

Human Anatomy

Lec.1

Introduction

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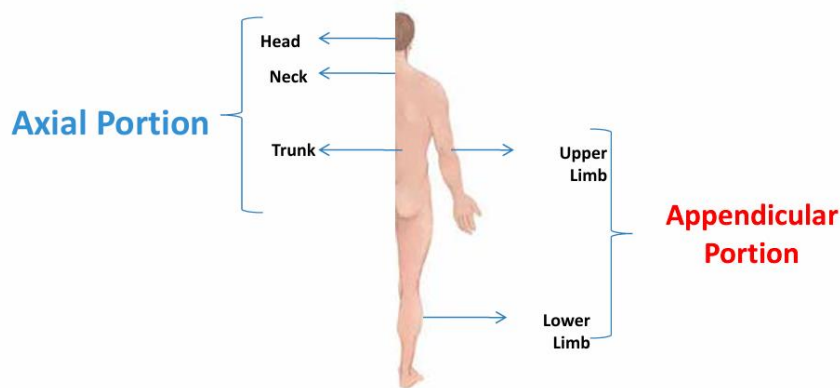
✚ **Anatomy:** Is a branch of science that deals with the internal and external structures (morphology) of the **human body parts**; their forms and arrangement. Anatomy is a Greek word meaning “**to cut apart.**”

Types of Anatomy:

1. Microscopic anatomy.
2. Macroscopic (gross) anatomy.

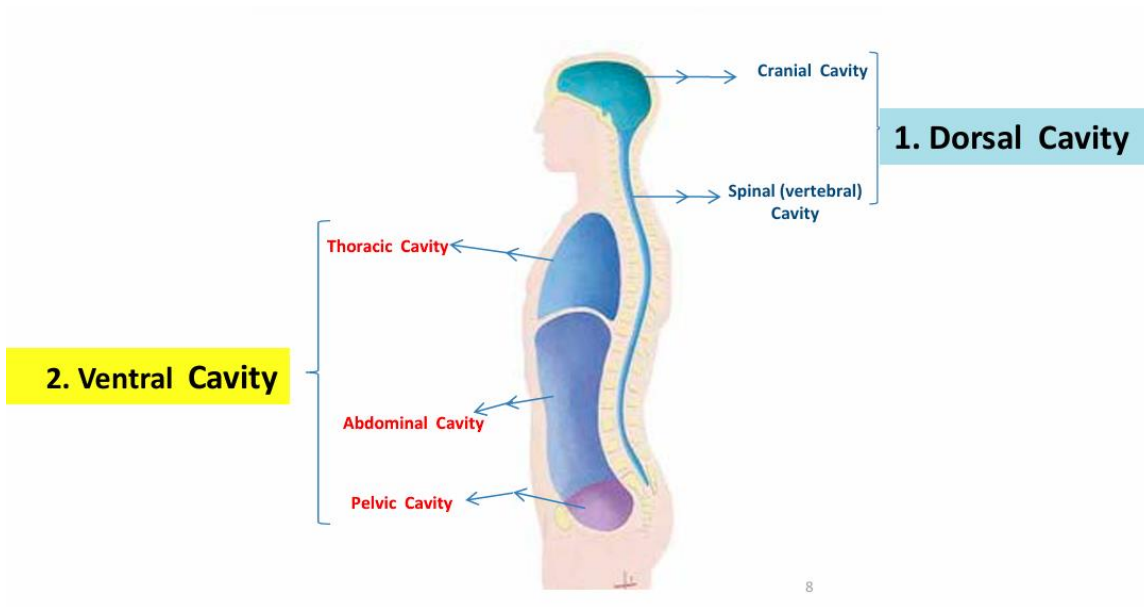
✚ **Clinical anatomy:** Refers to the practical application of anatomical knowledge to clinical problem-solving. It is anatomy in all its aspects - gross, histologic, developmental and neurologic as applied to clinical practice.

