A visual guide to surface anatomy

General Anatomy

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The blood vessels and lymph nodes

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Arteries and veins

- **Arteries and veins**
  - **The subclavian arteries**
  - **The carotids**
  - **The jugular veins**
  - **The axillary artery**
  - **The superficial temporal artery**
  - **The facial artery**
  - **The parotid glands**
  - **The brachial artery**
  - **The radial artery**
  - **The ulnar artery**
  - **The cephalic vein**
  - **The basilic vein**
  - **The median cubital vein**
  - **The femoral artery**
  - **The popliteal artery**
  - **The posterior tibial artery**
  - **The anterior tibial artery**
  - **The great saphenous vein**
  - **The small saphenous vein**
- **Lymph nodes**
  - **The submental nodes**
  - **The submandibular nodes**
  - **The posterior auricular lymph nodes**
  - **The anterior auricular lymph nodes**
  - **The occipital lymph nodes**
  - **The cervical lymph nodes**
  - **The deep internal jugular lymph nodes**
  - **The supraclavicular lymph nodes**
  - **The infraclavicular lymph nodes**
  - **The pectoral lymph nodes**
  - **The axillary lymph nodes**
  - **The superficial inguinal lymph nodes**
  - **The popliteal lymph nodes**
  - **The supratrochlear (epitrochlear) lymph nodes**

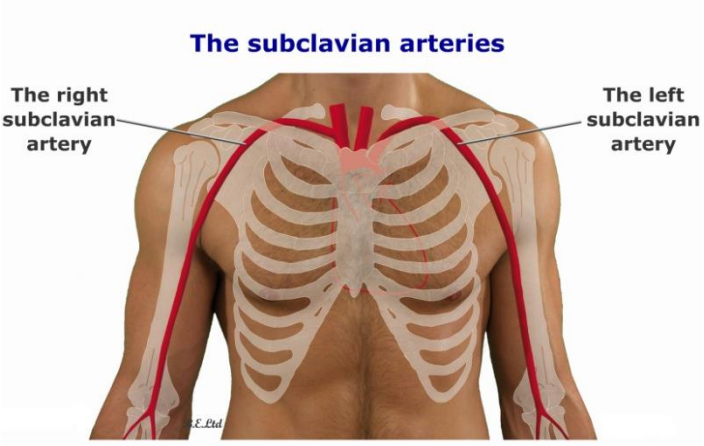
Video resources

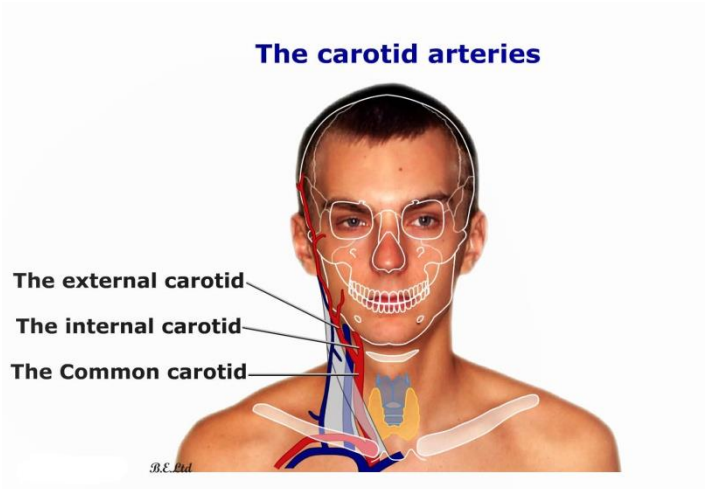
The vascular system:
https://www.youtube.com/watch?v=jvO1J5NoDis&t=15s

The lymph nodes:
https://www.youtube.com/watch?v=-uWoDlhm5Ek&t=94s

The Subclavian Arteries

- The right subclavian artery emerges with the right common carotid from the short brachiocephalic trunk.
- The left subclavian artery, starts directly from the arch of the aorta.
- It may be possible to palpate them as they travel over the 1st rib, posterior to the clavicle and posterior to scalinus anterior muscle. It continues deep to the clavicle and then into the axilla, hence the change of name to axillary artery.



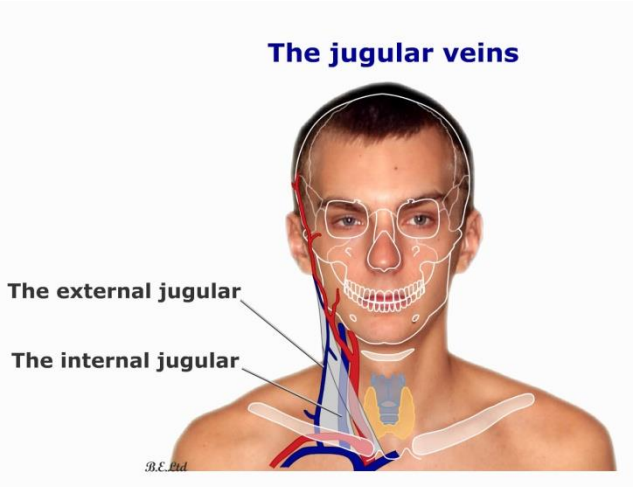


The Carotids

- The right common carotid originates in the neck from the brachiocephalic trunk. The left arises from the arch of the aorta.
- Each vessel passes obliquely upward, from behind the ternoclavicular joint to the level of the upper border of the thyroid cartilage, where it divides into internal and external carotids.

