

# Upper Extremity

## CHAPTER 9

---

# NEW TERMINOLOGY

Combining Form	Meaning	Example	Meaning of New Term
Acr/o	Extremities	Acroanesthesia	Absence of sensation in the extremities
Ankyl/o	Stiff joint	Ankylosis	Abnormal condition of a stiff joint
Arthr/o	Joint	Arthrocentesis	Surgical puncture of a joint
Articul/o		Articular	Pertaining to a joint
Burs/o	Bursa, sac	Bursitis	Inflammation of a bursa
Carp/o	Carpus	Carpectomy	Excision or surgical removal of a carpus

# NEW TERMINOLOGY

Combining Form	Meaning	Example	Meaning of New Term
Cervic/o	Neck	Cervicodynia	Pain of the neck
Chondr/o	Cartilage	Chondrodysplasia	Bad, painful, or difficult formation or growth of cartilage
Cost/o	Ribs	Costochondritis	Inflammation of the ribs and cartilage
Crani/o	Cranium	Craniocerebral	Pertaining to the cranium and brain
Fasci/o	Fascia	Fasciodesis	Binding or surgical fixation of a fascia
Humer/o	Humerus	Humeral	Pertaining to the humerus

# NEW TERMINOLOGY

Combining Form	Meaning	Example	Meaning of New Term
Kinesi/o	Movement	Kinesiology	Study of movement
Kyph/o	Hump	Kyphosis	Abnormal condition of a hump
Lamin/o	Lamina	Laminectomy	Excision or surgical removal of a lamina
Lord/o	Bent backward	Lordoscoliosis	Abnormal condition of crookedness and backward bend
Lumb/o	Lower back	Lumbodynia	Pain in the lower back
Menisc/o	Meniscus	Meniscectomy	Excision or surgical removal of a meniscus

# NEW TERMINOLOGY

Combining Form	Meaning	Example	Meaning of New Term
Metacarp/o	Metacarpus	Metacarpectomy	Excision or surgical removal of a metacarpus
Muscul/o	Muscle	Musculoskeletal	Pertaining to the muscles and skeleton
My/o		Myocardial	Pertaining to heart muscle
Myel/o	Spinal cord, bone marrow	Myeloplegia	Paralysis of the spinal cord
Orth/o	Straight	Orthopnea	Breathing in the straight position

# NEW TERMINOLOGY

Combining Form	Meaning	Example	Meaning of New Term
Oste/o	Bone	Osteolytic	Pertaining to the destruction of bone
Phalang/o	Phalanges	Phalangitis	Inflammation of the phalanges
Radi/o	Radius	Radioulnar	Pertaining to the radius and ulna
Scoli/o	Crooked, bent	Scoliometer	Measuring instrument for crookedness or bend
Spondyl/o	Vertebrae	Spondylomalacia	Softening of a vertebrae
Vertebr/o		Vertebroplasty	Surgical repair of a vertebrae

# NEW TERMINOLOGY

Combining Form	Meaning	Example	Meaning of New Term
Stern/o	Sternum	Sternocostal	Pertaining to the sternum and ribs
Sthen/o	Strength	Myasthenia	Condition of absence of muscle strength
Synov/o	Synovial membrane	Synovectomy	Surgical removal of a synovial membrane
Synovi/o		Synovioma	Tumor of a synovial membrane

# NEW TERMINOLOGY

Combining Form	Meaning	Example	Meaning of New Term
Ten/o	Tendon	Tenodynia	Pain of a tendon
Tend/o		Tendotome	Cutting instrument for a tendon
Tendin/o		Tendinous	Pertaining to a tendon
Thorac/o	Thorax	Thoracolumbar	Pertaining to the thorax and lower back
Uln/o	Ulna	Ulnocarpal	Pertaining to the ulna and carpus

