Muscles of the Pectoral Region

MUSCLES OF THE PECTORAL REGION

MEDMENTOR EDU | UPPER LIMB ANATOMY | MBBS • NEET PG • INI-CET

1. General Overview

The muscles of the pectoral region connect the upper limb to the anterior thoracic wall and play an important role in shoulder movements, scapular stabilisation and upper-limb mobility.

The four important muscles are:

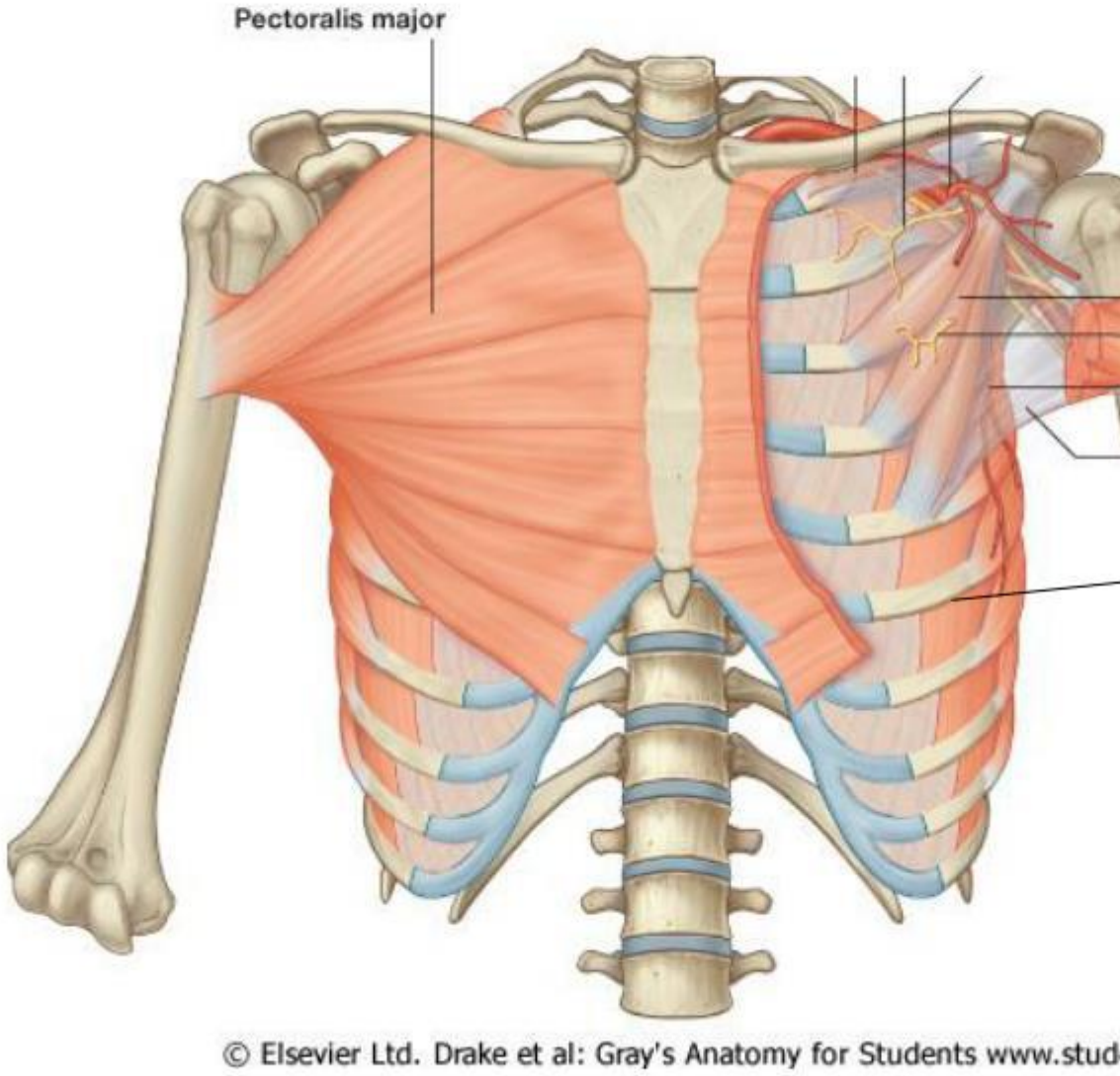
1. Pectoralis major
2. Pectoralis minor
3. Subclavius
4. Serratus anterior — situated on the lateral thoracic wall and functionally associated with the pectoral region.

