

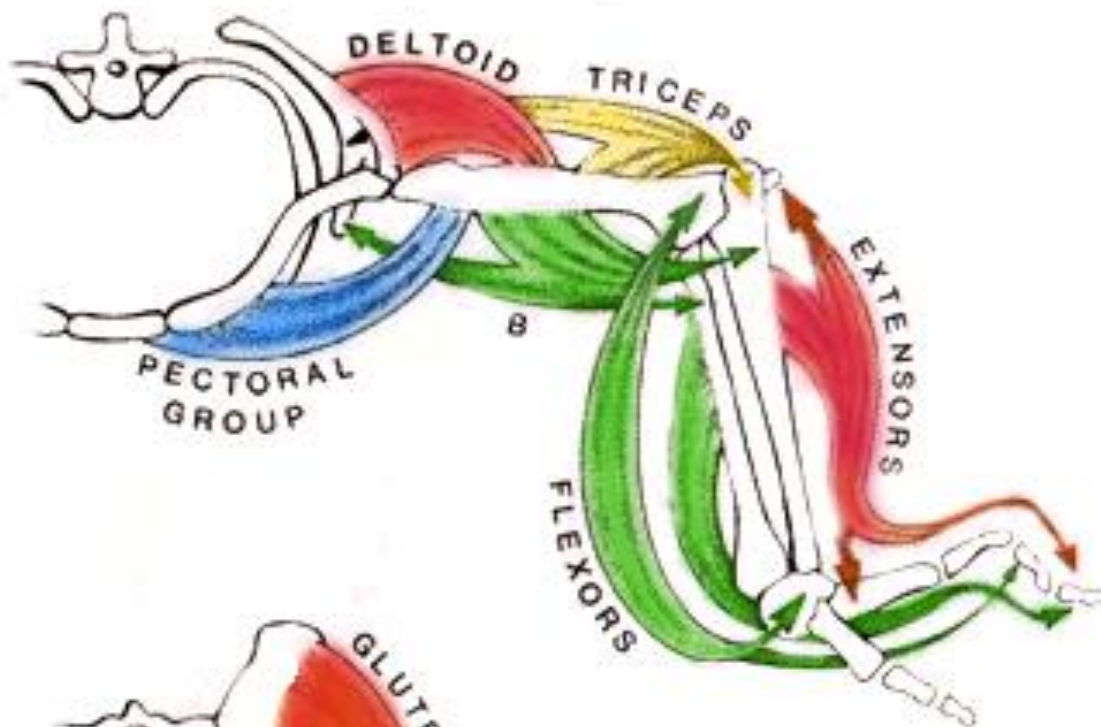
Biology 323

Human Anatomy for Biology Majors

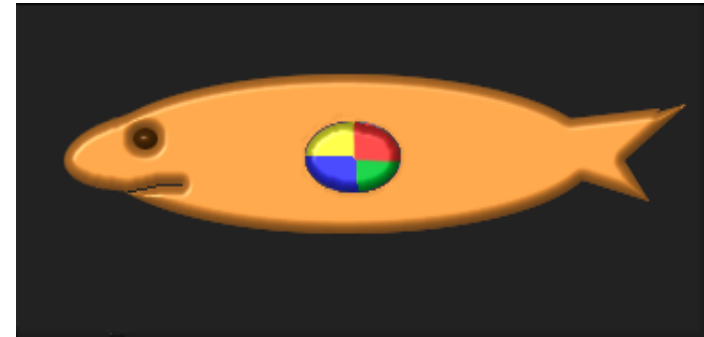
Lecture 8

Dr. Stuart S. Sumida

Musculature and Innervation of Pectoral Limb

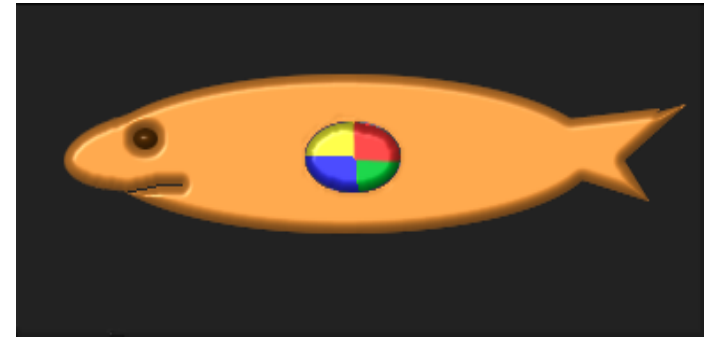
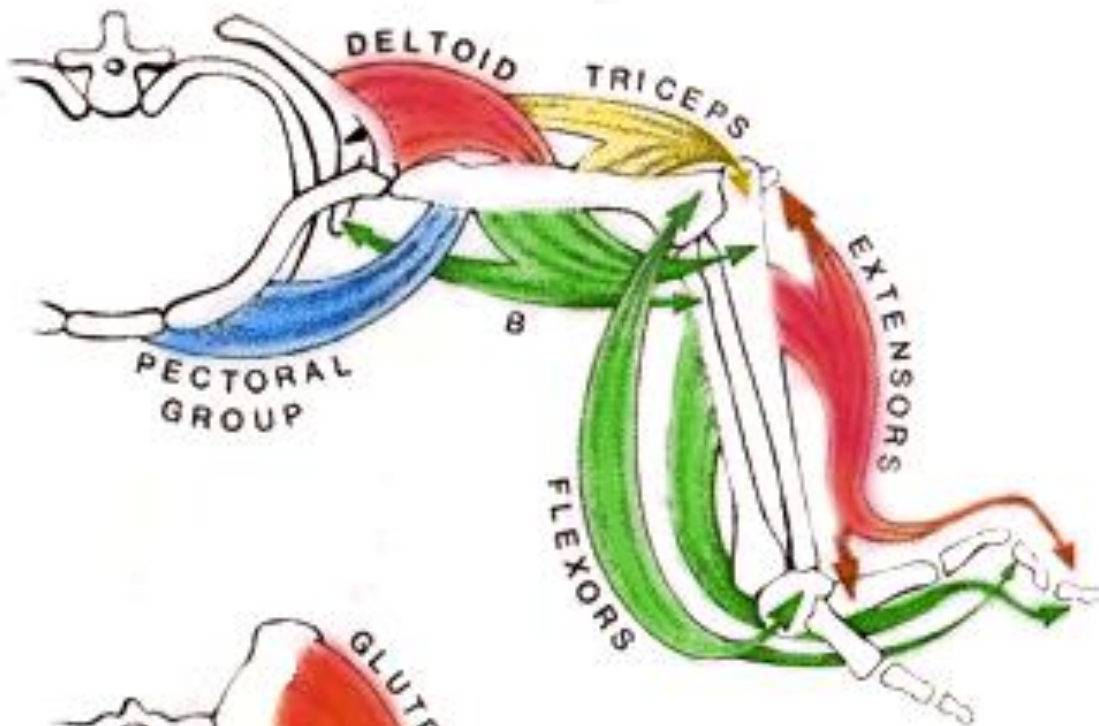


Cranial/dorsal



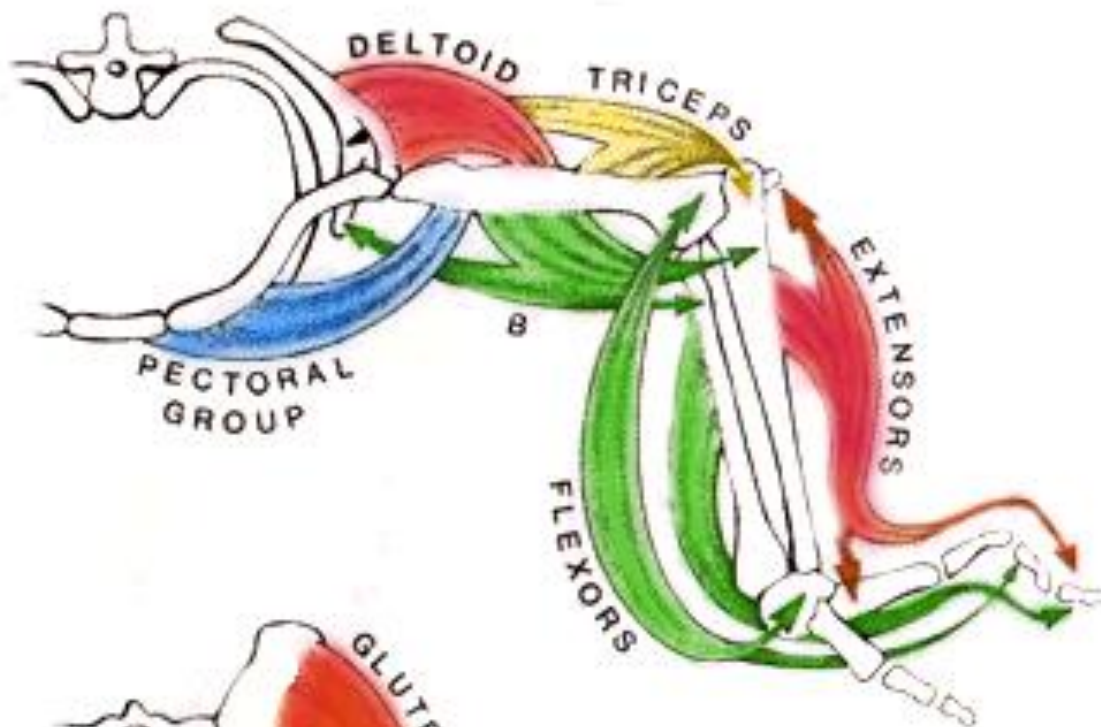
Triceps =
Quadriceps

Cranial/ventral

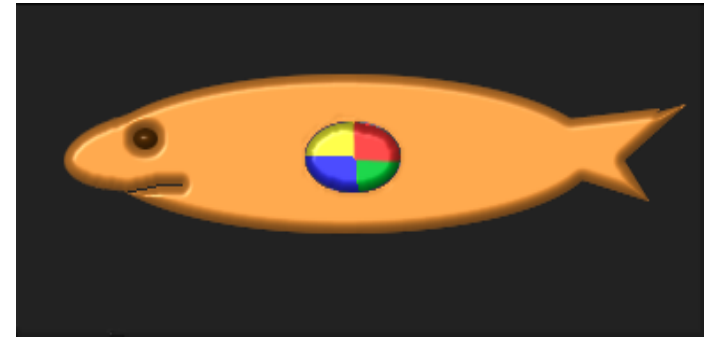


Pectoral
Group =
Adductors



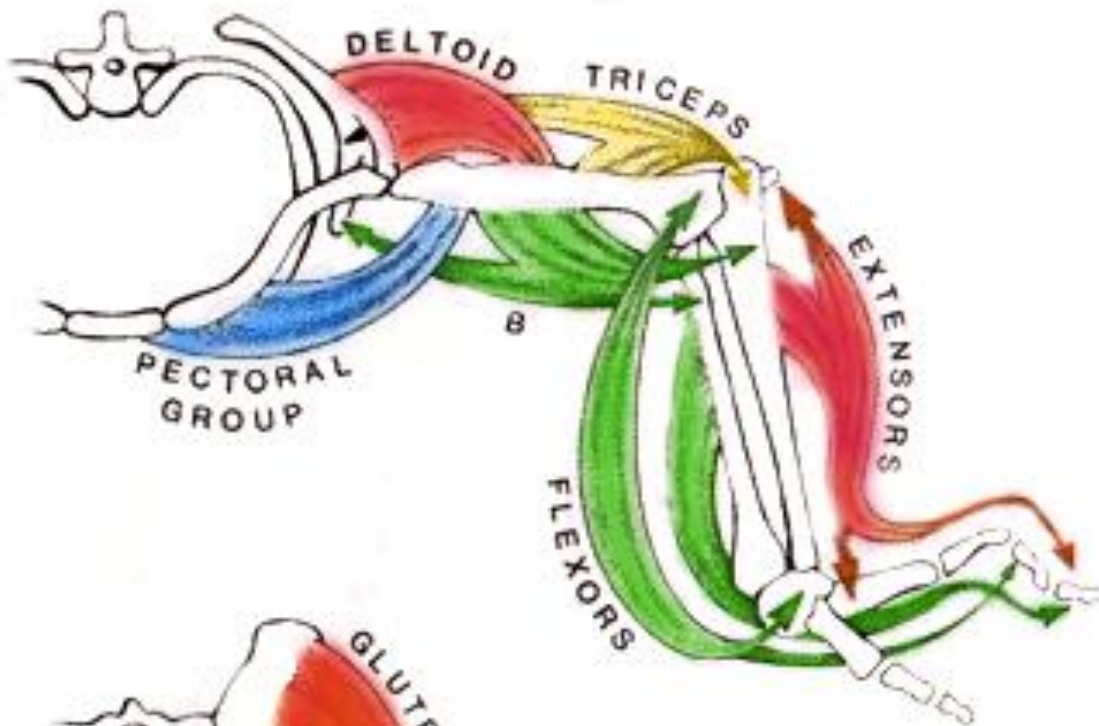


Caudal/dorsal

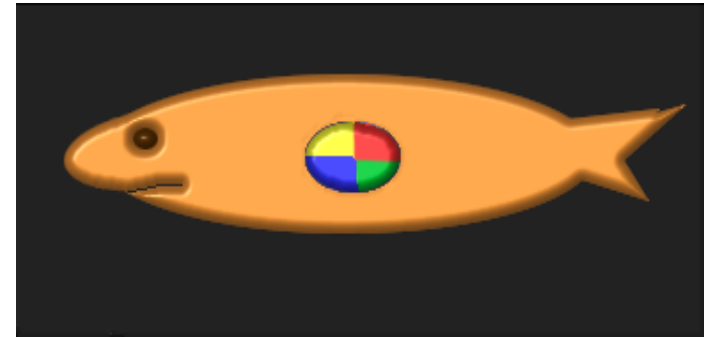


**Glutei =
Deltoid**

**Extensors =
Extensors**



Caudal/ventral



**Hamstrings =
brachii**



**Flexors =
Flexors**

Upper Limb Complications

1.

**Upper limb is not as
firmly attached, so has
extra muscles to hold
it in place**

2.

**There are several
large, fan shaped
muscles that do not
exist in the lower limb**

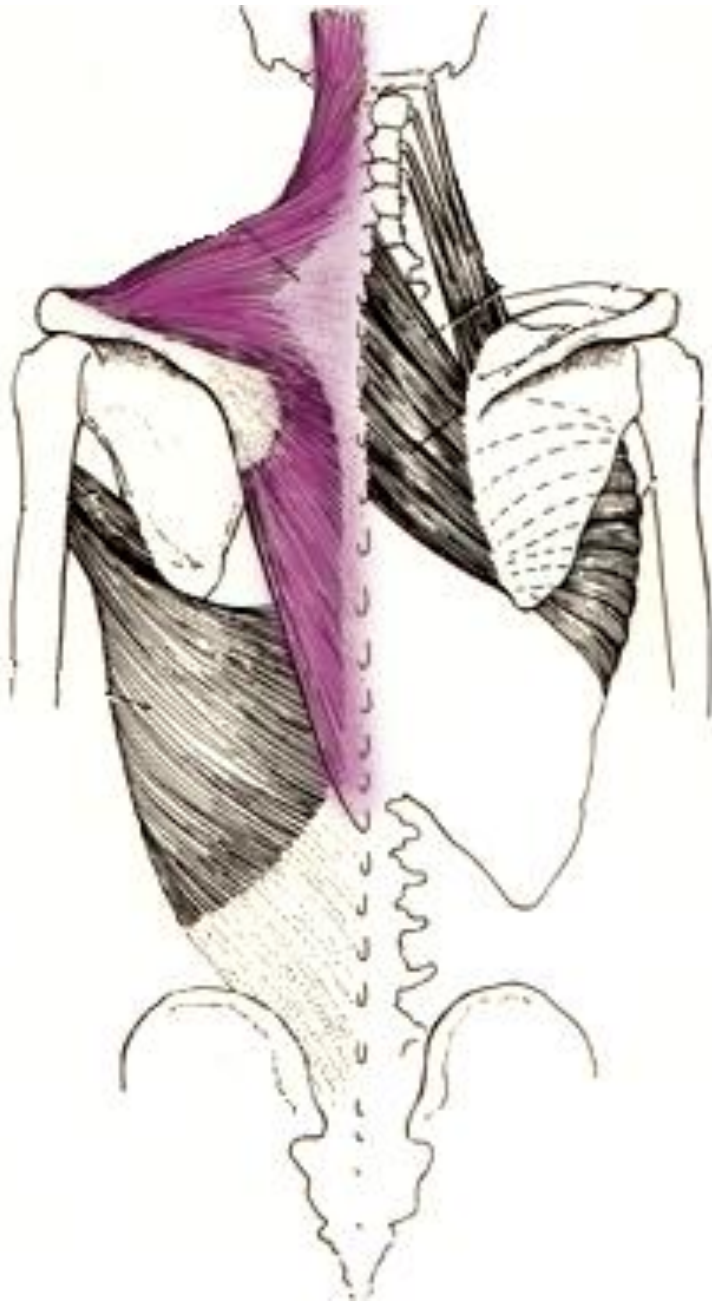
3

**There is more
migration of tissues
during early
development, making
the 4 quadrants more
complex**

4.

**There is a large
muscle that was not
originally
appendicular, so it has
an unusual innervation
and placement**

**Branchial (Gill Slit)
Muscles
Attaching
Scapula to Body
Wall**



Trapezius

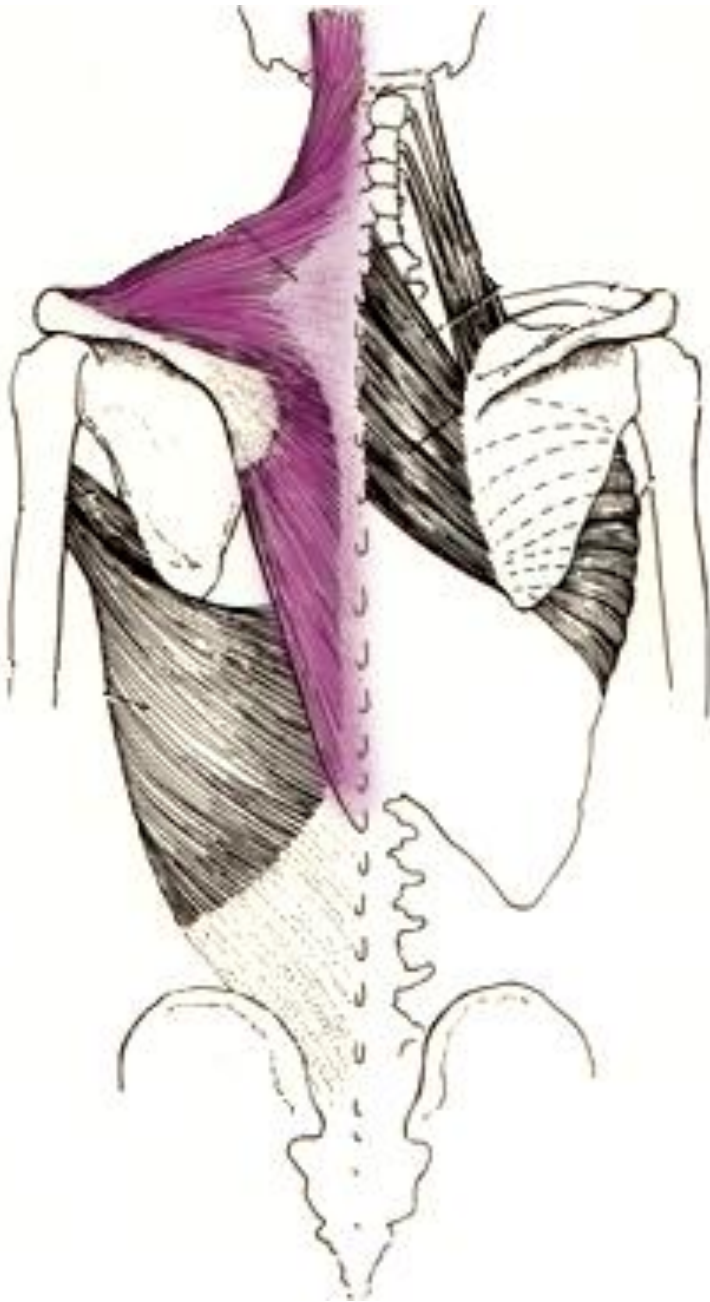
In more primitive species used for opening and closing gills - a BRANCHIAL muscle.

In humans, used to move scapula and keep head up

Trapezius

Origin:
Occipital bone,
Spines of C7 and
T1-12

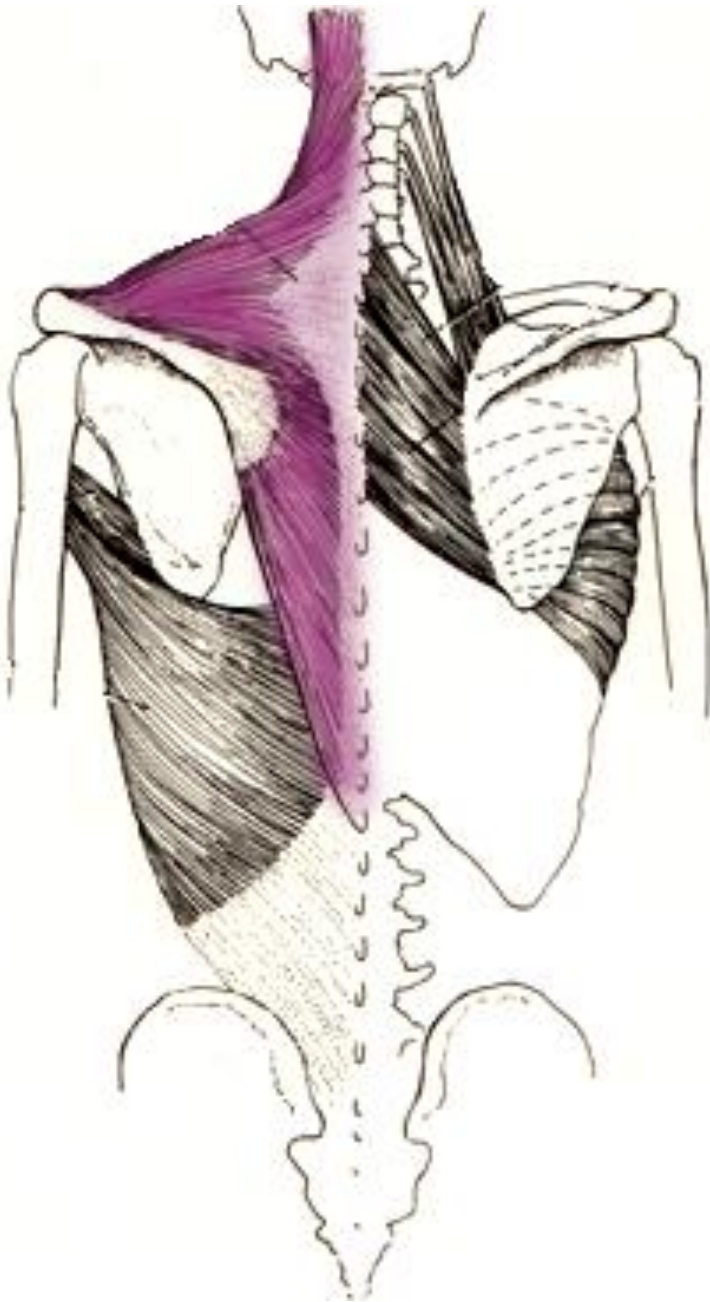
Insertion:
Acromion
Spine of scapula
Lateral 1/3 of
clavicle



