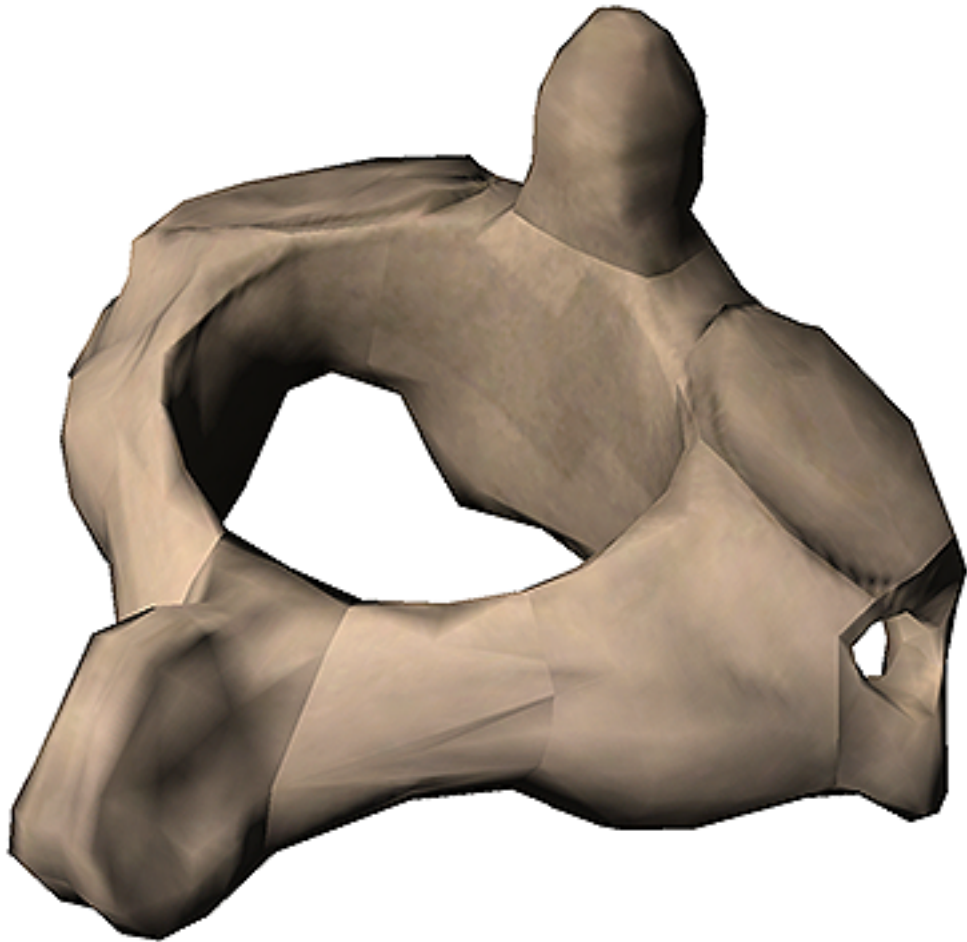


The facet for the dens is the site where the dens of the axis articulates with the atlas.



The articulation of the atlas on the dens provides the head with approximately 50% of its movement.

The axis (C02) is the second cervical vertebra.



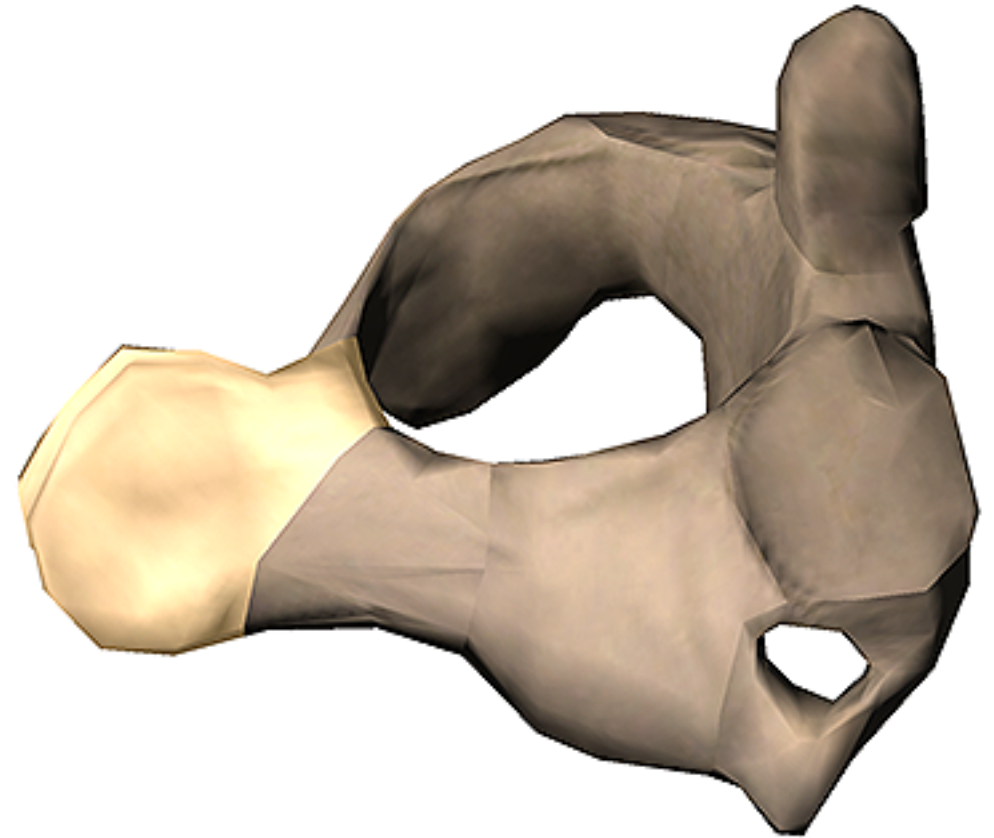
It is somewhat analogous to the other cervical vertebrae in that it has a spinous process that is not obviously bifid like the rest of the cervical vertebrae.