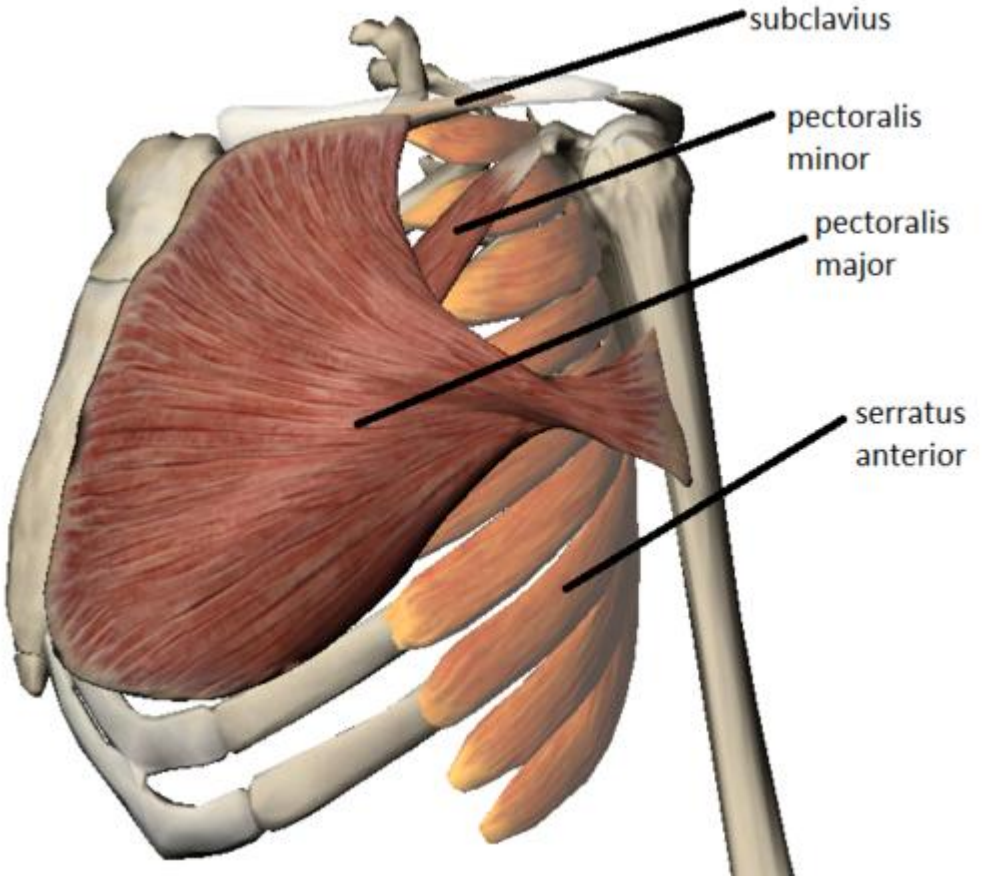
Classification

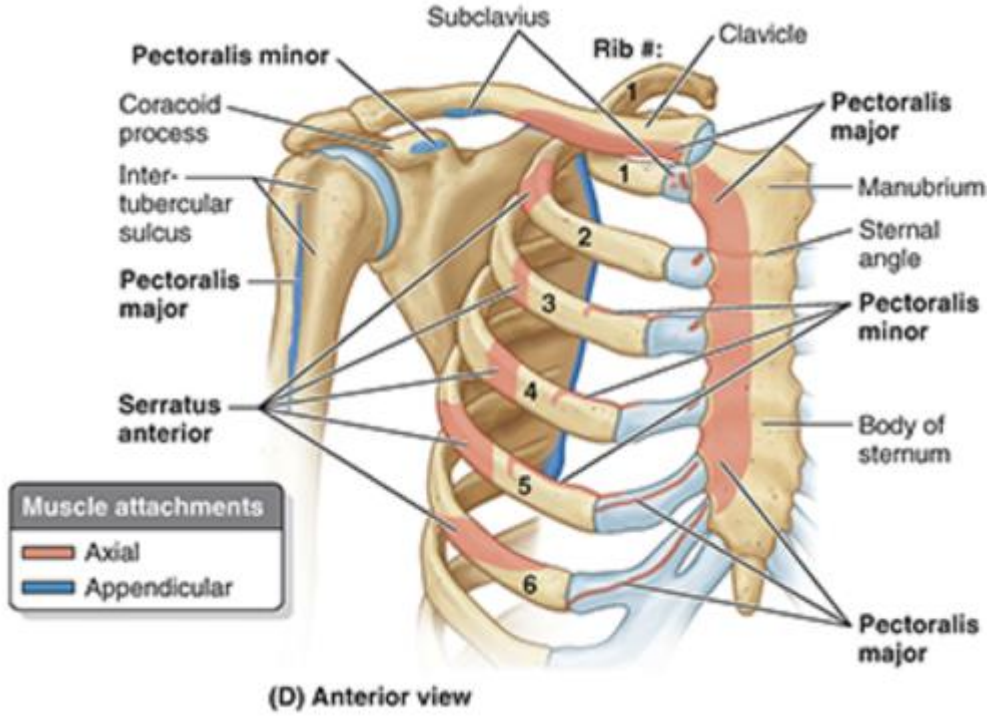
MUSCLE	LOCATION	PRINCIPAL FUNCTION
Pectoralis major	Superficial anterior chest wall	Adduction and medial rotation of arm
Pectoralis minor	Deep to pectoralis major	Scapular stabilisation

Subclavius	Inferior to clavicle	Stabilisation of clavicle
Serratus anterior	Lateral thoracic wall	Scapular protraction and upward rotation

