



swisspilates
— INSTITUTE —



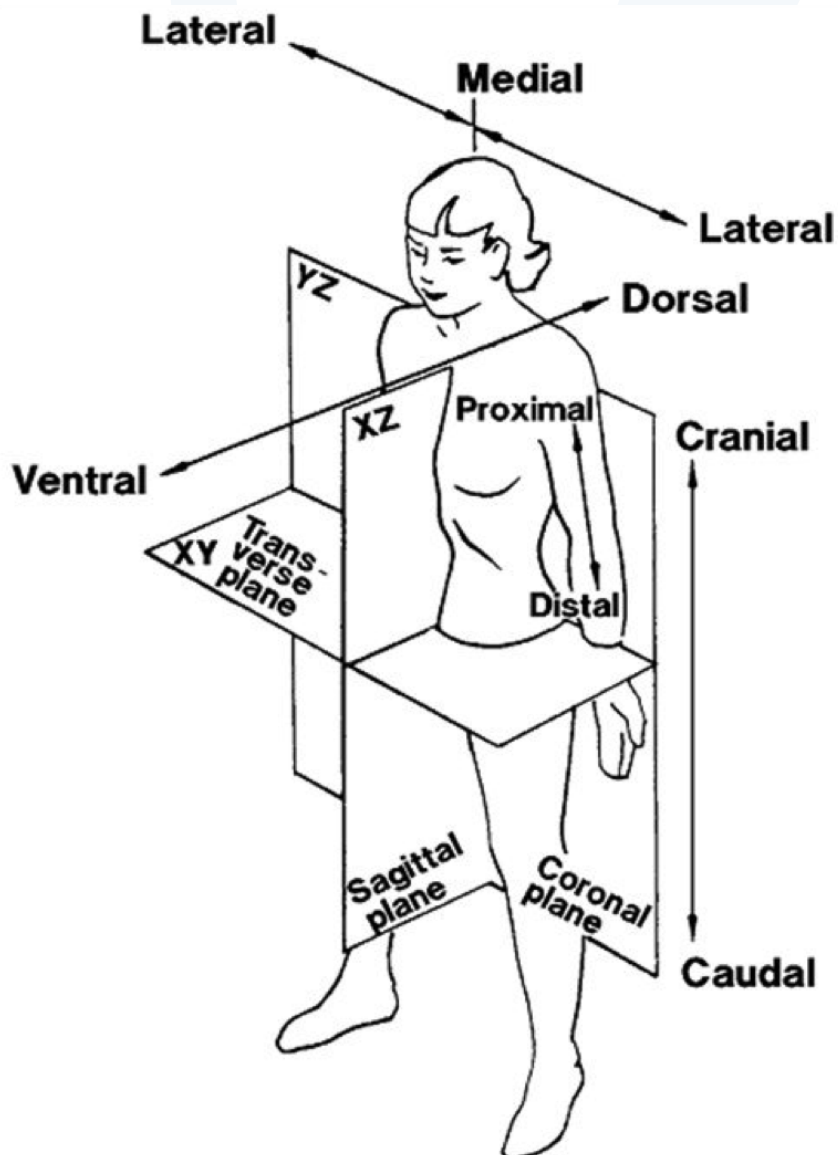
Anatomy

Essentials

1. ANATOMICAL TERMINOLOGY

There is a common set of terms used to describe the spatial positions and relationships in the human body when speaking of anatomy or movement. They are all related to anatomical position, which is standing erect with the palms of the hands forward, as seen in most anatomy charts.

2. PLANES



The body is divided into three planes:

- 1) Saggital Plane: The vertical plane dividing the body into left and right halves
- 2) Frontal Plane (Coronal Plane): The vertical plane dividing the body into front and back halves.
- 3) Transverse Plane: The horizontal plane dividing the body into upper and lower parts.

