



# The Blood Supply of the Upper Limb

Tracing the arterial journey  
and the venous return

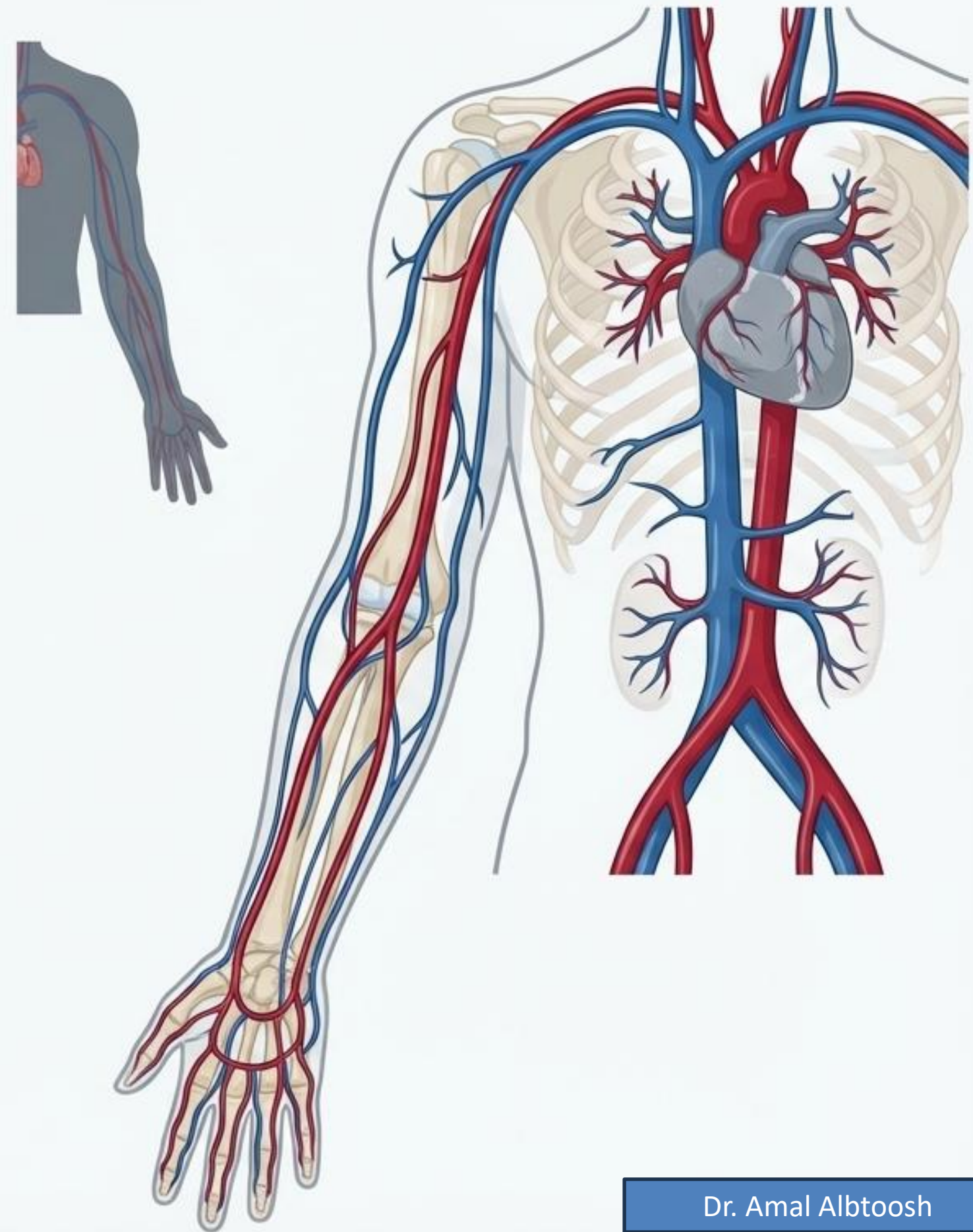
# A Continuous Loop: From Root to Fingertips

## The Arterial Journey (Outward)

A main arterial stem passes through the root of the neck, axilla, and arm before bifurcating in the forearm. It changes names as it crosses specific bony or muscular landmarks.

## The Venous Return (Inward)

Operates on a dual-track system—deep veins that shadow the arteries, and superficial veins that create their own pathways just beneath the skin.



