رَبِّ اشْرَحْ لِي صَدْرِي

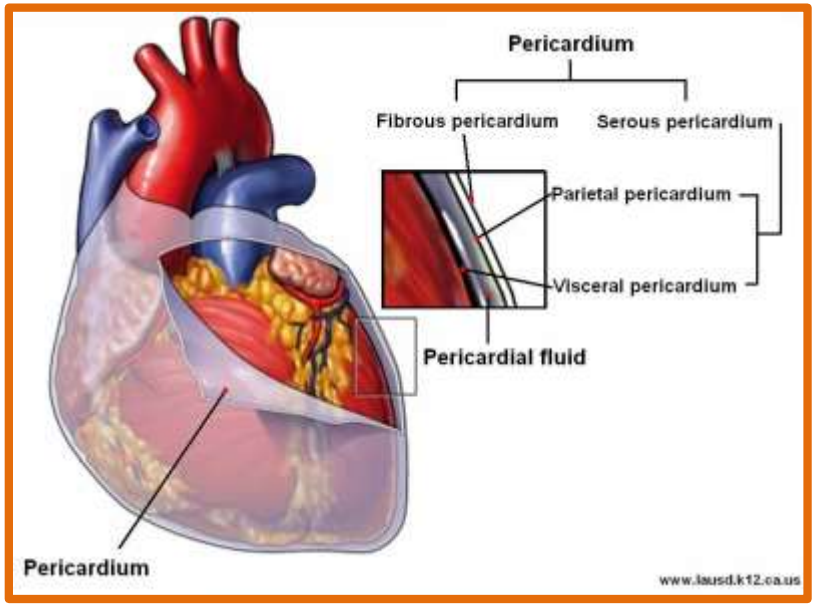
وَيَسِّرْ لِي أَمْرِي

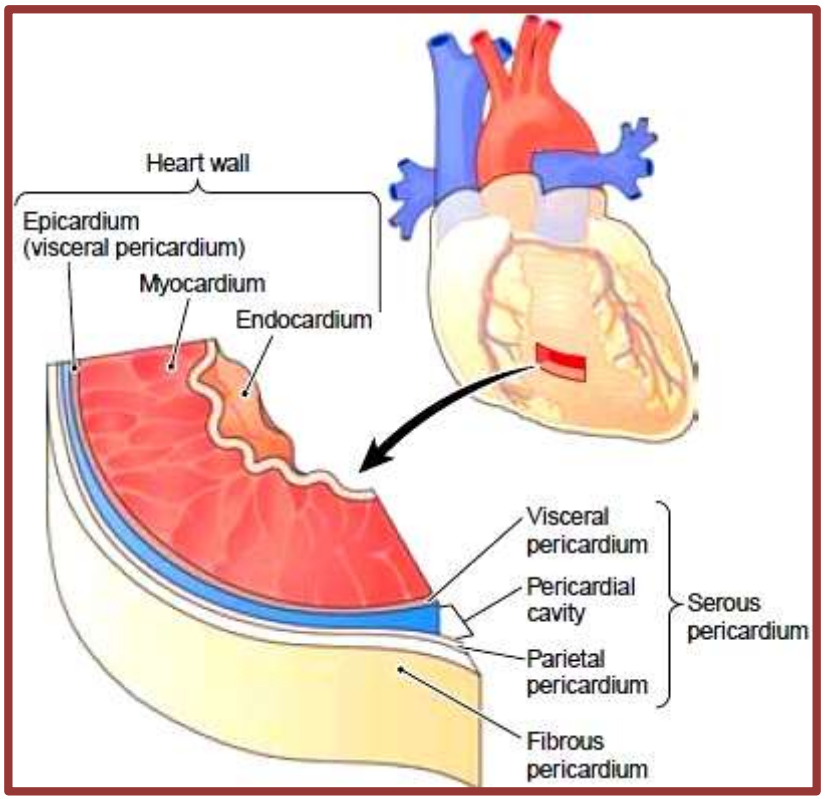
Serous Pericardium

The serous pericardium lines the fibrous pericardium and coats the heart.

- It is divided into parietal and visceral layers

- The parietal layer lines the fibrous pericardium and is reflected around the roots of the great vessels to become continuous with the visceral layer of serous pericardium that closely covers the heart

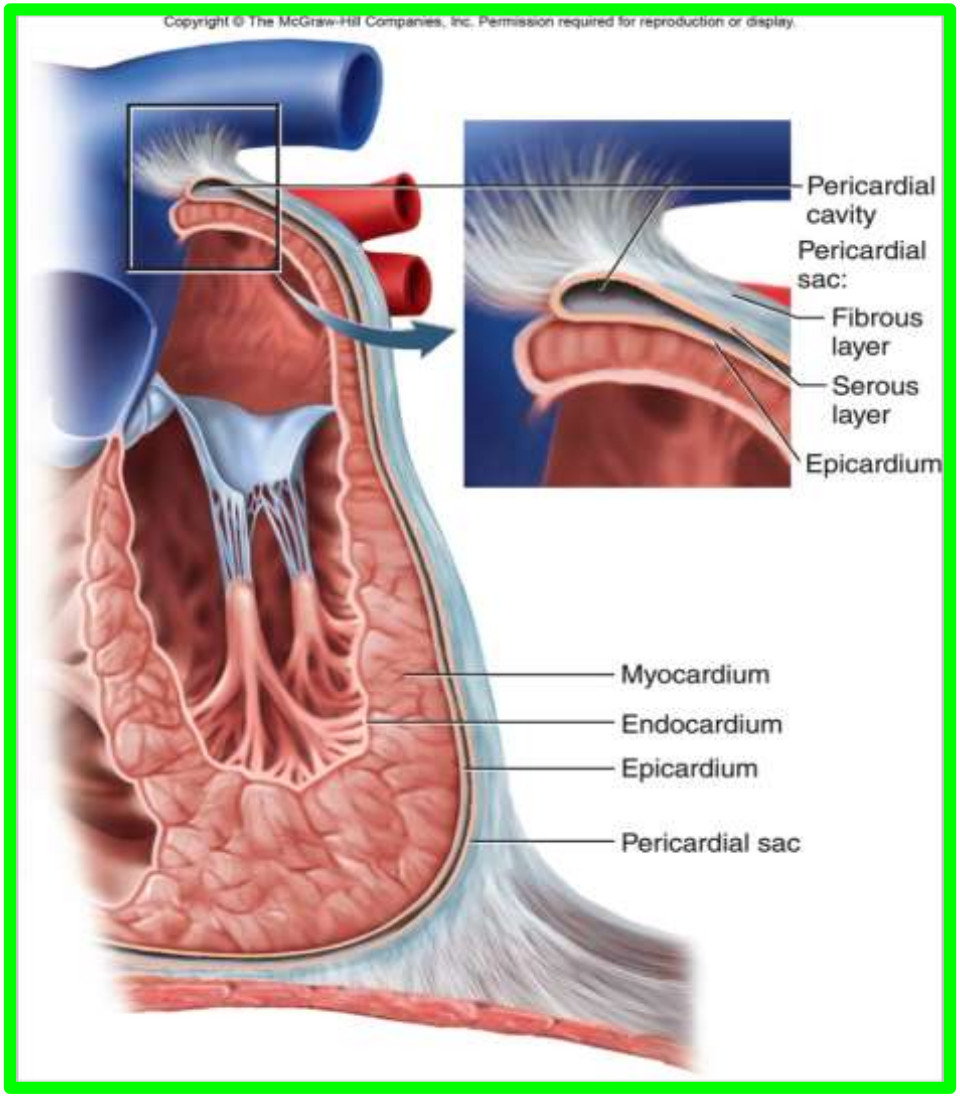




Serous Pericardium

- **The visceral layer** is closely applied to the heart and is often called **the epicardium.**