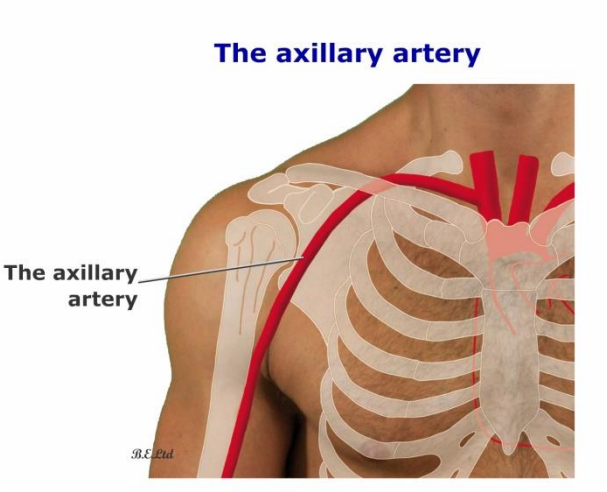
The Jugular Veins

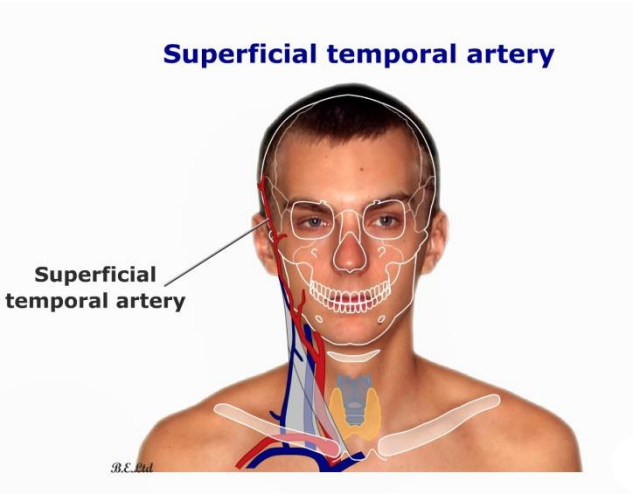
- The internal jugular travel with the common carotid and vagus nerve inside the carotid sheath. It provides venous drainage for the contents of the cranium.
- The external jugular runs superficially to SCM.
- The left and right external jugular veins drain into the subclavian veins.



The Axillary Artery

- The axillary artery may be palpated deep within the axilla. Its best to have the arm relaxed so that muscular tension does not mask the pulsations.
- Insert one or preferably two fingers superiorly and laterally against the lateral axillary border. Let us confirm the location of some of these superficial arteries using a vascular Doppler.



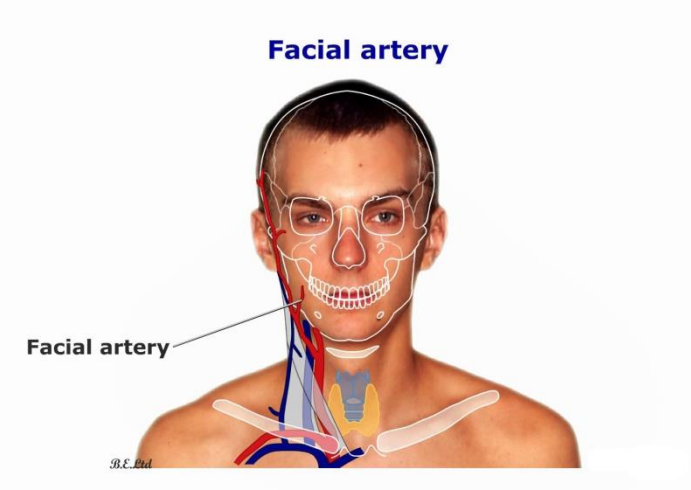


The Superficial Temporal Artery

- The temporal artery emerges as a branch of the external carotid.
- The temporal artery can easily be palpated just anterior to the tragus of the ear or just posterior to the neck of the mandible.
- If the fingers are traced superiorly and slightly anteriorly the superficial temporal artery can also be palpated over the temporalis muscle.

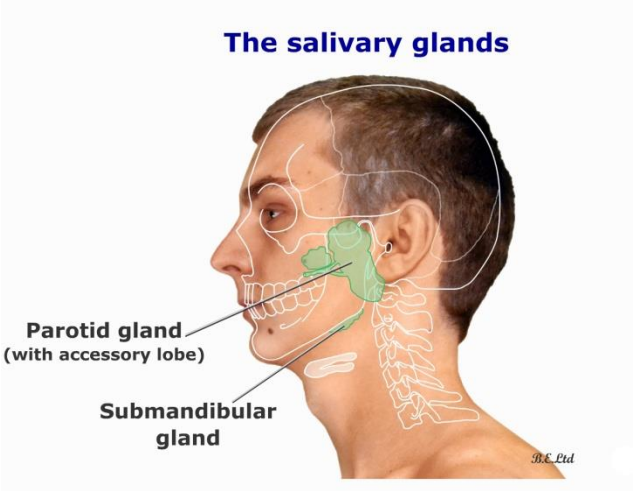
The Facial Artery

- This artery has an easy to palpate pulse. It is best felt as it passes over the ramus of the mandible appox mid way from the mental tubercle and the angle of the mandible.

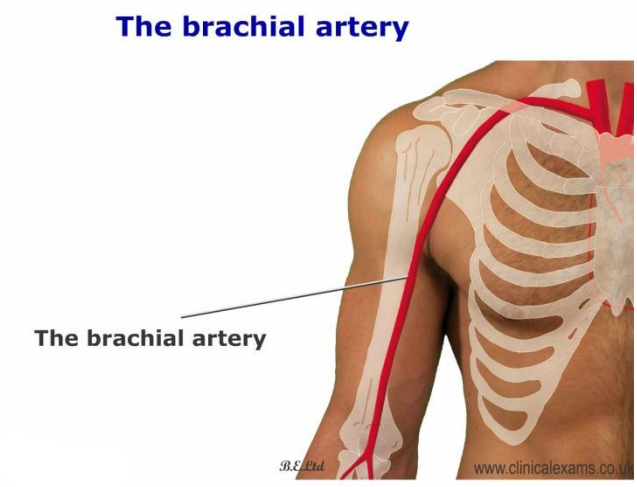


The Parotid Glands

- The superior border is at the level of the posterior two-thirds of the lower border of the zygomatic arch.
- The posterior border is in front of the external acoustic meatus, the mastoid process, and the anterior border of sternocleidomastoid.
- The inferior border is just below the angle of the mandible.
- The anterior border lies over the Masseter.
- The salivary duct drains opposite the second upper molar tooth.



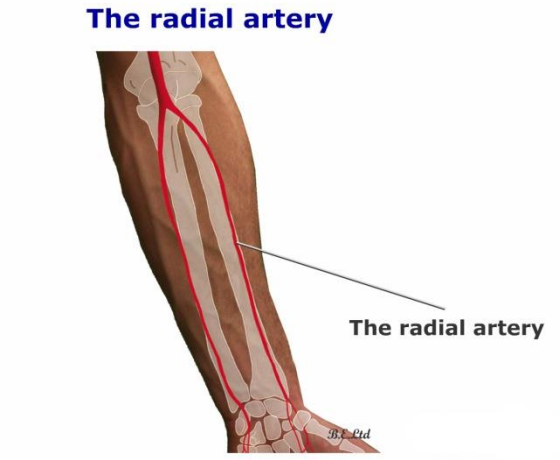
The Brachial Artery



- This is essentially a continuation of the axillary artery.
- The brachial artery descends the medial border of the arm. The upper part is located at the lower margins of the teres major, anterior to the coracobrachialis and medial to the biceps muscles.
- The ulnar nerve lies superficial to the superior part of the brachial artery and then over the median nerve as it approaches the antecubital crease.
- It is at this point that the brachial artery is commonly auscultated when taking the blood pressure - just before it goes deep to the biciptal aponeurosis.

