

SKELETAL SYSTEM—Axial Skeleton

Total Number of Each Type of Vertebrae

Description

The vertebral column contains a total of 24 vertebrae of three different types:

- o Cervical (7)
- o Thoracic (12)
- o Lumbar (5)

In total there are 7 cervical, 12 thoracic, and 5 lumbar vertebrae. To remember the total number of each type of vertebrae, think of meal times:

- o Breakfast at 7:00 a.m.
- o Lunch at 12:00 noon
- o Dinner at 5:00 p.m.

To remember the sacrum and coccyx, think of having 2 snacks in the evening:

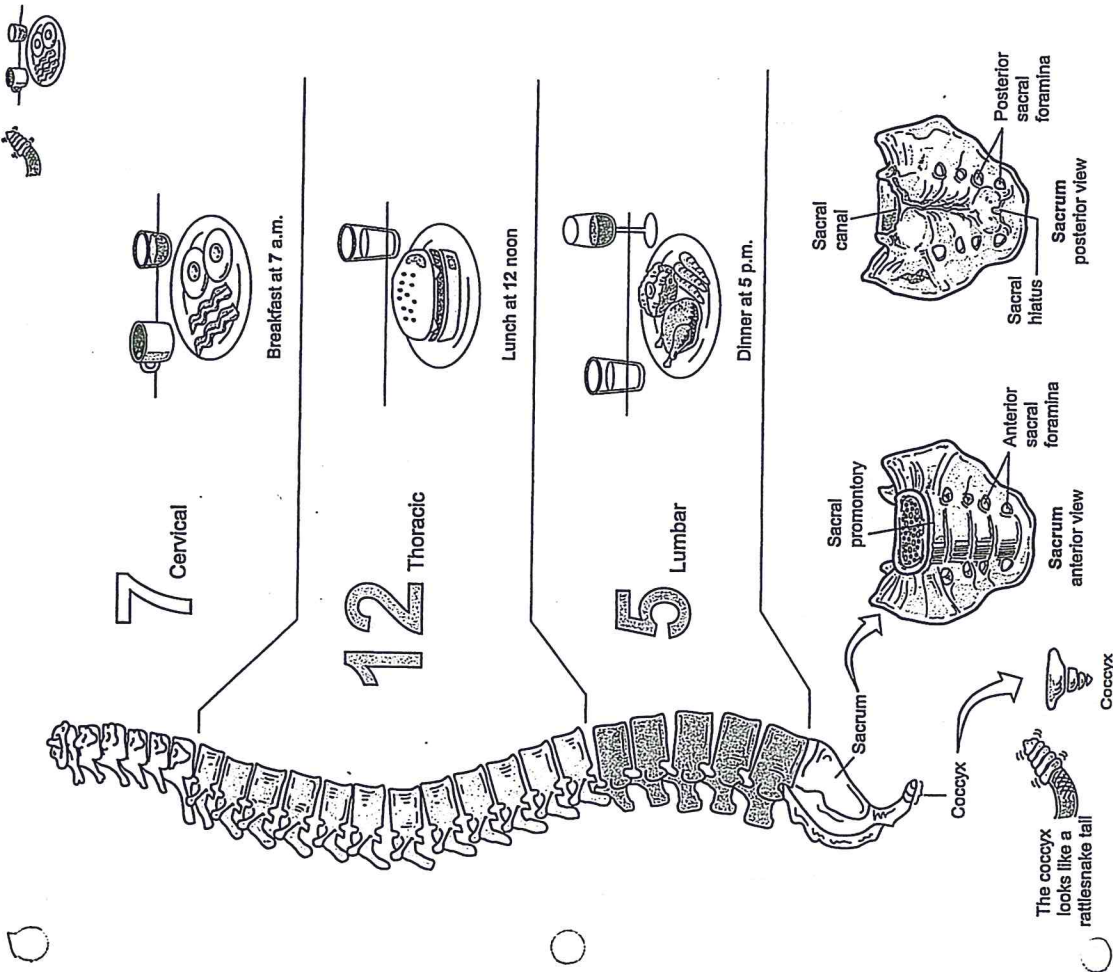
- o 1st snack = sacrum
- o 2nd snack = coccyx

The sacrum results from the fusion of five vertebrae. On the top, in the anterior view, is a ridge of bone called the sacral promontory. This is an important landmark for a female's pelvic exam. The series of holes running through the bone are called the sacral foramina—nerves of the sacral plexus pass through them. On the posterior surface, there is an opening called the sacral hiatus that leads into a long passageway called the sacral canal. Nerves from the spinal cord run through this canal.

The coccyx (tailbone) is located inferior to the sacrum and consists of 3–5 bones. It serves as an anchor point for muscles, tendons, and ligaments.

