



ANATOMY TEAM
VASCULAR ANATOMY OF
THE UPPER LIMB

Vascular anatomy of the upper limb

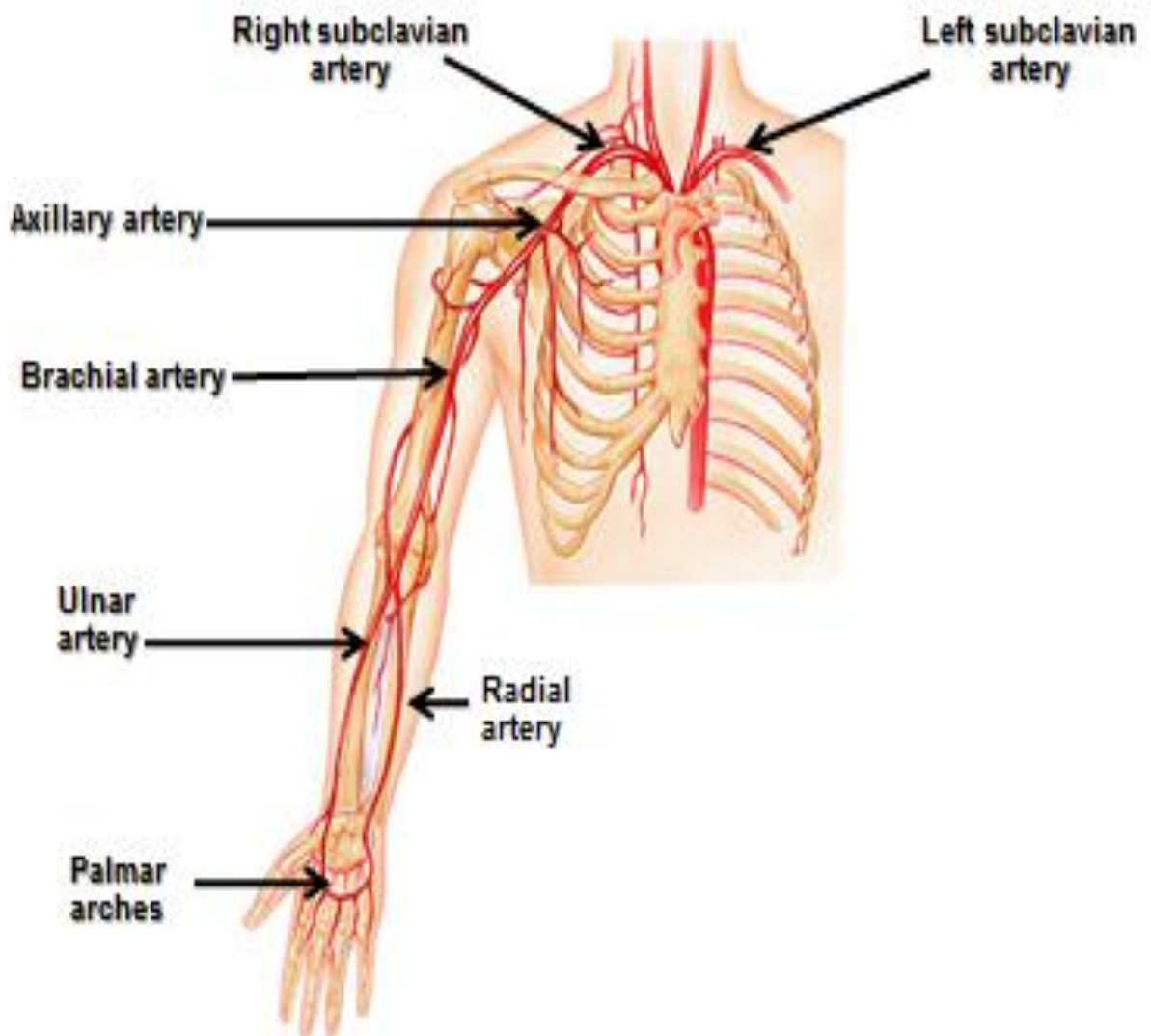
Lec. (11)"BOYS" Lec. (13) "GIRLS"

Objectives:

At the end of the lecture, the students should be able to:

- Identify the origin of the vascular supply for the upper limb.
- Describe the main arteries and their branches of the arm, forearm & hand.
- Describe the vascular arches for the hand.
- Describe the superficial and deep veins of the upper limb.