Ant. Thoracic muscles





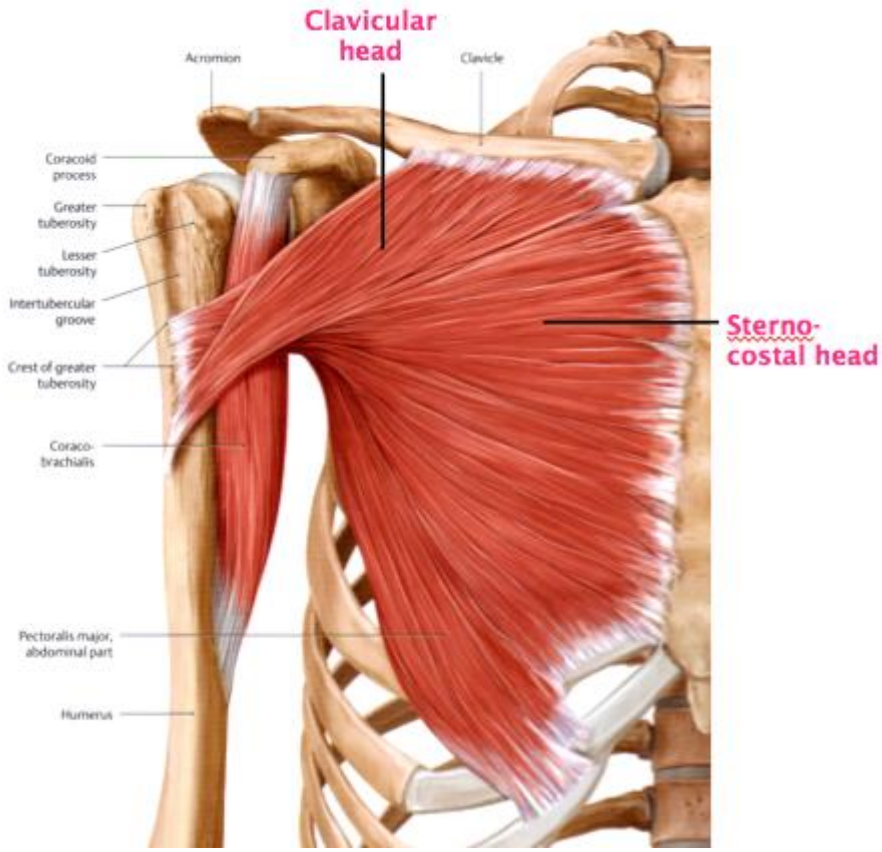


(D) Anterior view

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2. Pectoralis Major

- A large, thick, fan-shaped muscle covering the upper anterior thoracic wall.
- Forms the anterior axillary fold.
- Consists of two major parts: clavicular head and sternocostal head.



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Origin, insertion and nerve supply

FEATURE	DESCRIPTION
Clavicular head	Anterior surface of medial half of clavicle

Sternocostal head	Anterior sternum, upper six costal cartilages and aponeurosis of external oblique
Insertion	Lateral lip of intertubercular sulcus of humerus
Nerve supply	Lateral pectoral nerve (C5–C7) and medial pectoral nerve (C8–T1)
Main arterial supply	Pectoral branch of thoracoacromial artery, with additional contributions

Actions

- Adduction: Brings the arm towards the trunk.
- Medial rotation: Rotates the humerus internally.
- Clavicular head: Flexes the arm at the shoulder joint.
- Sternocostal head: Extends the arm from a flexed position towards the anatomical position.
- Assists forceful movements such as pushing, climbing and throwing.

Important anatomical relationships

- Superficial to pectoralis minor.
- Covered by pectoral fascia.
- Forms the medial boundary of the deltopectoral groove.
- Its inferolateral border forms the anterior axillary fold.
- Medial and lateral pectoral nerves enter its deep surface.

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Clinical anatomy

Pectoralis major rupture

- May occur during heavy resistance exercises, particularly bench pressing.
- Usually involves the tendon near its humeral insertion.
- Produces pain, bruising and weakness of adduction or medial rotation.
- Loss of the normal anterior axillary fold may be visible.

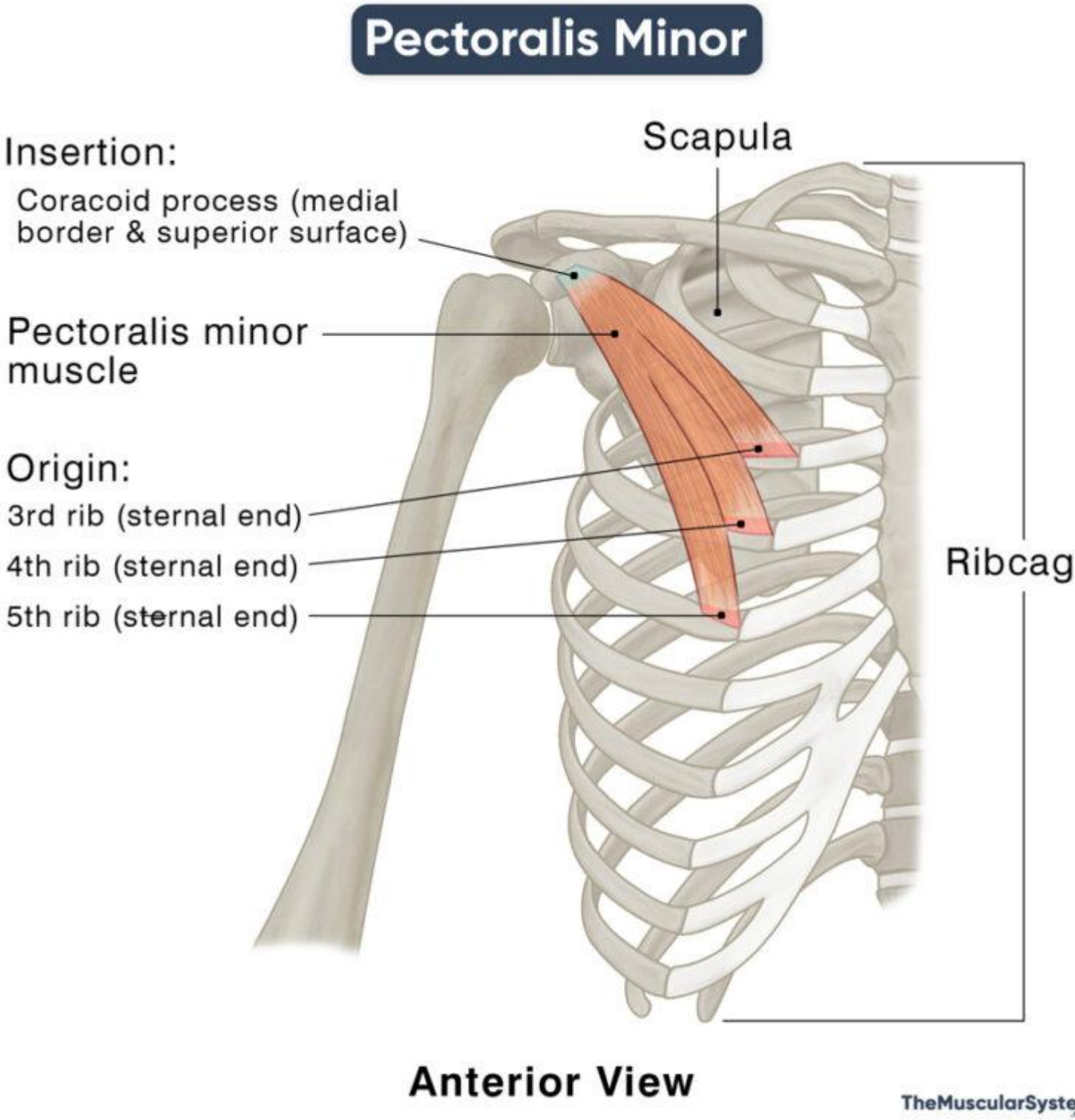
Surgical importance

- Important landmark during breast and axillary surgery.
- Generally preserved during modified radical mastectomy.
- Its neurovascular supply must be considered during surgical dissection.

