This week is the last week of class, and typically in this week (and the surrounding weeks of class) you are reviewing for the final exam. Please use the review below (as well as other resources from the semester) as a general overview of some of the key concepts taught in the course! Please take a look at all 12 weekly resources listed on our website, as well as the math content review, to help you review for the final exam!

If you have any questions about these study guides, the final schedule of group tutoring sessions, private 30 minute tutoring appointments, the Baylor Tutoring YouTube channel or any tutoring services we offer, please visit our website www.baylor.edu/tutoring or call our drop in center during open business hours. M-Th 9am-8pm on class days 254-710-4135. The last day of tutoring in the drop-in center will be the last day of class. To learn about additional resources available during Finals Week, please visit CASE in the West Wing basement of Sid Rich! Good luck on your final exam!

**Keywords:** Final review

**Topic of the Week:** Final Review!

**Cranial Nerves:** (S = sensory, M = motor, B = both)
- CN I: Olfactory (S) – cribriform foramina
- CN II: Optic (S) – optic canal
- CN III: Oculomotor (M) – superior orbital fissure
- CN IV: Trochlear (M) – superior orbital fissure
- CN V1: Ophthalmic (S) – superior orbital fissure
  - Nasociliary, frontal, lacrimal
  - Zygomatic, nasopalatine, superior alveolar, infraorbital, lesser palatine, greater palatine
- CN V3: Mandibular (B) – foramen ovale
  - Auriculotemporal, inferior alveolar, lingual
- CN VI: Abduces (M) – superior orbital fissure
- CN VII: Facial (B) – internal acoustic meatus
- CN VIII: Vestibulocochlear (S) – internal acoustic meatus
- CN IX: Glossopharyngeal (B) – jugular foramen
- CN X: Vagus (B) – jugular foramen
- CN XI: Accessory (M) – jugular foramen
- CN XII: Hypoglossal (M) – hypoglossal canal

**Vertebrae**
- Lamina: connects the transverse and spinous processes
- Pedicle: connects the vertebral arch and body
- Superior and inferior articular facets: form facet joints that allow for flexion and extension between vertebrae
  - Cervical: superior facets point up and inferior point down
  - Thoracic: superior facets point posteriorly and inferior point anteriorly
  - Lumbar: superior facets point medially and inferior point laterally
- Intervertebral foramen: where spinal nerves exit the vertebral column
## Features of Upper Limb

<table>
<thead>
<tr>
<th>Humerus</th>
<th>Femur</th>
</tr>
</thead>
<tbody>
<tr>
<td>- Greater tubercle and lesser tubercle</td>
<td>- Greater and lesser trochanters</td>
</tr>
<tr>
<td>- Head: articulates with glenoid fossa of scapula</td>
<td>- Head and neck: head articulates with acetabulum of bony pelvis</td>
</tr>
<tr>
<td>- Anatomical neck and surgical neck: fractures occur here; affect the axillary nerve</td>
<td>- Pectineal line</td>
</tr>
<tr>
<td>- Deltoid tuberosity</td>
<td>- Medial and lateral condyle</td>
</tr>
<tr>
<td>- Radial groove: mid-humeral fractures; affect the radial nerve</td>
<td>- Tibial tuberosity: where tendon of quadriceps inserts</td>
</tr>
<tr>
<td>- Trochlea</td>
<td>- Medial malleolus</td>
</tr>
<tr>
<td>- Capitulum</td>
<td></td>
</tr>
<tr>
<td>- Lateral and medial epicondyles: ulnar nerve runs behind the medial epicondyle</td>
<td></td>
</tr>
<tr>
<td>- Olecranon fossa</td>
<td></td>
</tr>
<tr>
<td>- Coronoid fossa</td>
<td></td>
</tr>
</tbody>
</table>

**Radius**
- Radial tuberosity: where the biceps brachii insert
- Styloid process

**Ulna**
- Olecranon: your elbow bone; articulates with olecranon fossa of humerus
- Coronoid process: articulates with coronoid fossa of humerus

## Articulations

**Movement:**
- Synarthrosis = immovable
- Amphiarthrosis = slightly movable
- Diarthrosis = freely movable

**Structure:**
- Fibrous: joint is made up of fibrous ligaments
- Cartilaginous: joint is made up of either hyaline cartilage or fibrocartilage
  - Hyaline = synchondrosis
  - Fibrocartilage = symphysis
- Synovial: joint has a joint cavity and surrounded by a synovial membrane; freely movable

**Mechanical classifications:** hinge, pivot, ball and socket, condyloid/ellipsoid, gliding/plane, saddle
**Extraocular Muscles**
1. **Superior rectus** – looks up (elevates eye)
2. **Inferior rectus** – looks down (depresses eye) (CN III)
3. **Medial rectus** – looks medially (towards nose) (CN III)
4. **Lateral rectus** – looks laterally (CN VI)
5. **Superior oblique** – depresses the adducted eye (CN IV)
6. **Inferior oblique** – elevates the adducted eye (CN III)

