

## AJ Petto's Top 20 Muscles for BIOSCI 202

| Name                          | Topography                                | Proximal Attachment   | Distal Attachment  | Action  |
|-------------------------------|---|---|--|---|
| 1. <i>Temporalis</i>          | Cranium; temporal bone above cheek        | Temporal fossa  | Anterior portion of mandibular ramus and coronoid process  | Elevates mandible; also involved in retraction and lateral excursion  |
| 2. <i>Sternocleidomastoid</i> | Muscular ridge in the anterolateral neck  | Mastoid process and superior nuchal line  | Manubrium and medial portion of the clavicle   | Rotates and flexes atlanto-occipital joint; head; flexes neck; unilaterally flexes neck ipsilaterally while rotating contralaterally. |
| 3. <i>Rectus abdominis</i>    | Medial ventral surface from ribs to pubis | Xiphoid process and inferior ribs (5-7)   | Pubic crest and symphysis  | Flexes lumbar spine; compresses abdomen; unilaterally flexes trunk ipsilaterally  |
| 4. <i>Iliopsoas</i>           | No external appearance                    | <i>Iliacus</i> : inner surface of ilium<br><br><i>Psoas major</i> & <i>Psoas minor</i> : on intervertebral cartilages, along bodies and on lower borders of transverse processes of L1-5; body of T12, on sacrum lateral and inferior to L5-S1 articulation | <i>Iliacus &amp; psoas major</i> : lesser trochanter of femur and shaft immediately inferior.<br><br><i>Psoas minor</i> : Pectineal line and iliopectineal eminence of ilium | Flexion of the hip; Flexion and external rotation of the femur  |

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| 5. <i>Pectoralis major</i> | Upper half of the chest and anterior margin of axilla | Medial half of anterior surface of clavicle, anterior surface of costal cartilages of ribs 1–6 and adjacent sternum        | Greater tubercle of the humerus and intertubercular crest (lateral aspect of intertubercular groove) | Adducts in frontal plane, flexes in sagittal plane, horizontally adducts in transverse plane, and internally rotates arm  |
| 6. <i>Latissimus dorsi</i> | Lower half of back, posterior margin of axilla        | Posterior crest of ilium, spinous processes of T7–S3, ribs 10–12   | Medial side of intertubercular groove of humerus   | Adducts in frontal plane, extends in sagittal plane, horizontally abducts in transverse plane, and internally (medially) rotates arm  |
| 7. <i>Deltoid</i>          | Rounded upper surface of "shoulder"                   | <u>3 portions</u> : anterior lateral 1/3 of clavicle, lateral aspect of acromion process, and inferior edge scapular spine | Deltoid tuberosity of humerus (lateral)  | (1) Adducts arm, assists in flexion, horizontal adduction, and internal rotation of glenohumeral joint (GHJ); (2) abduction of GHJ; (3) abduction, extension, horizontal abduction, and lateral rotation of GHJ |
| 8. <i>Biceps brachii</i>   | Anterior surface of upper arm                         | <u>Long head</u> : superior margin of glenoid fossa; <u>Short head</u> : coracoid process of scapula                       | Radial (bicipital) tuberosity of radius and bicipital aponeurosis                                    | Flexes elbow, weakly flexes glenohumeral joint; supinates hand  |
| 9. <i>Triceps brachii</i>  | Posterior surface of upper arm                        | Infraglenoid tubercle of scapula (1), lateral (2) and posterior (3) surfaces of the humerus                                | Olecranon process of ulna  | Extends elbow (1–3); adducts and extends glenohumeral joint (1)   |