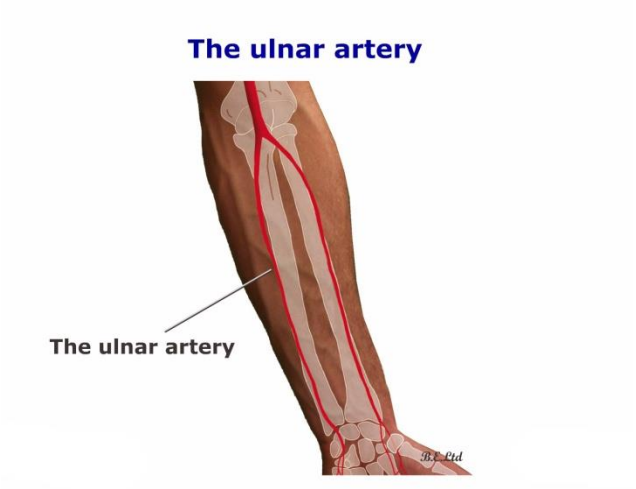
The Radial Artery

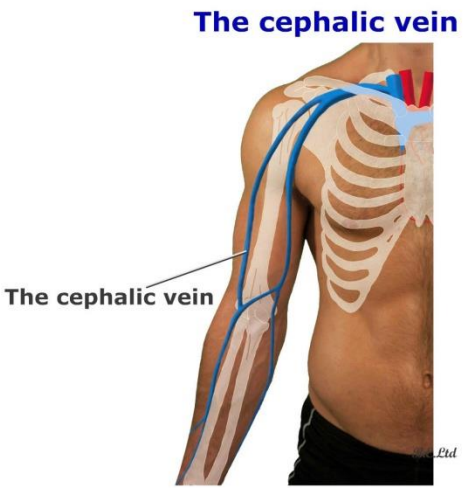
- The radial artery divides just distal to the antecubital crease to form the radial and ulnar arteries.
- At the wrist the radial artery is easily palpable just anterior to the styloid process of the radius.
- The radial artery can again be palpated over the dorsal aspect of the hand within the anatomical snuff box as it lies over the lateral border of the scaphoid.



The Ulnar Artery

- Similarly the ulnar artery can also be palpated at the wrist.
- This time palpate distal to the ulnar styloid process over the pisiform.
- The pulsations are weaker as this is a smaller artery and also diminished by the palmar aponeurosis.



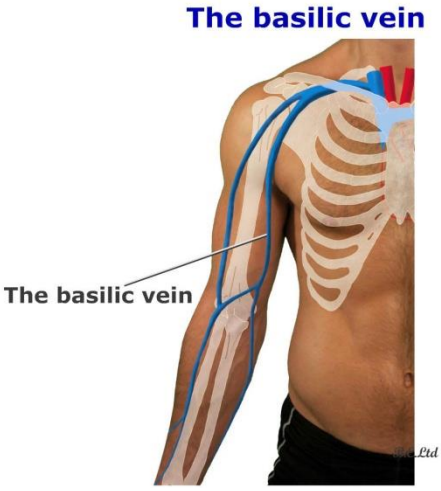


The Cephalic vein

- The cephalic vein lies in the lateral aspect of the arm and forearm. It eventually joins onto the subclavian vein.
- Starting from the forearm the cephalic vein can be traced in the lateral border then near the head of the radius, in the antero-lateral aspect of the elbow.
- It then travels superiorly lateral to the biceps brachi then between the pectoralis major and deltoid muscles to become the subclavian vein.

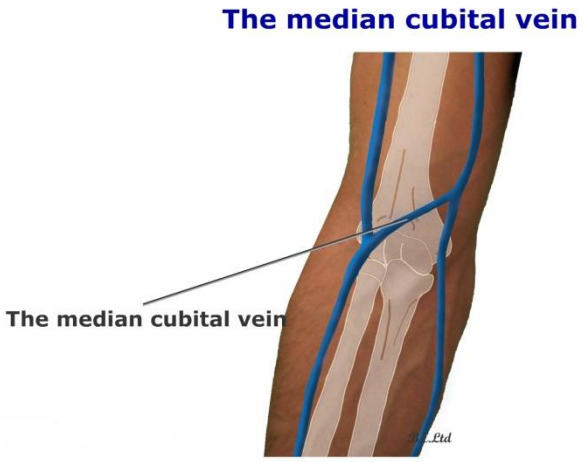
The Basilic vein

- The basilic vein can be traced in the medial aspect of the forearm as it ascends anterior to the medial condyle of the humerus.
- It continues medially in the arm until the axilla when it becomes the brachial vein then the axillary vein.



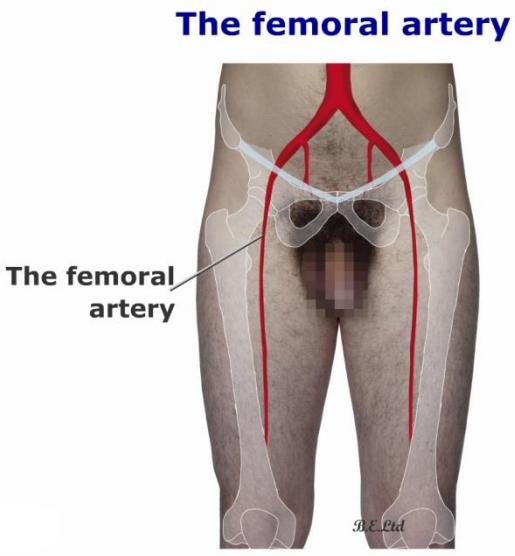
The Median cubital vein

- The median cubital vein (or median basilic vein) is a superficial vein of the upper limb.
- It lies in the cubital fossa superficial to the bicipital poneurosis.
- It connects the basilic and cephalic veins. It has an oblique course from lateral to medial. It is often used for venipuncture.



