

Side of the Neck

Introduction

- The **side of the neck** lies **between the midline anteriorly** and **the anterior border of trapezius posteriorly**.
 - It contains important **neurovascular structures, lymph nodes, and muscles**.
 - Functionally, it acts as a **connecting region** between the head, thorax, and upper limb.
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Landmarks

- **Anterior boundary:** Midline of the neck.
 - **Posterior boundary:** Anterior border of the trapezius.
 - **Superior boundary:** Inferior border of mandible and line from its angle to mastoid process.
 - **Inferior boundary:** Upper border of clavicle.
 - The side of neck is **divided by sternocleidomastoid (SCM)** into:
 - **Anterior triangle**
 - **Posterior triangle**
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Boundaries

- **Anterior:** Anterior border of sternocleidomastoid (SCM).
- **Posterior:** Anterior border of trapezius.
- **Superior:** Base of mandible and mastoid process.
- **Inferior:** Clavicle.

Skin

- Thin and **loosely attached** over the neck, except along the lower part where it is firm.
- Supplied by:
 - **Lesser occipital nerve (C2)**
 - **Great auricular nerve (C2, C3)**
 - **Transverse cervical nerve (C2, C3)**
 - **Supraclavicular nerves (C3, C4)**

Superficial Fascia

- Lies deep to the skin and contains:

- **Platysma muscle** – a thin subcutaneous sheet of muscle extending from thorax to mandible.
 - **Cutaneous nerves** (as above).
 - **External and anterior jugular veins.**
 - **Superficial lymph nodes** (like external jugular and anterior cervical).
- **Clinical relevance:** Injury to platysma ? skin scar adhesion if not sutured separately.
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Dissection

- Incision along upper border of clavicle, reflect skin upwards to anterior border of trapezius.
 - Identify **platysma**, **anterior cutaneous nerve**, and **anterior jugular vein**.
 - Remove superficial fascia to expose **deep cervical fascia**.
 - **External jugular vein** appears above clavicle.
 - **Suprasternal space** is opened by transverse incision above sternum.
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Clinical Anatomy

- **Platysma repair:** Essential during neck surgery to prevent skin adherence and scarring.
- **Jugular veins:** May be injured during tracheostomy or venesection.

- **External jugular vein distension:** Indicates raised venous pressure (cardiac failure).
 - **Infections of superficial fascia:** Spread rapidly due to loose areolar tissue.
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Deep Cervical Fascia (Fascia Colli)

- **Definition:** Condensed deep fascia forming **supportive compartments** of neck.
 - **Layers:**
 1. **Investing layer**
 2. **Pretracheal fascia**
 3. **Prevertebral fascia**
 4. **Carotid sheath**
 5. **Buccopharyngeal fascia**
 6. **Pharyngobasilar fascia**
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Investing Layer

- Lies deep to platysma and **surrounds the neck like a collar**.
- **Attachments:**
 - *Superiorly* ? External occipital protuberance, superior nuchal line, mastoid, mandible.

- *Inferiorly* ? Spine of scapula, acromion, clavicle, manubrium sterni.
- *Posteriorly* ? Ligamentum nuchae and spine of C7.
- *Anteriorly* ? Symphysis menti and hyoid bone.

- **Encloses:**

- Muscles ? *Trapezius, Sternocleidomastoid.*
- Glands ? *Parotid and Submandibular.*
- Spaces ? *Suprasternal and Supraclavicular.*

- **Suprasternal space (of Burns):**

- Lies above manubrium sterni.
- Contains:
 - Sternal heads of SCM
 - Jugular venous arch
 - Lymph node
 - Interclavicular ligament

Clinical Importance

- **Parotid fascia** (from investing layer) is dense ? swelling is painful.

- **Submandibular gland** enclosed between laminae ? limits gland expansion.
- **Deep cervical fascia** guides the spread of infections:
 - *Pretracheal layer* ? may transmit infection to mediastinum.
 - *Prevertebral layer* ? abscess may track into posterior mediastinum.
- **Surgical note:** Platysma should be sutured separately to avoid visible scarring.

Investing Layer

Description

- Lies deep to the **platysma** and surrounds the neck like a **collar**.
- Forms the **roof of anterior and posterior triangles** of the neck.

Attachments

Superiorly

- External occipital protuberance
- Superior nuchal line
- Mastoid process and styloid process
- External acoustic meatus
- Base of mandible

Inferiorly

- Spine of scapula
- Acromion process
- Clavicle
- Manubrium sterni

Posteriorly

- Ligamentum nuchae
- Spine of 7th cervical vertebra

Anteriorly

- Symphysis menti
- Hyoid bone

Structures Enclosed by Investing Layer

1. Muscles:

- *Trapezius*
- *Sternocleidomastoid (SCM)*

2. Glands:

- *Parotid gland* (forms parotid fascia — dense and unyielding)

- *Submandibular gland* (forms capsule between laminae)

3. Spaces:

- *Suprasternal (of Burns) ?* contains:
 - Sternal heads of SCM
 - Jugular venous arch
 - Lymph node
 - Interclavicular ligament
- *Supraclavicular space ?* crossed by:
 - External jugular vein
 - Supraclavicular nerves
 - Lymphatics

4. Special Modifications:

- Forms **stylomandibular ligament** between styloid process and mandible.
- Forms **parotidomasseteric fascia** and **pulleys for digastric and omohyoid tendons**.