# BONY ANATOMY

## ✘ Shoulder Girdle

+Clavicle

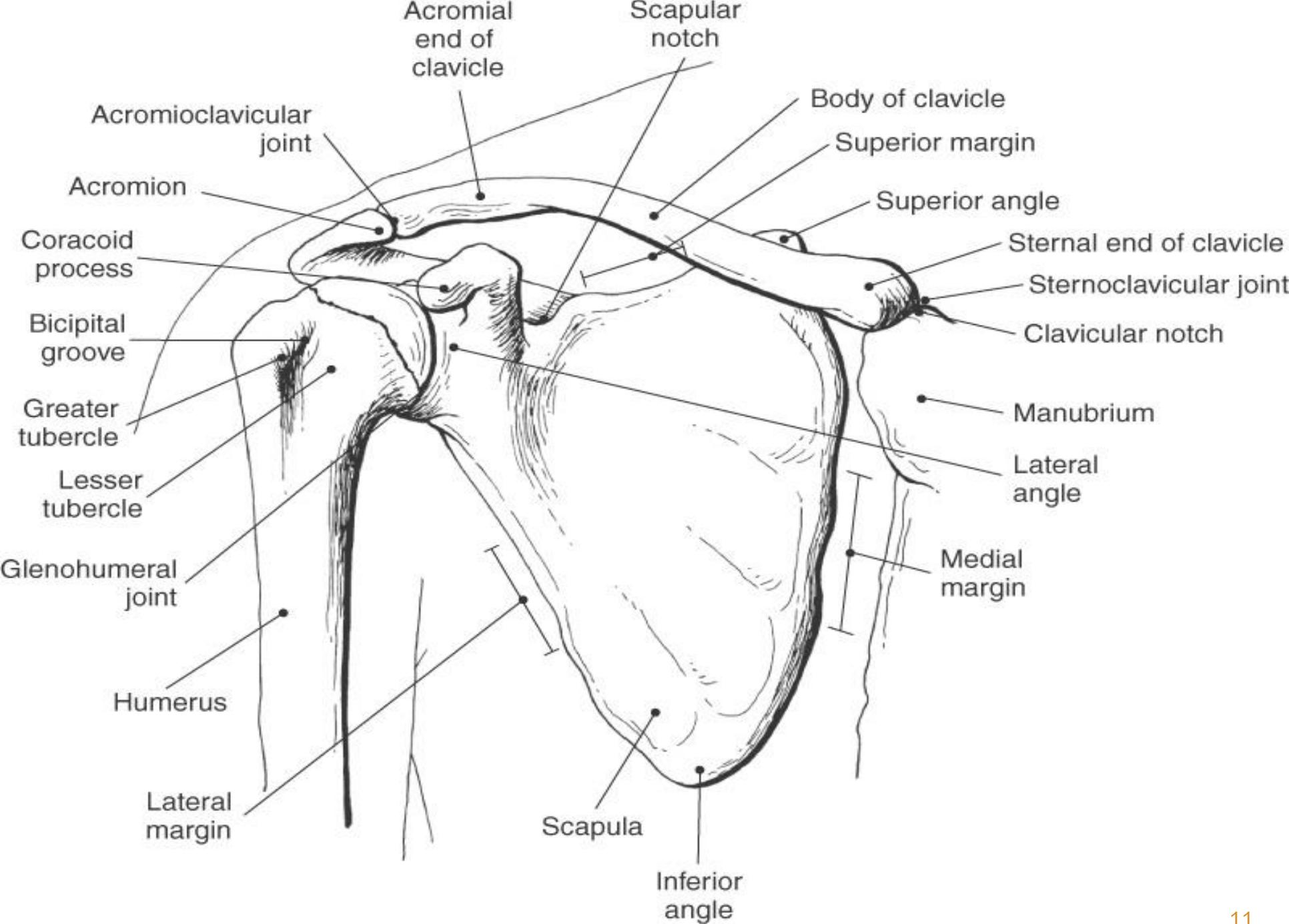
+Scapula

+Humerus

# CLAVICLE

---

- ✘ Connects upper limb to body
- ✘ Provides attachments for muscles/ligaments
- ✘ Long, slender “S” shaped
- ✘ Extends transversely from sternum to scapula



# SCAPULA

---

- ✗ **Triangular-shaped**
- ✗ **Flat bone**
- ✗ **Four projections provide attachment sites**
  - + **Muscles**
  - + **Ligaments**

# HUMERUS

---

- × Long bone
- × Articulates with:
  - + Scapula superiorly
  - + Radius and Ulna inferiorly
- × Proximal end
  - + Head of humerus

# BURSA

---

- ✘ Fluid filled
- ✘ Cushions shoulder joint:
  - + Tendons
  - + Ligaments
- ✘ Reduces friction