The slitlike space between **the parietal** and **visceral layers** is referred to as **the pericardial Cavity.**



Normally, the cavity contains a small amount of tissue fluid (about 50 mL), the pericardial fluid, which acts as a lubricant to facilitate movements of the heart

Pericardial Sinuses

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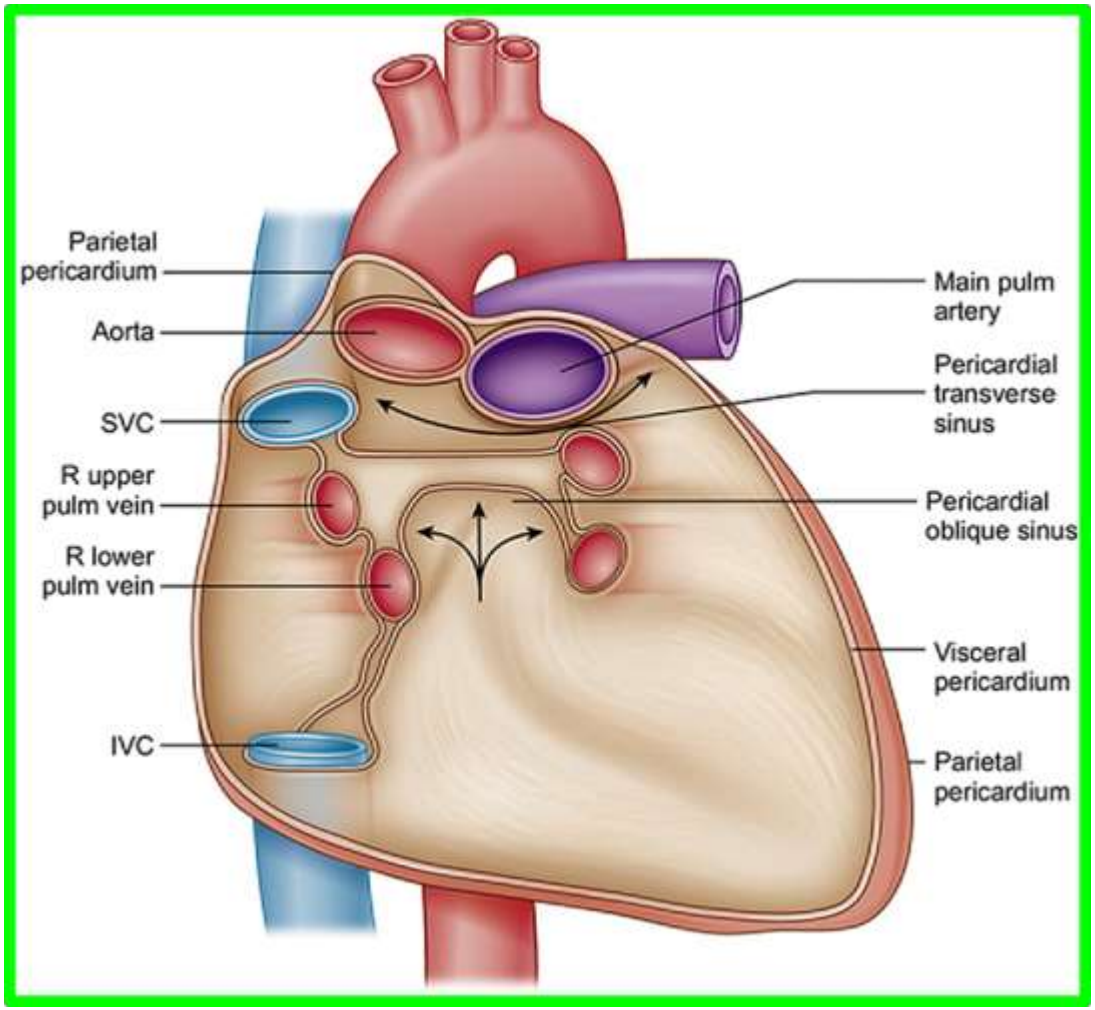
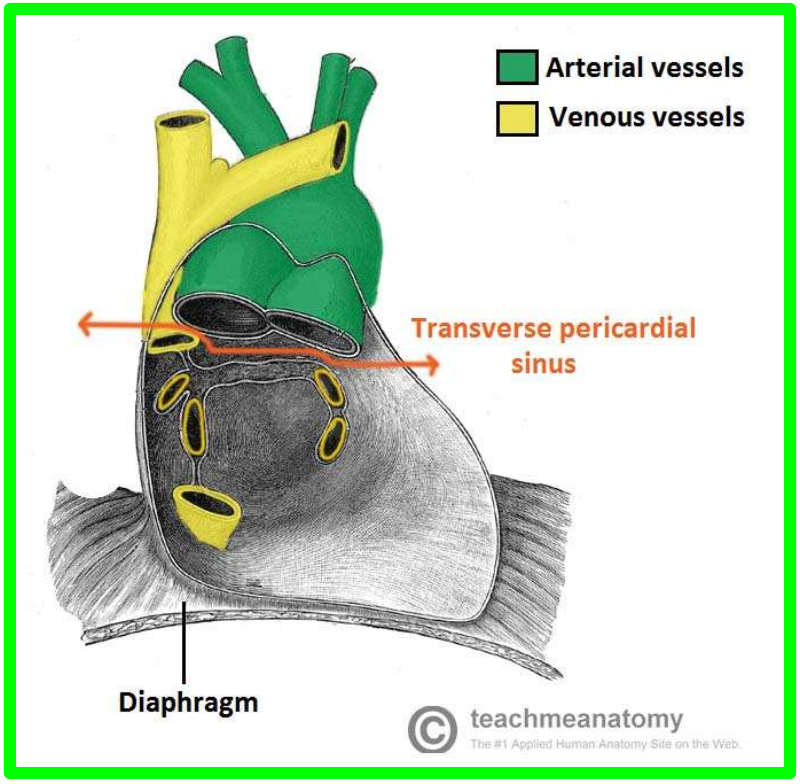
Between parietal and visceral layers there are two sinuses:

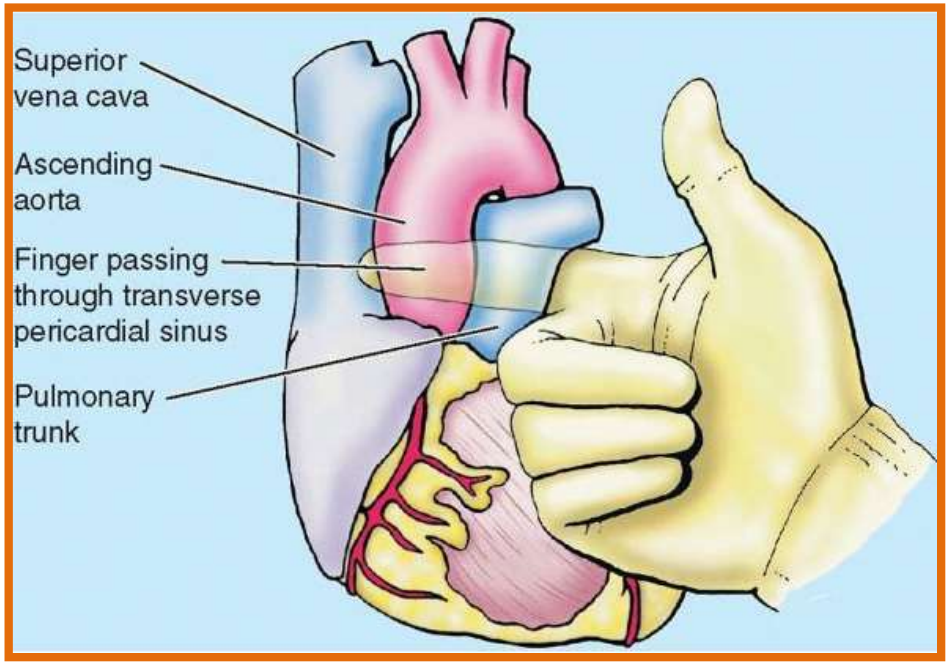
- **the transverse sinus and**
- **the oblique sinus of the pericardium.**



Pericardial Sinuses

❖ **The transverse sinus is a passage above the heart, between the ascending aorta and pulmonary trunk in front and the superior vena cava, left atrium and pulmonary veins behind**



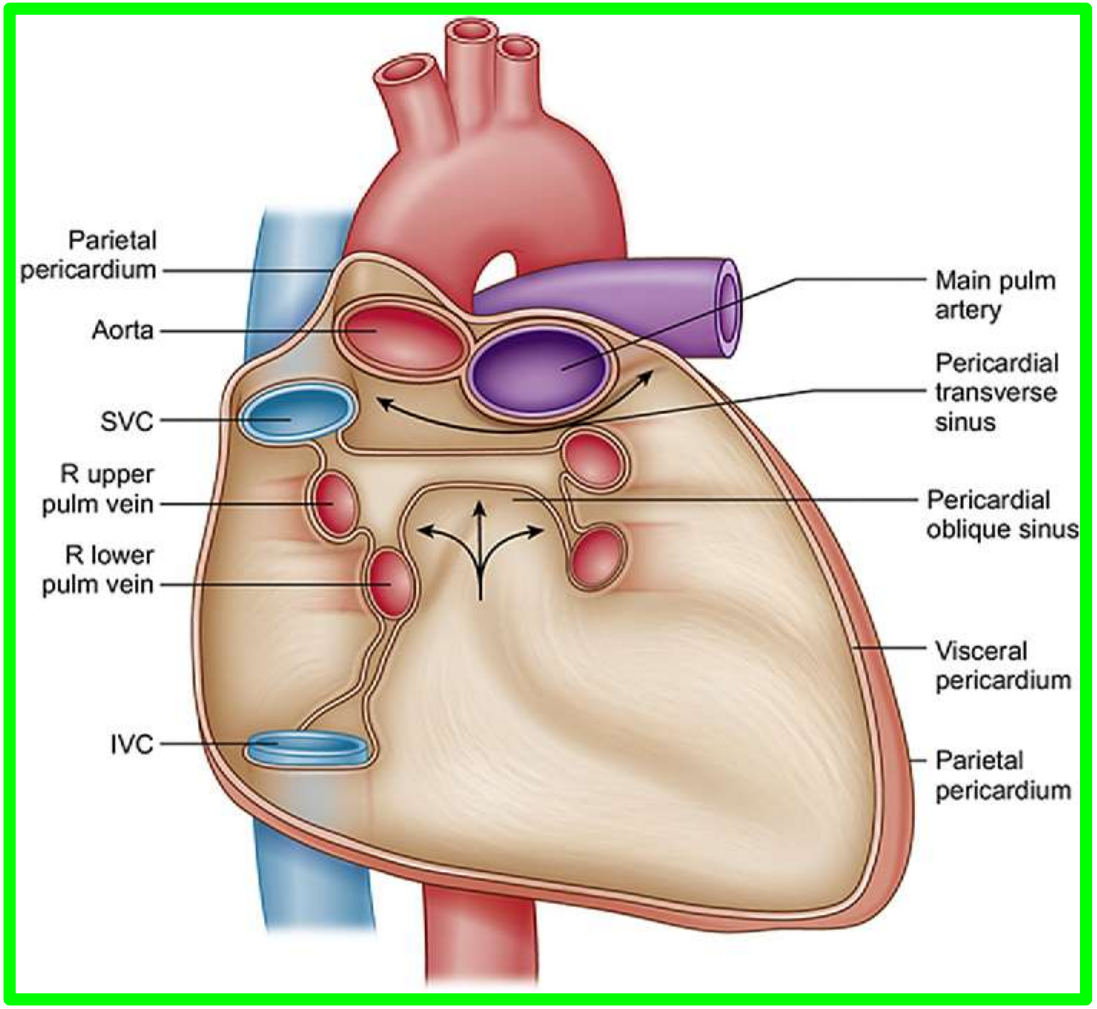


✓ **It is through the transverse sinus that temporary ligature is passed to occlude pulmonary trunk and aorta during pulmonary embolectomy and cardiac operations.**

Pericardial Sinuses

- The oblique sinus is a space behind the heart, between the left atrium in front and the fibrous pericardium behind, posterior to which lies the oesophagus.

- A hand passed from below easily enters the oblique sinus, but the fingertips can only pass up as far as a double fold of serous pericardium that separates the oblique and transverse sinuses from each other



The arterial supply of the pericardium

is mainly from branch of the internal thoracic artery, (the pericardiacophrenic artery)

Smaller contributions of blood come from the:

- Musculophrenic artery, a terminal branch of the internal thoracic artery.
- Bronchial, esophageal, and superior phrenic arteries, branches of the thoracic aorta.
- Coronary arteries (visceral layer of serous pericardium only), the first branches of the aorta.

