

# INTRODUCTION

## TERMS OF POSITION & DIRECTION

CN: (1) Use bright or dark colors for emphasis.  
(2) Color the arrows but not the illustrations.

Terms of position and direction describe the relationship of one organ to another, usually along one of the three body planes illustrated in the previous plate. To avoid confusion, these terms are related to the standard *anatomical position*: body standing erect, limbs extended, palms of the hands forward.

### CRANIAL, SUPERIOR, ROSTRAL<sup>A</sup>

These terms refer to a structure being closer to the head or higher than another structure of the body. See the quadruped in the right corner for a related application of the term "cranial."

### ANTERIOR, VENTRAL<sup>B</sup>

These terms refer to a structure being more in front than another structure in the body. The term "anterior" is preferred. See the quadruped for another application of the term "ventral."

### POSTERIOR, DORSAL<sup>C</sup>

These terms refer to a structure being more in back than another structure in the body. The term "posterior" is preferred. See the quadruped for another application of the term "dorsal."

### MEDIAL<sup>D</sup>

This term refers to a structure that is closer to the median plane than another structure in the body. "Medial" is not synonymous with "median."

### LATERAL<sup>E</sup>

This term refers to a structure that is further away from the median plane than another structure in the body.

### PROXIMAL<sup>F</sup>

Employed only with reference to the limbs, this term refers to a structure being closer to the median plane or root of the limb than another structure in the limb.

### DISTAL<sup>G</sup>

Employed only with reference to the limbs, this term refers to a structure being further away from the median plane or the root of the limb than another structure in the limb.

### CAUDAL, INFERIOR<sup>H</sup>

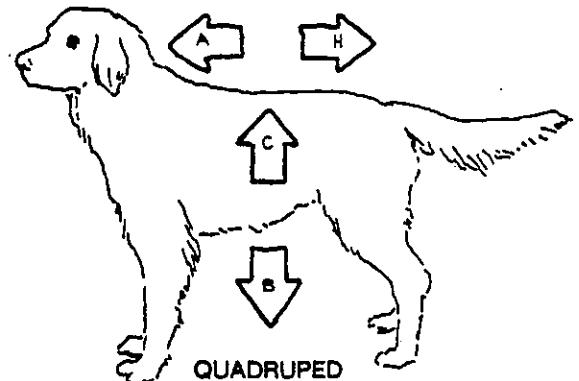
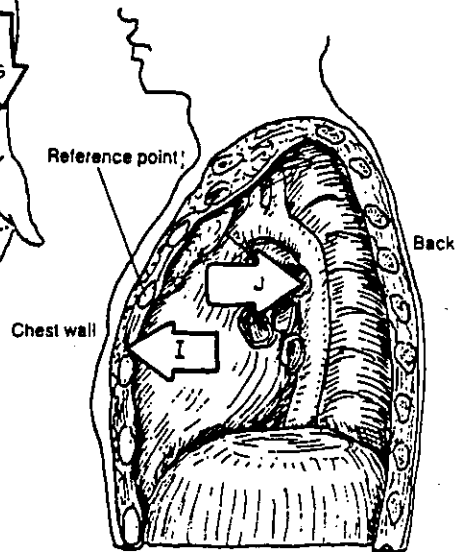
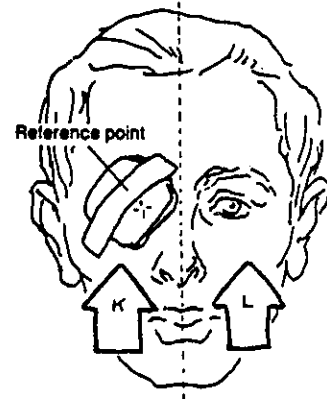
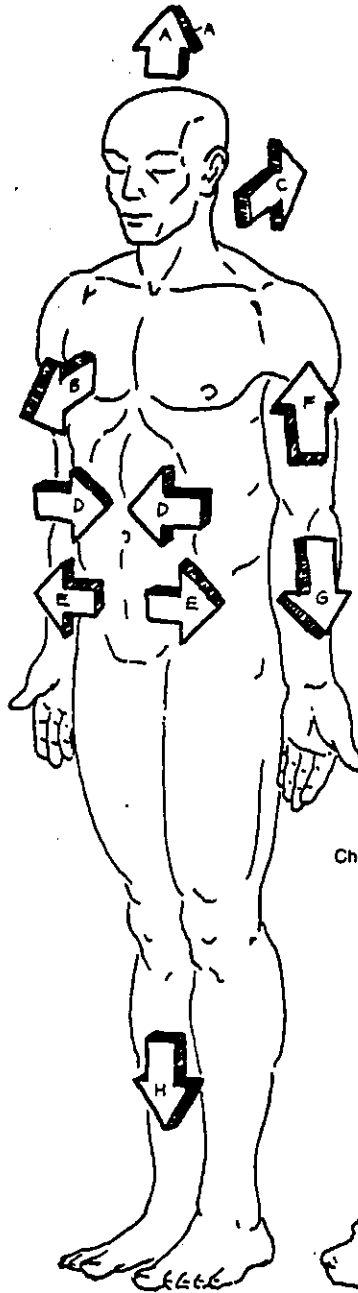
These terms refer to a structure being closer to the feet or the lower part of the body than another structure in the body. See the quadruped for a related application of the term "caudal."