Clinical Anatomy (Investing Layer)

- **Painful parotid swelling:** Dense parotid fascia prevents expansion.

- **Submandibular gland excision:** External carotid artery must be secured before division; it lies near *stylomandibular ligament*.
 - **External jugular vein injury:** May cause *air embolism* because fascia fixes the vein open.
 - **Surgical importance:** Platysma must be sutured separately to prevent *ugly scars*
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Pretracheal Fascia

Description

- Thin fascial layer **enclosing the thyroid gland** and forming its **false capsule**.
- Continuous above with **buccopharyngeal fascia** and laterally with **carotid sheath**.

Attachments

Superiorly:

- Hyoid bone (median plane)
- Oblique line of thyroid cartilage (laterally)
- Cricoid cartilage (more laterally)

Inferiorly:

- Below thyroid gland ? encloses inferior thyroid veins

- Blends with **fibrous pericardium** and **arch of aorta**

Laterally:

- Fuses with fascia deep to SCM, forming **anterior wall of carotid sheath**
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Other Features

- Posterior part forms **ligament of Berry** (suspensory ligament of thyroid) attaching gland to cricoid cartilage.
 - Allows **free movement of trachea** during swallowing.
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Clinical Anatomy (Pretracheal Fascia)

- **Infections anterior to fascia** ? may extend to *anterior mediastinum*.
 - **Thyroid swellings move with deglutition** because the gland is attached to laryngeal cartilages via *Berry's ligament*.
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Prevertebral Fascia

Description

- Lies in front of vertebral column, covering **prevertebral and scalene muscles**.
 - Extends laterally as **axillary sheath** around brachial plexus and subclavian vessels.
 - Provides a **fixed base** for movements of pharynx, oesophagus, and carotid sheath.
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Clinical Anatomy (Prevertebral Fascia)

- **Infections behind fascia:** Commonly due to *tuberculosis of cervical vertebrae (caries)*.
 - May produce **retropharyngeal abscess**, bulging into posterior pharyngeal wall.
 - Pus may extend **laterally into posterior triangle** or **down into superior mediastinum**.
 - **Infections in front of fascia (retropharyngeal space):**
 - From suppuration in retropharyngeal lymph nodes.
 - May form *acute abscess* and spread into *posterior mediastinum*
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Carotid Sheath

Formation

- Condensation of **fibroareolar tissue** around main neck vessels.
- **Anterior wall:** Formed by pretracheal fascia.
- **Posterior wall:** Formed by prevertebral fascia.

Contents

- **Common or internal carotid artery**

- **Internal jugular vein** (thin fascial covering)
 - **Vagus nerve (X cranial)**
 - In upper part: **Glossopharyngeal (IX), Accessory (XI), Hypoglossal (XII)** nerves pierce it at different levels.
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Relations

1. **Ansa cervicalis** – embedded in anterior wall.
 2. **Sympathetic chain** – lies behind sheath on prevertebral fascia.
 3. **SCM** – overlaps sheath superficially.
 4. **Fusion:** Sheath fused with layers of deep cervical fascia.
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Clinical Relevance

- **Pathway for spread of infection** between head, neck, and mediastinum.
- **Surgical importance:** Awareness of relationship with internal jugular vein (lateral) and carotid artery (medial) is crucial in neck dissections or central line placement.

Buccopharyngeal Fascia

Description

- Thin **outer covering of the pharynx**, continuous above with **pretracheal fascia**.

- Covers **pharyngeal constrictor muscles externally** and extends **onto the buccinator muscle** in front.
 - Forms part of the **deep cervical fascia**.
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Attachments

- **Superiorly:** Base of the skull (around pharyngeal tubercle).
 - **Inferiorly:** Blends with **pretracheal fascia** over the larynx.
 - **Laterally:** Continuous with **carotid sheath**.
 - **Anteriorly:** Fuses with the **fascia over buccinator muscle**, forming **pterygomandibular raphe**.
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Functions

- Provides a **smooth surface** for movements of pharyngeal muscles during swallowing.
 - Serves as a **barrier** separating the pharyngeal wall from the retropharyngeal space.
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Clinical Anatomy

- Infection behind buccopharyngeal fascia ? **retropharyngeal abscess**.
 - **Alar fascia**, a subdivision, divides the retropharyngeal space into:
 - **Anterior (true) space**
 - **Posterior “dangerous” space** (infection may descend to mediastinum).
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Pharyngobasilar Fascia

Description

- A **thick fibrous sheet** forming the **inner fibrous layer** of the pharyngeal wall.
- Lies **deep to the pharyngeal muscles**, giving structural support where muscles are deficient.

Attachments

- **Superiorly:**
 - *Base of skull* — petrous temporal bone, pharyngeal tubercle, and part of sphenoid (medial pterygoid plate).
- **Laterally:**
 - Blends with **buccinator** at pterygomandibular raphe.
- **Inferiorly:**
 - Blends with **muscle fibers of superior constrictor**.

Functions

- Maintains **rigidity of the pharyngeal wall**.
- Prevents collapse during swallowing.
- Provides **anchoring framework** for constrictor muscles.

