

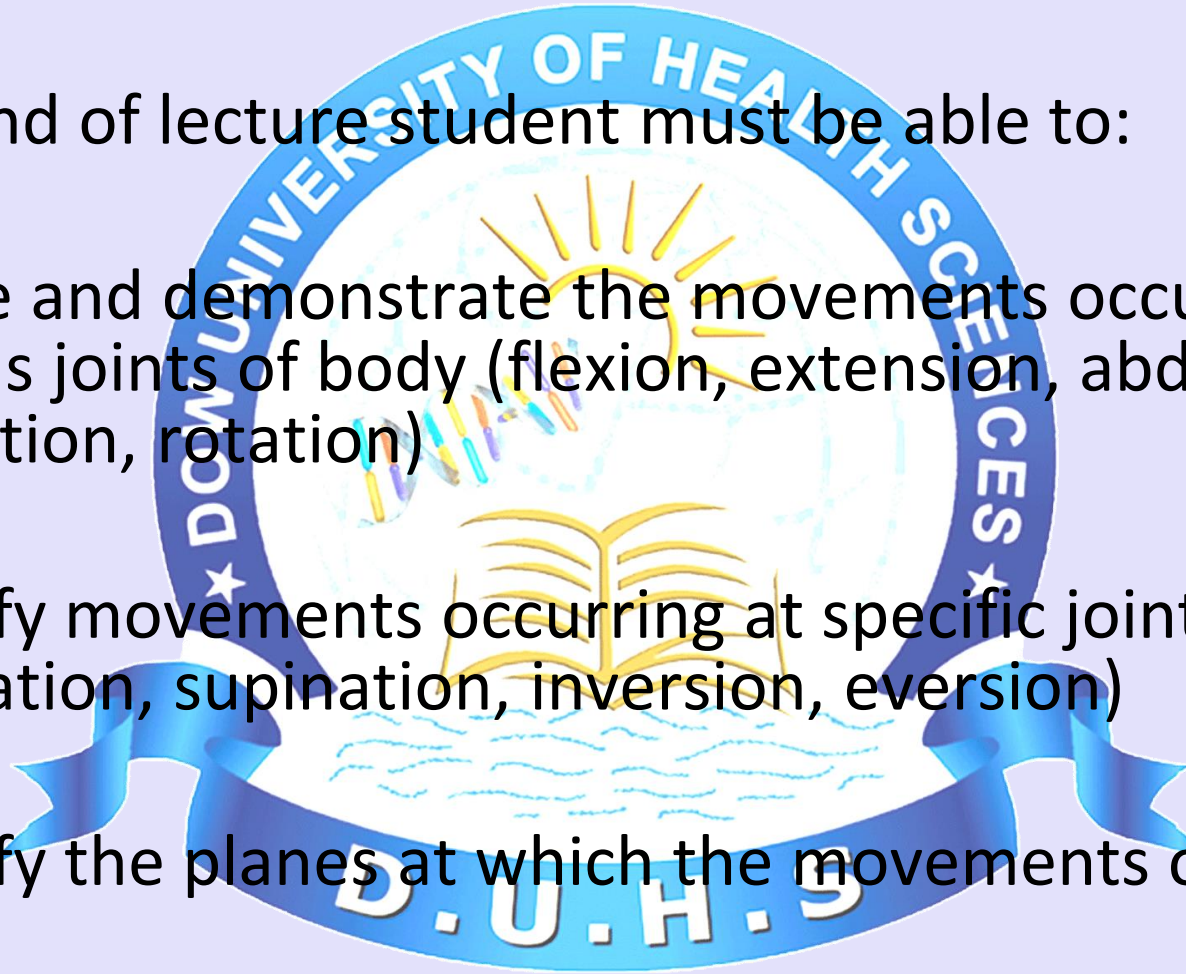
TERMS OF MOVEMENT



LEARNING OBJECTIVES

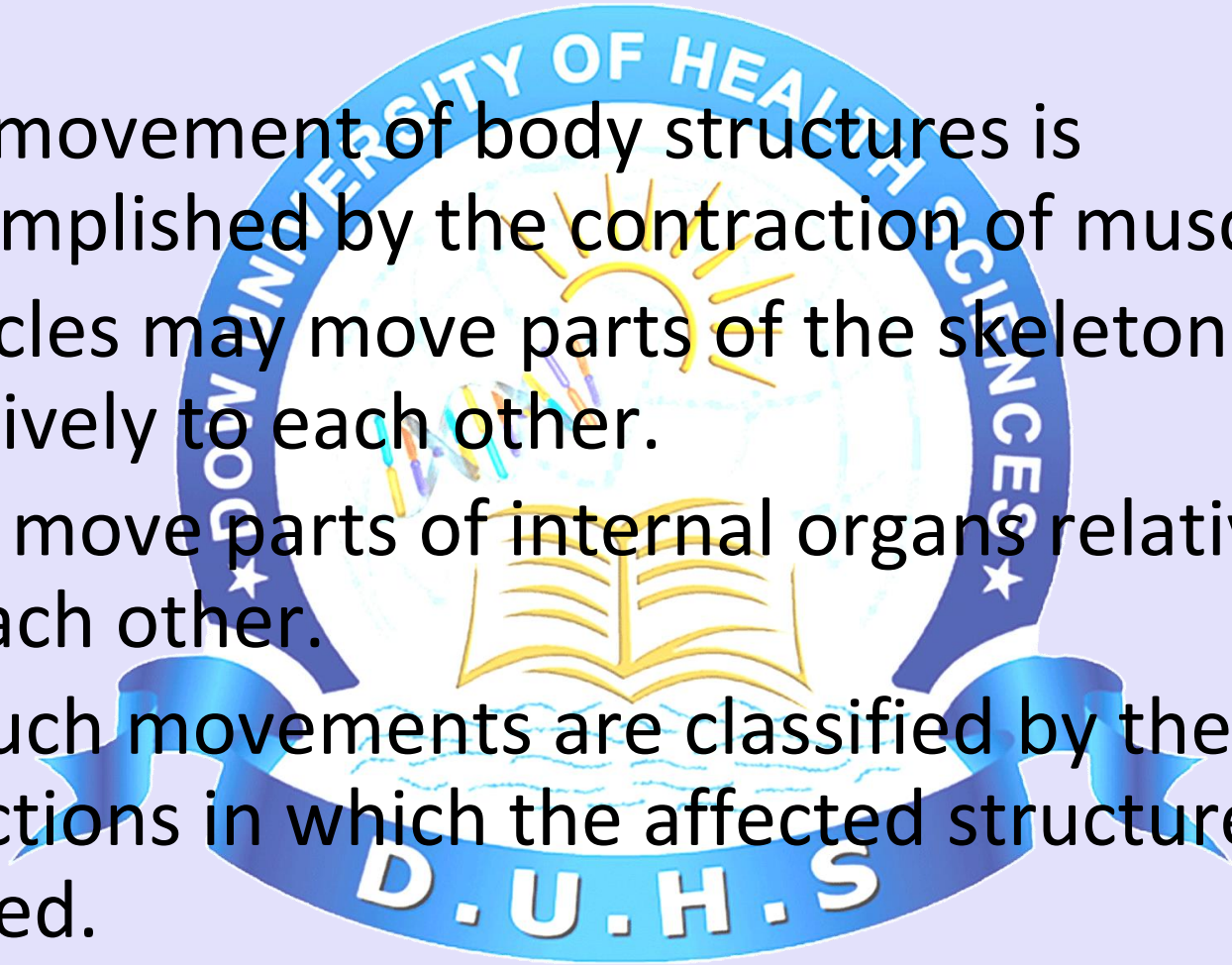
At the end of lecture student must be able to:

- Define and demonstrate the movements occurring at various joints of body (flexion, extension, abduction, adduction, rotation)
