


MUSCLES – Part 1

AXIAL MUSCLES


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Muscles Basics

- A muscle cannot reverse the movement it produces
 - Another muscle must undo the action
- Muscles with opposite actions lie on opposite sides of a joint


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Muscle Basics - Functional Groups

- **Prime mover (agonist)**
 - Has major responsibility for a certain movement
- **Antagonist**
 - Opposes or reverses a movement
- **Synergist** – helps the prime mover
 - By adding extra force
 - By reducing undesirable movements
- **Fixator**
 - A type of synergist that holds a bone firmly in place


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Naming the Skeletal Muscles

- **Location**
 - Example – the brachialis is located on the arm
- **Shape**
 - Example – the deltoid is triangular
- **Relative size**
 - Maximus, minimus, and longus indicate size
 - Example – gluteus maximus and gluteus minimus


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Naming the Skeletal Muscles

- **Direction of fascicles and muscle fibers**
 - Name tells direction in which fibers run
 - Example – rectus abdominis and transversus abdominis
- **Location of attachments** – name reveals point of origin and insertion
 - Example – brachioradialis

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Naming the Skeletal Muscles

- **Number of origins**
 - Two, three, or four origins
 - Indicated by the words biceps, triceps, and quadriceps
- **Action**
 - The action is part of the muscle's name
 - Indicates type of muscle movement
 - Flexor, extensor, adductor, or abductor

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Axial Muscles

- Lie anterior and posterior to the body axis
- Muscles of the
 - Thorax, abdomen, and pelvis
- Many muscles of the
 - Neck and some of the head
- They function to move the trunk and maintain posture

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Muscles of the Head – Facial Expression

- Muscles of facial expression
 - Lie in the face and scalp
 - Thin and variable in shape
 - Often insert in the skin – not on bones

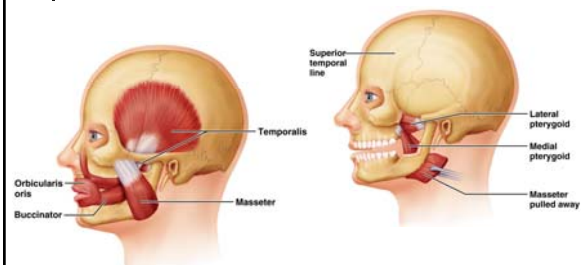
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Muscles Mastication

- Prime movers of jaw closure
 - Masseter and temporalis
- Side-to-side movement
 - Pterygoid muscles

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Muscles of Mastication



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Muscles of the the Neck

- Move the head
 - Flexion
 - Extension
 - Lateral Flexion
 - Rotation
- Anterior & Posterior muscles

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Muscles of the Neck (Anterior)

- **Sternocleidomastoid** – most prominent neck muscle
 - Origin – Sternum and clavicle
 - Insertion – Mastoid process
 - Action – Neck flexion, lateral flexion, and rotation

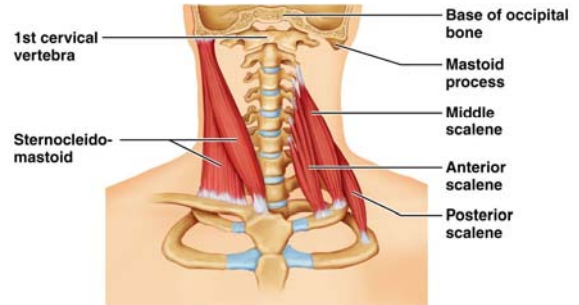
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Muscles of the Neck (Anterior)

- **Scalenes** – 3 divisions – Anterior, posterior and middle
 - Origin – Cervical vertebrae
 - Insertion – First two ribs
 - Action – Neck flexion, rotation, rib elevation

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Muscles of the Neck (Anterior)



Muscles of the Neck (posterior)

- **Trapezius** – 3 divisions – Upper (neck & scapula), middle & lower (Thorax & Scapula)
 - Origin – Occiput, Vertebral column (C1-T12)
 - Insertion – Scapula, clavicle
 - Action – Neck extension, movement of scapula

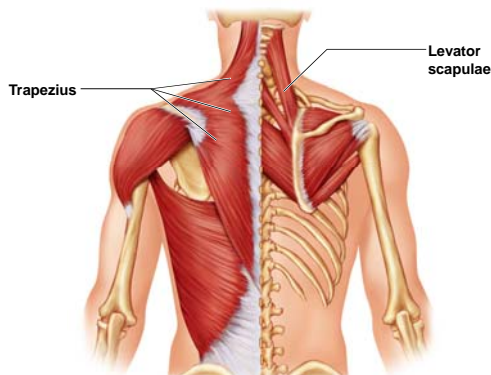
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Muscles of the Neck (posterior)

- **Levator scapulae**
 - Origin – Cervical vertebrae
 - Insertion – Scapula
 - Action – Elevates scapula, lateral flexion of neck to same side

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Muscles of the Neck (posterior)



Muscles of the Anterior Thorax

- They can fix the scapula in place or move it to increase the range of motion in the upper limb.
- Attach the shoulder girdle to the thorax.
- Move the upper limb.