Must know: Pectoralis major is supplied by both medial and lateral pectoral nerves, despite the names of these nerves.

3. Pectoralis Minor

- A thin, triangular muscle situated deep to pectoralis major.
- Extends from the upper ribs to the coracoid process of the scapula.
- Important in scapular stabilisation and as a landmark for axillary vessels.



themuscularsystem.com

Origin, insertion and nerve supply

FEATURE	DESCRIPTION
Origin	External surfaces of ribs 3, 4 and 5 near costal cartilages
Insertion	Medial border and superior surface of coracoid process
Nerve supply	Medial pectoral nerve (C8–T1)
Arterial supply	Pectoral branch of thoracoacromial artery and contributions from nearby vessels



NCBI Bookshelf

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Actions

- Draws the scapula forwards and downwards against the thoracic wall.
- Assists in stabilising the scapula during movements of the upper limb.
- Can act as an accessory muscle of forced inspiration when the scapula is fixed.

Important anatomical relationships

- Lies beneath pectoralis major.
- Enclosed by the clavipectoral fascia.
- The medial pectoral nerve commonly pierces the muscle or passes around its border.

- Lies anterior to the second part of the axillary artery.

Relationship to axillary artery

Pectoralis minor divides the axillary artery into three parts.

First part

Medial (proximal) to muscle

Second part

Posterior to muscle

Third part

Lateral (distal) to muscle

Clinical anatomy

Pectoralis minor syndrome

- Compression of parts of the brachial plexus or axillary vessels beneath pectoralis minor may produce neurovascular symptoms.
- May occur in association with muscle tightness, repetitive overhead activity or altered shoulder mechanics.
- Symptoms can include pain, paraesthesia and occasionally vascular complaints.

Surgical importance

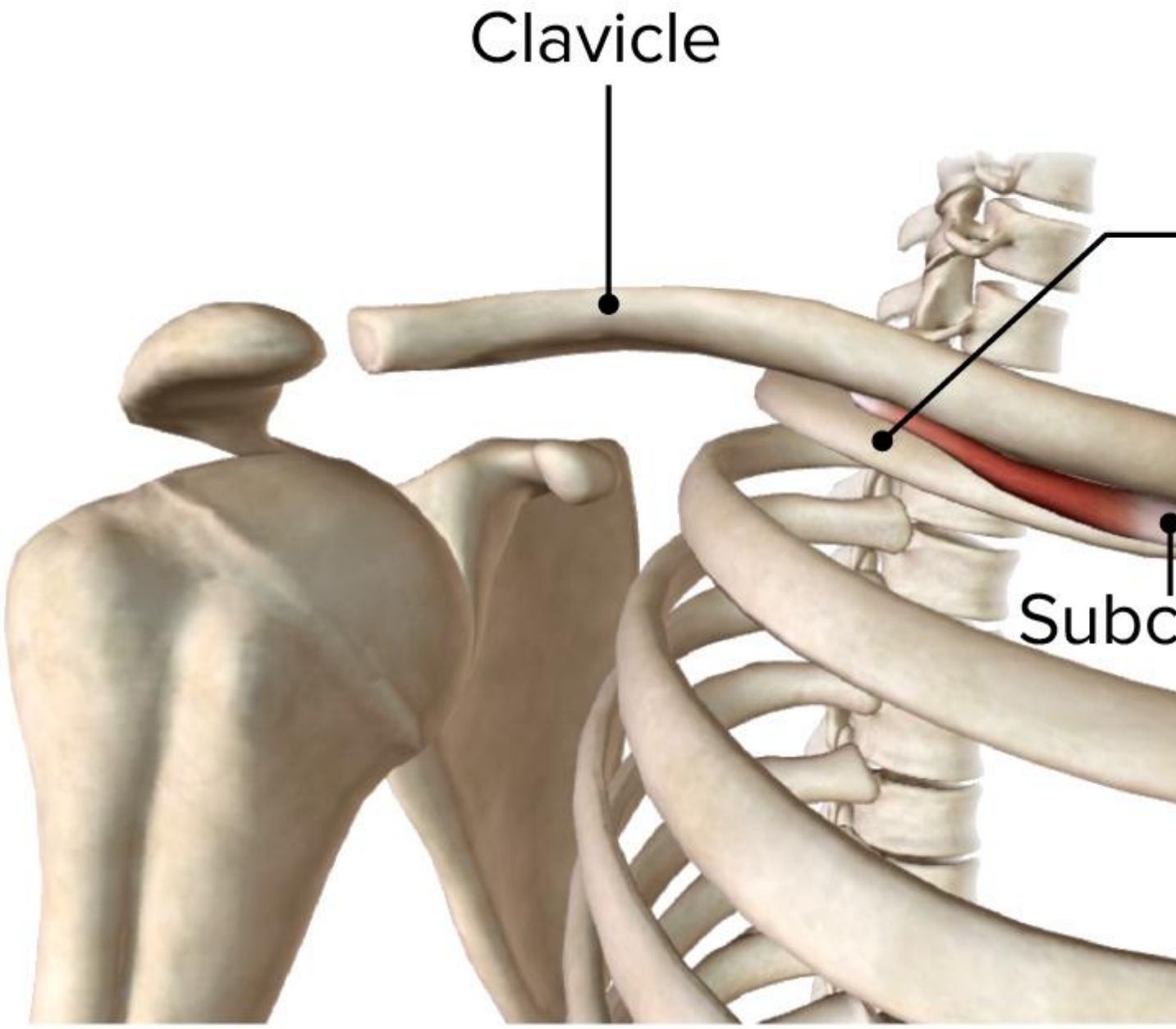
- Landmark for defining the three parts of the axillary artery.
- Used to classify axillary lymph nodes into levels I, II and III.