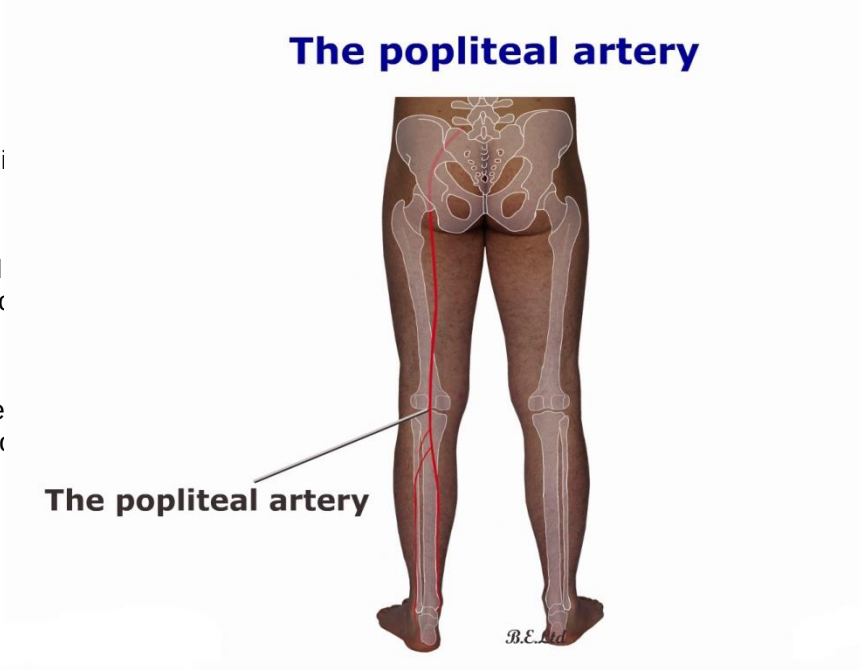
The Femoral Artery

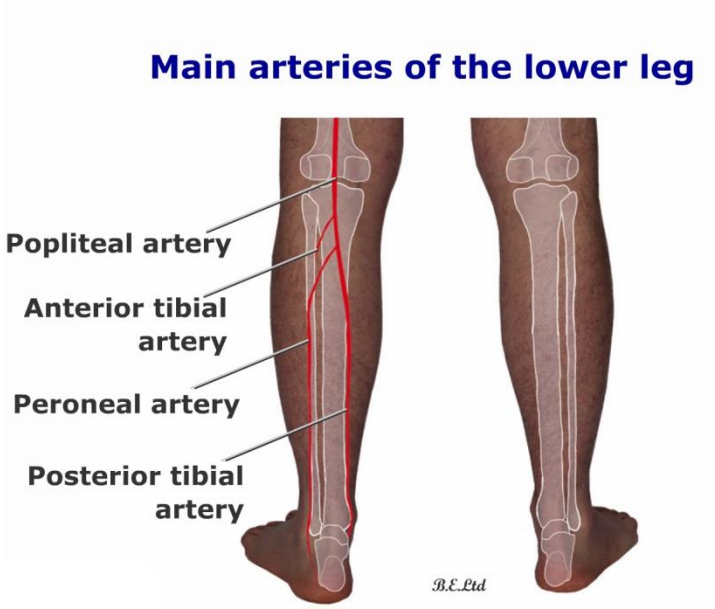
- This can be palpated with ease just inferior to the inguinal ligament half way between the anterior superior iliac spine and symphysis pubis.
- The femoral artery then travels deep within the muscles of the thigh then medially and then posteriorly as it approaches the knee joint.
- At the distal 1/3 of the thigh it travel through the adductor canal (together with the femoral vein, the femoral nerve, the saphenous nerve, and the nerve to the Vastus medialis).
- The femoral artery emerges through the opening of the adductor magnus to travel into the popliteal fossa.



The Popliteal Artery

- The femoral artery has now become the popliteal artery. It can be palpated deep i the popliteal fossa, but not with ease.
- To reduce tension from the muscles and tendons, the relaxed knee should be plac at 45^0.
- To increase your chances of locating the popliteal artery you may use the fingers o both hands cupped around the condyles whilst supporting the weight of the leg.





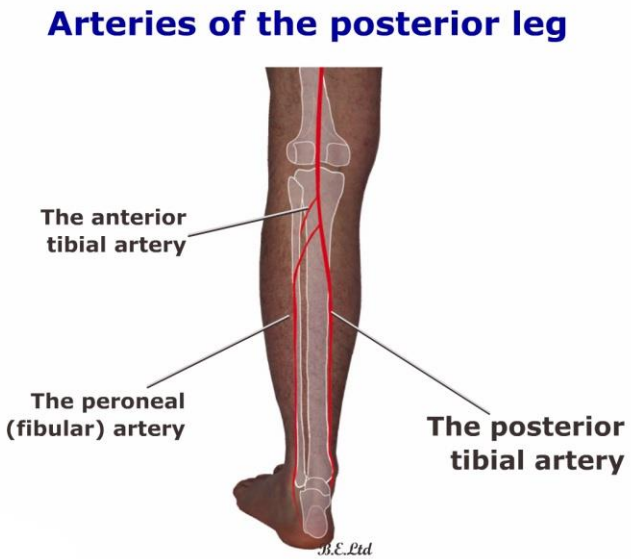
The Anterior and Posterior Tibial Arteries

- Their origin is just below the popliteal crease between the two heads of the gastrocnemius muscle.
- The popliteal artery gives off 3 branches:

➢Anterior tibial artery
➢Posterior tibial artery
➢Peroneal artery

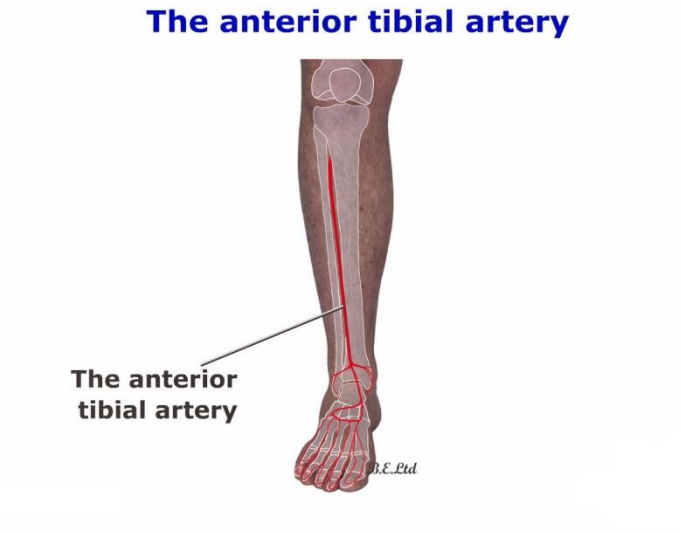
The Posterior Tibial Artery

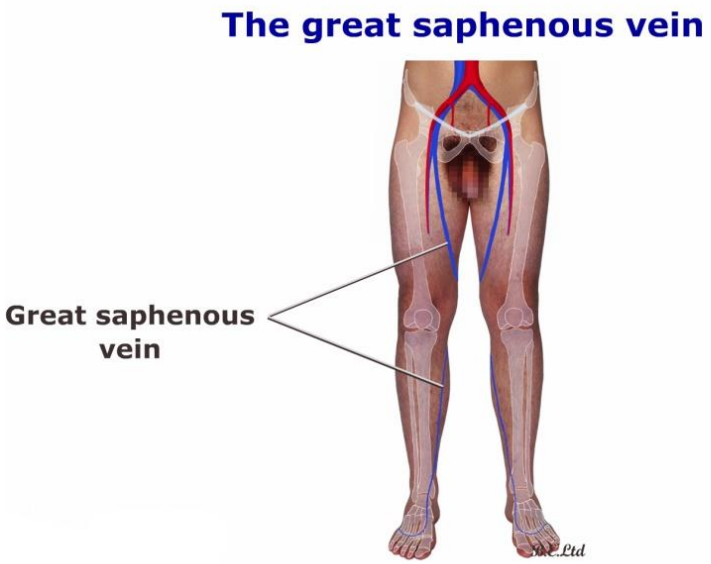
- The posterior tibial artery continues directly inferiorly deep to the gastrocnemius, soleus and plantaris muscles. Then it becomes superficial posterior to the medial malleolus.
- It then continues into the medial plantar aspect of the foot.
- At the ankle joint the posterior tibial artery passes behind the medial malleolus.
- It is accompanied by the posterior tibial vein, along its course.
- The posterior artery can be palpated infero-lateral to the medial malleolus. It is an important pulse in evaluating the vascular integrity of the lower extremities.



The Anterior Tibial Artery

- After the bifurcation from the popliteal artery it pierces the interosseous membrane to travel anteriorly between the tibia and the fubula.
- This artery descends deep within the tibialis muscles in the anterior and slightly medial aspect of the leg.
- Over the foot it becomes the dorsalis pedis. This is also a clinically significant artery to palpate.
- This pulse can be located between the tendons of extensor digitorum longus and extensor hallucis longus between the 1st and 2nd metatarsals.



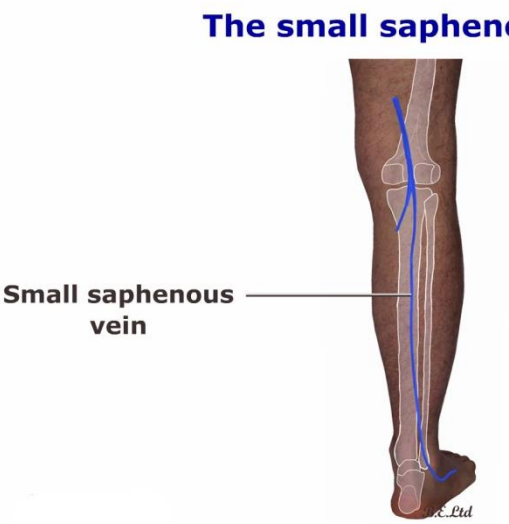


The Great Saphenous Vein

- This is a superficial vein in the anterior and medial aspect of the entire leg.
- It starts from the medial marginal vein at the dorsum of the foot.
- It ascends from the dorsal aspect of the foot, anterior to the medial malleolus, the medial aspect of the calf muscle.
- Then behind the posterior medial condyle of the knee, and the antero-medial aspect of the thigh.
- It pierces the saphenous opening just inferior to the inguinal ligament at mid way, to join onto the femoral vein.

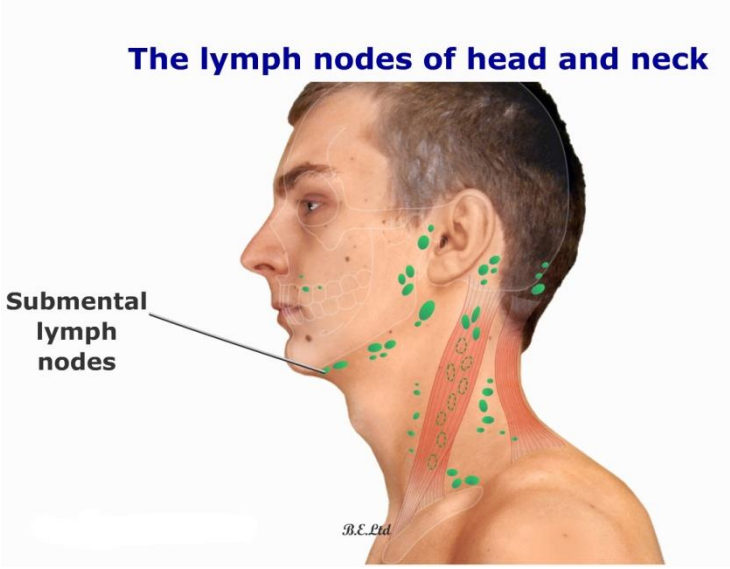
The Small Saphenous Vein

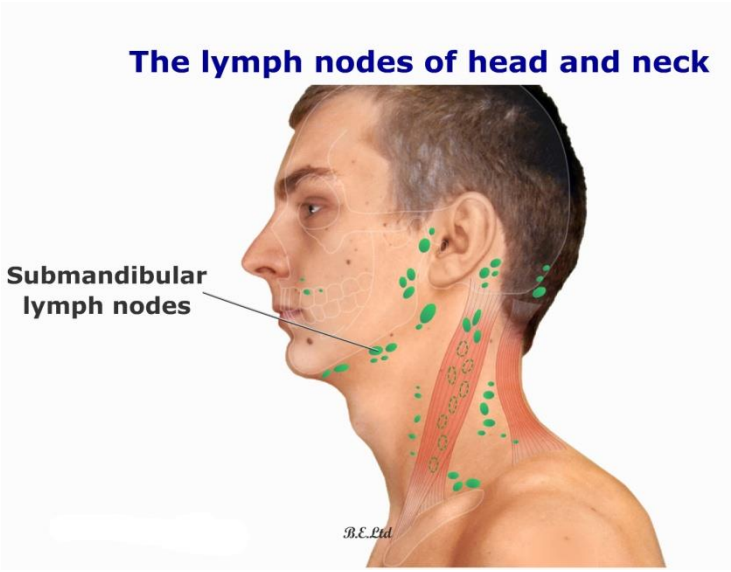
- This a relatively large superficial vein located in the posterior part of leg.
- It starts from the lateral marginal vein of the dorsum of the foot.
- It ascends posterior and lateral to the lateral malleolus, and slightly lateral to the calf muscles then between the two heads of the gastrocnemius muscle.
- It then joins the popliteal vein behind the knee.
- The popliteal vein then becomes the femoral vein as it ascends deep within the postero-medial muscles of the thigh.



