

**Arterial cannulation** with continuous pressure transduction and waveform display remains the accepted reference standard for blood pressure monitoring despite the fact that it is more costly than non invasive and has the potential for more complications.

**Indications;**

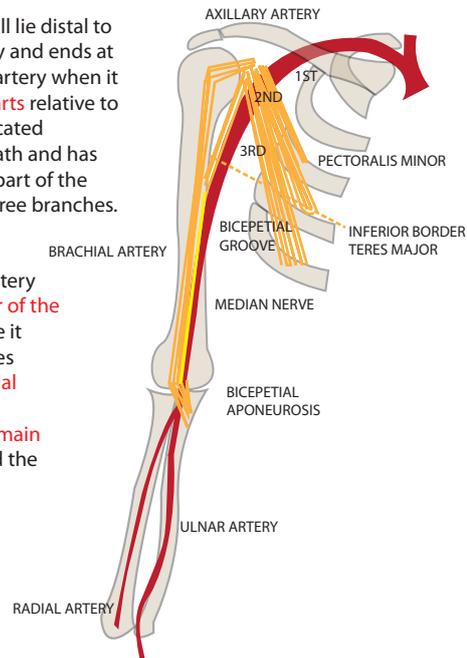
- Continuous, real-time blood pressure monitoring
- Planned pharmacologic or mechanical cardiovascular manipulation
- Repeated blood sampling
- Failure of indirect arterial blood pressure measurement
- Supplementary diagnostic information from the arterial waveform

**Complications;**

- Distal ischemia, pseudoaneurysm, arteriovenous fistula
- Hemorrhage
- Arterial embolization
- Infection
- Peripheral neuropathy
- Misinterpretation of data
- Misuse of equipment

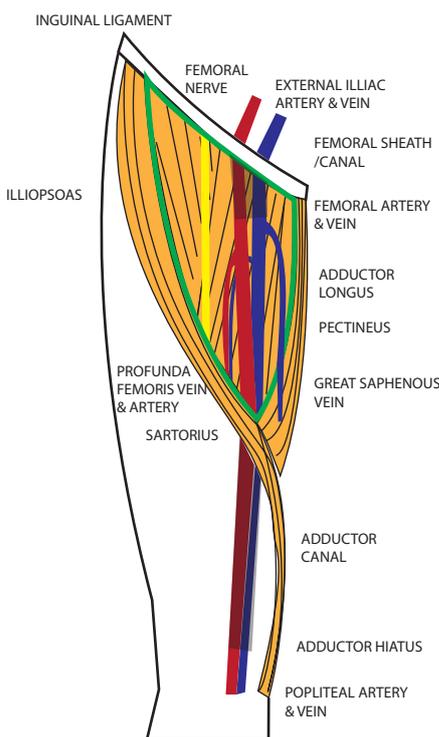
The most common site utilised for arterial cannulation is the radial artery. Peripheral arteries are preferable due to their lower risk of serious complications such as cerebral embolisation. Alternatives include the ulnar artery, brachial artery and dorsalis pedis and posterior tibial. The later two mainly in the paediatric population due to increasing likelihood of PVD in an adult population. The axillary artery and femoral artery are also used occasionally.

The **axillary artery** provides a site for **long term pressure monitoring**, the **left side** being preferred because the tip will lie distal to the aortic arch and great vessels. It begins at the **lateral border of the first rib** as the continuation of the subclavian artery and ends at the **inferior border of the teres major**. It passes **posterior to the pectoralis minor** into the arm and becomes the brachial artery when it passes distal to the inferior border of the teres major. For descriptive purposes, the axillary artery is divided into **three parts** relative to the pectoralis minor (the **part number also indicates the number of its branches**): The first part of the axillary artery is located between the lateral border of the first rib and the medial border of the pectoralis minor; it is enclosed in the axillary sheath and has one branch. The second part of the axillary artery lies posterior to the pectoralis minor and has two branches. The third part of the axillary artery extends from the lateral border of the pectoralis minor to the inferior border of the teres major and has three branches.



The **brachial artery**. Despite the absence of anatomic collateral flow at the elbow, brachial artery catheterization for perioperative blood pressure monitoring is a safe alternative to radial or femoral arterial catheterization. The brachial artery provides the main arterial supply to the arm and is the **continuation of the axillary artery**. It **begins** at the **inferior border of the teres major** and **ends in the cubital fossa** opposite the neck of the radius under cover of the bicipital aponeurosis, where it **divides into the radial and ulnar arteries**. The brachial artery, relatively **superficial and palpable throughout** its course, lies **anterior to the triceps and brachialis**. At first, it lies medial to the humerus, where its **pulsations are palpable in the medial bicipital groove**. It then passes anterior to the medial supraepicondylar ridge and trochlea of the humerus. As it passes inferolaterally, the brachial artery **accompanies the median nerve**, which crosses anterior to the artery. There are **three main branches** of the brachial artery that arise from its medial aspect are the profunda brachii artery (deep artery of arm) and the superior and inferior ulnar collateral arteries.

The **radial artery** is the most commonly used artery for placement of cannulas. The Allen's test is often recommended although its predictive power has been questioned by large studies. The radial artery is the **smaller terminal branch of brachial artery**. It runs inferolaterally **under cover of brachioradialis**; lies **lateral to flexor carpi radialis** tendon in distal forearm; winds around lateral aspect of radius and crosses **floor of anatomical snuff box** to pierce **1st dorsal interosseous muscle**.



The **femoral triangle** The **boundaries** of the femoral triangle are: the **inguinal ligament above**, **sartorius laterally** and **adductor longus medially**.

- The **floor** consists of: **iliopsoas** laterally and **pectineus** medially.
- The **roof** consists of: **fascia lata**.
- The **contents** include (from lateral to medial) the: **femoral nerve, artery, vein** and their branches and tributaries. The **femoral canal** is situated medial to the femoral vein. Transversalis fascia and psoas fascia fuse and evaginate to form the **femoral sheath** below the inguinal ligament. The sheath encloses the femoral artery, vein and canal but the femoral nerve lies outside on its lateral aspect. The triangle also contains **deep inguinal lymph nodes** and lymphatic vessels.

The **femoral artery** is the chief artery to the lower limb, is the **continuation of the external iliac artery**, **originating** distal to the inguinal ligament. It enters the **femoral triangle** deep to the **midpoint of the inguinal ligament** (midway between the ASIS and the pubic tubercle), lateral to the femoral vein. Lies **deep to the fascia lata** and descends on the adjacent borders of the iliopsoas and pectineus. Bisection of the femoral triangle and exits at its apex to enter the **adductor canal**, deep to the sartorius. Exits the adductor canal by passing through the **adductor hiatus** and **becoming the popliteal artery**. The **profunda femoris artery** (deep artery of the thigh) is the largest branch of the femoral artery and the chief artery to the thigh. It arises from the femoral artery in the femoral triangle.

The **femoral vein** is the **continuation** of the **popliteal vein proximal to the adductor hiatus**. As it **ascends** through the **adductor canal**, the femoral vein lies posterolateral and then **posterior to the femoral artery**. The femoral vein then enters the femoral triangle, and subsequently the femoral sheath medial to the **femoral canal**. It **ends** posterior to the inguinal ligament, where it becomes the **external iliac vein**. In the inferior part of the femoral triangle, the femoral vein **receives** the **profunda femoris vein**, the **great saphenous vein**, and other tributaries. The profunda femoris vein (deep vein of thigh), formed by the union of three or four perforating veins, enters the femoral vein inferior to the inguinal ligament and inferior to the termination of the great saphenous vein.