### SUPERFICIAL, DEEP<sup>I</sup>

The term "superficial" is synonymous with external, and the term "deep" with internal. Related to the reference point on the chest wall, structure closer to the surface of the body is superficial; structure further away from the surface is deep.

### IPSILATERAL<sup>K</sup> CONTRALATERAL<sup>L</sup>

The term "ipsilateral" means "on the same side" (in this case, as the reference point); "contralateral" means "on the opposite side" (of the reference point).



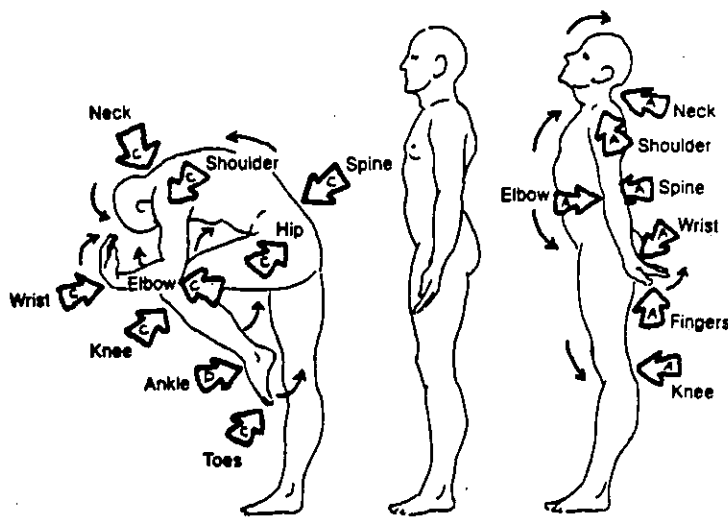
The quadruped presents four points of direction: head end (cranial), tail end (caudal), belly side (ventral), back side (dorsal). In the biped (e.g., human), the ventral side is also anterior, the dorsal side is also posterior, the cranial end is also superior, and the caudal end is inferior.

# IV. ARTICULAR SYSTEM

## TERMS OF MOVEMENTS

CN: Color the arrows pointing to the joints demonstrating the various movements of body. Note that inversion (K) and eversion (L) occur among bones of the foot, not at the ankle.

- EXTENSION<sub>A</sub>
- DORSIFLEXION<sub>B</sub>
- FLEXION<sub>C</sub>
- PLANTARFLEXION<sub>D</sub>
- ADDUCTION<sub>E</sub>
- ABDUCTION<sub>F</sub>
- CIRCUMDUCTION<sub>G</sub>
- ROTATION<sub>H</sub>
- SUPINATION<sub>I</sub>
- PRONATION<sub>J</sub>
- INVERSION<sub>K</sub>
- EVERSION<sub>L</sub>



ANATOMICAL POSITION (neutral)

Movements of bones occur at joints. Terms of movement are therefore applicable to joints, not bones (flexion of the humerus is to break it!). Ranges of motion are limited by the bony architecture of a joint, related ligaments, and the muscles crossing that joint. It is from the anatomical position that specific directions of movement can be clearly delineated and ranges of motion measured.