Clinical Anatomy

- Weakening may lead to formation of **pharyngeal diverticula (Zenker's diverticulum)** through Killian's dehiscence (gap between inferior constrictor and cricopharyngeus).
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Pharyngeal Spaces

There are **two main fascial spaces** around the pharynx:

1. **Retropharyngeal Space**
 2. **Lateral Pharyngeal (Parapharyngeal) Space**
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1. Retropharyngeal Space

Boundaries:

- **Anterior:** Buccopharyngeal fascia.
- **Posterior:** Prevertebral fascia (with *alar fascia* dividing it).
- **Lateral:** Carotid sheaths.
- **Superior:** Base of skull.
- **Inferior:** Continues down to **posterior mediastinum**.

Contents:

- Retropharyngeal lymph nodes.

- Loose areolar tissue.

Clinical Significance:

- Infections here form **retropharyngeal abscesses**, causing:
 - Dysphagia
 - Airway obstruction
 - Bulging of posterior pharyngeal wall
 - Pus may spread into **posterior mediastinum**, hence called the “**dangerous space of neck.**”
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2. Lateral Pharyngeal (Parapharyngeal) Space

Boundaries:

- **Medial:** Buccopharyngeal fascia (pharynx).
- **Lateral:** Mandible and medial pterygoid muscle.
- **Anterior:** Pterygomandibular raphe.
- **Posterior:** Carotid sheath and its contents.
- **Superior:** Base of skull.
- **Inferior:** Continuous with **submandibular space**.

Contents:

- Part of **parotid gland**.
- **Internal carotid artery, internal jugular vein, and cranial nerves IX–XII.**
- Loose connective tissue.

Clinical Significance:

- **Deep neck infections** can spread from tonsil or pharynx into this space.
- Abscess may compress **airway or great vessels**.
- Pathway for spread of **parapharyngeal abscess ? mediastinum**.

Summary: Differences between Pharyngeal Spaces

FEATURE	RETROPHARYNGEAL SPACE	LATERAL PHARYNGEAL SPACE
Position	Behind pharynx	Beside pharynx
Boundaries	Between buccopharyngeal and prevertebral fascia	Between pharynx and parotid/mandible
Contents	Lymph nodes, loose tissue	Carotid sheath, cranial nerves IX–XII
Spread of infection	Posterior mediastinum	Mediastinum via vascular sheath
Common abscess	Retropharyngeal abscess	Parapharyngeal abscess

Sternocleidomastoid Muscle (Sternomastoid)

Description

- Large, superficial **strap-like muscle** of the neck.
 - Divides the neck into **anterior** and **posterior triangles**.
 - Supplied by the **spinal part of the accessory nerve (cranial XI)**.
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Origin

1. **Sternal head** — Tendinous, from the *superolateral part of the front of manubrium sterni*.
 2. **Clavicular head** — Musculotendinous, from the *medial one-third of the superior surface of clavicle*.
 - Passes deep to sternal head.
 - Between the two heads lies the **lesser supraclavicular fossa** over the internal jugular vein.
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Insertion

1. **Mastoid process (lateral surface)** — by thick tendon.
 2. **Lateral half of superior nuchal line** — by thin aponeurosis.
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Nerve Supply

- **Motor:** Spinal accessory nerve (XI).
 - **Proprioceptive:** Ventral rami of **C2 and C3**.
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Blood Supply

- Branches from:
 - **Superior thyroid artery**
 - **Suprascapular artery**
 - **Occipital artery** (two branches)
 - Veins correspond to arteries.
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Actions

- **Unilateral contraction:**
 - Turns the **chin to opposite side**.
 - Tilts the **head toward the same shoulder**.
 - **Bilateral contraction:**
 - Flexes the **neck forward** (e.g., raising head from pillow).
 - Assists **forced inspiration** by elevating sternum and clavicle.
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Clinical Anatomy

- **Torticollis (Wry Neck):**

- Deformity due to spasm/contracture of sternocleidomastoid.
- **Head ? bent to one side; chin ? points to opposite side.**
- Types:
 - *Rheumatic* – exposure to cold.
 - *Reflex* – inflamed cervical lymph nodes irritating accessory nerve.
 - *Congenital* – birth injury ? intravascular clotting ? fibrosis of muscle.

Posterior Triangle of the Neck

Features

- Triangular **space behind sternocleidomastoid** on each side of neck.
- Roof formed by **investing layer of deep cervical fascia**.
- Floor formed by **prevertebral fascia** covering deeper muscles.

Boundaries

- **Anterior:** Posterior border of sternocleidomastoid.
- **Posterior:** Anterior border of trapezius.

- **Inferior (base):** Middle one-third of clavicle.
 - **Apex:** Union of SCM and trapezius near superior nuchal line.
 - **Roof:** Investing layer of deep cervical fascia.
 - **Floor:** Splenius capitis, levator scapulae, scalenes (ant., med., post.).
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Subdivisions

- Divided by **inferior belly of omohyoid** into:
 1. **Occipital triangle** (above).
 2. **Supraclavicular / subclavian triangle** (below).
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Contents

- **Arteries:**
 - Third part of **subclavian artery**
 - **Transverse cervical** and **suprascapular arteries**
 - Branches of **occipital artery**
- **Veins:**
 - **External jugular vein**
 - **Transverse cervical vein**

- **Nerves:**
 - **Accessory nerve (XI)**
 - **Branches of cervical plexus (C2–C4)**
 - **Roots and trunks of brachial plexus**
 - **Phrenic nerve** (on scalenus anterior)
 - **Ansa cervicalis**
 - **Lymph nodes:**
 - Superficial and deep cervical nodes.
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Dissection Notes

- Reflect investing fascia along posterior border of SCM.
 - Identify **external jugular vein**, **cutaneous nerves** (great auricular, transverse cervical).
 - Accessory nerve crosses triangle from SCM ? trapezius.
 - Locate **inferior belly of omohyoid**, **transverse cervical**, and **suprascapular vessels**.
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Clinical Anatomy

- **Accessory nerve injury:** during lymph-node biopsy ? paralysis of trapezius ? drooping shoulder.
 - **External jugular vein:** fixed to fascia ? risk of **air embolism** if injured.
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- **Infections:** may spread via fascial planes into **axilla or mediastinum**.
- **Pulsating mass in supraclavicular fossa** ? aneurysm of subclavian artery.
- **Supraclavicular lymph nodes:** enlarged in abdominal or thoracic malignancies (Virchow's node).