# ELBOW

---

- × **Complex hinge-pivot joint**

- × **Articulations of:**

  - + **Humerus**

  - + **Radius**

  - + **Ulna**

# FOREARM

---

## × Radius

- + Long & slender

- + Lateral

## × Ulnar

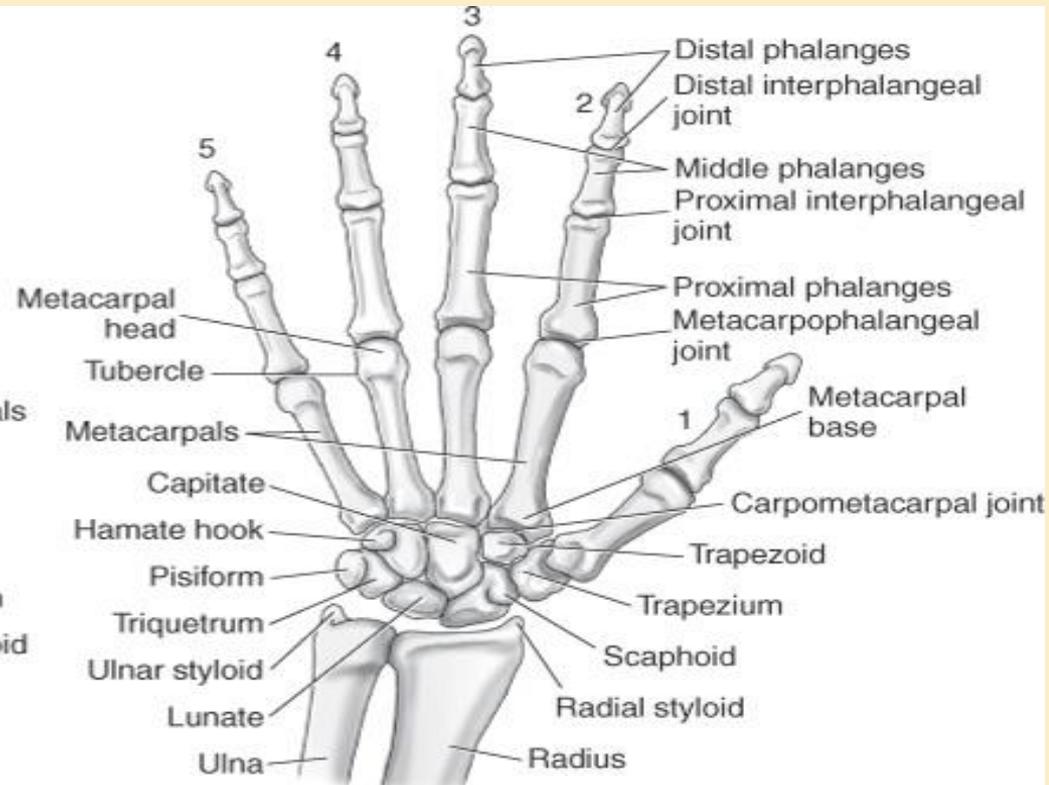
- + Slightly longer than radius

  - × Proximally associated with olecranon

- + Medial

# WRIST & HAND

- ✘ 8 carpal bones
- ✘ 5 metacarpal bones
- ✘ 14 phalanges



---

# ARTERIAL SUPPLY

# ✘ Aortic Arch Branches

## 1<sup>st</sup> - ~~Innominate/Brachiocephalic artery~~

- ✘ Bifurcates into right Subclavian and Rt. CCA

## ✘ Right Subclavian artery

- ✘ Arises from the innominate artery laterally after traveling cephalad for 4-5 cm

## ✘ Right Common Carotid Artery

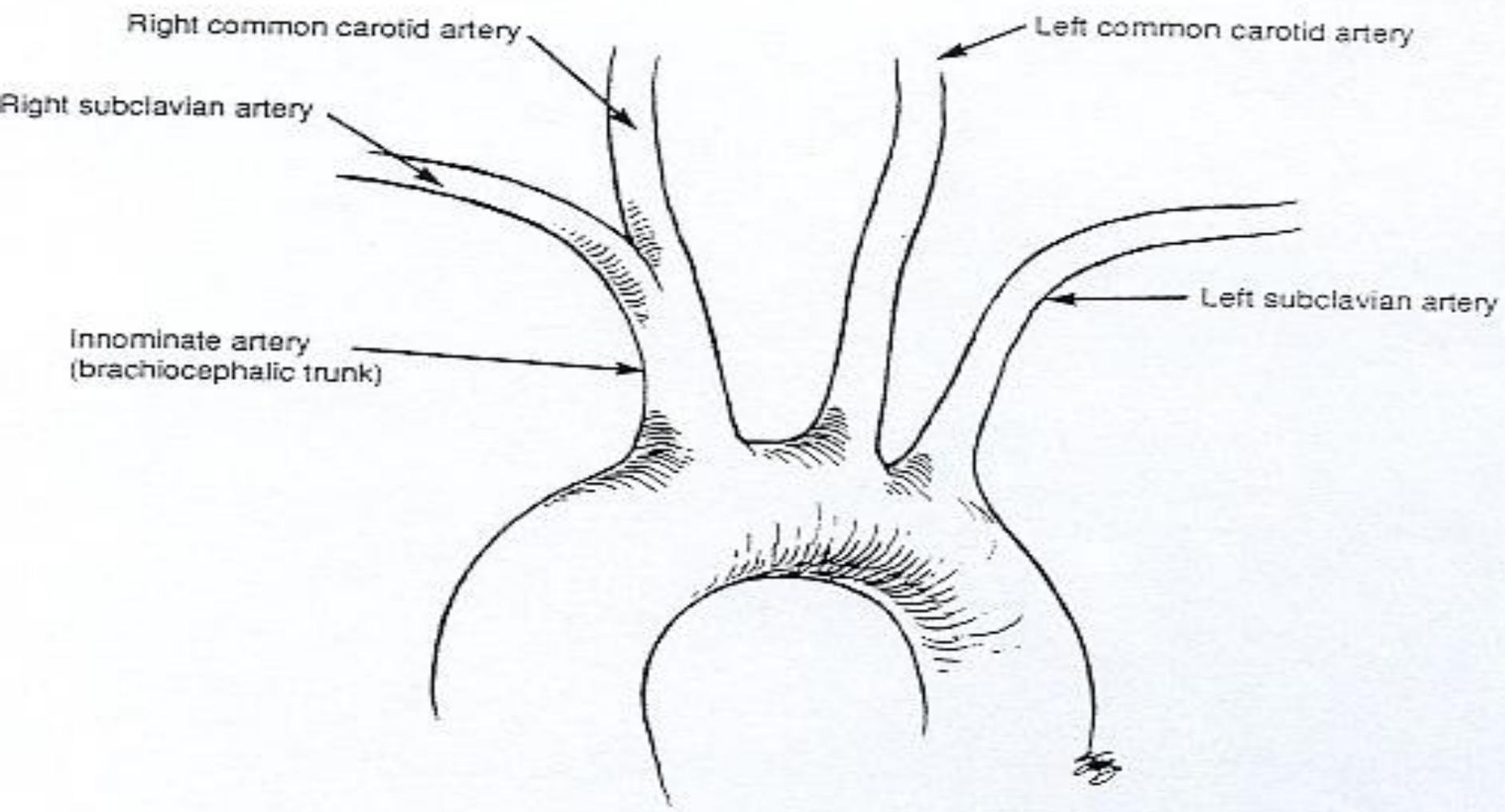
- ✘ Arises from the innominate artery coursing proximally towards the brain