Viva pearl: The medial pectoral nerve arises from the medial cord of the brachial plexus, principally carrying fibres from C8–T1.

4. Subclavius

- A small, elongated muscle located immediately inferior to the clavicle.

- Lies within the upper portion of the clavipectoral fascia.
- Important for stabilisation of the sternoclavicular region.



Origin, insertion and nerve supply

FEATURE	DESCRIPTION
Origin	Junction of first rib and its costal cartilage
Insertion	Subclavian groove on inferior surface of middle third of clavicle
Nerve supply	Nerve to subclavius (C5–C6)
Arterial supply	Clavicular branch of thoracoacromial artery

Actions

- Anchors and stabilises the clavicle during movements of the shoulder girdle.
- Assists in depression of the clavicle.
- Helps maintain stability of the sternoclavicular joint.

Clinical anatomy

Clavicular fractures

- Subclavius lies between the clavicle and the deeper subclavian vessels and brachial plexus.
- May provide a degree of mechanical protection to these structures.
- However, severe clavicular fractures may still produce neurovascular injury.

Surgical relevance

- The nerve to subclavius may occasionally be considered as a donor nerve during selected brachial plexus reconstruction procedures.
- Such use is specialised and depends on the injury pattern and surgical assessment.

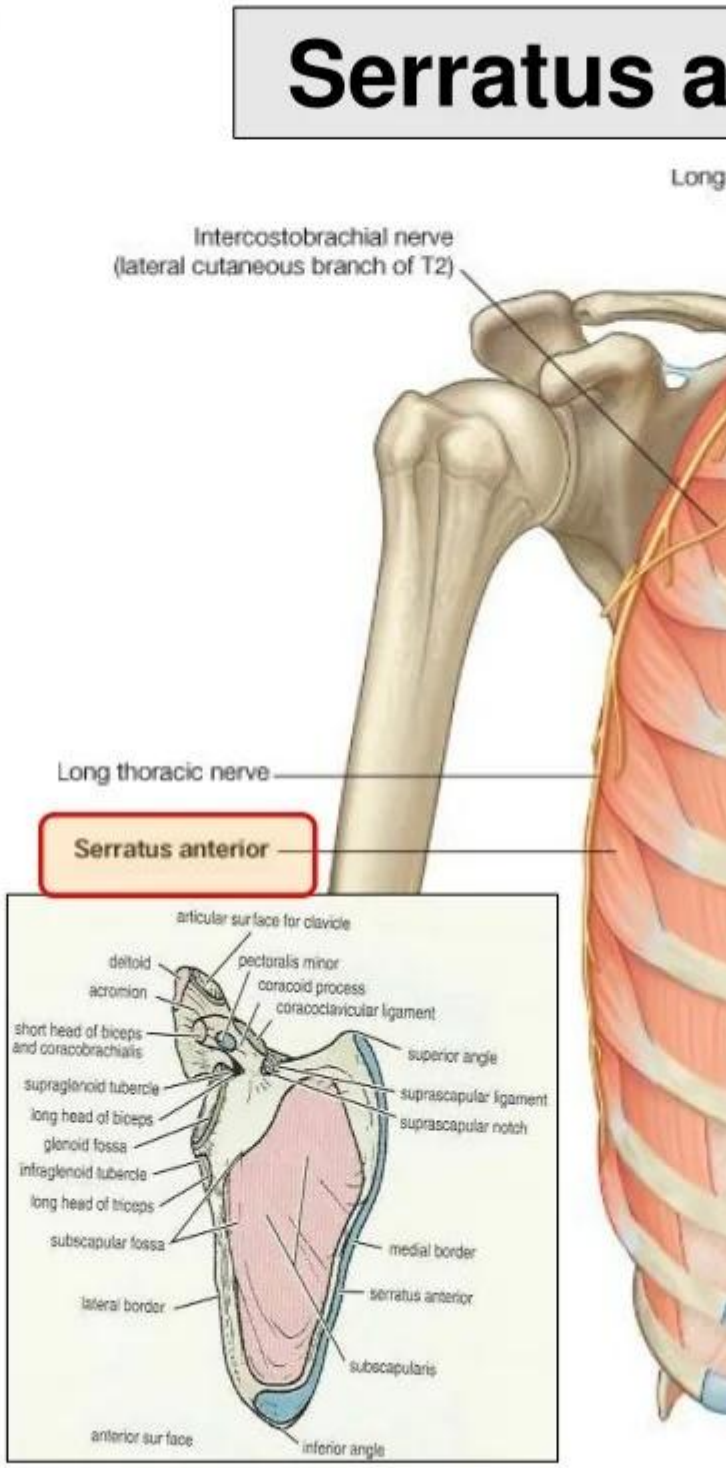
Must know: Subclavius is supplied by the nerve to subclavius (C5–C6), arising from the upper trunk of the brachial plexus.

5. Serratus Anterior

- A broad, flat muscle covering the lateral thoracic wall.
- Characterised by multiple serrated, finger-like digitations arising from the upper ribs.
- Holds the scapula against the thoracic wall.
- Essential for protraction and upward rotation of the scapula.

