

# 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.

---

### 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).

---

### Relations

- **Anteriorly** ? skin, fascia, pectoralis major.
- **Posteriorly** ? axillary artery and brachial plexus cords.

- **Medially** ? ulnar nerve, medial cutaneous nerves of arm and forearm.
- **Laterally** ? axillary artery.

---

## 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**.

---

### 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).

---

## 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**.

---

## 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.

---

### 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).

---

### 4. Tuberculosis

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

---

### 5. Infections of Upper Limb

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

---

### 6. Systemic Disease

- **Lymphomas and leukemias** present with generalized lymphadenopathy, often involving axillary nodes.

---

### 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.