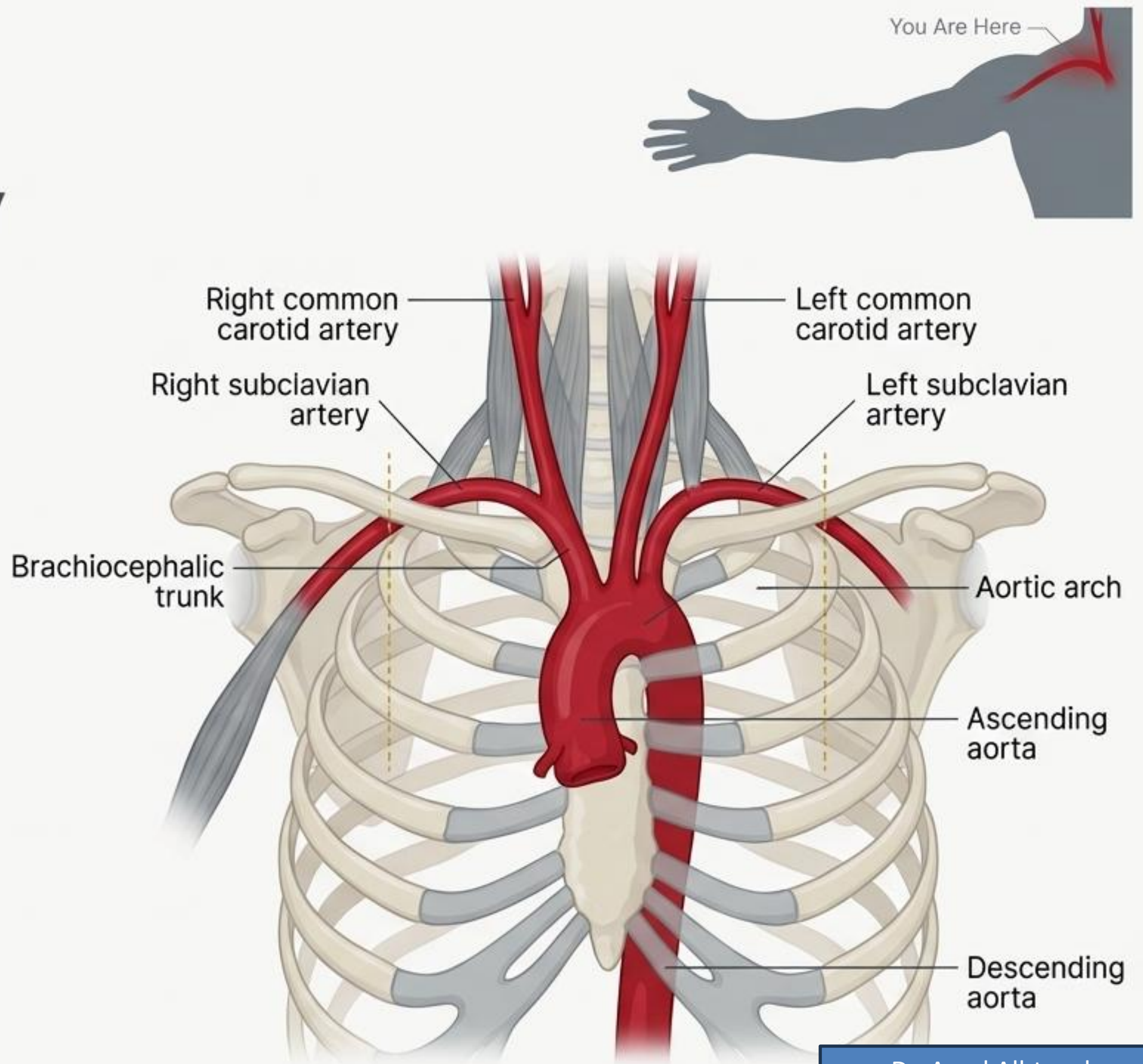
# The Origin: Subclavian Artery

The arterial supply begins as the Subclavian Artery, traveling laterally toward the axilla.

Right Side: Branches from the brachiocephalic trunk.