3. LOCATION TERMS

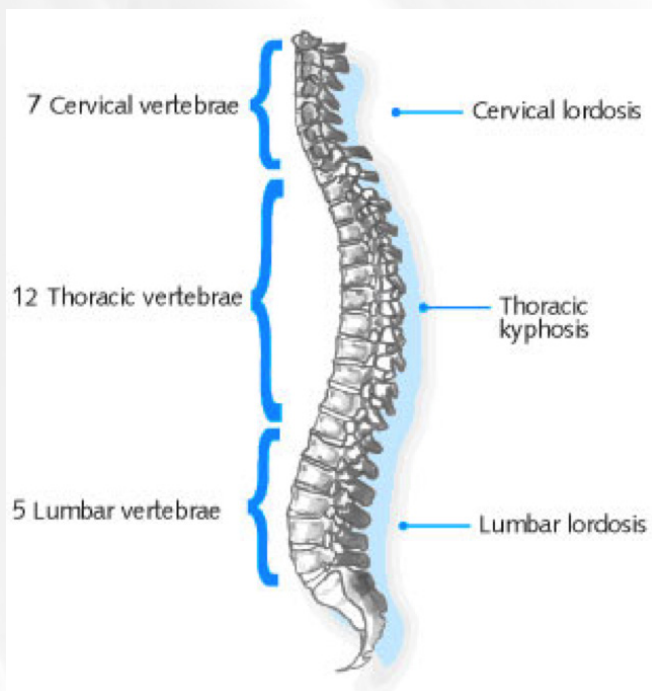
Term	Description of Location
Anterior	Towards the front of the body
Posterior	Towards the back of the body
Ventral	Towards the front of the torso
Dorsal	Towards the back of the torso
Medial	Towards the center or midline of the body
Lateral	Away from the midline of the body – to the side
Inferior (Caudal)	Below – in relation to another structure
Superior (Cranial)	Above – in relation to another structure
Proximal	Nearest the trunk or point of origin of the limb
Distal	Situated away from the center or midline of the body or away from the point of origin, closer to the end of the limbs
Contralateral	Pertaining or relating to the opposite side.
Ipsilateral	On the same side
Transverse	Horizontally across the body

4. MOVEMENT TERMS

Movement	Description	Examples
Flexion	Decreasing the inner angle of the joint	Bending the elbow. Dropping the chin to the chest. Folding forward
Extension	Increasing the inner angle of the joint	Back bend Kicking leg back
Abduction	Moving away from the midline of the body	Lifting leg to the side Lifting arms up from sides into T position
Adduction	Moving towards the midline of the body	Crossing one leg in front of the other Crossing arm in front of torso or behind back
Lateral Flexion	Side bending	Dropping ear towards shoulder Crescent Stretch
Rotation	Rotating or pivoting around a long axis	Twisting along spinal column
Circumduction	Circular movement	Arm circles
Dorsiflexion	Flexing the ankle with foot moving upwards	Lifting toes up towards body
Plantarflexion	Flexing the ankle with foot moving downward	Pointing toes
Pronation	Rotating the forearm with the palm turning inward	Lifting arm then turning arm
Supination	Rotating the forearm with the palm turning outward	Lifting arm then turning arm back
Inversion	Turning sole of foot medially	Turning feet in, turning toes towards each other
Eversion	Turning sole of foot laterally outward	Turning feet out, bringing backs of heels towards each other
Horizontal Abduction	Move arm in horizontal plane away from the body	Bring arms to shoulder height and pull arms back
Horizontal Adduction	Moving arm in horizontal plane inwards across body	Crossing arms in front of the chest
Protraction	Draw forward shoulder	Round shoulders forward “spreading” back
Retraction	Draw back shoulders	Squeezing shoulder blades together

5. THE SPINE AND PELVIC GIRDLE

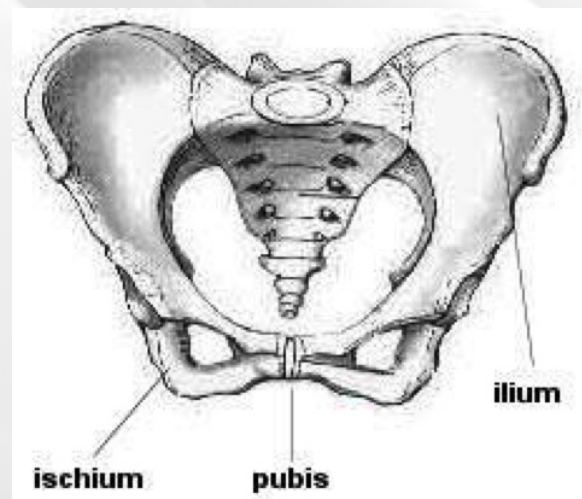
The spine has four distinct segments, consisting of the cervical, the thoracic, the lumbar, and the sacral. Each spinal segment contains a given number of vertebrae. The vertebrae are separated by the intervertebral discs. These discs absorb shock, permit some compression, and allow movement. There are no discs in the sacrum or coccyx where the vertebrae are fused together.