The Submental Lymph Nodes

- Situated between the anterior bellies of the digastric muscle or just posterior to the mental protuberance of the mandible.
- They are often palpable using one finger.
- They drain anterior portions of the lower lip, the floor of the mouth and the apex of the tongue.



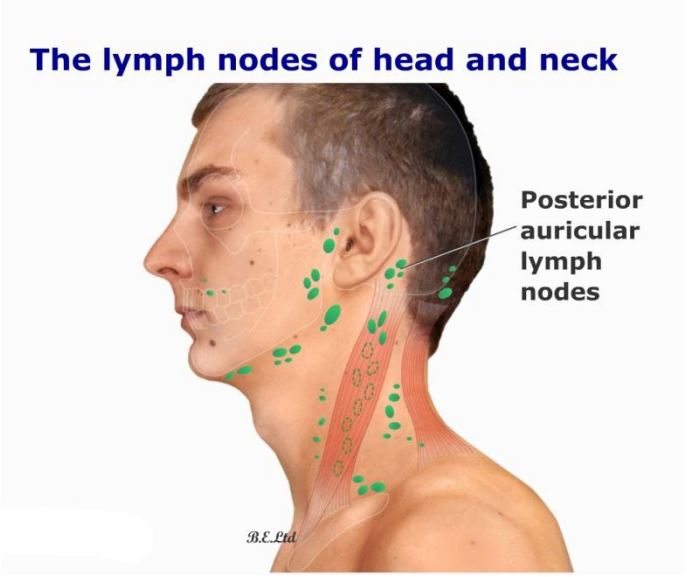


The Submandibular Lymph Nodes

- There are 3-6 lymph nodes on either side of the ramus of the mandible situated on its medial or lingual aspect.
- They drain the medial palpebral commissure, the cheek, the side of the nose, the upper lip, the lateral part of the lower lip, the gums, and the anterior part of the margin of the tongue.

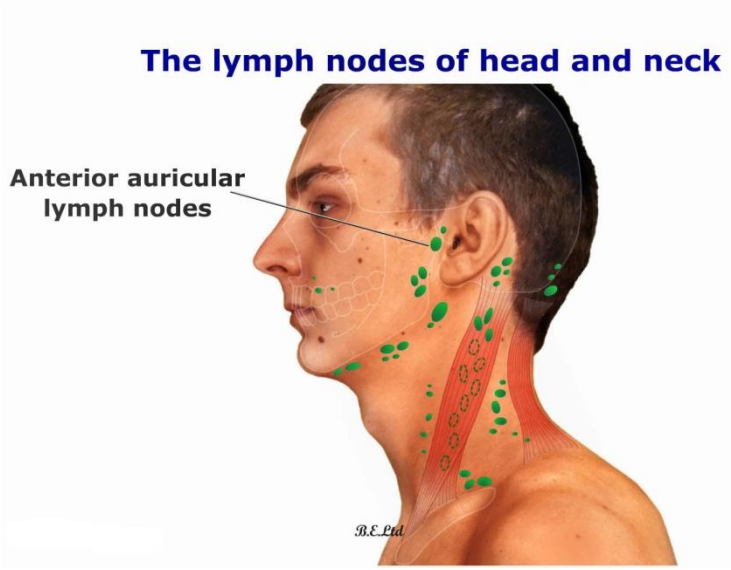
The Posterior Auricular Lymph Nodes

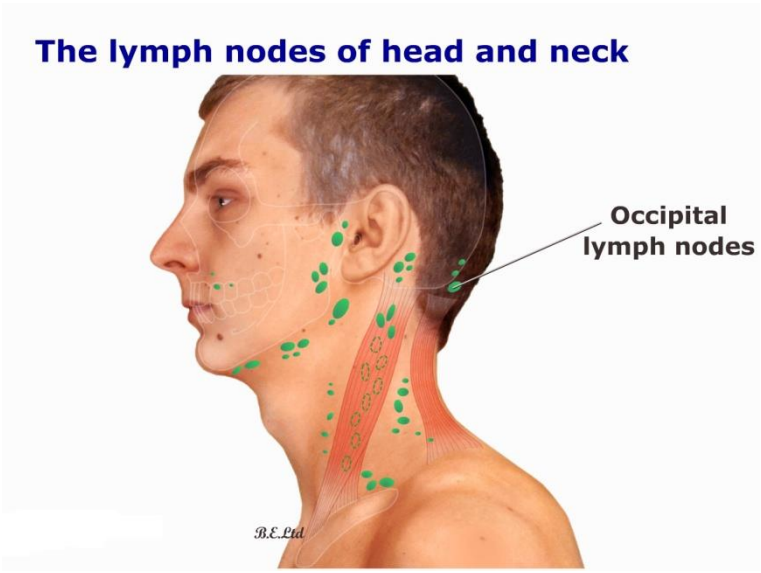
- Also referred to as the mastoid lymph nodes or retroauricular lymph nodes.
- They are situated on the mastoid insertion of the sternocleidomastoids near the mastoid process.
- Usually there are two in number
- They drain the posterior part of the temporo-parietal region, the upper part of the cranial surface of the pinna, and the back of the external acoustic meatus.



The Anterior Auricular Lymph Nodes

- Also referred to as pre-auricular deep parotid lymph nodes.
- They lie immediately in front of the tragus of the ear.
- There are about one to three in number.
- They drain the lateral surface of the auricula and the skin of the adjacent part of the temporal region.