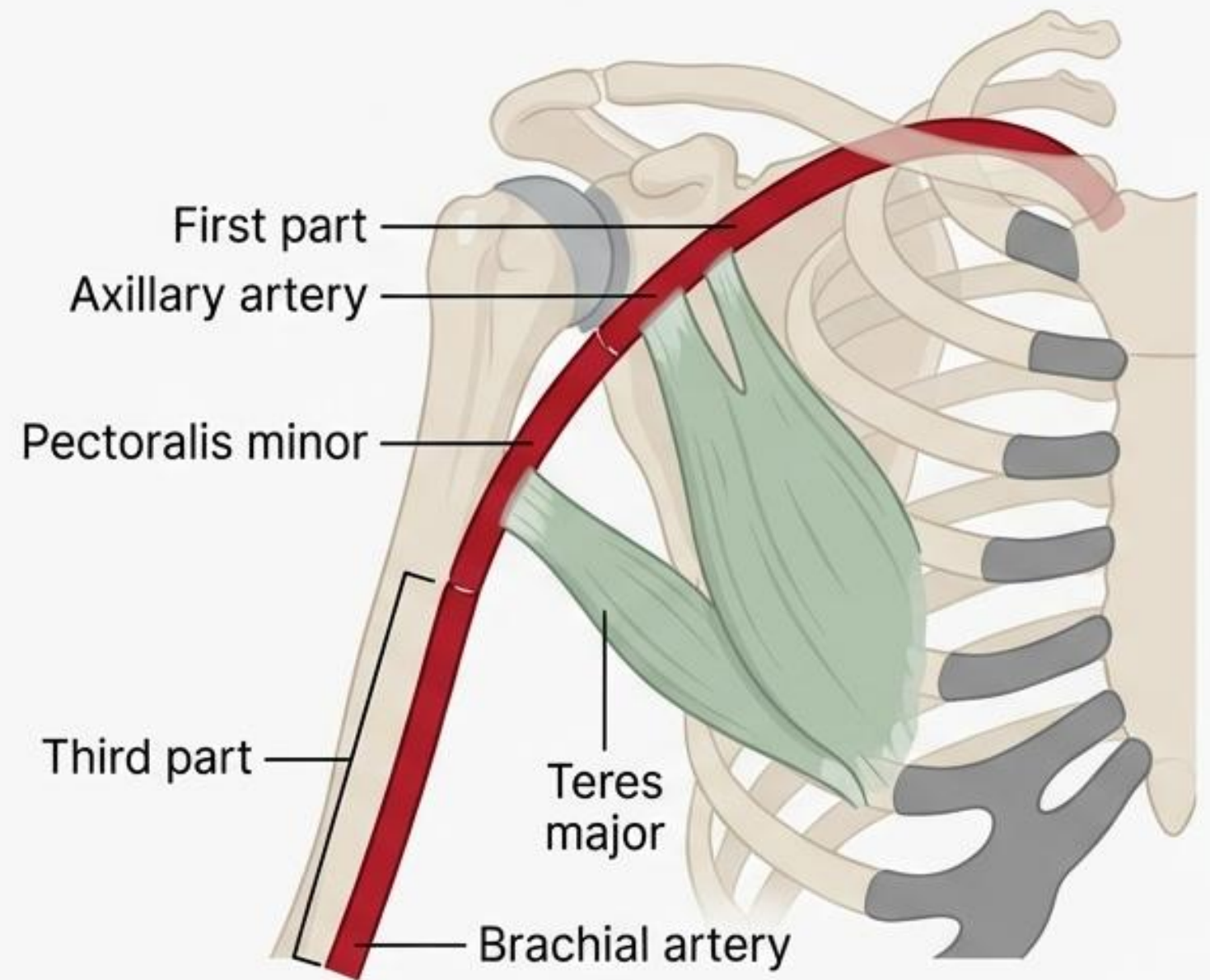
Left Side: Branches directly from the arch of the aorta.

The First Border: At the lateral border of the first rib, the subclavian artery crosses into the axilla and is renamed.



# Crossing the Border: Axillary Artery

- **Begins:** At the lateral border of the 1st rib (continuation of the subclavian). Enclosed within the axillary sheath.
- **Divisions:** The Pectoralis Minor muscle crosses over the artery, dividing it into three distinct parts:
  - First part: Proximal to the muscle.
  - Second part: Posterior to the muscle.
  - Third part: Distal to the muscle.
- **Ends:** At the lower border of the Teres Major muscle.