The cervical spine is curved in an extended position (cervical lordosis). The thoracic spine is curved in a flexed position (thoracic kyphosis). And the lumbar spine is curved in an extended position (lumbar lordosis). When there is too much rounding in the thoracic spine, it is called kyphosis. When there is too much arching in the lumbar region, it is called lordosis. When the spine is curved from right to left, it is called scoliosis.

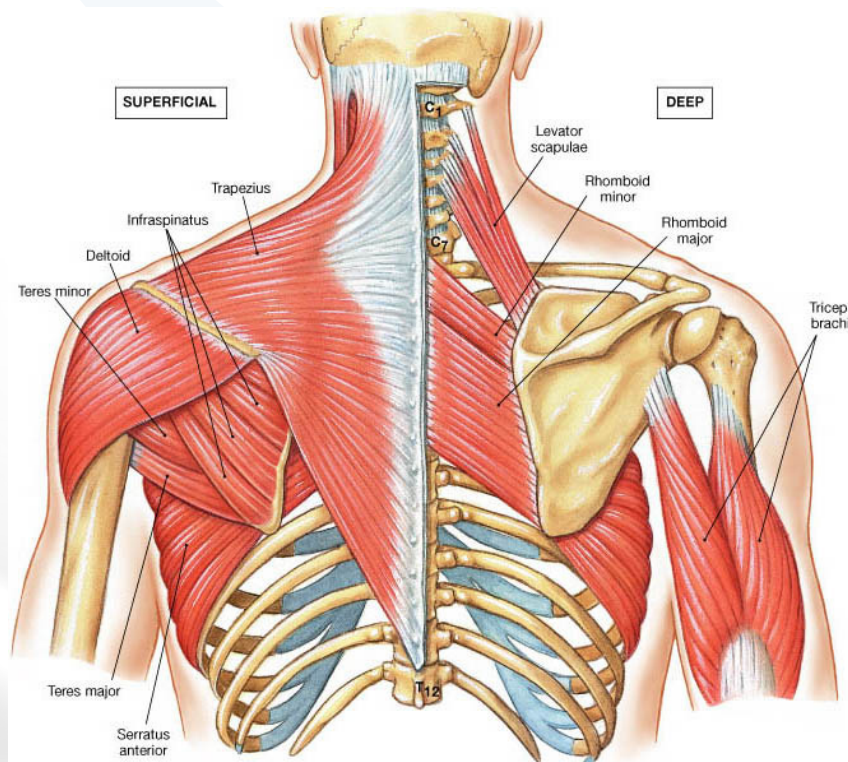
The sacrum is the foundation platform on which the spinal column is balanced. It is attached to the two hip bones at the sacroiliac joint. The rib cage consists of the twelve ribs that attach to the thoracic spine.

The appendicular skeleton (including shoulders, arms, pelvic girdle, legs) joins the axial skeleton (spinal column) at the shoulders and hips. The clavicle and the scapula form the shoulder. Each hip consists of three fused bones: the ilium, ischium, and pubis. This forms the pelvic girdle, which is shaped like a bowl.