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Muscles of the Anterior Thorax

- Pectoralis major
- Pectoralis minor
- Serratus anterior
- Subclavius

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Muscles of the Anterior Thorax

- **Pectoralis major** – crosses shoulder joint
 - Origin – Sternum, clavicle
 - Insertion – Greater tubercle of humerus
 - Action - Prime mover of arm flexion, internal (medial) rotation and ADduction of humerus.

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Muscles of the Anterior Thorax

- **Pectoralis minor**
 - Origin – Anterior surface of ribs
 - Insertion – Coracoid process of scapula
 - Action – Draws scapula forward and downward.

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Muscles of the Anterior Thorax

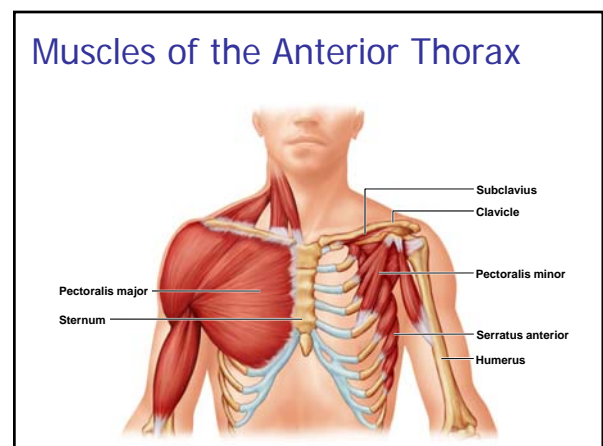
- **Serratus anterior**
 - Origin – Lateral surface of ribs
 - Insertion – Medial boarder of scapula
 - Action – Holds scapula against posterior thorax.

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Muscles of the Anterior Thorax

- **Subclavius**
 - Origin – First rib
 - Insertion – Clavicle
 - Action – Stabilize & depress pectoral girdle.

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Muscles of the Posterior Thorax

- They can fix the scapula in place or move it to increase the range of motion in the upper limb.
- Attach the shoulder girdle to the thorax.
- Move the upper limb.

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Muscles of the Posterior Thorax

- Trapezius
- Levator scapulae
- Rhomboids
- Latissimus dorsi

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Muscles of the Posterior Thorax

- **Trapezius** – 3 divisions – Upper (neck & scapula), middle & lower (Thorax & Scapula)
 - Origin – Occiput, Vertebral column (C1-T12)
 - Insertion – Scapula, clavicle
 - Action – Neck extension, movement of scapula

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Muscles of the Posterior Thorax

- **Levator scapulae**
 - Origin – Cervical vertebrae
 - Insertion – Scapula
 - Action – Elevates scapula, lateral flexion of neck to same side

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Muscles of the Posterior Thorax

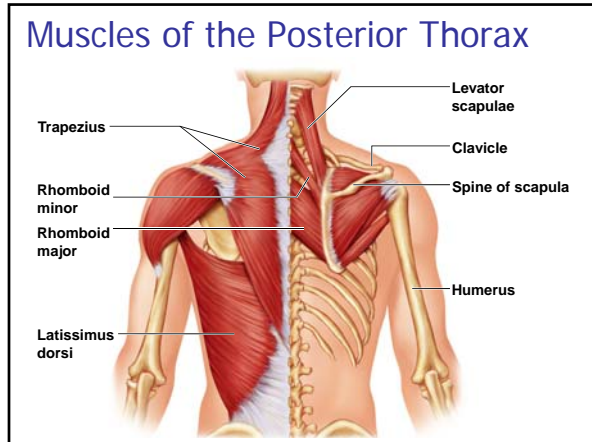
- **Rhomboids** – Major & Minor
 - Origin – Thoracic vertebrae between scapulae
 - Insertion – Medial boarder of scapula
 - Action – Stabilize, retract and rotate scapula

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Muscles of the Posterior Thorax

- **Latissimus Dorsi** – Crosses shoulder
 - Origin – Lower ribs, lumbar vertebrae, iliac crest (all via Thoracolumbar fascia)
 - Insertion – Humerus
 - Action – Extension, ADduction and internal (medial) rotation of humerus

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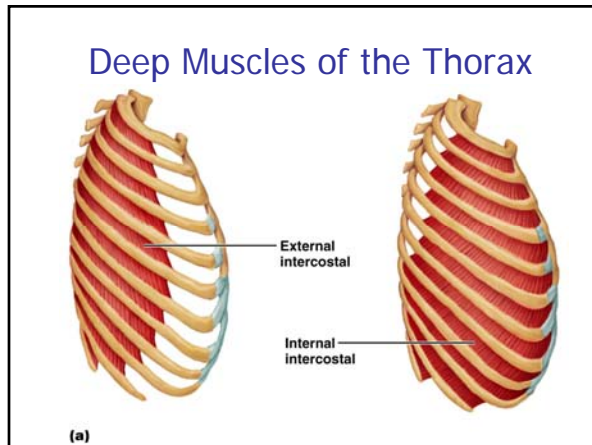