- Identify movements occurring at specific joints (pronation, supination, inversion, eversion)
- Identify the planes at which the movements occur



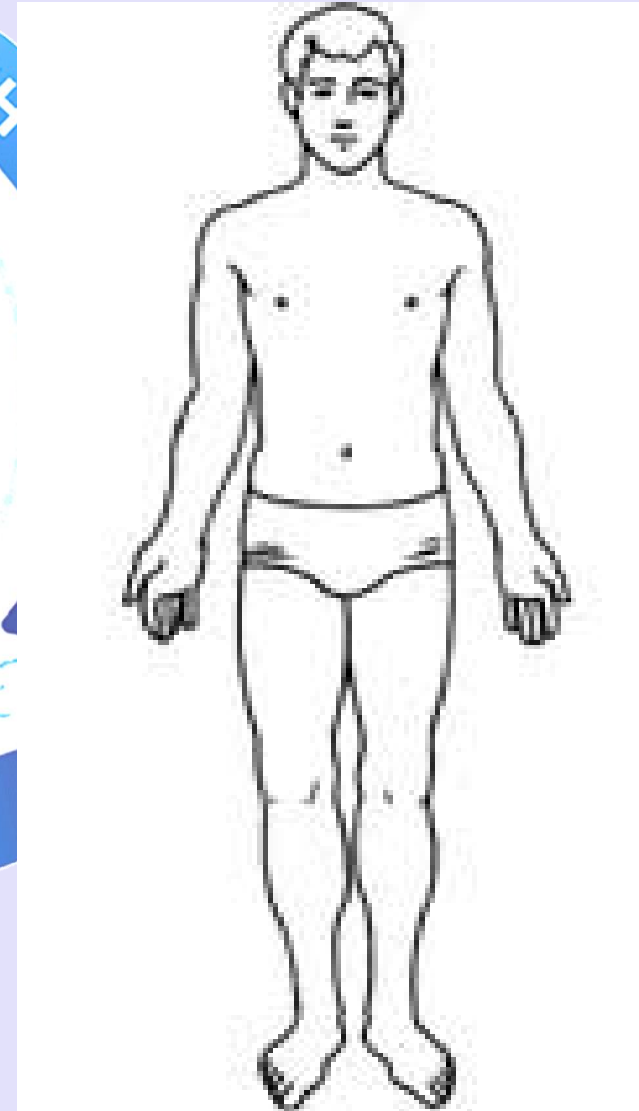
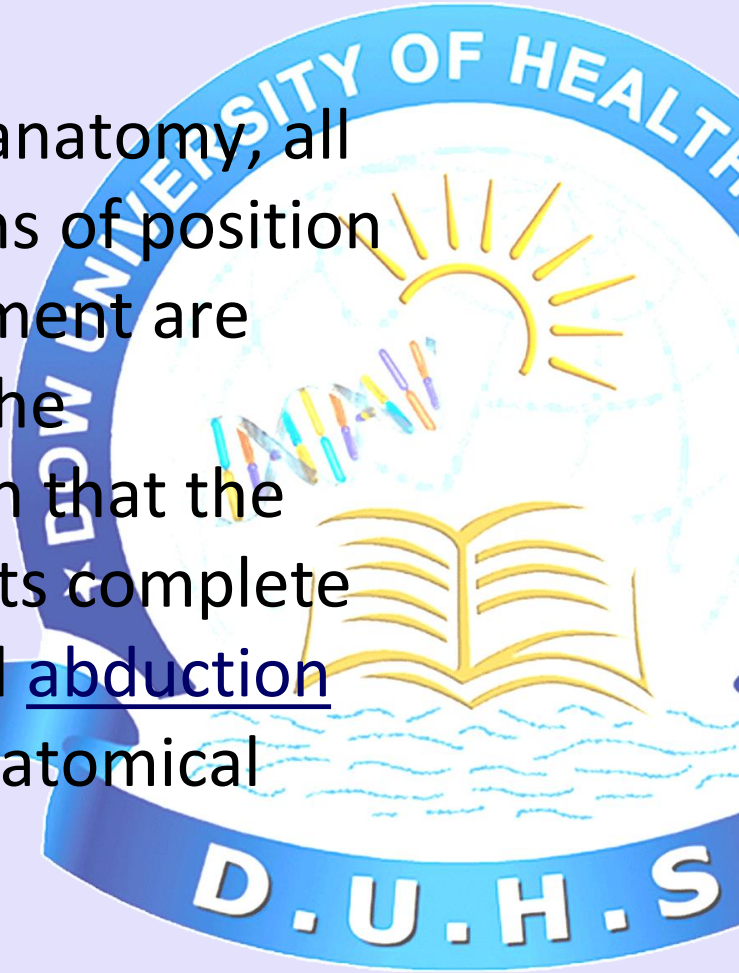
MOVEMENT

