Anatomical Terms

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Spatial and Directional Terminology

• Anatomical Position?

• Anterior (Ventral)
  – Toward the front of the body

• Posterior (Dorsal)
  – Toward the rear of the body
Spatial and Directional Terminology

- **Superior (Cranial)**: toward or closer to the head.
- **Inferior (Caudal)**: toward or closer to the feet.
- **Medial**: direction or positions relative to the midline of the body
- **Lateral**: away from or farther from the midline of the body
- **Proximal**: a location or direction toward or closer to the trunk.
- **Distal**: away or farther from the trunk
- **Superficial**: closer to the skin
- **Deep**: farther from the skin

Planes and Axes of Motion

- Plane: 2D surface
- Motion occurs **in a plane**.
- Anatomical Plane
  - **Sagittal**: an imaginary plane dividing the body into right and left parts
  - **Frontal**: an imaginary plane dividing the body into anterior and posterior parts
  - **Transverse (horizontal)**: an imaginary plane dividing the body into superior and inferior parts
- **Cardinal plane**: a plane that passes through the midpoint or center of gravity of the body.
Planes and Axes of Motion

- Axis: a line perpendicular to surface.
- Motion occurs *about an axis*.
- Anatomical Axes
  - A-P (anteroposterior): an imaginary line running from anterior to posterior and perpendicular to the frontal planes.
  - M-L (medical-lateral) or transverse: an imaginary line running from left to right and perpendicular to sagittal planes.
  - Longitudinal: an imaginary line running from top to bottom and perpendicular to transverse planes.

- Identifying Planes and Axes of Motion
  - Sagittal plane rotations occur about a medial-lateral (ML) axis
  - Frontal Plane rotations occur about an anterior-posterior (AP) axis
  - Transverse plane rotations occur about a longitudinal axis
Joint Actions

- Describe the relative movements of two limbs at joints.
- **Major joints**: Neck, Trunk, Shoulder, Elbow, Wrist, Hip, Knee, Ankle, and Scapular
- General Motions: Diagonal plane – Oblique axis
- Movement around specific planes and axes *(From Anatomical position basis)*

Movement in Sagittal Plane

- **Flexion**: Decreasing angles between two segments
- **Extension**: Increasing angles between two segments
- **Hyperextension**: Increasing angles more than 180°
- Major Joints involved: Wrist, Elbow, Shoulder, Hip, Knee, Trunk, Neck, & Ankle
Ankle Joints

- **Talocrural Joint (Ankle Joint)**
  - Plantar/Dorsi flexion (Sagittal Plane)
- **Subtalar Joint**
  - Inversion/Eversion (Frontal Plane)

Movement in Frontal Plane

- **Abduction**: Away from midline
- **Adduction**: Closer to midline
- **Radial/Ulnar deviation**
- **Inversion/Eversion**
- **Later flexion to R/L**
- **Elevation/Depression**
- **Upward/Downward rotation**

- Major Joints involved: Shoulder, Hip, Wrist, Ankle, Trunk, Neck, & Scapula
Dolphin VS. Shark

• Swimming Patterns?

Movement in Frontal Plane

Watch Out! Those motions are closely related to Ab-/Adduction of Shoulder
Movements in Transverse Plane

- **External/Internal rotation**
- **Horizontal abduction/adduction**
- **Pronation**: Palm down
- **Supination**: Palm up
- **Rotation to R/L**
- **Protraction/Retraction**

- Major joints involved: Hip, Shoulder, Radioulnar, Neck, Trunk, & Scapula

Radioulnar Joint

- Distal Radioulnar Joint
- Proximal Radioulnar Joint

Elbow Complex (Anterior View)