Arteries Of The Upper Limb



تنويه / هذا العمل لا يعتبر مصدر أساسي للمذاكرة وإنما هو للمراجعة فقط والمصدر الأساسي هو السلايدز ، وقد تم التأكد بأنه لا يوجد أي اختلاف بين سلايدز الأولاد والبنات "ماعدا اختلاف بسيط في سلايد 11 عند الأولاد"

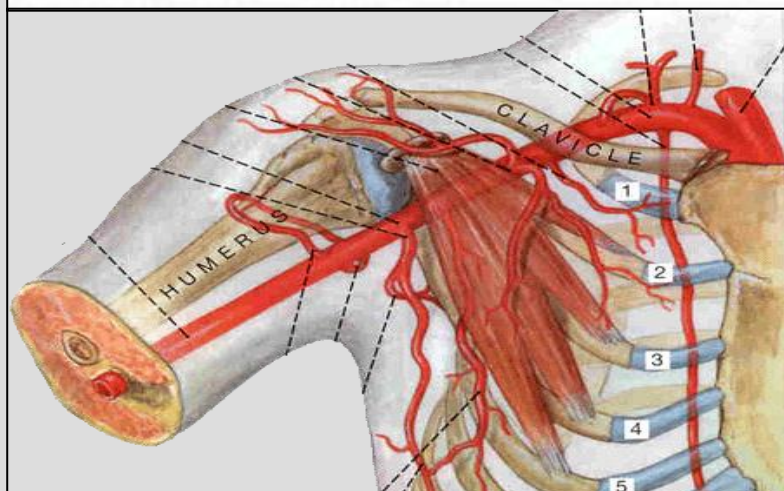
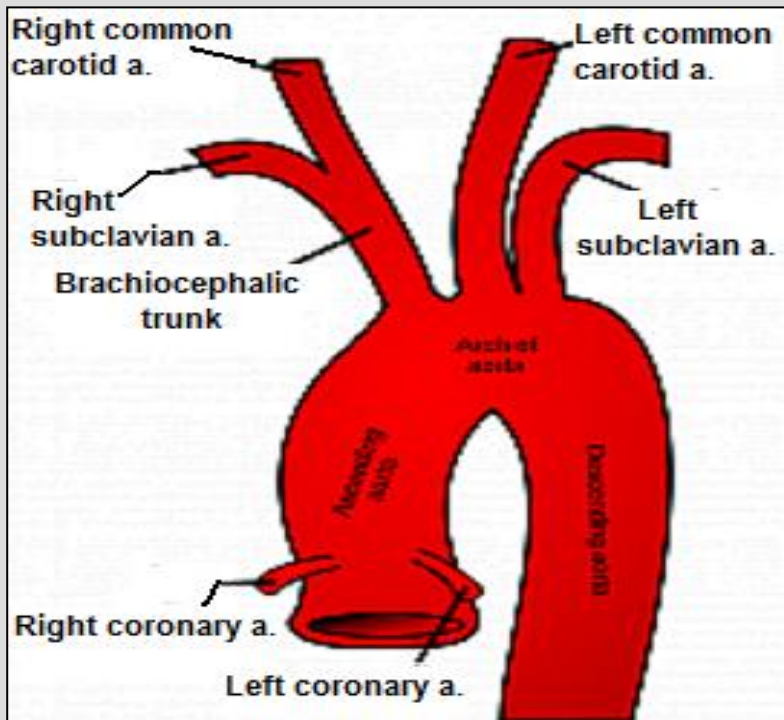
- Muscular.
- Nutrient to humerus.
- Profunda brachii
- Superior ulnar collateral.
- Inferior ulnar collateral.
- **Terminal; radial and ulnar**

The Subclavian Artery

❑ The **right** artery originates from the **brachiocephalic artery**.

❑ The **left** artery originates from the **arch of the aorta**

❑ The Subclavian Artery is continues as **Axillary artery** at the lateral border of the 1st rib



The Axillary Artery

- Begins at the lateral border of the 1st rib as continuation of the **subclavian artery**.
- Continues as **brachial artery** at lower border of teres major muscle.
- Is closely related to the cords of **brachial plexus** and their branches.
- Is enclosed within the **axillary sheath**.
- Is crossed anteriorly by the **pectoralis minor muscle**, and is divided into three parts; **1st, 2nd & 3rd**.

1st part of the axillary artery:

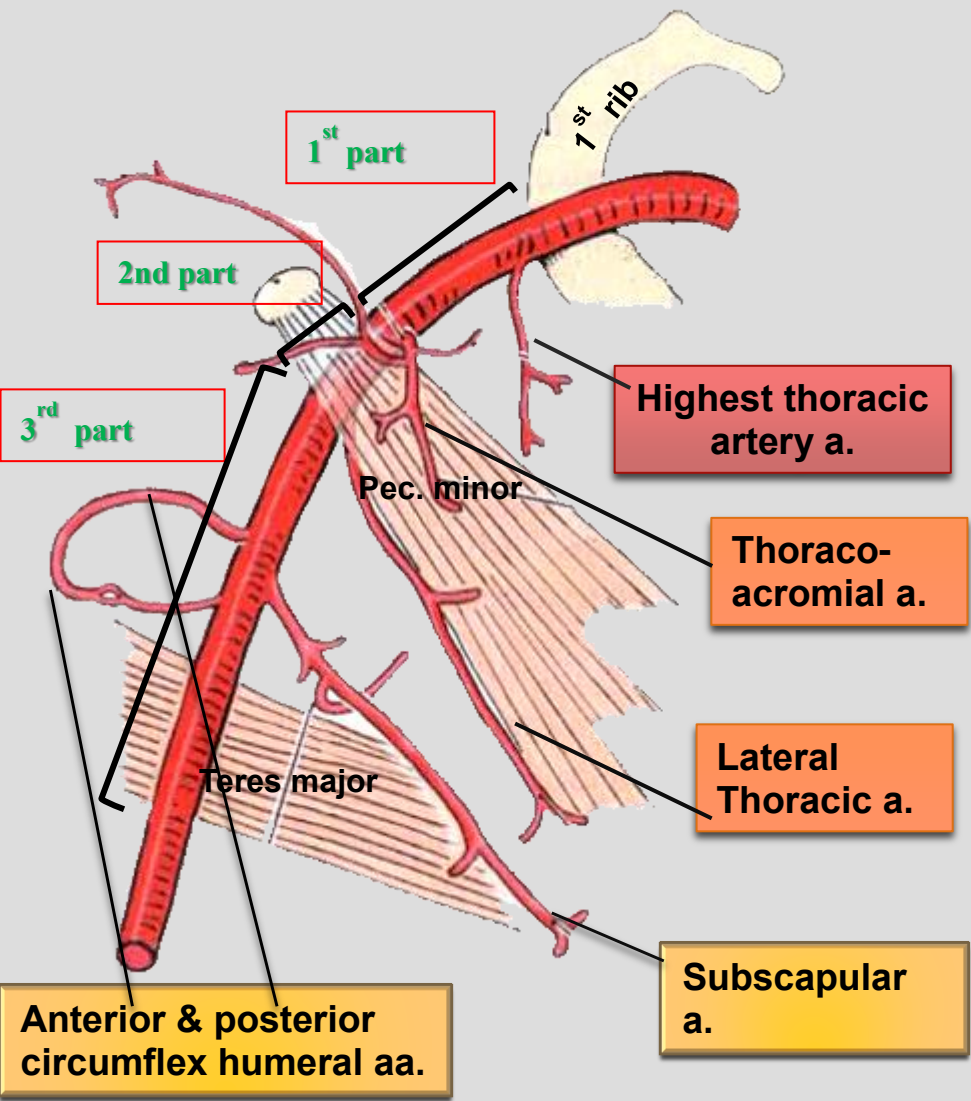
- Extends from the lateral border of 1st rib to upper border of the pectoralis minor muscle.
- **Related:**
 - **Anteriorly:** to the pectoralis major muscle
 - **Laterally:** to the cords of the brachial plexus.
 - **ONE branch:** Highest thoracic artery.

2nd part of the axillary artery:

- Lies **behind the pectoralis minor muscle**.
- It is related medially, laterally, and posteriorly to the corresponding cord of the brachial plexus.
- **TWO branches:**
 - Thoracoacromial a.
 - Lateral thoracic a.

3rd part of the axillary artery:

- Extends from **the lower border of pectoralis minor muscle to the lower border teres major muscle**.
- Related medially, laterally, and posteriorly, to the branches of the cords of the brachial plexus
- **Gives THREE Branches:**
 - Subscabular,
 - Anterior circumflex humeral
 - Posterior circumflex humeral.



- For 3rd part
- For 2nd part
- For 1st part

The Brachial Artery

- ❑ Is a continuation of the **axillary artery** at the **lower border of teres major muscle**.
- ❑ Provides main arterial supply for the arm.
- ❑ **Terminates** opposite neck of radius by dividing into **radial & ulnar arteries**.

❑ **Relations:**

Anteriorly: crossed from above downward by medial cutaneous nerve of the forearm, median nerve, and bicipital aponeurosis.

Posteriorly: triceps, coracobrachialis and brachialis.

Medially: basilic vein, ulnar and median nerves.

Laterally: coracobrachialis and biceps muscles.

- ❑ **Branches:**
 - Muscular.
 - Nutrient to humerus.
 - Profunda brachii
 - Superior ulnar collateral.
 - Inferior ulnar collateral.
 - Terminal; radial and ulnar

✚ **The Ulnar Artery :**

- The **larger** of the two terminal branches of the brachial artery.
- Begins in the cubital fossa at the level of **neck of radius**.
- Descends through the **anterior compartment** of the forearm.
- Enters the palm, **in front of the flexor retinaculum**, with the ulnar nerve.
- Ends by forming the **superficial palmar arch**, by anastomosing with superficial palmar branch of radial artery.