Body division



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Body cavities located only in the Axial Portion



1. Anatomical Position

- **B**ody erect
- **F**eet slightly apart
- **P**alms facing forward
- **T**humbs point away from body



✚ Planes and Sections

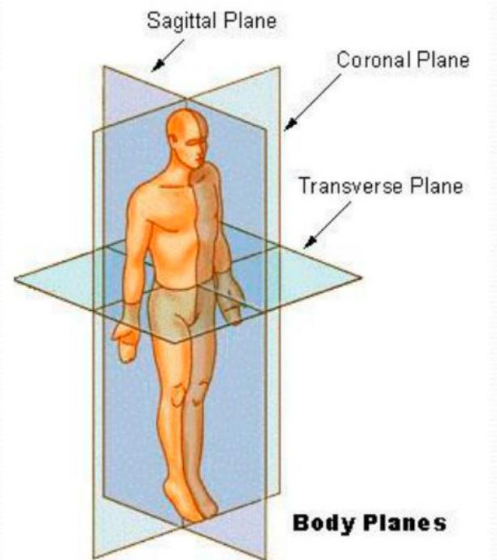
Plane

It is an imaginary flat surface that passes through the body for study

➤ Section

It is one of the two surfaces (pieces) that results when the body is cut by a plane.

- Planes are imaginary flat sections that pass through body parts.
- **Sagittal plane**: vertical to midline (rt./left)
- **Frontal (coronal) plane**: divides into anterior and posterior portions
- **Transverse plane**: divides into superior and inferior portions (cross section)

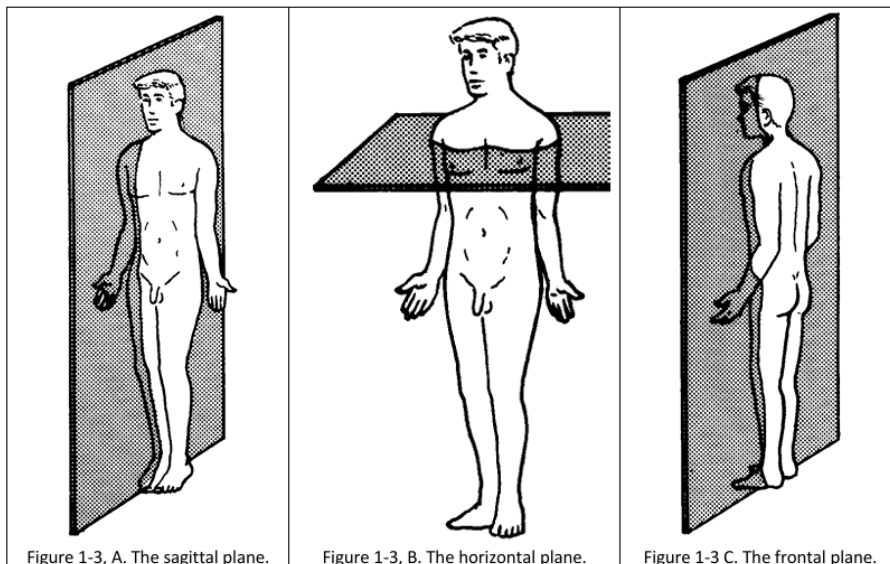


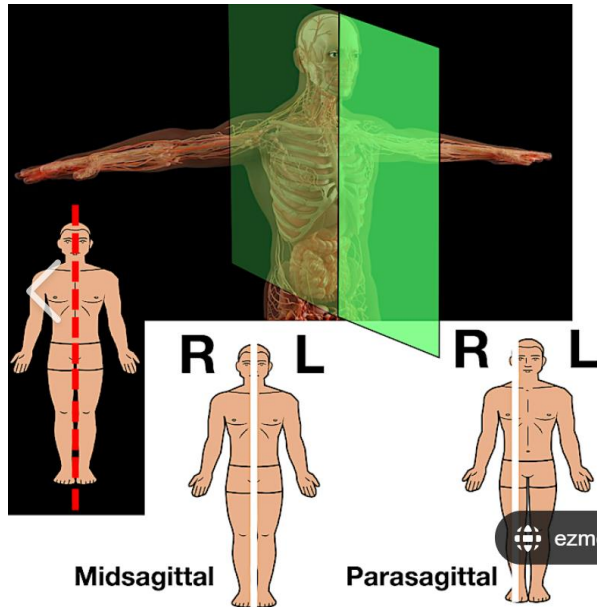
□ Midsagittal Plane

- It produces equal halves.

