



Unit 1

Introduction to Human Biology
(The world of anatomy and physiology)

Definitions

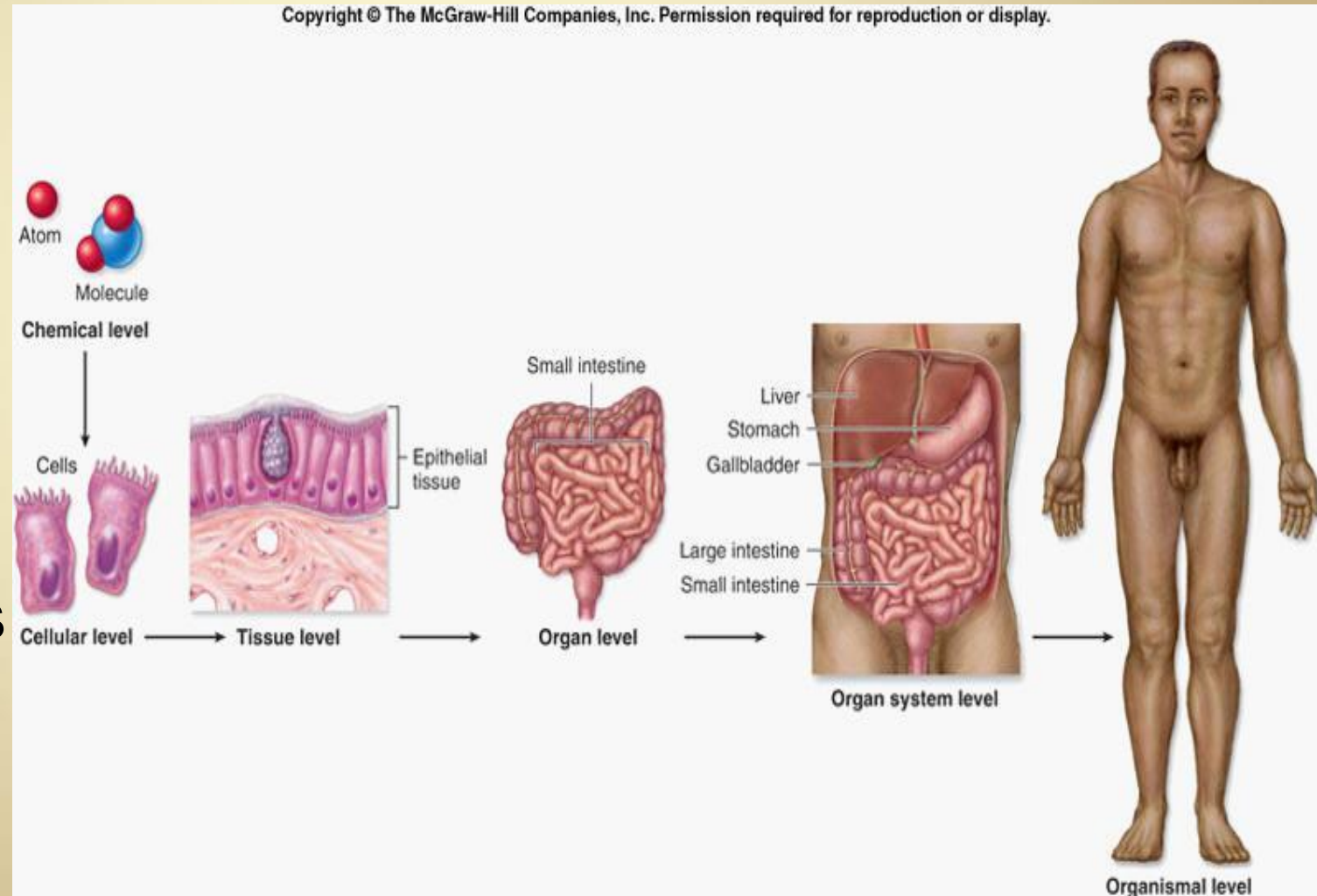
- Anatomy – the structure of body parts (also called Morphology)
- Physiology – the function of the body parts, what they do and how they do it



Levels of Organization

Do you remember what they are?:

- atom
- element
- molecule
- cell
- tissue
- organ
- organ systems
- organism



Levels of Structural Organization

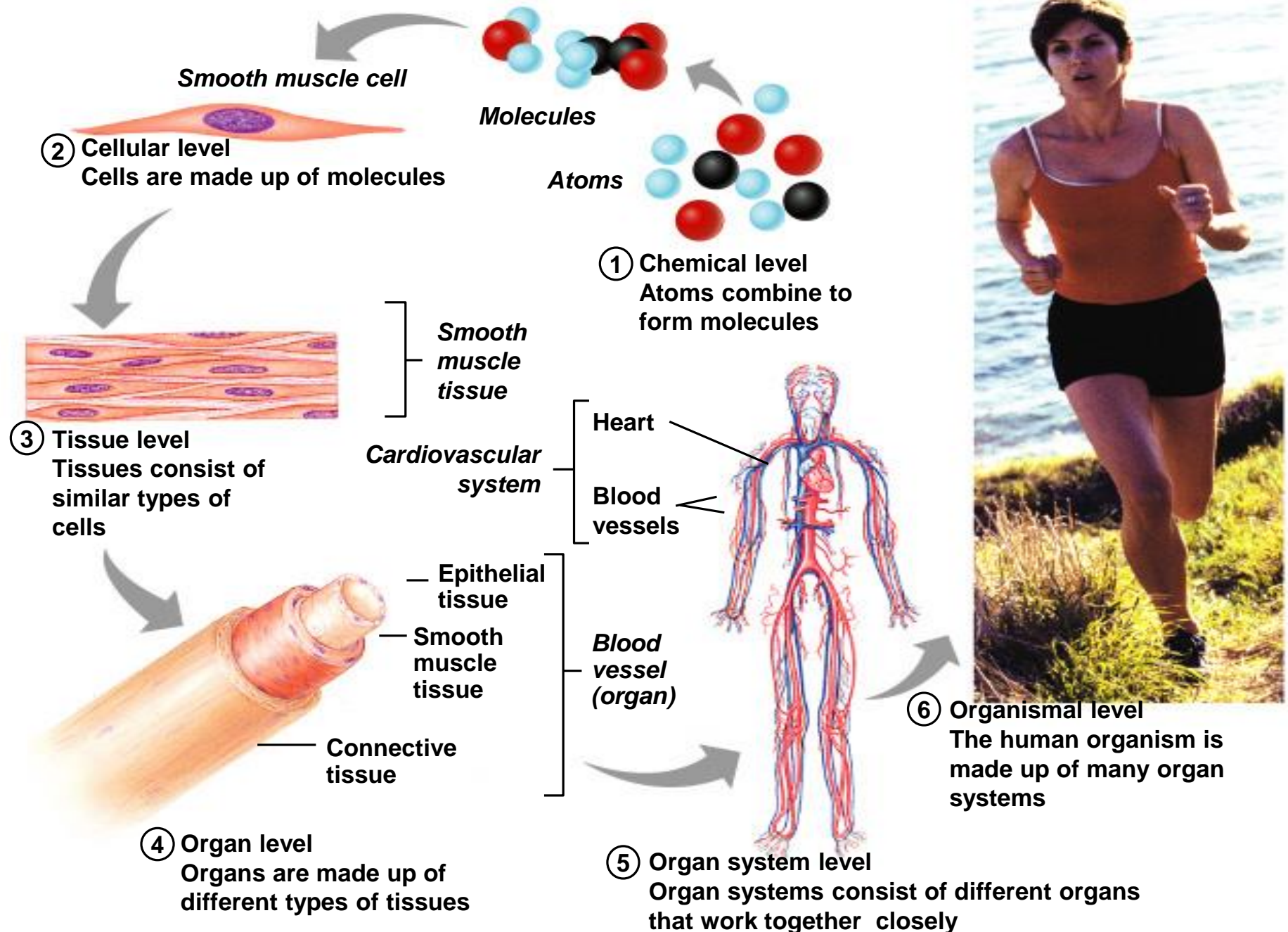
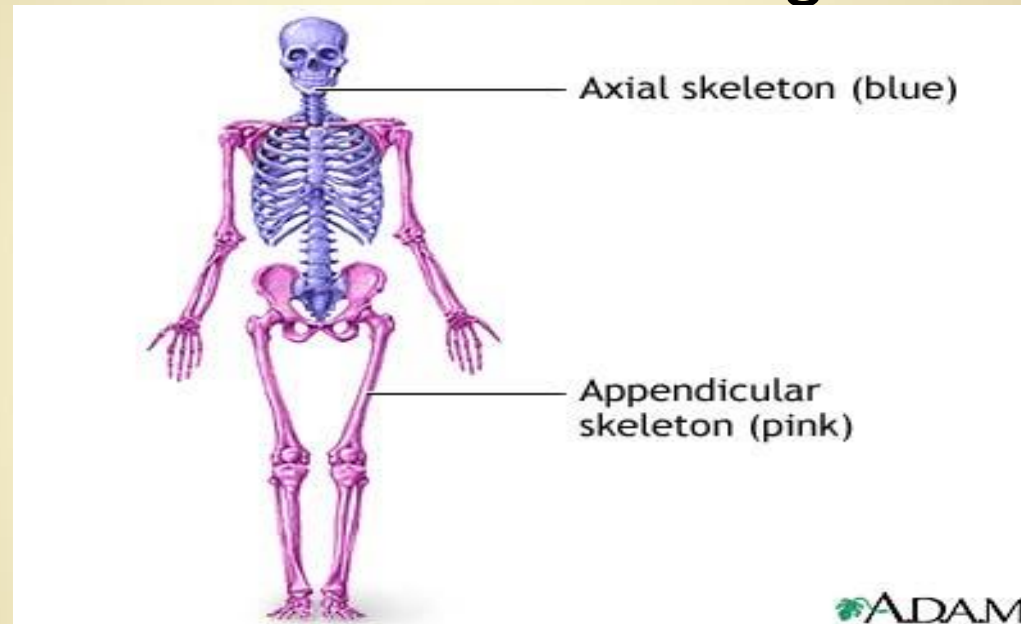


Figure 1.1

General Organization of the Body

Two main portions:

- Axial Portion - head, neck, trunk
- Appendicular Portion - arms & legs



- A. **Body Cavities** (Viscera=organs)
- B. **Body Regions** (different functions or supplied by blood vessels or nerves)
- C. **Directions** (position of part- grouped in pairs of opposites)
- D. **Movements**
- E. **Planes** (2D- used for location of parts on the body)

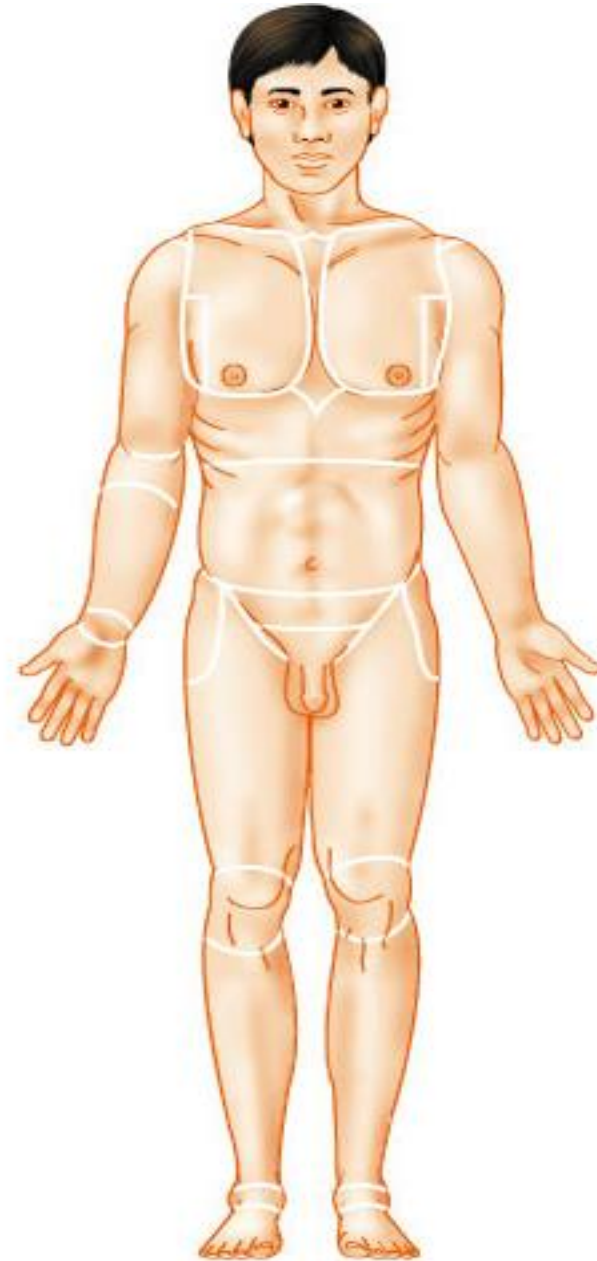
Eviscerate

Popular in horror movies and games



Anatomical Position

Body erect
Feet slightly apart
Palms facing forward
Thumbs point away from
body



(a)