**Spinal Cord**

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

<table>
<thead>
<tr>
<th>Myotomes (movement)</th>
<th>Dermatomes (touch)</th>
</tr>
</thead>
<tbody>
<tr>
<td>C5: should abduction</td>
<td>C2: back of the head</td>
</tr>
<tr>
<td>C6: elbow flexion</td>
<td>C5: lateral epicondyle</td>
</tr>
<tr>
<td>C7: elbow extension</td>
<td>C6: dorsal surface of thumb (digit 1)</td>
</tr>
<tr>
<td>C8: finger flexion (make a fist)</td>
<td>C7: dorsal surface of middle finger (digit 3)</td>
</tr>
<tr>
<td>T1: finger abduction</td>
<td>C8: dorsal surface of little finger (digit 5)</td>
</tr>
<tr>
<td>L2: hip flexion</td>
<td>T1: medial epicondyle</td>
</tr>
<tr>
<td>L3: hip adduction</td>
<td>T4: level of the nipple</td>
</tr>
<tr>
<td>L4: knee extension</td>
<td>T10: level of bellybutton/umbilicus</td>
</tr>
<tr>
<td>L5: dorsiflexion</td>
<td>L1: inguinal ligament</td>
</tr>
<tr>
<td>S1: plantar flexion</td>
<td>L3: medial knee</td>
</tr>
<tr>
<td></td>
<td>L4: medial malleolus</td>
</tr>
<tr>
<td></td>
<td>L5: dorsum of foot at 3rd metatarsophalangeal joint</td>
</tr>
<tr>
<td></td>
<td>S1: lateral aspect of calcaneus</td>
</tr>
<tr>
<td></td>
<td>S2: popliteal fossa (back of knee)</td>
</tr>
</tbody>
</table>

**Lower Limb Musculature** (muscle and innervation only; make sure to review functions!!)

<table>
<thead>
<tr>
<th>Muscles of anterior thigh/leg</th>
<th>Muscles of posterior thigh/leg</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Thigh:</strong> femoral nerve</td>
<td><strong>Thigh:</strong> tibial nerve</td>
</tr>
<tr>
<td>- Rectus femoris</td>
<td>- Biceps femoris long head</td>
</tr>
<tr>
<td>- Vastus lateralis</td>
<td>- Biceps femoris short head: common fibular nerve</td>
</tr>
<tr>
<td>- Vastus medialis</td>
<td>- Semitendinosus</td>
</tr>
<tr>
<td>- Vastus intermedius</td>
<td>- Semimembranosus</td>
</tr>
<tr>
<td>- Sartorius</td>
<td><strong>Leg:</strong> tibial nerve</td>
</tr>
<tr>
<td><strong>Leg:</strong> deep fibular nerve</td>
<td>- Gastrocnemius</td>
</tr>
<tr>
<td>- Anterior tibialis</td>
<td>- Soleus</td>
</tr>
<tr>
<td>- Extensor digitorum longus</td>
<td>- Posterior tibialis</td>
</tr>
<tr>
<td>- Extensor hallucis longus</td>
<td>- Flexor digitorum longus</td>
</tr>
</tbody>
</table>
Brachial Plexus and Upper Limb Musculature

Parasympathetics

- preganglionic
- postganglionic
**Vessels Diagram**

This image is from https://www.kindpng.com/imgv/hRTho_diagram-of-veins-and-arteries-in-body-hd/.

**Lungs**
The right lung has 3 lobes and 2 fissures. The left lung has 2 lobes, 1 fissure, and the cardiac notch.

**RALS:** For the right lung: pulmonary artery is **anterior** to the bronchus. For the left lung: pulmonary artery is **superior** to the bronchus.
**Larynx**

<table>
<thead>
<tr>
<th>Muscles</th>
<th>Vessels</th>
<th>Nerves</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Respiratory muscles</strong> – posterior cricoarytenoid</td>
<td><strong>Superior laryngeal artery:</strong></td>
<td><strong>Recurrent laryngeal n.</strong></td>
</tr>
<tr>
<td><strong>Phonatory muscles</strong> – lateral cricoarytenoid, arytenoids, cricothyroid, and thyroarytenoid</td>
<td>- Supplies above the vocal folds</td>
<td>- <strong>Motor:</strong> all intrinsic muscles of the larynx except for the cricothyroid muscle</td>
</tr>
<tr>
<td></td>
<td>- Runs with internal laryngeal nerve</td>
<td>- <strong>Sensory:</strong> below the vocal folds</td>
</tr>
<tr>
<td></td>
<td><strong>Inferior laryngeal artery:</strong></td>
<td><strong>Internal laryngeal n.:</strong> to above the vocal folds</td>
</tr>
<tr>
<td></td>
<td>- Supplies below the vocal folds</td>
<td><strong>External laryngeal n.</strong> innervates the cricothyroid</td>
</tr>
<tr>
<td></td>
<td>- Runs with recurrent laryngeal nerve</td>
<td></td>
</tr>
</tbody>
</table>