□ Parasagittal Plane.

- It produces unequal halves.

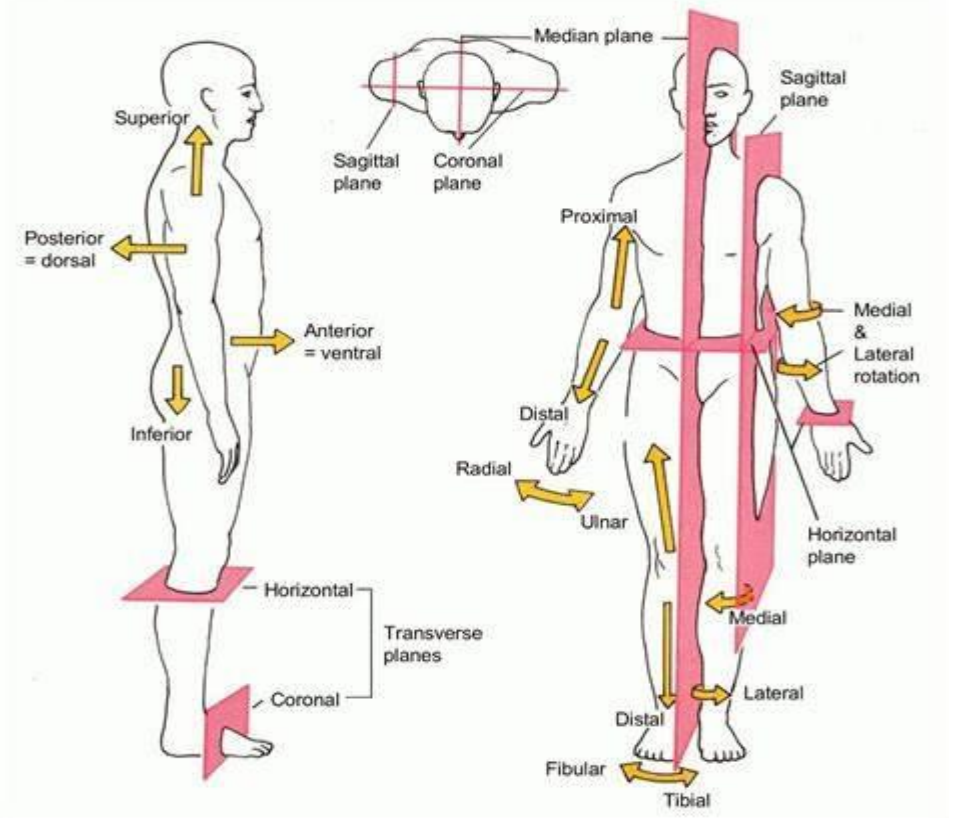
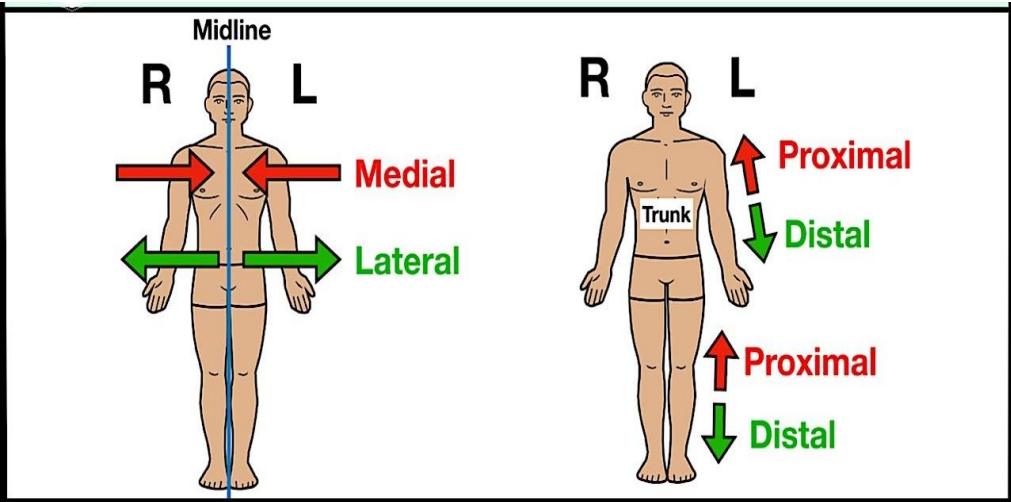