- The movement of body structures is accomplished by the contraction of muscles.
- Muscles may move parts of the skeleton relatively to each other.
- May move parts of internal organs relatively to each other.
- All such movements are classified by the directions in which the affected structures are moved.



ANATOMICAL POSITION

- In human anatomy, all descriptions of position and movement are based on the assumption that the body is in its complete medial and abduction stage in anatomical position.



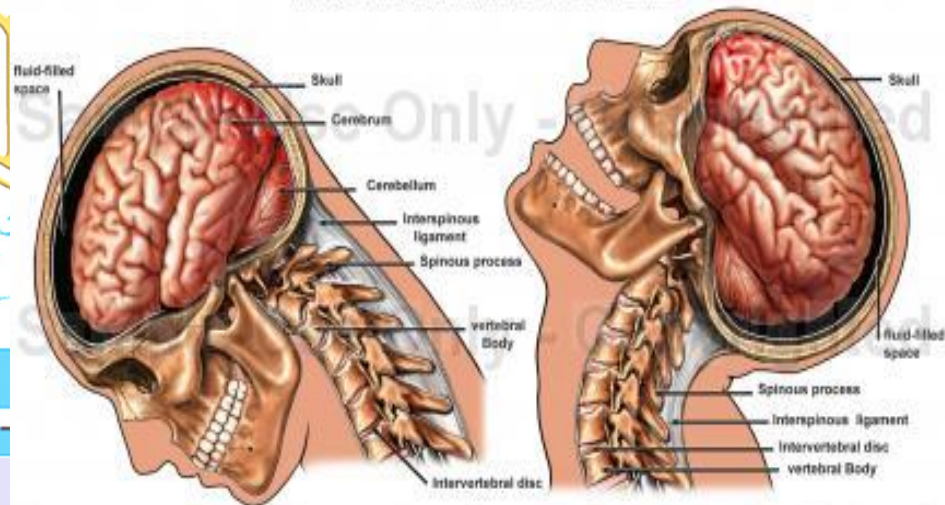
HYPER

- The prefix **hyper-** is sometimes added to emphasize movement beyond the normal position, such as in **hyperflexion** or **hyperextension**.
- Such movements can put significant stress on the joints involved.