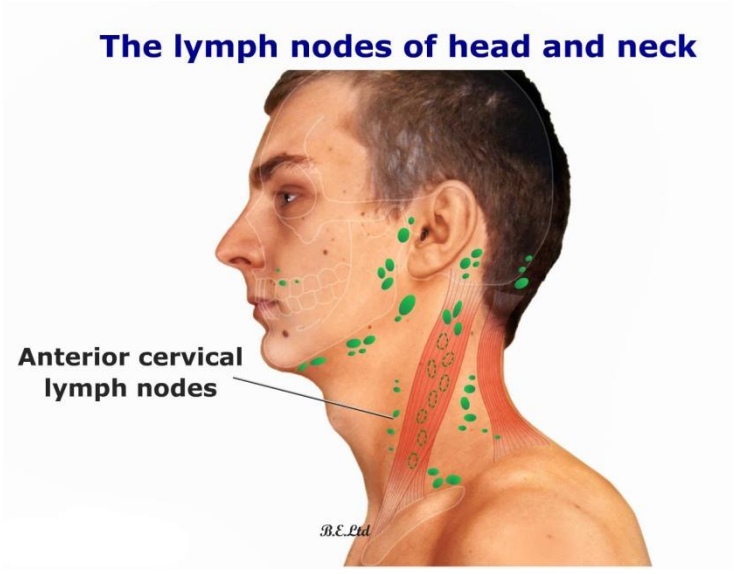


The Occipital Lymph Nodes

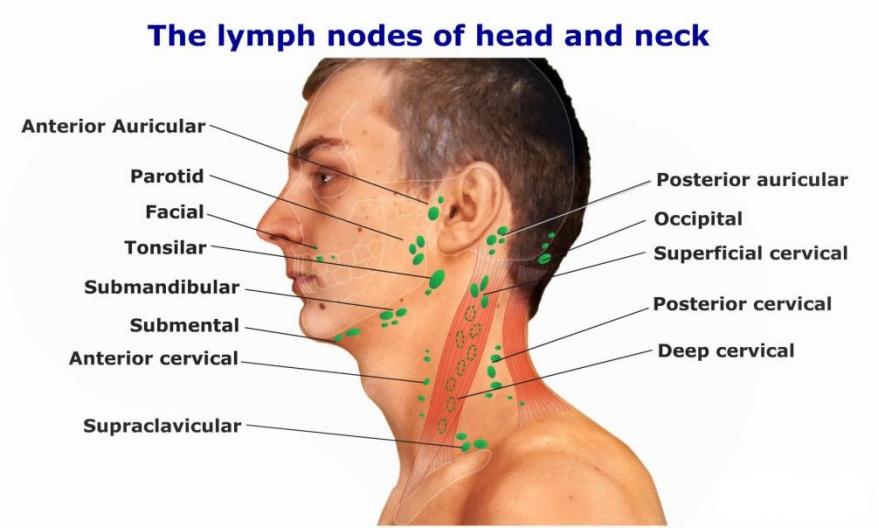
- They are located on the inferior parts of the occiput close to the insertion of the trapezius and over the insertion of the semispinalis capitis.
- The occipital lymph nodes are one to three in number.
- They drain the occipital region of the scalp.

The Cervical Lymph Nodes

- These are arranged in various groups by several classification systems. We will use the most commonly referred system.
- The most palpable are the anterior cervical.
- They follow the course of the external jugular vein.
- They receive drainage from skin and muscles of the anterior neck. Other significant groups are the:Deep internal jugular nodes .



- To palpate the cervical lymph nodes place the fingertips of one or two fingers almost flat against the sides of the neck and over the sternocleidomastoids.
- Feel them with a rolling circular motion.

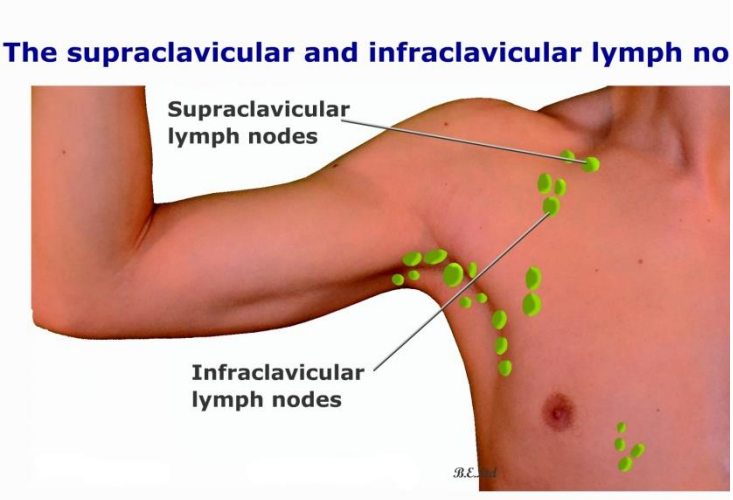


The Supraclavicular Lymph Nodes

- They are located superior to the clavicle, palpable within the supraclavicular fossa.
- To assist palpation ask the patient to shrug the shoulders in order to reduce skin tension and to enable your fingertips to reach deeper into the fossa.
- The most notable supraclavicular lymph node is Virchow's node on the left side.

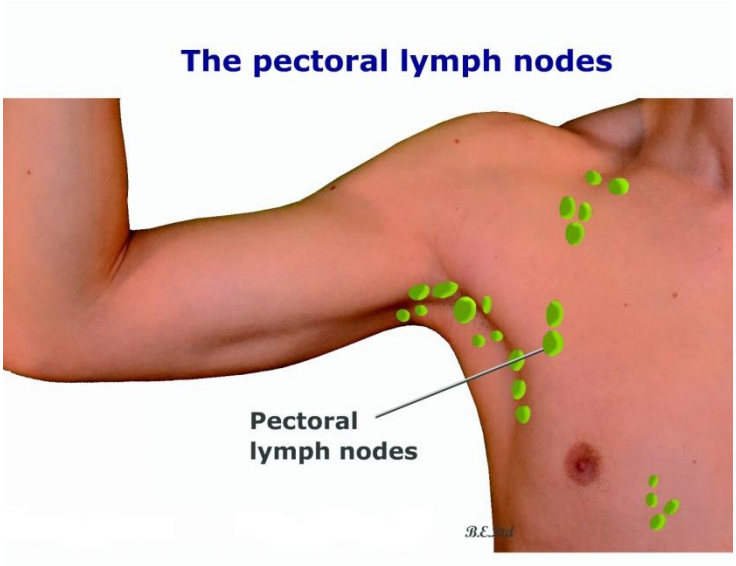
The Infraclavicular Lymph Nodes

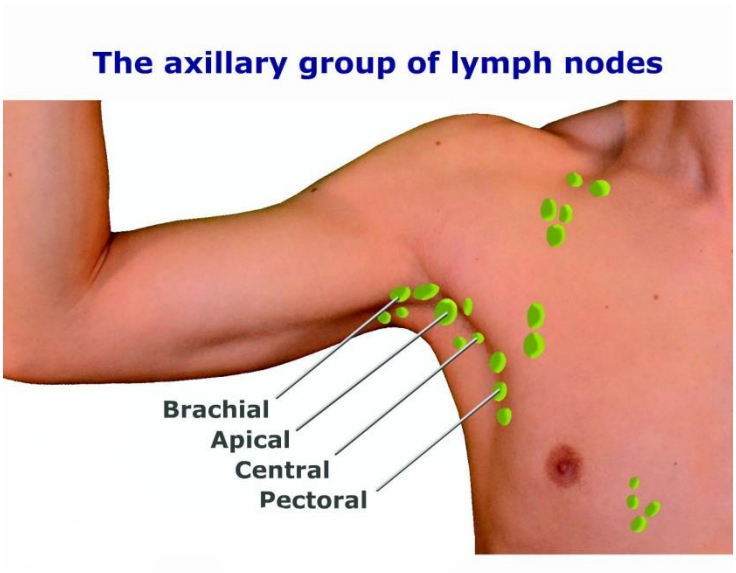
- Also referred to as delto-pectoral lymph nodes.
- They are located immediately below the clavicle.
- They are beside the cephalic vein, between the Pectoralis major and Deltoid muscles.
- They drain the external collecting trunks of the arm.