Extension of a joint is to generally straighten it. In the anatomical position, most joints are in relaxed extension (neutral). In relation to the anatomical position, movements of extension are directed in the sagittal plane. Extreme, even abnormal extension is called hyperextension. At the ankle and wrist joints, extension is termed *dorsiflexion*.

Flexion of a joint is to bend it or decrease the angle between the bones of the joint. Movements of flexion are directed in the sagittal plane. At the ankle joint, flexion is also called *plantar flexion*.

Adduction of a joint moves a bone toward the midline of the body (or in the case of the fingers or toes, toward the midline of the hand or foot). In relation to the anatomical position, movements of adduction are directed medially in the coronal plane.

Abduction of a joint moves a bone away from the midline of the body (or hand or foot). Movements of abduction are directed laterally in the coronal plane.

Circumduction is a circular movement permitted at ball and socket, condylar, and saddle joints. It consists of the movements of flexion, abduction, extension, and adduction performed in sequence.

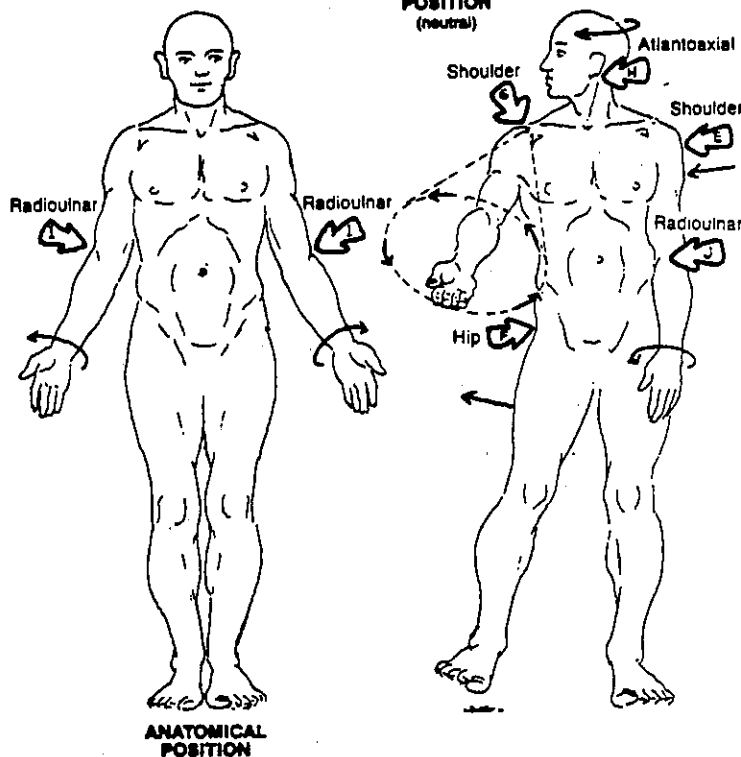
Rotation of a joint is to turn the moving bone about its axis. Rotation toward the body is internal or medial rotation; rotation away from the body is external or lateral rotation.

Supination is an external rotation of the radiohumeral joint. In the foot, it is the combined movements of inversion, adduction around a vertical axis, and plantar flexion.

Pronation is an internal rotation of the radiohumeral joint. In the foot, it is the combined movements of eversion, abduction around a vertical axis, and dorsiflexion. The joints involved in both supination and pronation are the tarsal and ankle joints.

Inversion turns the sole of the foot inward so that the medial border of the foot is elevated.

Eversion turns the sole of the foot outward so that its lateral border is elevated. Both inversion and eversion occur at subtalar (talocalcaneal) and transverse talar joints.



ANATOMICAL POSITION