Cervical Hyperflexion and Hyperextension with Brain Injury

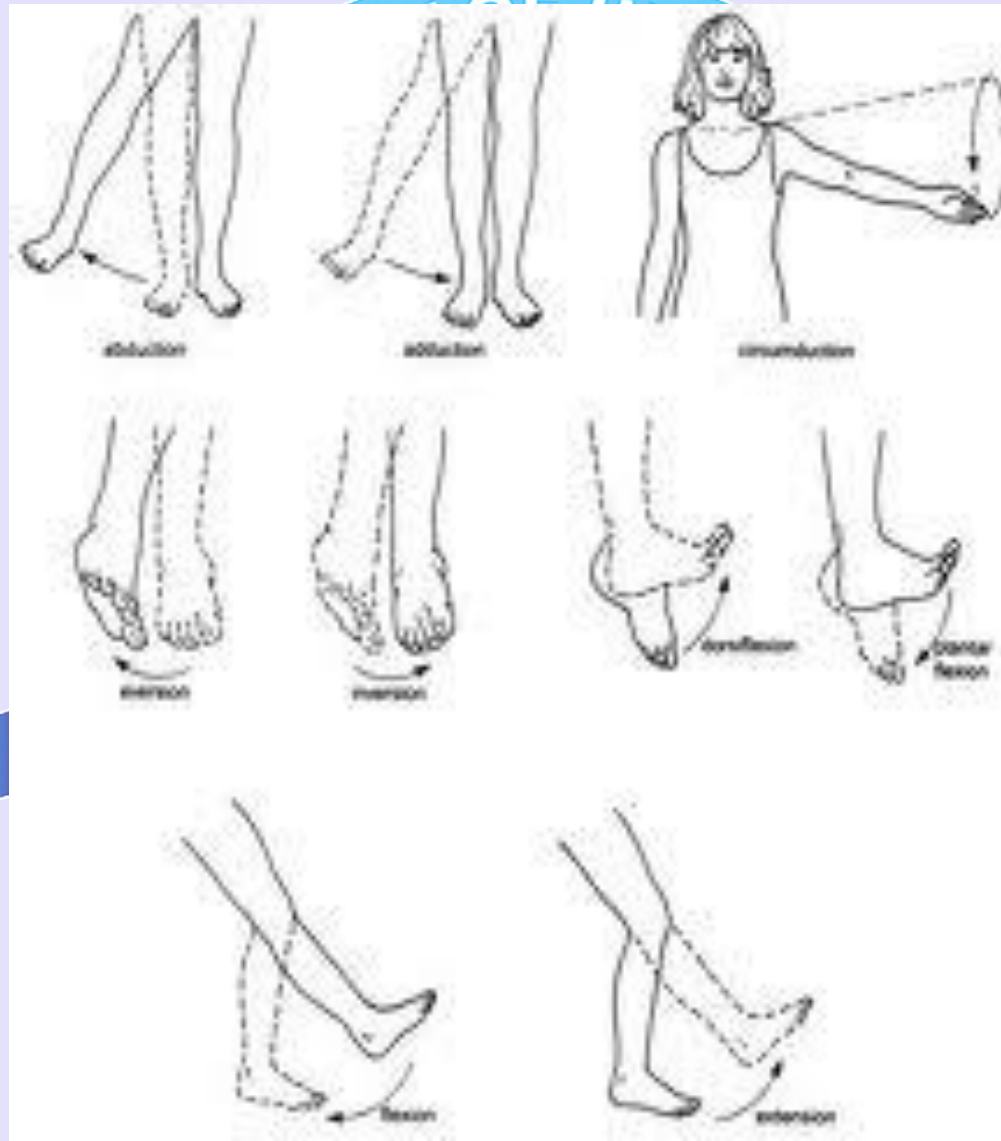
Excessive and forceful flexion and extension of the neck beyond the normal limits causes a **CONTRECOUP INJURY** of the brain, which is an injury to the opposite side of the initial impact. During rapid acceleration and deceleration of the head, the brain continues moving, striking the interior surface of the skull.



Hyperflexion: Sudden deceleration of the head, either by the chin striking the chest or impact, causes the brain to strike the back of the skull.

Hyperextension: Sudden forward acceleration of the skull causes the brain to move inside its protective covering, striking the front of the skull.

GENERAL MOTION

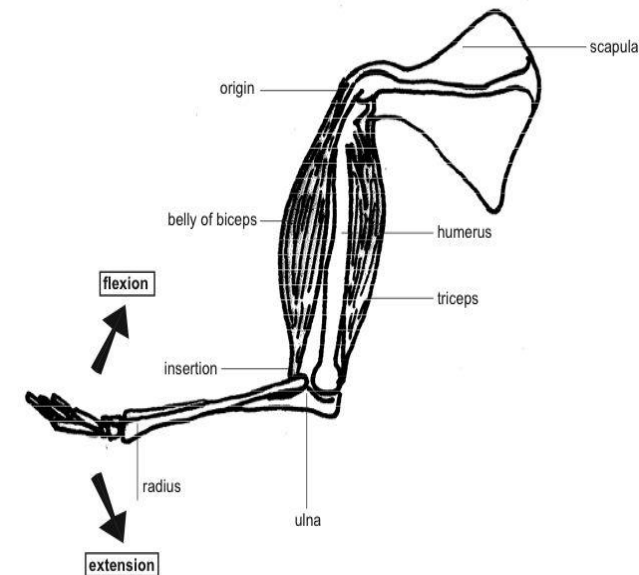
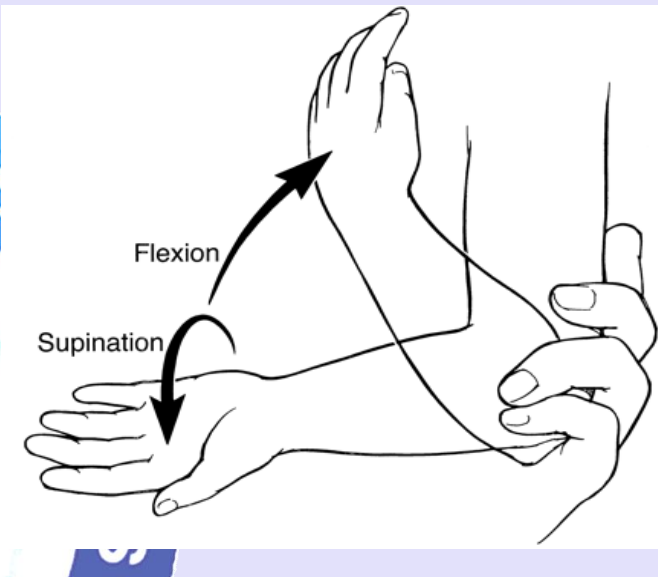