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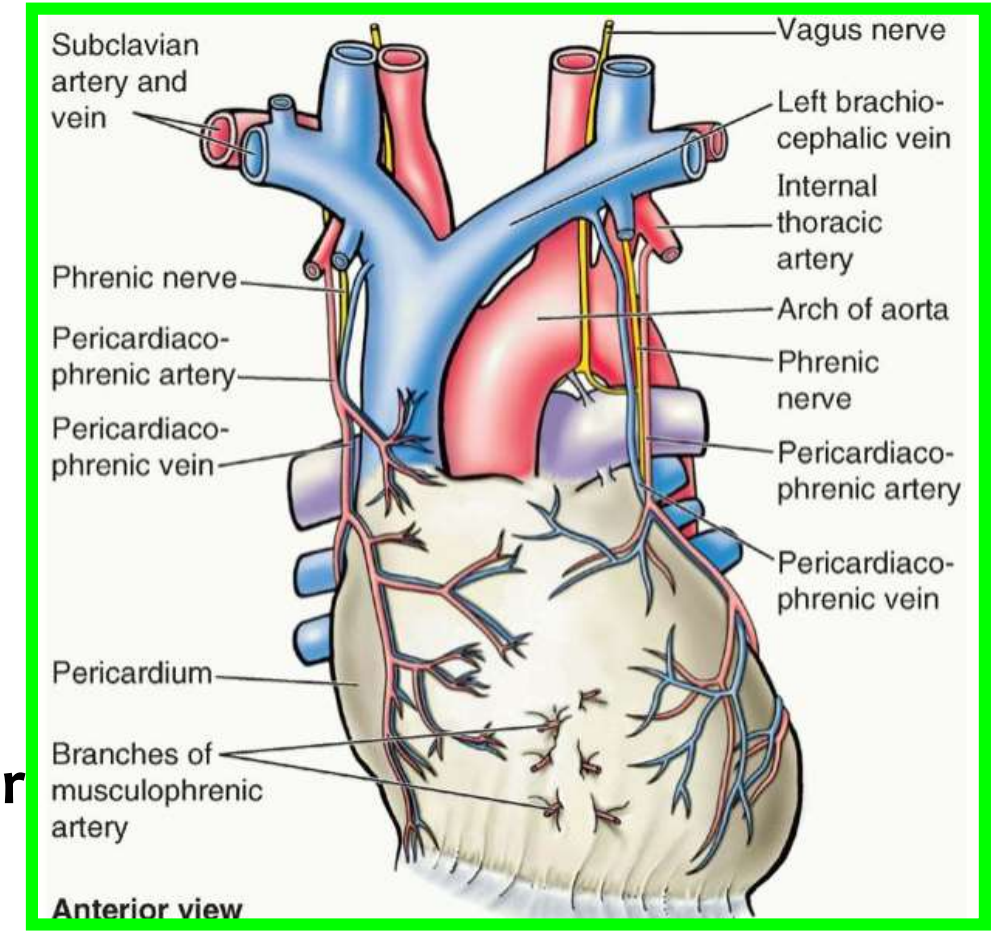
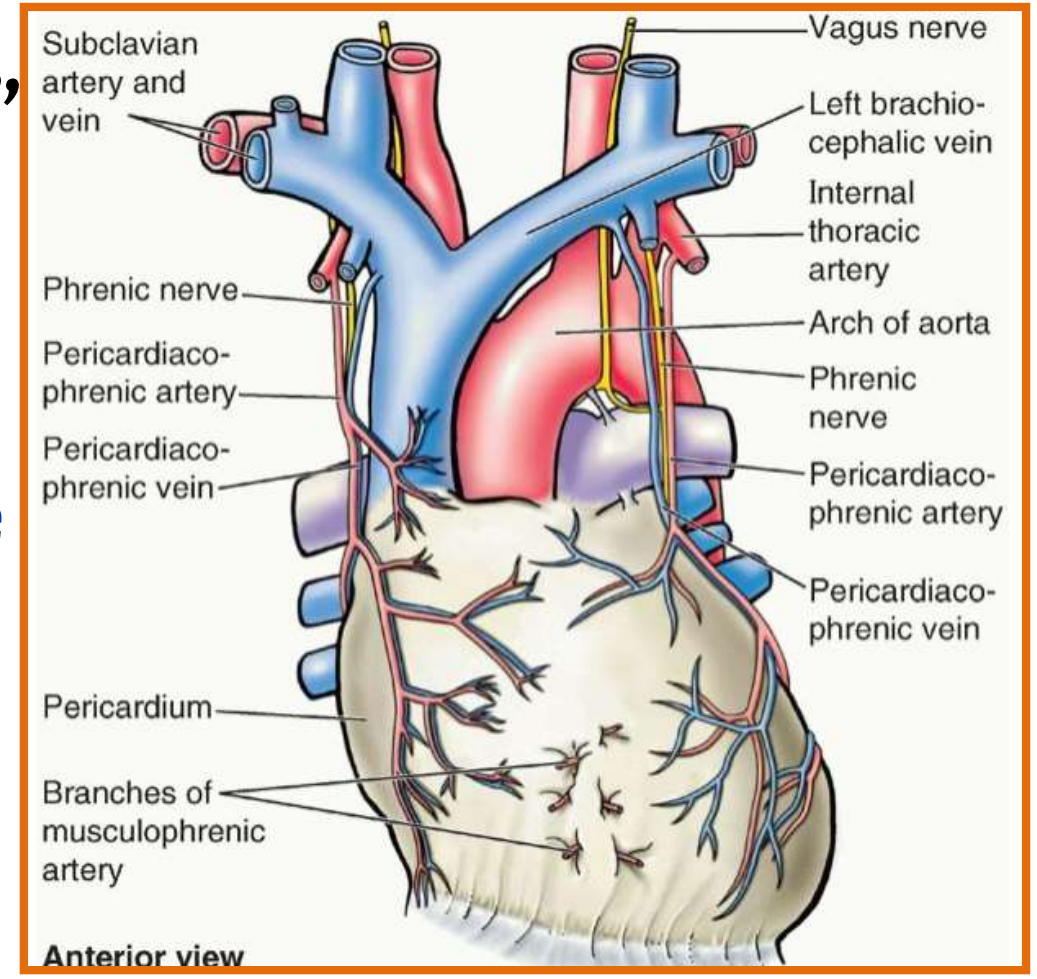


The venous drainage of the pericardium is from the:

Pericardiacophrenic veins, tributaries of the brachiocephalic (or internal thoracic) veins.

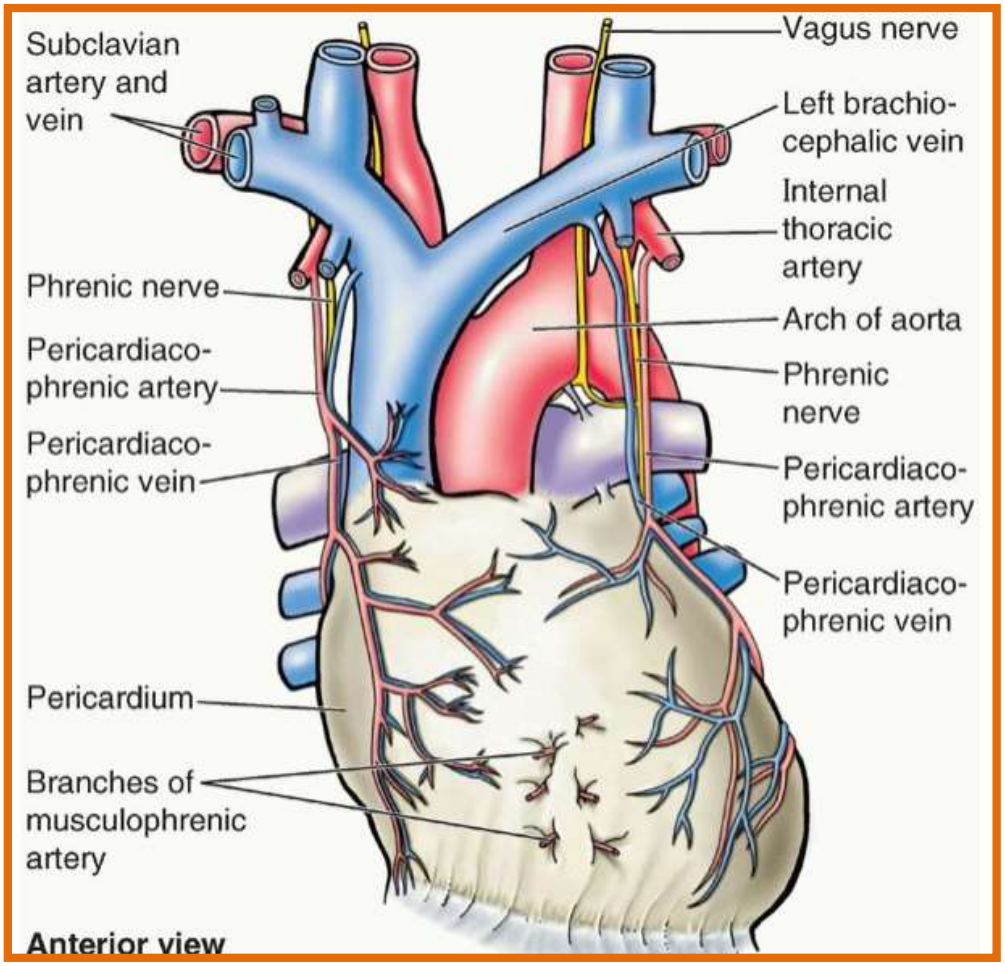
Variable tributaries of the azygos venous system



Nerve Supply of the Pericardium

The fibrous pericardium and the parietal layer of the serous pericardium are supplied by the phrenic nerves.

