

Anatomy is the science of the structure and function of the body.

Clinical anatomy is the study of the macroscopic structure and function of the body as it relates to the practice of medicine and other health sciences.

Basic anatomy is the study of the minimal amount of anatomy consistent with the understanding of the overall structure and function of the body.

Descriptive Anatomic Terms

It is important for medical personnel to have a sound knowledge and understanding of the basic anatomic terms.

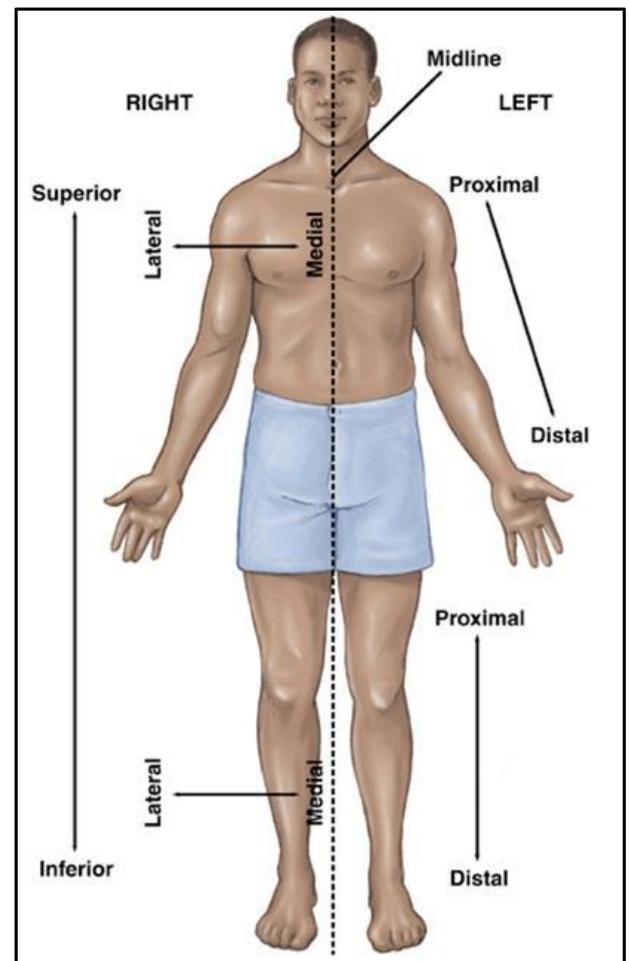
The accurate use of anatomic terms by medical personnel enables them to communicate with their colleagues both nationally and internationally. Without anatomic terms, one cannot accurately discuss or record the abnormal functions of joints, the actions of muscles, the alteration of position of organs, or the exact location of swellings or tumors.

- **Terms Related to Position:**

All descriptions of the human body are based on the assumption that 1) the person is standing erect, with 2) the upper limbs by the sides and 3) the face and palms of the hands directed forward. This is the so-called **anatomic position**.

The various parts of the body are then described in relation to certain imaginary planes.

There are three planes commonly used; sagittal, coronal and transverse.



- **Sagittal planes**

Vertical plane that divides the body into right and left sections.

Median Sagittal or midsagittal Plane is a vertical plane passing through the center of the body, dividing it into equal right and left halves.

Paramedian or parasagittal planes are vertical planes situated to one or the other side of the median plane and parallel to it and divides the body into unequal right and left portions.

