Head, neck, Shoulder, & Back Muscles

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Muscles of the Head and Neck

- **Scalp Muscle: epicranius**
  - frontal belly
  - occipital belly
  - gala aponeurotica

- **Muscles of Facial Expression: insert on skin or another muscle**
  - Action: expression of the face

- **Muscles of Mastication (chewing muscles): all have insertions on the mandible**

- **Tongue muscles**

- **Anterior Neck Muscles**

- **Posterior Neck Muscles**
Diagram of facial muscles:

- Epicranial aponeurosis
- Frontal belly of occipitofrontalis
- Procerus
- Orbicularis oculi
- Nasalis
- Levator labii superioris
- Zygomaticus minor
- Levator anguli oris
- Zygomaticus major
- Orbicularis oris
- Mentalis (cut)
- Depressor labii inferioris
- Depressor anguli oris
- Platysma (cut and reflected)
- Temporoparietalis (cut and reflected)
- Temporalis
- Occipital belly of occipitofrontalis
- Masseter
- Buccinator
- Sternocleidomastoid
- Omohyoid

(a) Lateral view
Mastication:
- Jaw closure: masseter and temporalis
- Side to side grinding: Lateral and medial pterygoids
- Buccinator: compresses cheek
Deep Muscles of mastication and deglutition

Pharyngeal constrictors
Extrinsic tongue muscles

“glossus” = tongue
Muscles of the Anterior Neck

Suprahyoid: form floor of oral cavity, anchor tongue, elevate hyoid, move larynx superiorly during swallowing

Infrahyoid: Depress hyoid and larynx during swallowing and speaking
Neck muscles

Antero-lateral neck
Scalenes elevate first 2 ribs

Posterior neck
Splenius’ (capitis and cervicis) extend head
Muscles of Neck innervations

- Trapezius and sternocleidomastoid (SCM) are both innervated by *spinal accessory nerve* (*CN XI*).
- Suboccipitals are innervated by *suboccipital nerve*.
- Scalenes, prevertebrals, and splenius capitis/cervicis are innervated by *cervical spinal nerves*.
- Platysma is involved with facial expression are innervated by the *facial nerve* (*CN VII*).
- Infrahyoids innervated by *cervical nerves*.
- Suprahyoids innervated by *cranial nerves*. 
Muscles of the back
**Trapezius**

**O:** EOP, Superior Nuchal Line, Nuchal ligament, and the SP of C7 through T12

**I:** Upper Traps: Lateral 1/3 of clavicle & Acromion
   Middle Traps: Spine of scapula and acromion
   Lower Traps: Root of the Spine of the scapula

**A:** Upper Traps: Elevates, upwardly rotates, and retracts the scapula
   Middle Traps: Retracts the scapula
   Lower Traps: Depresses, upwardly rotates, and retracts the scapula

**Reversed muscle action:** Bilaterally allows for extension of the neck. Unilaterally laterally flexes the neck to the same side and rotates to the opposite side.

**N:** CN XI (Spinal accessory nerve) and posterior rami of C3 and C4
**Splenius Capitis**

**O:** Nuchal ligament and the SP’s of C7-T4

**I:** Mastoid process and the occiput

**A:** Bilateral contraction: Extension of the neck

Unilateral contraction: Lateral flexion and Ipsilateral rotation of the neck

**N:** posterior rami of the cervical spinal nerves
**Splenius Cervicis**

O: SP’s of T4 – T6

I: TP’s of C1 – C3

A: Bilateral contraction: Extension of the neck

Unilateral contraction: Lateral flexion and Ipsilateral rotation of the neck

N: posterior rami of the cervical spinal nerves
Levator Scapulae

O: TP’s of C1 – C4
I: Medial border of the scapula, from the superior angle to the root of the spine of the scapula

A: Elevates retracts, and Downwardly, rotates scapula. Bilaterally allows for extension of the neck. Unilaterally laterally flexes the neck to the same side and rotates the to the same side.

N: Dorsal Scapular nerve
RHOMBOIDS

Description:
parallel bands forming oblique parallelograms. The rhomboid major is twice wider than the rhomboid minor.

