BIO 4432 – Human Anatomy 
Resource #4

The concepts this resource covers are the topics typically covered during this week of the semester. If you do not see the topics your particular section of class is learning this week, please take a look at other weekly resources listed on our website for additional topics throughout the semester.

We also invite you to look at the group tutoring chart on our website to see if this course has a group tutoring session offered this semester.

If you have any questions about these study guides, 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.

Keywords: Upper limb musculature, Muscles of the shoulder joint, Muscles of the hand, Associated nerves

Topic of the Week: Upper Limb Musculature

Muscles of the arm:
Biceps Brachii – musculocutaneous nerve
Origin:
- Short head: coracoid process
- Long head: supraglenoid tubercle of the scapula
Insertion: radial tuberosity Action: supination and flexion of the forearm
Coracobrachialis – musculocutaneous nerve Origin: coracoid process
Insertion: humerus
Action: flexes humerus
Brachialis – musculocutaneous nerve Origin: humerus Insertion: coronoid process of the ulna
Action: flexes forearm (elbow)
Triceps brachii – radial nerve Origin:
- Long head: infraglenoid tubercle
- Medial and lateral head: humerus
Insertion: olecranon process of ulna
Action: extends upper limb and forearm
Muscles of the anterior forearm:

**Pronator teres** – median nerve
- **Origin:** medial supracondylar ridge
- **Insertion:** radius
- **Action:** pronates forearm

**Flexor carpi radialis** – median nerve
- **Origin:** medial supracondylar ridge
- **Insertion:** 2\textsuperscript{nd} and 3\textsuperscript{rd} metacarpals
- **Action:** flexes forearm

**Palmaris longus** – median nerve
- **Origin:** medial supracondylar ridge
- **Insertion:** palmar aponeurosis
- **Action:** flexes hand and wrist

**Flexor carpi ulnaris** – ulnar nerve
- **Origin:** medial supracondylar ridge
- **Insertion:** hook of hamate and pisiform
- **Action:** flexes forearm

Deep muscles of the forearm:

**Flexor digitorum superficialis** – median nerve
- **Origin:** medial epicondyle of humerus and radius
- **Insertion:** middle phalanges
- **Action:** flex PIP joints and metacarpophalangeal joints

**Flexor digitorum profundus** – lateral tendons → median nerve; medial tendons → ulnar nerve
- **Origin:** coronoid process of ulna
- **Insertion:** distal phalanges
- **Action:** flex DIP, PIP joints, and metacarpophalangeal joints

Extensor muscles of the forearm: all innervated by the radial nerve

This image was taken from teachmeanatomy.com.
Brachioradialis
Origin: lateral supracondylar ridge
Insertion: close to styloid process of radius
Action: *flexes elbow* (only muscle of the posterior forearm that is a flexor!) Extensor carpi radialis longus and brevis
Origin: lateral supracondylar ridge and lateral epicondyle
Insertion: metacarpals
Action: extends wrist
Extensor digitorum
Origin: lateral epicondyle
Insertion: metacarpals
Action: extends digits
Extensor carpi ulnaris
Origin: lateral epicondyle
Insertion: 5th metacarpal
Action: extends wrist

Highlight #1: Muscles of the Shoulder Joint

Deltoid – axillary nerve
Origin: spine of scapula, acromion, and clavicle
Insertion: deltid tuberosity
Action:
- Anterior: flexes arm
- Posterior: extends arm
- Middle: abducts arm

Latissimus dorsi – thoracodorsal nerve
Origin: ribs, iliac crest, and vertebrae
Insertion: intertubercular groove of humerus
Action: adducts, extends, and internally rotates humerus

Pectoralis major – pectoral nerves
Insertion: intertubercular groove of humerus
Action: adducts and flexes arm, medially rotates scapula

This image was taken from https://sites.google.com/site/honkichoi/shoulder/anatom.
Rotator cuff muscles: all originate on the scapula

**Supraspinatus** – suprascapular nerve
Insertion: greater tubercle
Action: abducts and laterally rotates arm

**Infraspinatus** – suprascapular nerve
Insertion: greater tubercle
Action: laterally rotates arm

**Teres minor** – axillary nerve
Insertion: greater tubercle
Action: adducts and laterally rotates arm

**Subscapularis** – upper and lower subscapular nerve
Insertion: lesser tubercle
Action: medially rotates arm

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### Highlight #1: Muscles of the Hand

**Extrinsic muscles of the hand:**

**Flexor pollicis longus** – median nerve
Insertion: distal phalanx of thumb
Action: flexes thumb

Anatomical snuff box: **radial nerve**

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**Intrinsic muscles of the hand:**

Thenar muscles – **recurrent branch of median nerve**
Abductor pollicis brevis: abducts thumb
Flexor pollicis brevis: flexes thumb
Opponens pollicis: opposition of thumb towards pinky finger

Hypothenar muscles – **ulnar nerve**
Abductor digiti minimi: abducts pinky  
Flexor digiti minimi: flexes pinky  
Opponens digiti minimi: opposition of pinky towards thumb

Lumbricals and interossei

This image was taken from MCAT Memoranda.

Lumbricals – lateral 2 → median nerve, medial 2 → ulnar nerve
Origin: tendons of flexor digitorum profundus
Insertion: extensor expansion
Action: flex metacarpophalangeal joints and extend interphalangeal joints

Interossei – ulnar nerve
Palmar interossei: adduct digits toward midline (PAD)
  - Middle finger and thumb do not have palmer interossei
Dorsal interossei: abduct digits away from midline (DAB) and flex MCP joints and extend IP joints
  - Thumb and little finger do not have dorsal interossei

Week 6 Knowledge Checkpoint:

1. 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

2. The rotator cuff will be affected by an injury to which of the following muscles?
   B. Deltoid
   C. Sternoacleidomastoid
   D. Pectoralis minor
   E. Subscapularis
3. Which of the following muscles is supplied the recurrent branch of the median nerve? 
A. Flexor digiti minimi brevis 
B. Dorsal interossei 
C. Abductor pollicis brevis 
D. Flexor digitorum profundus 
E. Palmaris brevis

THINGS YOU MAY STRUGGLE WITH!

1. **As usual, the volume of material:** The upper limb muscles are a typically difficult topic so be sure you’re exposing yourself to the material frequently and in a variety of ways. The lower limb muscles are similarly named to the upper limb, so it’s going to be easy to confuse them. Make sure you get these solidified for before next week!

2. **Innervation:** It may be helpful to create a chart and organize which muscles are innervated by each nerve. If that’s not your style of learning, figure out how to organize the muscles in a way that works best for you!
CONGRATS: You made it to the end of the resource! Thanks for checking out these weekly resources! Don’t forget to check out our website for group tutoring times, video tutorials and lots of other resources: www.baylor.edu/tutoring!

Answers

1. B
2. E
3. C