



Vertebral Column

Psychology 372

Physiological Psychology

Steven E. Meier, Ph.D.

Listen to the audio lecture while viewing these slides

1

Psyc 372 – Physiological Psychology

Vertebral Column

- Consists of 26 bones
 - 24 individual vertebrae
 - Two groups that fuse together
- Has a hole running through the middle (Vertebral Foramen)
- Some have other holes as well (Transverse Foramen)
- Also have intervertebral disks located between the vertebrae
 - Forms strong joints
 - Provides some flexibility
 - Cushions shock

2

Psyc 372 – Physiological Psychology
Vertebrae are Grouped in
Different Regions

- Cervical
- Thoracic
- Lumbar
- Sacrum
- Coccyx

3

Psyc 372 – Physiological Psychology

Cervical

- Contains 7 bones
- Named C-1 through C-7
- C-1 is called the Atlas
- C-2 is called the Axis
- Only vertebrae to have three holes (Foramina)
 - Vertebral foramina in the center of the vertebral column
 - Transverse foramina (one on each side)
 - Are smaller
- Vertebrae have smaller bodies and shorter processes that stick straight back.
- C-7 (vertebra prominens)
 - Is a prominent process that can be felt at the base of the neck.

4

Psyc 372 – Physiological Psychology

Atlas and Axis

- The atlas connects the occipital condyles of the skull and with the axis.
- Allows the head to move in a up down direction
 - Yes movement
- Axis connects with the atlas
- Allows the head to move from side to side
 - No movement

5

Psyc 372 – Physiological Psychology

Thoracic

- Have 12 Bones plus disks
- Are connected to the ribs
 - T-1, is the vertebra where the top rib attaches
- Has a single vertebral foramen in the middle of each bone
- Body of the vertebrae is heart shaped
- Processes are long and point down
- Can develop exaggerated thoracic curvature
 - Hunchback appearance (Kyphosis)

6

Lumbar

- Consists of five vertebrae and disks in the lower back.
 - Vertebrae are much larger
 - Have a bean shape
 - Spinous process are short and point straight back
- Is the location for a lumbar puncture (spinal tap)
 - Done between L-3 and L-4 or L-4 and L-5
- Some people can develop exaggerated lumbar curvature (swayback)
 - Called Lordosis

7

Sacrum

- One group
- Consists of 5 vertebrae that fuse together
 - Occurs in late teens to early 20's
- Is the location for epidural anesthesia
 - Is injected into the sacrum at the sacral hiatus.

8

Coccyx

- Is the tailbone
- Consists of one group
- Contains 4 coccygeal vertebrae that fuse together

9

Other Structures

- Intervertebral Disks
 - Are located between each pair of vertebrae
 - Are made of fibrocartilage.
 - Adds support
 - Absorbs shock.
- Intervertebral foramen
 - Is the opening formed between two vertebrae
 - Is where nerves go out to the body
 - Not the same as the vertebral foramen

10

Some Disorders

- **Herniated (slipped) disc** - protrusion or rupture of an intervertebral disc
- **Scoliosis** - exaggerated lateral bending of spinal column
- **Spina bifida** - have incomplete closure of the vertebral column

11

- Occulta Types
 - Usually symptomless
 - A small defect or gap in the vertebrae
 - Spinal cord and nerves usually are normal
 - Most people have no problems.
- Meningocele (pronounced muh-NING-go-seal)
 - Rarest form
 - Cyst or lump surrounding the spinal cord pokes through the open part of the spine.
 - Can be removed by surgery
 - Normal development.
- Myelomeningocele (my-uh-low-muh-NING-go-seal)
 - Most severe form
 - Cyst contains nerve roots of the spinal cord and often the cord itself.
 - May be no cyst just open section of the spinal cord
 - Spinal fluid may leak out.
 - High risk of infection until the back is closed surgically
 - Antibiotic treatment may offer temporary protection
 - Usually have leg paralysis and bladder and bowel control problems

Other Things

- Is most common in the lumbar-sacral region
- Often occurs with Hydrocephalus
- Is correlated with the lack of B vitamins
 - Folic Acid
- Treatment is usually surgical
 - Very early 1-2 weeks post delivery
 - Prenatal surgery has begun as well