The visceral layer of the serous pericardium is innervated by branches of the sympathetic trunks and the vagus nerves.



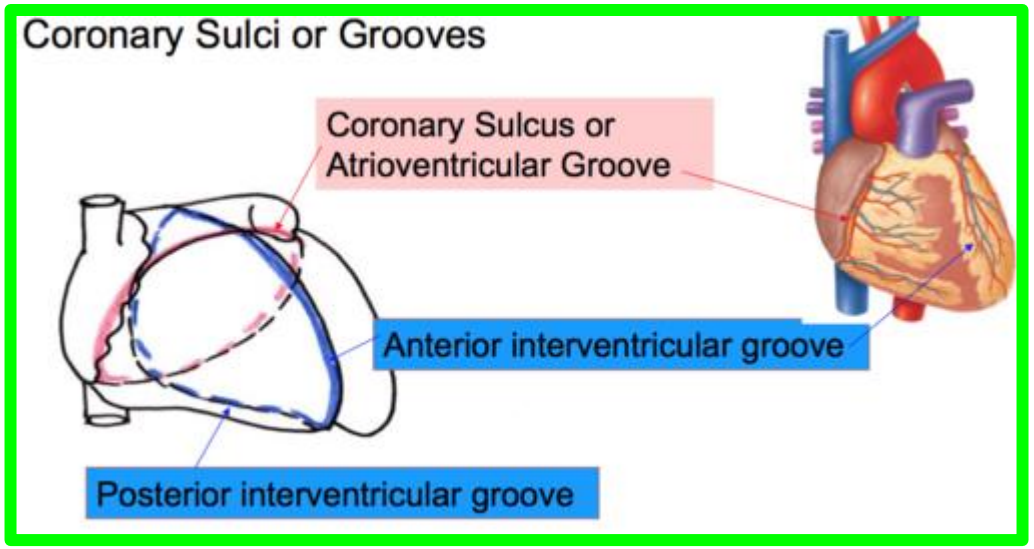
Heart

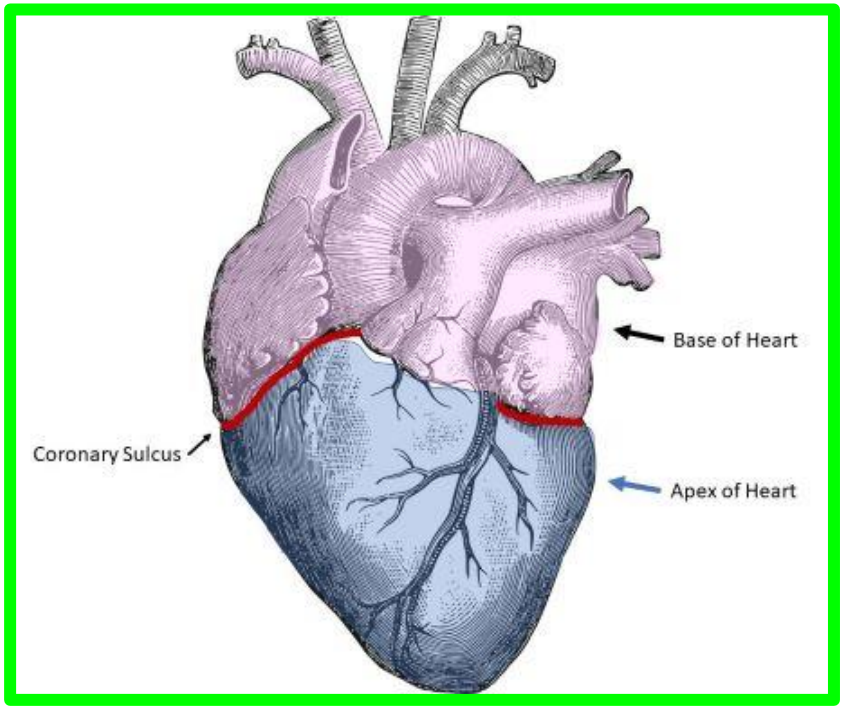
** **Shape:** It is a conical muscular organ somewhat larger than a closed fist.

** It consists of four chambers, two atria and two ventricles.

✓ The 2 atria are separated from the 2 ventricles (on the surface) by the atrio- ventricular (coronary) groove.

✓ The 2 ventricles are separated from each other (on the surface) by the anterior and posterior interventricular grooves.