**GI**

**Foregut:** from the last 1/3 of the esophagus to the first half of the duodenum
- **Blood supply:** celiac trunk
- **Sympathetic Innervation:** greater splanchnics (T5-T9)
- **Parasympathetic innervation:** vagus nerve

**Midgut:** from the second half of the duodenum to the first half of the transverse colon
- **Blood supply:** superior mesenteric artery
- **Sympathetic innervation:** lesser splanchnics (T10-T11), least splanchnics (T12), and lumbar splanchnics
- **Parasympathetic innervation:** vagus nerve

- **Blood supply:** inferior mesenteric artery
- **Sympathetic innervation:** lumbar splanchnics (L1-L2) and sacral splanchnics
- **Parasympathetic innervation:** vagus nerve

- **Hepatoduodenal ligament:** the portal triad lies within this ligament (common bile duct, hepatic artery proper, and portal vein)
- **Gastrosplenic ligament** contains the short gastric and right gastroepiploic vessels
Final Knowledge Checkpoint:

1. In this superior view of the skull, can you label all the foramina along with the nerve(s) each transmits? This image is a screenshot from Complete Anatomy.

![Image of skull with labeled foramina](image)

2. You are testing the extraocular muscles and their innervation in a patient who periodically experiences double vision. When you ask him to turn his right eye inward toward his nose and look downward, he is able to look inward, but not down. Which nerve is most likely involved?
   a. Abducens
   b. Nasociliary
   c. Oculomotor
   d. Trochlear

3. 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?

4. Which of the following muscles is LEAST likely to be affected in the presence of an ulnar nerve lesion?
   a. Palmar interossei
   b. Lateral two lumbricals
   c. Dorsal interossei
   d. Medial two lumbricals
   e. Abductor digiti minimi

5. Identify the indicated nerve.
6. If a sympathetic neuron is traveling to the head, where will its pre-ganglionic neuron most likely synapse?
   a. At the sympathetic ganglion at same level
   b. At the sympathetic ganglion higher
   c. At the sympathetic ganglion lower
   d. Within the target organ

7. A patient expresses to you that he is concerned that he cannot taste anything on the anterior 2/3 of his tongue. What nerve innervates this portion of the tongue?
   a. Chorda Tympani
   b. Glossopharyngeal
   c. Vagus
   d. Mandibular

8. Which fetal structure allows blood to bypass the liver?
   a. Ductus arteriosum
   b. Ductus venosus
   c. Ligamentum arteriosum

9. The brachiocephalic artery divides to form the right common carotid and the ____ ____ artery.
   a. Left subclavian
   b. Left common carotid
   c. Right subclavian
   d. Right thoracic artery

10. Which nerve runs with the inferior laryngeal artery?

11. A patient was admitted with symptoms of an upper bowel obstruction. Upon CT examination, it was found that the third (transverse) portion of the duodenum was compressed by a large vessel causing the obstruction. The vessel involved is most likely to be the:
    a. Inferior mesenteric artery
    b. Inferior mesenteric vein
    c. Portal vein
    d. Superior mesenteric artery

12. What nerve(s) supply parasympathetic innervation to the midgut?
    a. Pelvic splanchnics
    b. Vagus
    c. Lumbar splanchnics
    d. Least splanchnics
THANK YOU for using these resources this semester! Best wishes on your final exam!

Answers
1. A = cribiform foramina; CN I – olfactory B = optic canal; CN II – optic
   C = superior orbital fissure; CN III – oculomotor, CN IV – trochlear, CN V₁ – ophthalmic, CN VI – abducens
   D = foramen rotundum; CN V₂ – maxillary
   E = foramen ovale; CN V₃ – mandibular
   F = foramen spinosum; middle meningeal artery
   G = internal acoustic meatus; CN VII – facial, CN VIII – vestibulocochlear
   H = jugular foramen; CN IX – glossopharyngeal, CN X – vagus, CN XI – accessory I = hypoglossal canal; CN XII – hypoglossal
   J = foramen magnum; spinal cord
2. d
3. Elbow extension; dorsal surface of digit 3
4. b
5. Radial
6. b
7. a
8. b
9. c
10. Recurrent laryngeal nerve
11. d
12. b