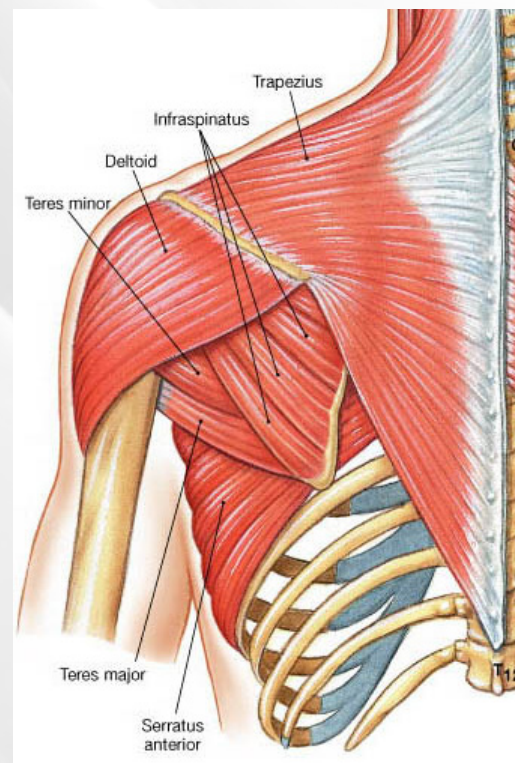
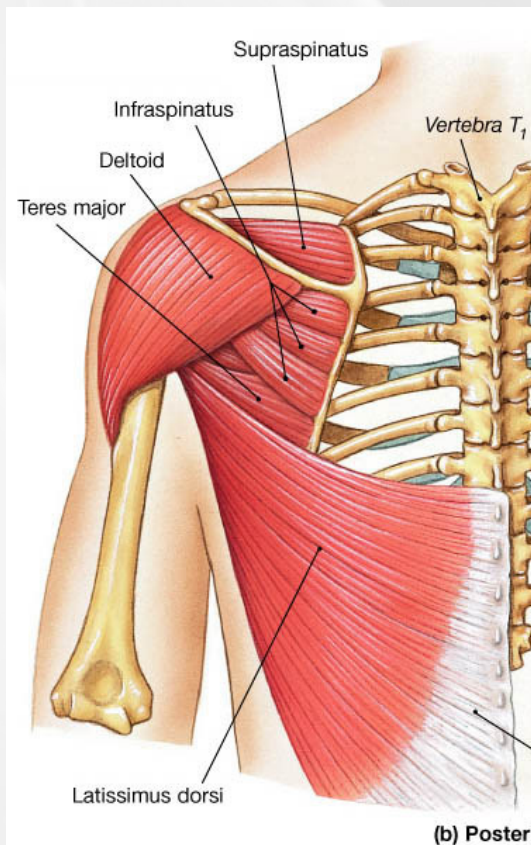
6. SHOULDER GIRDLE STABILIZATION MUSCLES

Muscle	Action	To Strengthen	To Stretch
Levator Scapula	Elevates scapula, rotates and side bends head	Rotate neck, keep head raised against gravity	Rotate head and flex cervical spine
Rhomboid major and minor	Retract scapula and rotate it to depress glenoid cavity; fix scapula to thoracic wall	Abduct shoulder, squeeze shoulder blades	Protract scapula while keeping shoulders down
Trapezius (upper, lower, middle)	Elevation and adduction of scapula. Upper fibers extend head	Abduct arm and shoulder, squeeze shoulder blades together	Flex neck, protract scapula
Serratus Anterior	Protraction and upward rotation of scapula	Push ups	Retract scapula



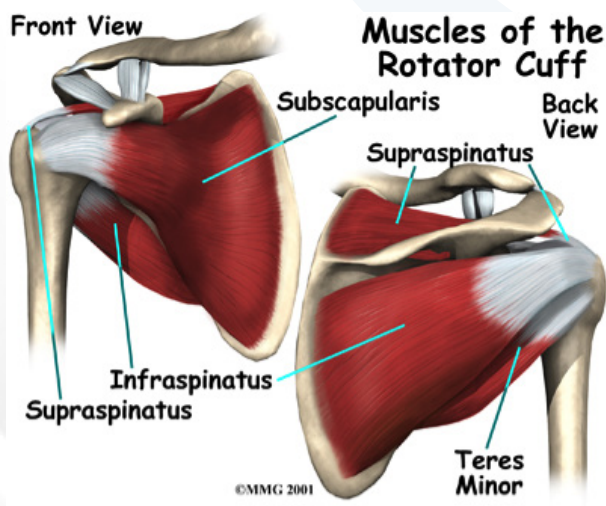
7. SHOULDER JOINT MOVERS

Muscle	Action	To Strengthen	To Stretch
Deltoid (anterior, lateral, posterior)	Abduct arm, anterior also draws arm forward, posterior also draws arm back	Abducting arms to shoulder height – arms in T position	Adduction – crossing arm across torso
Teres Major	Extension, internal rotation and adduction of shoulder joint	Internal rotation against resistance	External rotation of shoulder in 90 degree abducted position
Latissimus Dorsi	Adduction, extension, internal rotation	Exercises in which arms are pulled down	External rotation of shoulder in 90 degree abducted position