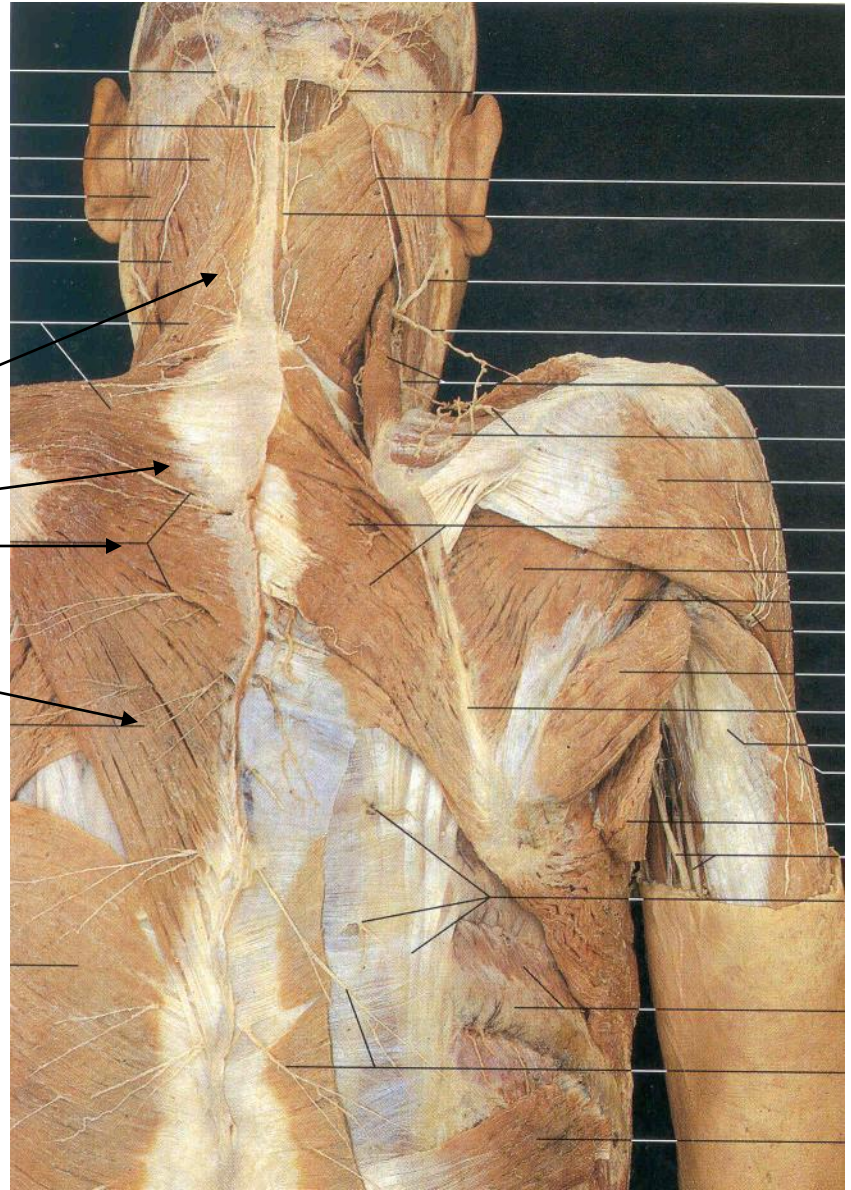
Trapezius

Innervation:
Accessory Nerve
(Cranial Nerve XI)

Action:
Extension of the
head
Elevation and
depression of
scapula

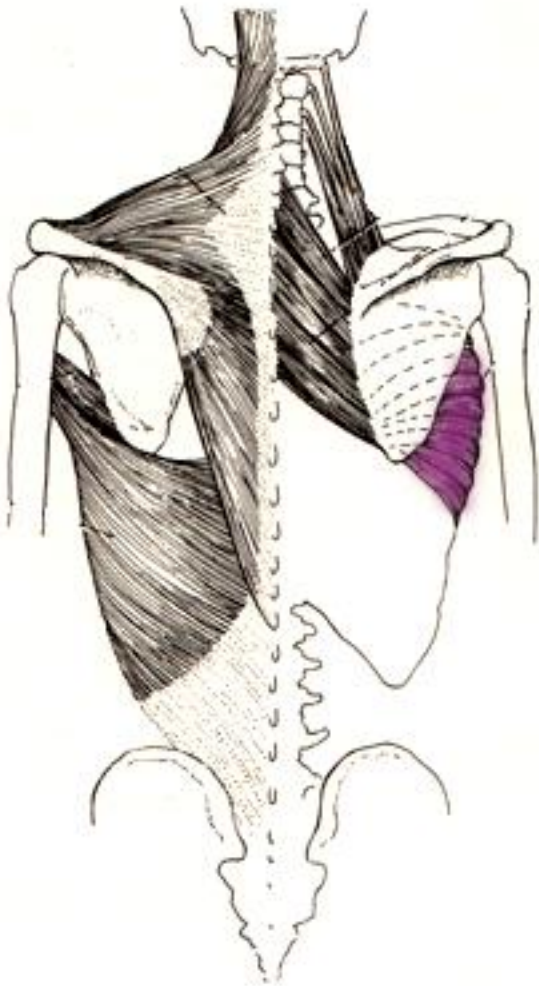


Trapezius



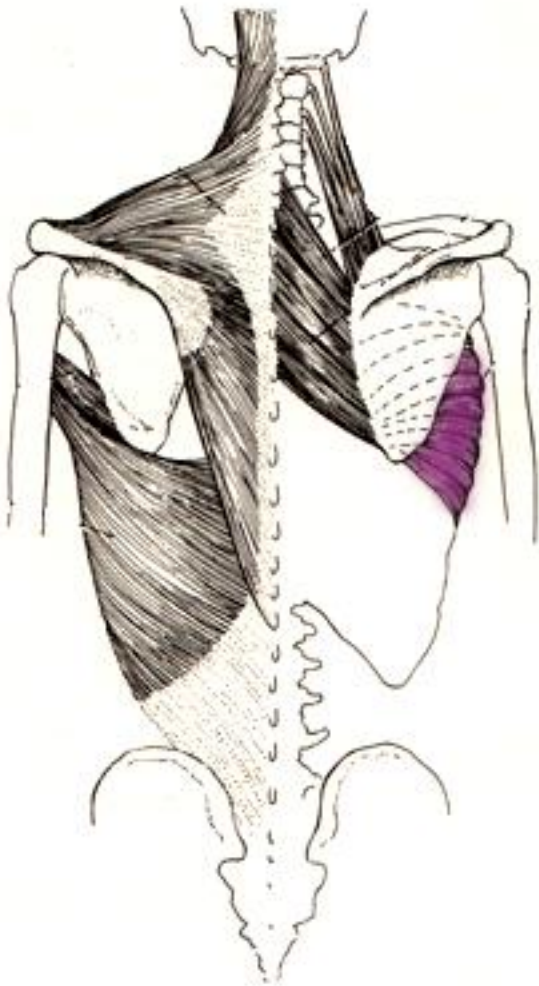
Axial Muscles Attaching Scapula to Body Wall

Serratus Anterior



Origin:
First 9 ribs

Insertion:
**Medial edge of
scapula's deep
surface**



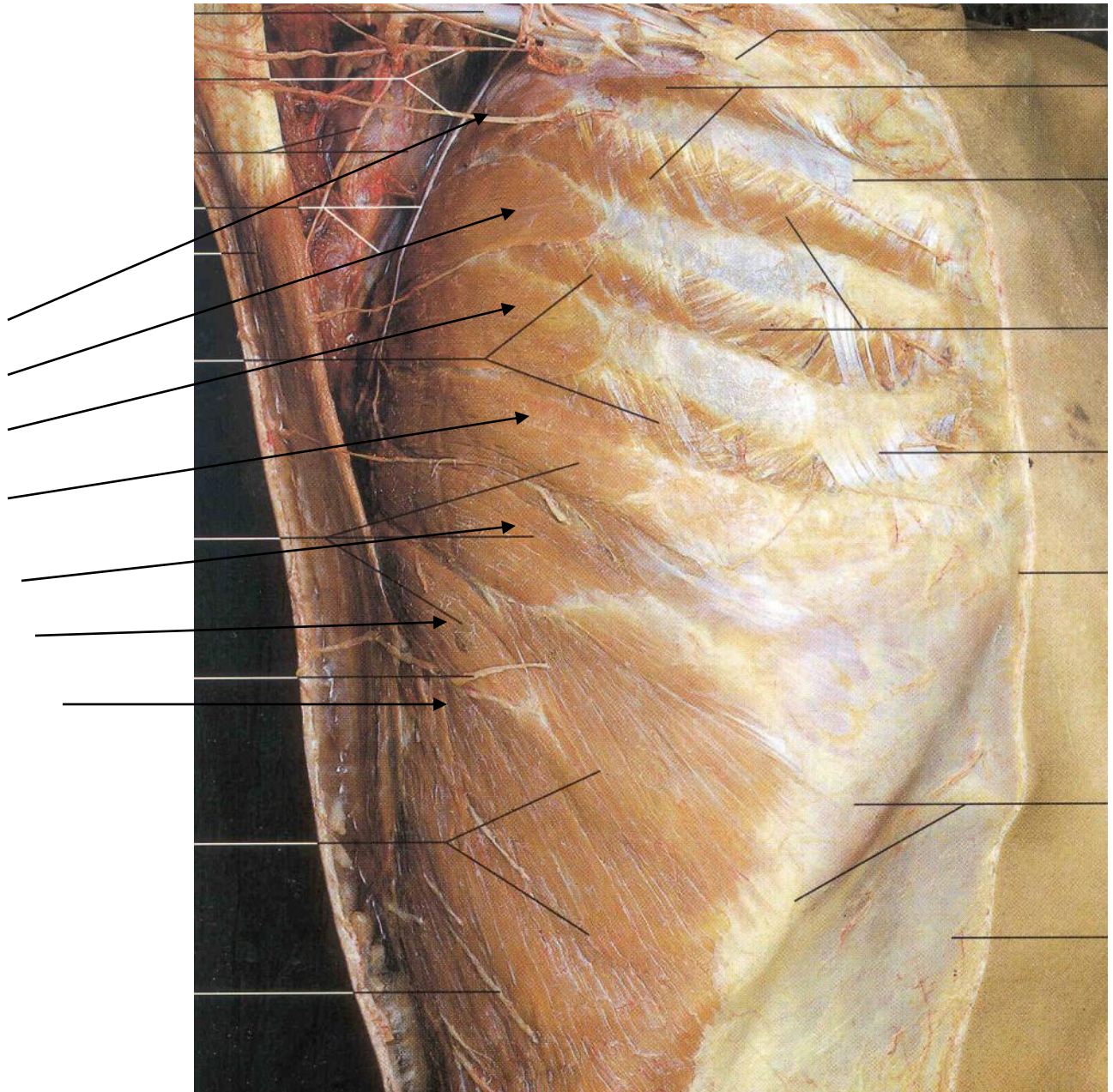
Serratus Anterior

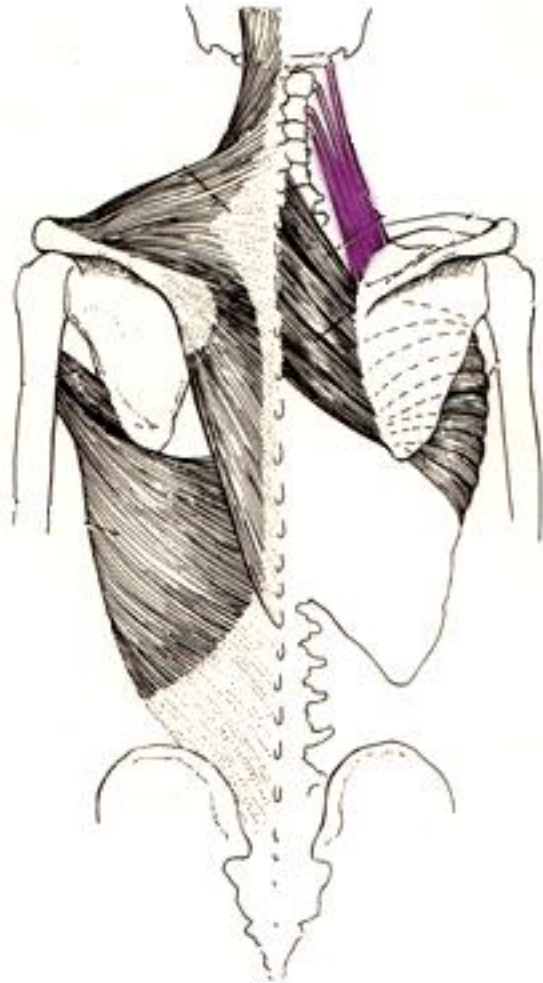
**Innervation:
Long thoracic nerve**

**Action:
Rotates scapula**

**Primitively a BODY
WALL MUSCLE**

Serratus Anterior



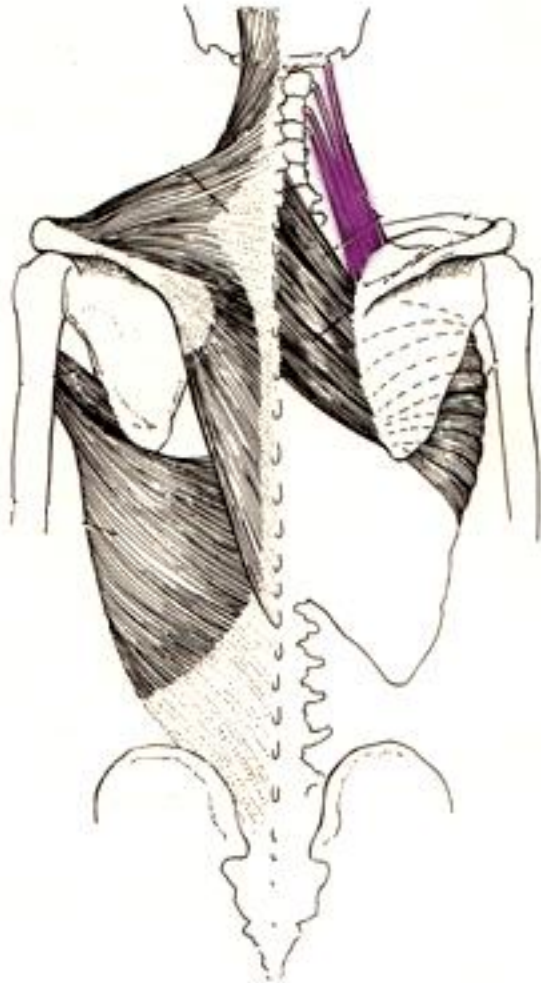


Levator Scapulae

**Origin:
Transverse
processes of C1-4**

**Insertion:
Medial edge of
scapula**

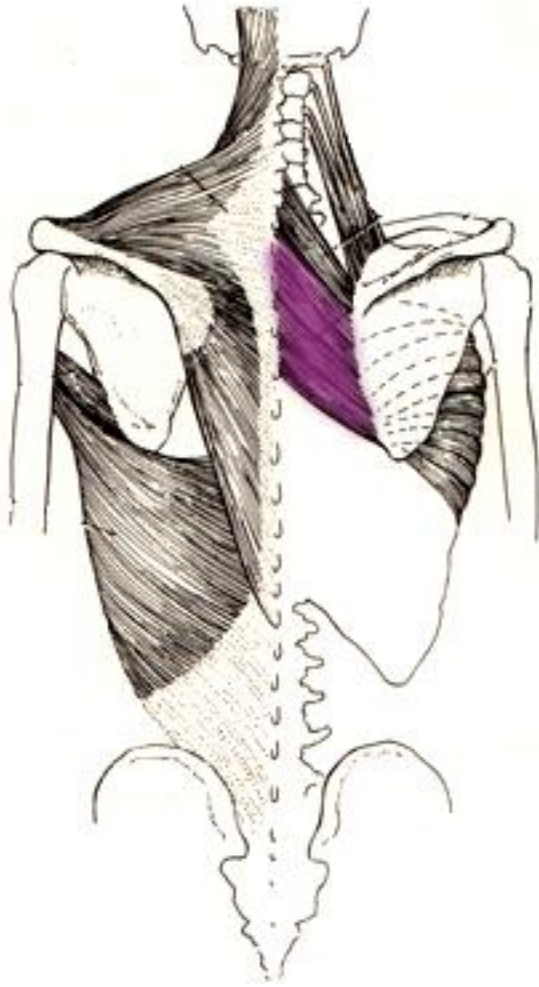
Levator Scapulae



Innervation:
Ventral Rami of C3
and C4

Action:
Retracts scapula
Depresses glenoid

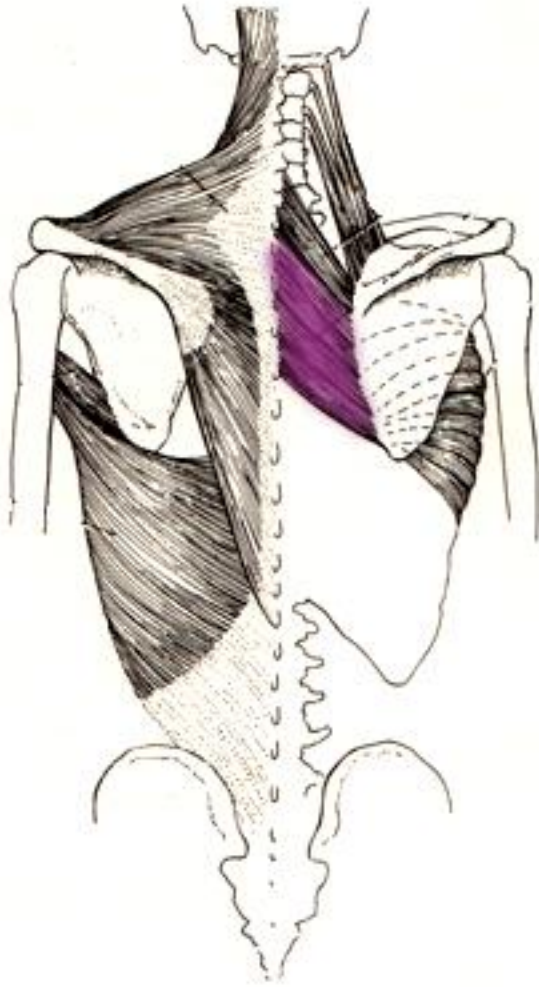
Rhomboidius Major



Origin:
Spines of T2-T5

Insertion:
**Medial edge of
scapula**

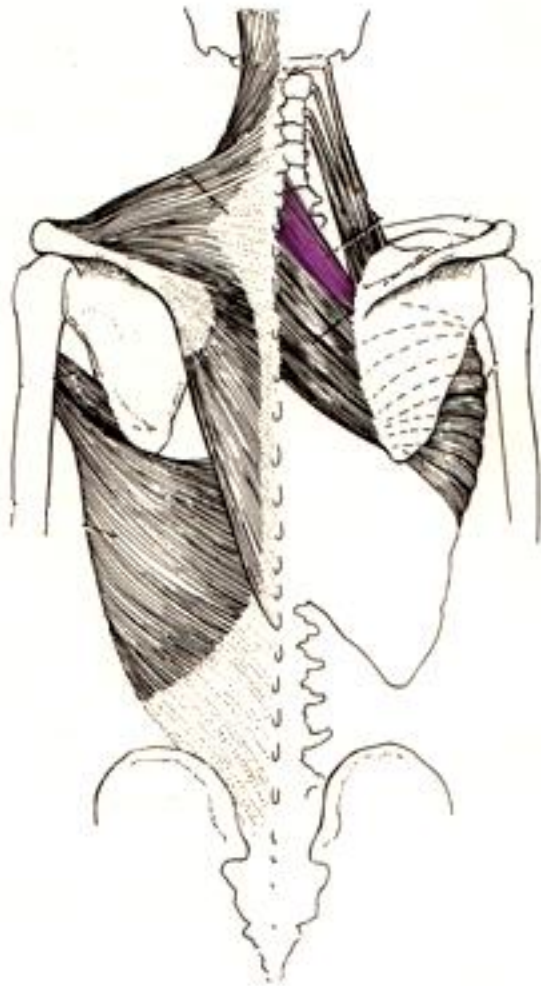
Rhomboidius Major



**Innervation:
Dorsal Scapula**

**Action:
Retracts scapula
Depresses glenoid**

Rhomboidius Minor

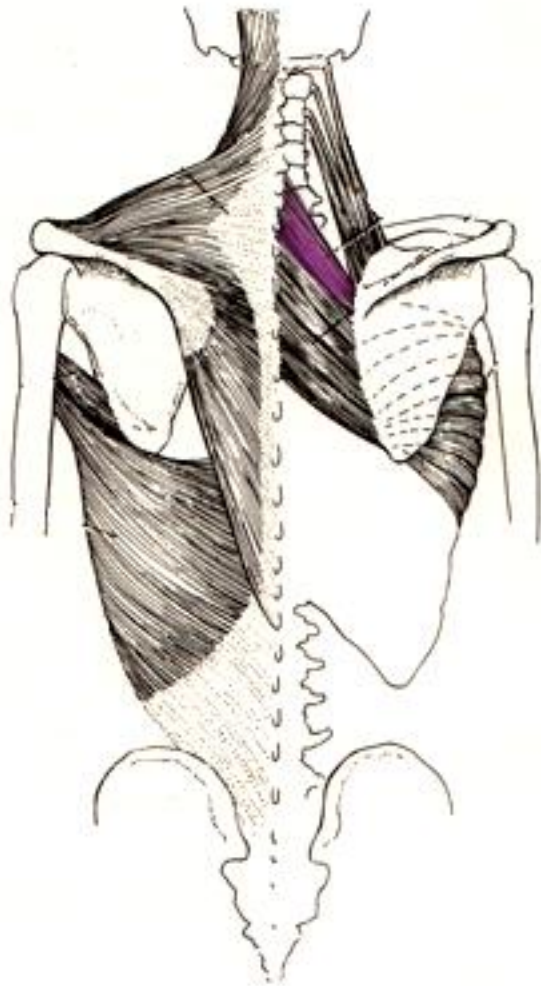


Origin:
Spines of C7 and T1

Insertion:
**Medial edge of
scapula**

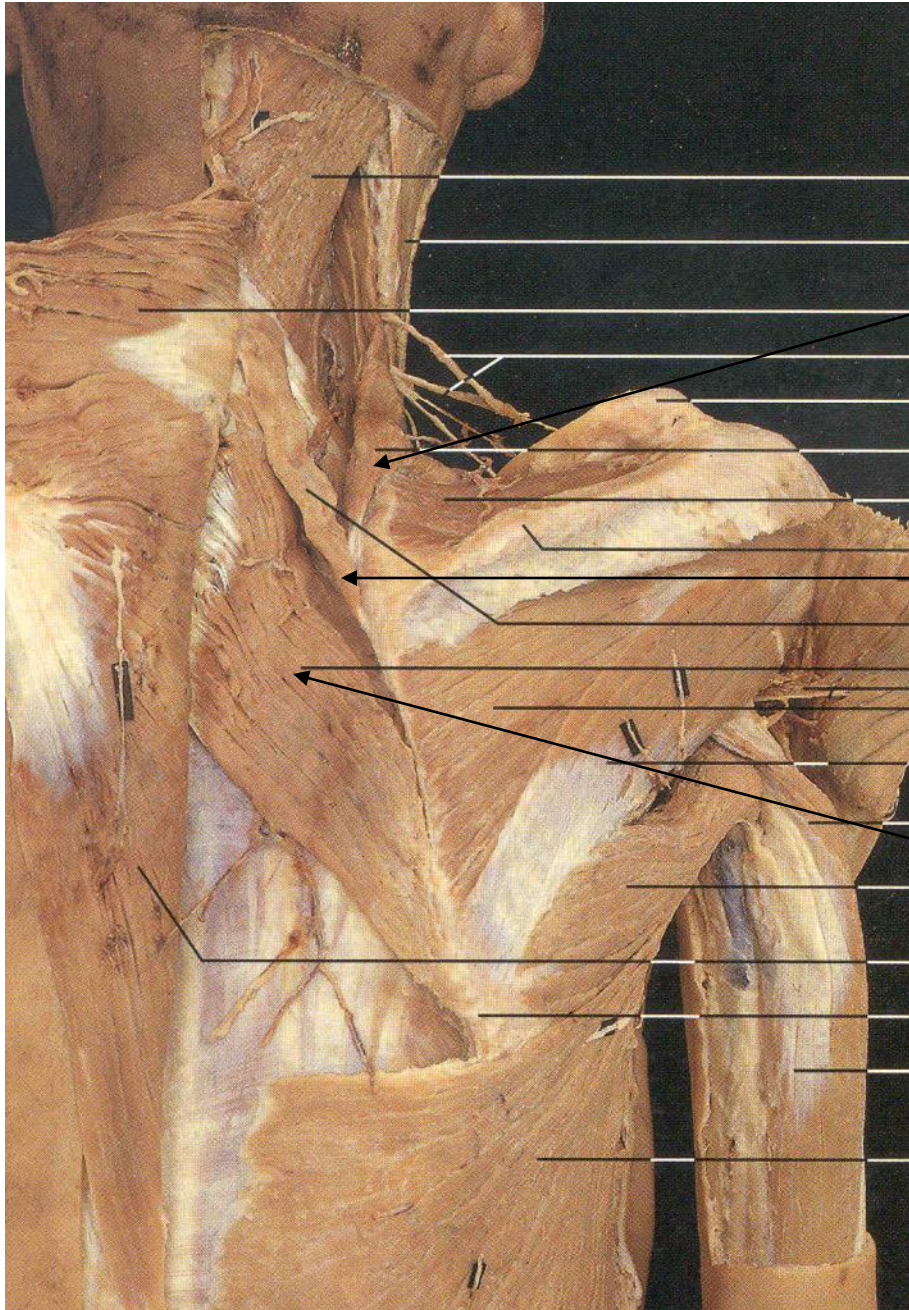
**Note: minor is
superior, but
SMALLER**