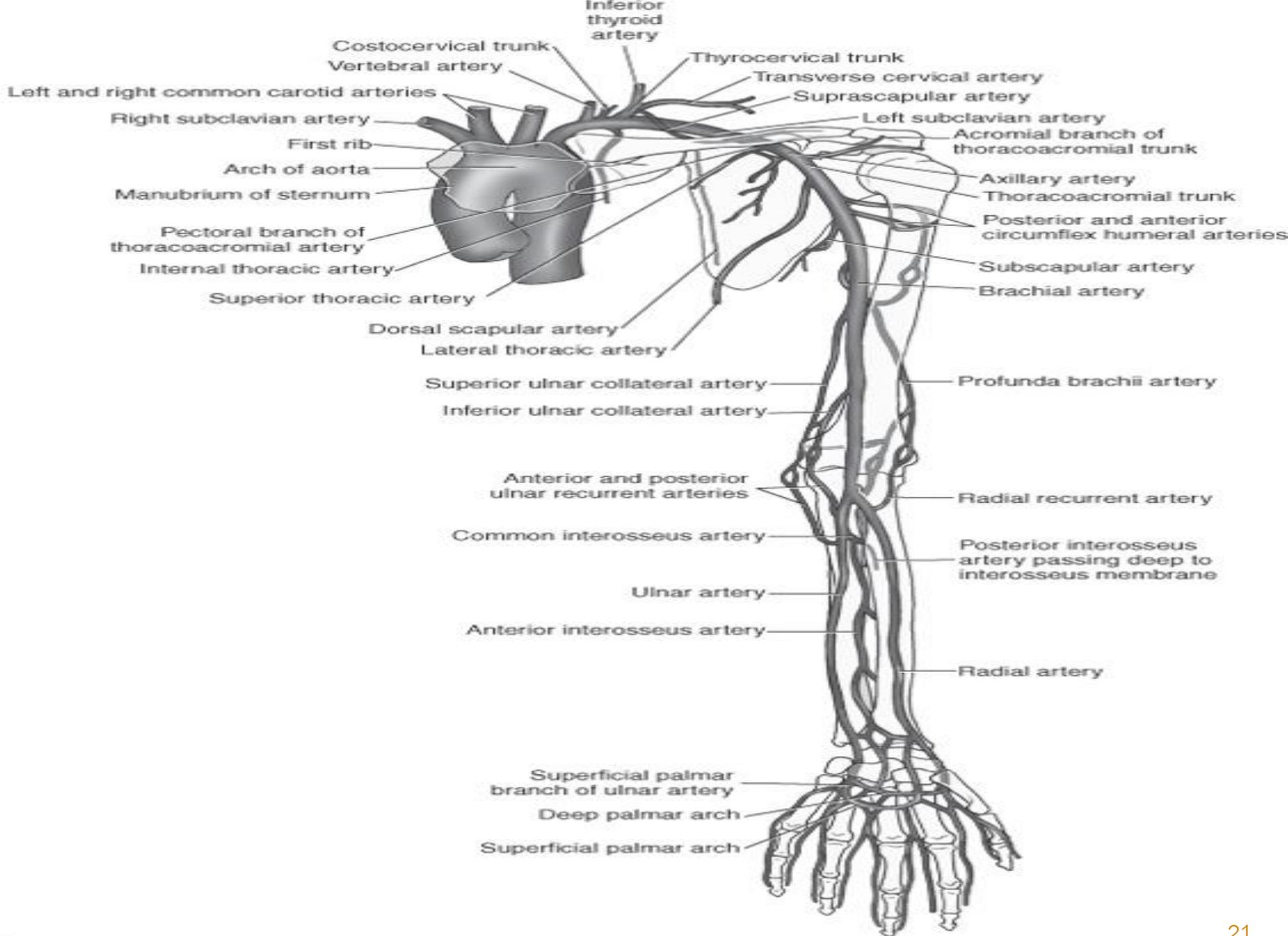
## 2<sup>nd</sup> – Left Common Carotid Artery