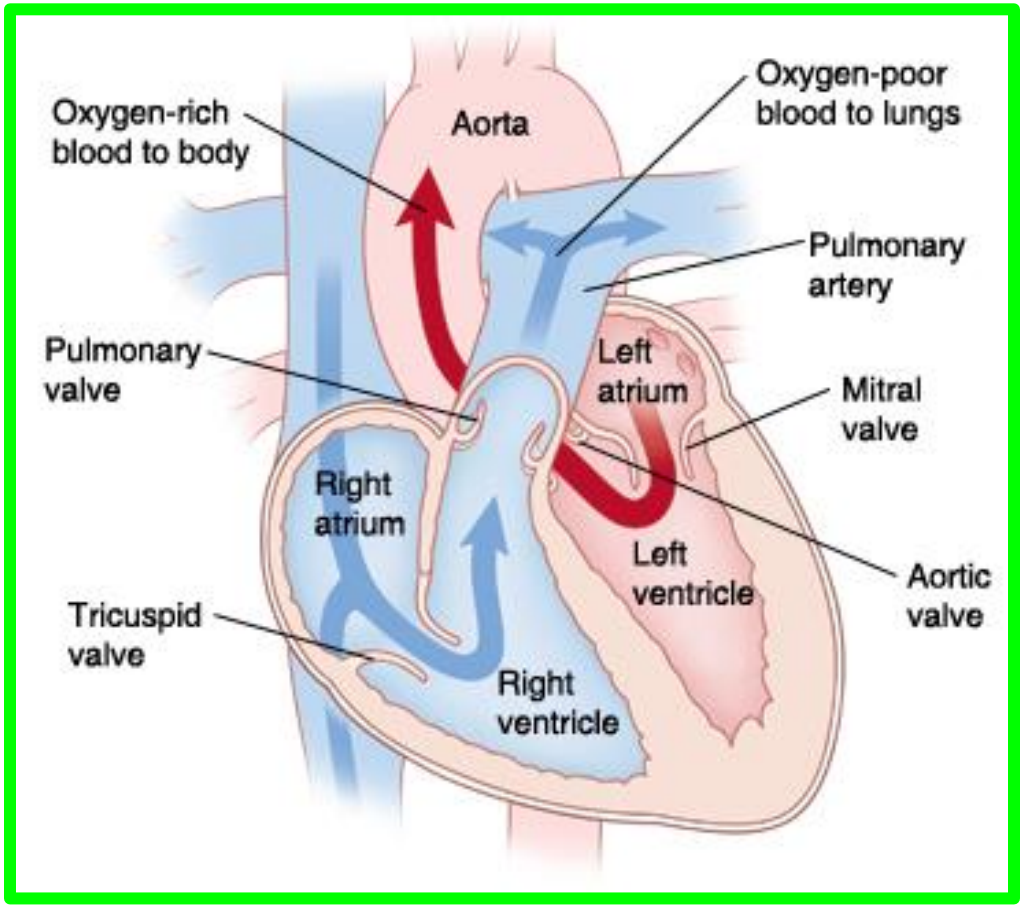




Heart

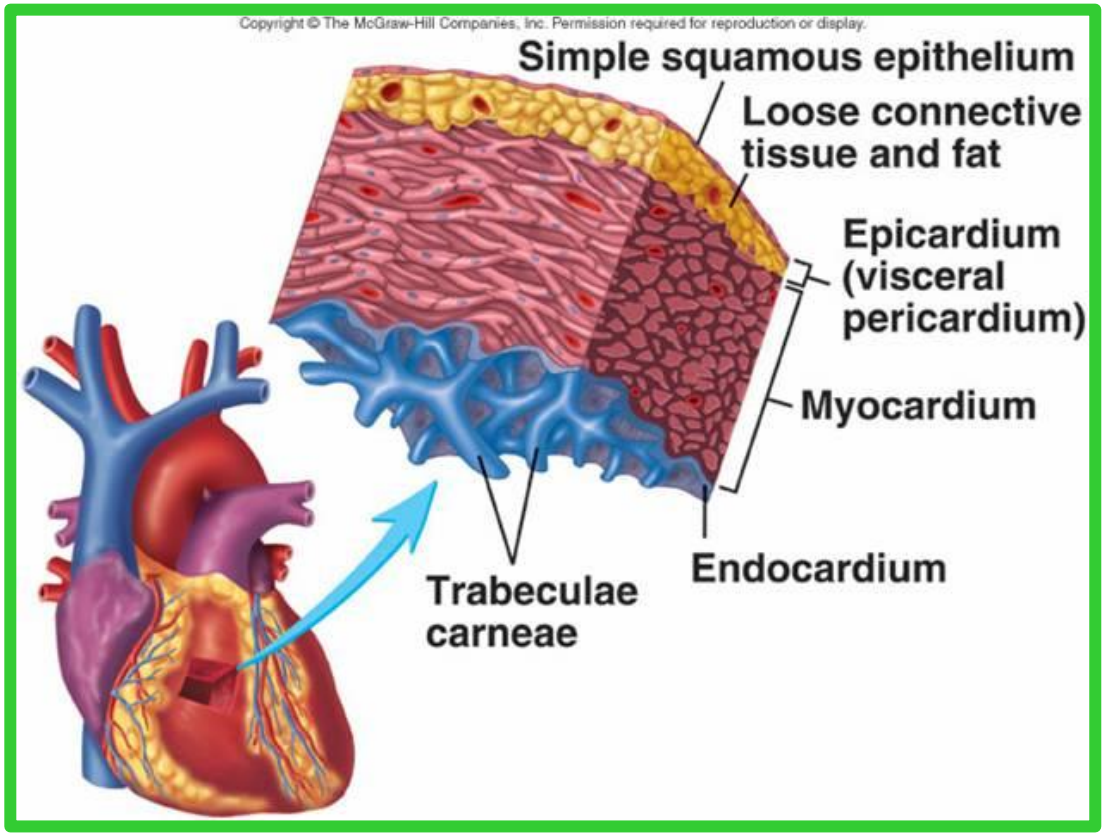
❖The left side of the heart receives well-oxygenated blood from the lungs through the pulmonary veins and pumps it into the aorta for distribution to the body.

❖The right side of the heart receives poorly oxygenated blood from the body through the SVC and IVC and pumps it through the pulmonary trunk to the lungs for oxygenation.



Heart

The wall of the heart consists of three layers; from superficial to deep, they are:



- **Epicardium**, a thin external layer (mesothelium) formed by the visceral layer of serous pericardium
- **Myocardium**, a thick middle layer composed of cardiac muscle
- **Endocardium**, a thin internal layer (endothelium and subendothelial connective tissue) or lining membrane of the heart that also covers its valves.

ORIENTATION OF HEART

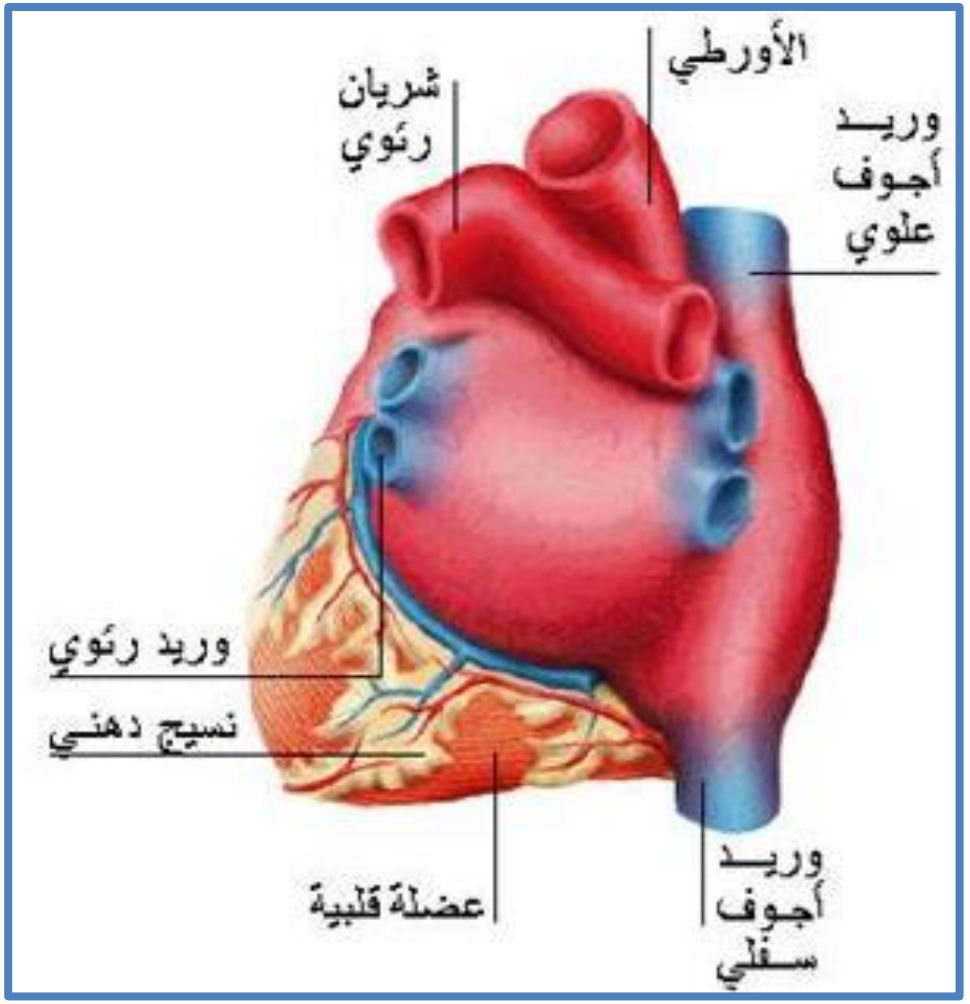
The base of the heart

Is the heart's posterior aspect

- Is formed mainly by the left atrium, with a lesser contribution by the right atrium

- Faces posteriorly toward the bodies of vertebrae T6–T9 and is separated from them by:

✓the pericardium,
✓oblique pericardial sinus,
✓esophagus,
✓and aorta.