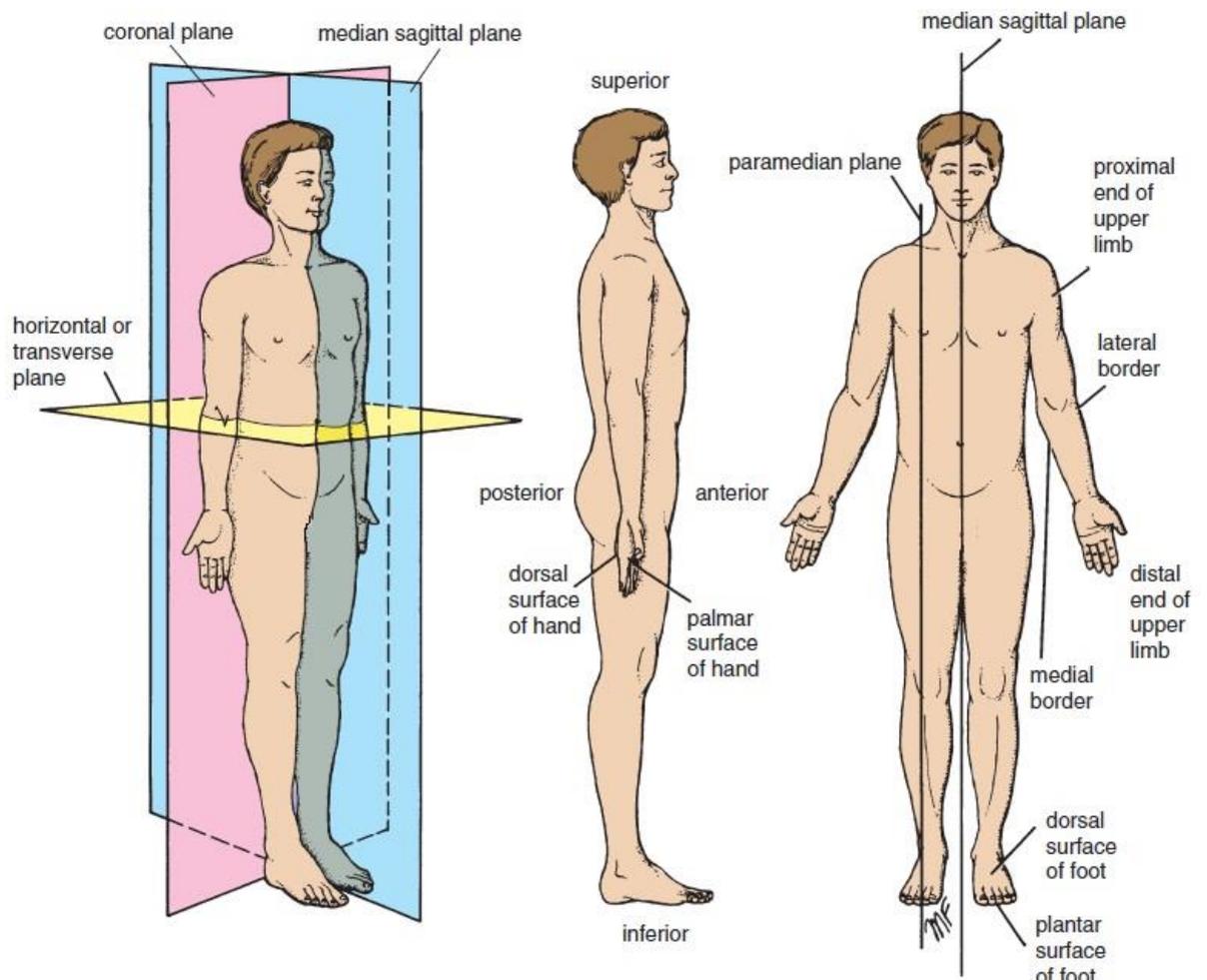
A structure situated nearer to the median plane of the body than another is said to be **medial** to the other. Similarly, a structure that lies farther away from the median plane than another is said to be **lateral** to the other. Examples: The eye is lateral to the nose, the nose is medial to the ears.

- **Coronal Planes**

These planes are imaginary vertical planes at right angles to the median plane, its divides the body into anterior and posterior portions (equal or unequal).