- **Vertical line**
- **Runs from top to bottom, and front to back**
- **Divides the body into a right section and a left section**
- **Midsagittal Plane** - The specific sagittal plane through the midline of the body
- **Parasagittal Plane** - Any sagittal plane off-center from midline

+ DIRECTIONS

- **Superior** means above.
- **Inferior** means below.
- **Anterior** means the front of the body. A commonly-used substitute word is **Ventral**.
- **Posterior** means the back of the body. A commonly-used substitute word is **Dorsal**.
- **Medial** means toward or **nearer the midline** of the body.
- **Lateral** means **away from the midline** or toward the side of the body.
- Superficial** means closer to the surface of the body.
- **Deep** means toward the center of the body or body part. **Proximal** and **distal** are terms applied specifically to the limbs.
- **Proximal** means **nearer** to the shoulder joint or the hip joint.
- **Distal** means further **away** from the shoulder joint or the hip joint.

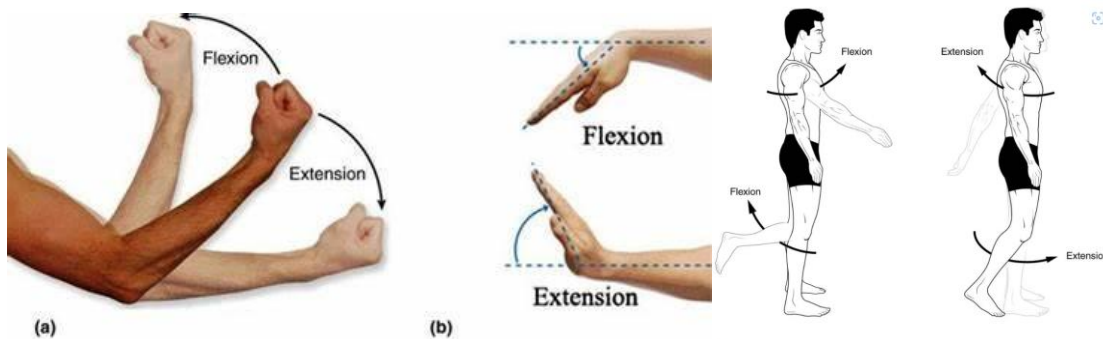


Anatomical terms of movement: are used to describe the actions of muscles upon the skeleton. **Muscles** contract to produce movement at joints, and the subsequent movements can be precisely described using this terminology. The terms used assume that the body begins in the **anatomical position**. Most movements have an opposite movement – also known as **an antagonistic movement**.

✚ Flexion & Extension

Flexion and extension are movements that occur in the sagittal plane. They refer to increasing and decreasing the angle between **two body parts**:

- **Flexion** refers to a movement that **decreases** the angle between two body parts. Flexion at the **elbow** is decreasing the angle between the **ulna** and the **humerus**. When the **knee** flexes, the **ankle** moves closer to the buttock, and the angle between the **femur** and **tibia** gets smaller.
- **Extension** refers to a movement that **increases** the angle between two body parts. Extension at the elbow is increasing the angle between the ulna and the humerus. Extension of the knee straightens the lower limb.



Shoulder Extension
(Increasing angle between humerus & acromion of your scapula)