A. Body Cavities

Dorsal = back side

→ includes cranial cavity and vertebral=*spinal* cavity

Ventral= front side

→ includes thoracic, abdomen, and pelvic

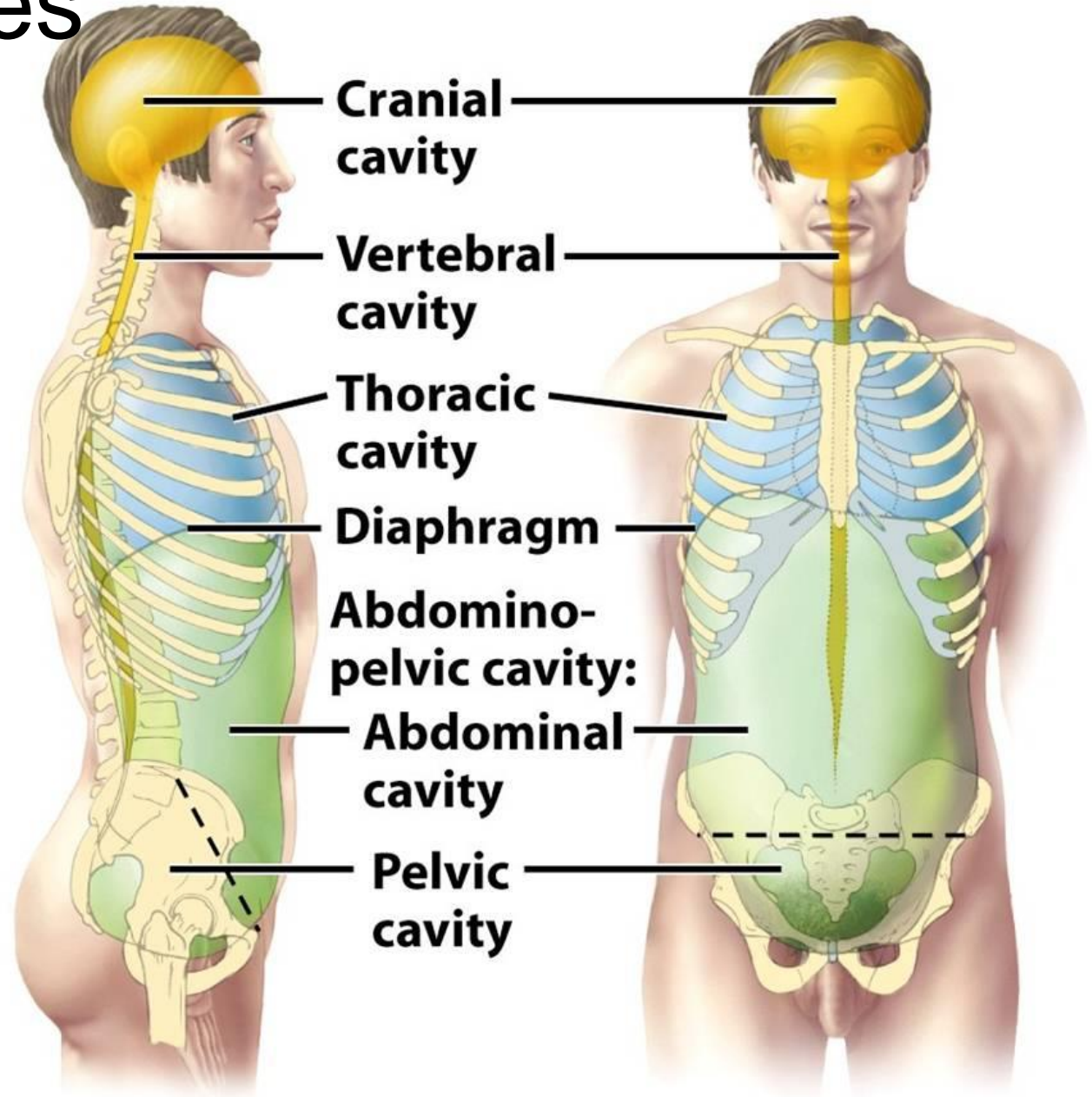
Thoracic= chest (heart, trachea, lungs...)

Abdomen= stomach area (spleen, intestines...)

Pelvic= lower abdomen (bladder, reproductive)

Diaphragm: Separates the thoracic from the abdominopelvic cavity

A. Body Cavities

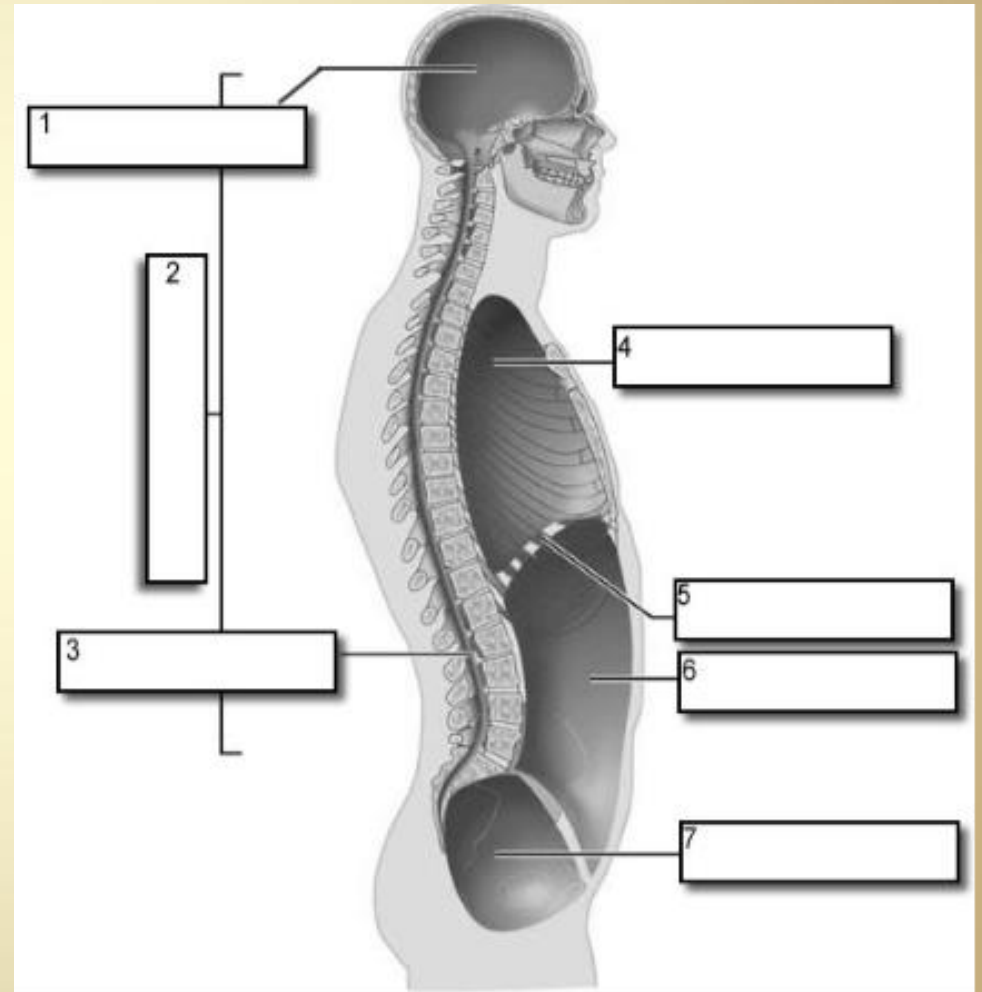
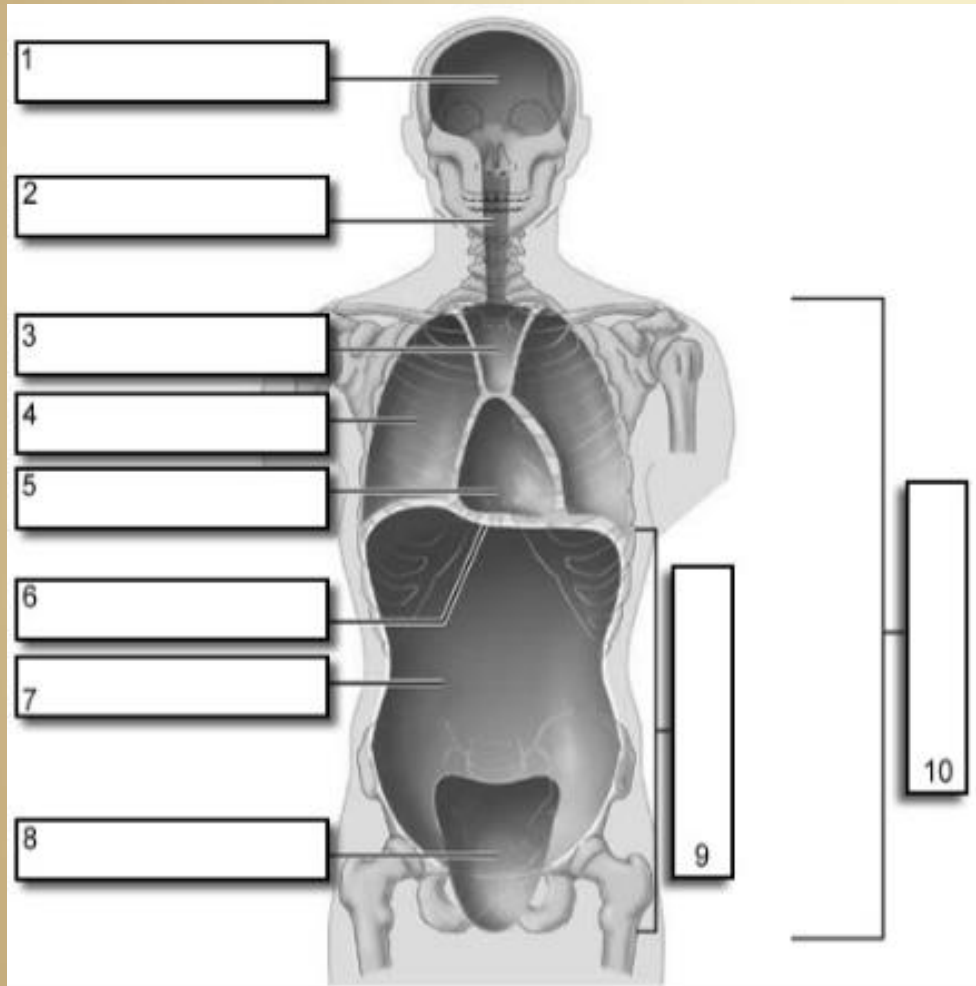