Rhomboidius Minor



Innervation:
Dorsal Scapula

Action:
Retracts scapula
Depresses glenoid

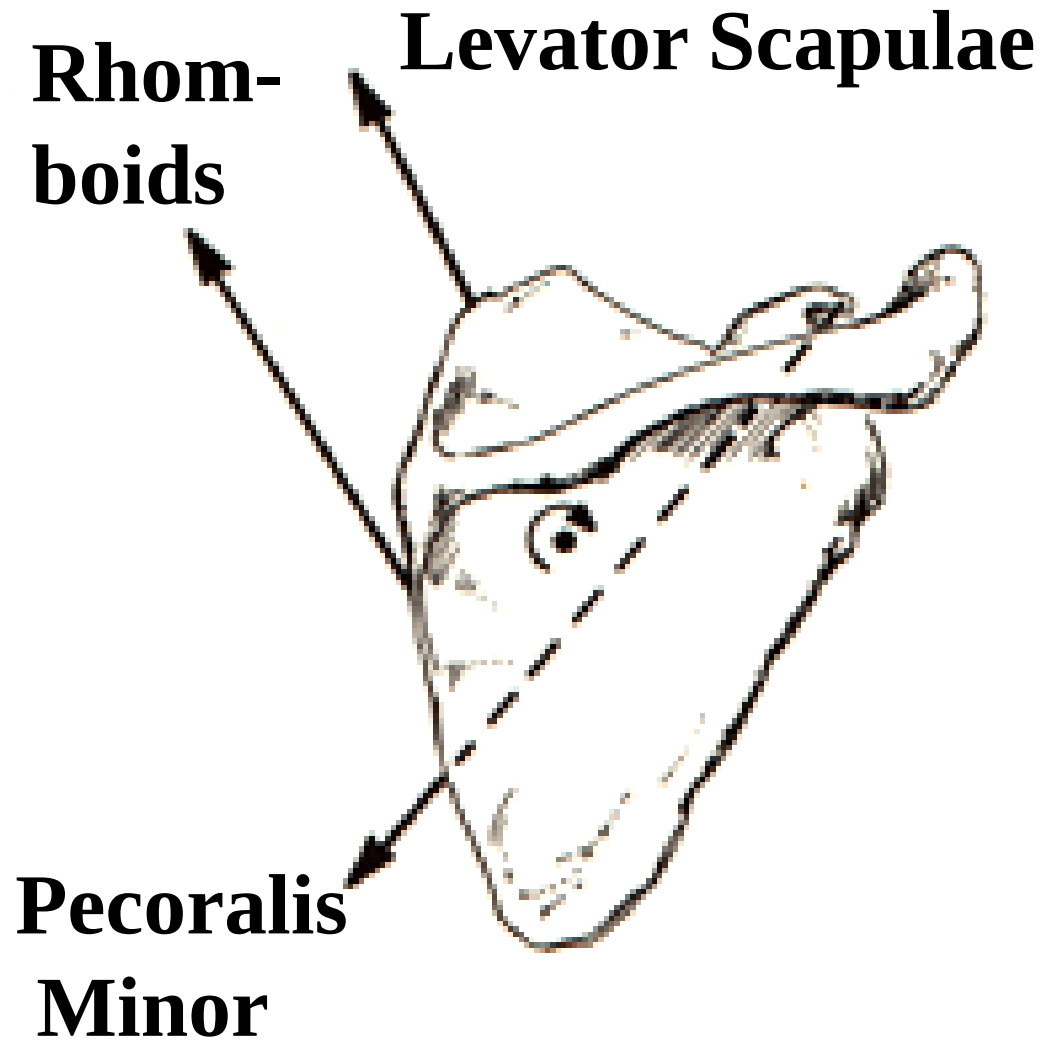


Levator Scapulae

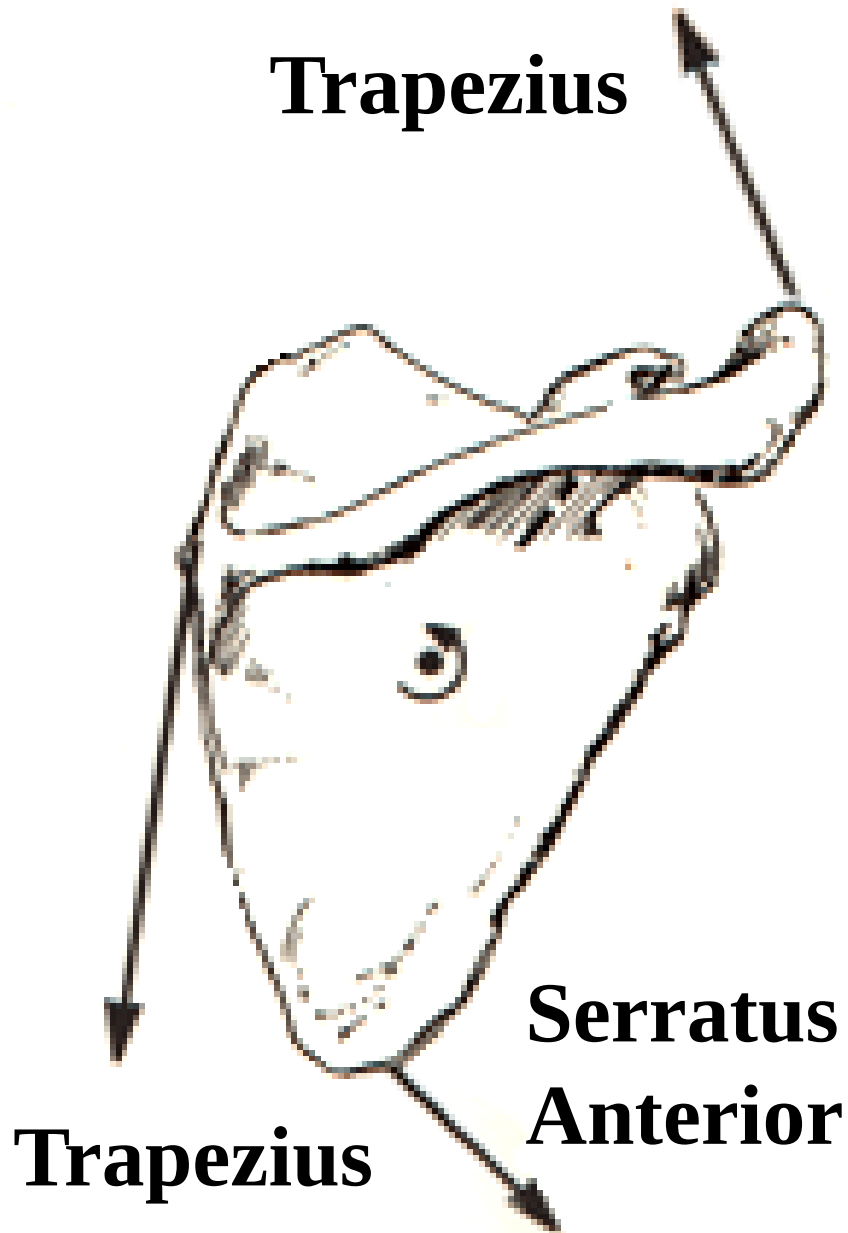
Rhomboid Minor

Rhomboid Major

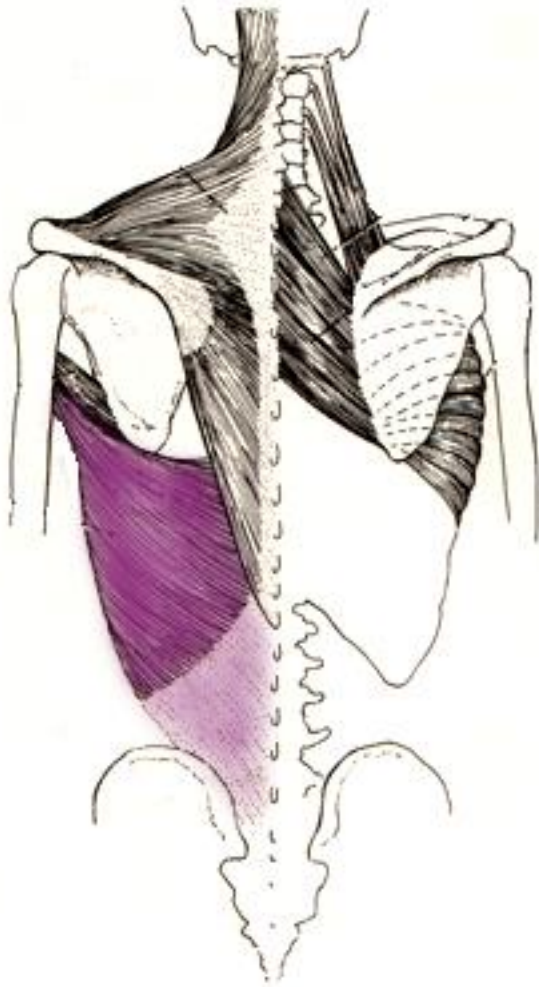
Depression



Elevation



Dorsal and Ventral Appendicular Muscles



Latissimus Dorsi

Origin:

Spines of T7-T12

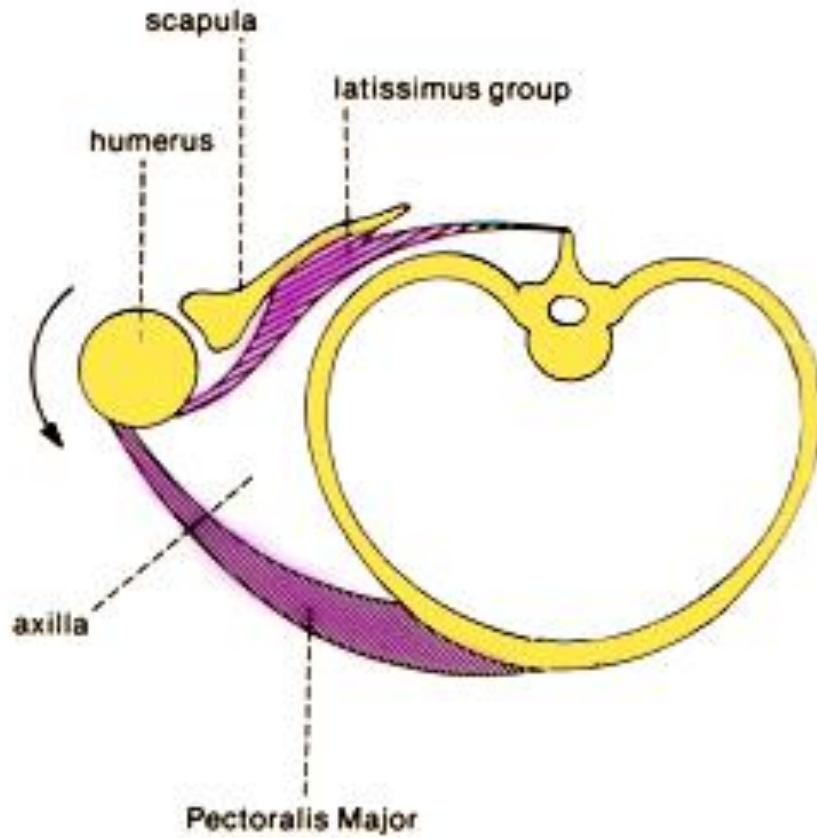
Thoracolumbar fascia

Insertion:

**Humerus: Intertubercular groove
And lesser tubercular crest**

Innervation:

Thoracodorsal Nerve



Latissiumus:
Extends,
adducts and
medially rotates
humerus

Pectoralis: is
large, fan-
shaped muscle
opposing it
ventrally

Ventral Musculature

**The Pectoralis Group
is a large, fan-shaped
group that SPANS
cranial-ventral and
caudal-ventral
regions.**

Pectoralis Major:

Clavicular Head:

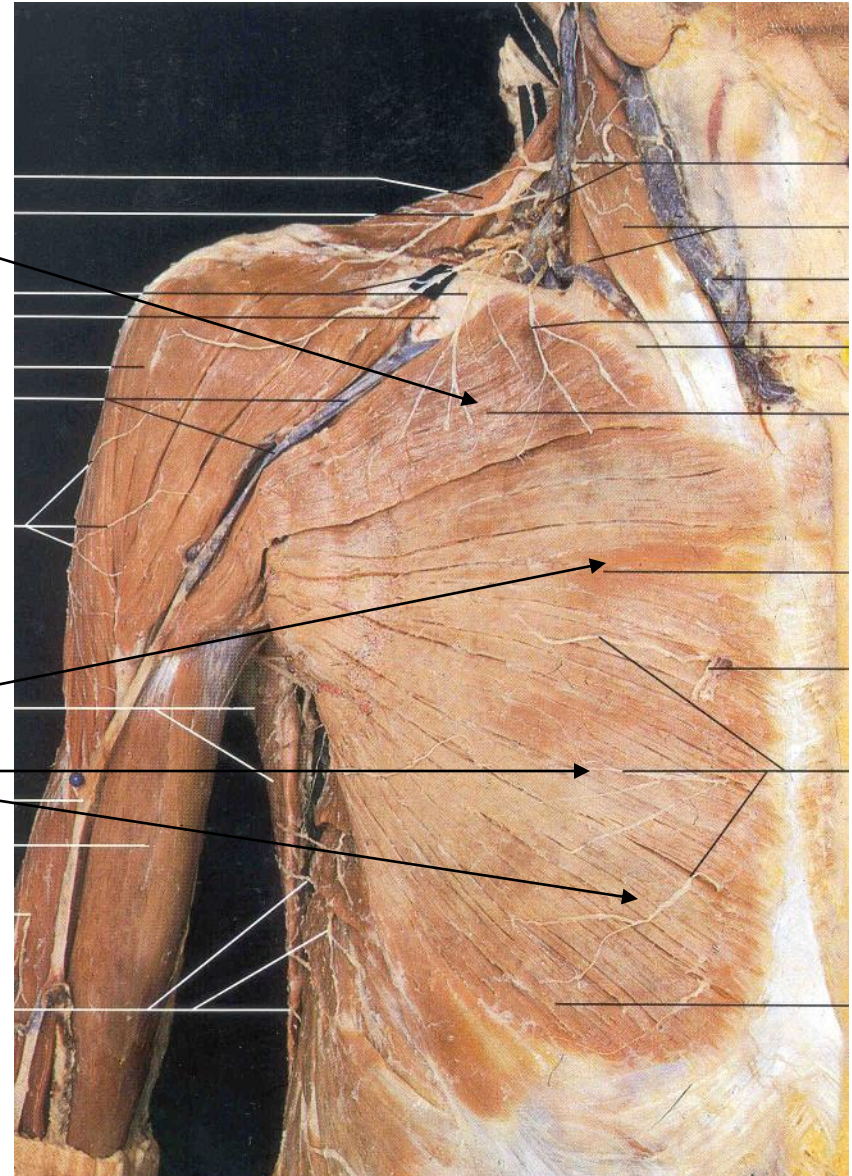
Origin: inferior margin of clavicle

Insertion: Delto-pectoral crest of **HUMERUS**

Sternal Head:

Origin: Vento-lateral margin of sternum

Insertion: Delto-pectoral crest of **HUMERUS**



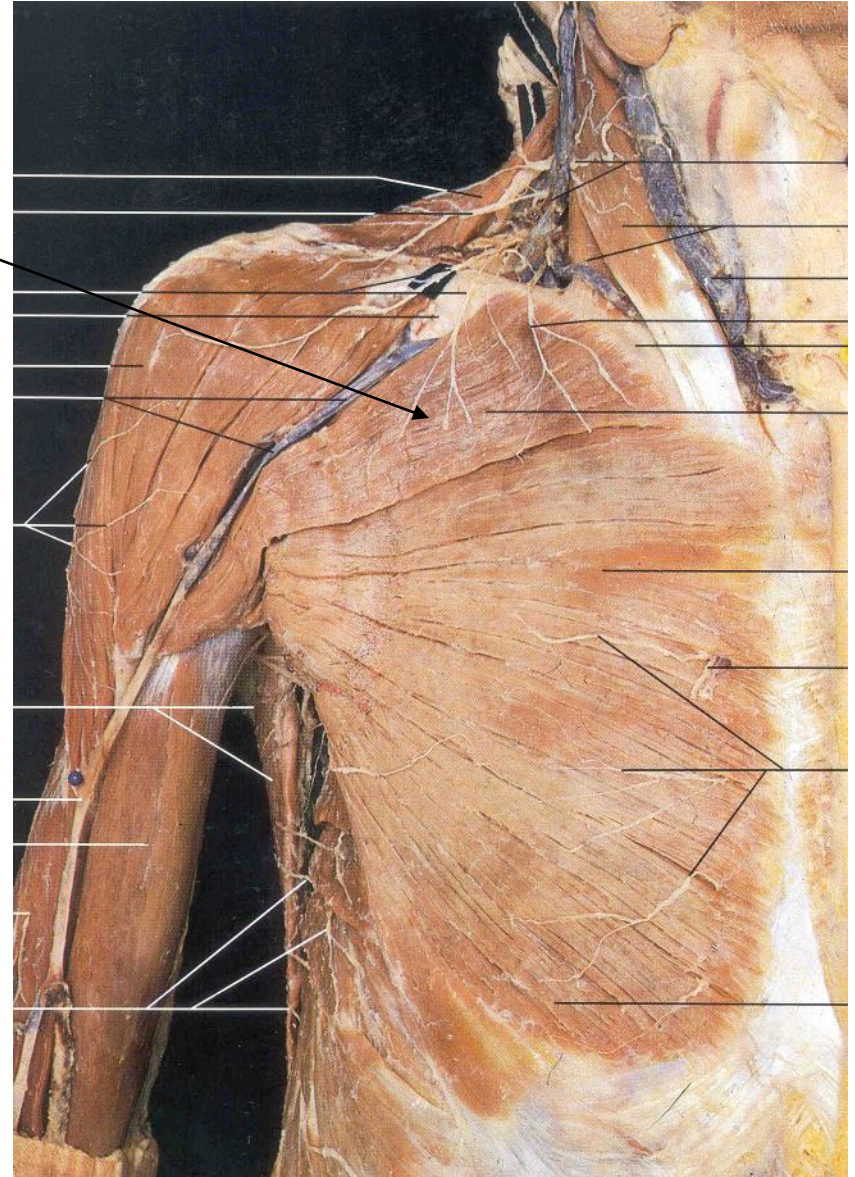
Pectoralis Major:

Clavicular Head:

Origin: inferior margin of clavicle

Insertion: Greater tubercular crest of
HUMERUS

Innervation: Medial and lateral pectoral nerves



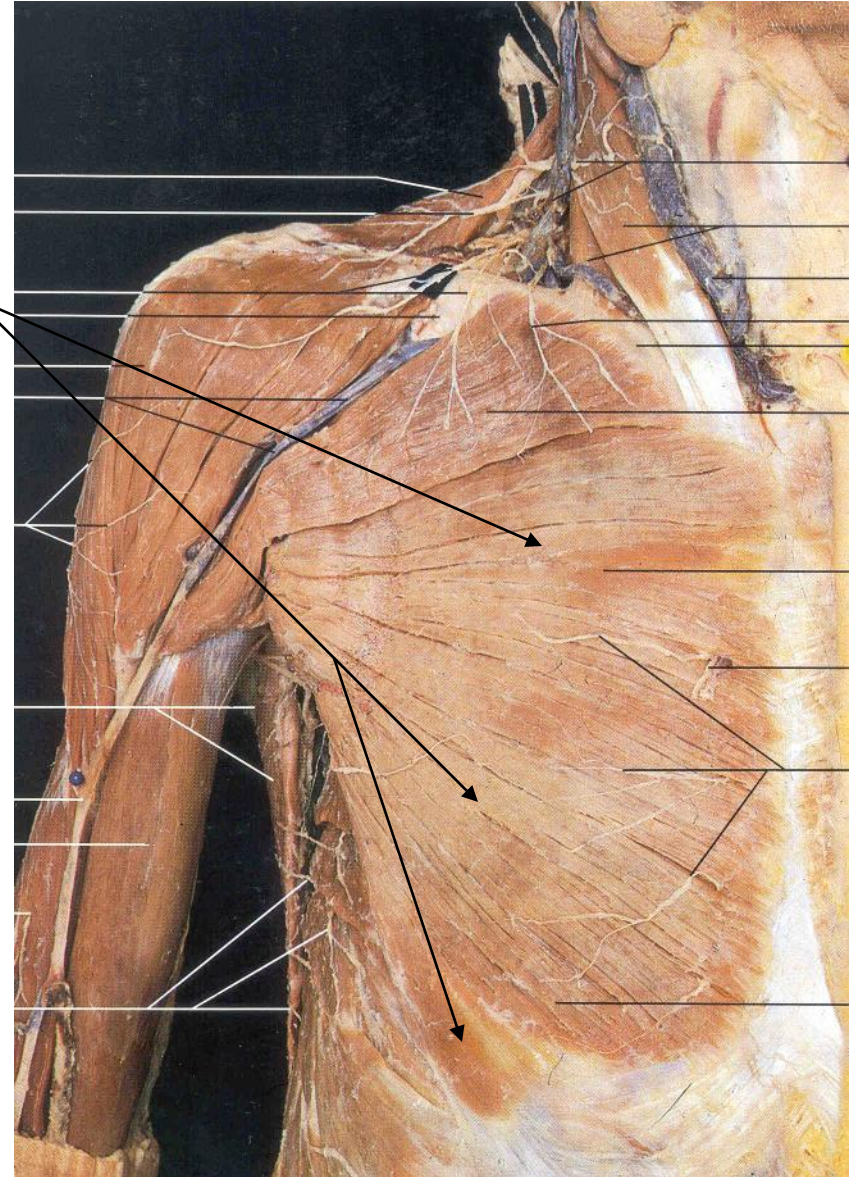
Pectoralis Major:

Sternal Head:
DEPRESSOR,
ADDUCTOR of humerus

Origin: Vento-lateral
margin of sternum; costal
cartilages 1-6

Insertion: Greater
tubercular crest of
HUMERUS

Innervation: Medial and
lateral pectoral nerves



Pectoralis MINOR: Deep to Pec. Major

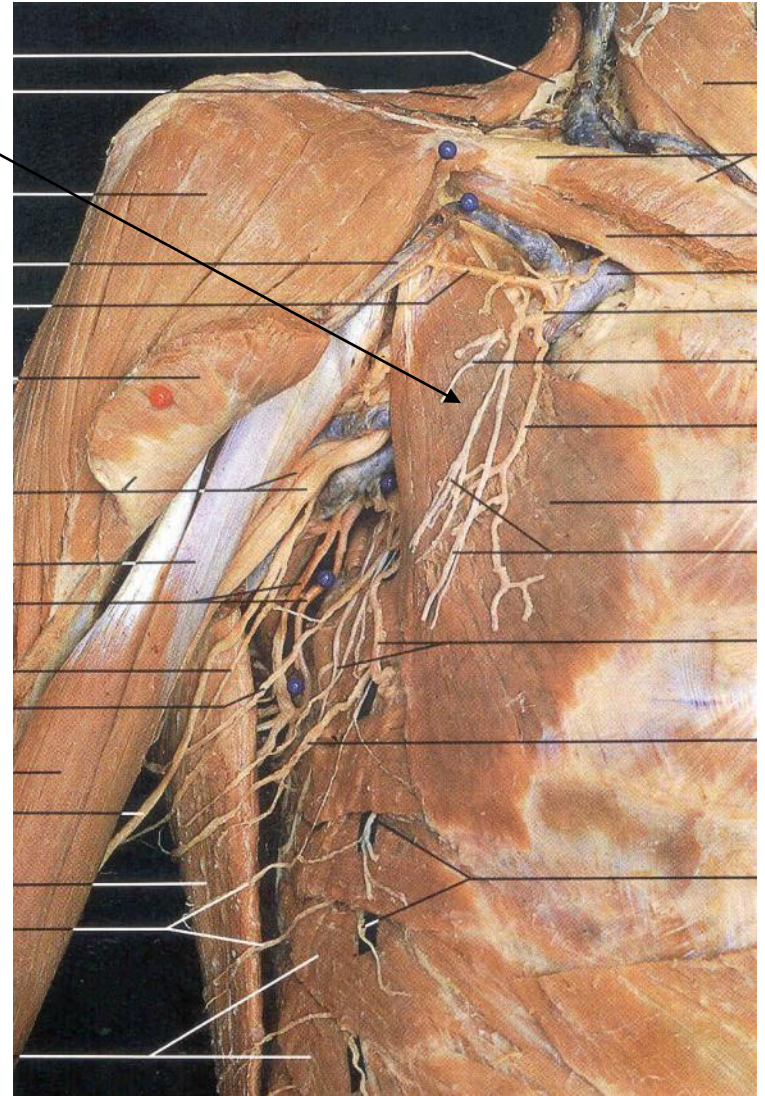
Origin: Ribs 3-6.

Insertion: Coracoid Process
of Scapula

Innervation:

Function: Stabilization of
scapula

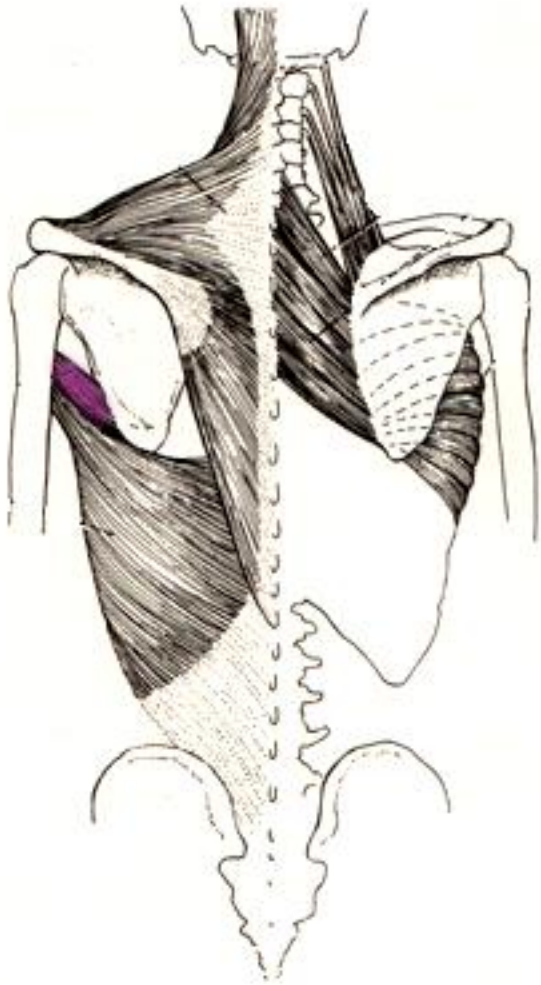
Positionally important for
understanding location of
other structures.