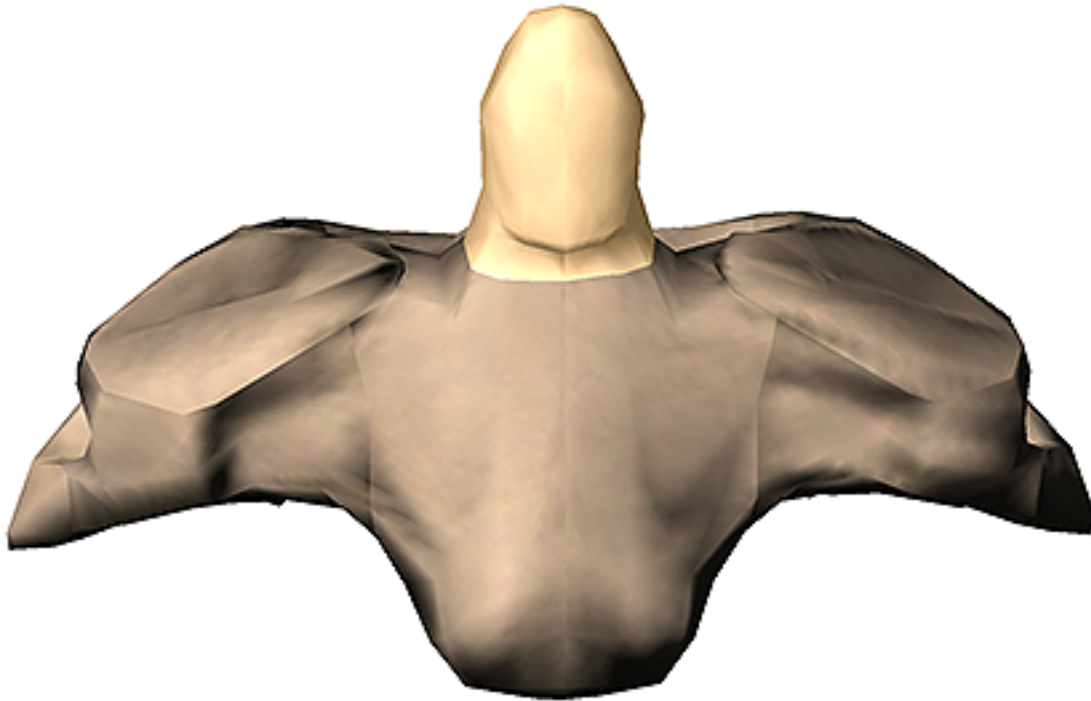
Factoid: The axis is also known as the epistropheus.

The spinous process serves as the attachment site for many muscles of the spine, as well as the nuchal ligament.

The process is not as obviously bifid as the other cervical vertebrae. Muscles closer to the skull attach here, whereas muscles that stretch along the length of the spine attach to the processes of the others.



The odontoid process, or dens, is a projection of bone that is fused with the axis.



The dens rises perpendicular from the upper surface of the axis body.

It articulates with the ring formed by the anterior arch and the transverse ligament of the atlas, creating the pivot joint.

Factoid: Dens is Latin for “tooth”; odontoid comes from the Greek root “odon,” also “tooth.”

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