Contents of the Posterior Triangle

The posterior triangle contains **important vascular, neural, and lymphatic structures**, divided according to their plane of depth.

1. Arteries

- **Third part of subclavian artery** — major artery of the lower triangle; gives off:
 - **Transverse cervical artery**
 - **Suprascapular artery**
 - **Occipital artery** — small branches crossing the upper part of the triangle.
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2. Veins

- **External jugular vein (EJV)** — lies superficially in roof; drains into subclavian vein.
- **Transverse cervical and suprascapular veins** — accompany respective arteries and drain into EJV or subclavian vein.
- **Subclavian vein** — lies anterior to scalenus anterior (usually outside the triangle).

- **Occipital vein** — drains into EJV.
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3. Nerves

(A) Cranial nerve:

- **Spinal accessory nerve (XI):**

- Emerges from posterior border of sternocleidomastoid at its middle.
- Crosses the posterior triangle superficially and enters trapezius.
- Lies about 1–2 cm above Erb's point (where cervical cutaneous nerves emerge).

(B) Cervical plexus (C2–C4):

- Appears at posterior border of SCM at the midpoint (Erb's point).
- Its branches include:
 - **Lesser occipital nerve (C2)** — behind ear.
 - **Great auricular nerve (C2, C3)** — to parotid region and ear.
 - **Transverse cervical nerve (C2, C3)** — across neck.
 - **Supraclavicular nerves (C3, C4)** — to skin over clavicle and upper chest.

(C) Brachial plexus:

- **Roots and trunks** of the plexus lie between scalenus anterior and medius muscles.
- **Suprascapular nerve (C5, C6)** — passes laterally across triangle.

- **Nerve to subclavius (C5, C6)** — small branch to subclavius muscle.

(D) Phrenic nerve:

- Descends obliquely across **scalenus anterior**, deep to prevertebral fascia.
 - Lies in front of **subclavian artery** and behind **subclavian vein**.
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4. Lymph Nodes

- **Superficial cervical lymph nodes** — along the external jugular vein.
 - **Deep cervical lymph nodes** — along the internal jugular vein (deep to SCM, continuous above and below).
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5. Muscles (forming floor)

- From above downward:
 - **Splenius capitis**
 - **Levator scapulae**
 - **Scalenus medius**
 - **Scalenus posterior** (sometimes)
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6. Other Structures

- **Inferior belly of omohyoid** — divides the triangle into:

- **Upper occipital triangle**
 - **Lower supraclavicular (subclavian) triangle**
 - **Prevertebral fascia** — forms the floor of both triangles.
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Clinical Anatomy

- **Accessory nerve injury** — during lymph-node biopsy or neck dissection ? trapezius paralysis ? shoulder droop.
- **External jugular vein injury** — risk of *air embolism* due to its fixation to deep fascia.
- **Infection spread:**
 - Through fascial planes ? posterior mediastinum or axilla.
 - From tonsil or parotid ? parapharyngeal space ? posterior triangle.
- **Subclavian artery aneurysm** — produces pulsatile swelling in lower triangle.
- **Enlarged supraclavicular lymph node (Virchow's node):**
 - Left-sided enlargement = sign of *abdominal malignancy* (especially gastric carcinoma).
- **Cervical rib or scalenus anticus syndrome:**
 - Compression of subclavian artery or brachial plexus ? pain, numbness in upper limb.

? Mnemonics

1. Boundaries of Posterior Triangle

Mnemonic — “**Stop Thinking Inside Art**”

- **S** ? *Sternocleidomastoid* (anterior boundary)
 - **T** ? *Trapezius* (posterior boundary)
 - **I** ? *Inferior* — clavicle (base)
 - **A** ? *Apex* — union of SCM and trapezius
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2. Roof and Floor of Posterior Triangle

Mnemonic — “**I Prefer Smooth Layers**”

- **I** ? *Investing layer* of deep cervical fascia (roof)
 - **P** ? *Platysma* (in fascia)
 - **S** ? *Splenius capitis*
 - **L** ? *Levator scapulae*
 - *(plus scalenus medius and sometimes posterior)*
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3. Contents of Posterior Triangle

Mnemonic — “**Never Ever Let A Surgeon Hurry**”

- **N** ? *Nerves* (Accessory, cervical, brachial plexus)
 - **E** ? *External jugular vein*
 - **L** ? *Lymph nodes* (superficial and deep)
 - **A** ? *Arteries* (Transverse cervical, Suprascapular, Subclavian)
 - **S** ? *Scalenes* (floor muscles)
 - **H** ? *Head of omohyoid* (dividing belly)
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4. Branches of Cervical Plexus (cutaneous)