Origin:

- Upper eight ribs.
- **Insertion:**
- anterior aspect of the medial border and inferior angle of scapula.
- **Nerve supply:**
- Long thoracic nerve.
- **Action:**
- Draws the scapula forward in boxing, (protrusion).
- Rotates scapula outwards in raising the arm above 90 degree.



slideserve.com

Origin, insertion and nerve supply

FEATURE	DESCRIPTION
Origin	Outer surfaces of upper 8–9 ribs
Insertion	Costal (anterior) surface of medial border of scapula, particularly its inferior angle
Nerve supply	Long thoracic nerve (C5–C7)
Arterial supply	Lateral thoracic, thoracodorsal and superior thoracic arterial contributions



Pectoral Region & Breast

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Actions

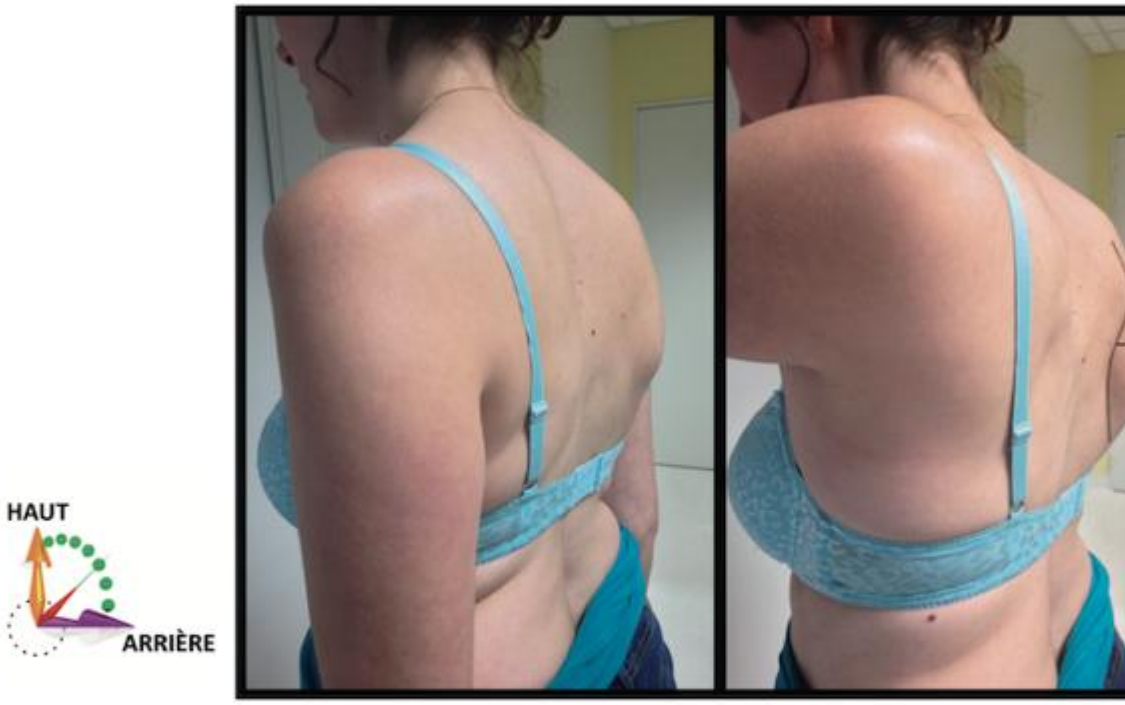
- Protraction of scapula: Moves the scapula forwards around the thoracic wall.
- Upward rotation: Rotates the glenoid cavity superiorly during overhead arm elevation.
- Holds the medial border of scapula firmly against the thoracic wall.
- Works with trapezius during elevation of the arm above shoulder level.