- ✘ Arises directly from the transverse aortic arch

## 3<sup>rd</sup> – Left Subclavian Artery

- ✘ Arises directly from the transverse aortic arch





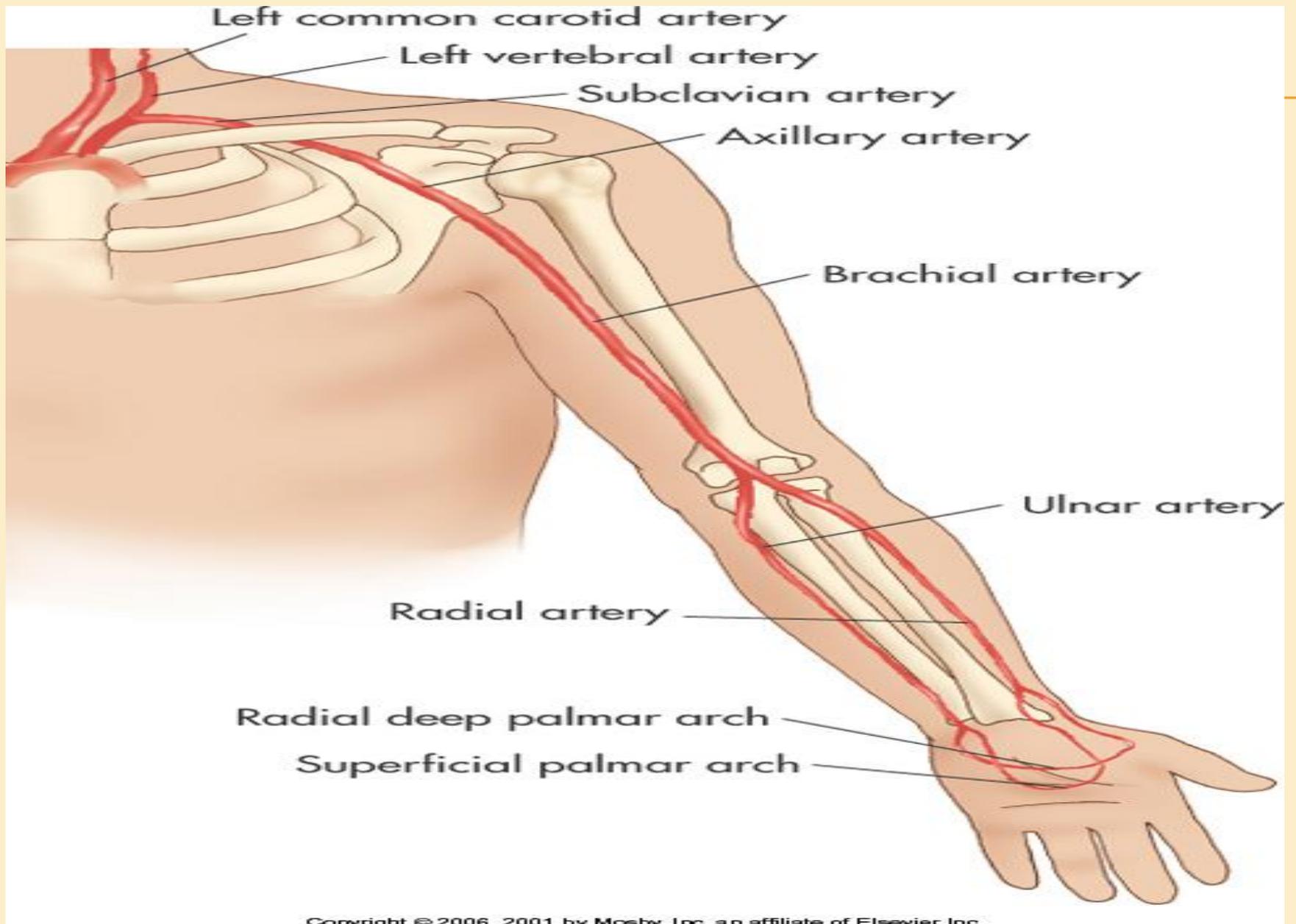
# SUBCLAVIAN

- ✘ Arches above clavicle
- ✘ Travels laterally and downward to the outer border of the first rib
- ✘ Important branches:
  - + Vertebral
  - + Thyrocervical
  - + Internal thoracic
  - + Costocervical
  - + Internal Mammary (Commonly used for coronary artery bypass)

# AXILLARY

---

- ✗ A continuation of the subclavian artery
- ✗ Branches:
  - + Superior Thoracic
  - + Lateral Thoracic
  - + Anterior Circumflex Humeral
  - + Thoraco-acromial
  - + Subscapular
  - + Posterior Circumflex Humeral



# BRACHIAL

---

- ✘ Continuation of the Axillary artery
- ✘ Divides into the radial and ulnar arteries approximately 1 cm distal to the elbow joint

# RADIAL

---

- ✘ Smaller of the terminal branches of the brachial artery
- ✘ Descends along the lateral aspect of the forearm
- ✘ Helps form the superficial palmar arch with one of its branches
- ✘ Crosses medially to form the deep palmar arch with the deep branch of the ulnar artery (At the level of the hand)
- ✘ Terminates in the deep palmar arch

# ULNAR

---

- ✘ Larger of the terminal branches of the brachial artery
- ✘ Descends along the medial aspect of the forearm
- ✘ Gives off a branch to form the deep palmar arch
- ✘ Terminates in the superficial palmar arch  
(At the level of the hand)

# PALMER ARCH

- ✘ Superficial – anastomosis formed primarily by the ulnar artery
- ✘ Deep – formed by the anastomosis of the distal segment of the radial artery with the deep palmar branch of the ulnar artery
- ✘ Approximately 1/3 of the superficial palmar arches are formed by the ulnar alone
- ✘ 1/3 are completed by a branch of the radial
- ✘ 1/3 are completed by other branches
  - + Primarily the medial artery distal segment of the ulnar artery
  - + Radial artery branch

# DIGITAL

---

- ✗ Arise from the palmar arches
- ✗ Each palmar digital artery had two dorsal branches anastomosing with the dorsal digital arteries
  - + Lateral branch
  - + Medial branch