Musculature of the Shoulder:

Muscles Connecting Scapula to Humerus

Elevators



Teres Major

Origin: Lower edge of scapula

Insertion: Lesser tubercular crest

Action: Extends, Adducts & Medially rotates humerus

Innervation: Lower scapular

Elevators



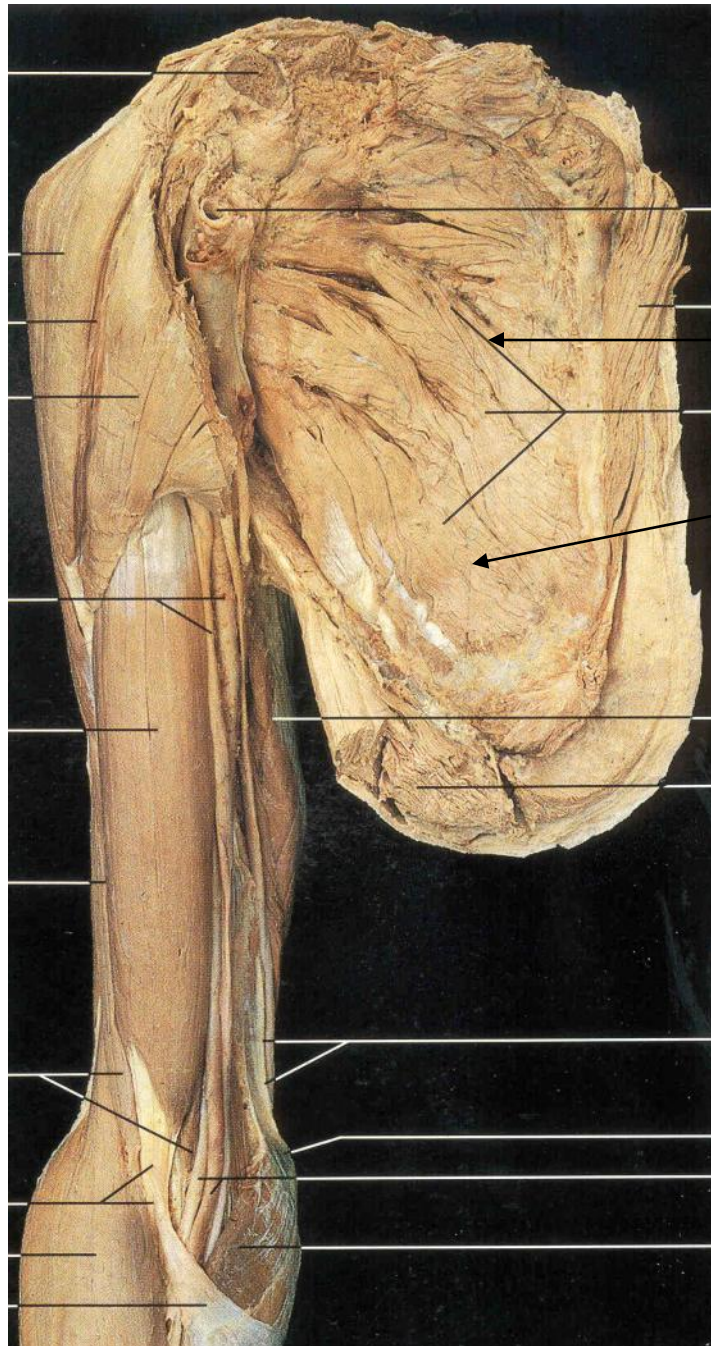
Subscapularis

Origin: Deep surface of scapula

Insertion: Lesser tubercle

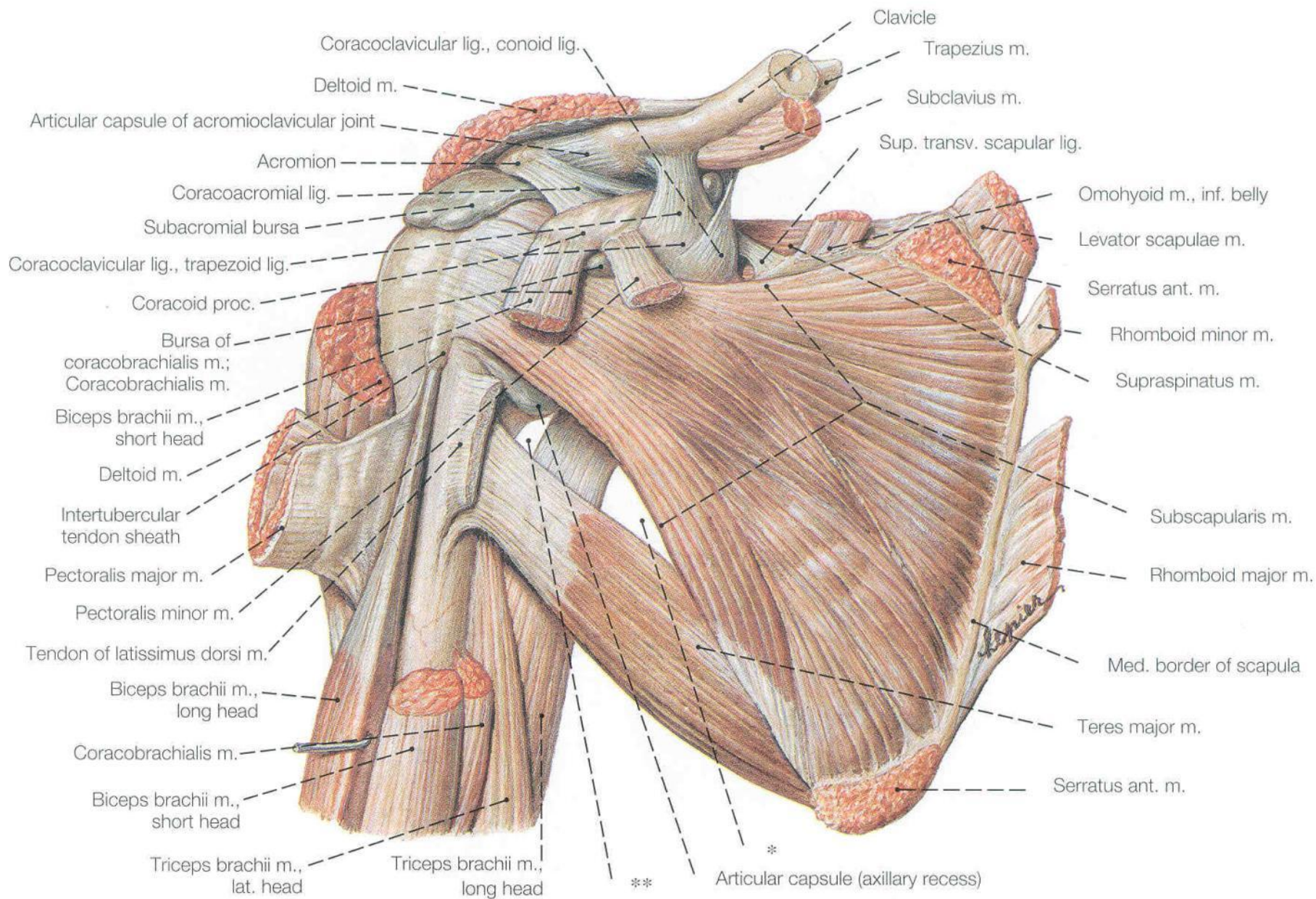
Action: Medially rotates humerus

Innervation: Upper and lower scapular



Internal View:

Subscapularis



Elevators

Teres Minor

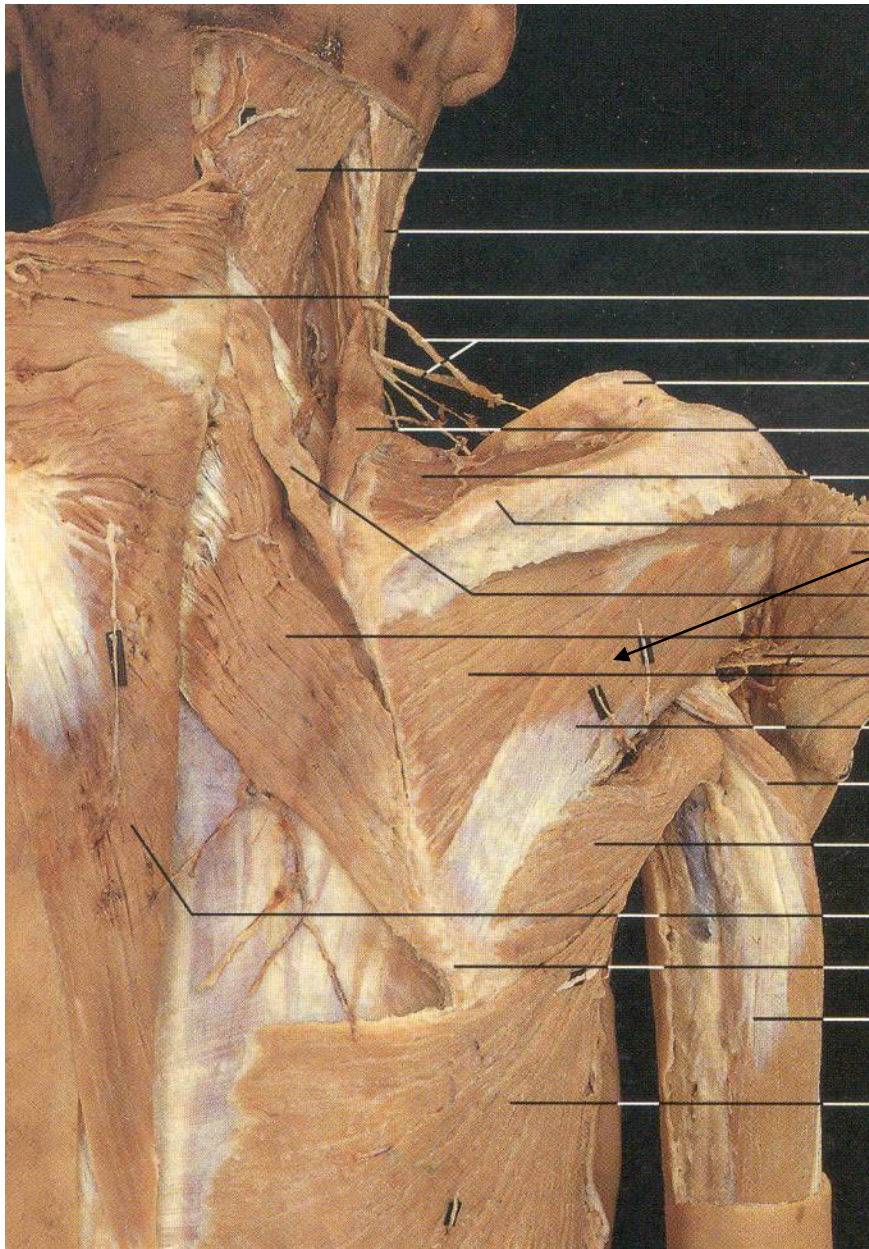


Origin: Lower edge of scapula

Insertion: Greater tubercle

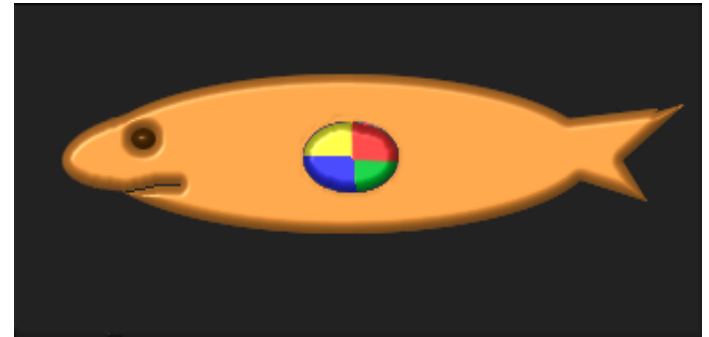
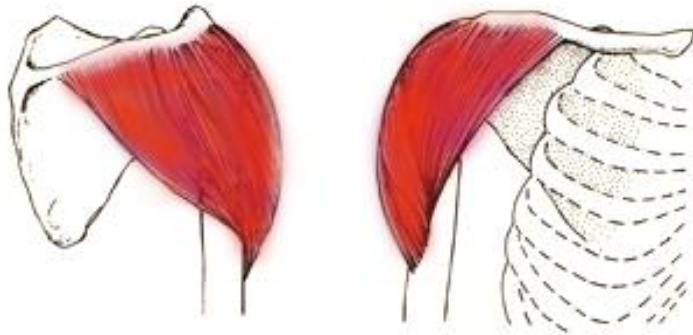
Action: Laterally rotates humerus

Innervation: Axillary



Teres Minor

Elevators



Deltoidaeus

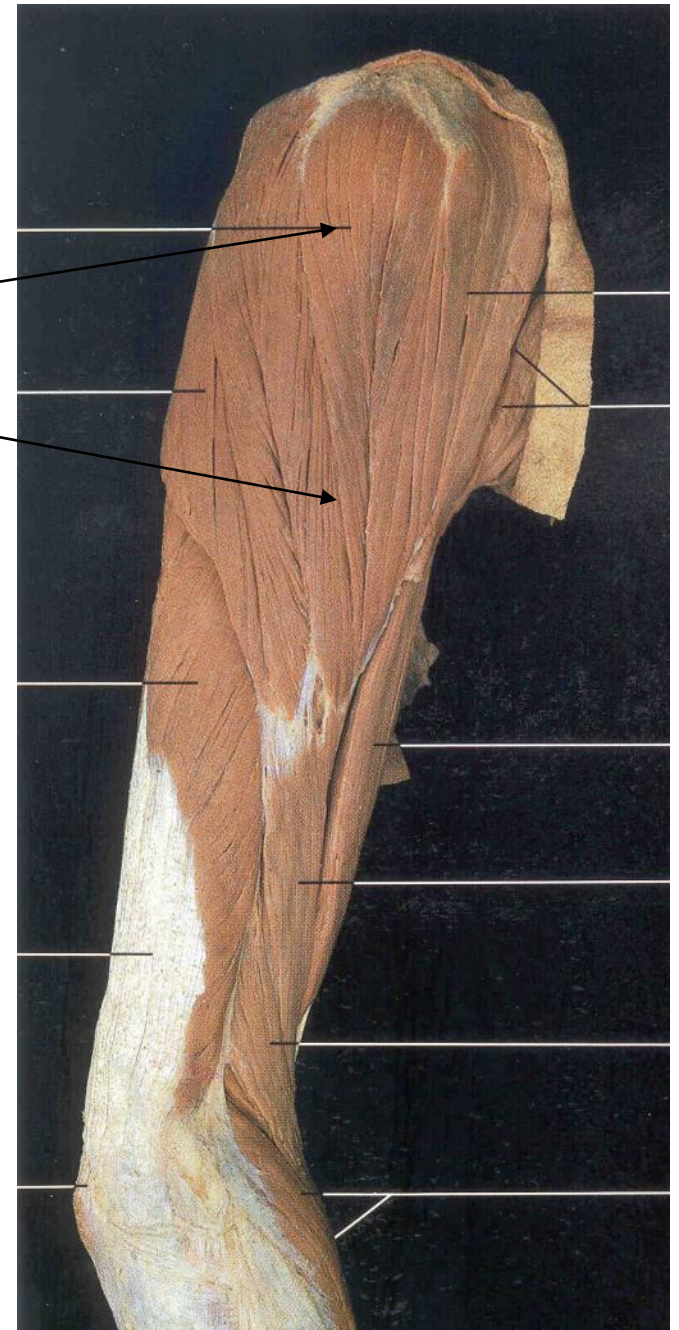
Origin: Lateral half of clavicle , Scapular spine, acromion process

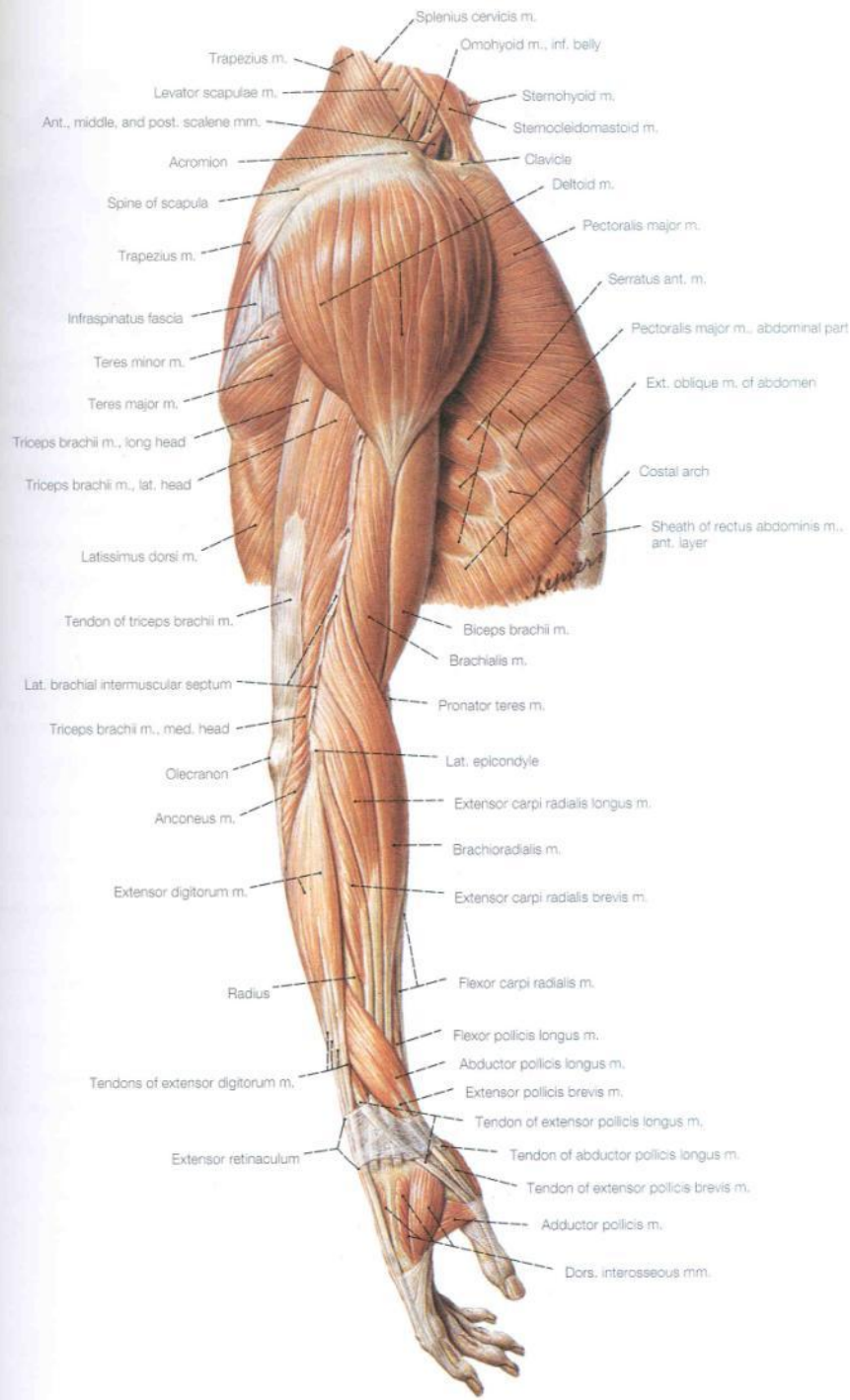
Insertion: Deltoid tuberosity of humerus

Action: Abducts humerus (also flexes, extends, rotates and adducts)

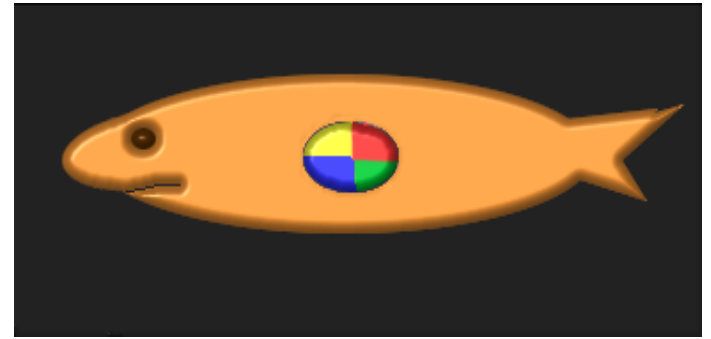
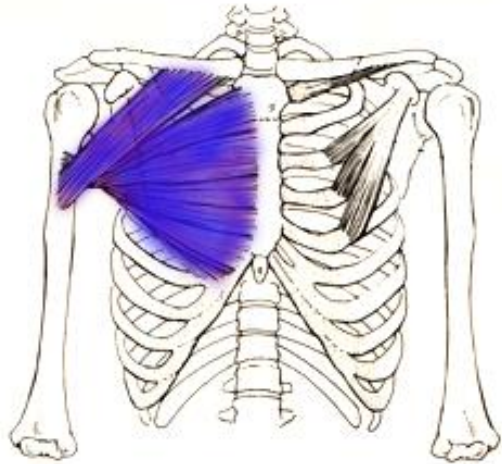
Innervation: Axillary nerve

Deltoid





Depressors



Pectoralis Major (Sternal Head)