➤ **Branches:**

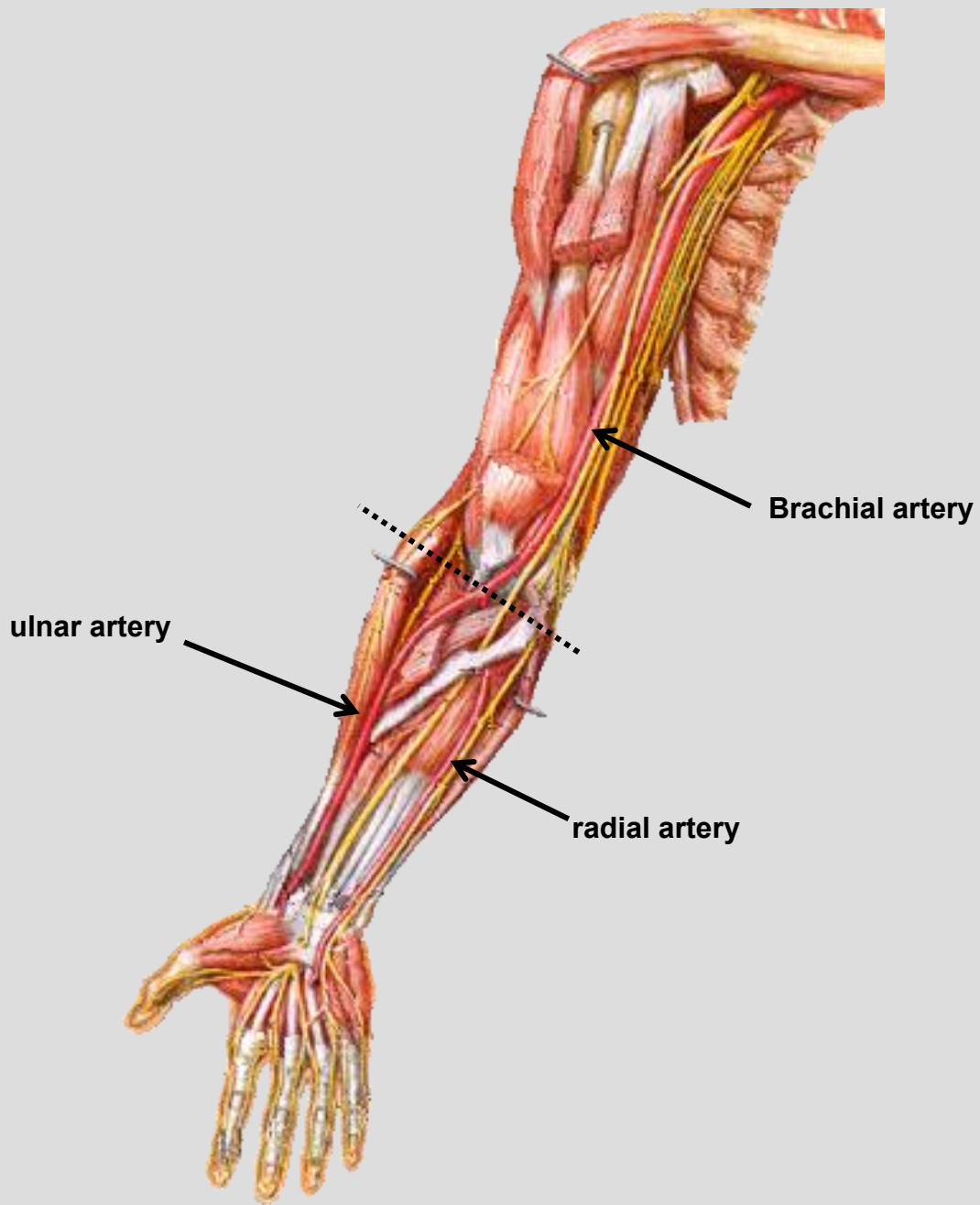
- Muscular .
- Recurrent branch for anastomosis around the elbow joint.
- Common interosseous artery, which gives anterior and posterior interosseous arteries.
- Branch to anastomoses around the wrist joint.

✚ **The Radial Artery:**

- The **smaller** of the two terminal branches of the brachial artery.
- Begins in the cubital fossa at the level of **neck of radius**.
- Descends downward and laterally.
- Leaves the forearm by **winding** around the lateral aspect of the wrist to reach the **dorsum** of the hand.

➤ **Branches:**

- Muscular
- Recurrent branch for anastomosis around the elbow joint.
- Superficial palmar branch , joins the ulnar -artery to form the superficial palmar arch.