(a) Right lateral view

(b) Anterior view

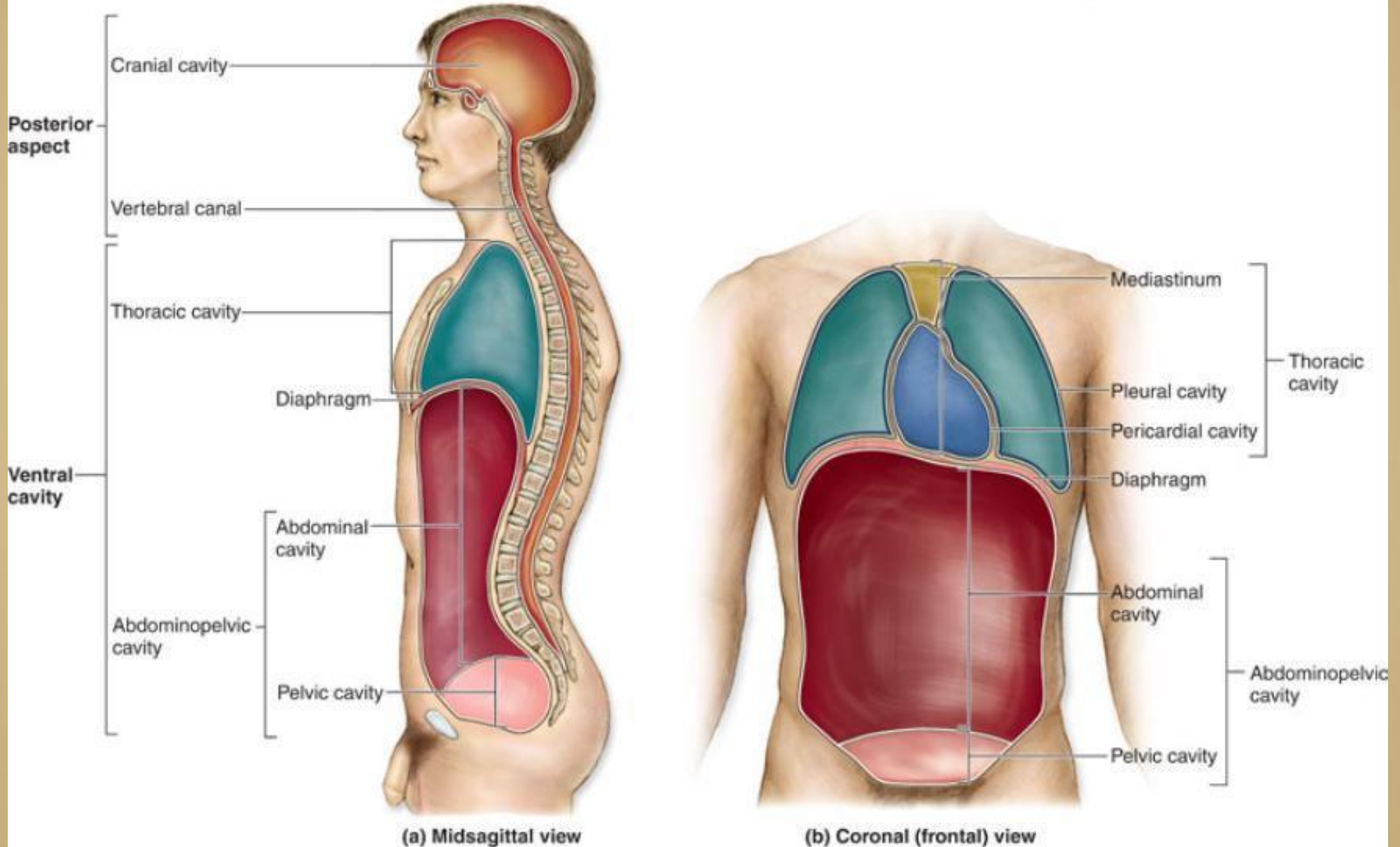
It's easier to visualize the body cavities on pictures - see your *body cavities diagrams with the word bank*.

Label the body cavities

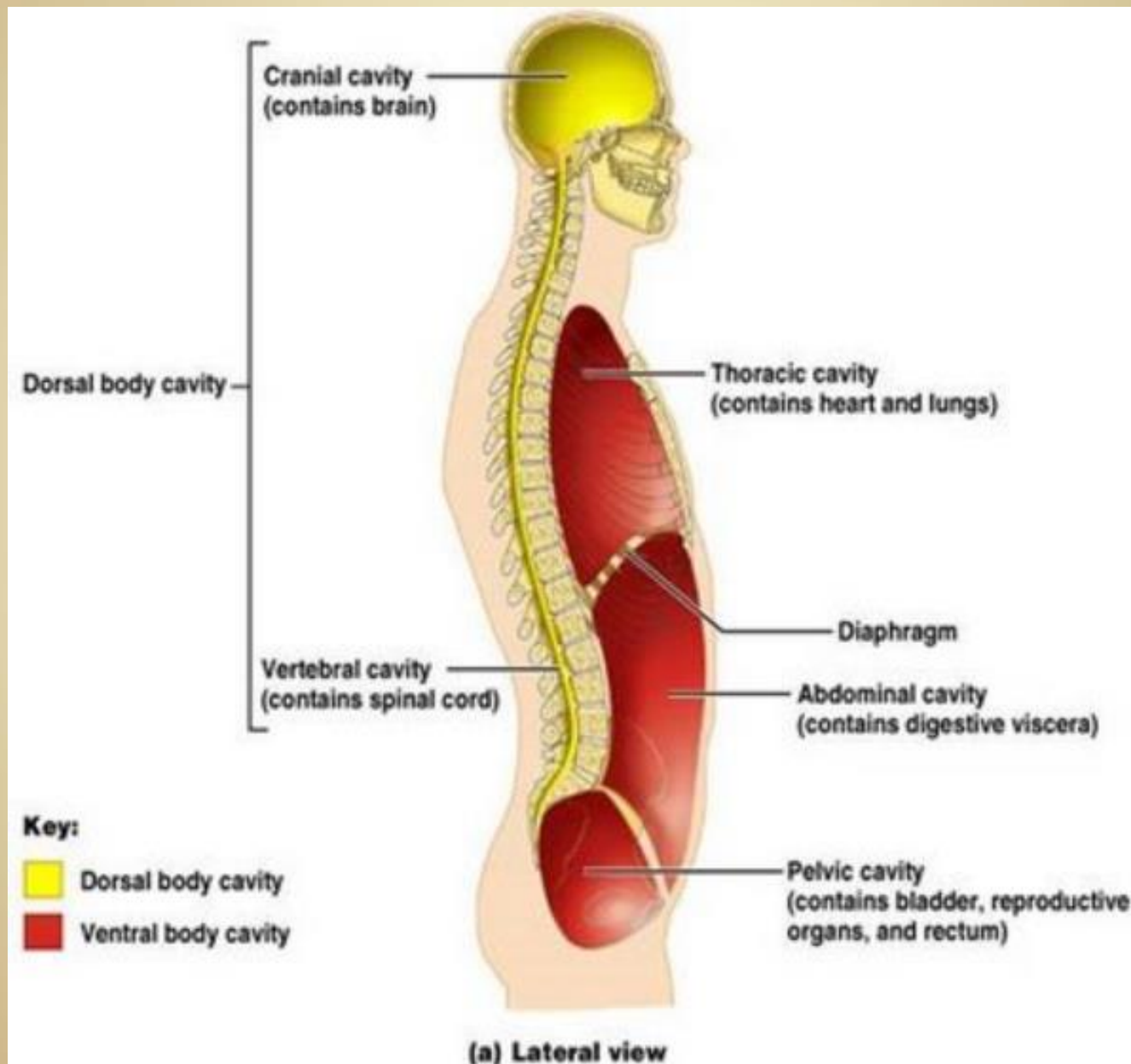


Body Cavities

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Body Cavities



Body Cavities (What's included in what?)

Dorsal cavity -protects the nervous system, and is divided into two subdivisions

- Cranial cavity** is within the skull and encases the brain

- Vertebral cavity** runs within the vertebral column and encases the spinal cord

Ventral cavity -houses the internal organs (viscera), and is divided into two subdivisions:

- **Thoracic** and **Abdominopelvic cavities**

Body Cavities (What's included in what?)

(cont.)

Thoracic cavity -is subdivided into pleural cavities, the mediastinum, and the pericardial cavity

Pleural cavities – each houses a lung

Mediastinum – contains the pericardial cavity, and surrounds the remaining thoracic organs

Pericardial cavity – encloses the heart

Body Cavities (What's included in what?)

(cont.)

Abdominopelvic cavity -separated from the superior thoracic cavity by the dome-shaped diaphragm.

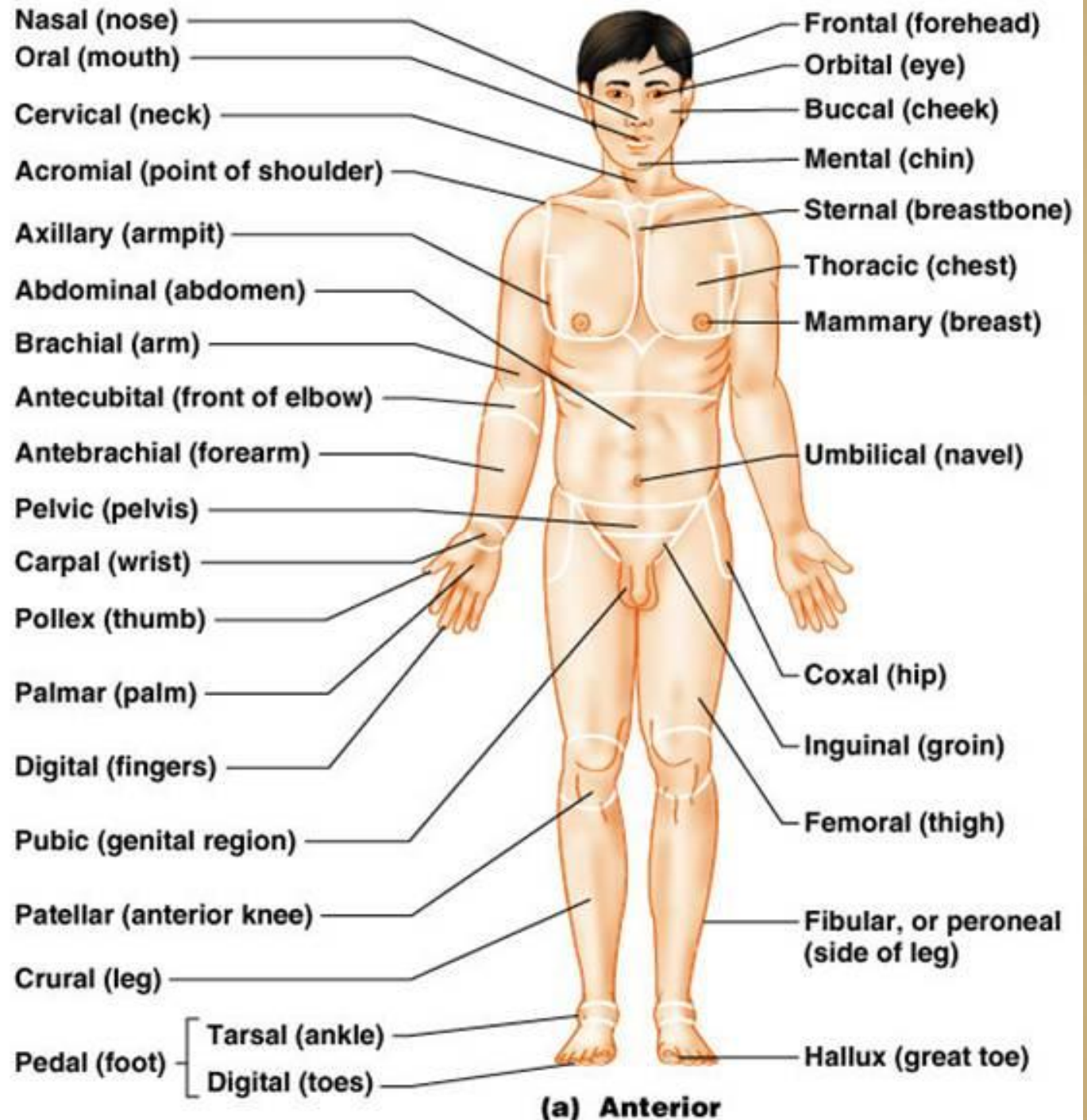
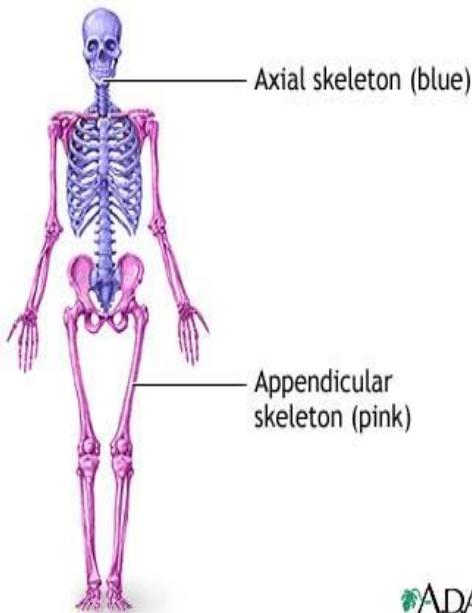
It is composed of two subdivisions:

Abdominal cavity – contains the stomach, intestines, spleen, liver, gall bladder, and pancreas

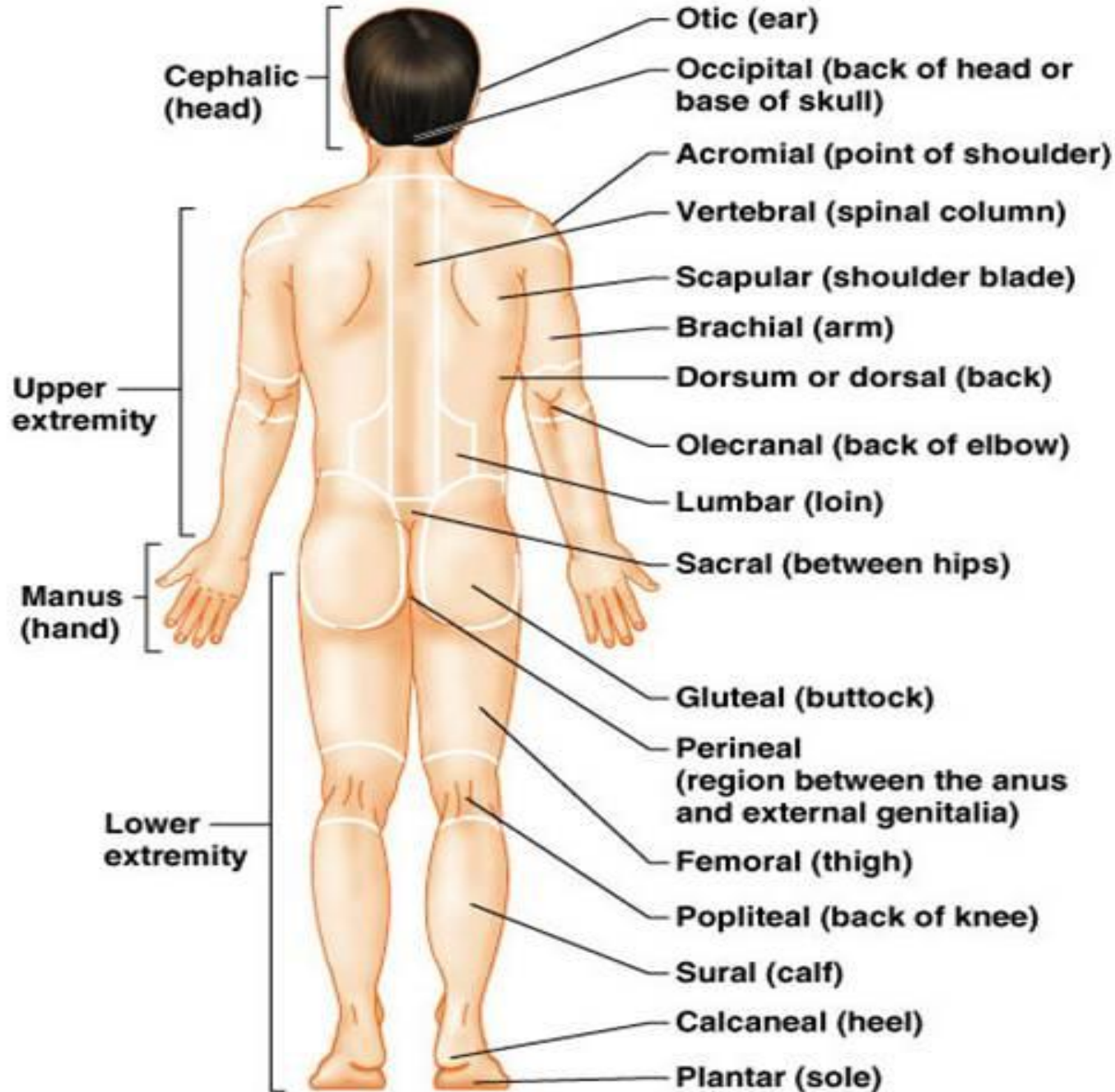
Pelvic cavity – lies within the pelvis and contains the bladder, reproductive organs, and rectum

B. Body Regions- Anterior View

Axial – head, neck, and trunk
Appendicular – appendages or limbs



B. Body Regions- Posterior View



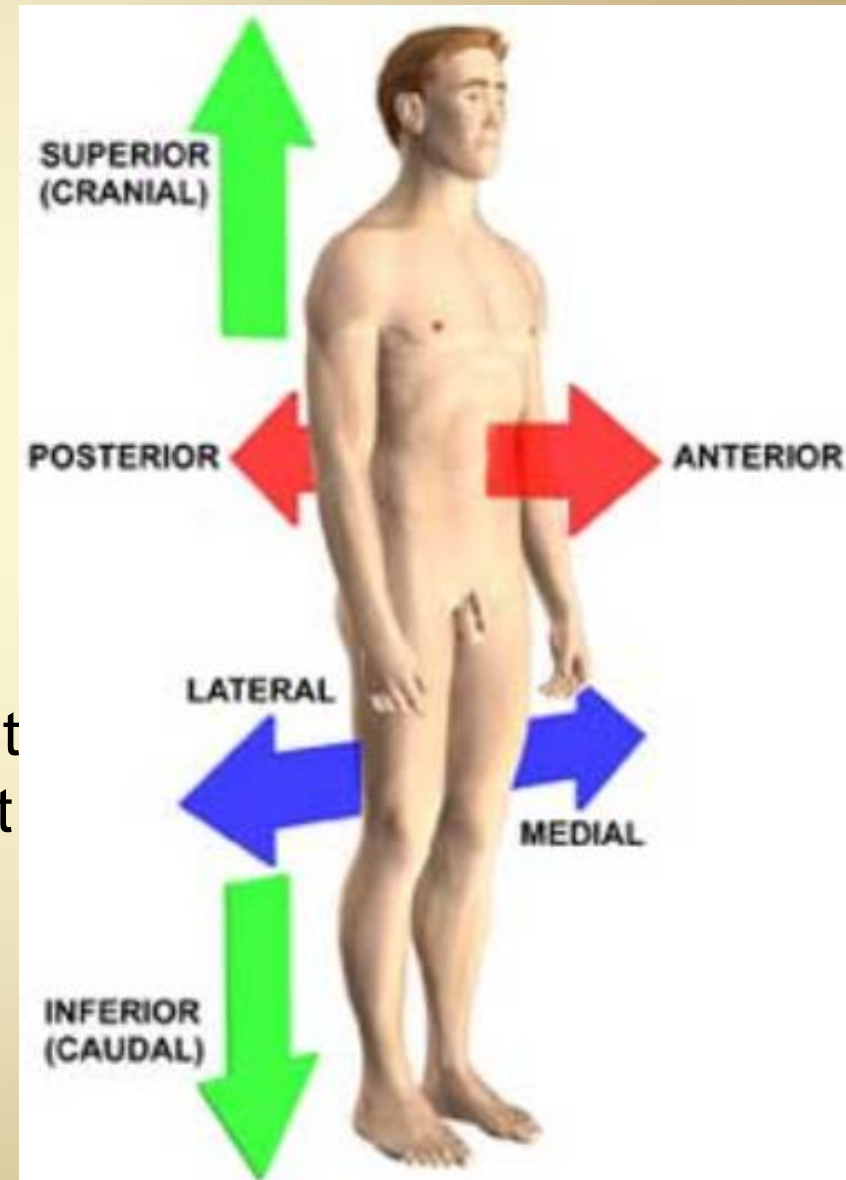
(b) Posterior

• C. Directions

Anatomical Terminology
Anatomical Position = standing erect, face forward, arms at side, palms facing forward

Study and learn the following terms

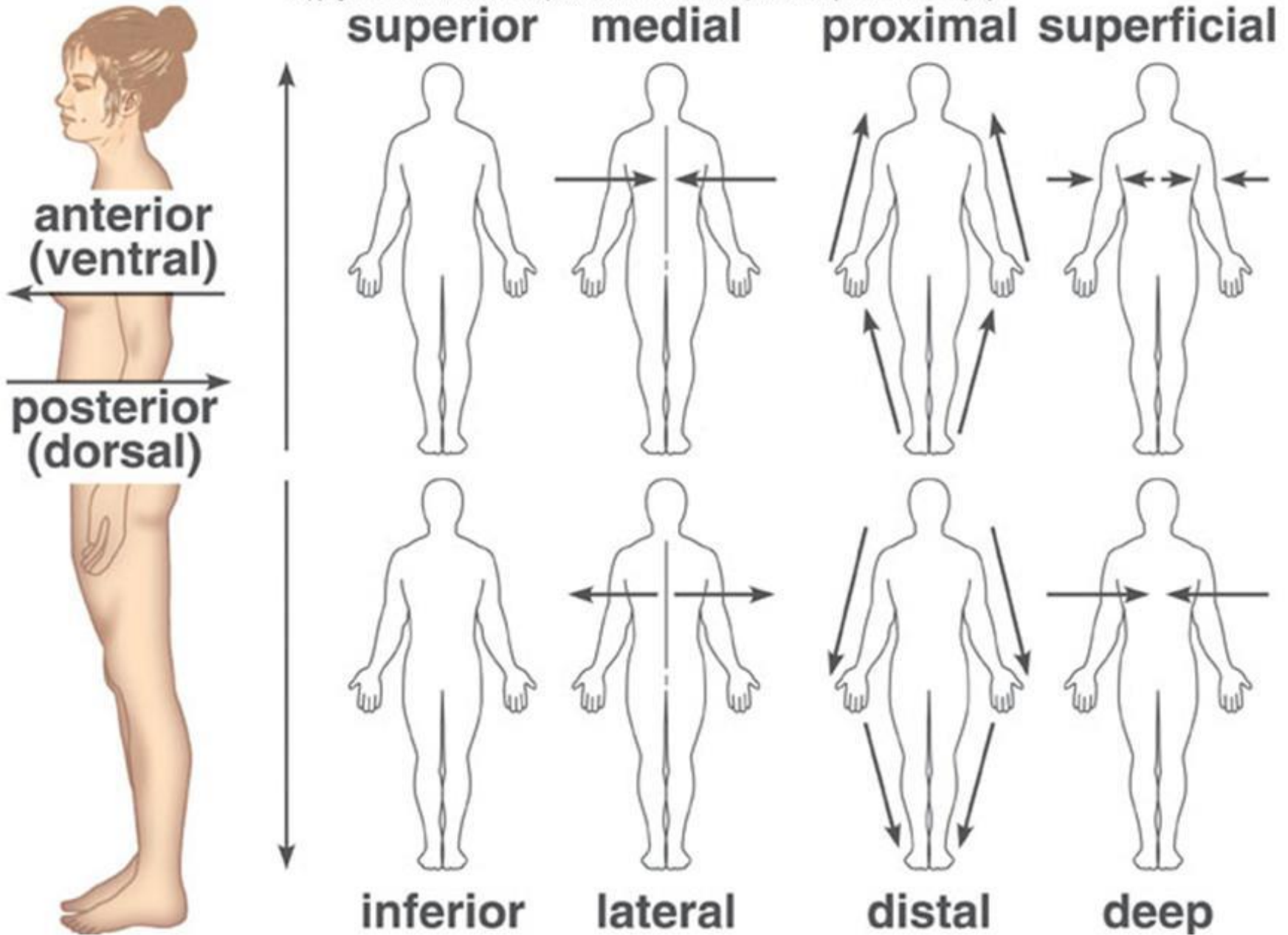
1. **Superior**- toward the head or head end
2. **Inferior**- away from head or head end
3. **Anterior**- front of body
4. **Posterior**- back of body
5. **Medial**- toward the midline
6. **Lateral**- away from midline
7. **Proximal**- closer to the point of attachment
8. **Distal**- farther from the point of attachment
9. **Superficial**- toward or at body surface
10. **Deep**- away from body surface