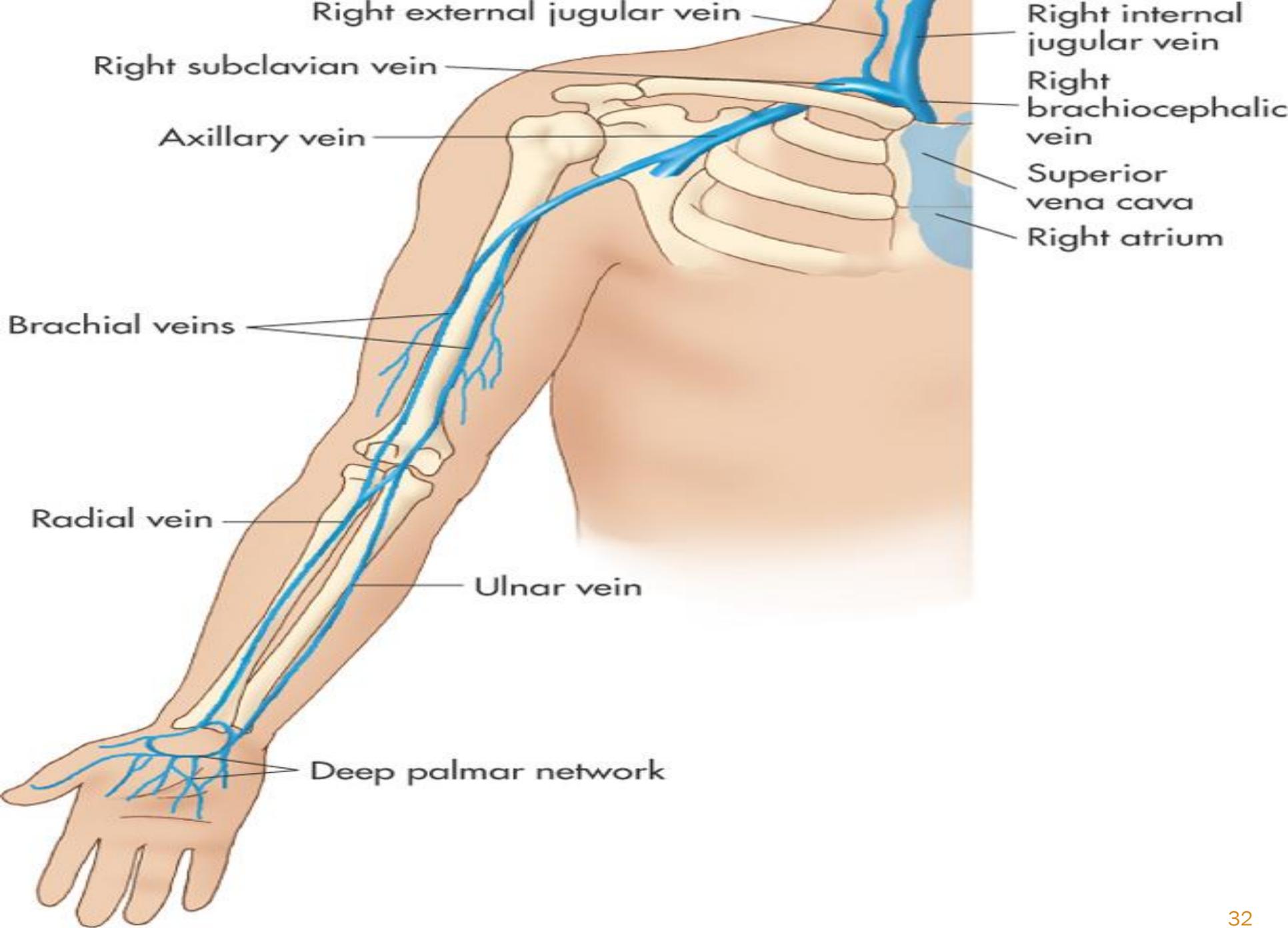
---

# VENOUS RETURN

# **VENOUS SYSTEM DIVIDED INTO 2 SYSTEMS:**

- × Deep system**
- × Superficial system**

**We will begin with the hand and work up the arm  
(Venous blood travels cephalad in the arm)**



# DEEP VEINS

## × Palmar Arch

+ Deep Digital Veins drain into Palmar Arch

+ Palmar Arch drains into:

× Radial Veins

× Ulnar Veins

## × Radial Veins

+ Paired veins on the lateral aspect of forearm

## × Ulnar Veins

+ Paired veins on the medial aspect of forearm

\*\*\* *Radial and Ulnar veins are venae comitantes* \*\*\*

# BRACHIAL

× Formed by:

+ Radial Vein

+ Ulnar Vein

× Paired veins that usually begin near the antecubital fossa

\* In some individuals the brachial vein may split into 2 separate trunks

*\*\*\* Brachial veins are venae comitantes \*\*\**

# AXILLARY

---

× Form by:

+ Brachial Vein

+ Basilic Vein

× A superficial vein along the medial aspect

× Usually formed near the armpit

# SUBCLAVIAN

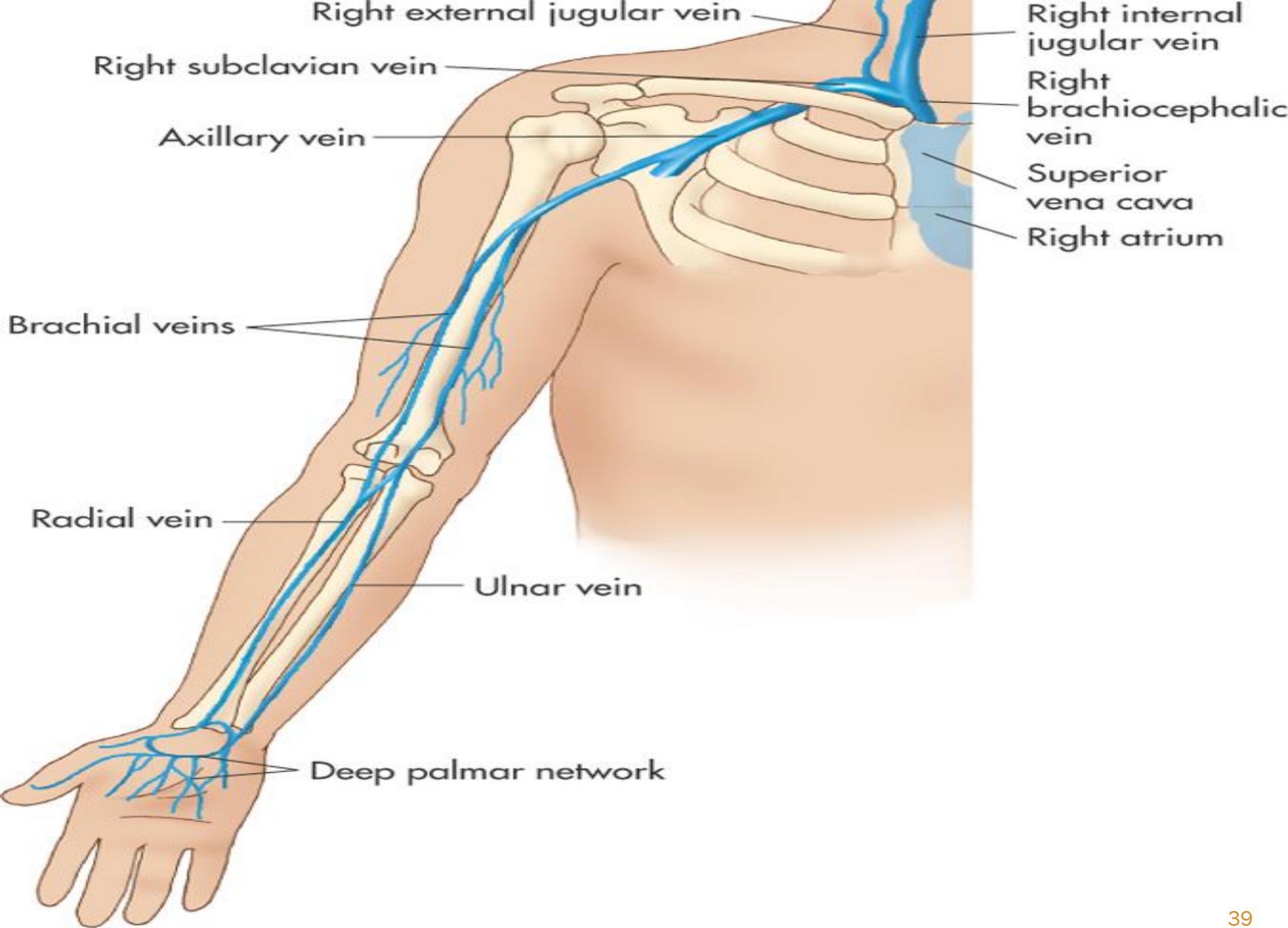
- × Formed by:
  - + Axillary Vein
  - + Cephalic Vein
    - × A superficial vein along the lateral aspect
- × Begins at the lateral border of the 1<sup>st</sup> rib and extends medially
- × Just below the clavicle level