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|---|---|--|--|---|
| 10. <i>Extensor digitorum</i>             | Lateral surface of dorsum of forearm            | Lateral epicondyle of humerus  | 4 tendons to the dorsal surfaces of the base of middle and distal phalanges of fingers 2–5       | Extends digits 2–5 at metacarpophalangeal (MCP) joints and wrist; weak extension of elbow                       |
| 11. <i>Flexor digitorum superficialis</i> | Anterior surface of the wrist on the ulnar side | Medial epicondyle of humerus; medial coronoid process of ulna; upper 2/3 of anterior border of radius  | 4 tendons that divide and attach to the sides of medial phalanges of fingers 2–5                 | Flexes digits at MCP and PIP joints, flexes wrist; weak flexion of elbow  |
| 12. <i>Gluteus maximus</i>                | Wide area on posterior surface of pelvis        | Posterior 1/4 of iliac crest; posterior surface of sacrum and coccyx near ilium; and lumbar fascia   | Oblique ridge on lateral surface of greater trochanter and iliotibial band of <i>fasci latae</i> | Stabilizes trunk in hip extension; extension and external rotation of hip; lower fibers assist in hip adduction |
| 13. <i>Rectus femoris</i>                 | Anterior surface of thigh                       | Anterior surface of inferior iliac spine and superior & posterior margin of acetabulum   | Superior aspect of patella and patellar tendon to the tibial tuberosity                          | Extension of the knee and flexion of the hip  |
| 14. <i>Biceps femoris</i>                 | Lateral posterior surface of thigh, near knee   | <u>Long head</u> : ischial tuberosity; <u>Short head</u> : lower half of <i>linea aspera</i> and lateral condylar ridge of femur             | Lateral condyle of tibia and head of fibula  | Flexion of knee, extension of hip, external rotation of hip and knee  |
| 15. <i>Gastrocnemius</i>                  | Posterior aspect of lower leg ("calf" muscle)   | <u>Medial head</u> : posterior surface of the medial femoral condyle; <u>Lateral head</u> : posterior surface of the lateral femoral condyle | Posterior surface of calcaneus via calcaneal (Achilles') tendon                                  | Plantar flexion of ankle; weak flexion of the knee  |

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| 16. <i>Tibialis anterior</i> | Anterior lateral side of tibia | Upper 2/3 of the lateral surface of tibia  | Inner surface of the medial cuneiform and the first metatarsal bone | Dorsiflexion of the ankle and inversion of the foot.                                    |
| <b>Rotator Cuff Muscles</b>  |                                |  |   |   |
| 17. <i>Supraspinatus</i>     | No external appearance         | Medial 2/3 of the supraspinous fossa of the scapula                              | Superiorly on the greater tubercle of the humerus                   | Stabilizes glenohumeral joint (GHJ), weak abduction of GJH                              |
| 18. <i>Infraspinatus</i>     | No external appearance         | Medial aspect of infraspinous fossa of the scapula                               | Posteriorly on the greater tubercle of the humerus                  | Stabilizes GHJ joint, external rotation, horizontal abduction, and extension of the GHJ |
| 19. <i>Teres minor</i>       | No external appearance         | Posteriorly on the upper and middle aspects of the lateral border of the scapula | Posteriorly on the greater tubercle of the humerus                  | Stabilizes GHJ, External rotation, horizontal abduction, and extension of GHJ           |
| 20. <i>Subscapularis</i>     | No external appearance         | Entire anterior surface of subscapular fossa                                     | Lesser tubercle of humerus  | Stabilizes GHJ; internal rotation, adduction, and extension of the GHJ                  |

To analyze a muscle's actions properly, you must take into account its origin, insertion, direction of pull, orientation of fascicles, shape of the joint, and other mechanical variables that have an effect. Here is an example of the sort of analysis that you should be able to perform when you are asked how a particular muscle produces its observed actions.

**Pronator teres:** The pronator teres is difficult to see on the surface, but it can be found on the medial side of the "hollow" in front of the elbow (antecubital fossa). It attaches proximally at the medial epicondyle of the humerus and attaches distally on the pronator tuberosity of the radius. When the pronator teres contracts, it applies tension to the pronator tuberosity of the radius; it acts on the radioulnar and humeroradial pivot joints, as well as the humeroulnar hinge joint, which allow both rotation in the transverse plane and flexion–extension in the sagittal plane. Since the muscle is oriented diagonally in front of the joints in a superomedial to inferolateral position, its action can generate lateromedial rotation of the radius and/or flexion of the elbow.