- **Horizontal, axial or Transverse Planes**

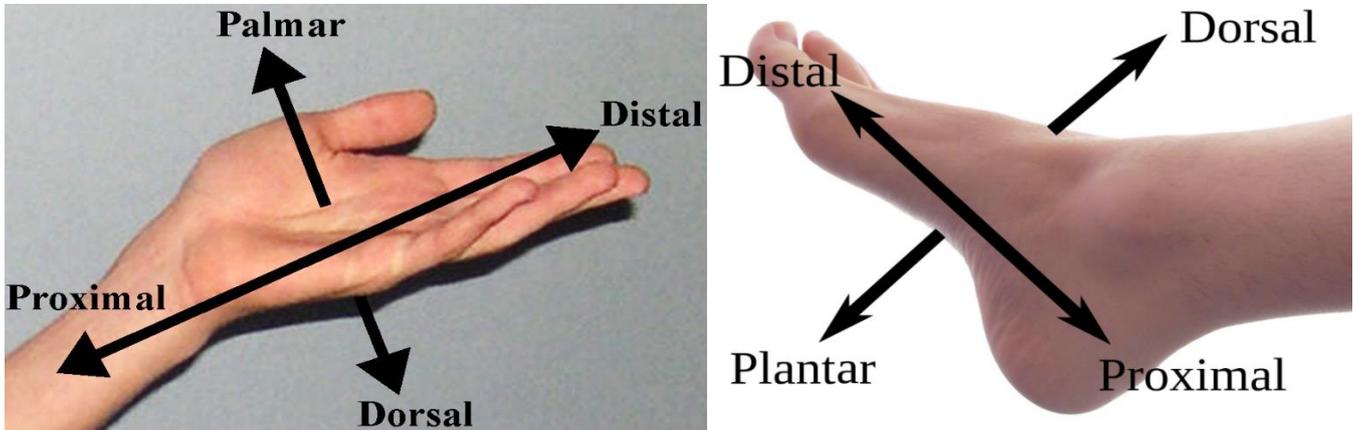
These planes are horizontal planes that divides the body into superior and inferior portions (equal or unequal) and at right angles to both the median and the coronal planes.



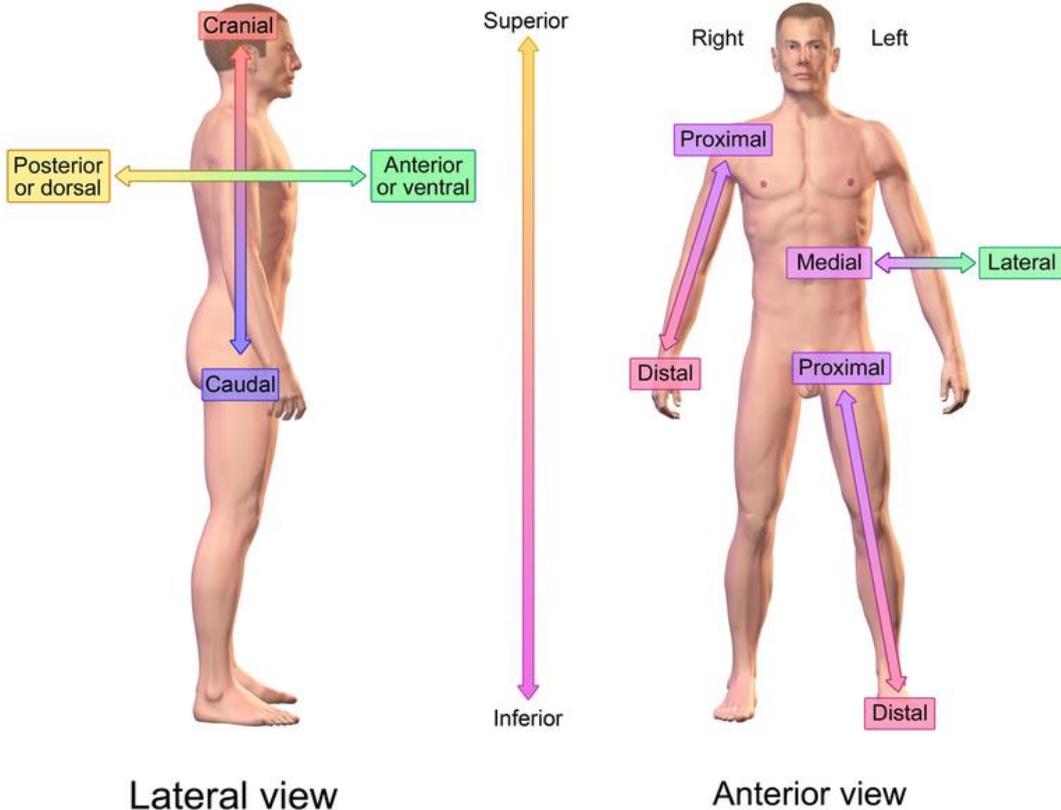
The terms **anterior (ventral) and posterior (dorsal)** are used to indicate the front and back of the body, respectively.