Origin: Medial half of clavicle, sternum, costal cartilages 1-6

Insertion: Greater tubercular crest

Action: Medially rotates, flexes and adducts humerus

Innervation: Lateral and medial pectoral



Supraspinatus

Origin: Supraspinous fossa of scapula

Insertion: Greater tubercle of humerus

Action: Abducts humerus

Innervation: Subscapular



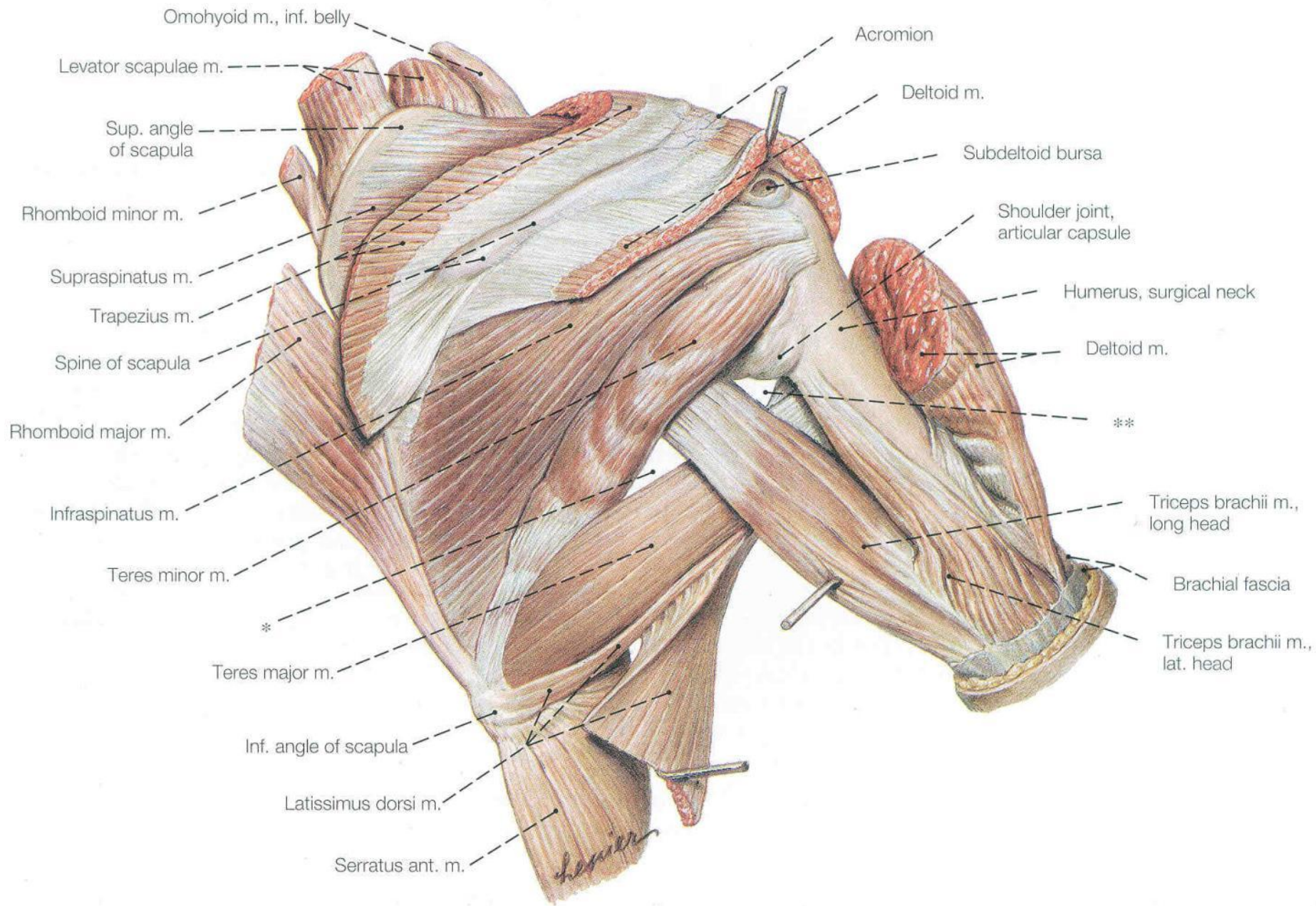
Infraspinatus

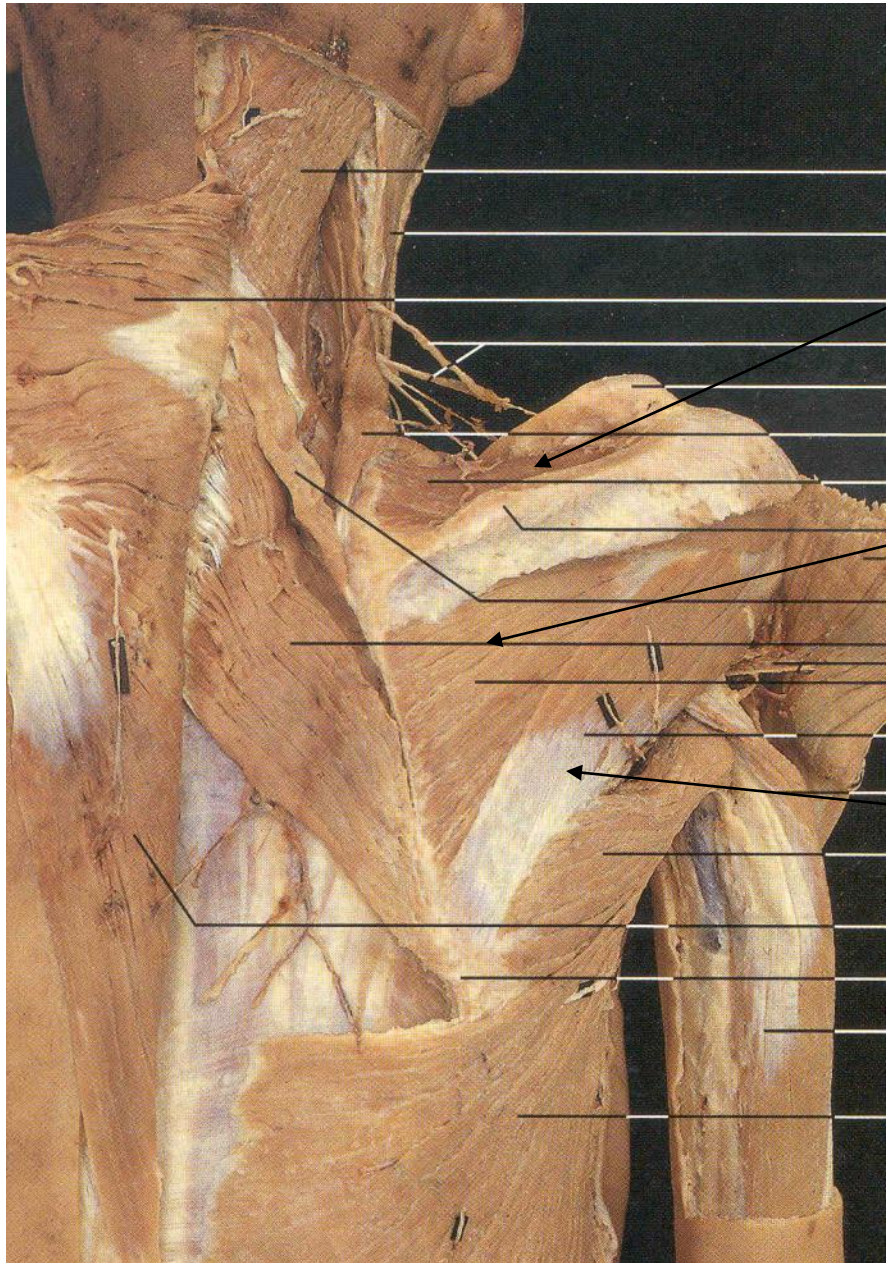
Origin: Infraspinous fossa of scapula

Insertion: Greater tubercle of humerus

Action: Laterally rotates humerus

Innervation: Subscapular



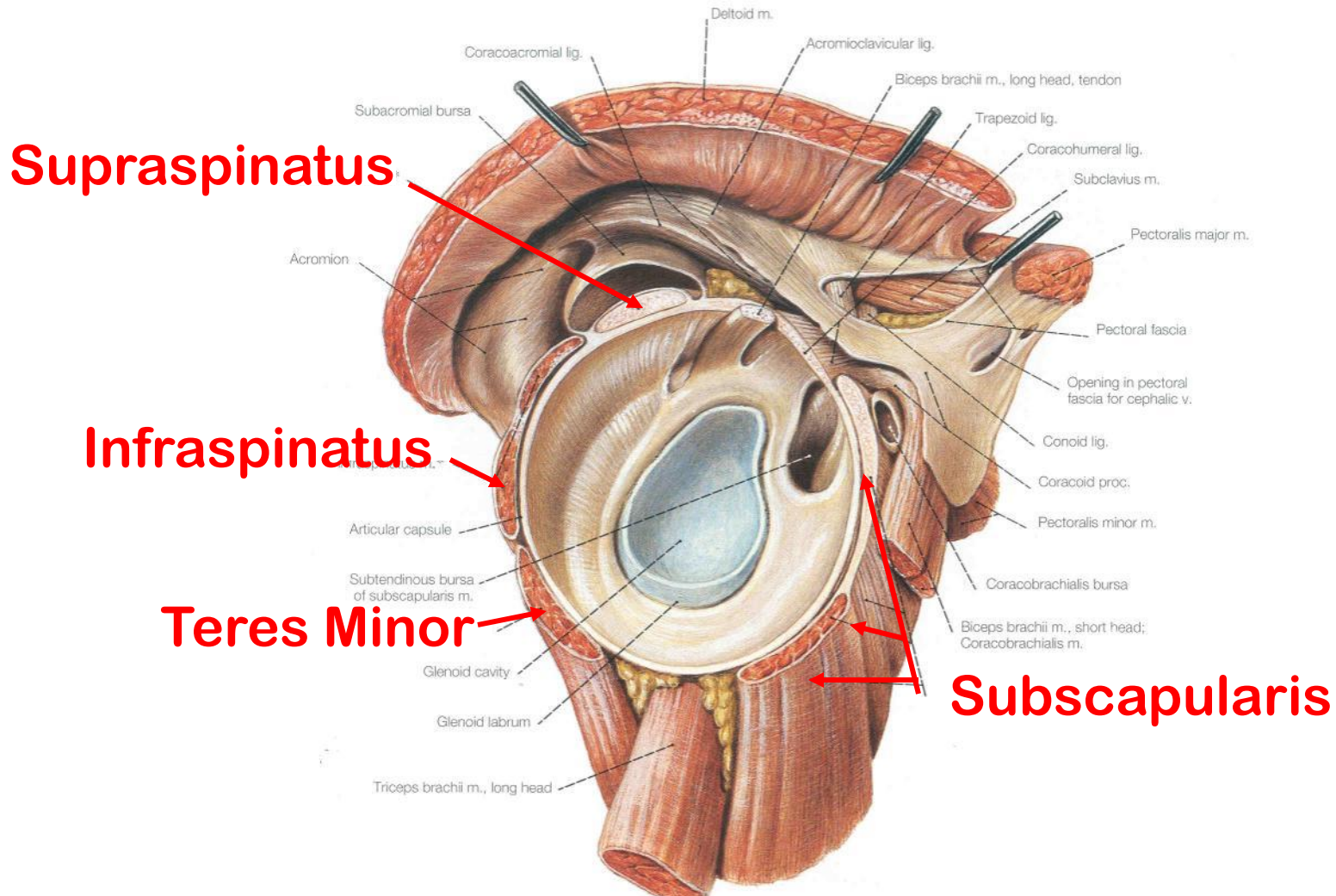


Supraspinatus

Infraspinatus

Teres Minor

Muscles of the Rotator Cuff

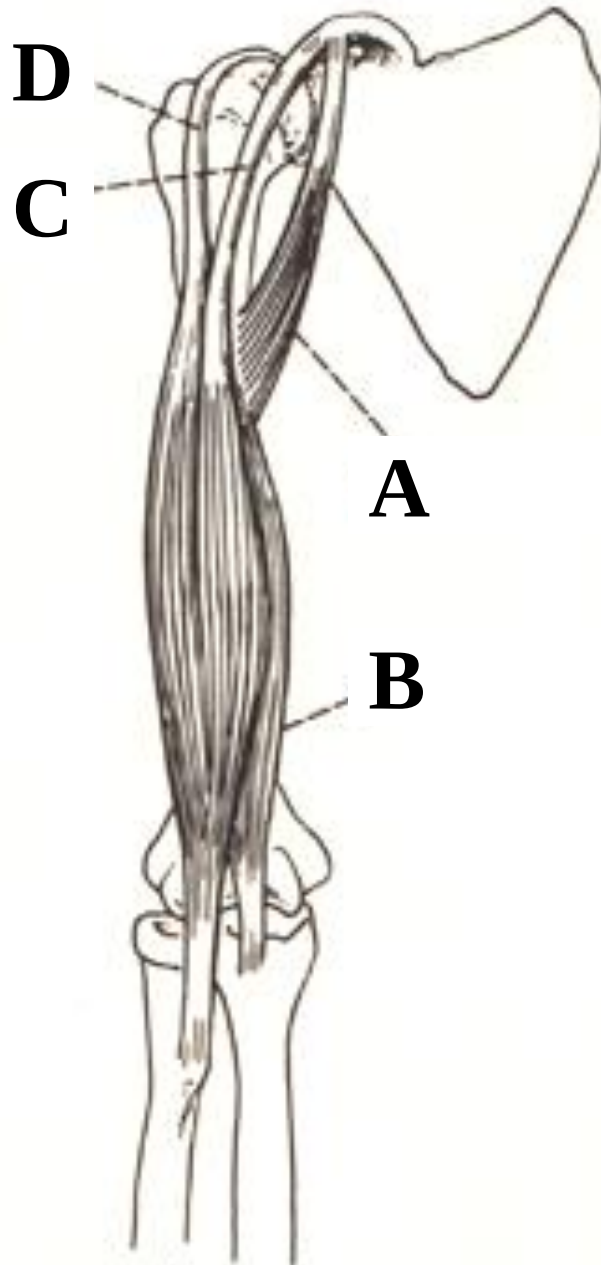


Musculature Crossing the Elbow Joint

Muscles moving the elbow all cross the joint and insert on the bones of the forearm.

They may originate from the scapula or the brachium (humerus).

Biceps Brachii:



**Which muscle
is NOT a flexor
of the elbow?**

**Answer = A
Coracobrachialis**

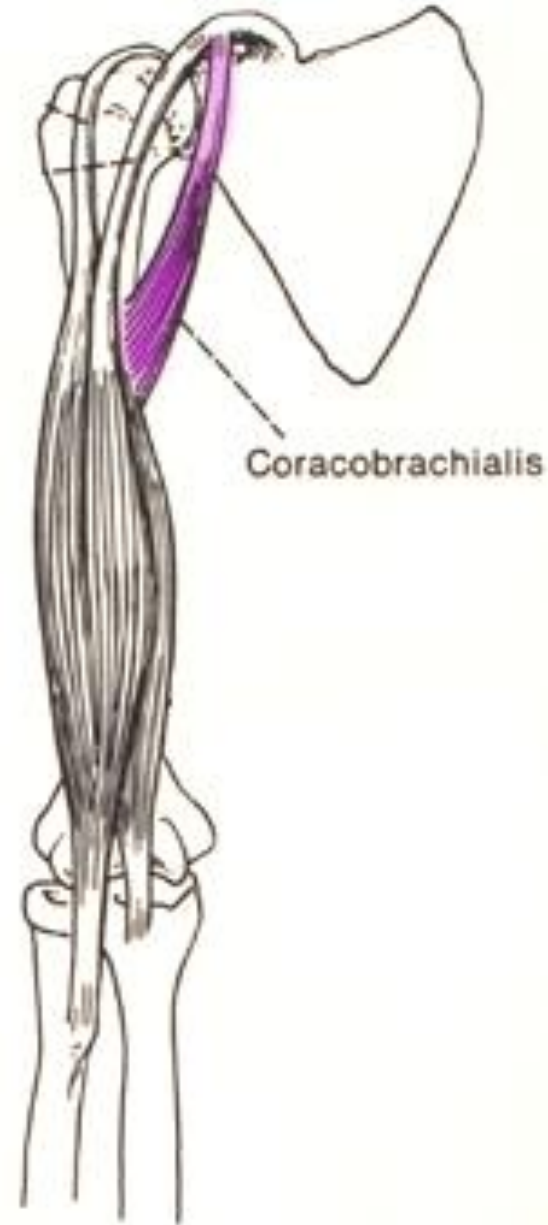
**The Coracobrachialis
makes up part of the
mass of the upper arm
but doesn't actually
cross the joint (scapula
to humerus only).**

Origin: coracoid process

Insertion: Humerus

**Flexion and adduction
of humerus.**

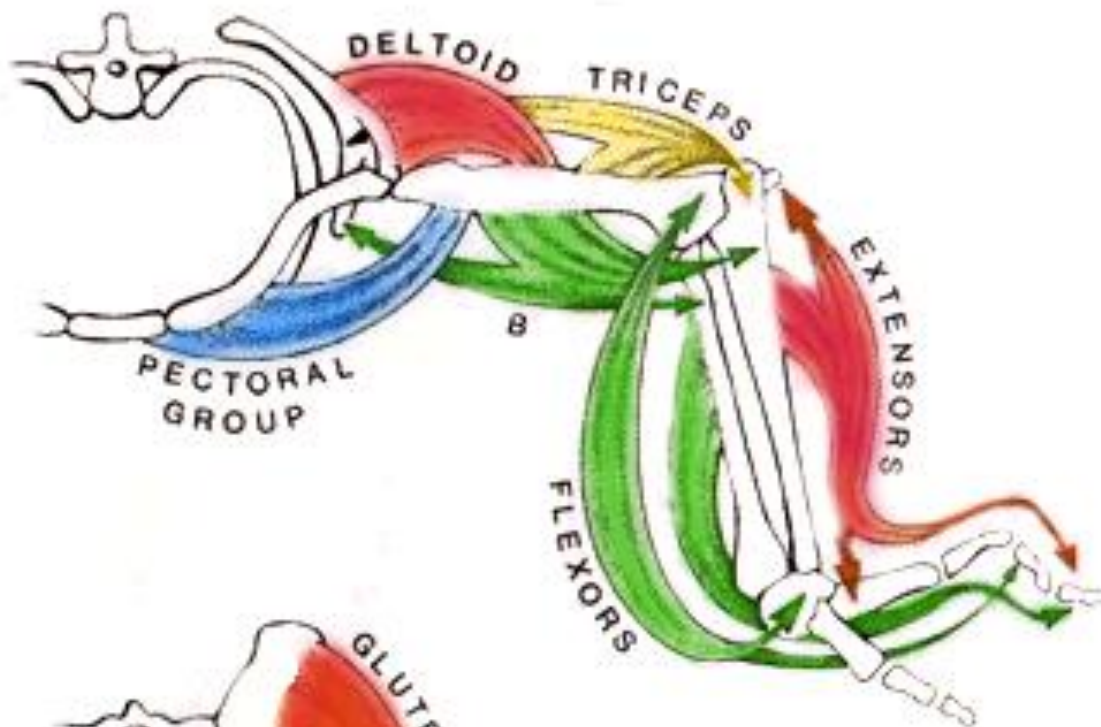
Musculocutaneous nerve



Elbow extensors

Triceps brachii

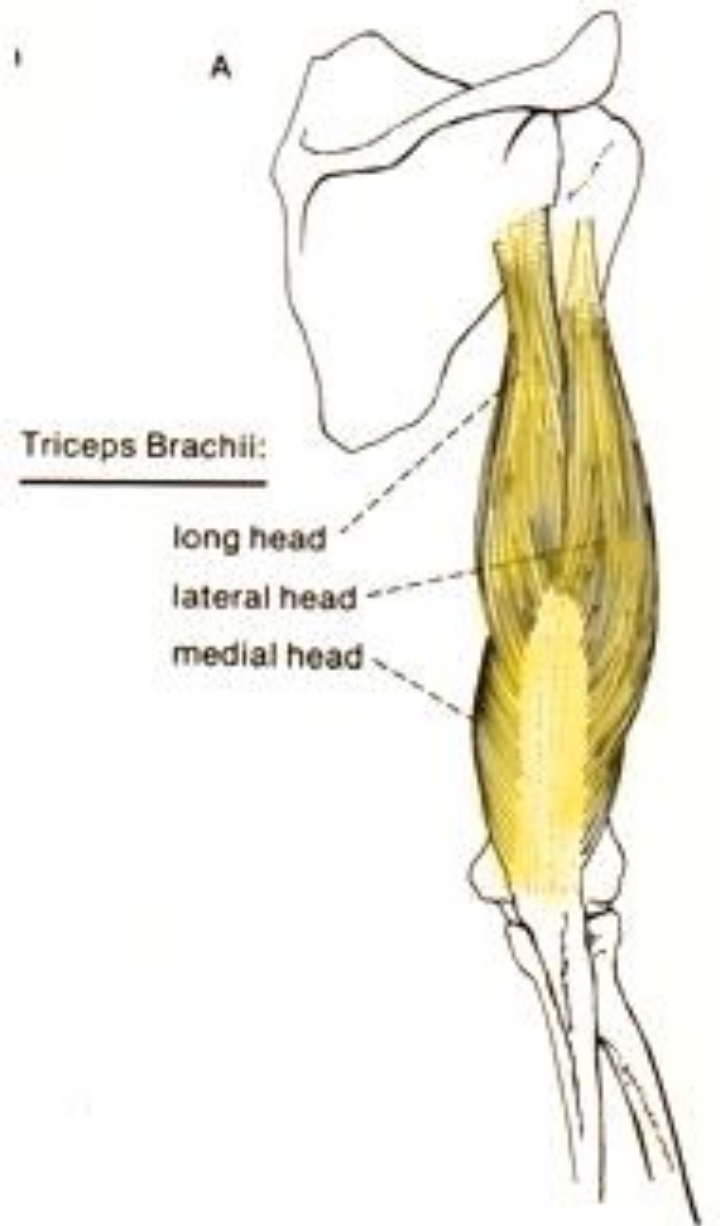
(Radial Nerve)



Cranial/dorsal



Triceps =
Quadriceps



Origin:

Long Head: Glenoid Fossa

Medial & Lateral Heads:

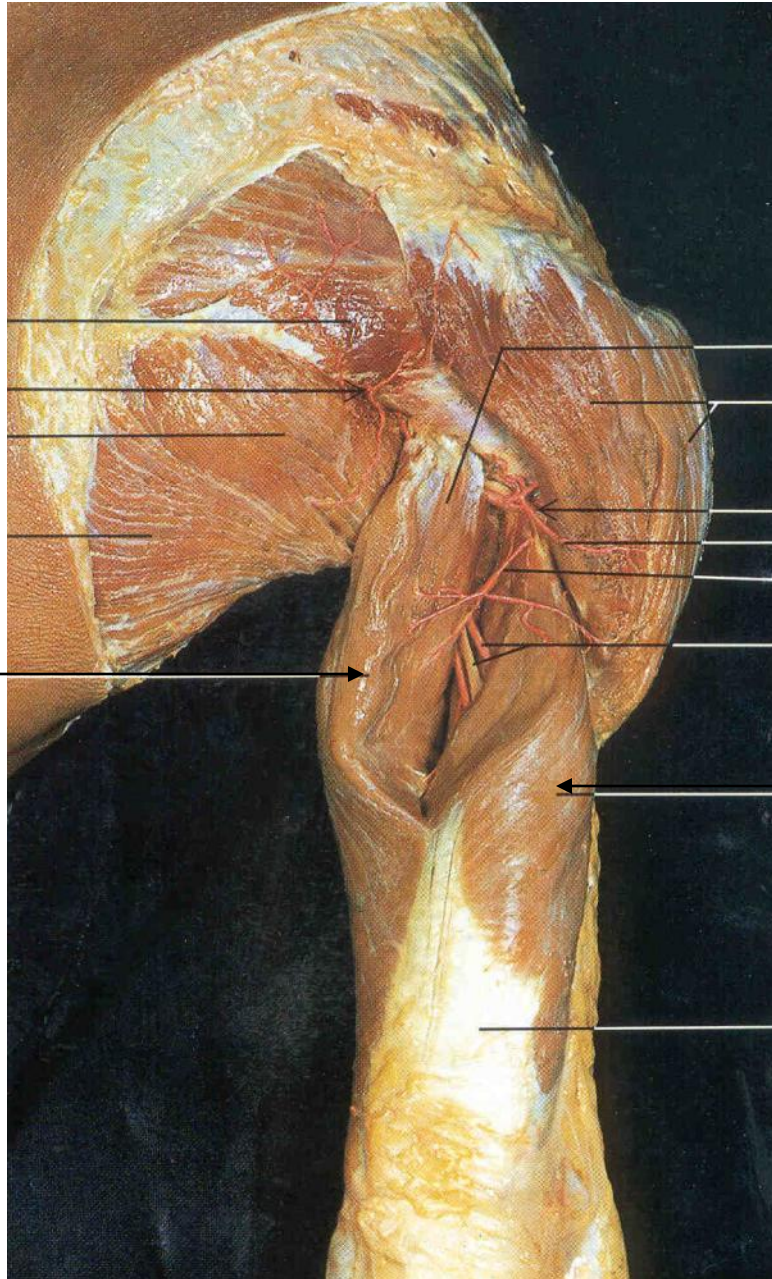
Posterior surface of humeral shaft

Insertion:

Olecranon process of ulna

Action: Extends elbow

**Triceps
Long
Head**

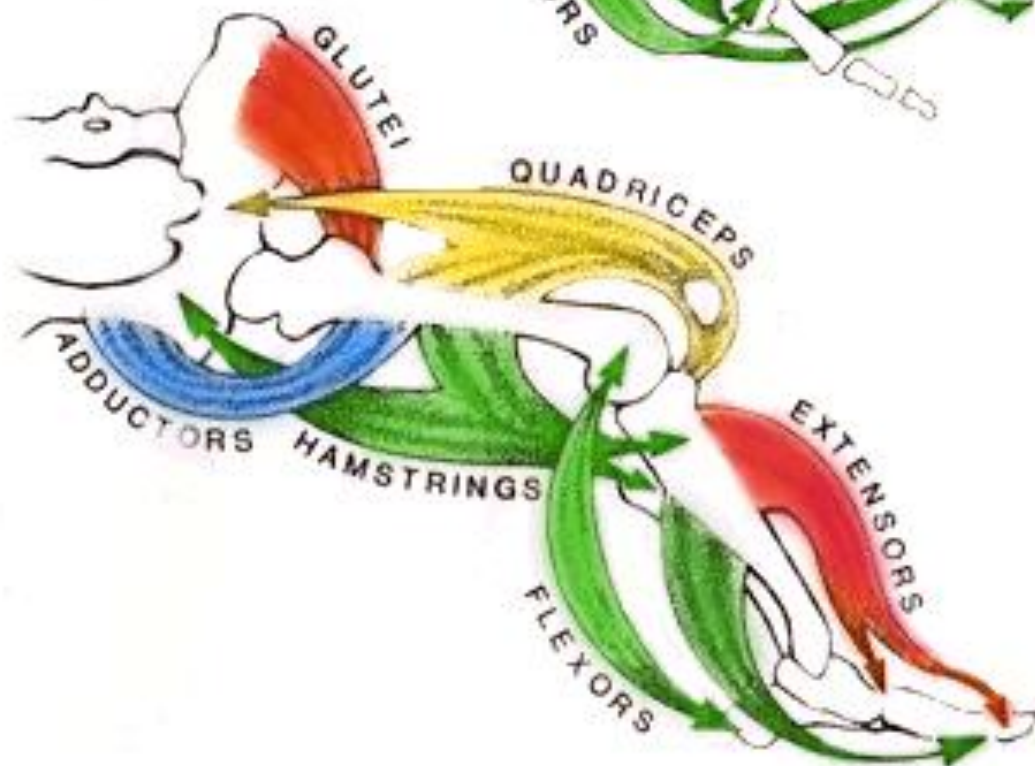
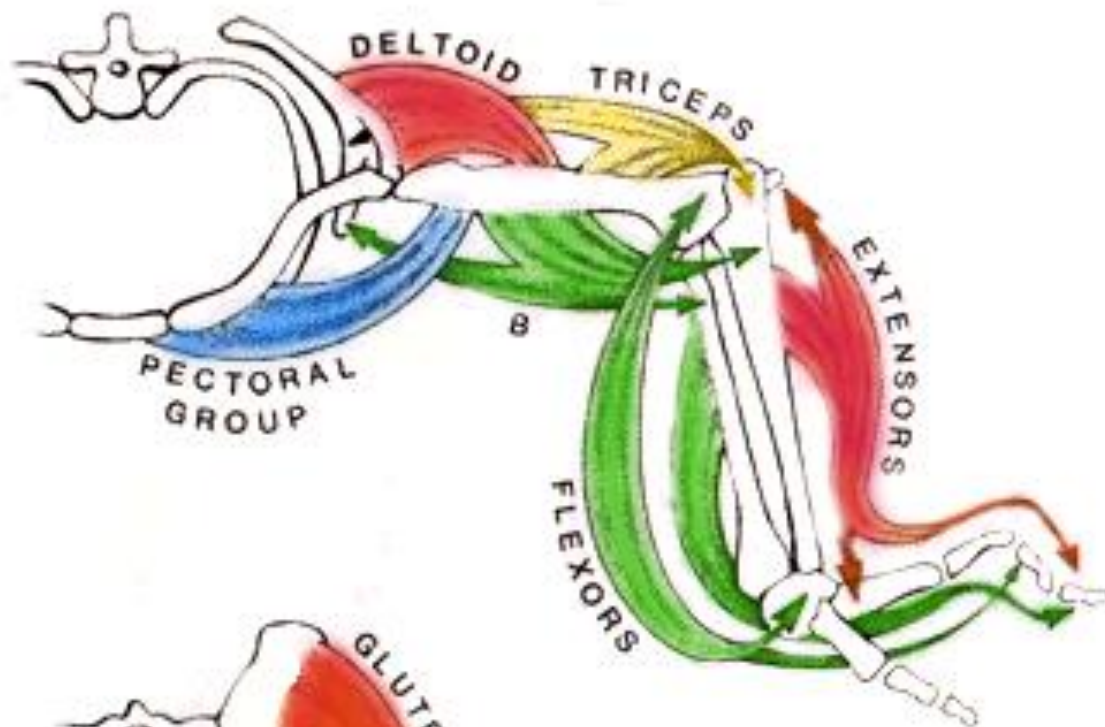


**Triceps,
Lateral
Head**

Elbow flexors

Brachii (brachial group)

(Here, spelling counts...)