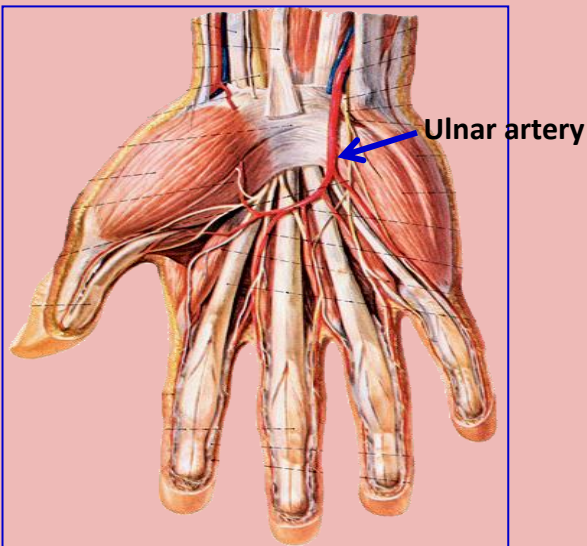


NOTE: if you want to see the **Relations & Branches** go back to the slide

Arteries of the Palm

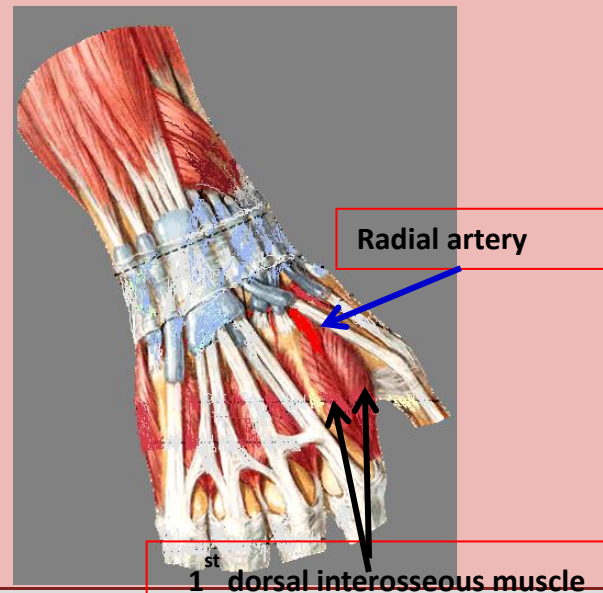
✚ **Ulnar artery:**

- Enters the hand:
 - **anterior** to the flexor retinaculum,
 - on the lateral side of the ulnar nerve and pisiform bone.
- Gives a deep branch.
- Continue as the **superficial palmar arch**.



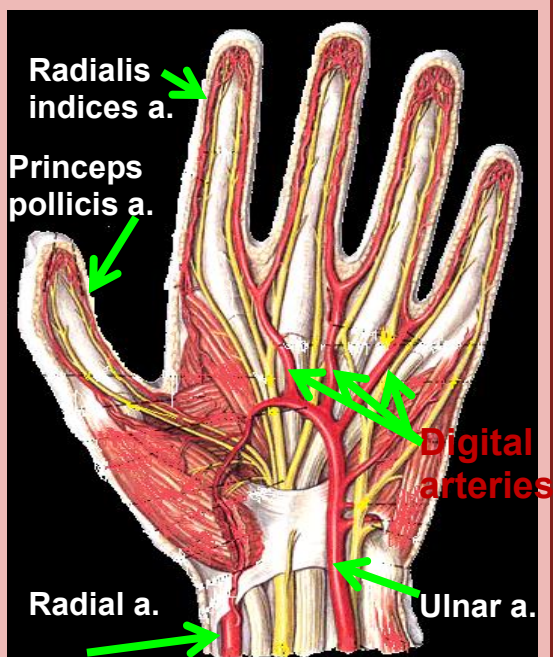
✚ **Radial artery:**

- Leaves dorsum of the hand by **turning forward** between the proximal ends of the **1st and 2nd** metacarpal bones and two heads of the **1st dorsal interosseous** muscle.
- On entering the palm it continues **as deep palmar arch**.
- It gives; **arteria radialis indicis** and **arteria princeps policis**.



The Superficial Palmar Arch

- Is the direct continuation of **the ulnar artery**, as it curves laterally behind the - palmar aponeurosis.
- Is completed by branch from the **radial artery**.
- Lies approximately at the level of the **distal border of the extended thumb**.
- Gives: **digital arteries** from its convexity to supply the fingers.

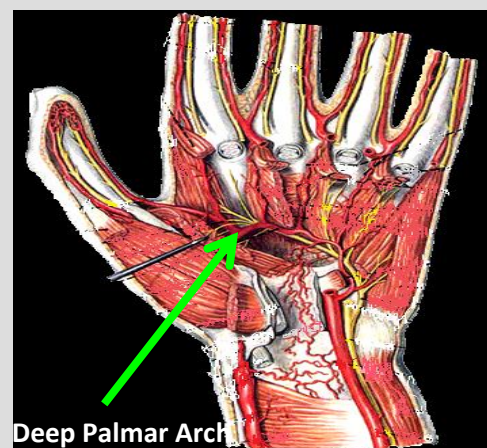


The Deep Palmar Arch

- Is a continuation of the **radial artery** as it curves medially beneath long flexor tendons, in front of the metacarpal bones and interosseous muscles.
- Is completed on the medial side by **deep branch of ulnar artery**.
- Lies at a level of the **proximal border of extended thumb**.