To describe the relationship of two structures, one is said to be anterior or posterior to the other insofar as it is closer to the anterior or posterior body surface.

In describing the hand, the terms **palmar and dorsal surfaces** are used in place of anterior and posterior, and in describing the foot, the terms **plantar and dorsal surfaces** are used instead of lower and upper surfaces.



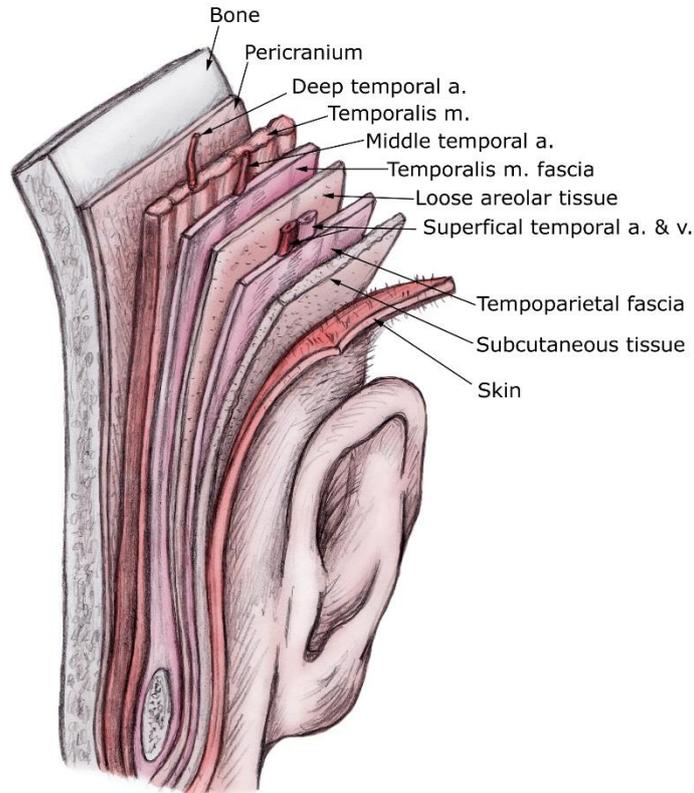
The terms **proximal and distal** describe the relative distances from the roots of the limbs; for example, the arm is proximal to the forearm and the hand is distal to the forearm.



