24a A&P: Muscular System-Organization of Skeletal Muscle

24a A&P: Muscular System -Organization of Skeletal Muscle Class Outline

5 minutes	Attendance, Breath of Arrival, and Reminders
10 minutes	Lecture:
30 minutes	Lecture:
15 minutes	Active study skills:
60 minutes	Total

24a A&P: Muscular System -Organization of Skeletal Muscle Class Reminders

Quizzes:

- **30a Kinesiology Quiz**
 - Supraspinatus, infraspinatus, teres minor, subscapularis, pec minor, & serratus anterior
- 31a Quiz (20a, 20b, 21b, 22a, 23a, 24b, 29b, and 30a, 24a, 25a, 26a, 27a, 28a, 29a, 30b, and 31b)

Assignments:

- **30a Review Questions**
 - Packet A: 141-158

Preparation for upcoming classes:

- **2**5a A&P: Muscular System: Mechanism of Contraction
 - Trail Guide: subscapularis
 - Packet E: 37-40
 - RQ Packet A-151
- **2**5b Hydrotherapy: Dry Brushing, Cold Water Wash, Hand and Foot Treatment
 - Packet G: 15-19

Classroom Rules

Punctuality - everybody's time is precious

- Be ready to learn at the start of class; we'll have you out of here on time
- Tardiness: arriving late, returning late after breaks, leaving during class, leaving early

The following are not allowed:

- Bare feet
- Side talking
- Lying down
- Inappropriate clothing
- Food or drink except water
- Phones that are visible in the classroom, bathrooms, or internship

You will receive one verbal warning, then you'll have to leave the room.

Rotator Cuff

Trail Guide, Page 74



Rotator Cuff

Trail Guide, Page 74



Teres Minor Posterior View Subscapularis Anterior View

Infraspinatus and Teres Minor Trail Guide, Page 75



Infraspinatus is located in the infraspinous fossa, with its medial portion deep to the trapezius fibers.

Teres minor is a small muscle squeezed between infraspinatus and teres major.

What do you use infraspinatus and teres minor for?

Laterally rotate the shoulder joint (glenohumeral joint)

Adduct the shoulder joint (glenohumeral joint)

Stabilize the head of the humerus in glenoid cavity

Infraspinous fossa of the scapula

Greater tubercle of the humerus



Posterior View



Laterally rotate the shoulder joint (glenohumeral joint)

Adduct the shoulder joint (glenohumeral joint)

Stabilize the head of the humerus in glenoid cavity

- Infraspinous fossa of the scapula
 - Greater tubercle of the humerus



Posterior View



Laterally rotate the shoulder joint (glenohumeral joint)

Adduct the shoulder joint (glenohumeral joint)

Stabilize the head of the humerus in glenoid cavity

Infraspinous fossa of the scapula





Posterior View

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Adduct the shoulder joint (glenohumeral joint)

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Infraspinous fossa of the scapula

Greater tubercle of the humerus





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Adduct the shoulder joint (glenohumeral joint)

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Infraspinous fossa of the scapula

Greater tubercle of the humerus





Shift gears from Infraspinatus to Teres Minor



Laterally rotate the shoulder joint (glenohumeral joint)

Adduct the shoulder joint (glenohumeral joint)

Stabilize the head of the humerus in glenoid cavity

Upper two-thirds of lateral border of the scapula

Greater tubercle of the humerus





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Rotator Cuff

Trail Guide, Page 74



Teres Minor Posterior View Subscapularis Anterior View 24a A&P: Muscular System -Organization of Skeletal Muscle E-37



Anatomy

Skeletal <u>muscles</u>. Related fascial structures including <u>tendons</u> and aponeuroses.





Movement Posture maintenance Moving substances Heat production



Movement Skeletal muscle <u>contractions</u> produce movement of the body as a whole, called locomotion, and movement of its parts.





Posture maintenance Skeletal muscles must contract to maintain static postures, such as in sitting and <u>standing</u>.





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Moving substances Contraction of skeletal muscles promotes lymphatic flow and blood flow from the extremities to the <u>heart</u>.





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Heat production (AKA: thermogenesis) Muscle contractions produce and release heat that is important for homeostasis.





Muscle group \rightarrow skeletal muscle \rightarrow fascicle \rightarrow muscle fiber \rightarrow myofibril \rightarrow myofilamentCovered byCovered byCovered byDeep fascia \rightarrow epimysium \rightarrow perimysium \rightarrow endomysium

Myofilaments Sarcomere Myofibrils Muscle fiber Fasciculi



Myofilaments Thick and thin protein strands within each sarcomere. Consist of actin and myosin.





Sarcomere A muscle's contractile unit. Found within myofibrils.





Sarcomere A muscle's contractile unit. Found within myofibrils.





Myofibrils Thin strands within each muscle fiber. Contain myofilaments.





Muscle fiber Thread-like muscle cell.





Fasciculi (s. fascicle) Groups of muscle fibers or neurons.





Endomysium Perimysium Epimysium Deep fascia

Myofascial Tendon Aponeurosis Retinaculum

Deep Fascia, Epimysium, Perimysium, Endomysium





Endomysium Connective tissue layer that surrounds individual muscle <u>fibers</u>





Perimysium Connective tissue layer that surrounds <u>fasciculi</u>.





Epimysium Connective tissue layer surrounding an entire <u>muscle</u>.





Deep fascia Connective tissue layer that surrounds muscle <u>groups</u>.





Superficial Fascia





Connective Tissues Myofascial Referring to skeletal muscles and related fascia in the <u>muscular</u> system.





Tendon Cord-like structure anchoring the end of a <u>muscle</u> to a bone.





Aponeurosis (p. aponeuroses) Broad, <u>flat</u> tendon. Attaches skeletal muscle to bone, another muscle, or skin.



Lateral View



Retinaculum (p. retinacula) <u>Bandage</u>-like retaining bands of connective tissue found primarily around the elbows, knees, ankles, and wrists. May also act as a pulley for tendons.







Sarcoplasm Sarcolemma Sarcoplasmic reticulum T-tubules Sarcomere



Sarcoplasm Muscle cell <u>cytoplasm</u>. Sarcolemma Muscle cell <u>membrane</u>.





SarcoplasmMuscle cellcytoplasmSarcolemmaMuscle cellmembrane





Sarcoplasmic reticulum A fluid-filled system of sacs that store calcium.





T-tubule Runs <u>transversely</u> across the sarcoplasmic reticulum, forming inward channels. Transports stored calcium ions from the sarcoplasmic reticulum into the interior of the muscle cell.





Sarcomere A muscle's <u>contractile</u> unit. Found within myofibrils.





Myofilaments

Thin myofilaments

Actin Tropomyosin Troponin

Thick myofilaments

Myosin



Myofilaments

Thin myofilaments

Actin Protein molecules within a muscle cell that contain binding sites used during skeletal muscle contraction. Help make up thin myofilaments.

Tropomyosin Protein molecule. **Troponin** Protein molecule.





Myofilaments

Thick myofilaments

Myosin Protein molecules within a muscle cell that attach to actin during skeletal muscle contraction. Make up the bulk of thick myofilaments.





Muscle Cell Properties

Excitability Contractility Extensibility Elasticity



Muscle Cell Properties

Excitability The ability to respond to a <u>stimulus</u>.

Contractility The ability to <u>shorten</u>.

Extensibility The ability to <u>lengthen</u>.

Elasticity The ability to return to its original <u>shape</u> after movement.

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