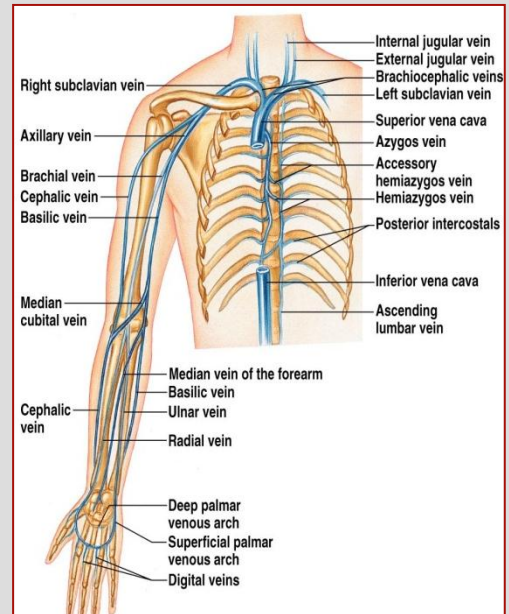
➤ It sends branches:

superiorly to share in anastomosis around the wrist joint & **inferiorly** to join branches of the superficial palmar arch.



Veins of the Upper Limb

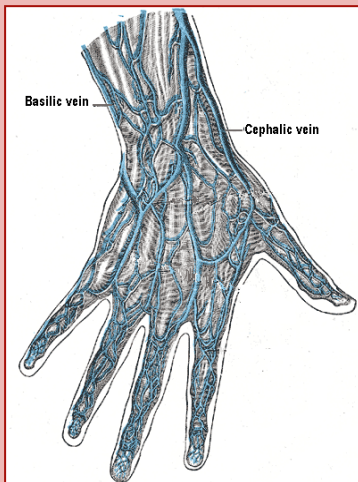
- The veins of the upper limb are divided into two sets:
Superficial and **Deep**.
- The two sets anastomose frequently with each other.
- The **superficial veins** are placed immediately beneath the skin, in the superficial fascia.
- The **deep veins** accompany the arteries, and constitute the venæ comitantes of those vessels.



Superficial Veins of the Upper Limb

Dorsal Venous Arch (network)

- The **dorsal digital veins** drain into **dorsal metacarpal veins**, which unite to form a **dorsal venous arch or network**.
- Dorsal venous network lies on the dorsum of the hand, in the **subcutaneous tissue**, proximal to the **metacarpophalangeal joints**
- Drains into the **cephalic vein laterally**, and **basilic vein medially**.



+ **Cephalic Vein :**

- Arises from the **lateral end of the dorsal venous arch of hand**.
- Ascends on **radial side** of the forearm to the elbow and continues up the arm in the **deltopectoral groove**.
- Pierces (يَتَقَب) **clavipectoral fascia** to **drain** into the **axillary vein**.

+ **Basilic Vein :**

- Arises from the **medial side of the dorsal venous arch of hand**.
- Ascends on the **ulnar side** of forearm to the elbow , in the middle of the arm, it pierces the **deep fascia** and joins the **brachial vein** and ends **as axillary vein**.

+ **Median Cubital Vein:**

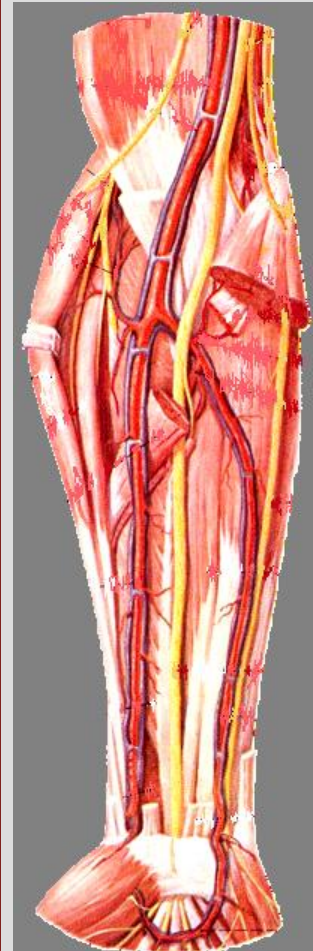
- **Links cephalic vein and basilic vein in the cubital fossa**.
- Is a frequent site for **venipuncture**.