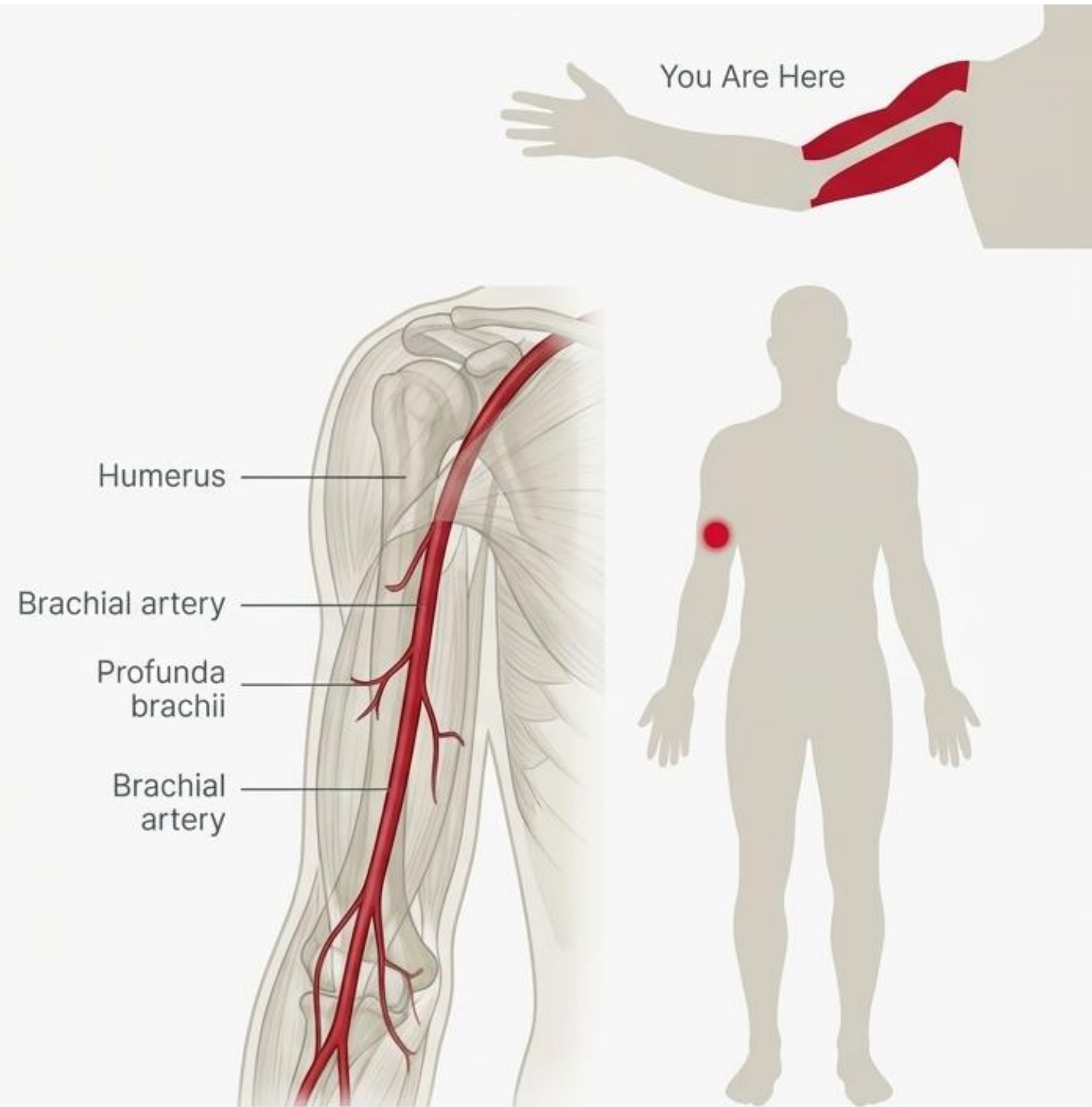


# The Main Vessel of the Arm: Brachial Artery

**Course:** Begins at the distal border of the Teres Major tendon. Travels straight down the anterior compartment of the upper arm.

**Clinical Significance:** Its pulsations are palpable because portions of the artery lie close to the skin, uncovered by muscle. It is the primary site for the auscultation of blood pressure.