C. Directions

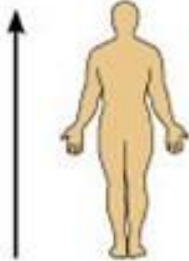
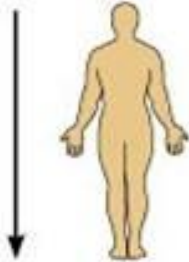
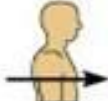
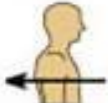
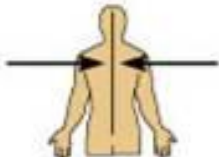
Fig. 1.2

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C. Directions

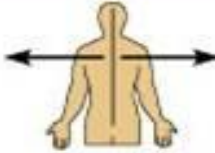

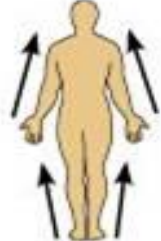
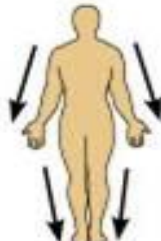


TABLE 1.1 Orientation and Directional Terms

Term	Definition	Example
Superior (cranial)	Toward the head end or upper part of a structure or the body; above	 The head is superior to the abdomen
Inferior (caudal)	Away from the head end or toward the lower part of a structure or the body; below	 The navel is inferior to the chin
Anterior (ventral)*	Toward or at the front of the body; in front of	 The breastbone is anterior to the spine
Posterior (dorsal)*	Toward or at the back of the body; behind	 The heart is posterior to the breastbone
Medial	Toward or at the midline of the body; on the inner side of	 The heart is medial to the arm

*Whereas the terms *ventral* and *anterior* are synonymous in humans, this is not the case in four-legged animals. *Ventral* specifically refers to the "belly" of a vertebrate animal and thus is the inferior surface of four-legged animals. Likewise, although the *dorsal* and *posterior* surfaces are the same in humans, the term *dorsal* specifically refers to an animal's back. Thus, the *dorsal* surface of four-legged animals is their superior surface.

C. Directions

TABLE 1.1 Orientation and Directional Terms

Term	Definition	Example	
Lateral	Away from the midline of the body; on the outer side of		The arms are lateral to the chest
Intermediate	Between a more medial and a more lateral structure		The collarbone is intermediate between the breastbone and shoulder
Proximal	Closer to the origin of the body part or the point of attachment of a limb to the body trunk		The elbow is proximal to the wrist
Distal	Farther from the origin of a body part or the point of attachment of a limb to the body trunk		The knee is distal to the thigh
Superficial (external)	Toward or at the body surface		The skin is superficial to the skeletal muscles
Deep (internal)	Away from the body surface; more internal		The lungs are deep to the skin

● D. Movements

Flexion

Extension

Plantar Flexion

Dorsiflexion

Inversion

Eversion

Abduction

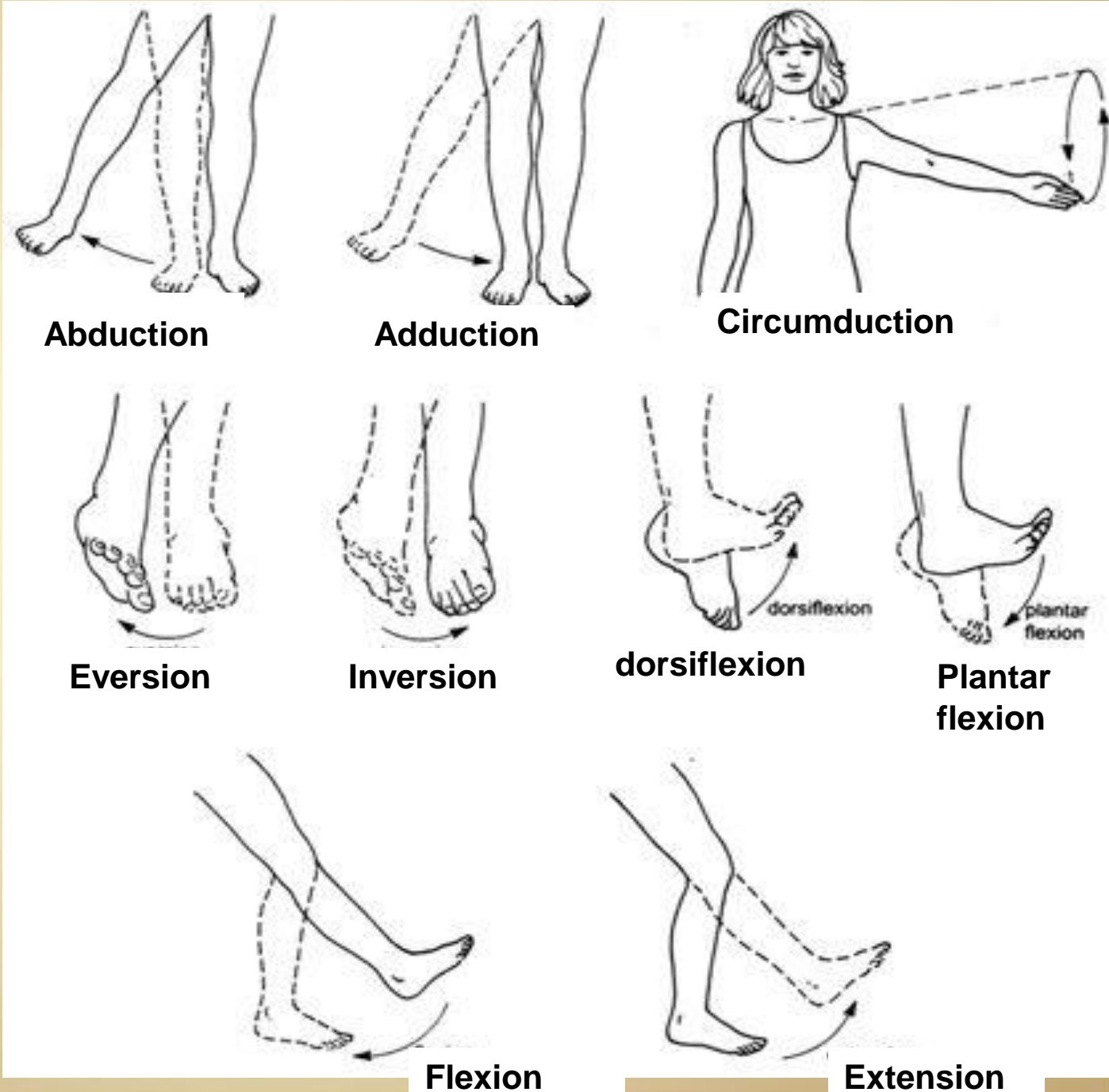
Adduction

Circumduction

Rotation

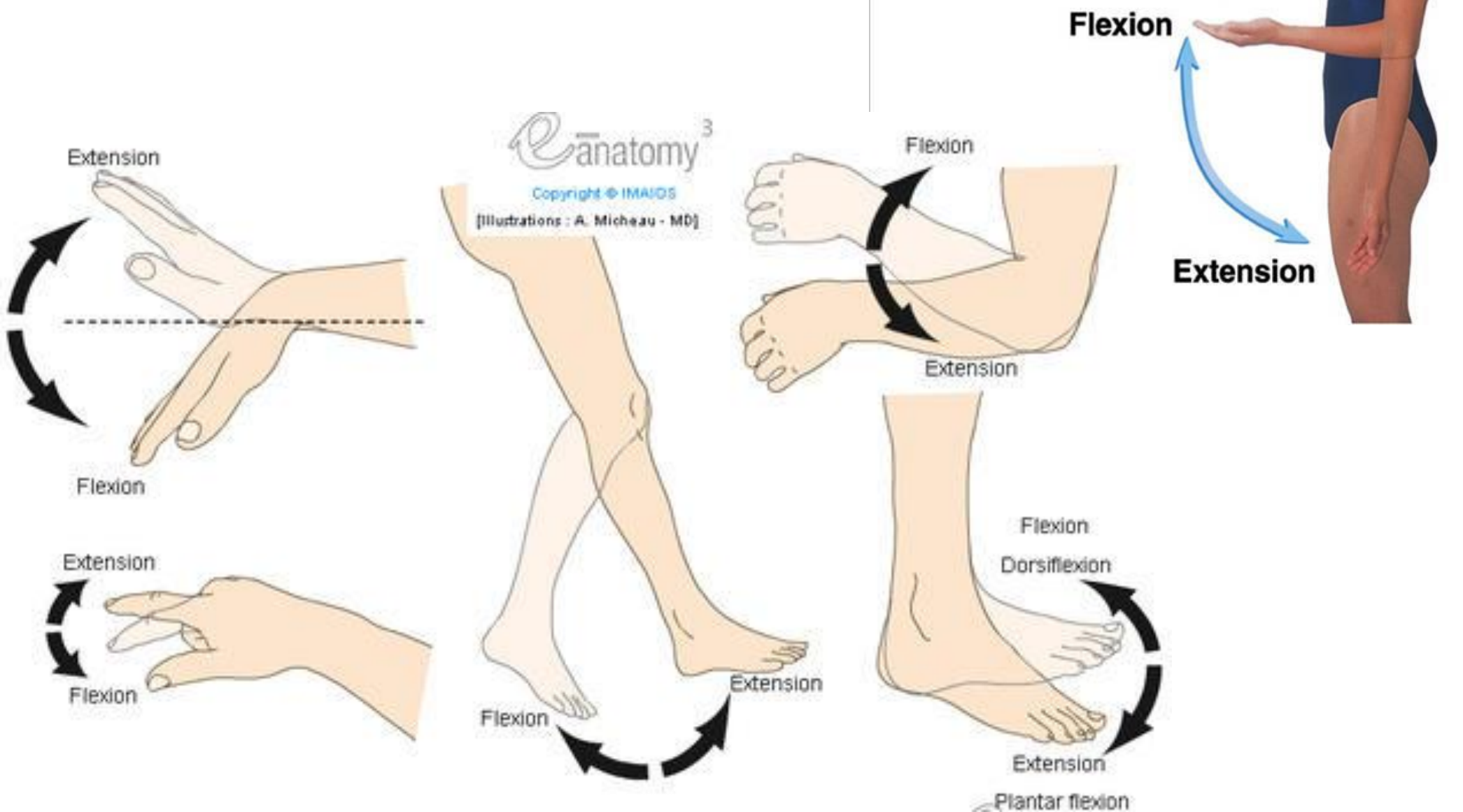
There are 6 more...

But first let's review
these 10.....



D. Movements- Flexion and Extension

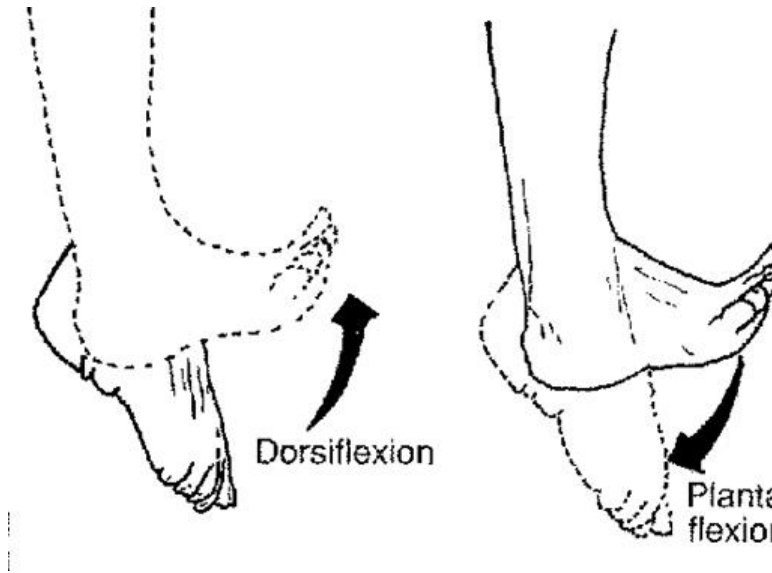
- 1. Flexion – 2 ends of an extremity closer together
- 2. Extension- 2 ends of an extremity farther apart