8. ROTATOR CUFF MUSCLES (STABILIZES SHOULDER JOINT)

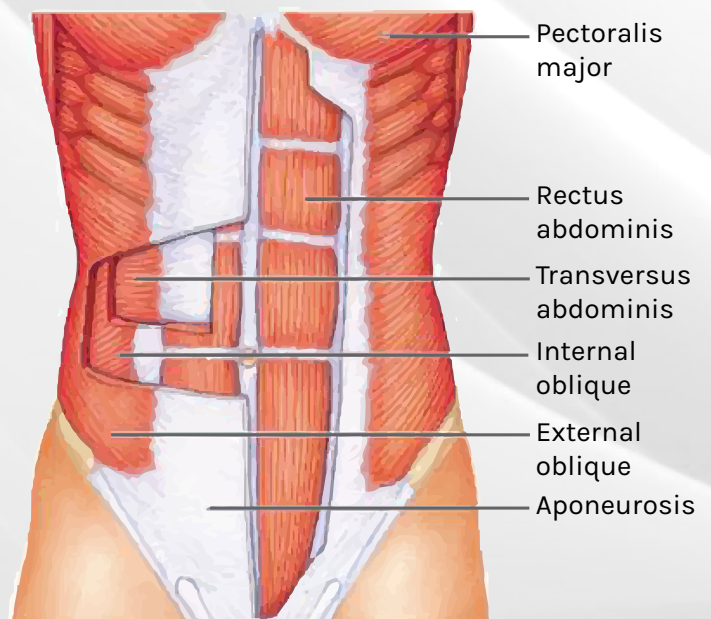
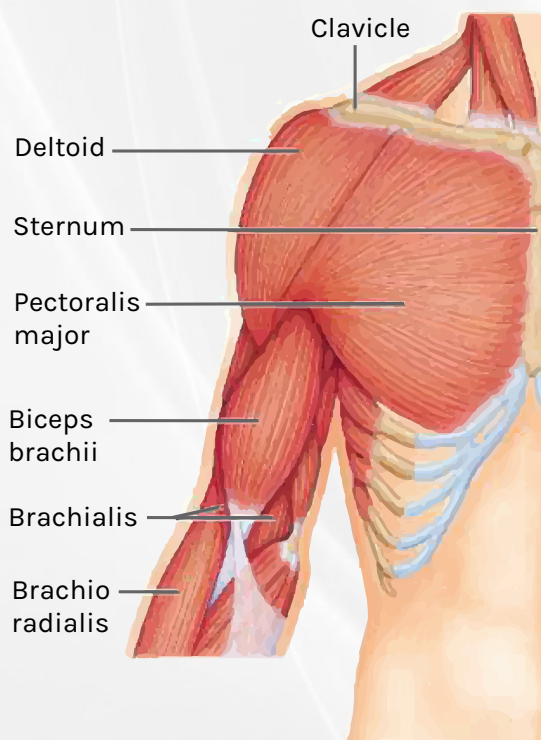
Muscle (SITS)	Action	To Strengthen	To Stretch
Supraspinatus	Abduction	Internally rotate shoulder and abduct arm	Adduct arm behind back with shoulder extended
Infraspinatus	External rotation	Exercises in which arms are pulled down	Internal rotation and horizontal adduction
Teres Minor	External rotation	Exercises in which arms are pulled down	Internal rotation and horizontal adduction
Subscapularis	Internal rotation	Internal rotation with arms beside the body against resistance	External rotation and horizontal adduction



Multi-Axial Ball and Socket: Hip, shoulder joint. This type of joint allows movement in all planes with wide range of rotation and movement.