ADJUSTING ANGLE BETWEEN TWO PARTS

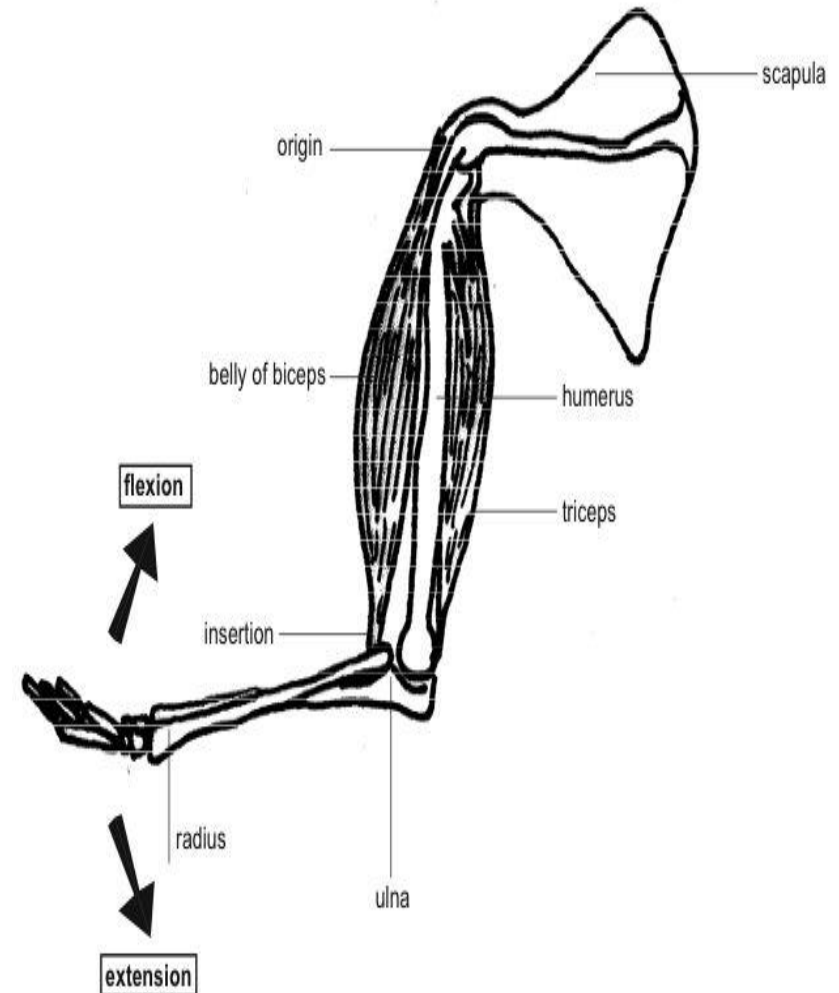
FLEXION

- Bending movement that decreases the angle between two parts.
- Bending the elbow, or clenching a hand into a fist, are examples of flexion.
- When sitting down, the knees are flexed.
- Flexion of the hip or shoulder moves the limb forward (towards the anterior side of the body).



EXTENSION

- The opposite of flexion; a straightening movement that *increases* the angle between body parts.
- In a conventional handshake, the fingers are fully extended.★
- When standing up, the knees are extended.
- Extension of the hip or shoulder moves the limb backward (towards the posterior side of the body).