Mnemonic — “**LGT Super**” (appear at Erb’s point)

- **L** ? *Lesser occipital nerve* (C2)
 - **G** ? *Great auricular nerve* (C2, C3)
 - **T** ? *Transverse cervical nerve* (C2, C3)
 - **Super** ? *Supraclavicular nerves* (C3, C4)
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5. Muscles Forming Floor

Mnemonic — “**Some Lovely Scalenes**”

- **S** ? *Splenius capitis*
 - **L** ? *Levator scapulae*
 - **S** ? *Scalenus medius / posterior*
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6. Subdivision of Posterior Triangle

Mnemonic — “**Only Sun Shines**”

- **O** ? *Occipital triangle (upper)*
- **S** ? *Subclavian (supraclavicular) triangle (lower)*
- **S** ? *Separated by omohyoid (inferior belly)*

7. Arteries in Posterior Triangle

Mnemonic — “**Two Tiny Soldiers**”

- **T** ? *Transverse cervical artery*
- **T** ? *Thyrocervical trunk (branch)*
- **S** ? *Suprascapular artery*

? Facts to Remember

1. **Posterior triangle** lies between *sternocleidomastoid* and *trapezius*.
2. It is divided into **occipital** and **supraclavicular** triangles by the *inferior belly of omohyoid*.
3. **Roof:** Investing layer of deep cervical fascia.
4. **Floor:** Prevertebral fascia covering *splenius capitis*, *levator scapulae*, and *scalene muscles*.

5. **Spinal accessory nerve (XI)** is the *most important nerve* of this triangle.
6. **Cervical plexus cutaneous branches** emerge at the **midpoint of posterior border of SCM** (Erb's point).
7. **External jugular vein** crosses the triangle superficially; drains into *subclavian vein*.
8. **Brachial plexus roots and trunks** occupy the floor of lower part of the triangle.
9. **Phrenic nerve** descends obliquely on *scalenus anterior*, deep to prevertebral fascia.
10. **Lymph nodes:**
 - Superficial nodes ? along *external jugular vein*.
 - Deep nodes ? along *internal jugular vein*.
11. **Subclavian artery (3rd part)** and **suprascapular artery** are key vessels in lower triangle.
12. **Accessory nerve injury** causes *paralysis of trapezius* ? shoulder droop.
13. **External jugular vein** injury can cause *air embolism* due to its fixed opening in fascia.
14. **Infections** in the triangle can spread via fascial planes to *axilla or mediastinum*.
15. **Left supraclavicular lymph node enlargement (Virchow's node)** suggests *abdominal or thoracic malignancy*.
16. **Cervical rib** may compress *subclavian artery or brachial plexus*, producing *thoracic outlet syndrome*.
17. **Prevertebral fascia** forms *axillary sheath* around subclavian vessels and brachial plexus.

18. **Platysma** lies superficial to investing fascia and must be sutured separately during neck surgery.
19. **SCM acts bilaterally** to flex the neck and unilaterally to turn the face to the opposite side.
20. **Omoxyoid** acts as a landmark, not a functional divider, during neck dissections.

Clinicoanatomical Problems

1. A patient presents with drooping of the shoulder and difficulty raising the arm above the horizontal after lymph-node biopsy in the posterior triangle. What is the cause?

Explanation:

- The **spinal accessory nerve (cranial nerve XI)** is vulnerable during posterior triangle surgery or lymph-node removal.
- It supplies the **trapezius** and **sternocleidomastoid**.
- Injury causes:
 - Weakness of **shoulder elevation** (trapezius paralysis).
 - Difficulty in **abduction above 90°** (loss of scapular rotation).
 - Shoulder droop and winging of scapula (trapezius type).

Clinical correlation: Common after **radical neck dissection** or **biopsy of posterior cervical lymph nodes**.

2. A surgeon incises the external jugular vein in the lower neck, and the patient suddenly collapses. Why?

Explanation:

- The **external jugular vein** is fixed to the **investing layer of deep cervical fascia**, keeping its lumen open.
- If injured, **negative intrathoracic pressure** during inspiration sucks in air ? **air embolism**.
- Air travels to the **right atrium**, causing **cardiac arrest**.

Preventive measure:

- Apply immediate **pressure** and lower patient's head to raise venous pressure before ligation.
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3. A hard pulsatile swelling appears in the lower part of the posterior triangle. What could it be?

Explanation:

- The **third part of the subclavian artery** lies in the lower (supraclavicular) triangle.
- A **subclavian aneurysm** presents as a pulsatile mass here.
- May compress **brachial plexus** ? pain, paresthesia, or weakness in upper limb.

Diagnostic clue:

- Pulse **disappears on pressure above clavicle**.
- May produce **bruit** on auscultation.

4. A child has congenital wry neck (torticollis). What is its anatomical basis?

Explanation:

- Caused by **fibrosis of sternocleidomastoid** due to **birth trauma** or **intrauterine malposition**.
- Results in:
 - Head tilted to **affected side**.
 - Chin rotated to **opposite side**.
- Chronic cases ? asymmetrical face and skull (plagiocephaly).

Treatment:

- Physiotherapy or surgical release of SCM if fibrosis persists.
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5. A patient with abdominal carcinoma develops a hard, enlarged left supraclavicular lymph node. Why is it significant?

Explanation:

- **Left supraclavicular node (Virchow's node)** drains via **thoracic duct**, which collects lymph from most of the body below the diaphragm.
- Enlargement indicates **secondary metastasis** from abdominal or thoracic malignancies (often **stomach or pancreas**).