9. MUSCLES OF THE TORSO - ANTERIOR VIEW

Muscle	Action	To Strengthen	To Stretch
Sternocleido-mastoid	Flex and rotate head, raise ribs	Flex head, rotate head	Extend head, rotate head
Pectoralis Major	Internal rotation of arm, horizontal adduction, and adduction	Push ups	Externally rotating shoulder with arm adducted behind back horizontal abduction of shoulder
Obliques (external, internal, transverse)	Rotate, flex and side bend trunk	Rotate trunk while flexing hips, knees flexed	Laterally flex the opposite side while rotating lumbar region
Rectus Abdominus	Flex trunk	Flex hip with knees flexed	Extend lumbar and thoracic spine, and extend hips to accentuate the rotation of the pelvis



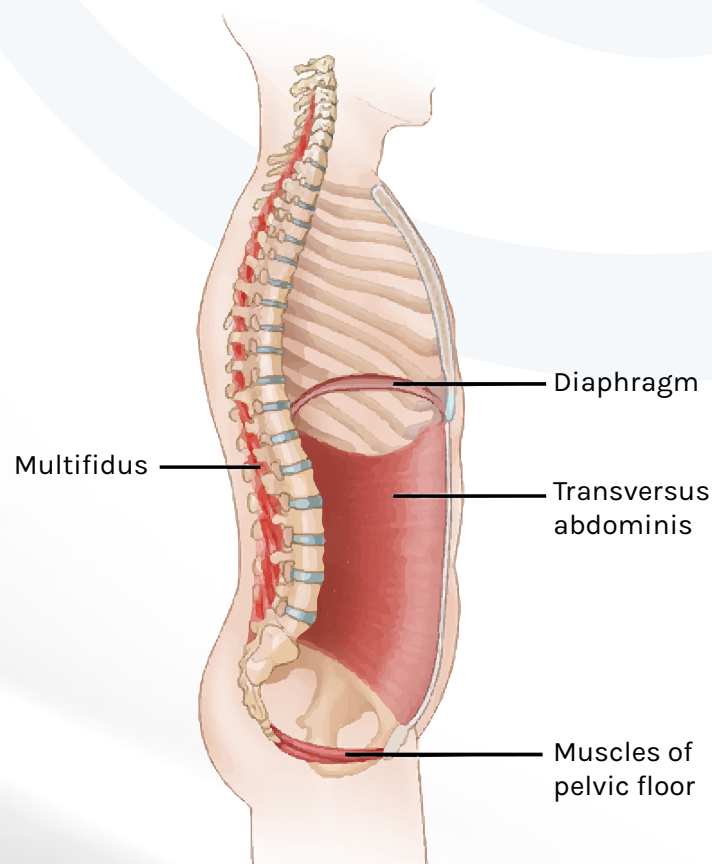
10. CORE MUSCLES

The inner core consists of the deep muscles that attach directly to every bone in the lumbar spine and deep into the pelvis. The inner core muscles are:

- The deepest abdominal muscle, the transverse abdominis
- The very deepest back muscle, the multifidus
- The pelvic floor muscles
- The diaphragm

The inner-core muscles work differently from bigger, more visible muscles - they need to work at low levels of activity for prolonged periods of time, so they require high levels of stamina and must become more active before other muscles move the body, so they need to be trained differently.

Teaching clients how to use their inner core is key to help them improve their performance and allow them to grow to the next level.



11.FOUR TYPES OF POSTURAL ALIGNMENTS

Correct Posture, Alignment and Exercise

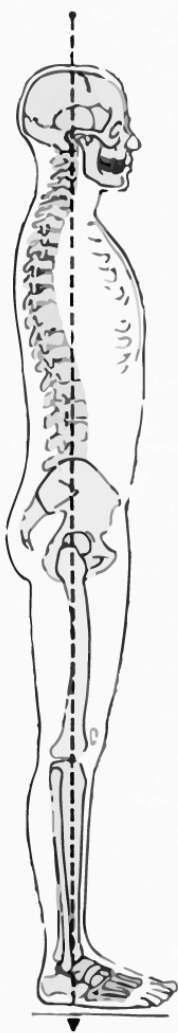
Experts predict that 80% of people will experience some type of back problem in their lifetime

Understanding posture is the first way to prevent back pain and avoid potential injuries. Although neutral posture is “ideal”, most of us have deviations in our postural alignment.

This is due to an imbalance of muscle use that forces our body more towards one side of the body than the other (i.e. Front, back, side to side, or rotation).

Before one can improve their posture they need to identify the type of posture they currently have.

Neutral Posture



Kyphosis/Lordosis



Flat back



Swayback