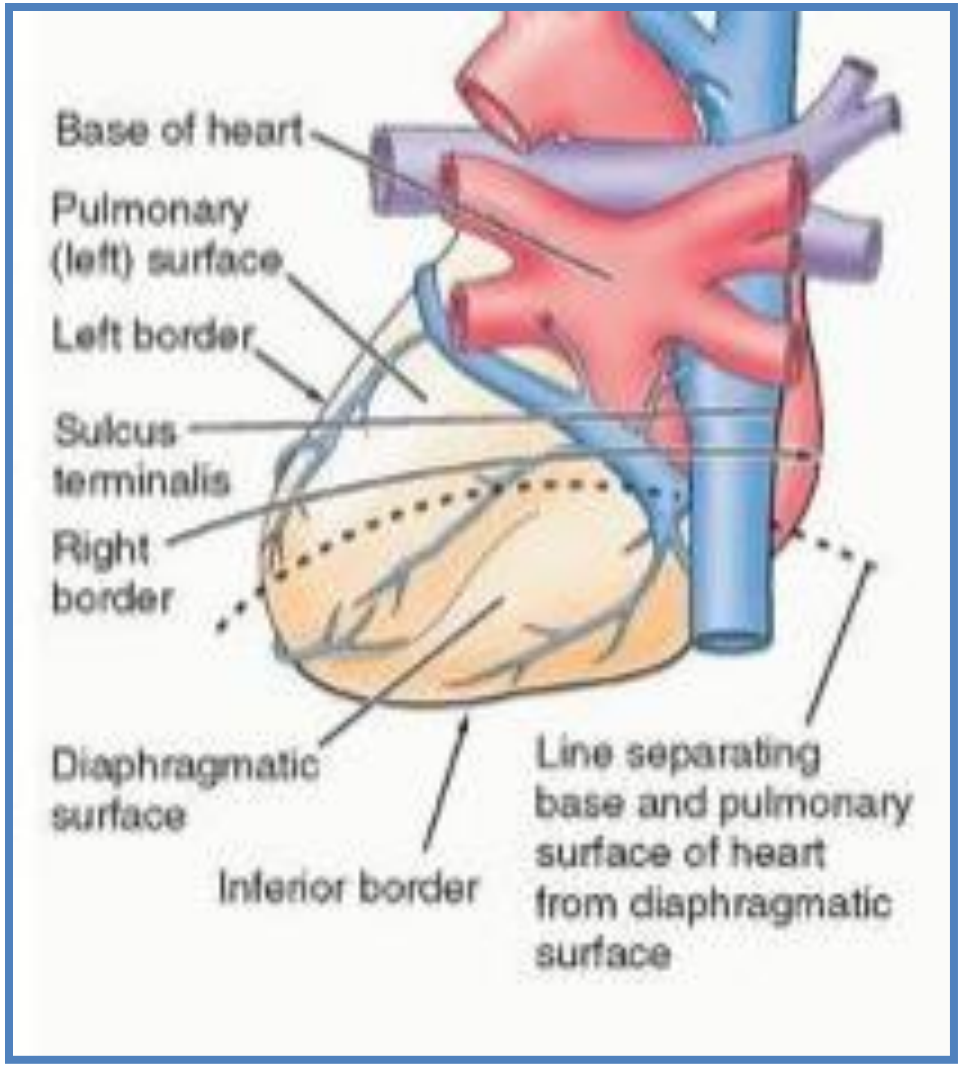


ORIENTATION OF HEART

The base of the heart

- Extends superiorly to the bifurcation of the pulmonary trunk and inferiorly to the coronary sulcus (groove)

- Receives the pulmonary veins on the right and left sides of the left atrium and the superior and inferior venae cavae at the superior and inferior ends of the right atrium.



Surface Anatomy

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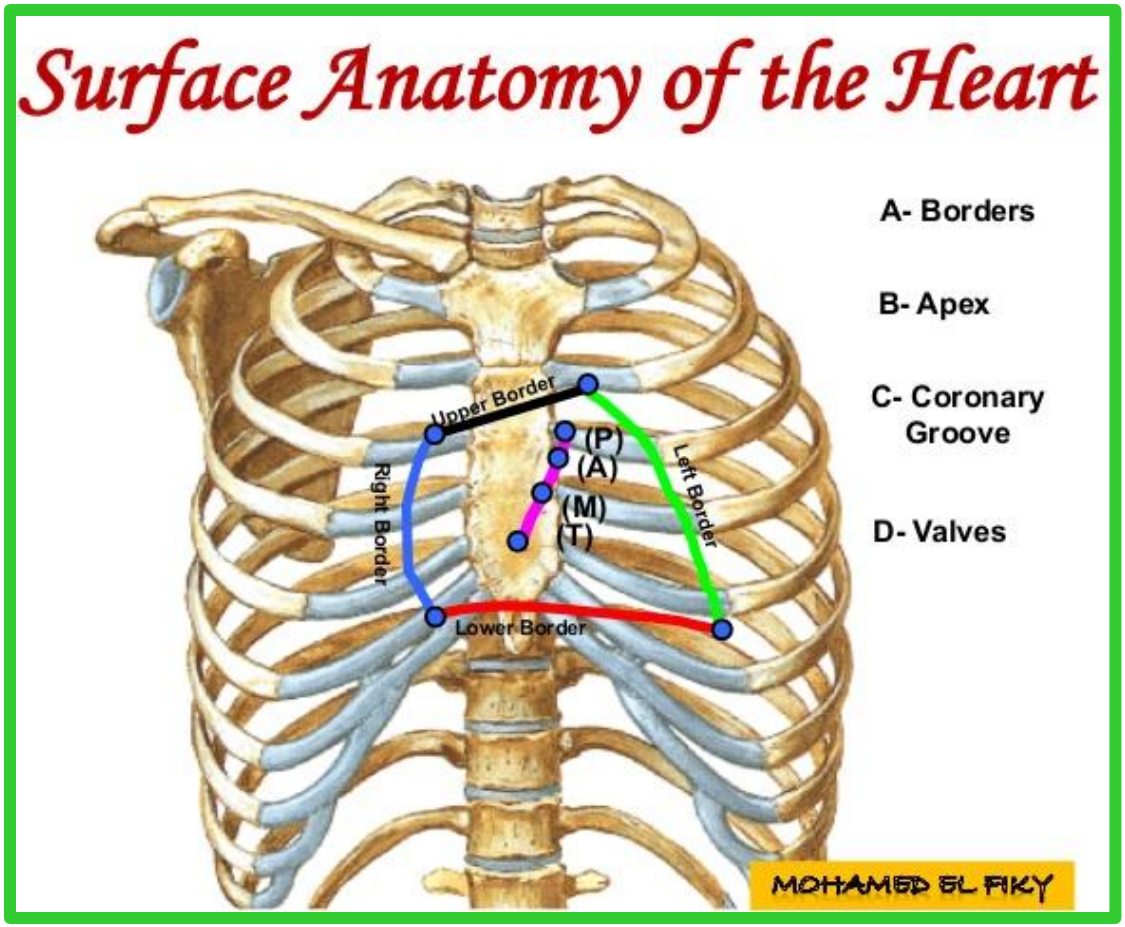
- **The superior border**

corresponds to a line connecting the inferior border of the 2nd left costal cartilage to the superior border of the 3rd right costal cartilage.