See : **very useful picture**

http://www.rci.rutgers.edu/~uzwiak/AnatPhys/Blood_Vessels_files/image040.jpg

Deep Veins of the Upper Limb

- Accompany the arteries of the same region and bear similar names.
- Venae comitantes: They are generally arranged in pairs, and are situated one on either side of the corresponding artery, and connected at intervals by short transverse branches.
- The superficial and deep palmar arterial arches are each accompanied by a pair of venæ comitantes which constitute the **superficial** and **deep palmar venous arches**, and receive the veins corresponding to the branches of the arterial arches.
- The **deep veins of the forearm** are the venæ comitantes of the radial and ulnar veins
- The **brachial veins** are placed one on either side of the brachial artery.



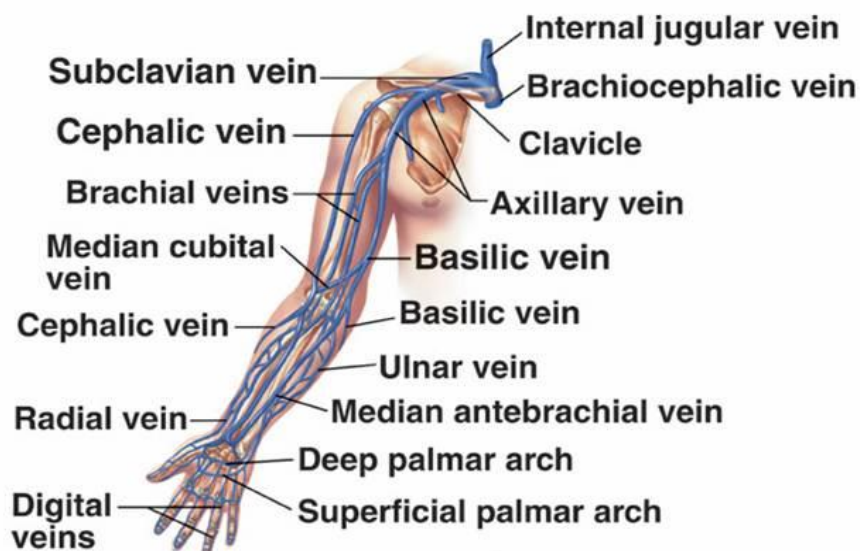
✚ The axillary vein:

- **Begins** at the **lower border of the Teres major**, as the continuation of the **basilic vein**.
- **Ends** at the **outer border of the first rib** as the **subclavian vein**.
- Receives the **brachial veins and**, close to its termination, **the cephalic vein**.

✚ The subclavian vein:

- Is the continuation of the **axillary vein**.
- Extends from the **outer border of the first rib** to the **sternal end of the clavicle**, where it unites with the **internal jugular** to form the **brachiocephalic (innominate) vein**.

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Some important notes:

- The Subclavian Artery is Continues as **Axillary artery**.
- The Axillary Artery Continues as **brachial artery**.
- **Axillary Artery** divided into three parts; 1st, 2nd & 3rd.
 - 1st parts of Axillary Artery have **one branch**.
 - 2nd parts of Axillary Artery have **two branches**.
 - 3rd parts of Axillary Artery have **three branches**.
- The **Ulnar Artery** is **larger** than **Radial Artery**.
- **Radial artery** Leaves dorsum of the hand by turning forward **between the proximal ends of the 1st and 2nd metacarpal bones**.
- The Superficial Palmar Arch Is the direct continuation of the **ulnar artery**.
- The Deep Palmar Arch Is a continuation of the **radial artery**.
- **The superficial palmar arch is more distal than the deep palmar arch**.
- The veins of the upper limb are divided into two sets: **Superficial** and **Deep**.
- The **dorsal digital veins** drain into **dorsal metacarpal veins**, which unite to form **a dorsal venous arch or network**.
- Cephalic Vein Arises from the **lateral end** & Ascends **on radial side**.
- Basilic Vein Arises from the **medial side** & Ascends **on the ulnar side**.
- **Median Cubital Vein** Links cephalic vein and basilic vein
- The axillary vein receives the **brachial veins** & close to its termination the **cephalic vein** & Ends as the subclavian vein.



Review

1- The Subclavian Artery Continues as?

Axillary artery.

2- The Axillary Artery Begins at the?

Lateral border of the 1st rib.

3-The Axillary Artery Is enclosed within the?

Axillary sheath.

4- The 1st part of the axillary artery Extends from the?

Lateral border of 1st rib.

5- The 1st part of the axillary artery Related Anteriorly to the?

pectoralis major muscle.

6- The Brachial Artery Is a continuation of the?

axillary artery.

7- The Brachial Artery Terminates opposite neck of radius by dividing into?

radial & ulnar arteries.

8- Brachial Artery Relations Medially to?

basilic vein, ulnar and median nerves.

9- The Ulnar Artery Begins in the cubital fossa at the level of?

neck of radius.