Caudal/ventral



Hamstrings =
brachii

Biceps brachii

(musculocutaneous n.)

Origin:

Short head: coracoid process

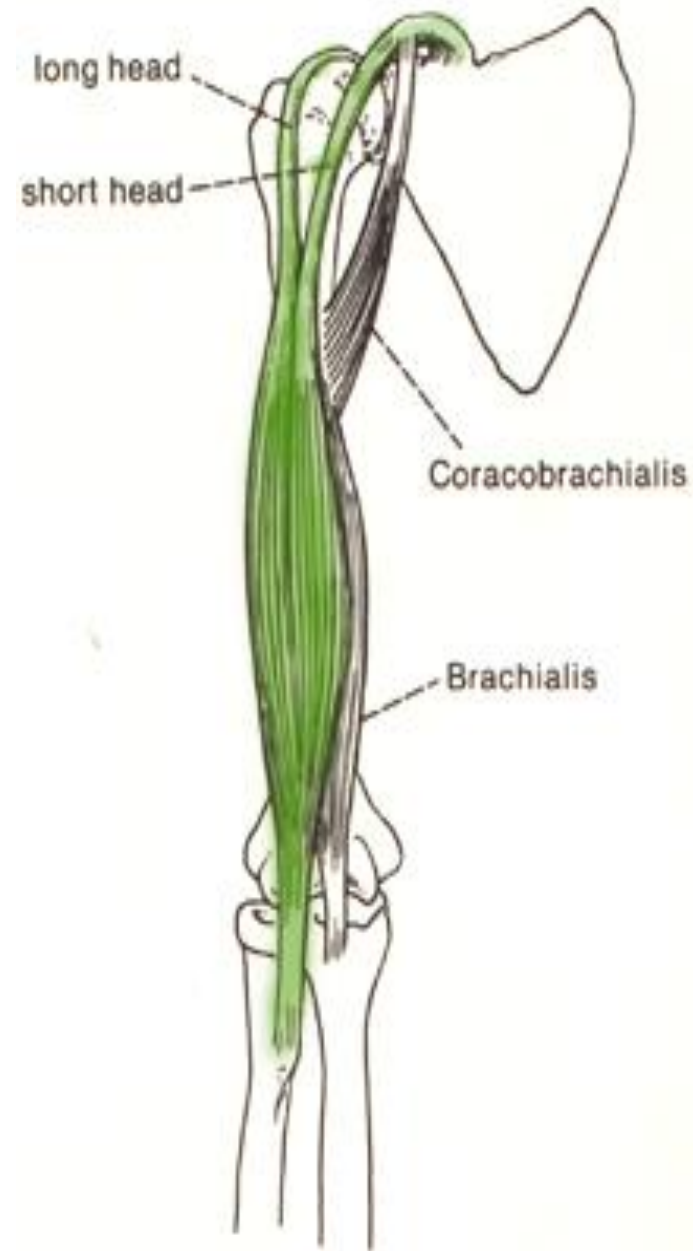
Long head; glenoid fossa

Insertion:

Proximal radius

Action:

**Flexes elbow
supinates**

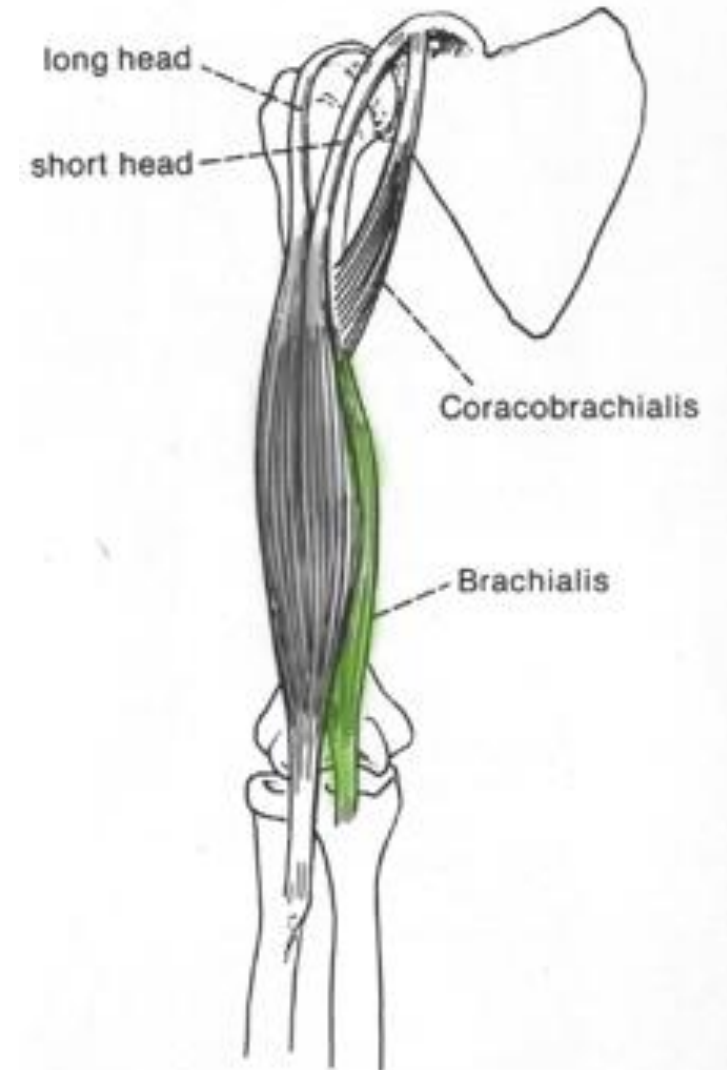


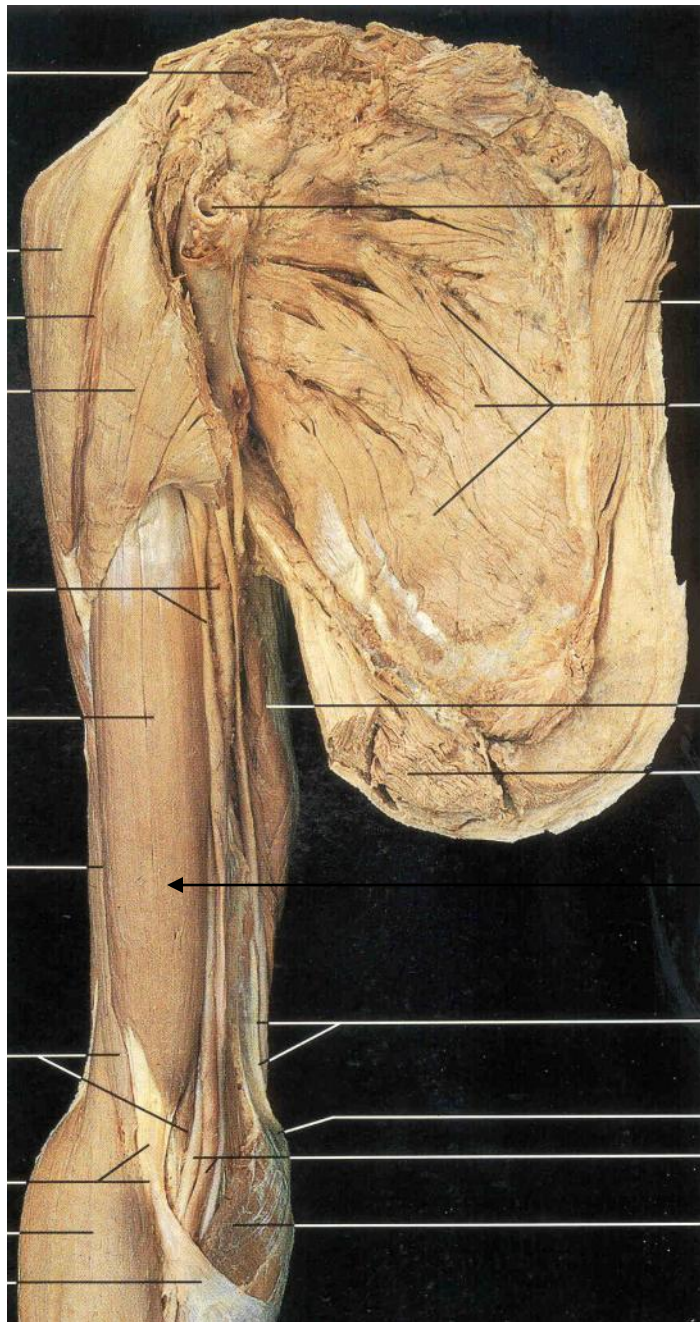
Brachialis (musculocutaneous n.)

Origin:
Humeral shaft

Insertion
Proximal ulna

Action: flexes elbow

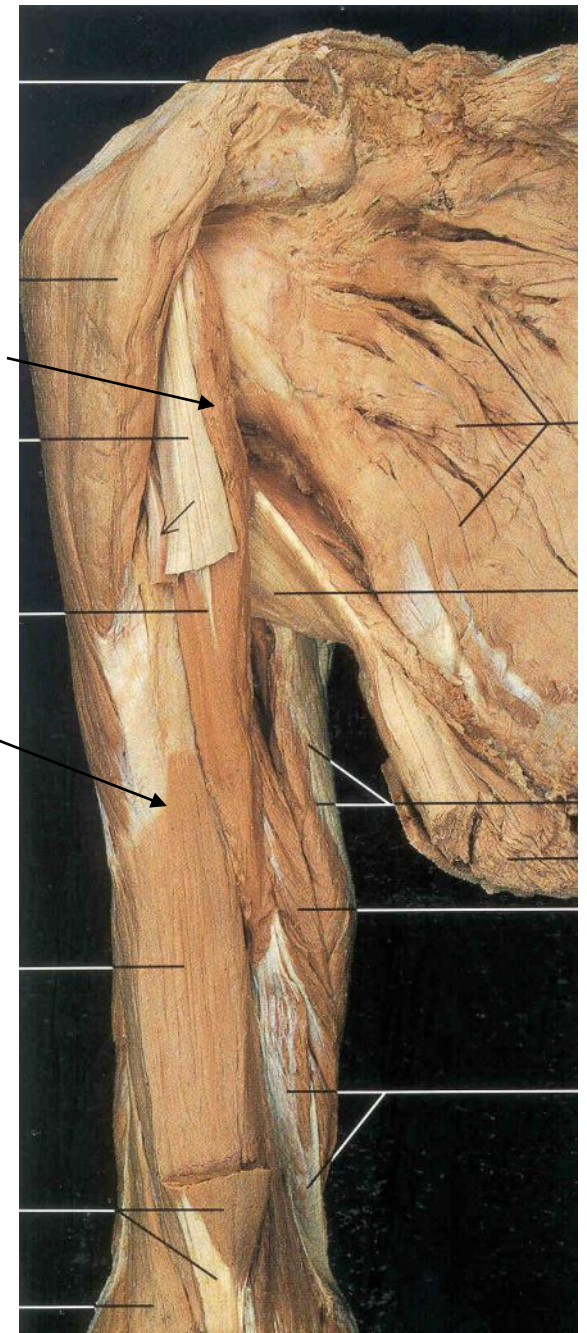




Coracobrachialis

Brachialis

Biceps



Brachioradialis

(Radial n.* exception)

Origin:
distal humerus

Insertion:
Styloid process of ulna

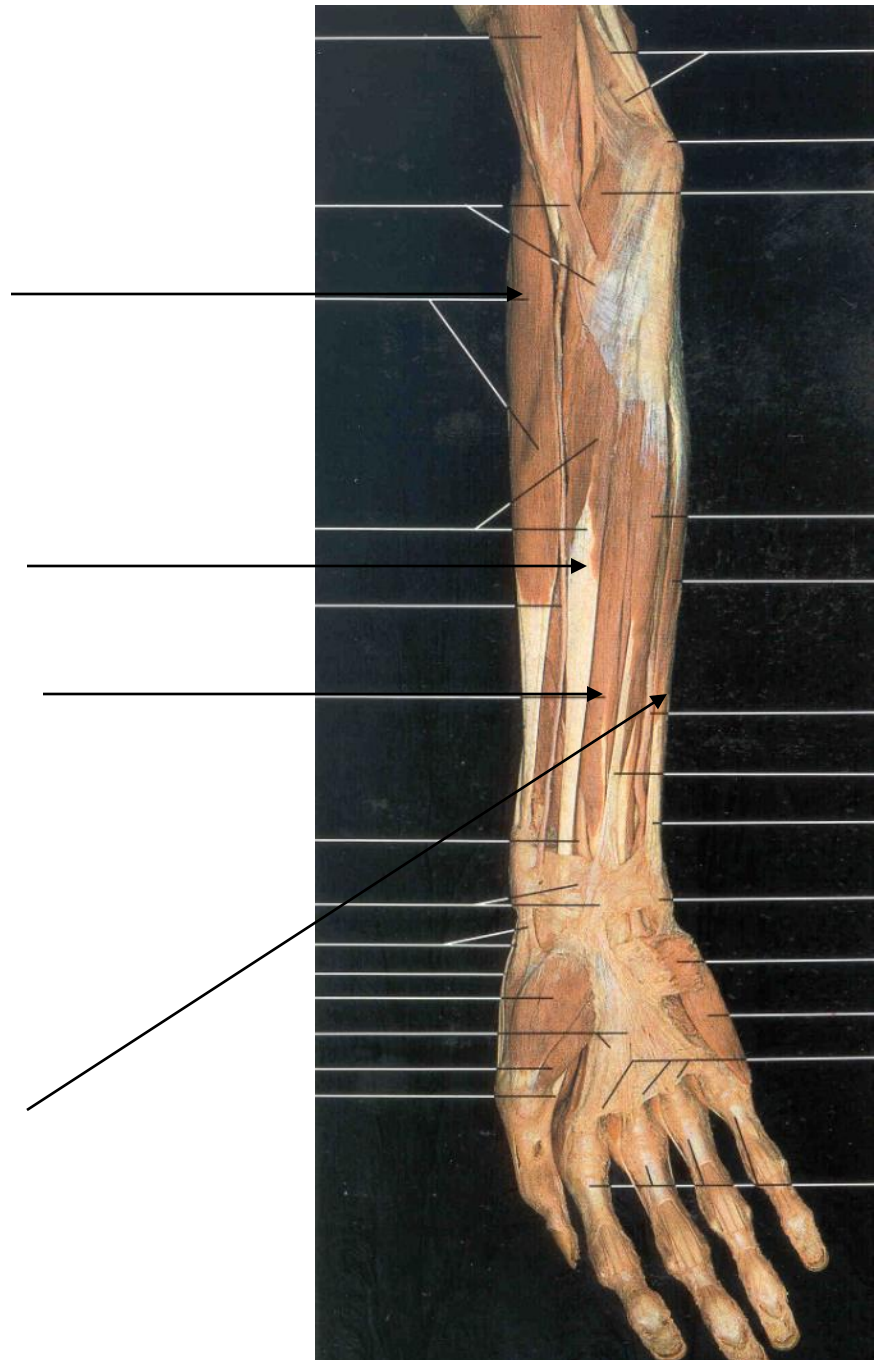
Action:
Flexes elbow



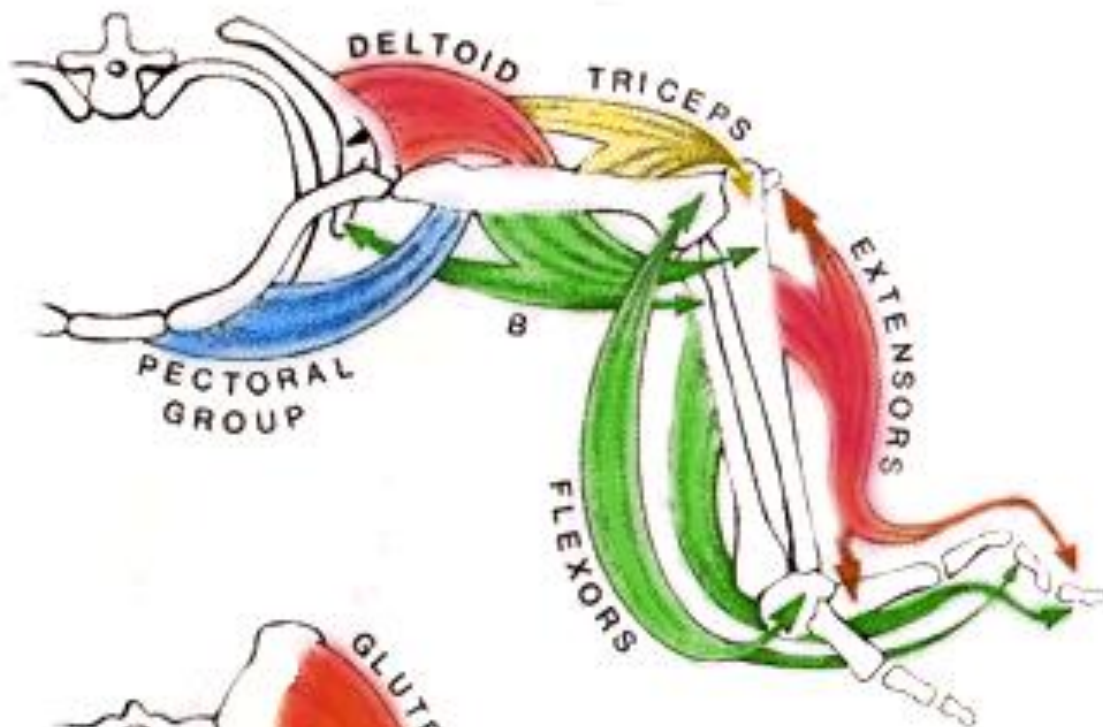
Brachioradialis

Flexor Carpi Radialis
Flexor Digitorum
Superficialis

Flexor Carpi Ulnaris



FLEXORS of the Wrist



Caudal/ventral



Flexors =
Flexors

Superficial Layer

Flexor carpi radialis

Median n.

Origin:

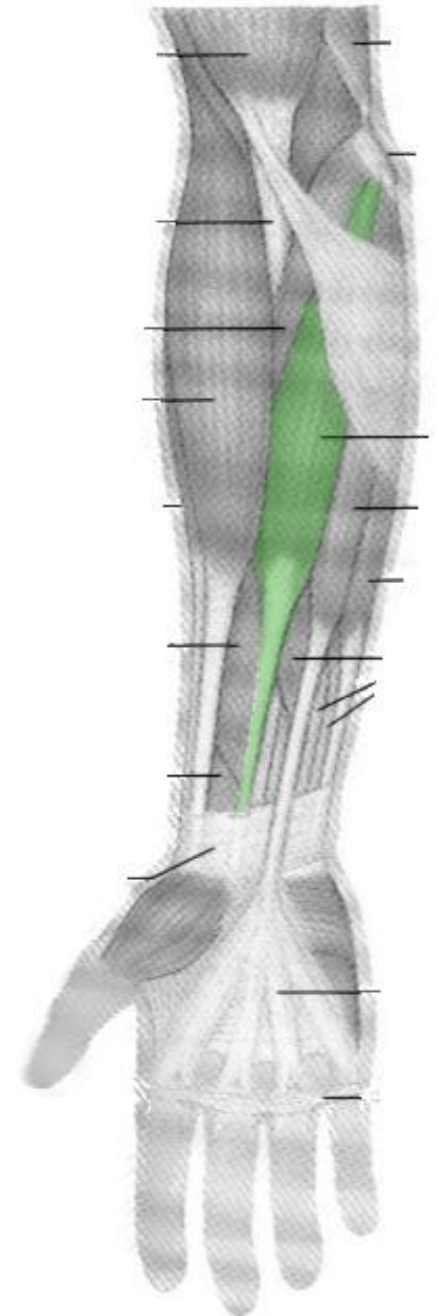
Medial epicondyle of humerus

Insertion:

Base of 2nd & 3rd metacarpals

Action:

Flexes wrist; abducts hand



Superficial Layer

Palmaris longus

Median n.

Origin:

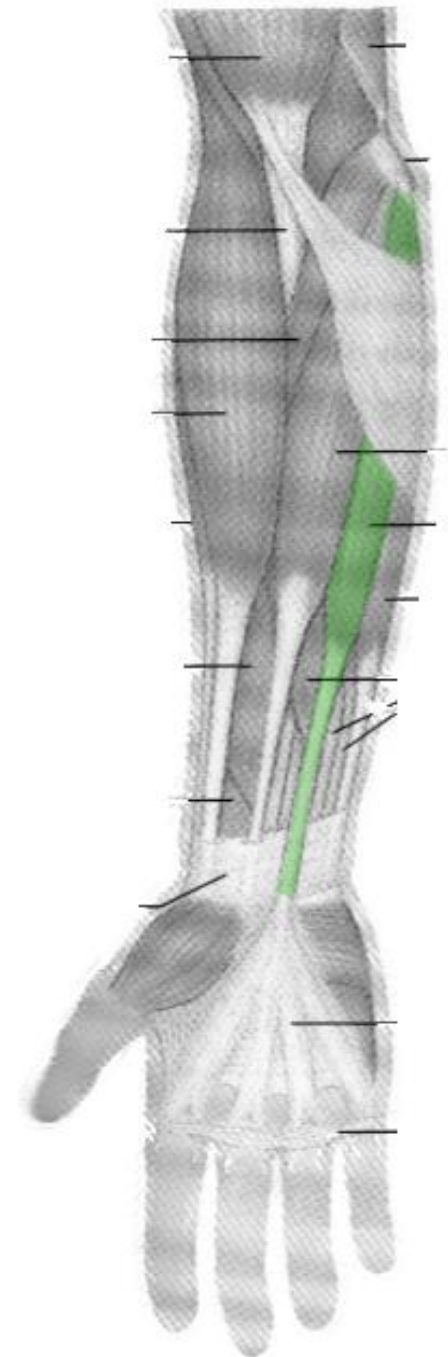
Medial epicondyle of humerus

Insertion:

Palmar aponeurosis

Action:

Flexes wrist



Superficial Layer

Flexor carpi ulnaris

Ulnar n.