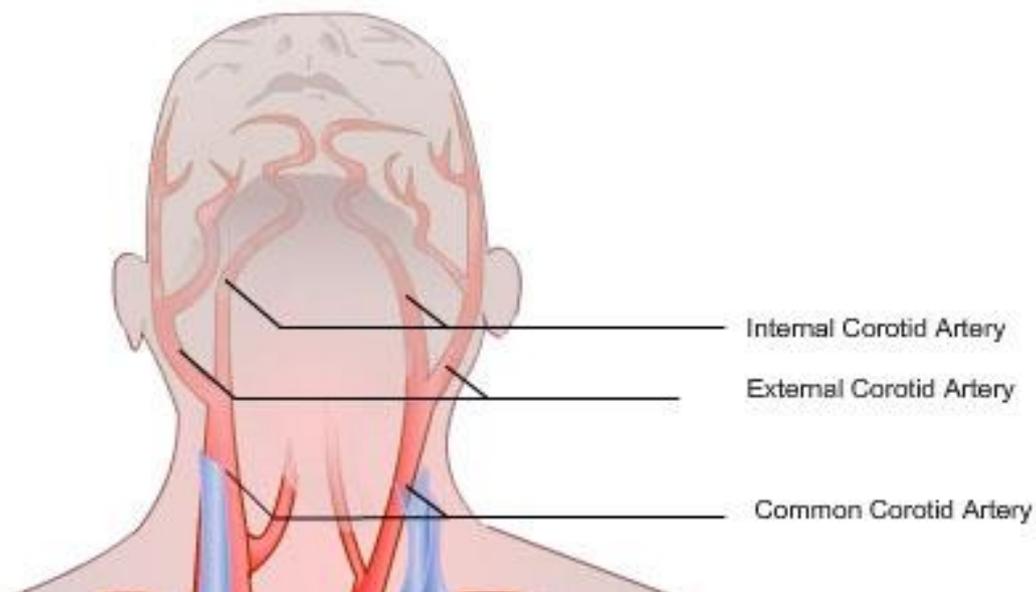
Directional References

The terms **superficial and deep** denote the relative distances of structures from the surface of the body.

The terms **superior and inferior** denote levels relatively high or low with reference to the upper and lower ends of the body, that is **Superior** (cranial) “Upward, or near the head” and **inferior** (caudal) “Downward, or near the feet”.



The terms **internal and external** are used to describe the relative distance of a structure from the center of an organ or cavity; for example, the internal carotid artery is found inside the cranial cavity and the external carotid artery is found outside the cranial cavity.



The term **ipsilateral** refers to the same side of the body; for example, the left hand and the left foot are ipsilateral. **Contralateral** refers to opposite sides of the body; for example, the left eye and the right ear are contralateral.

The **supine position of the body** is lying on the back. The **prone position** is lying face downward.

Supine



Prone



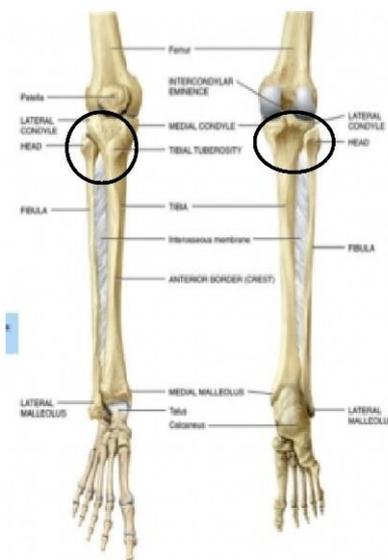
• **Terms Related to Movement**

A site where two or more bones come together is known as a **joint**. Some joints have no movement (sutures of the skull), some have only slight movement (superior tibiofibular joint), and some are freely movable (shoulder joint).

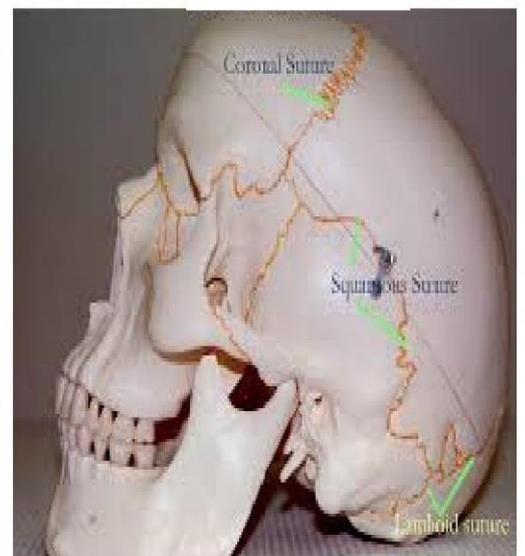
Anatomical terms of movement are used to describe the actions of muscles on the skeleton. Muscles contract to produce movement at joints, and the subsequent movements can be precisely described using the terminology below.