SKELETAL SYSTEM—Axial Skeleton

Total Number of Each Type of Vertebrae



SKELETAL SYSTEM—Axial Skeleton

Atlas and Axis—Visualizing Structural Differences

Description

The vertebral column contains a total of 24 vertebrae of three different types: cervical (7), thoracic (12), and lumbar (5). The first two cervical vertebrae at the top of the vertebral column are referred to as the atlas (*cervical 1* or *C1*) and the axis (*cervical 2* or *C2*). Like the Greek god Atlas held up the earth, the atlas vertebra is positioned at the base of the globe-like skull. The atlas is designed to pivot on the axis, which permits you to turn your head from side to side.

Analogy

The atlas (*C1*) resembles a turtle's head with eyeglasses. The anterior arch is the handle of the eyeglasses, the superior articular facets are the lenses of the glasses, the transverse process is the arm of the eyeglasses, and the posterior arch is the smile on the turtle's face.

The axis (*C2*) resembles a football player grasping a football. The odontoid process is the football player's helmet, the superior articular facet is the football player's shoulder pad, the lamina is the forearm, and the spinous process is the hands grasping the football.

Location

The first two cervical vertebrae at the top of the vertebral column

Function

The atlas and axis together form a pivot joint. When you turn your head from side to side, the atlas is rotating on the more stationary axis.

Study Tips

The following are good landmarks for these bones:

Atlas

- transverse foramen
- large superior articular facets

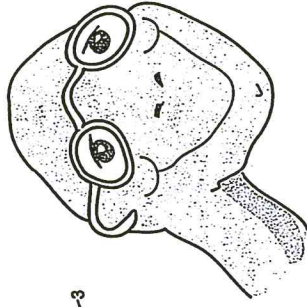
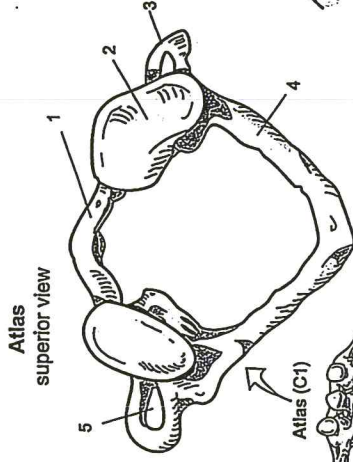
Axis

- transverse foramen
- odontoid process (*dens*) (unique to axis only)
- large superior articular facets

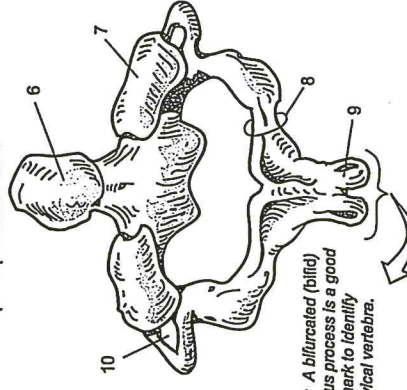
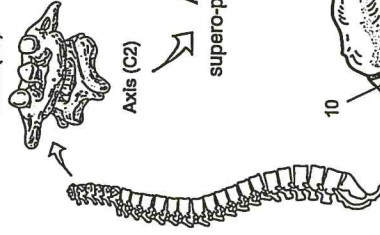
Note that only cervical vertebrae have a transverse foramen. This makes them easy to distinguish from thoracic or lumbar vertebrae.

SKELETAL SYSTEM—Axial Skeleton

Atlas and Axis—Visualizing Structural Differences



Atlas the turtle



Note: A bifurcated (bifid) spinous process is a good landmark to identify a cervical vertebra.

Bubba Axis, the football player

Key to Illustration

Atlas

1. Anterior arch
2. Superior articular facet
3. Transverse process
4. Posterior arch
5. Transverse foramen

Axis

6. Odontoid process (*dens*)
7. Superior articular facet
8. Lamina
9. Bifid spinous process
10. Transverse foramen

1. _____
2. _____
3. _____
4. _____
5. _____

6. _____
7. _____
8. _____
9. _____
10. _____

SKELETAL SYSTEM—Axial Skeleton

Lumbar Versus Thoracic Vertebrae—Distinguishing the Difference I

Description

The vertebral column contains three different types of vertebrae: cervical (7), thoracic (12), and lumbar (5). Each type has its own unique features to distinguish one from another, yet all of the types have three basic features in common:

1. Body—bears weight and increases in size as one moves down the vertebral column.
2. Vertebral arch—structure that contains a vertebral foramen, pedicles, lamina, spinous process, and transverse processes.
3. Articular processes—there are two of these—superior articular process and the inferior articular process that are used to join one vertebra to another.

Analogy

The posterior portion of a thoracic vertebra looks like a goose with wings *arched forward*. The posterior portion of a lumbar vertebra looks like a goose with wings *horizontal*. The spinous process is the head and neck of a goose and the transverse process is the wing of a goose.