**Termination:** Ends approximately 1 cm distal to the elbow joint, where it divides into two distinct paths.



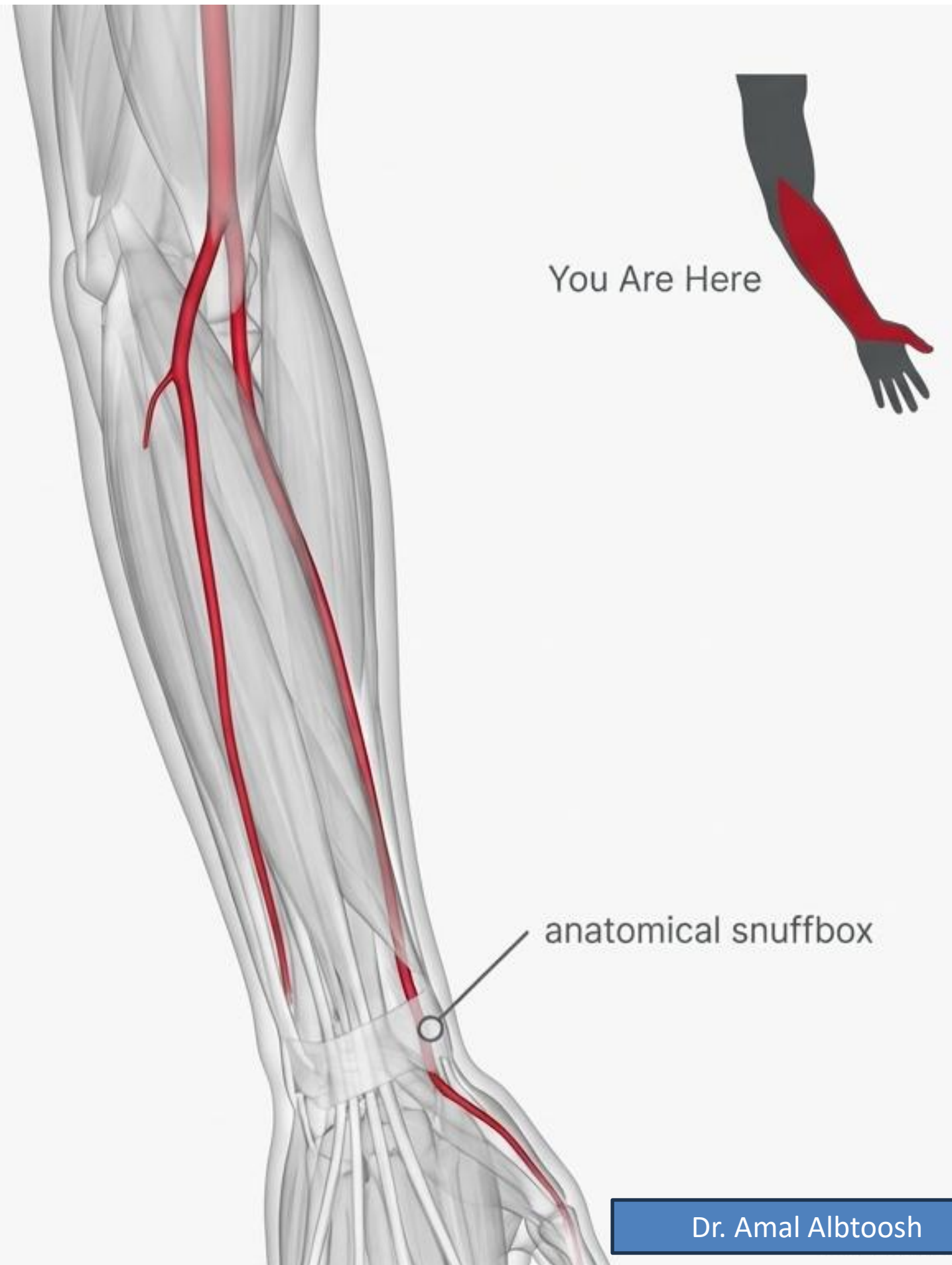
# The Lateral Path: Radial Artery

**Origin:** Branches from the brachial artery near the neck of the radius.

**Course:** Passes down the lateral side of the forearm, deep to the brachioradialis muscle.

**Clinical Landmark:** At the wrist, it passes through the anatomical snuffbox, serving as the standard site for palpating a radial pulse.

**Termination:** Ends in the hand by anastomosing with the deep branch of the ulnar artery.





# The Medial Path: Ulnar Artery

**Origin:** The medial branch from the brachial artery near the radial neck.

**Course:** Passes deep to the pronator teres, flexor carpi radialis, palmaris longus, and flexor digitorum superficialis.

**Crucial Landmark:** The ulnar head of the pronator teres physically separates the ulnar artery from the median nerve.

**Termination:** Ends in the hand by anastomosing with the superficial palmar branch of the radial artery.



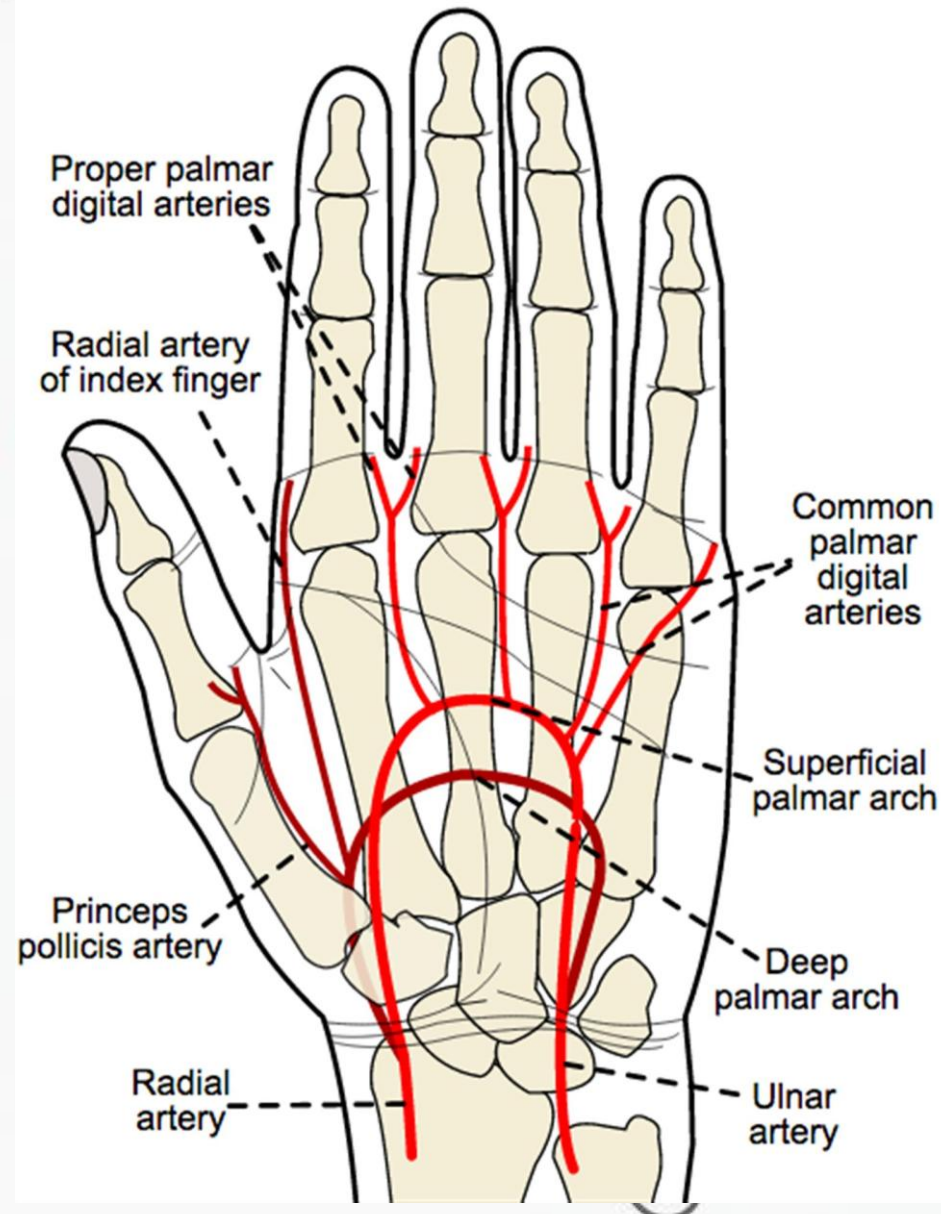
# Convergence in the Hand: The Palmar Arches