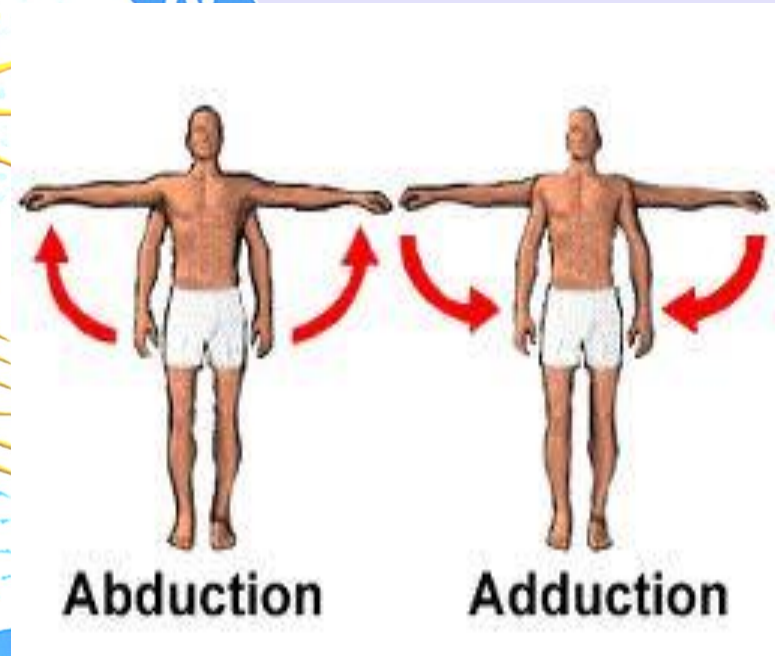


ADJUSTING RELATION **TO MID-LINE OF BODY**



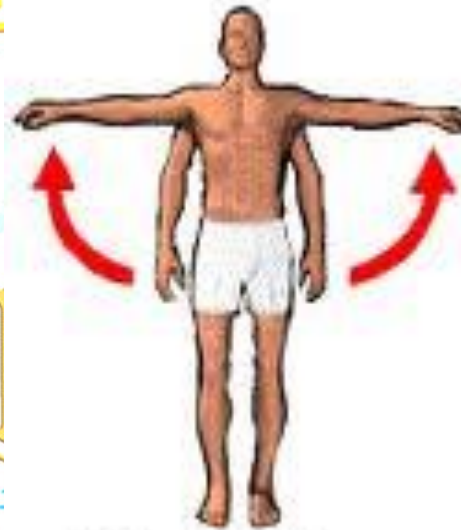
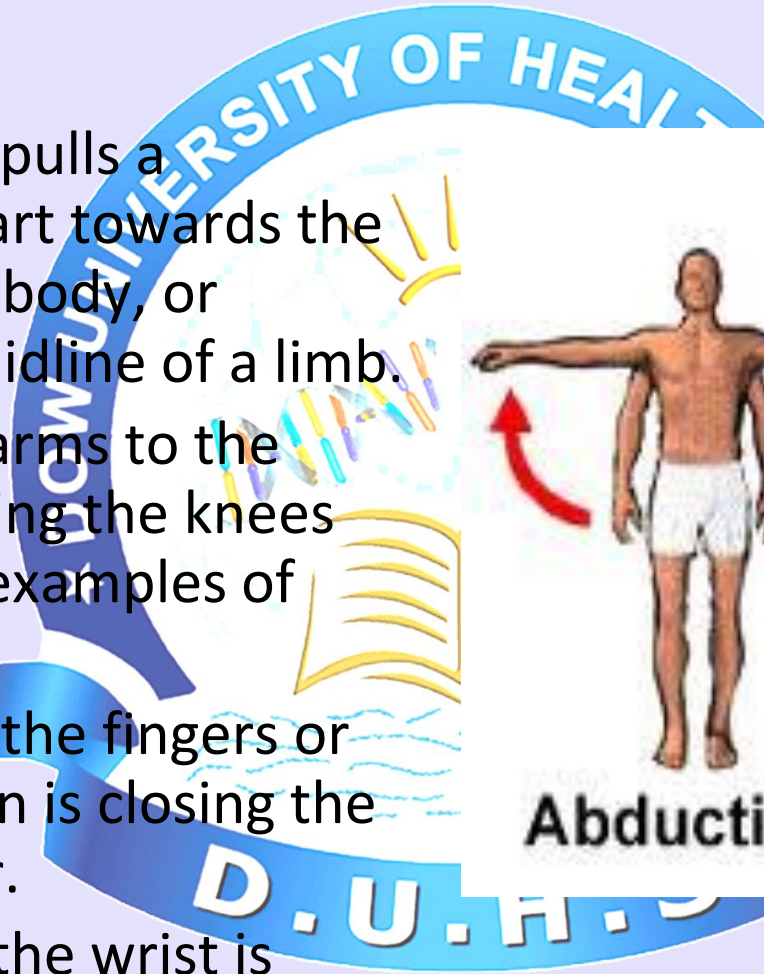
ABDUCTION

- A motion that pulls a structure or part away from the midline of the body (or, in the case of fingers and toes, spreading the digits apart, away from the centerline of the hand or foot).
- Abduction of the wrist is called radial deviation.
- Raising the arms laterally, to the sides, is an example of abduction.

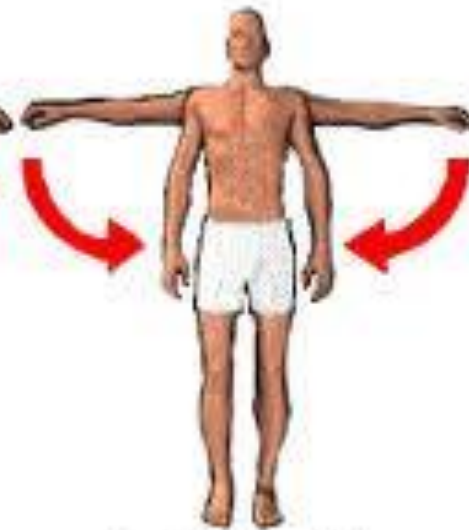


ADDUCTION

- A motion that pulls a structure or part towards the midline of the body, or towards the midline of a limb.
- Dropping the arms to the sides, or bringing the knees together, are examples of adduction.
- In the case of the fingers or toes, adduction is closing the digits together.
- Adduction of the wrist is called ulnar ***deviation***.