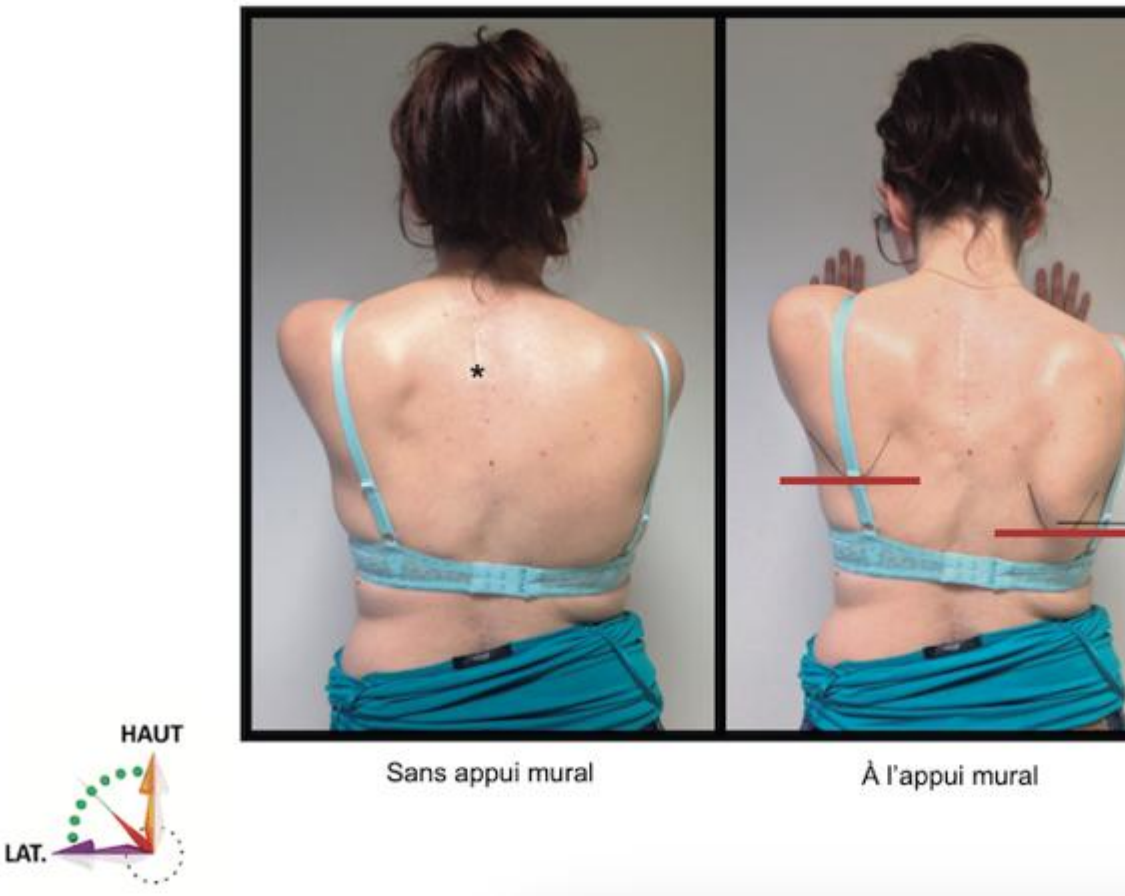
Important anatomical relationships

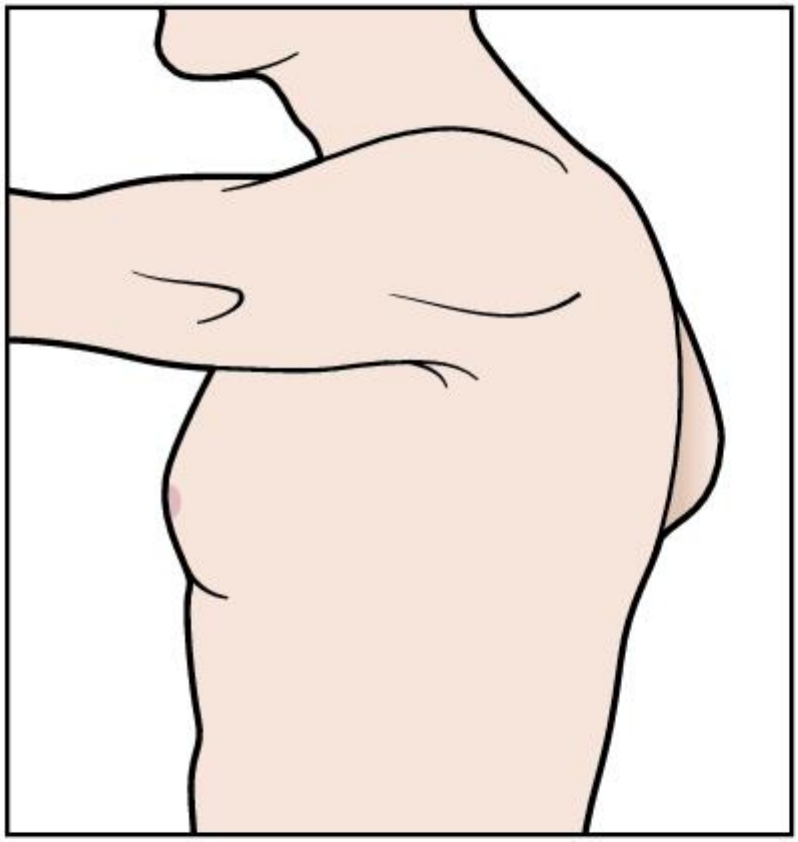
- Lies deep to the scapula along the lateral thoracic wall.
- The long thoracic nerve descends along its superficial surface.

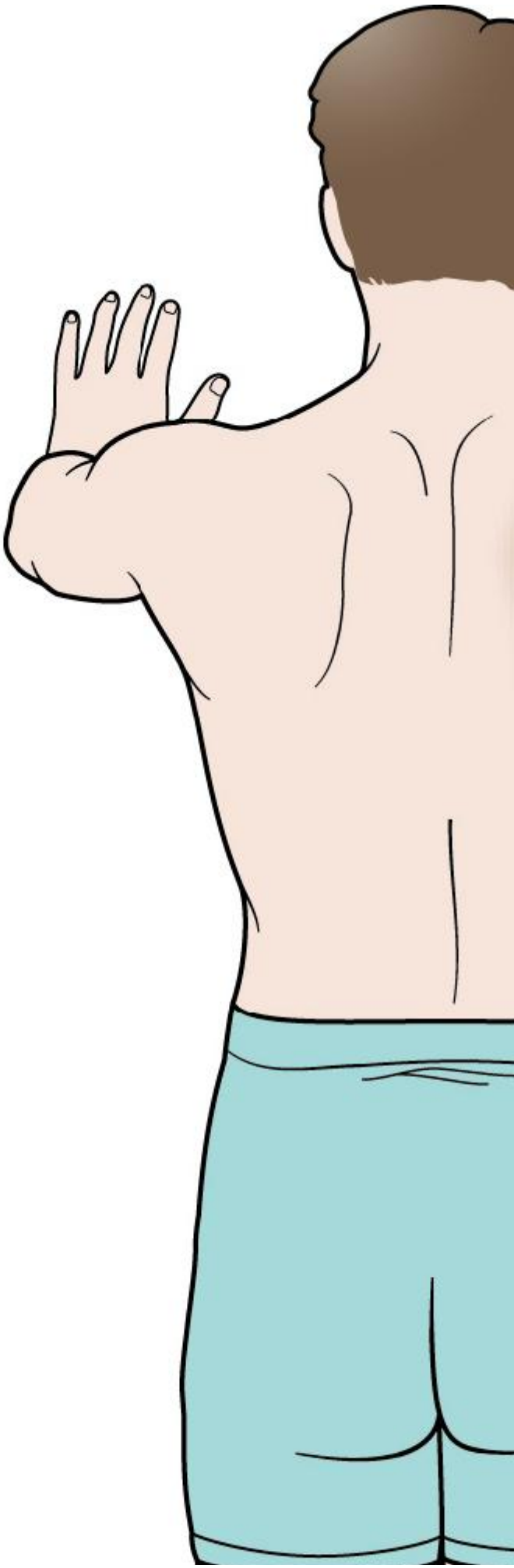
- Forms a major part of the medial wall of the axilla.
- Its lower digitations contribute strongly to upward rotation of the scapula.