Shoulder joint



Superior tibiofibular joint



Sutures of the skull

Most movements have an opposite movement, otherwise known as an antagonistic movement. The terms are described here in antagonistic pairs for ease of understanding.

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

Flexion is a movement that decreases the angle between two body parts. For example, flexion of the elbow joint approximates the anterior surface of the forearm to the anterior surface of the arm. It is usually an anterior movement, but it is occasionally posterior, as in the case of the knee joint.

Extension means straightening the joint and increases the angle between two body parts, usually takes place in a posterior direction.

Lateral flexion is a movement of the trunk in the coronal plane.

Abduction is a movement of a limb away from the midline of the body in the coronal plane.

Adduction is a movement of a limb toward the body in the coronal plane. In the fingers and toes, abduction is applied to the spreading of these structures and adduction is applied to the drawing together of these structures.

Rotation is the term applied to the movement of a part of the body around its long axis.

Medial rotation is the movement that results in the anterior surface of the part facing medially.

Lateral rotation is the movement that results in the anterior surface of the part facing laterally.

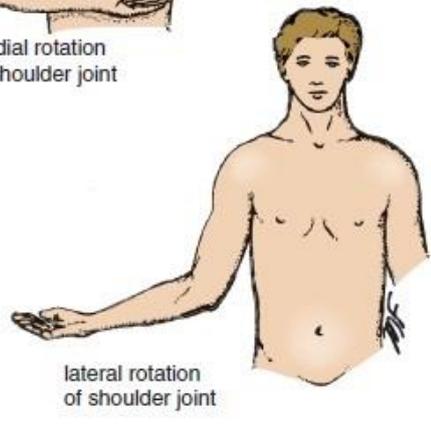
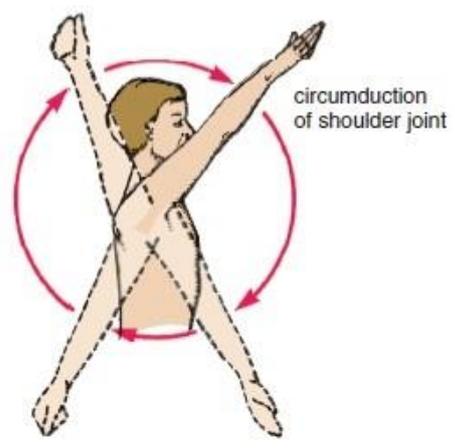
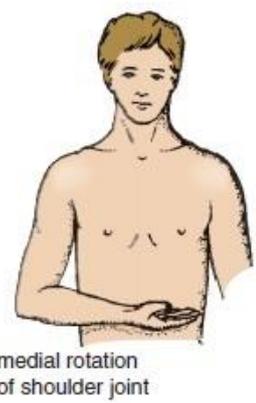
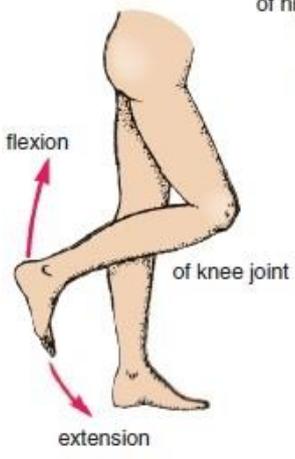
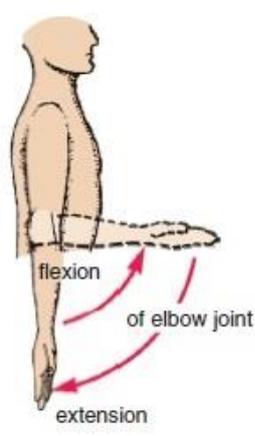
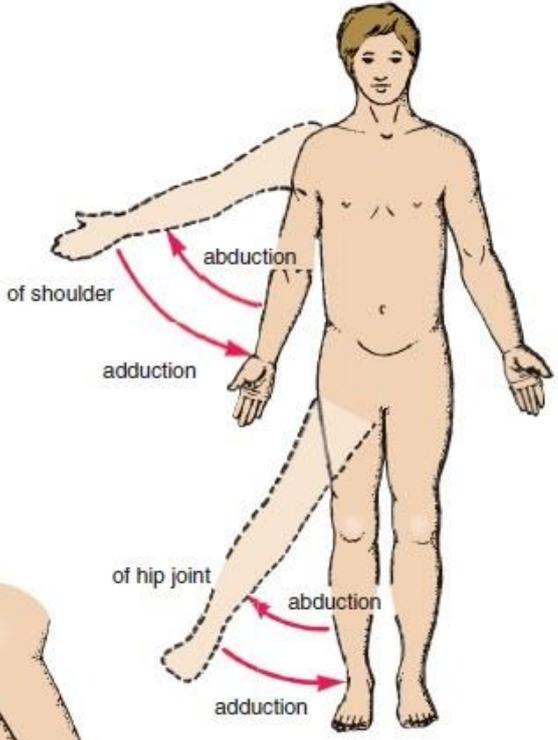
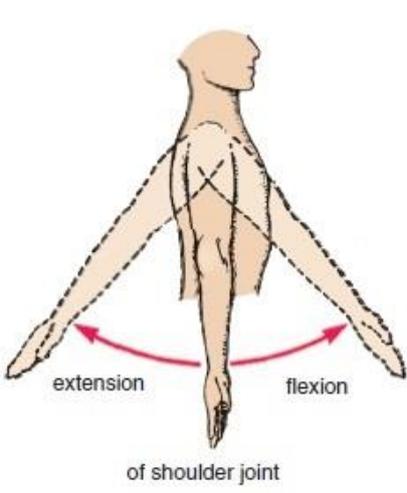
Pronation of the forearm is a medial rotation of the forearm in such a manner that the palm of the hand faces posteriorly.