Location

Vertebral column

Distinguishing Features

Feature	Thoracic	Lumbar
Location	Chest	Lower back
Body of vertebra	Medium-sized, heart-shaped; facets for ribs	Largest diameter, thicker, oval-shaped
Vertebral foramen	Medium-sized	Smaller-sized
Spinous process	Long, slender; points inferiorly	Broad; flat; blunt
Transverse process	10 of 12 have facets for rib articulations	Short; narrower, no articular facets or transverse foramina

1. Spinous process
2. Lamina
3. Vertebral foramen

Key to Illustration

4. Transverse process
5. Superior articular facet
6. Superior articular process
7. Body
8. Pedicle
9. Facet for rib articulation

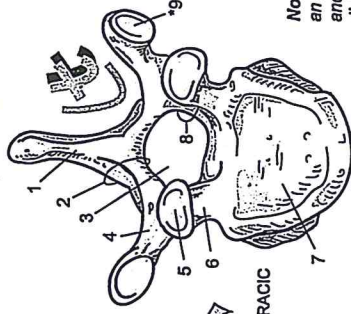
SKELETAL SYSTEM—Axial Skeleton

Lumbar Versus Thoracic Vertebrae—Distinguishing the Difference I

Fun Fact: A human neck has the same number of vertebrae as a giraffe.



Thoracic vertebra superior view

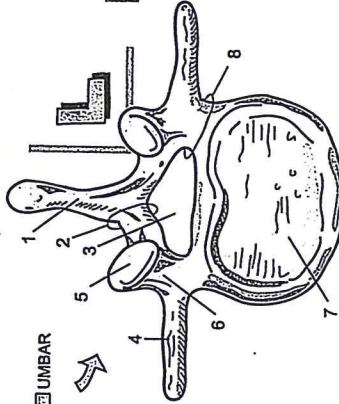


Location



Note: Most—but not all—thoracic vertebrae have an angle that is $<90^\circ$ between the spinous process and the transverse process. Be sure to use all the distinguishing features in the table on p. 98.

Lumbar vertebra superior view



- 1.
- 2.
- 3.
- 4.
- 5.

- 6.
 - 7.
 - 8.
 - *9.
- (*found only on thoracic vertebrae)

SKELETAL SYSTEM—Axial Skeleton

Thoracic Versus Lumbar Vertebrae—Distinguishing the Difference II

Description

The vertebral column contains three different types of vertebrae: cervical (7), thoracic (12), and lumbar (5). Each type has its own unique features to distinguish one from another, yet all of the types have three basic features in common:

1. Body—bears weight and increases in size as one moves down the vertebral column.
2. Vertebral arch—structure that contains a vertebral foramen, pedicles, lamina, spinous process, and transverse processes.
3. Articular processes—there are two of these—superior articular process and the inferior articular process that are used to join one vertebra to another.

Analogy

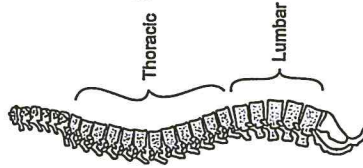
In the postero-lateral view, the thoracic vertebra looks like a giraffe. The giraffe's snout is the spinous process, the giraffe's ears are the transverse processes, and the giraffe's horns are the superior articular processes. The giraffe's cheek is the inferior articular process.

In the lateral view, a lumbar vertebra looks like the head of a moose. The moose's snout is the spinous process, the moose's horns are the superior articular processes, and the moose's bell is the inferior articular process.

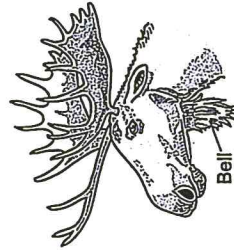
Location

Vertebral column

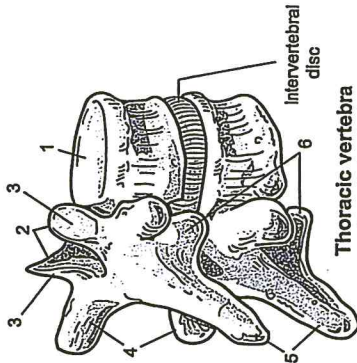
Location



"Thoracic giraffe"
In this postero-lateral view, the posterior portion of a lumbar vertebra looks like the head of a giraffe.

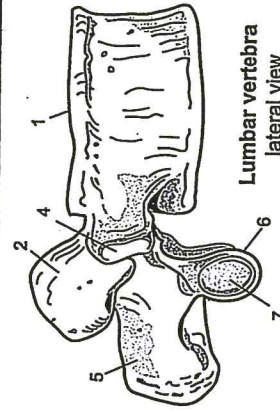


"Lumbering moose"
In the lateral view, the posterior portion of a lumbar vertebra looks like the head of a moose.



Thoracic vertebra
postero-lateral view

- 1.
- 2.
- 3.
- 4.
- 5.
- 6.
- 7.



Lumbar vertebra
lateral view

Key to Illustration

- | | | |
|-------------------------------|-------------------------------|-----------------------------|
| 1. Body | 4. Transverse process | 7. Inferior articular facet |
| 2. Superior articular process | 5. Spinous process | |
| 3. Superior articular facet | 6. Inferior articular process | |

SKELETAL SYSTEM—Axial Skeleton

Thoracic Versus Lumbar Vertebrae—Distinguishing the Difference II