Origin:

Medial epicondyle of humerus

Insertion:

Pisiform and base of 5th metacarpal

Action:

Flexes wrist; adducts hand



Intermediate Layer

**Flexor digitorum
superficialis**

Median n

Origin:

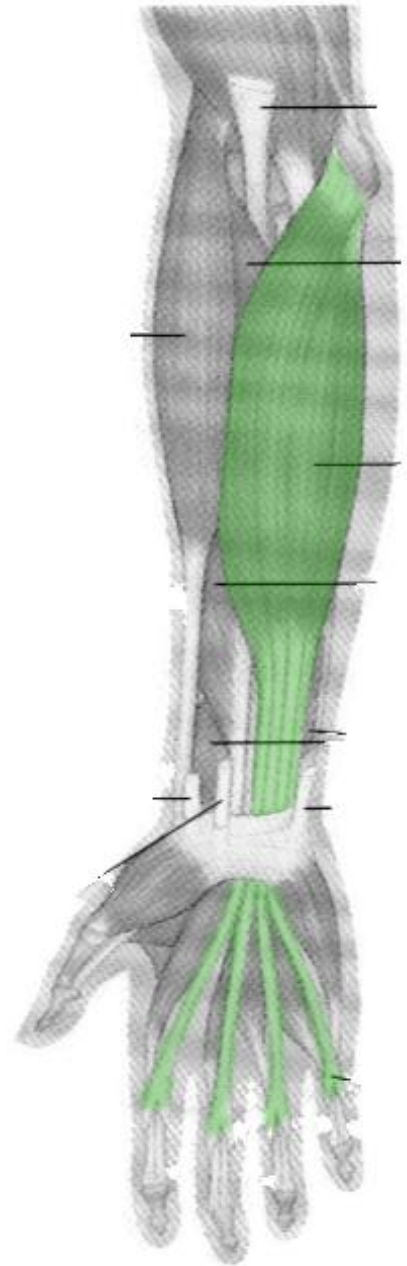
Medial epicondyle of humerus

Insertion:

Middle phalanges of fingers 2-5

Action:

**Flexes wrist and middle
phalanges**



Deep Layer

Flexor pollicis longus

Median n

Origin:

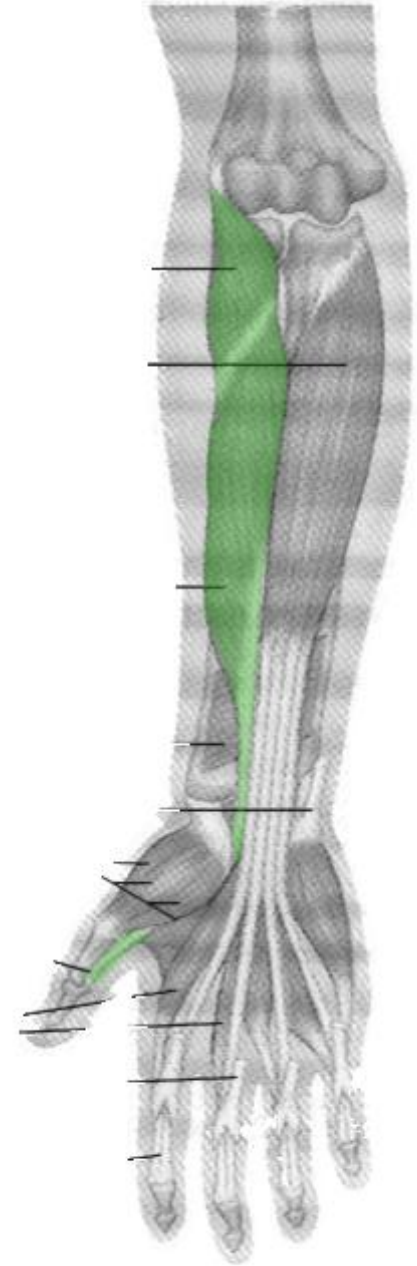
Anterior surface of radius

Insertion:

Distal phalanx of thumb

Action:

Flexes distal phalanx of thumb



Deep Layer

Flexor digitorum profundus

Median n

Origin:

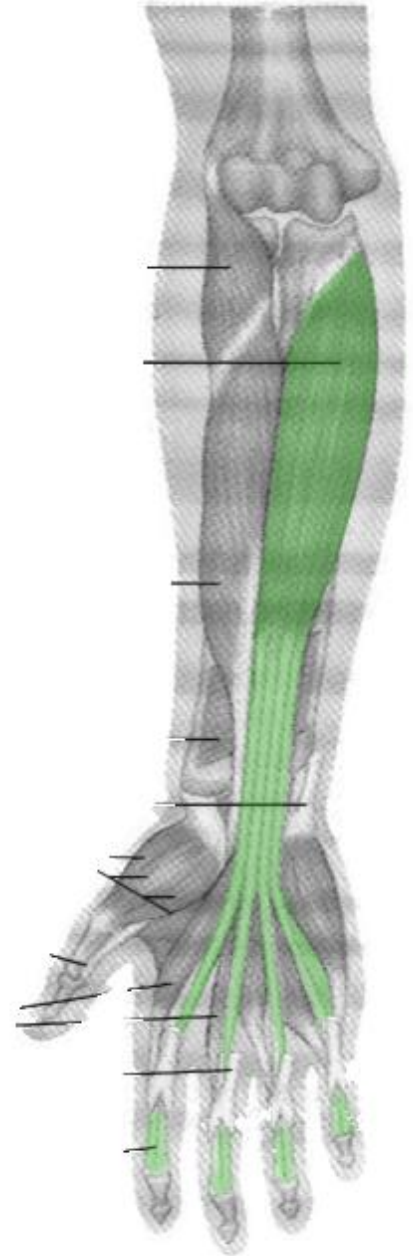
Anteromedial surface ulna

Insertion:

Distal phalanges of fingers 2-5

Action:

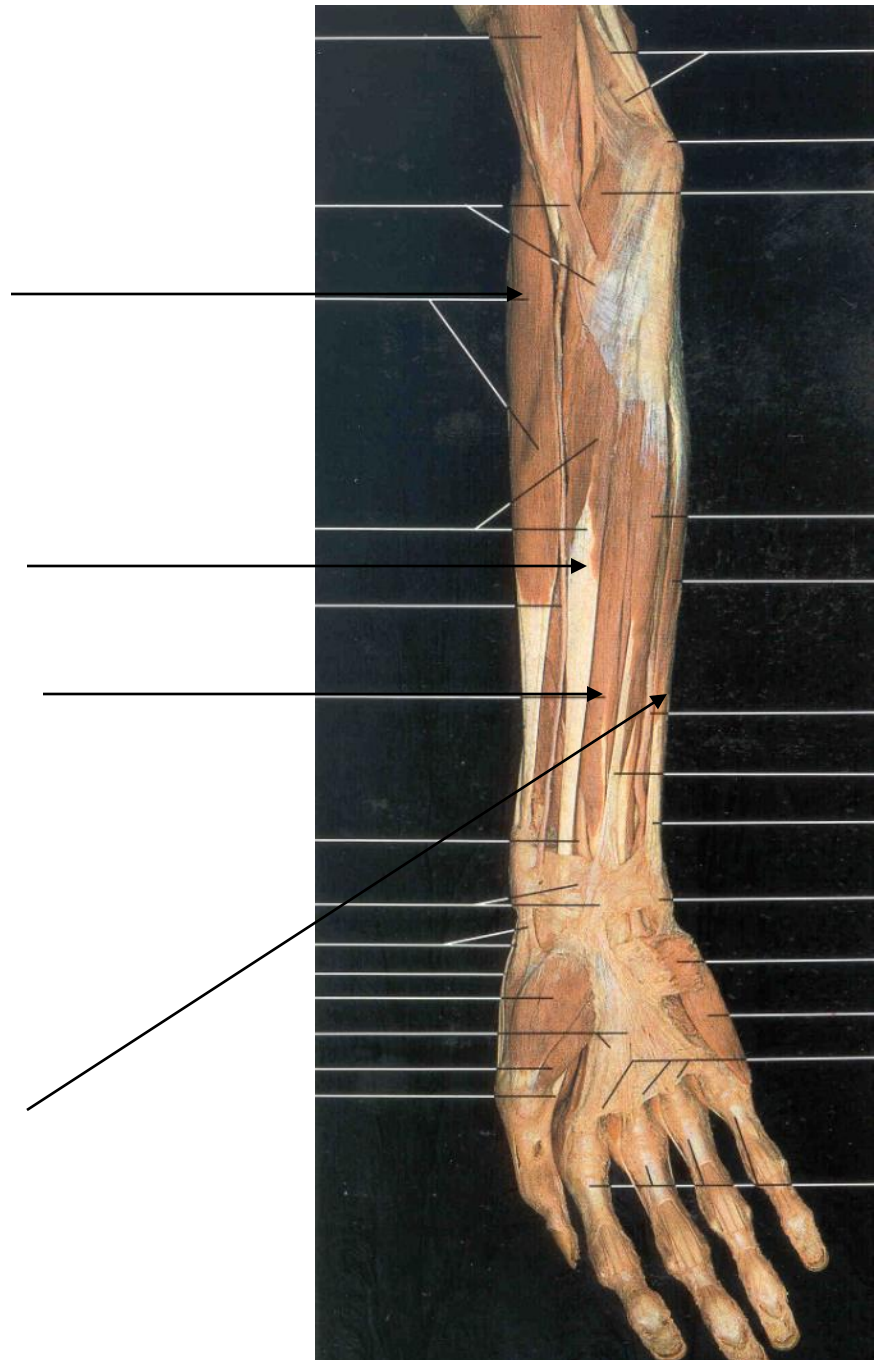
Flexes distal phalanges



Brachioradialis

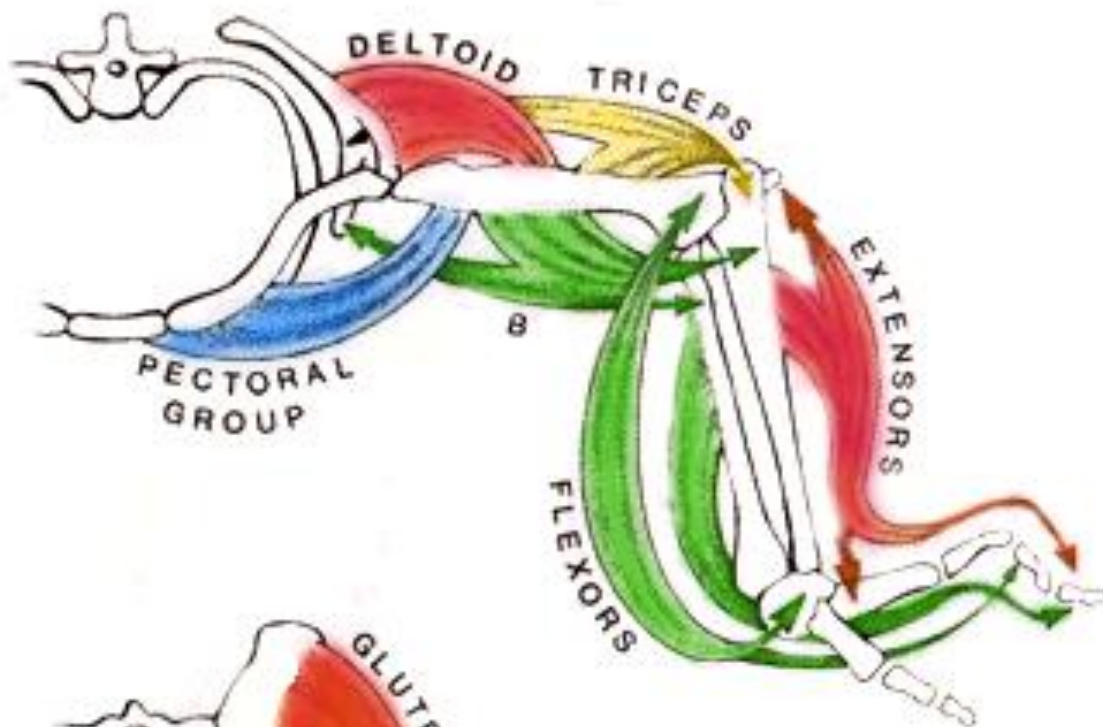
**Flexor Carpi Radialis
Flexor Digitorum
Superficialis**

Flexor Carpi Ulnaris



EXTENSORS

of the Wrist



Caudal/dorsal



**Extensors =
Extensors**

Superficial

Extensor carpi radialis brevis

Radial n.

Origin:

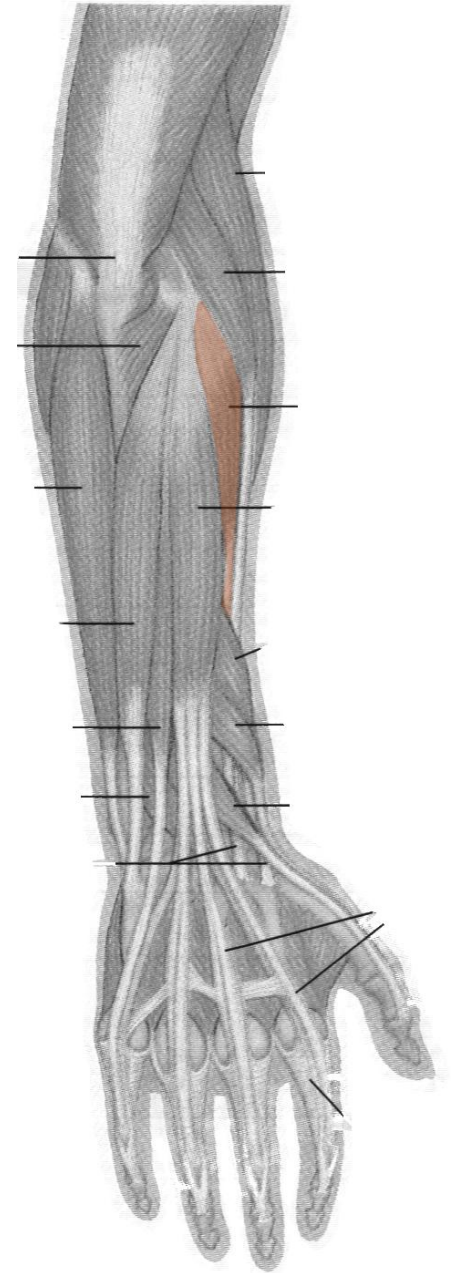
Lateral epicondyle of
humerus

Insertion:

Base of 3rd metacarpal

Action:

Extends and abducts wrist



Superficial

Extensor digitorum minimi Radial n.

Origin:

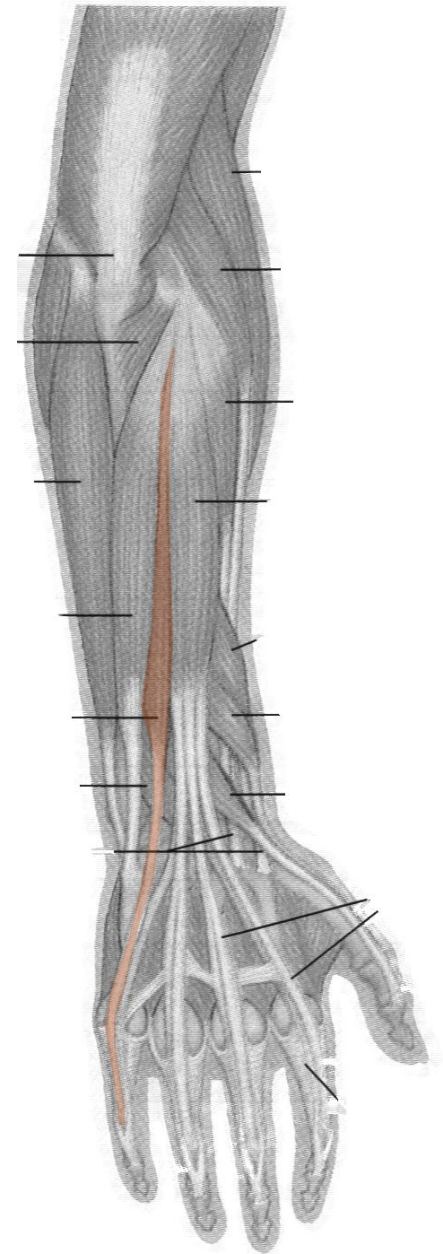
Lateral epicondyle of humerus

Insertion:

Distal phalange of little finger

Action:

Extends little finger



Superficial

Extensor digitorum Radial n.

Origin:

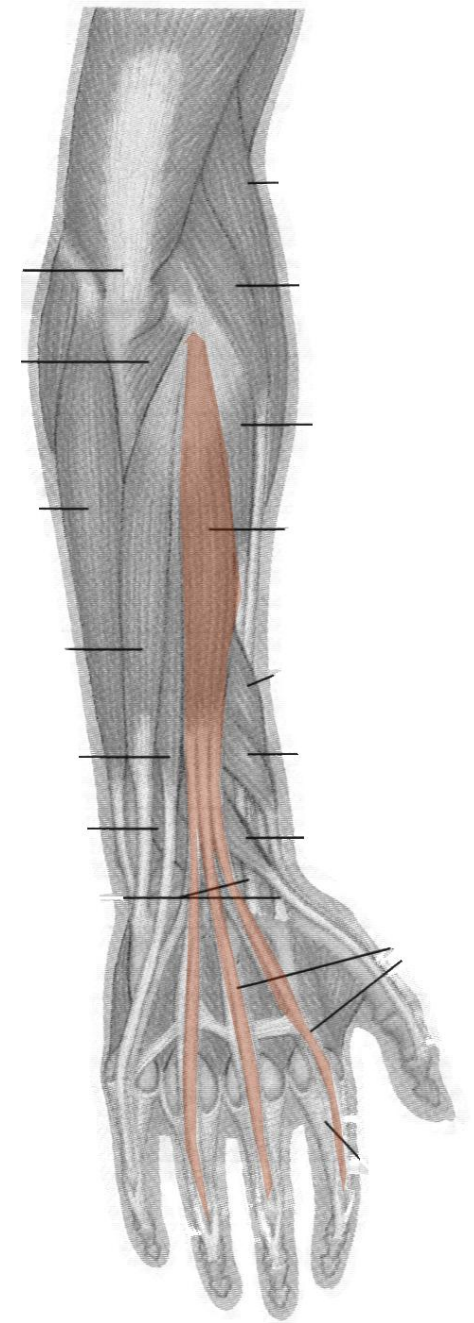
Lateral epicondyle of humerus

Insertion:

Distal phalange of fingers 2-4

Action:

**Extends fingers and wrist;
abduct fingers**



**Extensor Carpi
Ularis**

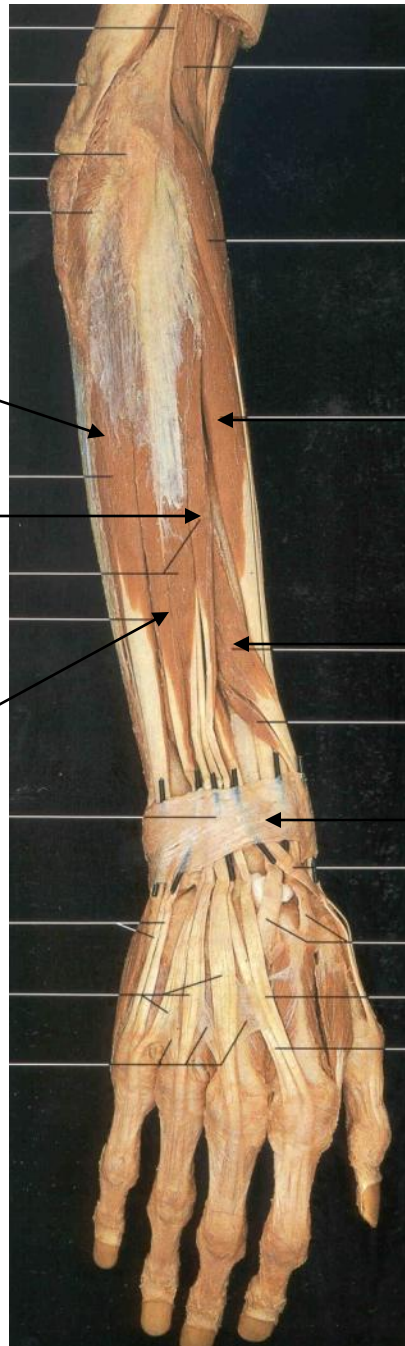
**Extensor
Indicis**

**Extensor
Digitorum
Superficialis**

**Extensor Carpi
Radialis**

**Abductor Pollicis
Longus**

**Extensor
Retinaculum**



Deep

Extensor indices

Radial n.

Origin:

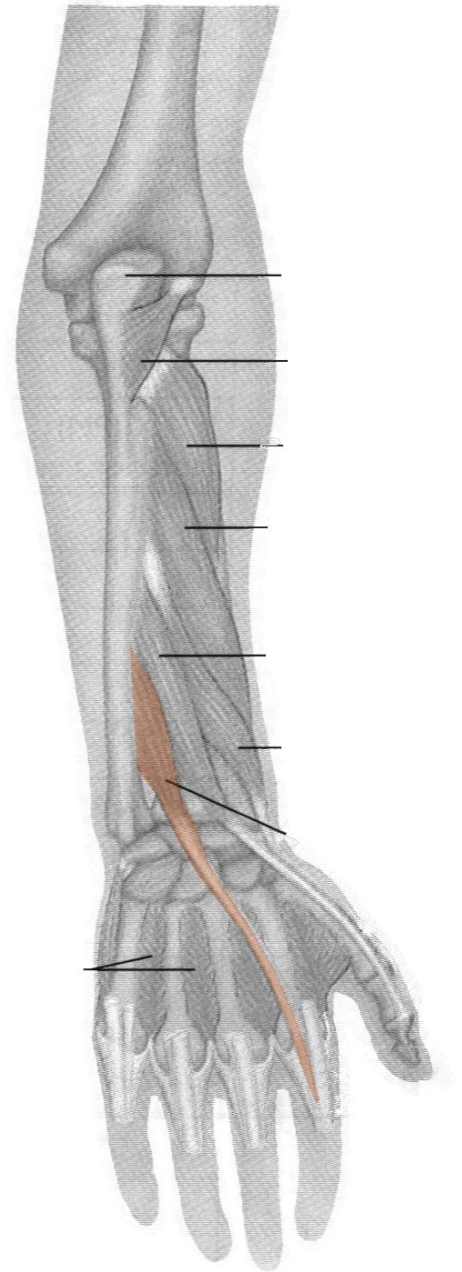
Posterior surface of distal ulna

Insertion:

Extensor expansion of index finger

Action:

Extends index finger



Deep

Extensor pollicis longus Radial n.

Origin:

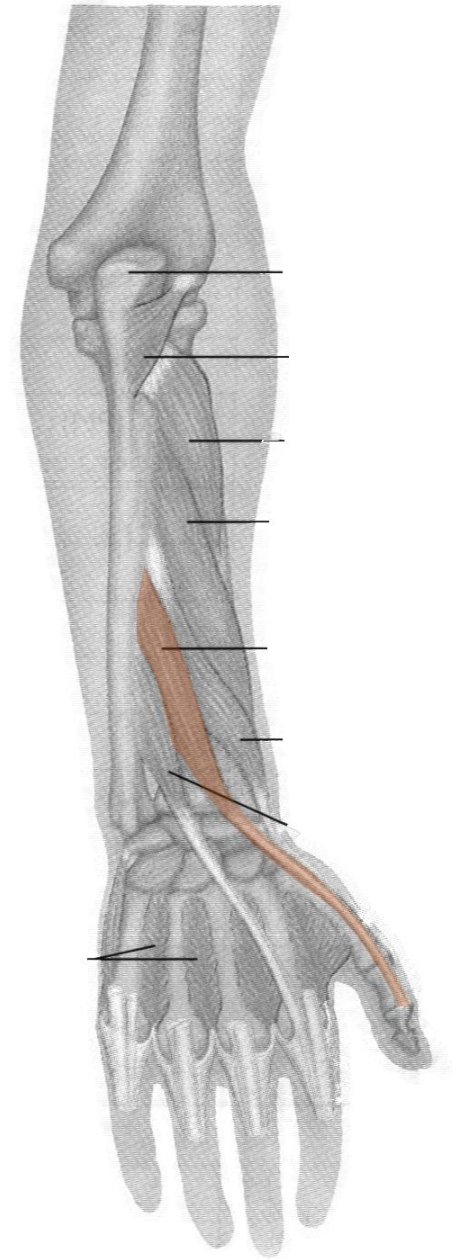
Dorsal shaft of radius and ulna

Insertion:

Base of distal phalanx of thumb

Action:

Extends thumb



Deep

Extensor pollicis brevis Radial n.

Origin:

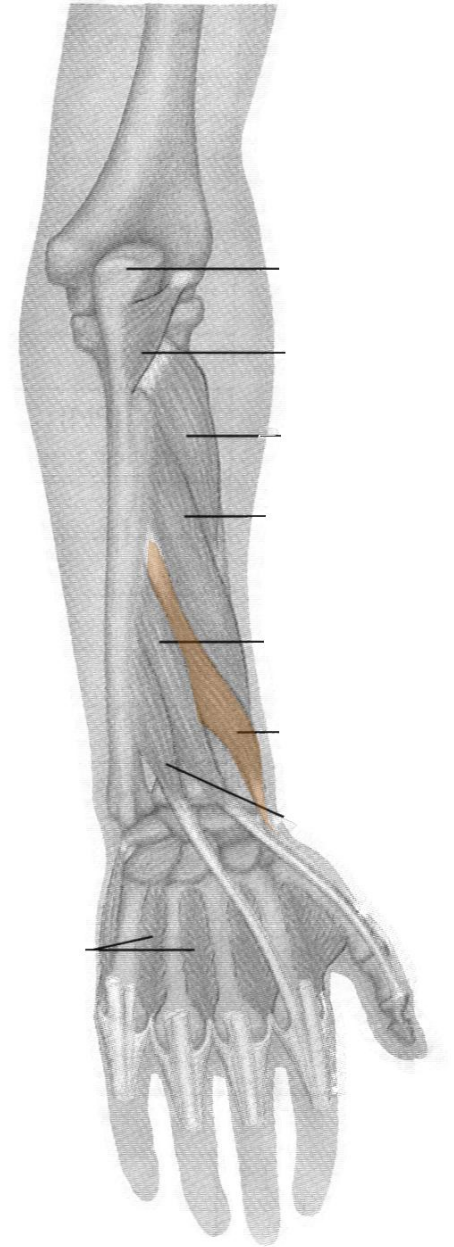
Dorsal shaft of radius and ulna

Insertion:

Base of proximal phalanx of thumb

Action:

Extends thumb



Deep

Abductor pollicis longus Radial n.