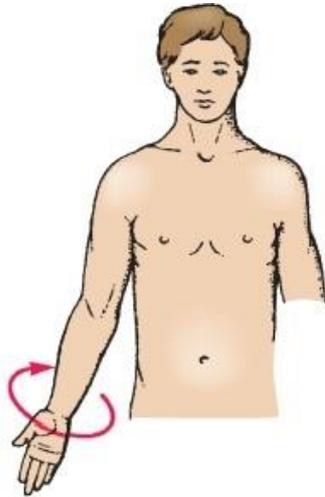
Supination of the forearm is a lateral rotation of the forearm from the pronated position so that the palm of the hand comes to face anteriorly.

Circumduction is the combination in sequence of the movements of flexion, extension, abduction, and adduction.

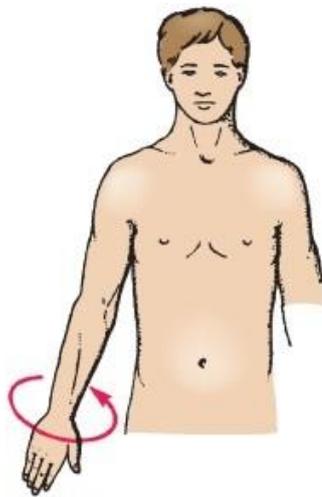
Inversion is the movement of the foot so that the sole faces in a medial direction.

Eversion is the opposite movement of the foot so that the sole faces in a lateral direction.