10- The Ulnar Artery Ends by forming the?

superficial palmar arch.

11- Ulnar artery Enters the hand anterior to the?

flexor retinaculum.

- 12- Radial artery Leaves dorsum of the hand by turning forward between the proximal ends of the?**
1st and 2nd metacarpal.
- 13- The Superficial Palmar Arch Is the direct continuation of the?**
ulnar artery.
- 14- The Deep Palmar Arch Is a continuation of the?**
radial artery.
- 15- The superficial veins are placed immediately beneath the skin in the?**
superficial fascia.
- 16- The dorsal digital veins drain into dorsal metacarpal veins, which unite to form?**
a dorsal venous arch or network.
- 17- Cephalic Vein Arises from the?**
lateral end of the dorsal venous arch of hand.
- 18- Median Cubital Vein Links cephalic vein and?**
basilic vein.
- 19- The axillary vein Begins at the?**
lower border of the Teres major.
- 20- The subclavian vein Is the continuation of the?**
axillary vein.



Quiz

1- The Axillary Artery Is crossed anteriorly by the?

- a- pectoralis minor
- b- pectoralis major
- c- Teres major
- d- None of them

2- The Axillary Artery Is closely related to the cords of?

- a- axillary sheath
- b- brachial plexus
- c- subclavian artery.
- d- brachial artery

3- The 1st part of the axillary artery have branch called?

- a- Thoracoacromial a.
- b- Lateral thoracic a.
- c- Highest thoracic artery
- d- Subscapular a.

4- The 1st part of the axillary artery Extends from the lateral border of 1st rib to?

- a- lower border of the pectoralis minor muscle.
- b- upper border of the pectoralis minor muscle.
- c- lower border of the pectoralis major muscle.
- d- upper border of the pectoralis major muscle.

5- The 2nd part of the axillary artery Lies?

- a- behind the pectoralis minor muscle.
- b- Front the pectoralis minor muscle.
- c- behind the pectoralis major muscle.
- d- Front the pectoralis major muscle.

6- The 2nd part of the axillary artery has?

- a- ONE branch
- b- TWO branches
- c- THREE Branches
- d- Have no Branches

7- The Brachial Artery Is a continuation of the?

- a- axillary artery
- b- Subclavian artery
- c- brachiocephalic artery.
- d- arch of the aorta

8- Brachial Artery Relations Laterally to?

- a- basilic vein
- b- triceps
- c- biceps
- d- brachialis

9- The Ulnar Artery Descends through the?

- a- distal compartment of the forearm.
- b- Lateral compartment of the forearm.
- c- Posterior compartment of the forearm.
- d- None of them.

10- The Radial Artery Leaves the forearm by winding around the lateral aspect of the wrist to reach the?

- a- dorsum of the hand.
- b- dorsum of the arm.
- c- dorsum of the forearm.
- d- None of them

11-Ulnar artery Continue IN THE PALM as the?

- a- deep palmar arch
- b- superficial palmar arch.
- c- All of them
- d- None of them

12-Ulnar artery Enters the hand?

- a- Posterior to the flexor retinaculum
- b- Medial to the flexor retinaculum
- c- anterior to the flexor retinaculum
- d- Lateral to the flexor retinaculum

13-The Superficial Palmar Arch Lies approximately at the level of the?

- a- Medial border of the extended thumb.
- b- proximal border of the extended thumb.
- c- distal border of the extended thumb.
- d- Lateral border of the extended thumb.

14-The Deep Palmar Arch Is a continuation of the?

- a- radialis indicis artery
- b- digital artery
- c- ulnar artery
- d- radial artery

15-The superficial palmar arch is than the deep palmar arch?

- a- more Medial
- b- more distal
- c- more proximal
- d- more Lateral

16-Superficial Veins Drains laterally into the?

- a- cephalic vein
- b- basilic vein
- c- Median Cubital Vein
- d- None of them

17-Basilic Vein Arises from the?

- a- Lateral side
- b- Posterior side
- c- medial side
- d- anterior side

18-Cephalic Vein Ascends on?

- a- radial side
- b- ulnar side
- c- all of them
- d- none of them

19-which of the following ends as axillary vein?

- a- Cephalic Vein
- b- Basilic Vein
- c- Median Cubital Vein
- d- None of them

20-The subclavian vein Extends from the?

- a- outer border of the first rib
- b- inner border of the first rib
- c- upper border of the pectoralis minor muscle.
- d- lower border of pectoralis minor muscle

21-we take blood sample from:

- A-Median Cubital Vein
- B- Cephalic Vein
- C-Basilic Vein
- D- ulnar vein

Question	Answer
1	A
2	B
3	C
4	B
5	A
6	B
7	A
8	C
9	D
10	A
11	B
12	C
13	C
14	D
15	B
16	A
17	C
18	A
19	B
20	A
21	A

Good luck ;)