Clinical anatomy — Winged scapula


HAUT
ARRIÈRE


HAUT
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Sans appui mural
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Cause

- Injury to the long thoracic nerve (C5–C7).
- Results in weakness or paralysis of serratus anterior.

Clinical features

- Prominence of the medial border and inferior angle of the scapula.
- Winging becomes more obvious when pushing against a wall.
- Weakness of scapular protraction.
- Difficulty with overhead arm elevation due to impaired upward rotation.

Important distinction: Serratus anterior paralysis can impair elevation of the arm above approximately 90°, but this is not always a complete inability; severity depends on compensation by other muscles.

Common causes of long thoracic nerve injury

- Axillary surgery.
- Trauma to the lateral chest wall.
- Repetitive traction or overhead activity.
- Iatrogenic injury during procedures involving the axilla.

NEET PG pearl: Medial scapular winging on wall-push testing suggests long thoracic nerve injury causing serratus anterior weakness.

6. Comparative Table — Muscles of Pectoral Region

MUSCLE	ORIGIN	INSERTION	NERVE SUPPLY	PRINCIPAL ACTION
Pectoralis major	Medial clavicle, sternum, upper costal cartilages, external oblique aponeurosis	Lateral lip of intertubercular sulcus	Medial and lateral pectoral nerves (C5–T1)	Adduction, medial rotation and flexion of arm
Pectoralis minor	Ribs 3–5	Coracoid process	Medial pectoral nerve (C8–T1)	Draws scapula forward and down
Subclavius	First rib and costal cartilage	Subclavian groove of clavicle	Nerve to subclavius (C5–C6)	Stabilises clavicle
Serratus anterior	Upper 8–9 ribs	Costal surface of medial scapular border	Long thoracic nerve (C5–C7)	Protraction and upward rotation of scapula

7. Summary of Nerve Supply

NERVE	ROOT VALUE	MUSCLE SUPPLIED
Lateral pectoral nerve	C5–C7	Pectoralis major
Medial pectoral nerve	C8–T1	Pectoralis minor and pectoralis major

Nerve to subclavius	C5–C6	Subclavius
Long thoracic nerve	C5–C7	Serratus anterior

Nerve origins from brachial plexus

- Lateral pectoral nerve: Lateral cord.
- Medial pectoral nerve: Medial cord.
- Nerve to subclavius: Upper trunk.
- Long thoracic nerve: Roots of brachial plexus (C5–C7).

8. Important Clinical Correlations

CLINICAL FINDING	INJURED STRUCTURE	ANATOMICAL EXPLANATION
Loss of anterior axillary fold after bench pressing	Pectoralis major	Muscle or tendon rupture
Weak adduction and medial rotation	Pectoralis major / pectoral nerves	Loss of major shoulder adductor
Neurovascular symptoms beneath coracoid region	Pectoralis minor region	Possible compression of brachial plexus or axillary vessels

Clavicular instability	Subclavius or supporting structures	Impaired clavicular stabilisation
Medial scapular winging	Long thoracic nerve	Serratus anterior paralysis
Difficulty with overhead elevation	Serratus anterior weakness	Impaired upward scapular rotation

9. High-Yield Quick Revision

EXAMINATION POINT	ANSWER
Largest superficial pectoral muscle	Pectoralis major
Muscle forming anterior axillary fold	Pectoralis major
Pectoralis major insertion	Lateral lip of intertubercular sulcus
Main action of pectoralis major	Adduction and medial rotation
Muscle deep to pectoralis major	Pectoralis minor
Pectoralis minor origin	Ribs 3–5
Pectoralis minor insertion	Coracoid process

Axillary artery divided by	Pectoralis minor
Muscle stabilising clavicle	Subclavius
Nerve supplying subclavius	Nerve to subclavius
Muscle responsible for scapular protraction	Serratus anterior
Main nerve of serratus anterior	Long thoracic nerve
Root value of long thoracic nerve	C5–C7
Cause of medial winged scapula	Serratus anterior paralysis
Muscle pair responsible for upward scapular rotation	Serratus anterior and trapezius

10. Exam Focus

University long-answer questions

1. Describe pectoralis major under the headings of origin, insertion, nerve supply, actions and applied anatomy.
2. Describe the muscles of the pectoral region with their attachments and nerve supply.
3. Explain the anatomical basis of winged scapula.

Short-note questions

- Pectoralis major.
- Pectoralis minor and its relation to axillary artery.
- Subclavius muscle.
- Serratus anterior.
- Long thoracic nerve injury.
- Pectoral nerves.

Viva questions

1. Which muscle forms the anterior axillary fold? — Pectoralis major.
2. What are the nerves supplying pectoralis major? — Medial and lateral pectoral nerves.
3. Which muscle divides the axillary artery into three parts? — Pectoralis minor.
4. What is the nerve supply of pectoralis minor? — Medial pectoral nerve (C8–T1).
5. Which nerve supplies subclavius? — Nerve to subclavius (C5–C6).
6. Which nerve supplies serratus anterior? — Long thoracic nerve (C5–C7).
7. What causes medial winging of the scapula? — Weakness or paralysis of serratus anterior.
8. Which muscles produce upward rotation of the scapula? — Serratus anterior and trapezius.

NEET PG / INI-CET Clinical Pearls

- Bench-press injury + loss of anterior axillary fold ? Pectoralis major rupture.
- Nerve supplying both pectoralis major and minor ? Medial pectoral nerve.
- Nerve arising from lateral cord supplying pectoralis major ? Lateral pectoral nerve.

- Second part of axillary artery ? Deep to pectoralis minor.
- Subclavius nerve origin ? Upper trunk of brachial plexus.
- Winged scapula during wall-push test ? Long thoracic nerve injury.
- Difficulty elevating arm above shoulder level ? Consider serratus anterior dysfunction.
- Scapular protraction during punching ? Serratus anterior.