Origin:
- minor: ligamentous ruchae and spinous process of vertebrae
- major: spinous process of vertebrae

Insertion:
medial border of scapula from level of spine to inferior angle

Function:
- retraction of the scapula
- rotation of the scapula as to depress its glenoid cavity

Modelization:
two parallel vectors from vertebrae to medial border of scapula

Notes:
Muscles of the Posterior Neck – Deep (Suboccipitals)

- Suboccipitals are found deep to trap, SCM, splenius capitis, and semispinalis capitis.
- Suboccipitals are more important as postural muscles, providing fine control of head posture, than movers.
  - Rectus Capitis Posterior Major:
  - Rectus Capitis Posterior Minor:
  - Obliquus Capitis Inferior:
  - Obliquus Capitis Superior
**Rectus Capitis Posterior Major**

**O:** SP of the Axis (C2)

**I:** Occiput (lateral aspect)

**A:** Bilateral contraction:

- Extension of Head

Unilateral contraction:

- Lateral flexion and Ipsilateral rotation of neck

**N:** Suboccipital nerve
Rectus Capitis Posterior Minor

O: Posterior tubercle of the Atlas (C1)

I: Occiput

A: Bilateral contraction will cause Extension of Head

N: Suboccipital nerve
Obliquus Capitis Inferior

O: SP of the Axis (C2)

I: TP of the Atlas (C1)

A: Ipsilateral Rotation of Atlas

N: Suboccipital nerve
Obliquus Capitis Superior

O: TP of the Atlas (C1)

I: Occiput (between the superior and inferior nuchal lines)

A: Bilateral Contraction:
   Extension of Head

   Unilateral Contraction: Lateral flexion of the head.

N: Suboccipital nerve
Muscles Crossing the Shoulder

- Nine muscles cross the shoulder joint and insert into the humerus
- Prime movers include:
  - Pectoralis major – arm flexion
  - Latissimus dorsi and posterior fibers of the deltoid – arm extension
  - Middle fibers of the deltoid – arm abduction
PECTORALIS MAJOR

Description:
- large, thick, fan-shaped muscle covering the superior part of the thorax.

Two parts:
- clavicular head
- sternocostal head

Origin:
- anterior surface of the medial half of clavicle
- anterior surface of sternum and costal cartilages of the upper seven ribs

Insertion:
- intertubercular groove of the humerus

Function:
- flexion of the humerus (clavicular head)
- adduction and medial rotation of the humerus (sternocostal head)

Modelization:
- two vectors from clavicle and sternum to intertubercular groove of humerus

Notes:
Anterior thoracic Muscles
DO Not Crossing the Shoulder

PECTORALIS MINOR

Description:
lies in the anterior wall of
the axilla, and is covered by
the pectoralis major

Origin:
the 3rd to 5th ribs near
their costal cartilages

Insertion:
medial border and superior
surface of coracoid process
of scapula

Function:
- inferior drawing of scapula
- anterior drawing of scapula

Modelization:
one vector from the
coracoid process to the 4th
rib near costal cartilage

Notes:
Deltoid muscle

The deltoid
Right shoulder joint.

DELTOIDEUS

Description:
Thick and powerful triangular muscle covering the shoulder joint

Three parts:
- anterior head
- lateral head
- posterior head

Origin:
- the lateral third of the clavicle (anterior head)
- the lateral margin of the acromion of the scapula (lateral head)
- the spine of the scapula (posterior head)

Insertion:
- deltoid tuberosity of the humerus

Function:
- flexion of the humerus (anterior head)
- abduction of the humerus (lateral head)
- extension of the humerus (posterior head)

Modelization:
three paths for the three heads:
- one curved path for the lateral head
- two vectors for the anterior and posterior heads

Notes: posterior fibers of the deltoid – arm extension
Middle fibers of the deltoid – arm abduction
More Muscles Crossing the Shoulder

- Rotator cuff muscles – supraspinatus, infraspinatus, teres minor, and subscapularis
  - Function mainly to reinforce the capsule of the shoulder
  - Secondarily act as synergists and fixators
- The coracobrachialis and teres major:
  - Act as synergists
  - Do not contribute to reinforcement of the shoulder joint
Rotator calf muscles
**SUPRASPINATUS**

