

Axillary Vein & Axillary Lymph Nodes

Axillary Vein

Anatomy

- **Origin** ? continuation of **basilic vein** at the lower border of teres major.
 - **Termination** ? continues as **subclavian vein** at the outer border of 1st rib.
 - **Position** ? lies **anteromedial to axillary artery** throughout its course.
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Tributaries

- Correspond roughly to branches of axillary artery:
 - Veins accompanying superior thoracic, thoracoacromial, lateral thoracic, subscapular, circumflex humeral arteries.
 - Major superficial tributaries:
 - **Cephalic vein** (joins near 1st part of axillary vein).
 - Basilic vein (forms axillary vein).
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Relations

- **Anteriorly** ? skin, fascia, pectoralis major.
 - **Posteriorly** ? axillary artery and brachial plexus cords.
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- **Medially** ? ulnar nerve, medial cutaneous nerves of arm and forearm.
 - **Laterally** ? axillary artery.
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Clinical Anatomy

- **Central venous access:** axillary vein can be cannulated, safer than subclavian in some cases.
- **Injury:** during trauma or surgery, injury may cause **severe hemorrhage** or **air embolism** (negative pressure in thorax).
- **Compression:** in axillary swellings, enlarged nodes or aneurysms may compress the vein ? arm edema.
- **Thrombosis:** effort-related thrombosis (Paget-Schroetter syndrome) can occur in athletes due to repetitive shoulder movements.
- **Surgical landmark:** important in **axillary dissections** (breast carcinoma surgeries).

Axillary Lymph Nodes

General Features

- About **20–30 lymph nodes** present in axilla.
 - Function: drain lymph from **upper limb, breast, and thoracic wall**.
 - Clinically important as the **main pathway of breast carcinoma spread**.
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Groups of Axillary Nodes

1. Pectoral (Anterior) Group

- Location ? along the lateral thoracic vessels, near lower border of pectoralis minor.
- Drainage ? anterior thoracic wall (including most of breast).
- Clinical ? first involved in carcinoma of breast.

2. Subscapular (Posterior) Group

- Location ? along subscapular vessels, near posterior axillary fold.
- Drainage ? posterior thoracic wall, scapular region.

3. Humeral (Lateral) Group

- Location ? along axillary vein, medial to humerus.
- Drainage ? upper limb (except lymphatics following cephalic vein, which drain to apical nodes).

4. Central Group

- Location ? deep in axillary fat, near base of axilla.
- Receive ? lymph from pectoral, subscapular, and humeral groups.
- Drain into apical nodes.

5. Apical Group

- Location ? apex of axilla, near 1st rib and clavicle.
- Drainage ? central nodes, cephalic vein lymphatics, upper part of breast.

- Efferents ? form **subclavian lymph trunk** ? drains into thoracic duct (left) or right lymphatic duct (right).
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Lymphatic Drainage Pathway (Summary)

- Breast ? mainly to **pectoral nodes**.
 - Upper limb ? mainly to **humeral nodes**.
 - Back ? to **subscapular nodes**.
 - All ? converge on **central nodes** ? **apical nodes** ? **subclavian trunk** ? **venous system**.
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Clinical Anatomy

- **Breast carcinoma:**
 - 75% of lymph from breast drains to axillary nodes.
 - Axillary nodes (especially pectoral group) are first involved.
 - Spread to apical nodes ? systemic dissemination.
- **Axillary clearance (surgery):**
 - Done in breast cancer operations.
 - Must preserve **long thoracic nerve** (to serratus anterior) and **thoracodorsal nerve** (to latissimus dorsi).
- **Tuberculosis:** axillary nodes may be enlarged in TB infection.

- **Sentinel lymph node biopsy:** identifies first draining node of breast ? used to detect metastasis.

Clinical Anatomy of Axillary Lymph Nodes

1. Carcinoma of Breast

- **Most important clinical relevance.**
- 75% of lymph from breast drains to **axillary nodes**, especially anterior (pectoral) group.
- Spread pattern:
 - Pectoral ? central ? apical ? subclavian trunk ? venous system.
- **Clinical signs:**
 - Hard, immobile axillary nodes in carcinoma.
 - Skin dimpling, nipple retraction, peau d'orange (from lymphatic obstruction).
- **Contralateral spread** ? via parasternal nodes, but axillary involvement is usually earliest.

2. Axillary Node Dissection

- Performed in carcinoma breast to remove involved nodes.
- **Structures to preserve** during dissection:
 - Long thoracic nerve (to serratus anterior) ? injury causes winged scapula.

- Thoracodorsal nerve (to latissimus dorsi).
 - Used for staging and treatment of breast carcinoma.
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3. Sentinel Lymph Node Biopsy

- First node draining breast (usually anterior group) identified using dye or isotope.
 - If uninvolved ? full axillary clearance can be avoided.
 - Minimizes morbidity (lymphedema, nerve injury).
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4. Tuberculosis

- Axillary nodes often enlarged and matted in **tuberculous lymphadenitis**.
 - May form cold abscesses that track along fascial planes.
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5. Infections of Upper Limb

- Minor infections of hand or arm ? lymphadenitis in axillary nodes (painful, tender swelling).
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6. Systemic Disease

- **Lymphomas and leukemias** present with generalized lymphadenopathy, often involving axillary nodes.
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7. Surgical & Clinical Significance

- **Sentinel node biopsy** ? gold standard for detecting early metastasis.
- **Axillary swellings** ? differential diagnosis includes lipoma, abscess, aneurysm, and lymphadenopathy.
- **Metastatic spread** ? involvement of apical nodes indicates advanced disease.
- **Postoperative complication** ? removal of nodes may cause lymphedema of upper limb.