D. Movements- Plantar Flexion and Dorsiflexion

3. PF-pointing the toe

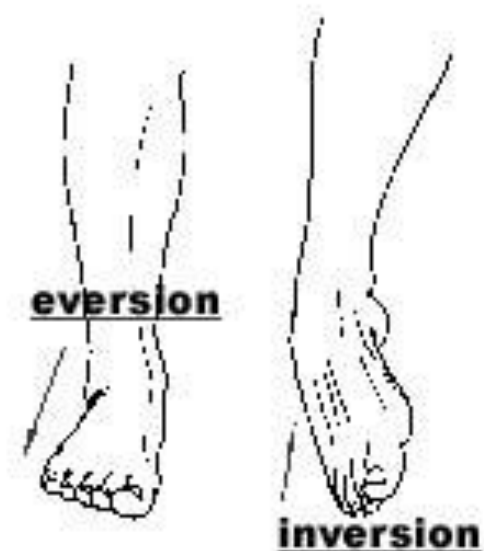
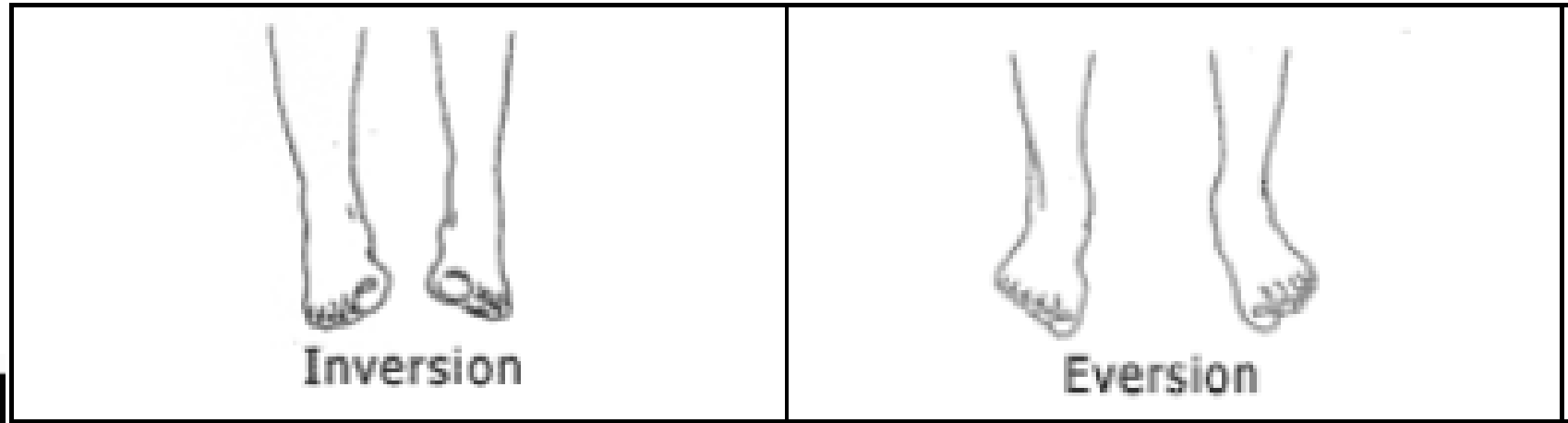
4. Dors- raising toe toward shin



D. Movements- Inversion and Eversion

5. Inversion- feet turned inward (soles face each other)

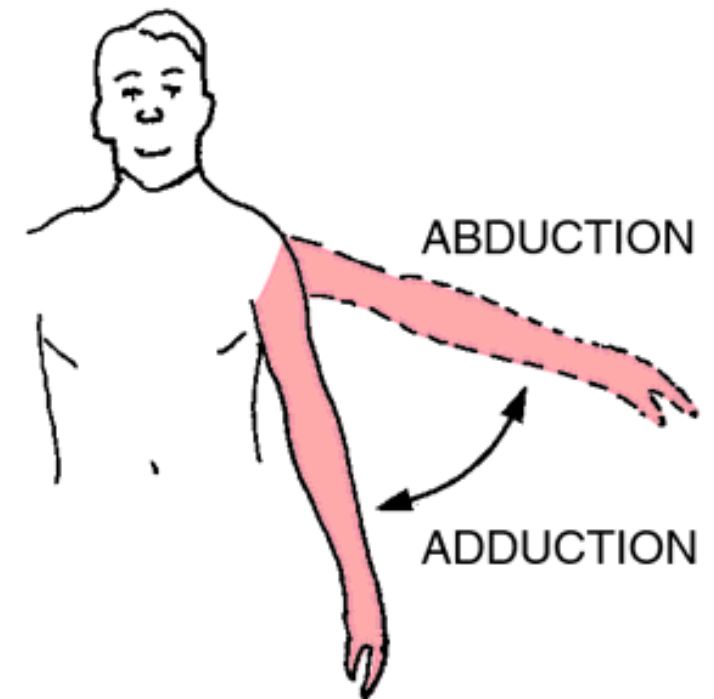
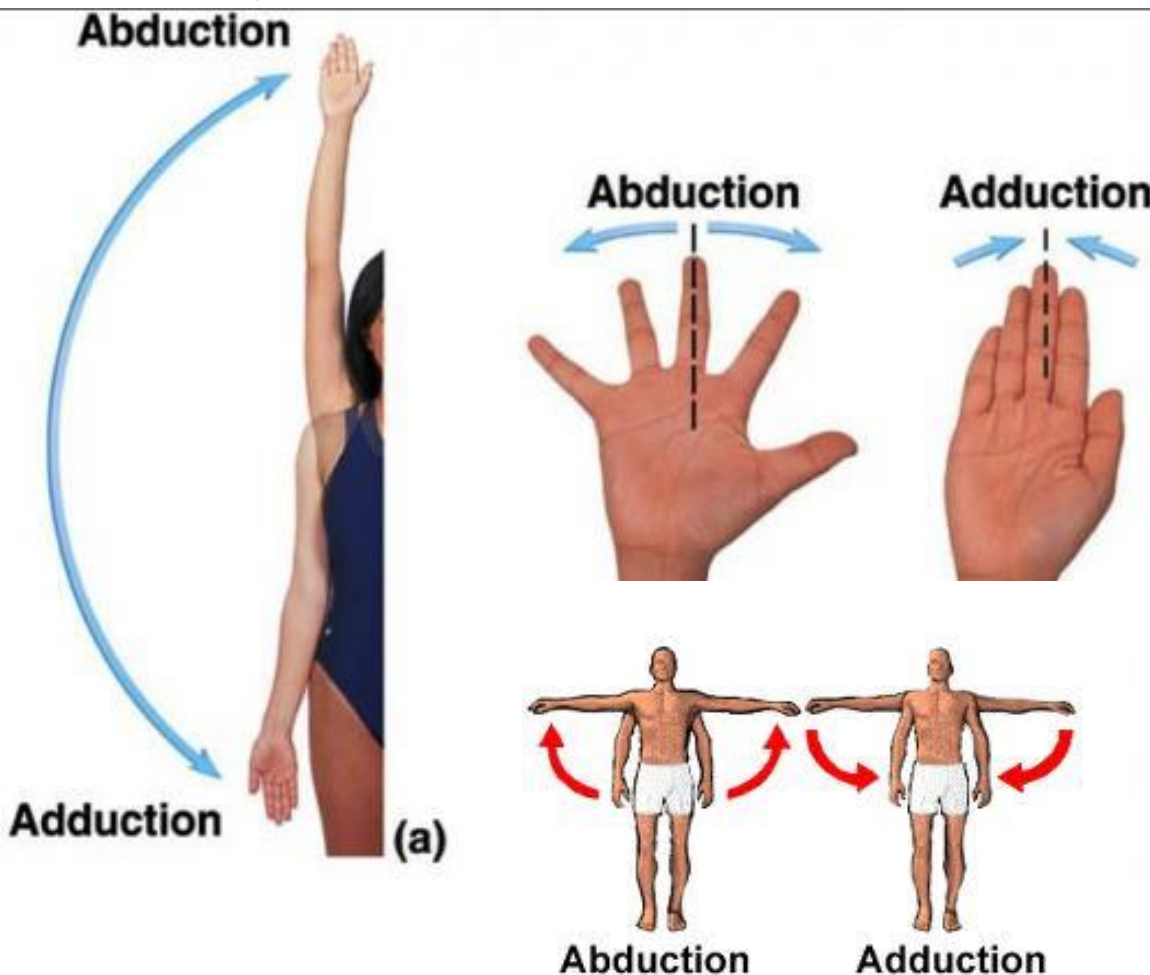
6. Eversion- soles of feet face laterally (outward)



D. Movements- Abduction and Adduction

7. Abduction- movement of an extremity laterally (away from median)

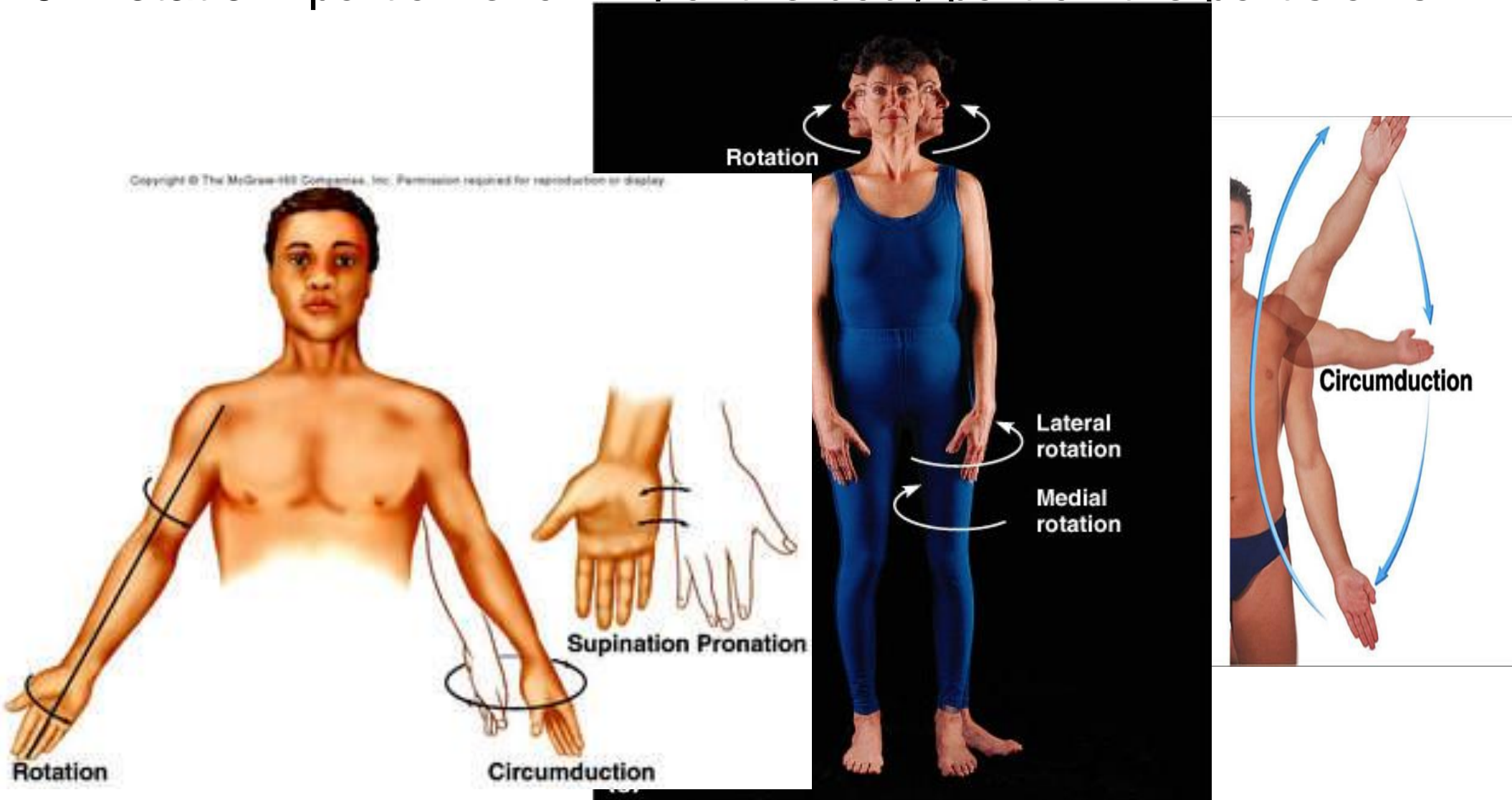
8. Adduction-movement of an extremity moved inward(toward median)