Abduction

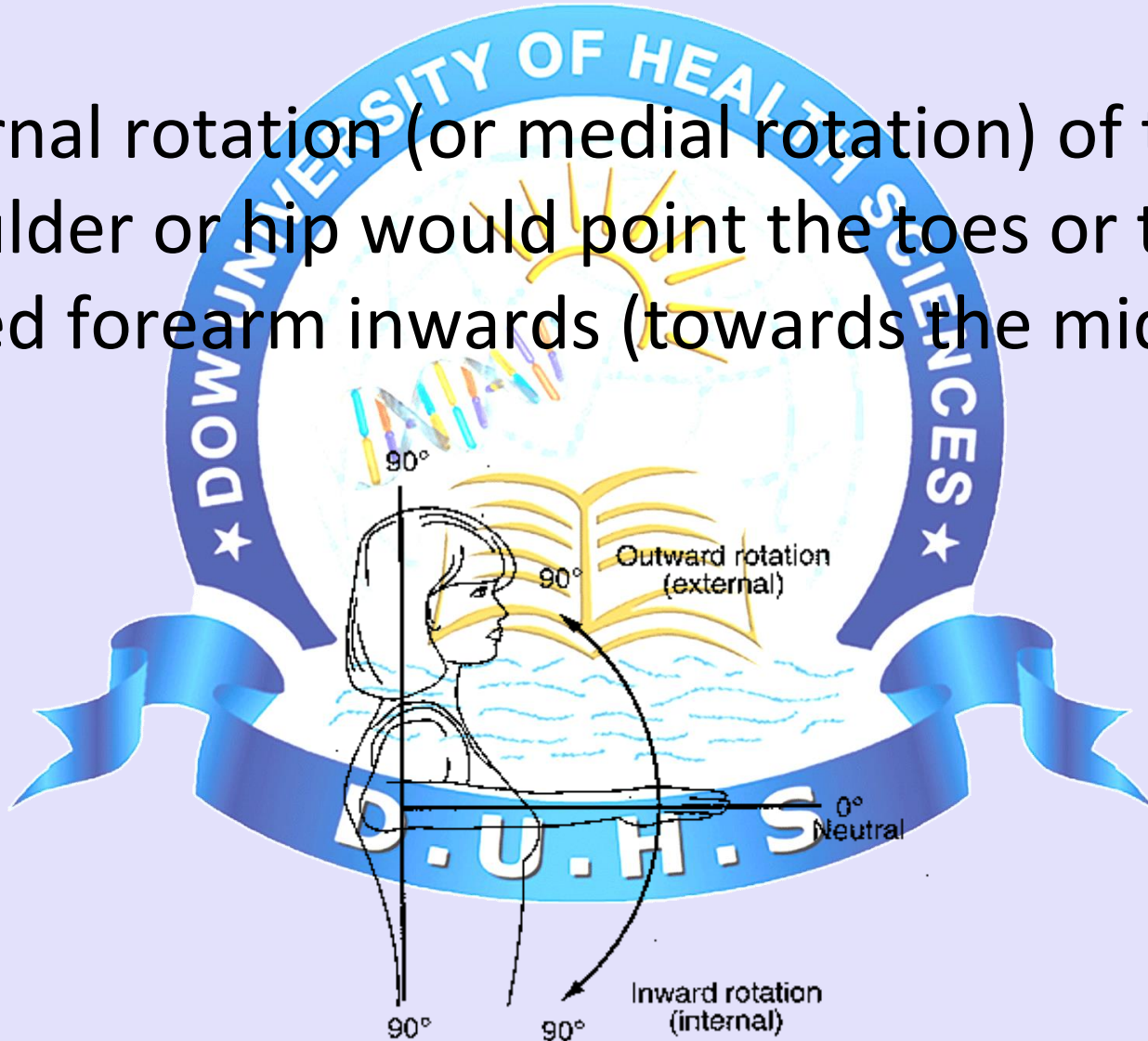


Adduction



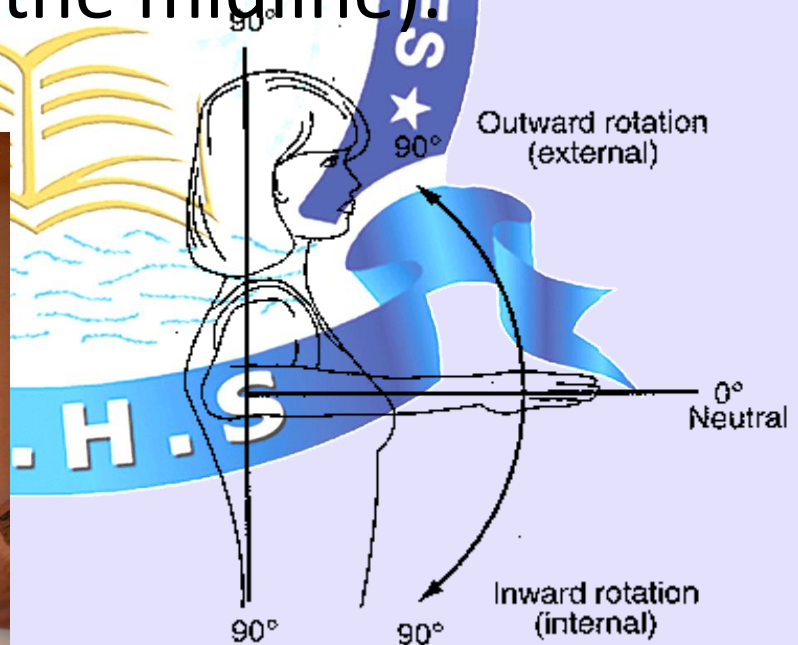
INTERNAL ROTATION

- Internal rotation (or medial rotation) of the shoulder or hip would point the toes or the flexed forearm inwards (towards the midline).



EXTERNAL ROTATION

- External rotation (or lateral or outward rotation) is the opposite of Internal Rotation.
- It would turn the toes or the flexed forearm outwards (away from the midline).

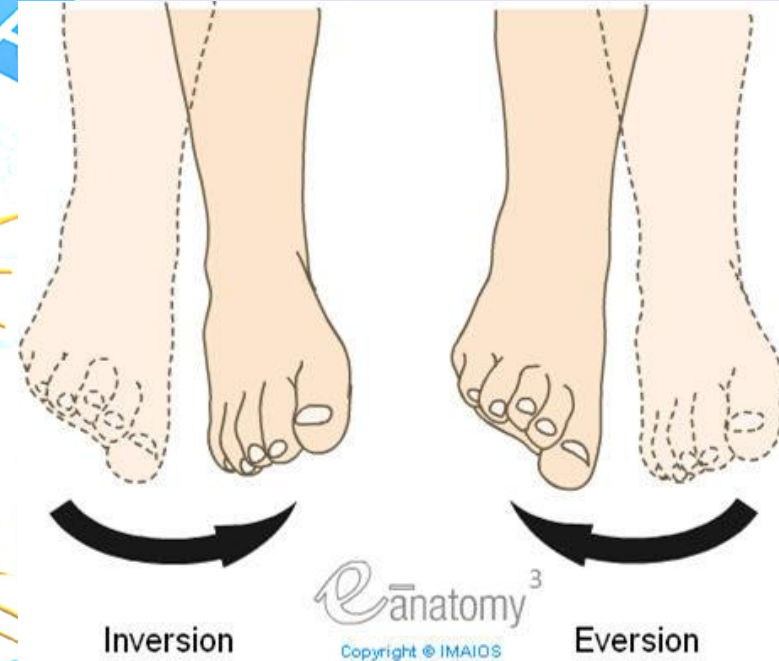


EVERSION

- the movement of the sole of the foot away from the median plane

INVERSION

- The movement of the sole towards the median plane (same as when an ankle is twisted).