Origin:

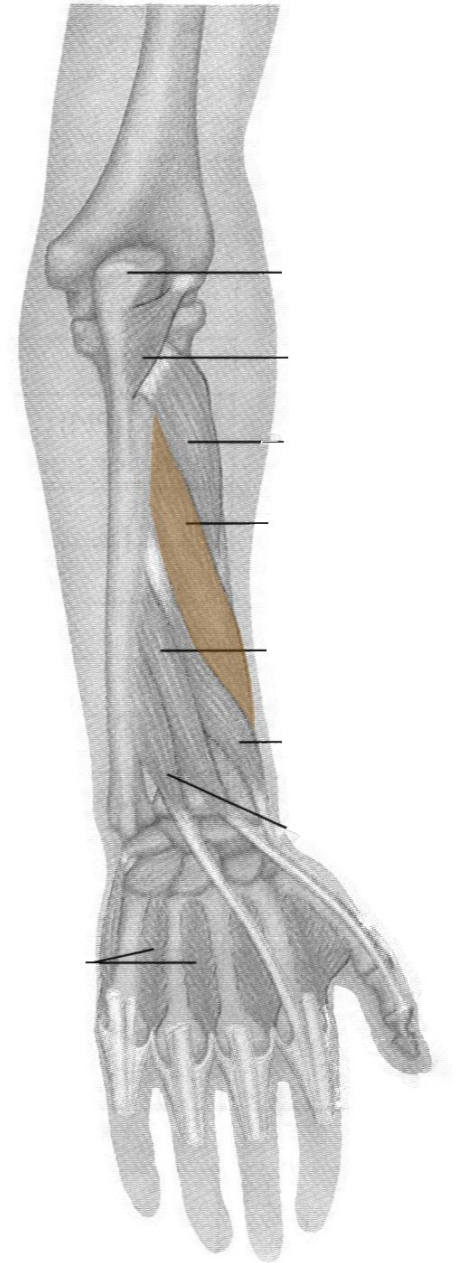
**Posterior surface of radius and
ulna**

Insertion:

Base of 1st metacarpal

Action:

Abducts and extends thumb



Muscles of Pronation and Supination

Deep

Abductor pollicis longus Radial n.

Origin:

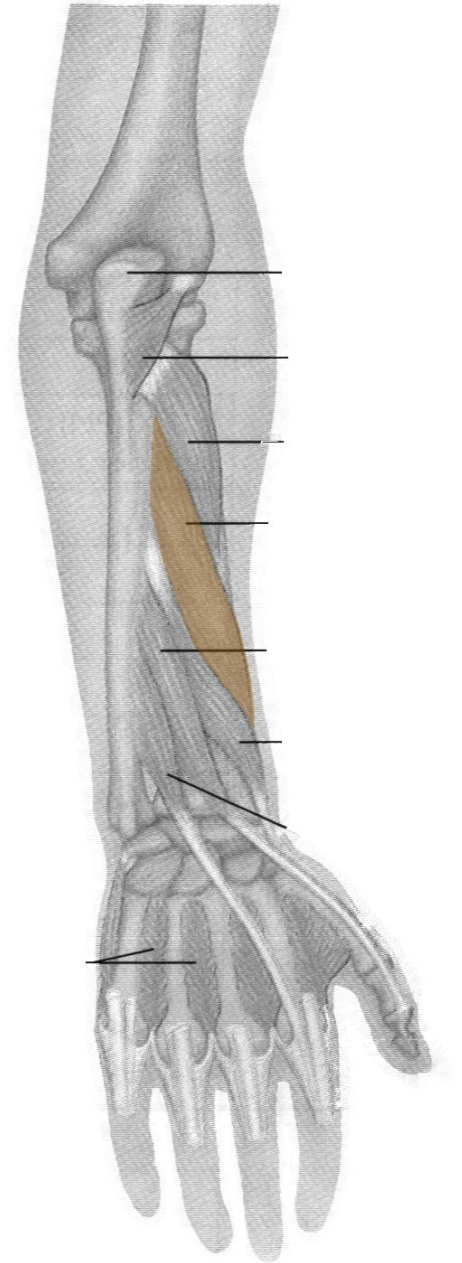
**Posterior surface of radius and
ulna**

Insertion:

Base of 1st metacarpal

Action:

Abducts and extends thumb

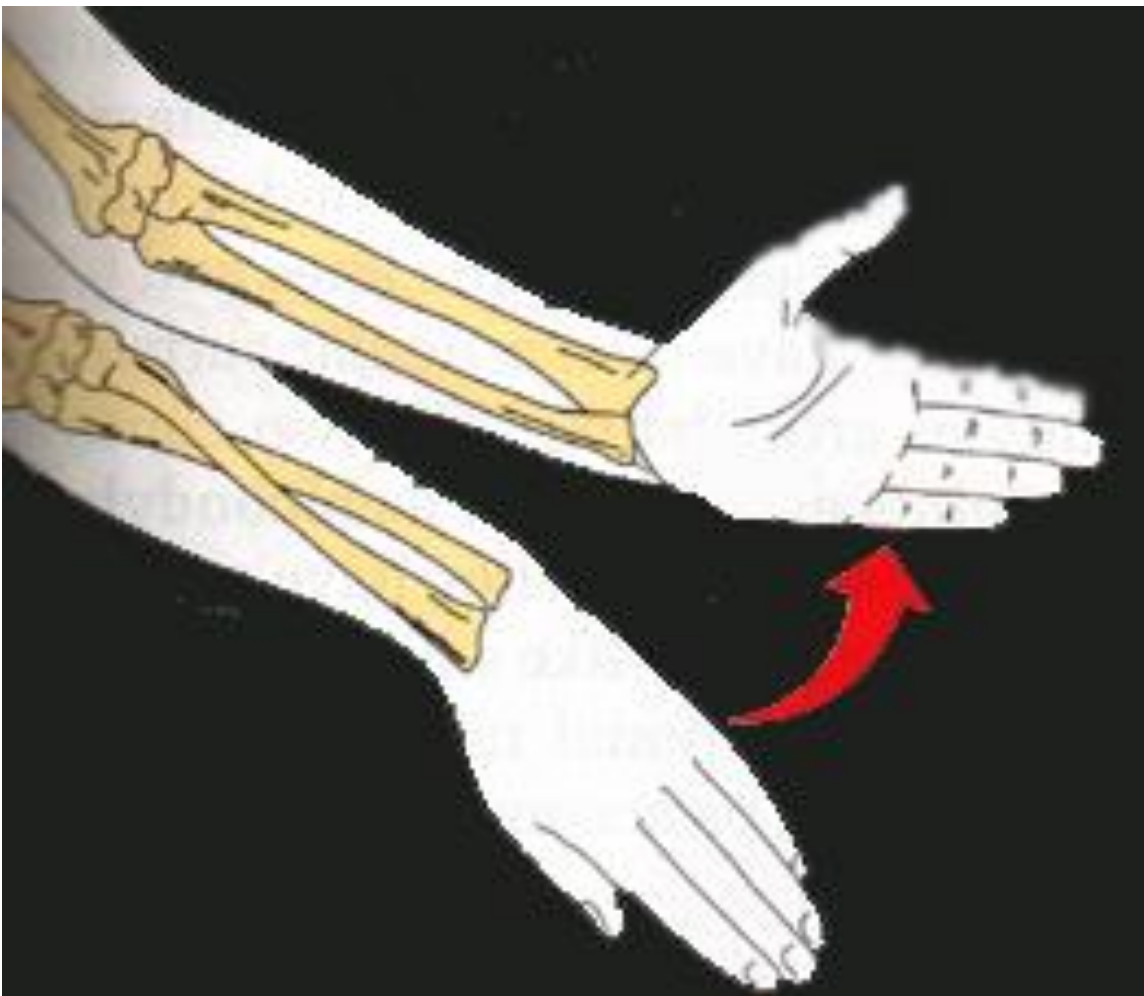


Supination:

Movement of the radius and ulna

Lateral rotation of the arm so palm faces superiorally

(anatomical position)



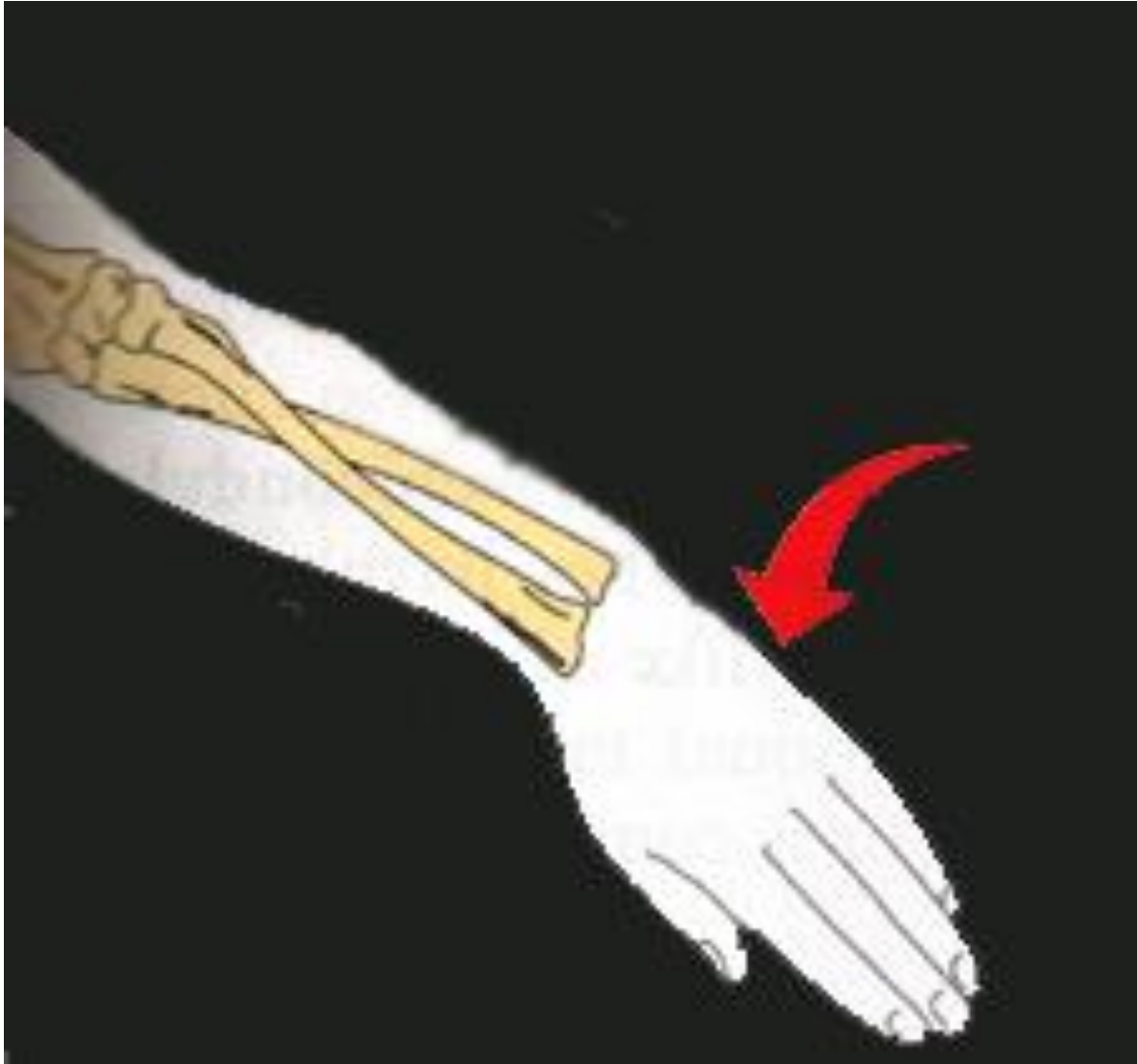
**Ulna and
Radius are
parallel**

Pronation:

Opposite of supination

**Medial rotation of the arm
so palm faces inferiorly**

Relaxed position



**Ulna and
Radius are
crossed**

Supination

Supinator

Radial n.

Origin:

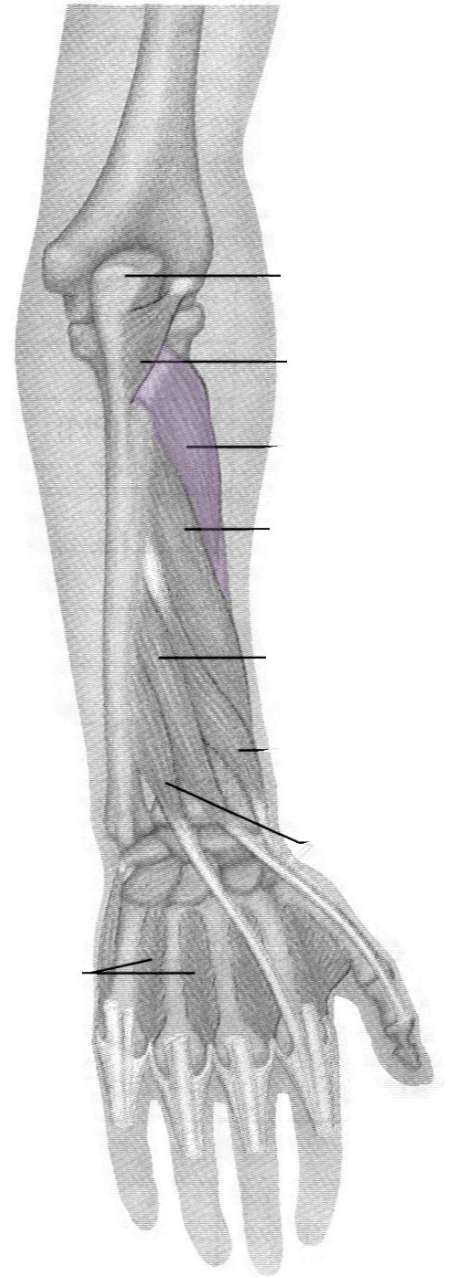
Lateral epicondyle of humerus

Insertion:

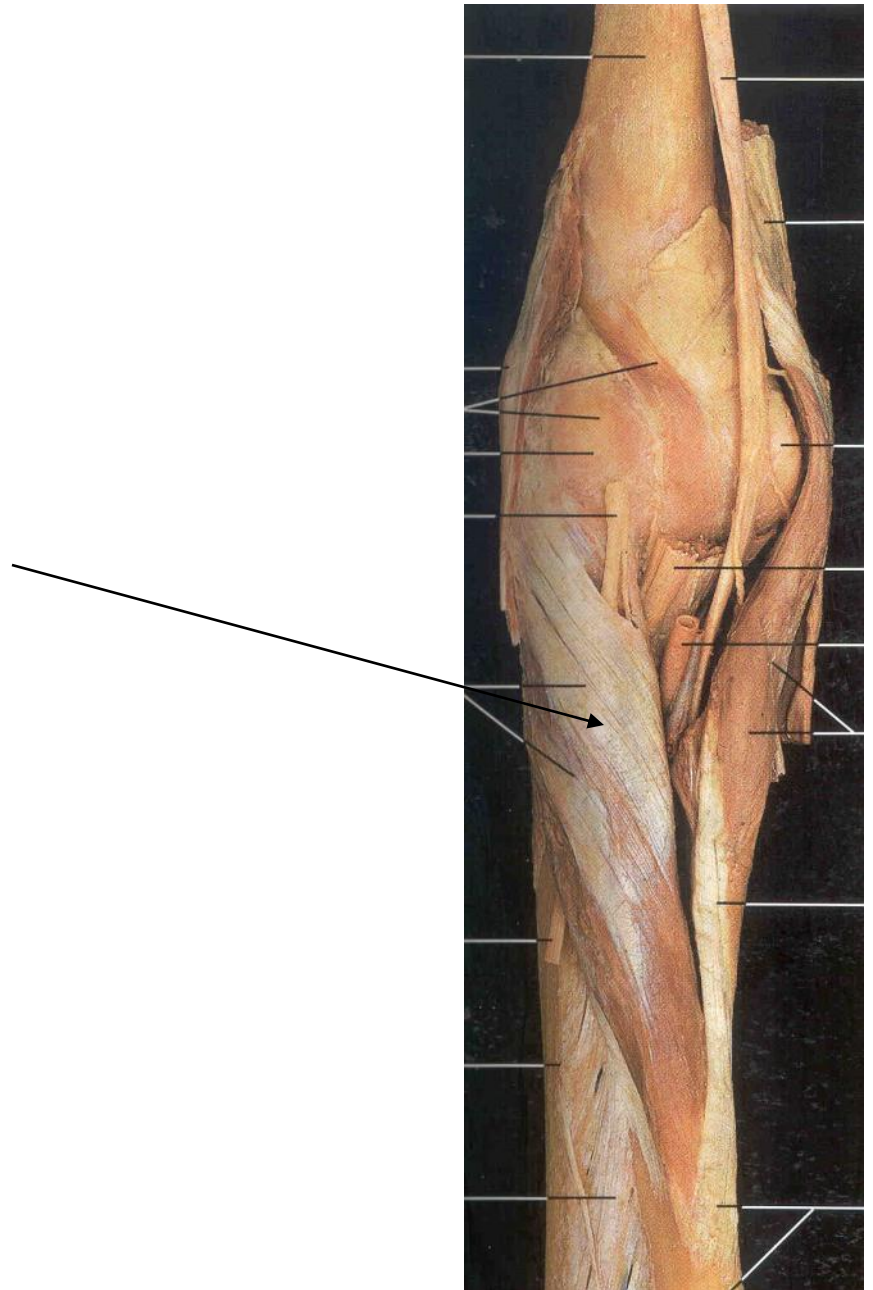
Proximal end of radius

Action:

Supinates forearm



Supinator



Supination

Biceps brachii musculocutaneous n.

Origin:

Short head: coracoid process

Long head; glenoid fossa

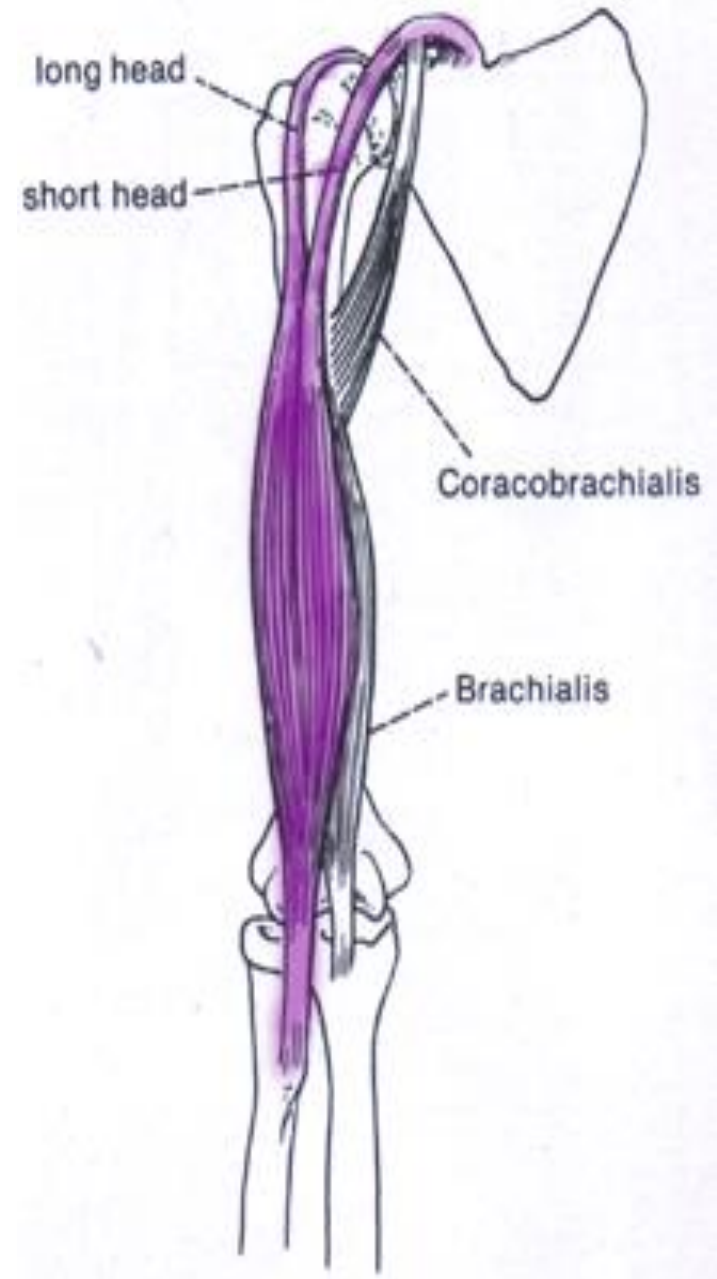
Insertion:

Proximal radius

Action:

Flexes elbow

supinates



Pronation

Pronator teres Median n.

Origin:

Medial condyle of humerus

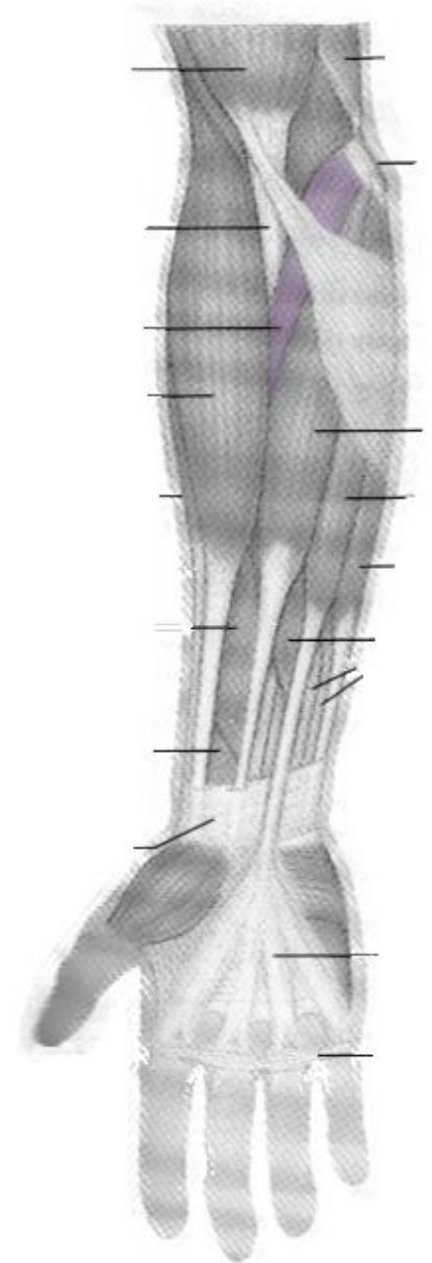
Coronoid process of ulna

Insertion:

Lateral radius (midshaft)

Action:

Pronates forearm



Pronation

Pronator quadratus

Median n.

Origin:

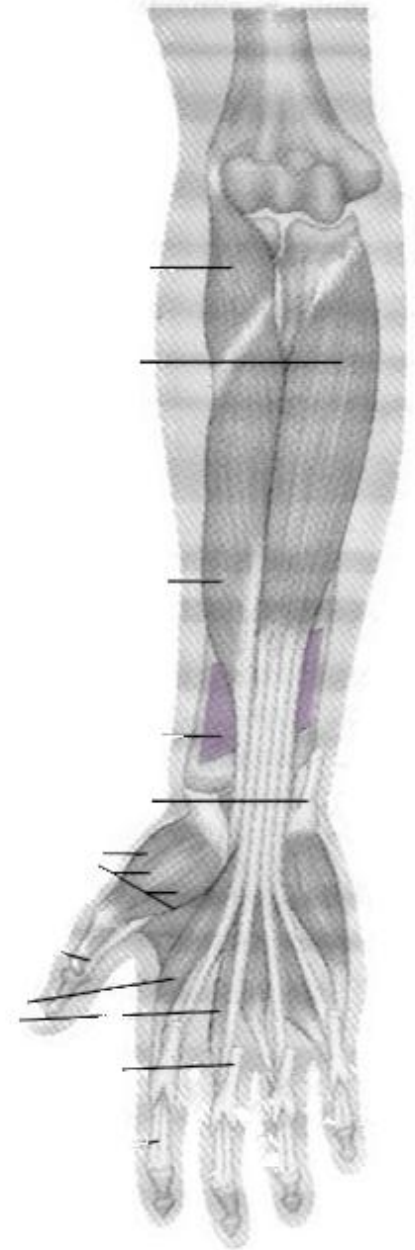
Distal portion of anterior ulnar shaft

Insertion:

Distal surface of anterior radius

Action:

Pronates forearm



Pronator Teres

**Pronator
Quadratus**