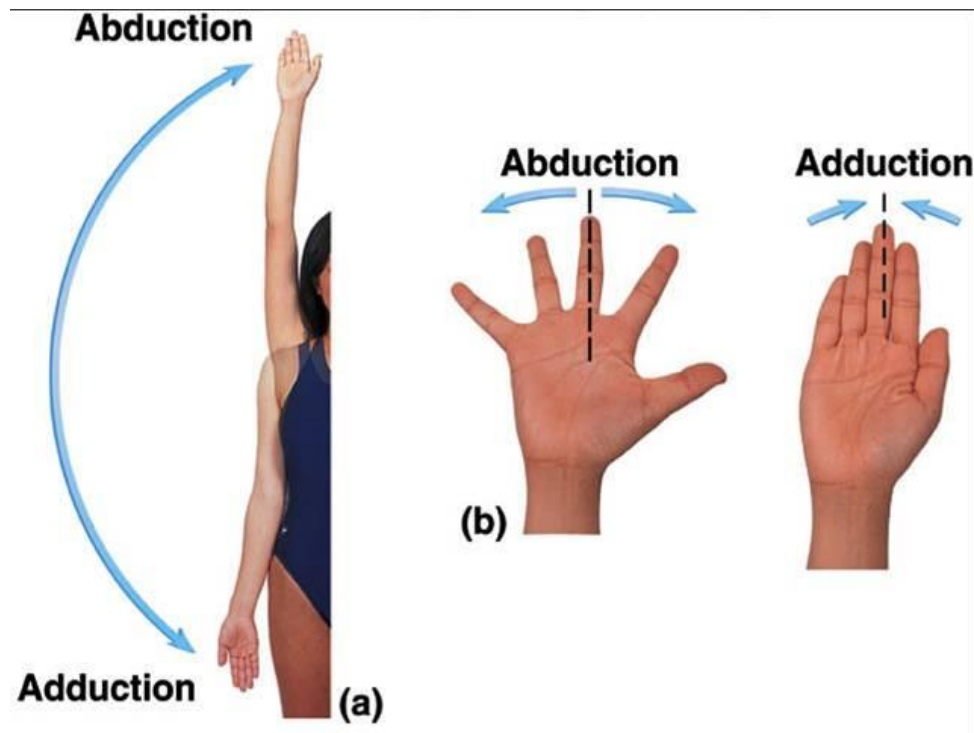
Shoulder Flexion
(Decreasing angle between humerus & acromion of your scapula)



✚ Abduction & Adduction

Abduction and adduction are two terms that are used to describe movements towards or away from the midline of the body.