The radial and ulnar arteries reunite to create a robust, **dual-layered** blood supply to the hand.

**Superficial Palmar Arch:** Primarily formed by the ulnar artery, completed by a branch of the radial artery.

**Deep Palmar Arch:** Primarily formed by the radial artery, completed by a branch of the ulnar artery.

From these arches, common and proper digital arteries travel distally to supply the fingertips.



# The Venous Return: A Dual System

The venous drainage of the upper limb initiates on the back of the hand at the dorsal venous arch. From there, the blood travels back to the heart via two distinct networks:



## Deep Veins



Hidden companions that mirror the arterial highway.

## Superficial Veins

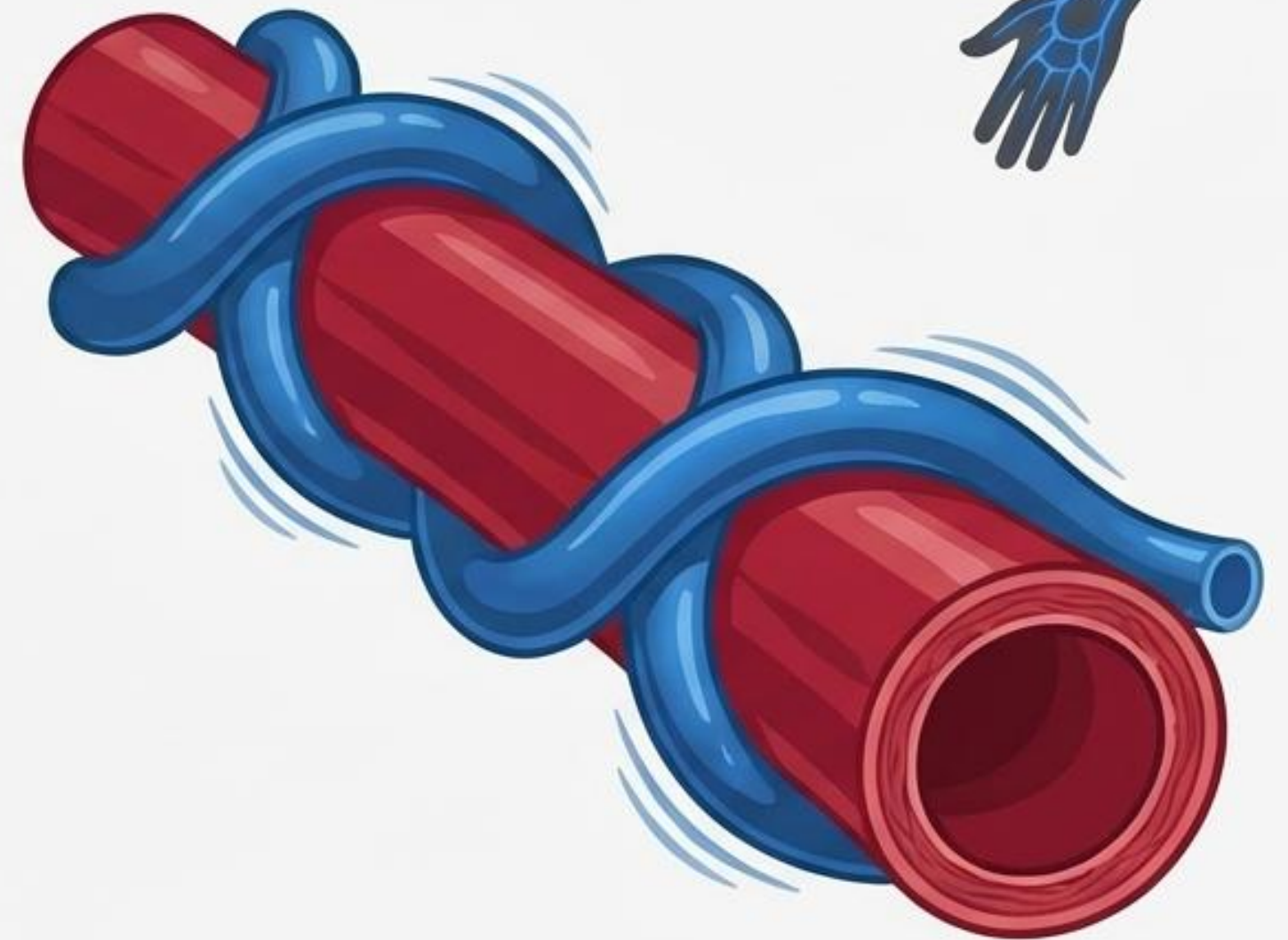