Clinical sign:

- Painless, firm swelling in left supraclavicular fossa — *Troisier's sign*.
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6. A patient complains of neck pain and numbness of the hand; X-ray shows a cervical rib. Explain the symptoms.

Explanation:

- A **cervical rib** arises from C7 vertebra.
- Compresses the **subclavian artery** and **lower trunk of brachial plexus**.
- Symptoms:
 - Tingling/numbness in ulnar aspect of hand.
 - Weakness in grip.
 - Reduced radial pulse on arm elevation.

Condition: Thoracic outlet (scaleneus anticus) syndrome.

7. Infection in posterior triangle spreading to axilla — what pathway allows this?

Explanation:

- The **prevertebral fascia** extends laterally as the **axillary sheath**.
 - Pus or infection beneath prevertebral fascia may track **into the axilla**, leading to **deep abscesses** around brachial plexus and axillary vessels.
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8. A teenager presents with painful swelling behind the ear and fever; on examination, tenderness extends into the upper posterior triangle. What is the likely condition?

Explanation:

- **Mastoiditis** (infection of mastoid air cells) ? pus spreads along **upper fibers of sternocleidomastoid** or **occipital triangle**.
 - May cause **deep neck abscess** or **secondary thrombophlebitis** of veins in the triangle.
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9. Why is knowledge of fascial layers important in neck infections?

Explanation:

- **Deep cervical fascia** divides neck into **compartments and potential spaces**.
- Infection may spread along these planes:
 - **Pretracheal fascia** ? anterior mediastinum.
 - **Prevertebral fascia** ? posterior mediastinum.
 - **Carotid sheath** ? base of skull or mediastinum.
- Determines **direction, depth, and severity** of deep neck infections.

Frequently Asked Questions

1. What is the posterior triangle of the neck?

It is the **triangular area on the lateral side of the neck** bounded by the sternocleidomastoid anteriorly, trapezius posteriorly, and clavicle inferiorly.

2. Why is it called the “posterior” triangle?

Because it lies **posterior to the sternocleidomastoid**, whereas the area anterior to it forms the *anterior triangle*.

3. What are the boundaries of the posterior triangle?

- **Anterior:** Posterior border of sternocleidomastoid
 - **Posterior:** Anterior border of trapezius
 - **Base:** Middle third of clavicle
 - **Apex:** Union of SCM and trapezius near superior nuchal line
-

4. What forms the roof and floor of the triangle?

- **Roof:** Investing layer of deep cervical fascia and platysma
 - **Floor:** Prevertebral fascia covering splenius capitis, levator scapulae, and scalene muscles
-

5. Which muscle divides the posterior triangle into two smaller triangles?

The **inferior belly of omohyoid**, dividing it into:

- **Occipital triangle (upper)**
 - **Supraclavicular / subclavian triangle (lower)**
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6. Name the important arteries present in the posterior triangle.

- **Third part of subclavian artery**
-

- Transverse cervical artery
 - Suprascapular artery
 - Occipital artery branches
-

7. Name the important veins found in the triangle.

- External jugular vein
 - Transverse cervical vein
 - Suprascapular vein
-

8. What is the most important nerve in the posterior triangle?

The **spinal accessory nerve (cranial XI)** — crosses the triangle superficially from SCM to trapezius.

9. What is Erb's point (nerve point of the neck)?

The **midpoint of the posterior border of the sternocleidomastoid**, where four cutaneous branches of the cervical plexus emerge:

- Lesser occipital (C2)
 - Great auricular (C2, C3)
 - Transverse cervical (C2, C3)
 - Supraclavicular (C3, C4)
-

10. What are the contents of the occipital triangle?

- Accessory nerve
 - Occipital artery and vein
 - Cervical plexus branches
 - Lymph nodes
-

11. What are the contents of the supraclavicular (subclavian) triangle?

- Third part of subclavian artery
 - Subclavian vein (lower, anterior part)
 - Suprascapular and transverse cervical vessels
 - Brachial plexus trunks
 - Supraclavicular lymph nodes
-

12. What muscles form the floor of the posterior triangle?

From above downward:

- **Splenius capitis**
 - **Levator scapulae**
 - **Scalenus medius**
 - **Sometimes scalenus posterior**
-

13. Which fascia forms the roof of the triangle?

The **investing layer of deep cervical fascia**.

14. Which lymph nodes are found in the posterior triangle?

- **Superficial cervical nodes** along external jugular vein
 - **Deep cervical nodes** along internal jugular vein (deep to SCM)
-

15. What are the clinical effects of accessory nerve injury in the triangle?

- Paralysis of trapezius
 - Drooping of shoulder
 - Weakness of arm elevation beyond 90°
 - Wasting of upper back muscles
-

16. What is the dangerous consequence of injury to the external jugular vein?

- May cause **air embolism**, because the vein is **tethered to fascia** and remains open when cut.
-

17. What is the relation of the brachial plexus to the scalenus muscles?

- **Roots and trunks** of brachial plexus lie **between scalenus anterior and medius** muscles.
-

18. What nerve descends on the anterior surface of scalenus anterior?

The **phrenic nerve (C3, C4, C5)**.

19. What structure lies deep to the investing layer in the triangle?

The **spinal accessory nerve** and **external jugular vein**.

