Muscle gross anatomy

Introduction

There are over 700 skeletal muscles that have been identified in human body.

Each contributes to motion, facial expression, posture, and/or temperature regulation.
Body Movements

Specific terminology used to describe movements at synovial joints

Terminology indicates
  Form of motion
  Direction of movement
  Relationship of body parts

Movements at synovial joints can be grouped in four categories
  Gliding
  Angular
  Rotation
  Special
Body Movements

Gliding movement

Movement of the hand back and forth at the wrist
Body Movements

Angular movements

Flexion/extension (hinge, pivot, condyloid, saddle, ball-and-socket)

Movement to reduce or increase angle at a joint

Hyperextension - increases the angle at a joint past anatomical position

This is actually hyperextension of the arm.
Body Movements
Angular movements
Abduction/adduction:
  movement away or toward the longitudinal axis
  of the body
Circumduction:
  combination of abduction/adduction and flex/extension
Body Movements

Rotation

left or right rotation of bone on an axis, medial or lateral rotation is toward or away from the anterior body surface.
Body Movements
Special movements
Protraction/retraction

anteriorly or posteriorly in the horizontal plane (jaw, clavicles)
Body Movements
Special movements
Elevation / depression

superior and inferior movement at a joint
(shrug shoulders, jaw)
Body Movements

Special movements

Dorsi/plantar flexion

special actions of the foot
Body Movements
Special movements
Inversion/eversion

- inversion is a twisting motion of the foot which turns the sole inward;
- eversion turns the sole outward
Body Movements

Special movements

Supination and pronation

palm downward = pronation;
palm upward = supination
Identifying muscle

Origin and insertion of a muscle

**Origin** - where the muscle begins on a bone; stays stationary in a movement

**Insertion** - where the muscle ends; portion which pulls on bone to cause movement; distal to origin

![Diagram of muscle origins and insertions]
Classifying muscle based on action

**Agonist** - muscle primarily responsible for the movement
Example: Biceps brachii

**Antagonist** - muscle which opposes the action of the agonist
Example: Triceps brachii

**Synergist** - assists the agonist in making the action more efficient
Example: Brachialis
Classifying muscle based on action

**Fixators** - special synergists which help to prevent movement at muscle origin

Example: Deltoid - pectoralis minor and rhomboid
Naming of muscles based on other characteristics

Orientation of muscle fibers

rectus = straight (rectus abdominis)

oblique = diagonal to midline (internal oblique)

transverse = perpendicular to midline (transversus abdominis)
Naming of muscles based on location

Frontalis

Tibialis anterior

Naming of muscles based on position

internus (internal oblique)
externus (external oblique)

supraspinatus
Naming of muscles based on structure/shape/size

**Structure:** number of origins (biceps, triceps, quadriceps)

**Shape:** trapezius, rhomboideus (diamond)

**Size:** maximus, minimus, brevus, longus
Types of muscle contraction

**Isotonic Muscle contractions**

Two types: 1. Concentric contraction  
2. Eccentric contraction

**Concentric contraction:** Tension developed exceeds resistance and muscle shortens
Isotonic Muscle contractions
Eccentric contraction

Eccentric contraction: Load force greater than muscle force; muscle lengthens; “down phase”

A lengthening contraction
Types of muscle contraction

**Isometric**: Resistance is equal to, or greater than tension; no change in length; tension is created.
Types of levers systems that are present in body

First class: Fulcrum between resistance (load) and force (effort) (EFL)
Types of levers systems that are present in body

Second class: Resistance (load) between fulcrum and force (effort) (FLE)
Types of levers systems that are present in body

Third class: Force (effort) between fulcrum and resistance (load) (FEL)