# INNOMINATE

- ✗ Also known as Brachiocephalic Vein
- ✗ Formed by:
  - + Subclavian Vein
  - + Internal Jugular
    - ✗ Descends the neck anterior and lateral to the Carotid Artery
- ✗ Begins usually at the level of the clavicle

# **SUPERIOR VENA CAVA**

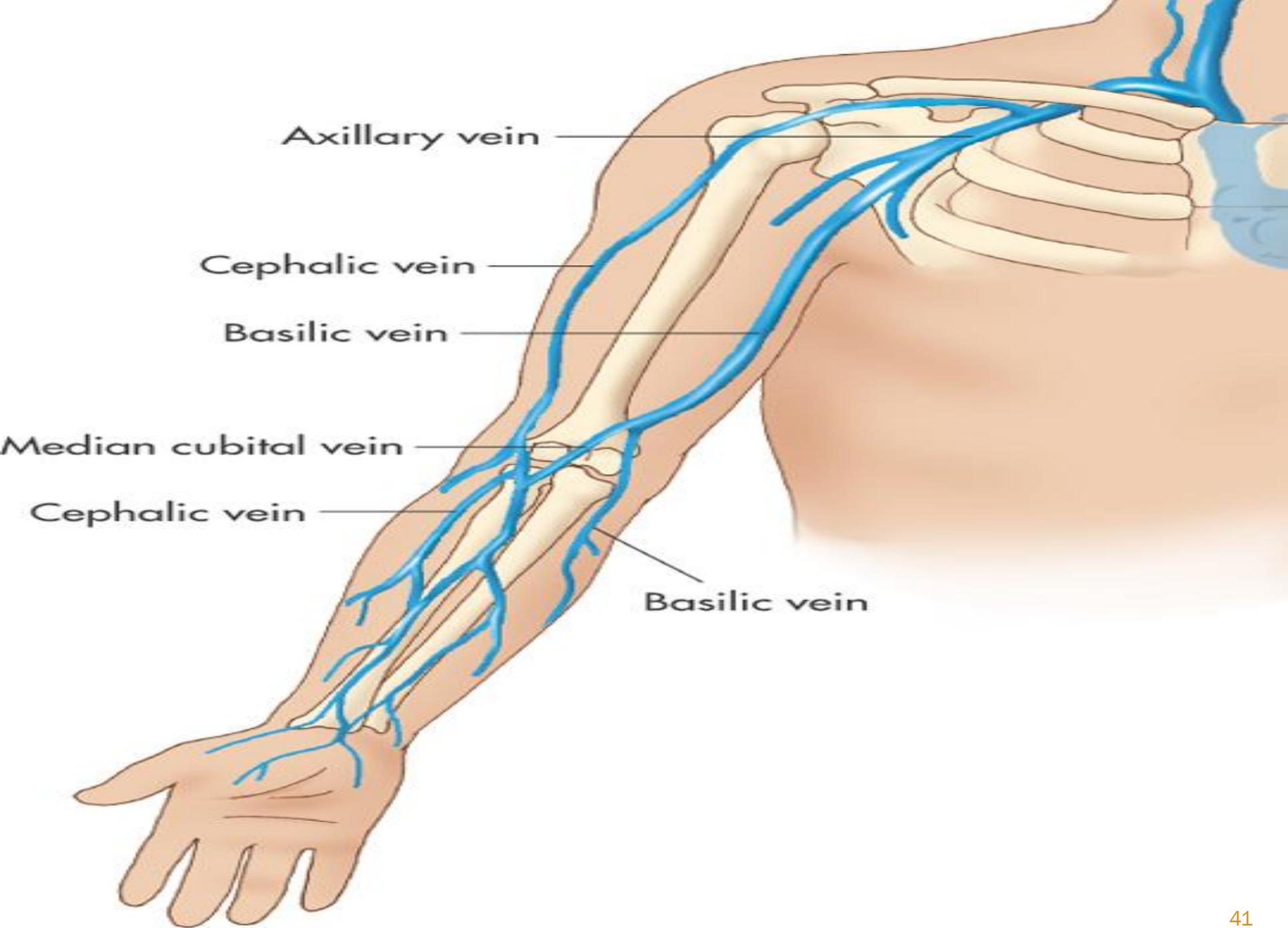
- ✘ Returns blood to the heart from the superior portion of the body**
  - + Formed by the junction of the innominate veins (Both Right and Left Innominate)**
  - + Begins near the sternum and ends in the superior portion of the right atrium**