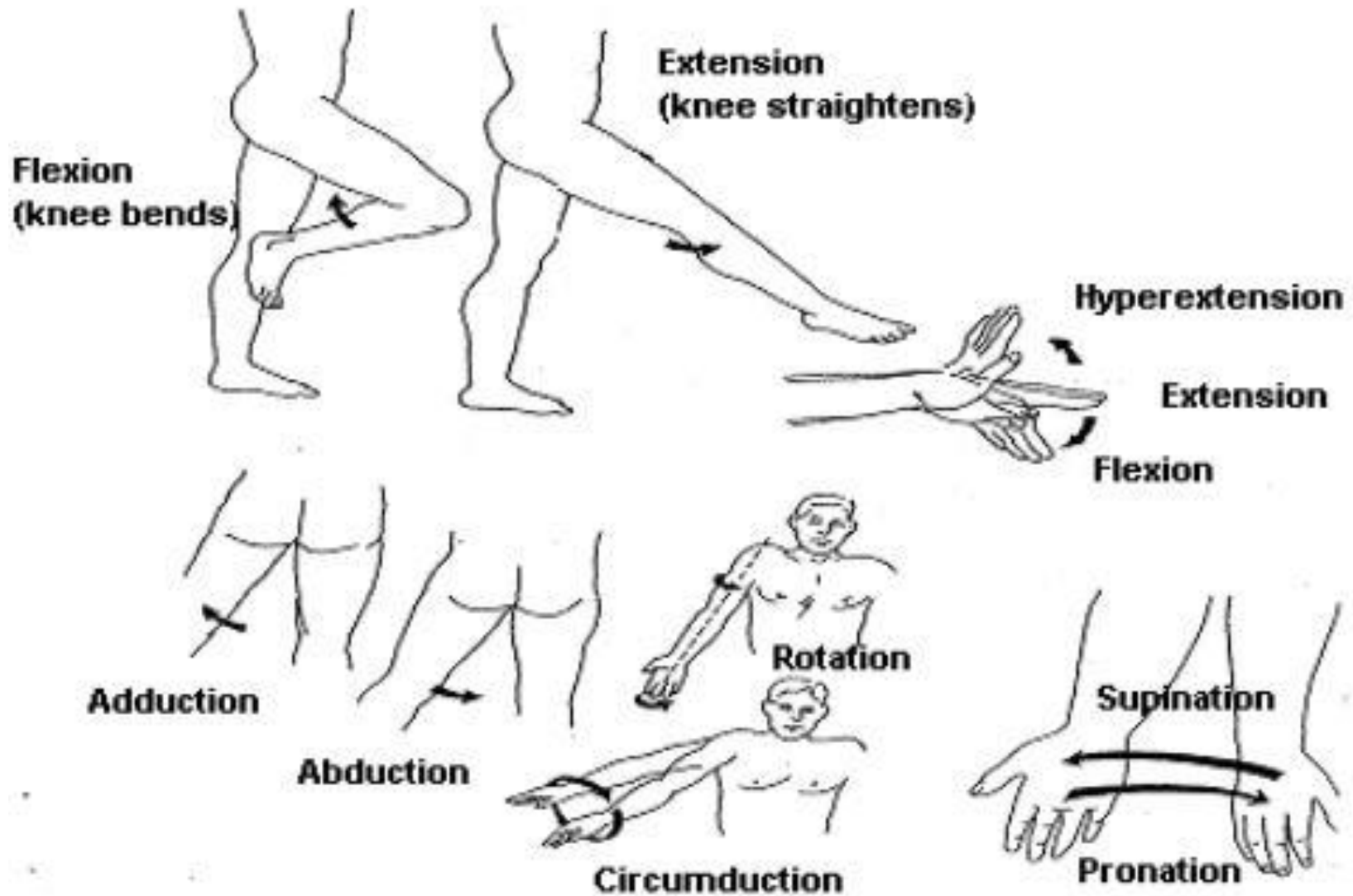
D. Movements- Circumduction and Rotation

9. Circumduction- follows a cone shaped path- a circular movement that combines flexion/extension with abduction/adduction

10. Rotation- partial revolving of the body part on the part's axis



D. Movements – the next 6



Supination
Pronation
Protraction
Retraction
Elevation
Depression

Let's review
these next 6...

D. Movements- Pronation and Supination

11. Supination- rotation that makes the palm of hand face forward

12. Pronation- rotation that makes the palm face backward

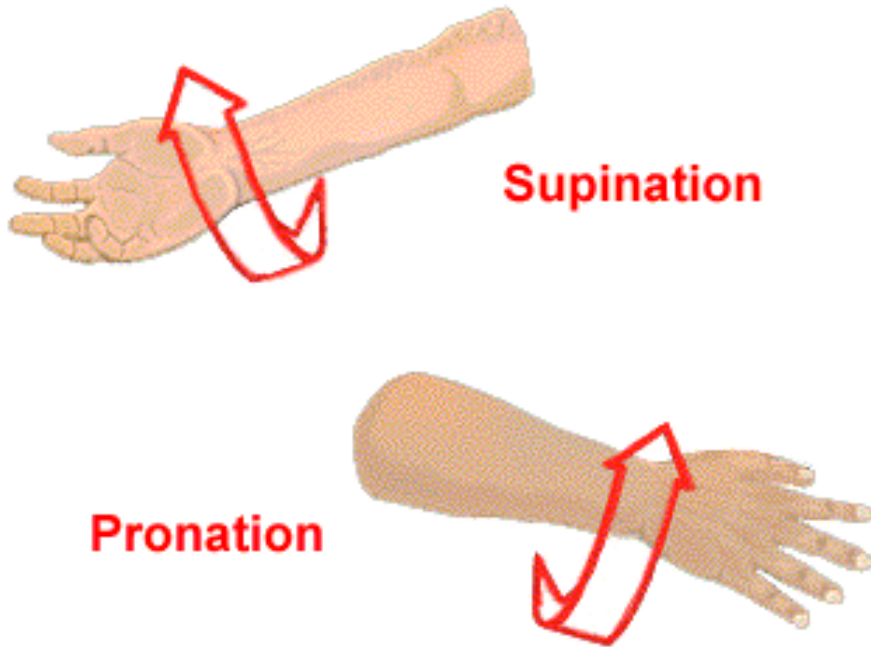
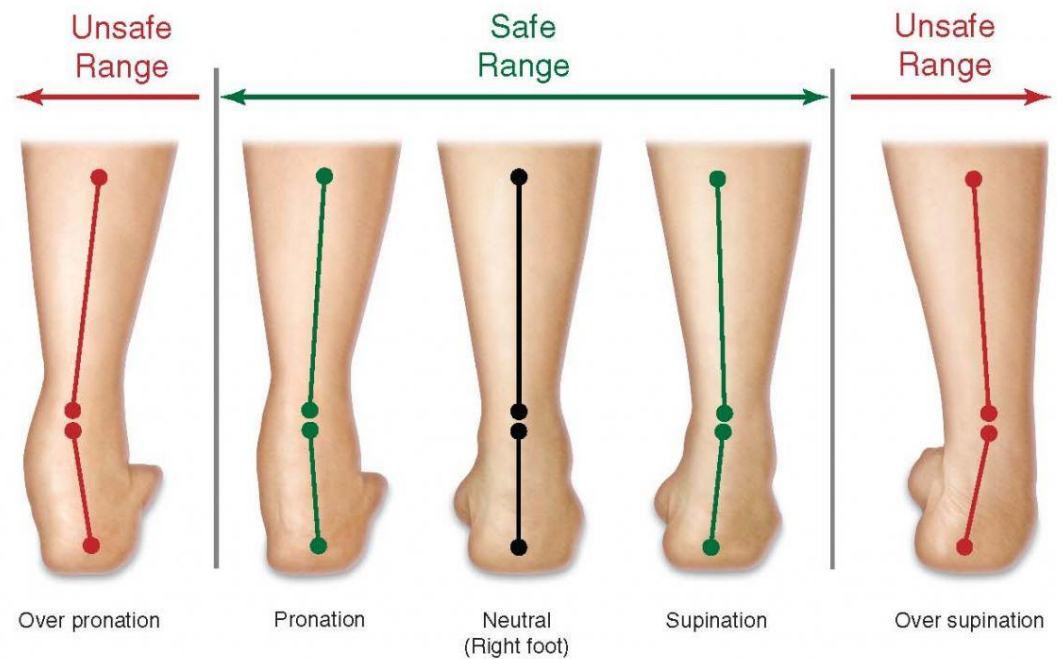


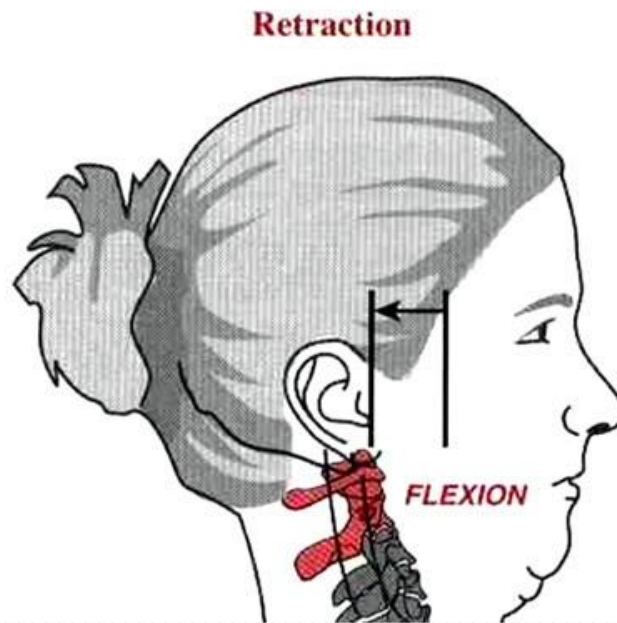
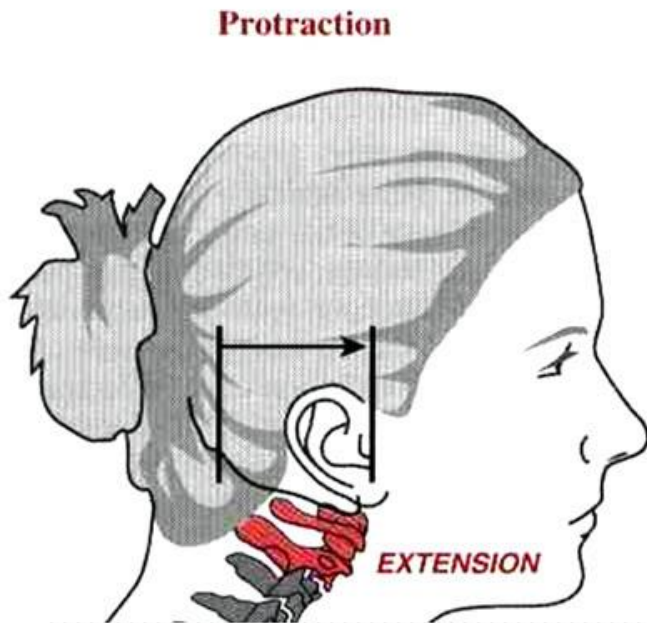
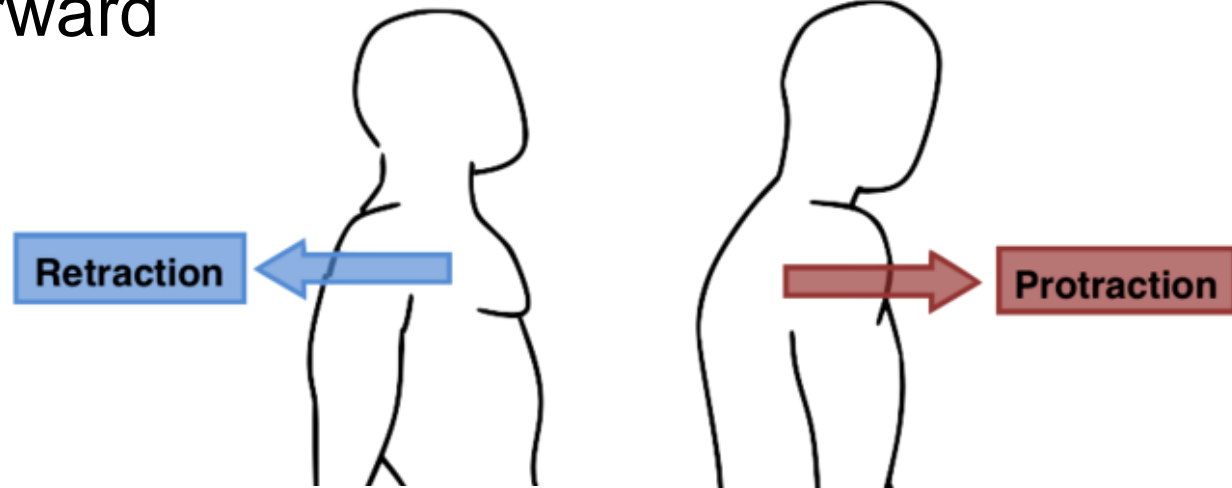
Fig. 10