**Description:** rounded, conical muscle, lying in the supraspinous fossa of the scapula

**Origin:** supraspinous fossa of scapula

**Insertion:** superior facet on greater tubercle of humerus

**Function:**
- acts with rotator cuff muscles
- helps deltoid to abduct arm

**Muscularization:** one vector between humeral head and superior part of spine of scapula

**Notes:**

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**INFRASPINATUS**

**Description:** triangular muscle occupying most of the infraspinous fossa of the scapula

**Origin:** the infraspinous fossa of the scapula

**Insertion:** middle facet on greater tubercle of humerus

**Function:** laterally rotate arm

**Muscularization:** one vector between the scapula and the humeral head

**Notes:**
**Teres Minor Muscle**

**TERES MINOR**

**Description:**
elongated, tapering muscle lying along the inferior border of the infraspinatus

**Origin:**
superior part of lateral border of scapula

**Insertion:**
interior facet on greater tubercle of humerus

**Function:**
lateral rotation and adduction of the humerus

**Modelization:**
one vector between the humeral head and the lateral border of scapula

**Notes:**
Sub-scapularis Muscle

Origin
Medial two thirds of the subscapular fossa of scapula
Lower two thirds of lateral border of scapula

Insertion
Lesser tubercle of humerus
Anterior part of joint capsule of shoulder

Nerve Supply
Upper subscapular nerve (C5, C6)
Lower subscapular nerve (C5, C6)

Actions
Medial rotation of humerus
Extension when shoulder fully abducted/flexed
Stabilisation and protection of the shoulder joint
**Teres major**

**TERES MAJOR**

**Description:**
flattened rectangular muscle lying below the infra- and teres minor muscles

**Origin:**
dorsal surface of inferior border of scapula

**Insertion:**
medial lip of the intertubercular groove of humerus

**Function:**
- adduction of the arm
- medial rotation of the arm

**Modelization:**
one vector between the dorsal border of the scapula and the frontal side of the humerus

**Notes:**
Coraco-brachialis

**Description:**
elongated, narrow muscle lying along the superior-medial part of the arm

**Origin:**
the coracoid process of the scapula

**Insertion:**
the middle part of medial border of humerus

**Function:**
- flexion of the humerus
- adduction of the arm

**Modelization:**
one vector between the humerus and the coracoid process of the scapula

**Notes:**
SERRATUS ANTERIOR

**Description:**
- large foliate muscle
- overlying the lateral portion of the thorax and rib cage

**Origin:**
- the eight upper frontal ribs

**Insertion:**
- anterior surface of medial border of scapula

**Function:**
- protraction of scapula
- rotation of scapula

**Modelization:**
- two curved paths as upper and lower fibers around the thorax and rib cage to the medial border of scapula

**Notes:**
Latissimus dorsi

**LATISSIMUS DORSI**

**Description:** broad, triangular muscle covering the inferior half of the back

**Origin:**
- the lower six thoracic and lumbar vertebrae
- the spine of the sacrum and posterior part of the iliac crest
- the outer surface of the lower four ribs

**Insertion:** bottom of the intertubercular groove of the humerus

**Function:**
- medial rotation of the arm
- extension of the humerus
- adduction of the humerus

**Modellization:** three half-curved paths between the humerus, and the lower thoracic vertebrae, the spine of the sacrum and the lower ribs

**Notes:**
The prime mover of back extension is the erector spinae. Erector spinae, or sacrospinalis, muscles consist of three columns on each side of the vertebrae – iliocostalis, longissimus, and spinalis. Lateral bending of the back is accomplished by unilateral contraction of these muscles. Other deep back extensors include the semispinalis muscles and the quadratus lumborum.
Deep muscles of back

Erector spinae (extend back):
- Iliocostalis
- Longissimus
- Spinalis

Quadratus lumborum (lateral flexion)

Labeled cervicis, thoracics, lumborum depending on where they are

Right side: deeper