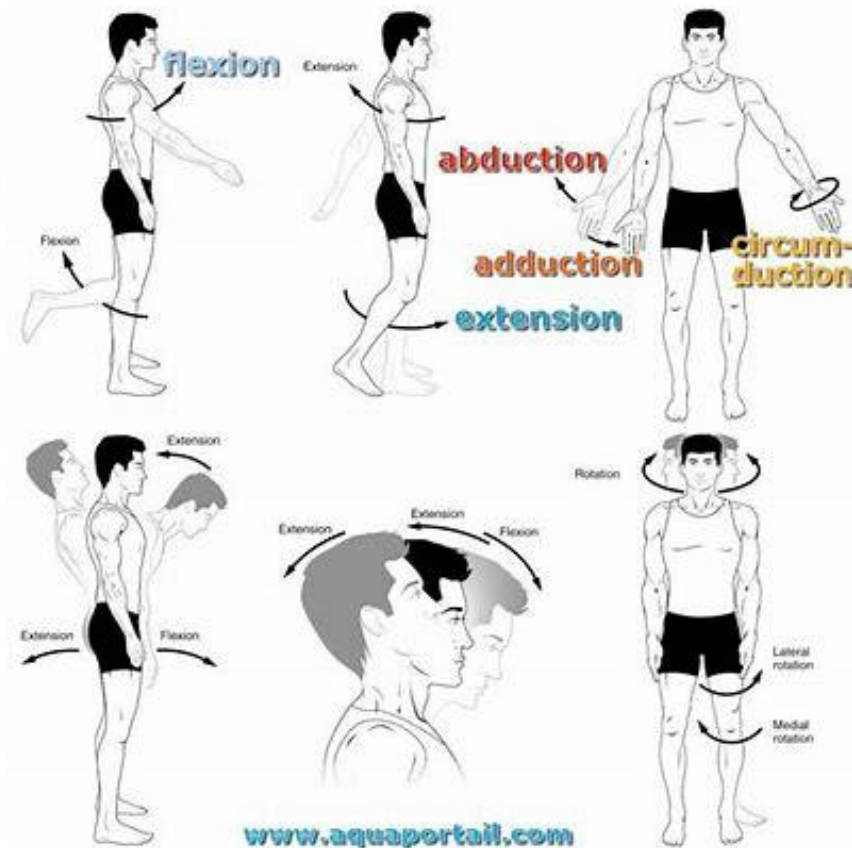
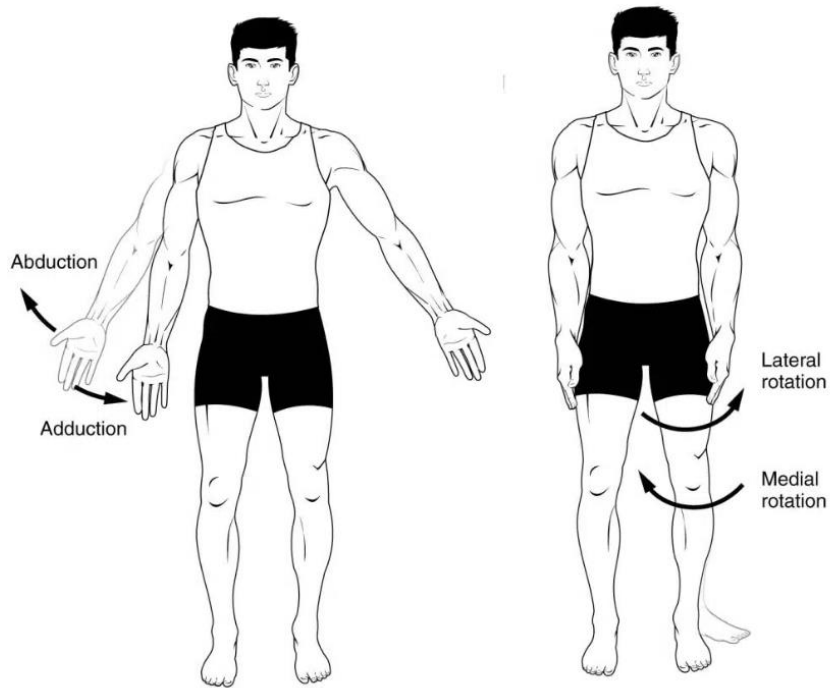
- **Abduction:** is a movement **away from the midline** – just as abducting someone is to take them away. For example, abduction of the shoulder raises the arms out to the sides of the body.
- **Adduction:** is a movement **towards the midline**. Adduction of the hip squeezes the legs together.



✚ **Medial & Lateral Rotation**

Medial and lateral rotation describe movement of the limbs around their long axis:

- **Medial rotation:** is a rotational movement **towards** the midline. It is sometimes referred to as internal rotation.
- **Lateral rotation:** is a rotating movement **away** from the midline. This is in the opposite direction to the movements described above.