Deep Muscles of the Thorax

Provide movements for breathing

- External intercostal muscles
 - Lift the ribcage
- Internal intercostal muscles
 - Aid expiration during heavy breathing

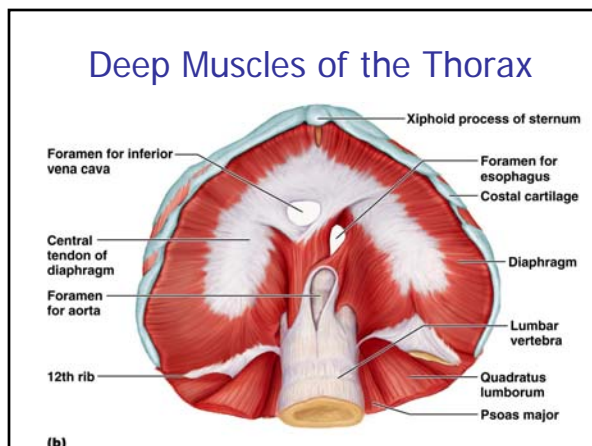
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Deep Muscles of the Thorax

- Diaphragm
 - Most important muscle of respiration
 - Flattens as it contracts
 - Increases the volume of the thoracic cavity

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Muscles of the Back

- Trunk extension
 - Deep muscles of the back
 - Maintain normal curvatures of the spine
 - Form a column from sacrum to the skull
 - Erector spinae group
 - Largest of the deep back muscles

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Muscles of the Back

- Erector spinae – 3 main divisions – each division is subdivided
- Semispinalis – 3 divisions
- Quadratus lumborum

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Muscles of the Back

- **Erector Spinae** – 3 divisions
 - Iliocostalis
 - Longissimus
 - Spinalis

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Muscles of the Back

- **Erector Spinae** – 3 divisions
 - Origin – Lumbar, thoracic and cervical vertebrae and iliac crest
 - Insertion – Lumbar, thoracic and cervical vertebrae and ribs
 - Action – Extension and lateral flexion of vertebral column

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Muscles of the Back

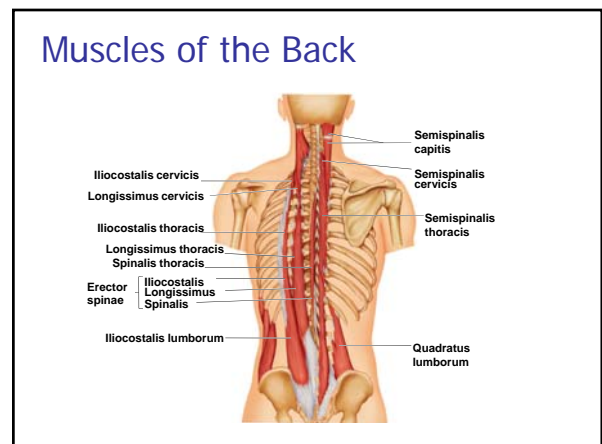
- **Semispinalis** – 3 divisions
 - Origin – Thoracic vertebrae
 - Insertion – Occiput – T4
 - Action – Extends vertebral column and head and rotates them to opposite side

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Muscles of the Back

- **Quadratus lumborum**
 - Origin – Iliac crest
 - Insertion – Upper lumbar and 12th rib
 - Action – Extension and lateral flexion of lumbar spine

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Muscles of the Abdominal Wall

- Lateral and anterior abdominal wall
 - Formed from three flat muscle sheets
 - External oblique
 - Internal oblique
 - Transversus abdominis
 - Fourth muscle pair
 - Rectus abdominis
 - Inserts at the linea alba

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Muscles of the Abdominal Wall

- **External oblique**
 - Origin – Lower eight ribs
 - Insertion – Linea alba, iliac crest
 - Action – Flex vertebral column & compress abdominal wall.

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Muscles of the Abdominal Wall

- **Internal oblique**
 - Origin – Lumbar fascia, iliac crest
 - Insertion – Linea alba, lower ribs
 - Action – Flex vertebral column & compress abdominal wall.

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Muscles of the Abdominal Wall

- **Transversus abdominis**
 - Origin – Lumbar fascia, iliac crest, last six ribs
 - Insertion – Linea alba
 - Action – Compress abdominal wall.

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Muscles of the Abdominal Wall

- **Rectus abdominis**
 - Origin – Pubic symphysis
 - Insertion – Xiphoid process & costal cartilage
 - Action – Flex and rotate lumbar spine

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