# SUPERFICIAL VEINS

## × Dorsal Digital Veins

- + Drain blood from the fingers
- + Pass along the sides of the fingers
- + Unite into 3 dorsal metacarpal veins



Axillary vein

Cephalic vein

Basilic vein

Median cubital vein

Cephalic vein

Basilic vein

# BASILIC

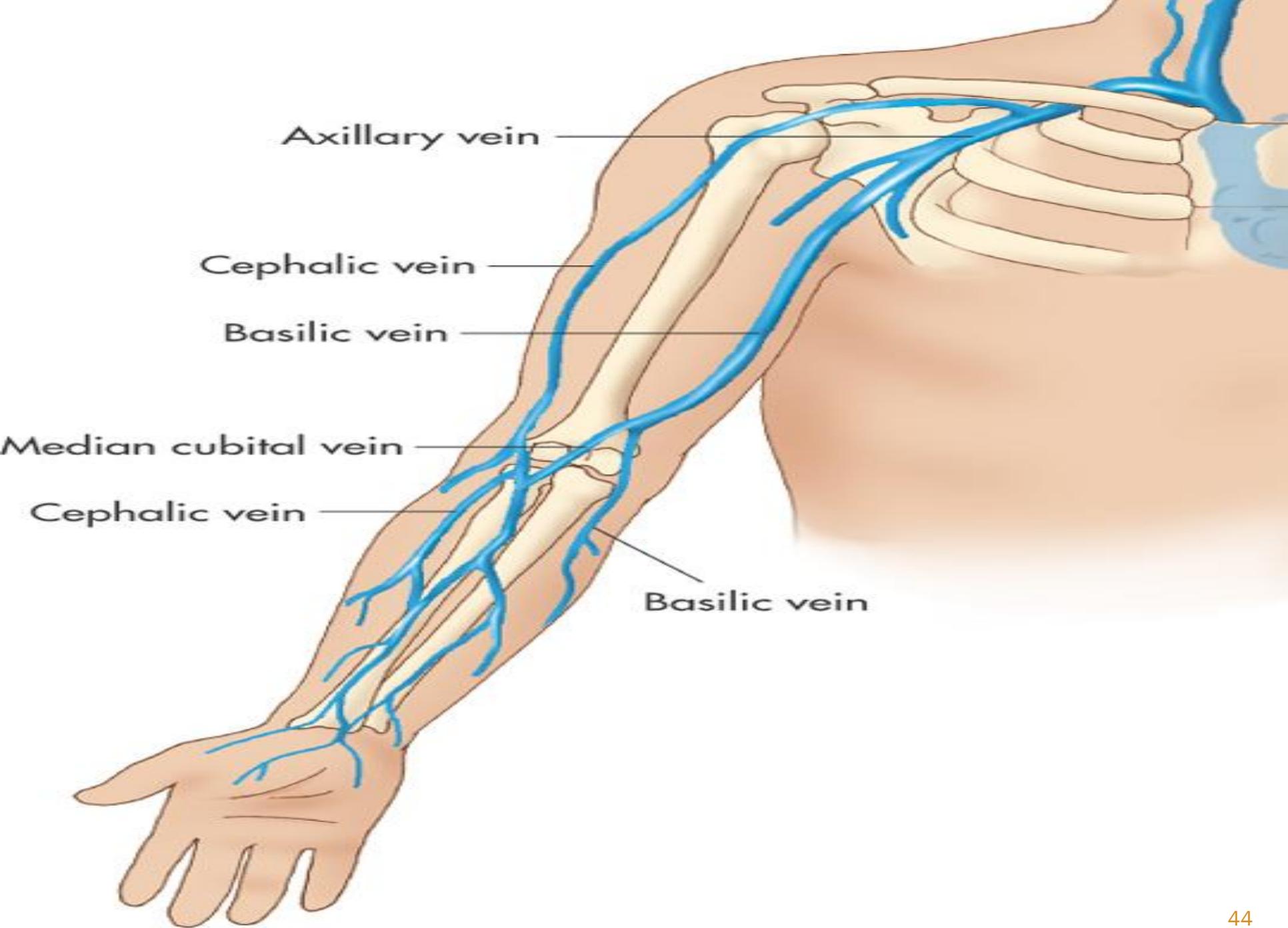
---

- × Formed by:
  - + Digital veins on the medial aspect of the forearm
- × Courses medially up the arm and joins the Brachial Veins to become the Axillary Vein

# CEPHALIC

---

- ✗ Formed by:
  - + Digital veins on the lateral aspect of the forearm
- ✗ Courses laterally up the arm and joins the Axillary Vein
- \* Median cubital Vein – Connects the Basilic and Cephalic Veins at the antecubital fossa



Axillary vein

Cephalic vein

Basilic vein

Median cubital vein

Cephalic vein

Basilic vein