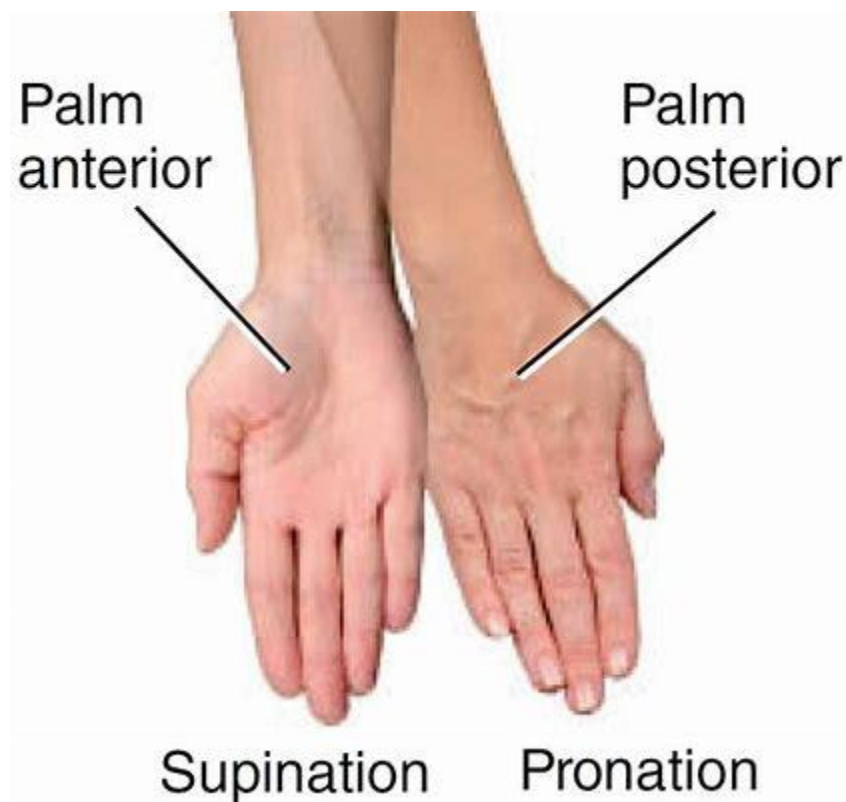
✚ Elevation & Depression

- **Elevation:** refers to movement in a superior direction (e.g. shoulder shrug).
- **Depression:** refers to movement in an inferior direction.

✚ Pronation & Supination

This is easily confused with medial and lateral rotation, but the difference is subtle. With your hand resting on a table in front of you, and keeping your shoulder and elbow still, turn your hand onto its back, palm up. This is the supine position, and so this movement is **supination**.

Again, keeping the elbow and shoulder still, flip your hand onto its front, palm down. This is the prone position, and so this movement is named **pronation**.





✚ **Dorsiflexion & Plantarflexion**

- **Dorsiflexion:** refers to flexion at the ankle, so that the foot points more superiorly. Dorsiflexion of the hand is a confusing term, and so is rarely used. The dorsum of the hand is the posterior surface, and so movement in that direction is extension. Therefore we can say that dorsiflexion of the wrist is the same as extension.
- **Plantarflexion:** refers extension at the ankle, so that the foot points inferiorly. Similarly, there is a term for the hand, which is palmar flexion.



Inversion & Eversion

- **Inversion:** involves the movement of the sole **towards the median plane** – so that the sole faces in a medial direction.
- **Eversion:** involves the movement of the sole **away from the median plane** – so that the sole faces in a lateral direction.



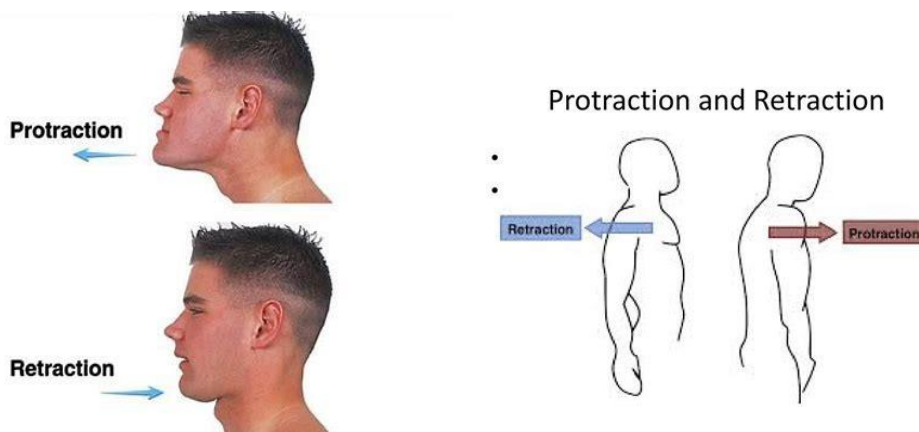
+ Opposition & Reposition

A pair of movements that are limited to humans and some great apes, these terms apply to the additional movements that the hand and thumb can perform in these species.

- **Opposition:** brings the thumb and little finger together.
- **Reposition:** is a movement that moves the thumb and the little finger away from each other, effectively reversing opposition.

+ Circumduction

- **Protraction:** describes the **anterolateral movement of the scapula** on the thoracic wall that allows the shoulder to move anteriorly. In practice, this is the movement of ‘reaching out’ to something.
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- **Retraction:** refers to the **posteromedial movement of the scapula** on the thoracic wall, which causes the shoulder region to move posteriorly i.e. picking something up.



References

- + Snell RS. Clinical Anatomy by Regions. 9th edition. Philadelphia, PA: Lippincott Williams & Wilkins, 2012.
- + <https://teachmeanatomy.info>.