The Pectoral Lymph Nodes

- The pectoral or anterior lymph nodes are found along the lower border of the Pectoralis minor.
- There are about four or five glands.
- They drain the skin and muscles of the anterior and lateral thoracic walls, and the central and lateral parts of the breasts.





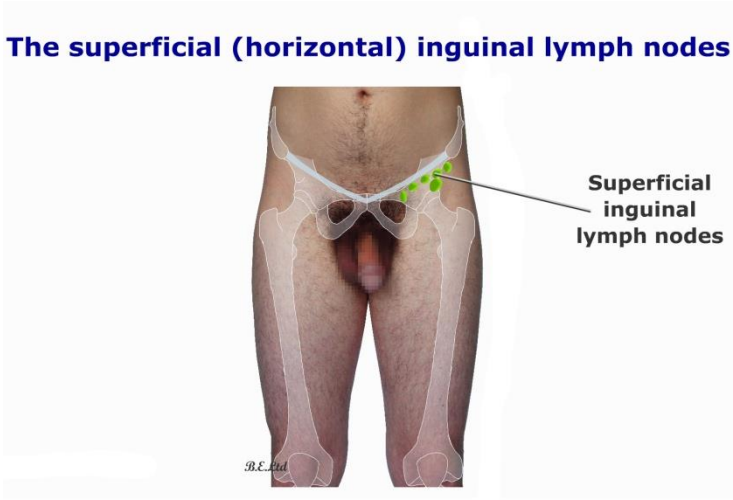
The Axillary Lymph Nodes

The Axillary lymph nodes are often classified into the following groups, starting anteriorally:

- Pectoral axillary lymph nodes (or "anterior")
- Central lymph nodes
- Apical lymph nodes (or "medial" or "subclavicular")
- Brachial lymph nodes (or "lateral")
- Sub-scapular axillary lymph nodes (or "posterior")
- They are of large size, varying from twenty to thirty in number.

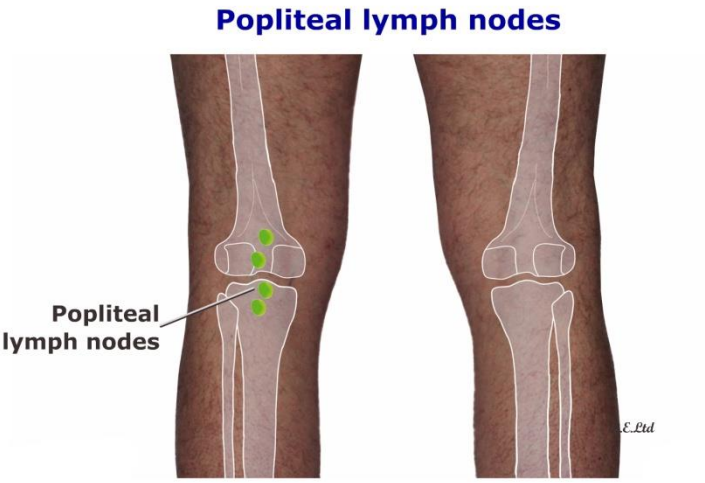
The Superficial Inguinal or Horizontal Lymph Nodes

- They are arranged obliquely along the inguinal ligament.
- The are often described as “shotty”, mobile and discrete lymph nodes.
- There are about 10 lymph nodes. They drain the lower abdominal wall, the perineum and much of the external genitalia except from the testes.
- They then drain into the deep inguinal nodes.
- A vertical or antero-medial group that follows the long saphenous vein drain into the superficial inguinal lymph nodes.



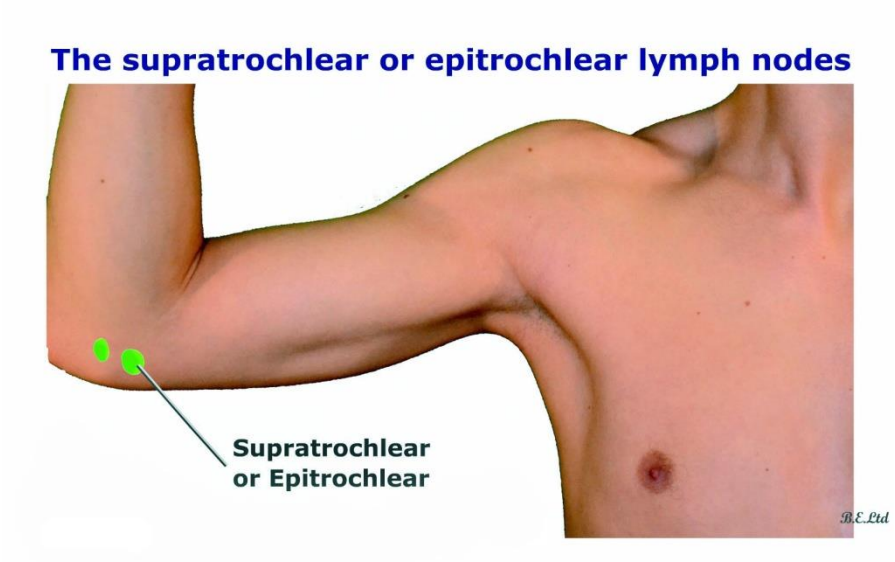
The Popliteal Lymph Nodes

- They are embedded in the fat contained in the popliteal fossa.
- There are about 6 or 7 nodes that are small in size.
- To palpate them place the knee at 45º with the fingertips of both hands cupped under the knee.



The Supratrochlear or Epitrochlear Lymph Nodes

- They are found above the medial epicondyle of the humerus, medial to the basilic vein.
- They are not easy to palpate.
- There are 1 or 2 lymph nodes.
- They drain large areas of the forearm



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