

Kinesiology Terminology

Basic Terminology

- **Kinesiology = The study of movement**

This definition is so broad. What other fields of study come together to create kinesiology?

Yes!! And it relates them all to HUMAN MOVEMENT.

Basic Terminology continued

- **Mechanics =**

- The study of forces and the motions that they produce

- **Biomechanics =**

- Mechanical principles applied to the human body
- What forces act on the human body?
- What are the results of those forces?

Basic Terminology continued

- **Biomechanical systems can be considered:**
 - Static or dynamic

STATIC	DYNAMIC

Basic Terminology continued

- **Dynamic Systems can be divided into:**
 - Kinetics and Kinematics

KINETICS	KINEMATICS

Kinematics Terminology

- **Kinematics can be divided into:**
 - Osteokinematics and arthrokinematics

OSTEOKINEMATICS	ARTHROKINEMATICS

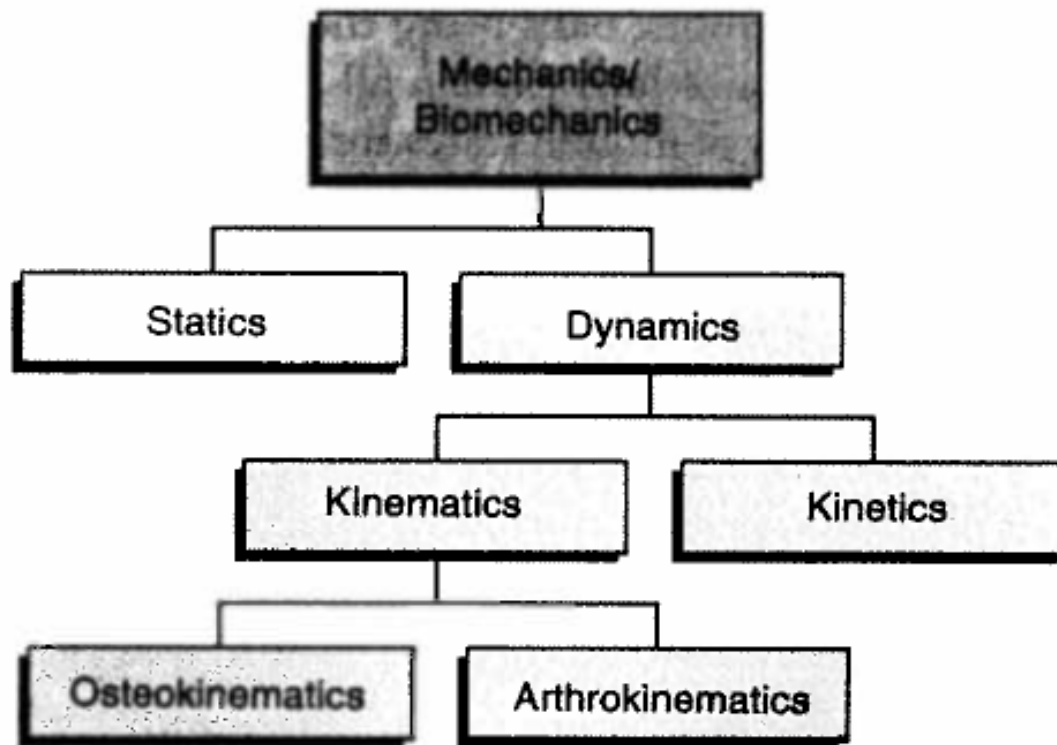


Figure 8-1. Mechanics/biomechanics relationship flowchart.

Kinematics Terminology

continued

- **Linear motion (aka translatory motion)**

- occurs in a straight line from one location to another
- All the parts of the object move the same distance, in the same direction, and at the same time

- **Angular motion (aka rotary motion)**

- Movement of an object around a fixed point
- All the parts of the object move through the same angle, in the same direction, and at the same time, but they do not move the same distance.