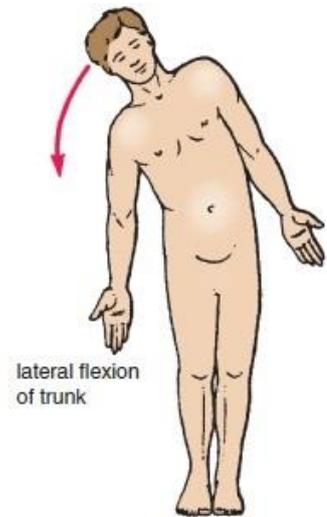




supination of forearm



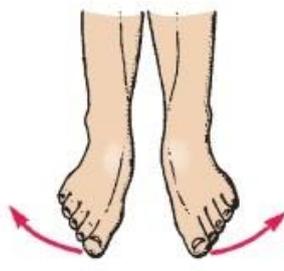
pronation of forearm



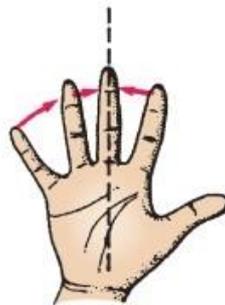
lateral flexion of trunk



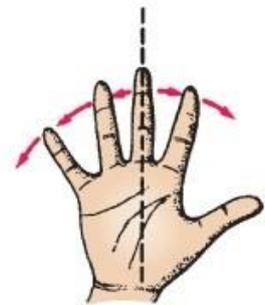
inversion of foot



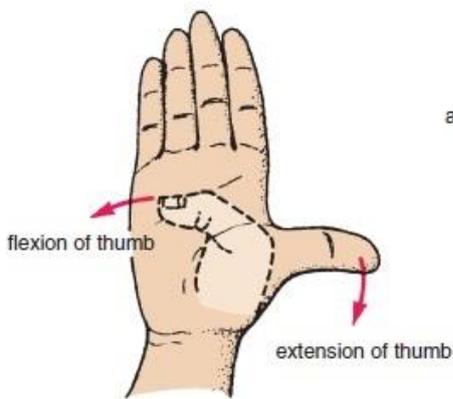
eversion of foot



adduction of fingers

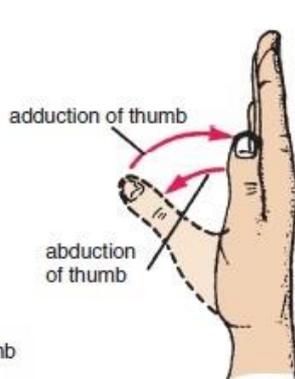


abduction of fingers



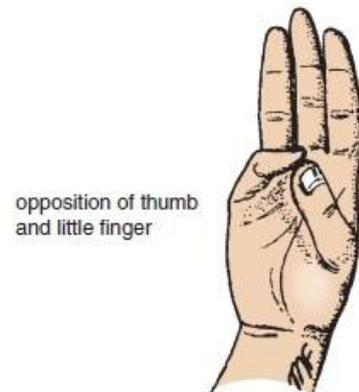
flexion of thumb

extension of thumb



adduction of thumb

abduction of thumb



opposition of thumb and little finger

Protraction is to move forward; **retraction** is to move backward (used to describe the forward and backward movement of the jaw at the temporomandibular joints).



General Terms of Anatomical Relationship			
Term	Definition	Term	Definition
Anterior (ventral)	Near the front	Superficial	Closer to the surface
Posterior (dorsal)	Near the back	Deep	Farther from the surface
Superior (cranial)	Upward, or near the head	Median plane	Divides body into equal right and left parts
Inferior (caudal)	Downward, or near the feet	Midsagittal plane	
Medial	Toward the midline or median plane	Paramedian or Parasagittal plane	Divides body into unequal right and left parts
Lateral	Farther from the midline or median plane	Frontal (coronal) plane	Divides body into equal or unequal anterior and posterior parts
Proximal	Near the roots of the limbs	Transverse plane	Divides body into equal or unequal superior and inferior parts (cross sections)
Distal	Away from the roots of the limbs		