Visible pathways traveling independently within the superficial fascia.

# Deep Veins: The Shadows (Venae Comitantes)

The deep system perfectly shadows the arterial system.

**Venae Comitantes (Companion Veins):** Deep veins wrap around and accompany all large arteries (radial, ulnar, brachial), typically traveling in pairs. They share the exact nomenclature of their corresponding arteries. These paired veins eventually merge to become the larger Axillary vein, which continues past the clavicle to become the Subclavian vein.



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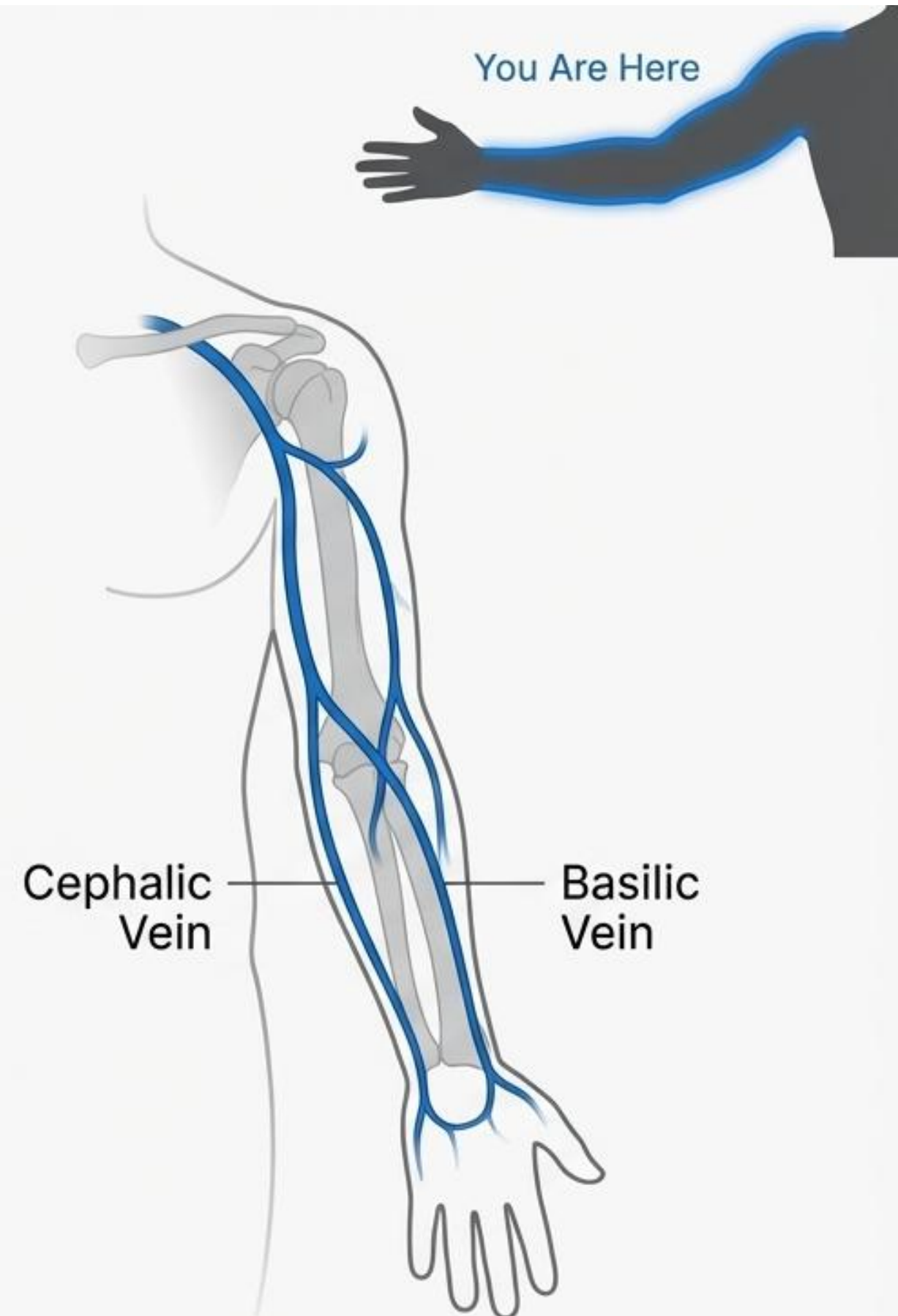


# Superficial Highways: Cephalic & Basilic Veins

Originating from the dorsal arch of the hand, these vessels travel entirely within the superficial fascia.