Kinematics Terminology

continued

- **Linear Motion (aka translatory motion)** can be broken down into 2 categories:
 - Rectilinear motion = movement that occurs in a straight line
 - Curvilinear motion = movement in a curved path that isn't necessarily circular

Kinematics Terminology

continued

- Which type of motion is it? Are we seeing rectilinear, curvilinear or angular?
- <http://www.youtube.com/watch?v=32qZrt5wMVc>
- http://www.youtube.com/watch?v=8_VsXcKBs8k&feature=related
- http://www.youtube.com/watch?v=wIUYYuri_LuM
- <http://www.youtube.com/watch?v=ivwTWaZd1f8&feature=related>

Descriptive Terminology

- **The Anatomic Position:**

- **The human body:**

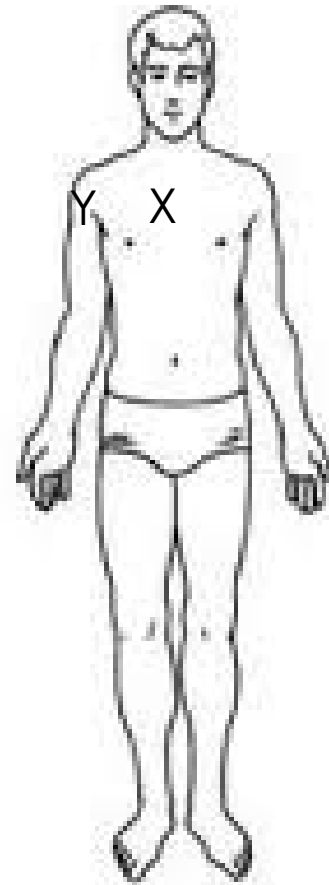
- Standing in an upright position
- Eyes facing forward
- Feet parallel and close together
- Arms at the sides of the body
- Palms facing forward



Descriptive Terminology continued

- **Medial and Lateral**

- Medial = a location or position toward the midline
- Lateral = a location or position farther from the midline



Descriptive Terminology

continued

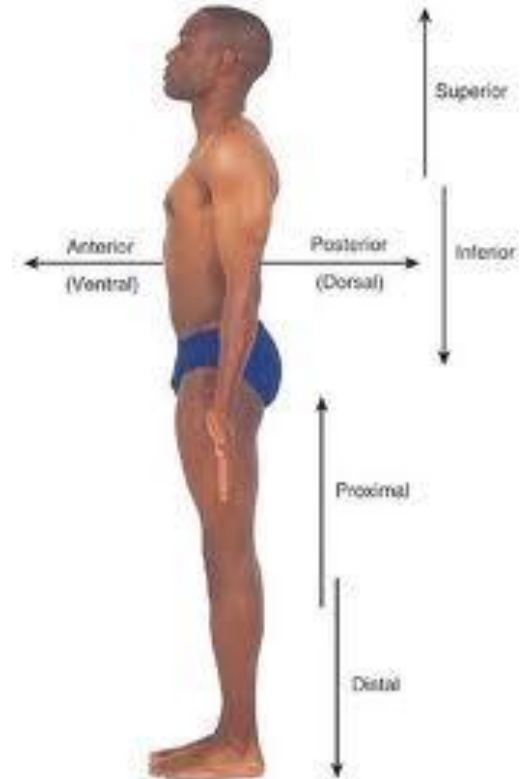
○ **Medial or Lateral??**

- The ulna is on the _____ side of the forearm
- The radius is _____ to the ulna
- The fibula is _____ to the tibia
- The SC joint is _____ to the AC joint

Descriptive Terminology continued

○ Anterior and Posterior

- Anterior = refers to the front of the body or to a position closer to the front (synonymous with *ventral*)
- Posterior = refers to the back of the body or to a position more toward the back (synonymous with *dorsal*)



Descriptive Terminology

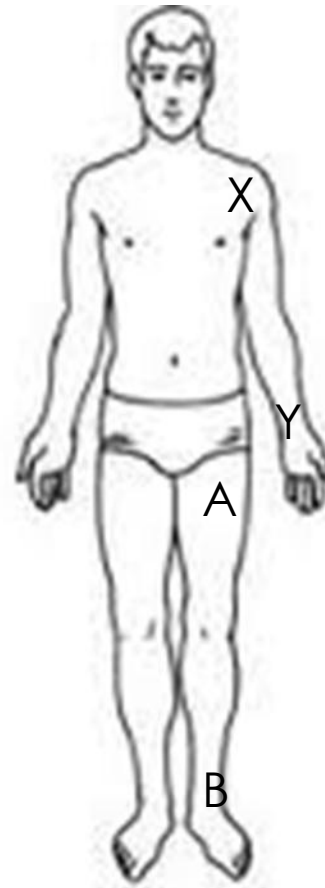
continued

- **Anterior or Posterior?**

- The sternum is _____ on the chest wall and the scapula is _____
- The patella is _____ to the popliteal fossa
- The gluteal fold is _____ to the pubic symphysis

Descriptive Terminology continued

- **Proximal and Distal**
- Proximal = toward the trunk
- Distal = away from the trunk



Lippert, p5

Descriptive Terminology

continued

- **Proximal or Distal?**

- The humeral head is located on the _____ end of the humerus.
- The elbow is _____ to the wrist, but _____ to the shoulder.
- The ankle is _____ to the knee.
- The scapula is _____ to the ilium.