PRONATION

- **Pronation** is a rotational movement of the forearm at the radioulnar joint.

SUPINATION

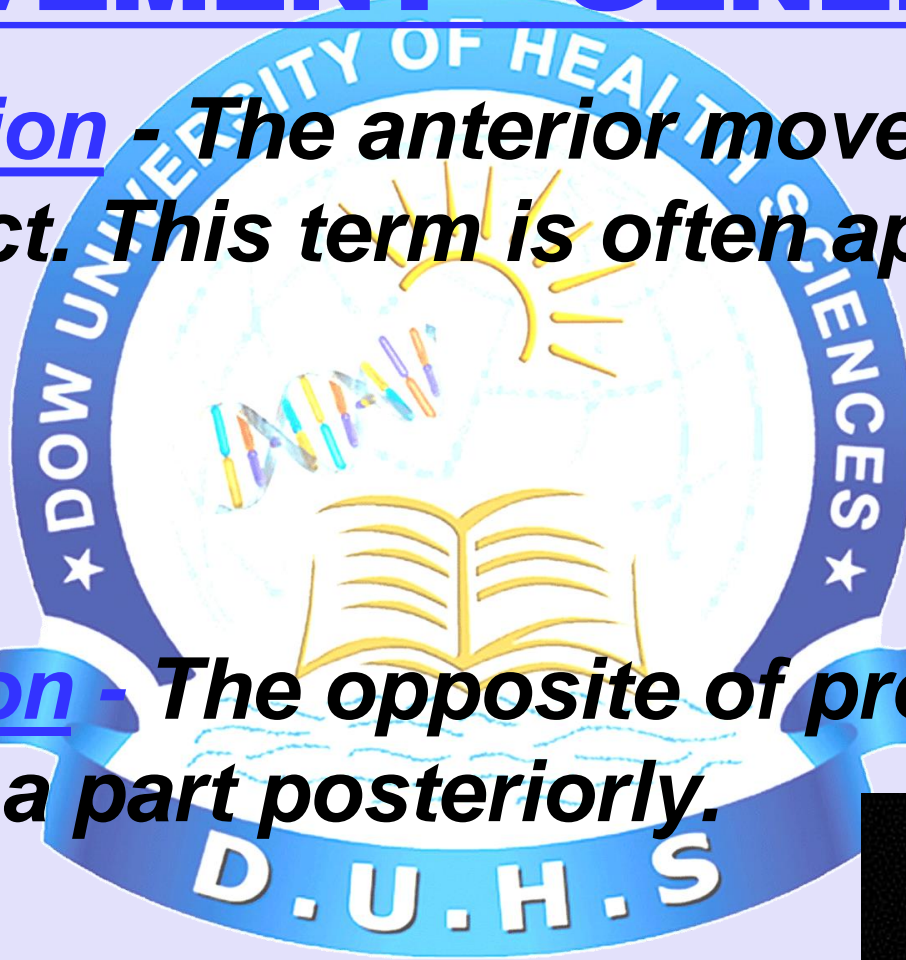
- **Supination** is a position of forearm; in the forearm when the palm faces anteriorly, or faces up (when the arms are unbent and at the sides).





ANTERIOR/POSTERIOR MOVEMENT - GENERAL

- Protrusion - The anterior movement of an object. This term is often applied to the jaw.
- Retrusion - The opposite of protrusion, moving a part posteriorly.



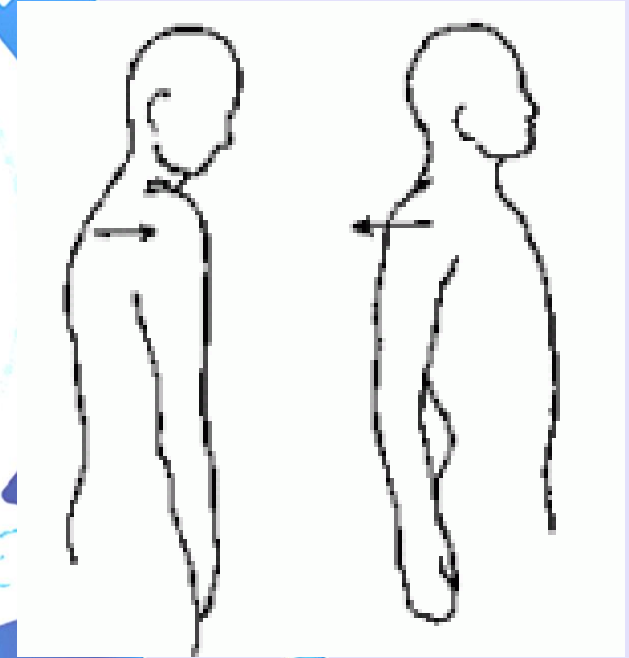
ANTERIOR/POSTERIOR **MOVEMENT - SHOULDERS**

PROTRACTION:

- Anterior movement of the arms at the shoulders.

RETRACTION:

- Posterior movement of the arms at the shoulders.



CIRCUMDUCTION

- The circular (or, more precisely, conical) movement of a body part, such as a ball-and-socket joint or the eye.
- It consists of a combination of flexion, extension, adduction, and abduction.
- "Windmilling" the arms or rotating the hand from the wrist are examples of circumductive movement.



APPOSITION

- A motion involving a grasping of the thumb and fingers.

REPOSITION

- To release an object by spreading the fingers and thumb.



REFERENCES

- KLM Human Anatomy.
- <https://www.youtube.com/watch?v=KO4nUzO7xoo>