D. Movements- Protraction and Retraction

13. Retraction -drawn backward

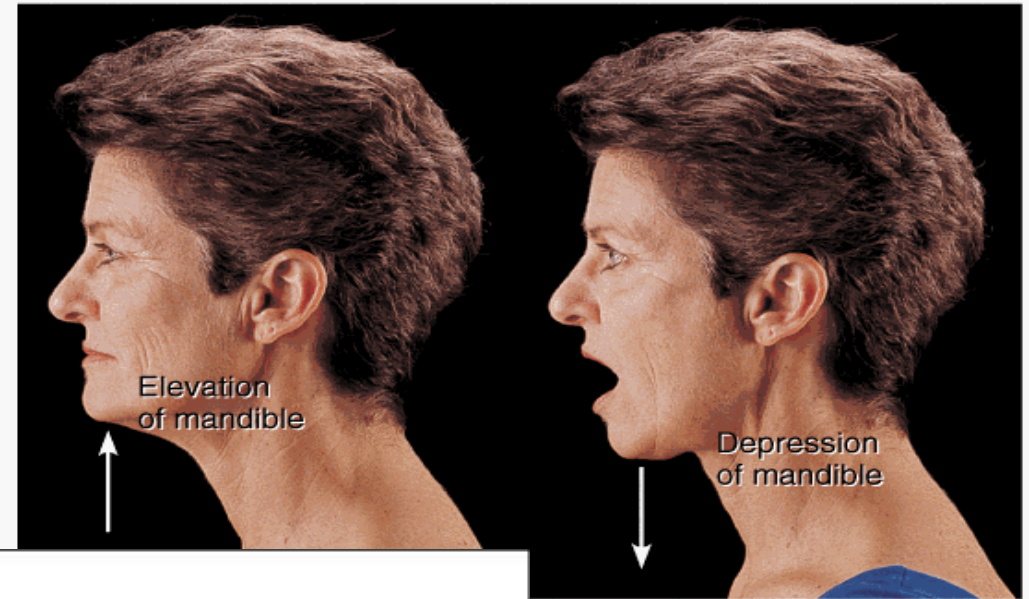
14. Protraction-pushed forward



D. Movements- Depression and Elevation

15. Depression- lowering of the shoulders

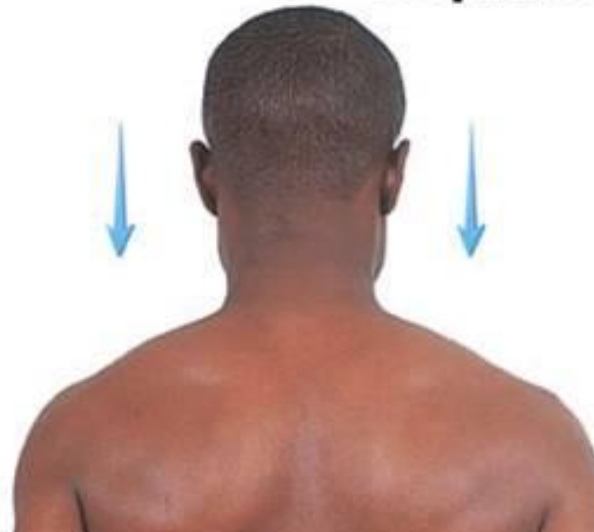
16. Elevation- raising of the shoulders



Elevation



Depression



Wesley Longman, Inc.

E. Planes

Sagittal/Lateral – divides the body into right and left parts

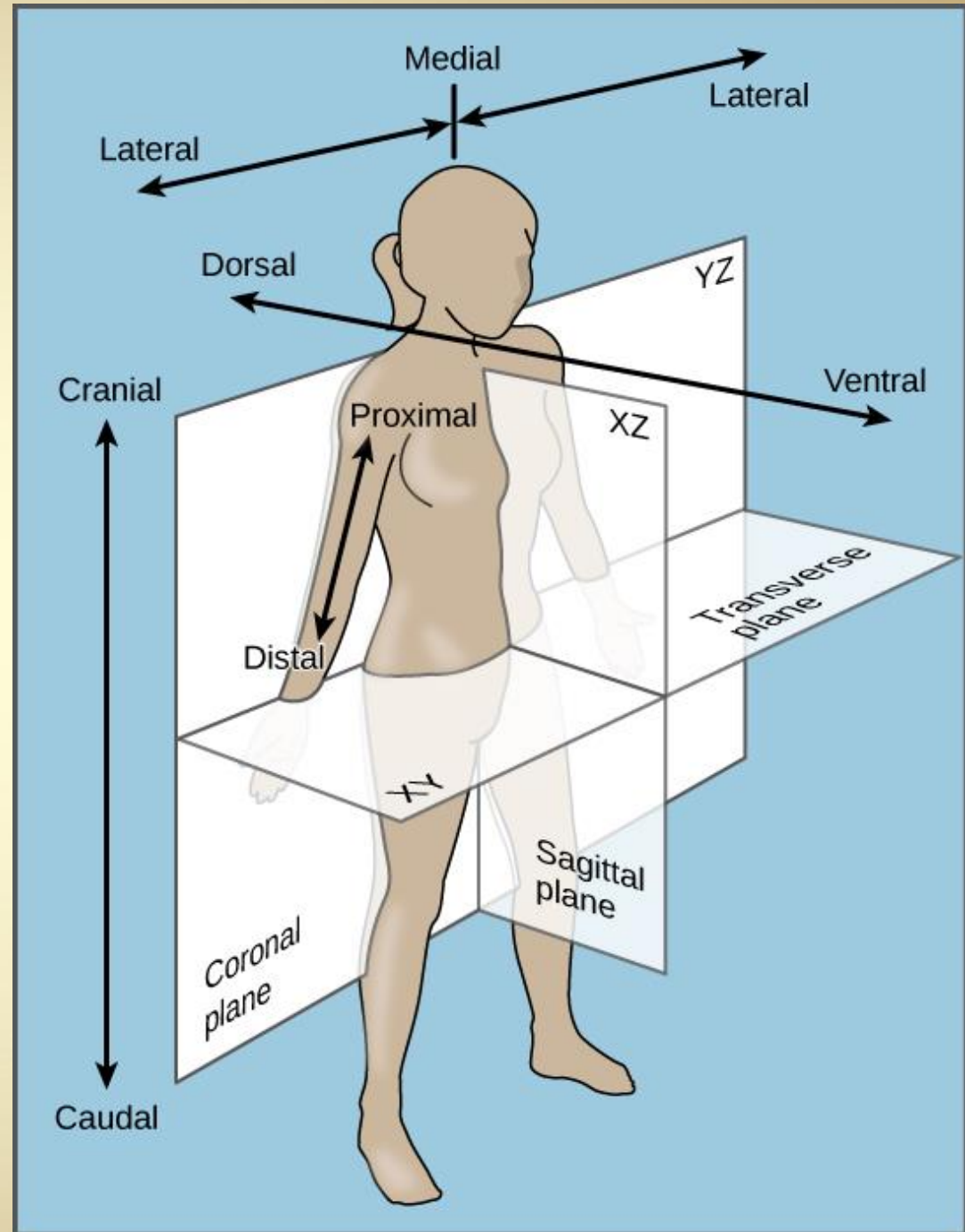
Midsagittal or medial – sagittal plane that lies on the midline

Parasagittal- Divides anywhere; not down middle; divides body into unequal parts

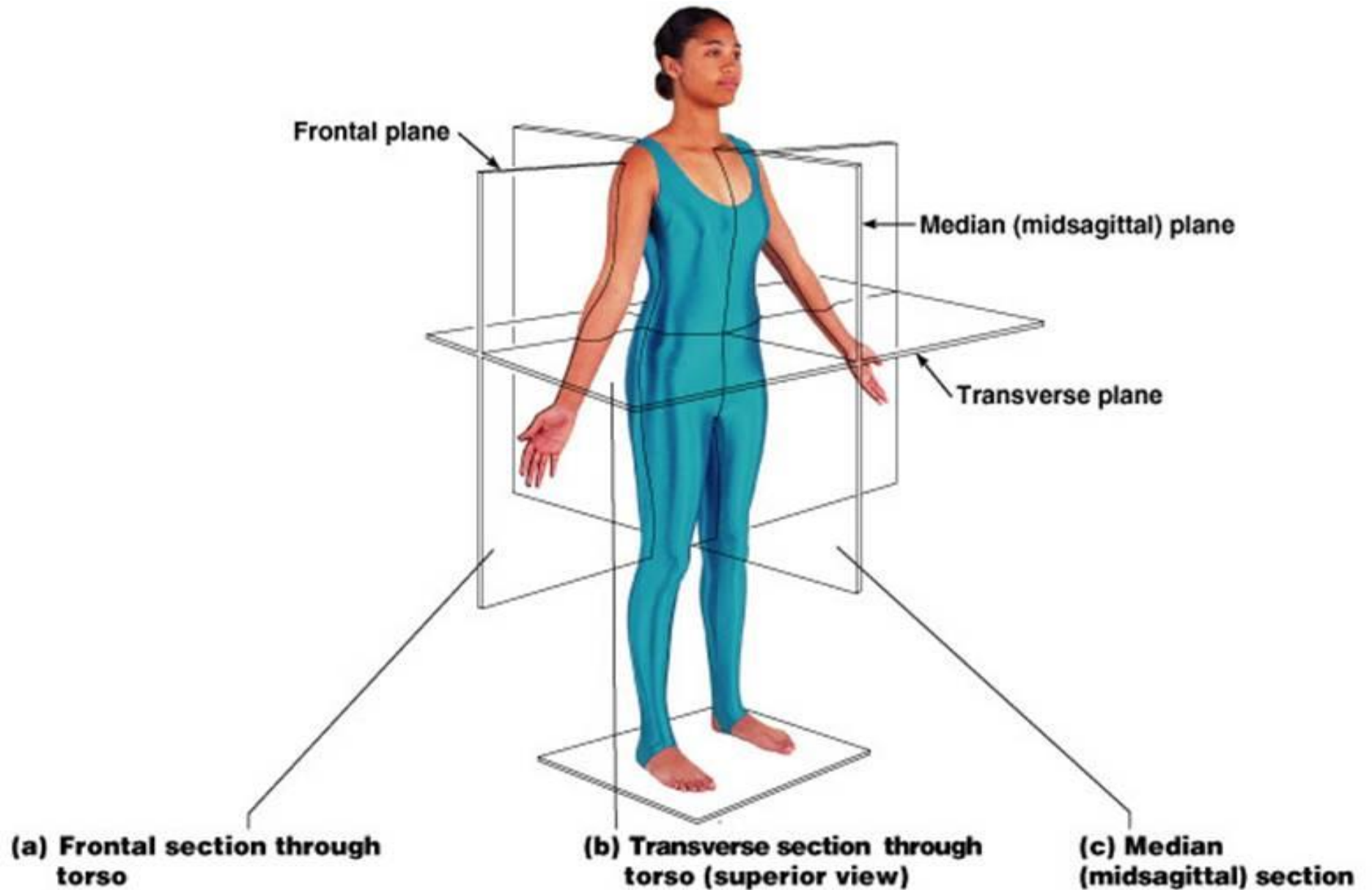
Frontal or coronal
– divides the body into anterior and posterior parts

Transverse or horizontal (cross section) – divides the body into superior and inferior parts

Oblique section – cuts made diagonally



E. Body Planes



Careers in Medicine

- There are tons of careers, some of them only require a short term of training. What are your goals?
- See [Explore Health Careers](#)
- Homework: Medical and Applied Science

