Happy week 5! This resource will be shorter than usual because we only have one lecture this week. Test one is this Thursday, so keep up the hard work and good luck!

Remember: The tutoring center offers free individual and group tutoring for this course. Our group tutoring session will be Thursdays from 6:45-7:45 PM in the basement of Sid Rich, room 74. You can reserve your spot at https://baylor.edu/tutoring. Hope to see you there!

**Keywords:** Spinal cord, Spinal nerves, Myotomes, Dermatomes

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**Topic of the Week:** Spinal Cord

**Terminology**
- **Somatic** — voluntary innervation; goes to skeletal muscle
- **Visceral** — involuntary innervation; goes to smooth muscle or glands
- **Afferent** — sensory; travels TO spinal cord
- **Efferent** — motor; brings signal back to the muscles (think Efferent causes an Effect in the muscles/glands)

**Spinal Nerves**
- 8 cervical pairs, 12 thoracic pairs, 5 lumbar pairs, 5 sacral pairs, 1 coccygeal pair
  - Spinal nerves exit through the *intervertebral foramen*
  - Remember that cervical spinal nerve 1 starts above the first cervical vertebra!

**Dorsal Rami**
- Sensory to: the skin over the back
- Motor to: the deep/intrinsic back muscles

**Ventral Rami**
- Sensory to: the skin over ventral trunk and limbs
- Motor to: skeletal muscles of neck, trunk, and extremities

**Cross Section**

*This image is from Dr. Parizi’s lecture.*
The ventral horn contains motor/efferent cell bodies, but the dorsal horn does not contain any cell bodies – sensory/afferent cell bodies are found in the dorsal root ganglion.

**Important Features**

1. 3 coverings of the spinal cord:
   - Pia
   - Dura
   - Arachnoid
2. Conus medullaris: end of the spinal cord (level of L1-L2)
3. Cauda equina: collection of nerve roots at the end of the spinal cord (literally means “horse’s tail and looks like one too!”)
4. Filum terminale: extension of the pia that becomes the coccygeal ligament
5. Denticulate ligaments: stabilize the spinal cord by keeping it attached to the dura

Dr. Acland’s video covering the spinal cord:

**Knowledge checkpoint 1:** Trace the path of an efferent signal from the spinal cord to a skeletal muscle.

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**Highlight #1: Myotomes and Dermatomes**

**Myotomes:** a group of muscles innervated by a single spinal nerve level
- Tested by movement!
C5: should abduction
C6: elbow flexion
C7: elbow extension
C8: finger flexion (make a fist)
T1: finger abduction
L2: hip flexion
L3: hip adduction
L4: knee extension
L5: dorsiflexion
S1: plantar flexion
**Dermatomes:** an area of skin innervated by a single spinal nerve level
  - Tested by touch!

C2: back of the head
C5: lateral epicondyle
C6: dorsal surface of thumb (digit 1)
C7: dorsal surface of middle finger (digit 3)
C8: dorsal surface of little finger (digit 5)
T1: medial epicondyle
T4: level of the nipple
T10: level of bellybutton/umbilicus
L1: inguinal ligament
L3: medial knee
L4: medial malleolus
L5: dorsum of foot at 3rd metatarsophalangeal joint
S1: lateral aspect of calcaneus
S2: popliteal fossa (back of knee)

**Knowledge checkpoint 2:** If a patient suffers nerve damage to the C7 spinal nerve level, which movement will be affected? Which area, if palpitated, will they be unlikely to feel?

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**THINGS YOU MAY STRUGGLE WITH!**

1. **The difference between horns, roots, spinal nerves, and rami:** The ventral and dorsal horns are projections of spinal cord grey matter. Remember the ventral horn contains efferent cell bodies and the dorsal horn has no cell bodies. The nerve root is the part of the spinal nerve that branches directly off the spinal cord. There are dorsal and ventral roots – the dorsal root ONLY brings sensory information to the spinal cord and the ventral root ONLY brings motor information to muscles. The spinal nerve is where the ventral and dorsal roots come together before branching into rami. Ventral and dorsal rami carry BOTH sensory and motor information, but to different destinations.

2. **Myotomes and dermatomes:** These you will just have to commit to memory. It helps to act out the myotomes and point out the dermatomes on yourself to cement them into your memory!
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Answers
1. Ventral horn ➔ ventral root ➔ spinal nerve ➔ ventral ramus ➔ skeletal muscle
2. Elbow extension; dorsal surface of digit 3