Descriptive Terminology

continued

- **Superior and Inferior**
- Superior = the location of a body part that is above another (or to refer to the upper surface of an organ or a structure)
- Inferior = indicates that a body part is below another (or refers to the lower surface of an organ or a structure)

Descriptive Terminology

continued

- **Superior or Inferior?**

- The body of the sternum is _____ to the xiphoid process, but _____ to the manubrium.
- The patella is _____ to the malleoli.
- The olecranon process is _____ to the ulnar styloid process.

Descriptive Terminology

continued

- **Cephalad and Caudal**

- Cephalad = a position or structure close to the head

- Caudal = a position or structure closer to the feet

Descriptive Terminology continued

○ Superficial and Deep

- Descriptions used to refer to relative depth of a structure.
- For example, when describing the layers of the abdominal muscles, the external oblique is deep to the rectus abdominis but superficial to the internal oblique.



Descriptive Terminology

continued

- **Supine** = When a person is lying on his back with his legs extended.
- **Prone** = when a person is lying on his stomach.



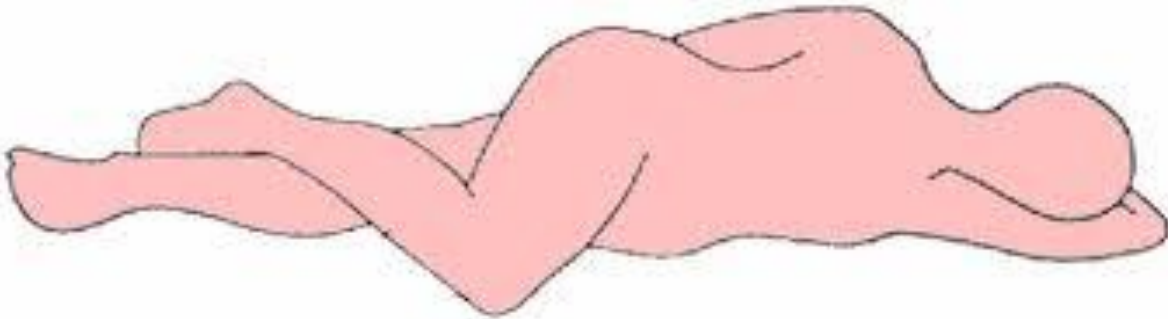
Supine



Prone

Descriptive Terminology continued

- **Sidelying** = when a person is lying on his side.



Descriptive Terminology continued

- **Hooklying** = when a person is lying on his back with his hips and knees flexed, so that his feet are on the surface of the bed or table.



Descriptive Terminology continued

- **Short Sitting** = when a person is sitting with his hips and knees flexed to approximately 90 degrees.



Descriptive Terminology continued

- **Long Sitting** = when a person is sitting with his hips flexed to approximately 90 degrees and the knees extended.



Descriptive Terminology

continued

- **Bilateral and Unilateral**
- Bilateral = refers to two, or both, sides.
 - Bilateral above knee amputation means both the right and left legs were amputated
 - Bilateral quad sets means both quads were working (typically at the same time)
- Unilateral = refers to one side.

Descriptive Terminology

continued

- **Ipsilateral and Contralateral**

- Ipsilateral = refers to the same side of the body

- Sometimes I see someone who has hurt their leg use a crutch on the ipsilateral side of the injury. This is incorrect.

- Contralateral = refers to the opposite side of the body

- A person with a stroke in the right hemisphere of the brain may have contralateral paralysis (meaning paralysis of the left arm and leg)

References

- Lippert, L.S., (2011), Clinical Kinesiology and Anatomy, 5th ed. F.A. Davis, Philadelphia, PA.
- Mansfield, P.J., & Neumann, D.A. (2009). Essentials of Kinesiology for the Physical Therapist Assistant. St. Louis, MO: Mosby Elsevier.