20. What is Virchow's node and why is it important?

- **Left supraclavicular lymph node** in the posterior triangle.
 - Enlargement suggests **secondary metastasis from abdominal malignancy**, especially *gastric carcinoma*.
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21. Why can infection in the posterior triangle spread to the axilla?

Because the **prevertebral fascia** continues laterally as the **axillary sheath**, providing a path for pus or infection.

22. What is the significance of the subclavian artery in the triangle?

- It can be **compressed against the first rib** to control hemorrhage.
 - May be the site of **aneurysm** causing pulsatile supraclavicular swelling.
-

23. What are the chief cutaneous nerves of the triangle?

- Lesser occipital
 - Great auricular
 - Transverse cervical
-

- Supraclavicular nerves

24. What does the omohyoid muscle do in the triangle?

Acts as a **landmark**, dividing it into two triangles; its **inferior belly** lies within the posterior triangle.

25. What is the fascia forming the floor of the triangle?

The **prevertebral fascia**.

Multiple Choice Questions

1. The posterior triangle of the neck is bounded anteriorly by:

- a) Trapezius
 - b) Midline of neck
 - ? **c) Posterior border of sternocleidomastoid**
 - d) Clavicle
-

2. The posterior boundary of the posterior triangle is formed by:

- ? **a) Trapezius**
- b) Levator scapulae
 - c) Scalenus medius
 - d) Omohyoid
-

3. The base of the posterior triangle is formed by:

- ? **a) Middle one-third of clavicle**
- b) Inferior belly of omohyoid
 - c) Subclavius muscle
 - d) Sternum
-

4. The roof of the posterior triangle is formed by:

? **a) Investing layer of deep cervical fascia**

- b) Pretracheal fascia
 - c) Buccopharyngeal fascia
 - d) Pharyngobasilar fascia
-

5. The floor of the posterior triangle is formed by:

? **a) Prevertebral fascia covering muscles**

- b) Pretracheal fascia
 - c) Investing fascia
 - d) Buccopharyngeal fascia
-

6. The posterior triangle is divided into two by:

? **a) Inferior belly of omohyoid**

- b) Superior belly of omohyoid
 - c) Sternohyoid
 - d) Scalenus medius
-

7. The upper division of the posterior triangle is called:

? **a) Occipital triangle**

- b) Supraclavicular triangle
 - c) Submandibular triangle
 - d) Carotid triangle
-

8. The lower division of the posterior triangle is called:

? **a) Supraclavicular (subclavian) triangle**

- b) Occipital triangle
 - c) Muscular triangle
 - d) Carotid triangle
-

9. The spinal accessory nerve crosses which triangle?

? **a) Posterior triangle**

- b) Submental triangle
-

- c) Carotid triangle
 - d) Digastric triangle
-

10. The spinal accessory nerve supplies:

? a) **Sternocleidomastoid and trapezius**

- b) Omohyoid and levator scapulae
 - c) Platysma and scalenus anterior
 - d) Sternohyoid and thyrohyoid
-

11. The external jugular vein pierces which fascia?

? a) **Investing layer of deep cervical fascia**

- b) Prevertebral fascia
 - c) Pretracheal fascia
 - d) Buccopharyngeal fascia
-

12. Erb's point (nerve point of neck) is located at:

? a) **Middle of posterior border of SCM**

- b) Apex of posterior triangle
 - c) Upper part of SCM
 - d) Near the clavicle
-

13. The nerves emerging from Erb's point are branches of:

? a) **Cervical plexus (C2–C4)**

- b) Brachial plexus
 - c) Vagus nerve
 - d) Hypoglossal nerve
-

14. The cutaneous branches of cervical plexus appearing at Erb's point are:

? a) **Lesser occipital, great auricular, transverse cervical, supraclavicular**

- b) Facial, auriculotemporal, occipital, vagus
 - c) Accessory, hypoglossal, auricular, phrenic
 - d) None of the above
-

15. The phrenic nerve descends on which muscle?

? **a) Scalenus anterior**

b) Scalenus medius

c) Longus colli

d) Sternohyoid

16. The brachial plexus roots and trunks are located:

? **a) Between scalenus anterior and medius**

b) In front of scalenus anterior

c) Behind scalenus medius

d) Between longus colli and sternohyoid

17. Which artery lies in the lower part of posterior triangle?

? **a) Third part of subclavian artery**

b) Common carotid artery

c) Vertebral artery

d) Inferior thyroid artery

18. Which vein is superficial in the posterior triangle?

? **a) External jugular vein**

b) Internal jugular vein

c) Subclavian vein

d) Facial vein

19. Injury to the spinal accessory nerve produces:

? **a) Drooping of shoulder due to trapezius paralysis**

b) Winging of scapula due to serratus anterior paralysis

c) Loss of sensation on shoulder due to supraclavicular nerve damage

d) None of the above

20. A pulsating swelling in the supraclavicular fossa suggests:

? **a) Subclavian artery aneurysm**

b) Enlarged lymph node

c) Lipoma

d) Cystic hygroma

21. Which lymph node, when enlarged, indicates abdominal malignancy?

? a) **Left supraclavicular (Virchow's node)**

b) Deep cervical node

c) Submental node

d) Parotid node

22. The fascia forming the axillary sheath is a continuation of:

? a) **Prevertebral fascia**

b) Investing fascia

c) Pretracheal fascia

d) Buccopharyngeal fascia

23. The prevertebral fascia extends laterally as:

? a) **Axillary sheath**

b) Carotid sheath

c) Pharyngobasilar fascia

d) Buccopharyngeal fascia

24. Which nerve may be injured during posterior cervical lymph node biopsy?

? a) **Spinal accessory nerve**

b) Hypoglossal nerve

c) Phrenic nerve

d) Suprascapular nerve

25. The external jugular vein is a tributary of:

? a) **Subclavian vein**

b) Internal jugular vein

c) Brachiocephalic vein

d) Facial vein

1. What is the posterior triangle of the neck?

A **triangular space on the lateral side of the neck**, bounded by the sternocleidomastoid, trapezius, and clavicle.