**Cephalic Vein:** Begins at the radial (lateral) edge of the hand and ascends along the lateral side of the biceps. It eventually joins the axillary vein just distal to the clavicle.

**Basilic Vein:** Ascends along the medial aspect of the forearm and the medial side of the biceps, eventually piercing deep to merge into the axillary system.



# The Crossroads: Median Cubital Vein

**The Bridge:** Sitting directly in front of the elbow (in the antecubital fossa), the Median Cubital **vein** forms a crucial transverse link between the lateral Cephalic vein and the medial Basilic vein.

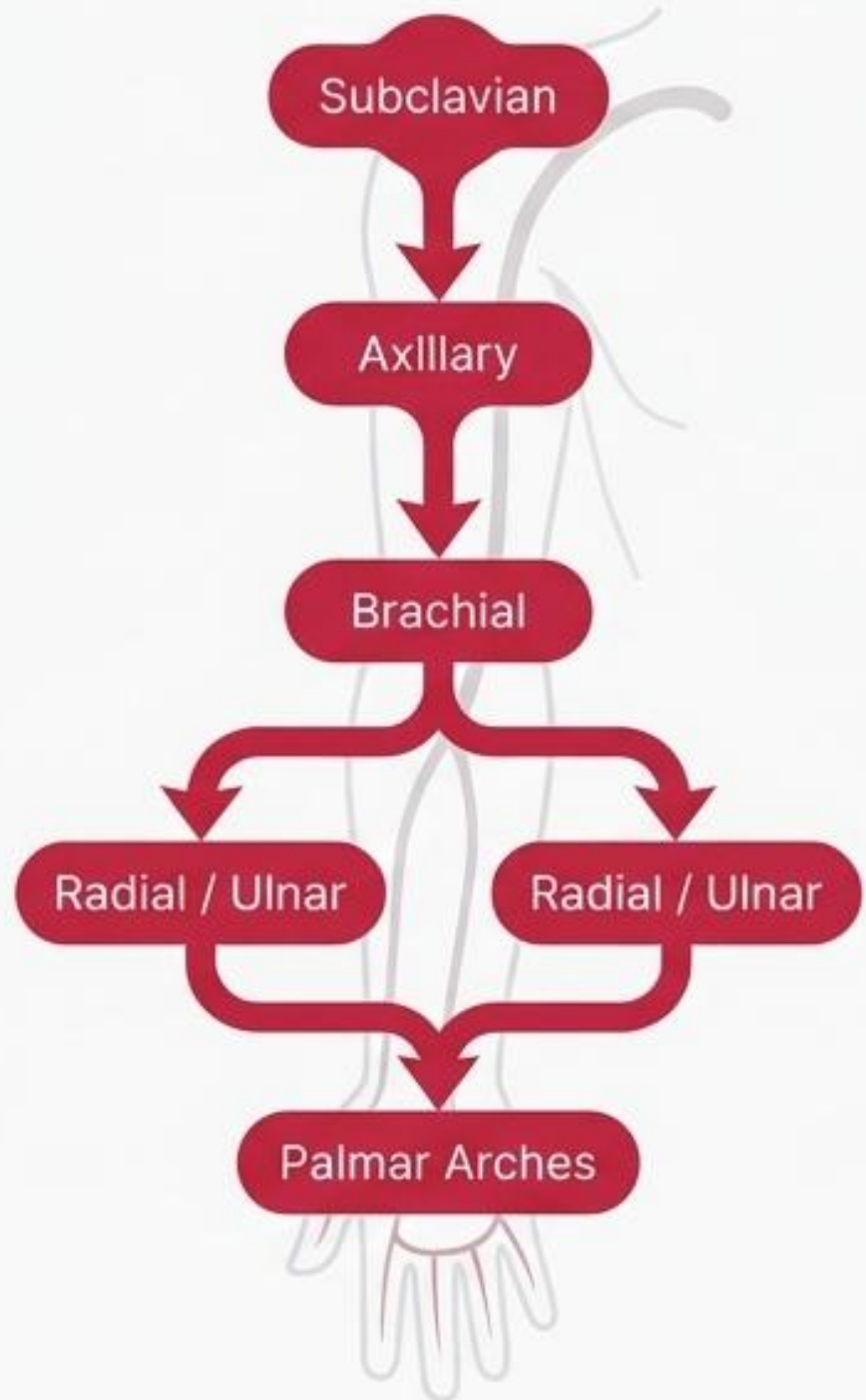
**Clinical Application:** Because of its superficial prominence, accessibility, and stability, it is the primary site used worldwide for phlebotomy (blood draws) and intravenous (IV) injections.

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# The Complete Vascular Circuit

## The Outward Flow



## The Return Flow