2. Why is it called the posterior triangle?

Because it lies **posterior to the sternocleidomastoid**, as opposed to the anterior triangle in front of it.

3. What are the boundaries of the posterior triangle?

- **Anterior:** Posterior border of sternocleidomastoid
 - **Posterior:** Anterior border of trapezius
 - **Inferior (base):** Middle third of clavicle
 - **Apex:** Union of SCM and trapezius at superior nuchal line
-

4. What forms the roof and floor of the posterior triangle?

- **Roof:** Investing layer of deep cervical fascia + platysma
 - **Floor:** Prevertebral fascia covering splenius capitis, levator scapulae, and scalene muscles
-

5. Which muscle divides the posterior triangle into two parts?

The **inferior belly of omohyoid**:

- **Upper part:** Occipital triangle
 - **Lower part:** Supraclavicular (subclavian) triangle
-

6. Name the structures forming the floor of the posterior triangle.

From above downward:

1. Splenius capitis
 2. Levator scapulae
 3. Scalenus medius
 4. (Sometimes) Scalenus posterior
-

7. What forms the roof of the posterior triangle?

The **investing layer of deep cervical fascia**.

8. Which nerve crosses the posterior triangle superficially?

The **spinal accessory nerve (cranial nerve XI)**.

9. What are the contents of the occipital triangle?

- Accessory nerve
 - Branches of cervical plexus
 - Occipital artery and vein
 - Lymph nodes
-

10. What are the contents of the supraclavicular (subclavian) triangle?

- Third part of subclavian artery
- Suprascapular artery
- Branches and trunks of brachial plexus
- Supraclavicular lymph nodes

11. Which vein lies in the roof of the posterior triangle?

The **external jugular vein**.

12. Where does the external jugular vein drain?

Into the **subclavian vein**.

13. What happens if the external jugular vein is injured?

Because the vein is **fixed to the investing fascia**, it may remain open when cut, leading to **air embolism**.

14. What is the nerve point of the neck (Erb's point)?

The **midpoint of the posterior border of the sternocleidomastoid**, where the **cutaneous branches of cervical plexus** emerge.

15. Name the nerves emerging at Erb's point.

- Lesser occipital (C2)
- Great auricular (C2, C3)

- Transverse cervical (C2, C3)
 - Supraclavicular (C3, C4)
-

16. What are the branches of the cervical plexus found in the posterior triangle?

- Cutaneous branches (as above)
 - Phrenic nerve (on scalenus anterior)
 - Ansa cervicalis (loop in carotid sheath)
-

17. Which nerves of the brachial plexus pass through the posterior triangle?

- **Roots and trunks** of brachial plexus
 - **Suprascapular nerve (C5, C6)**
 - **Nerve to subclavius (C5, C6)**
-

18. What is the course of the accessory nerve in the posterior triangle?

- Emerges from SCM's posterior border (middle third)
 - Crosses the triangle obliquely
 - Enters trapezius near its anterior border
-

19. What are the effects of injury to the accessory nerve?

- **Paralysis of trapezius** ? shoulder droop
 - Difficulty in raising arm above horizontal
 - Wasting of upper back muscles
-

20. What muscle divides the posterior triangle from the anterior triangle?

The **sternocleidomastoid** muscle.

21. What is the clinical importance of the posterior triangle?

- Common site for **lymph node biopsies**
 - Contains **vessels for venous access or ligation**
 - Pathway for **spread of infections**
 - Location of **subclavian artery aneurysm**
-

22. Which lymph nodes are present in the posterior triangle?

- **Superficial cervical nodes** (along EJV)
 - **Deep cervical nodes** (along internal jugular vein)
-

23. What is Virchow's node?

- The **left supraclavicular lymph node**,

- Enlargement suggests **abdominal malignancy**, commonly *stomach cancer* (Troisier's sign).
-

24. Why can infection spread from the posterior triangle to the axilla?

Because the **prevertebral fascia** continues laterally as the **axillary sheath**, enclosing axillary vessels and brachial plexus.

25. What is the relation of the phrenic nerve to scalenus anterior?

The **phrenic nerve** descends **obliquely on the anterior surface** of *scalenus anterior*, deep to the prevertebral fascia.

26. Which muscles are supplied by the accessory nerve?

- **Sternocleidomastoid**
 - **Trapezius**
-

27. What artery passes through the posterior triangle?

The **third part of the subclavian artery**.

28. Which fascia forms the axillary sheath?

The **prevertebral fascia**.

29. What fascia forms the roof of the triangle and why is it clinically important?

The **investing layer of deep cervical fascia** — it fixes the **external jugular vein**, making it prone to air embolism if cut.

30. What is the function of the omohyoid in the posterior triangle?

It acts as a **landmark**, dividing the triangle, and maintains **venous patency** by tensing cervical fascia.