- **The right border**

corresponds to a line drawn from the 3rd right costal cartilage to the 6th right costal cartilage; this border is slightly convex to the right.



Surface Anatomy

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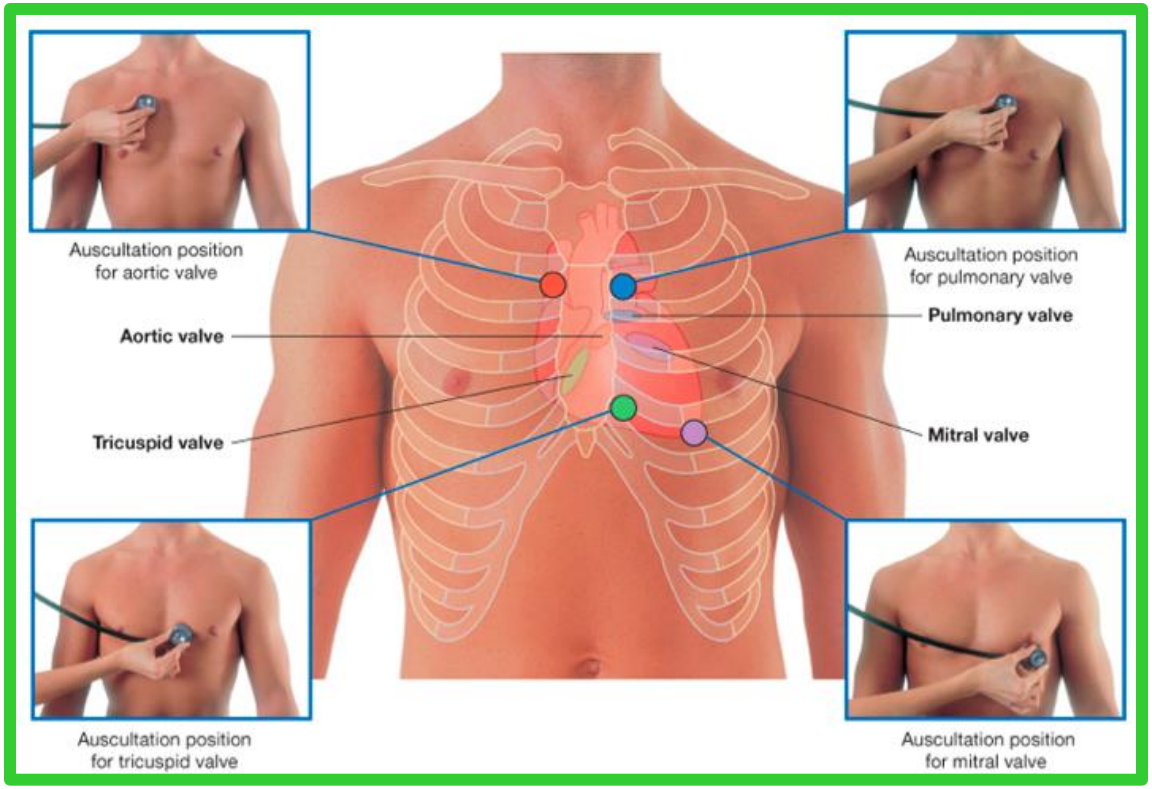
The apex beat is an **impulse that results from the apex being forced against the anterior thoracic wall when the left ventricle contracts.**



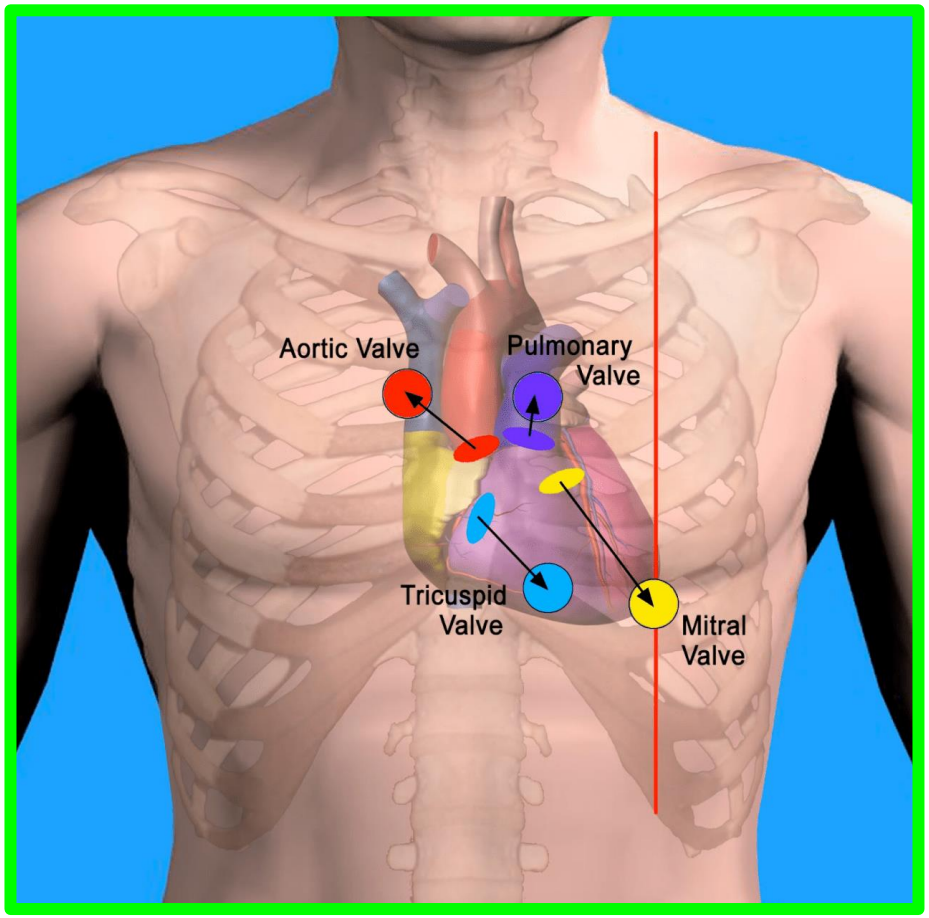
The location of the apex beat (mitral area) varies in position; it may be located in the 4th or 5th intercostal spaces, 6–10 cm from the midline of the thorax. Below and medial to the left nipple

Surface Anatomy

Clinicians' interest in the surface anatomy of the heart and cardiac valves results from their need to listen to **individual valve sounds.**

Because the **auscultatory areas are wide apart as possible**, the sounds produced at any given valve may be distinguished from those produced at other valves.

Blood tends to carry the sound in the direction of its flow. Each area is situated superficial to the chamber or vessel into which **the blood has passed and in a direct line with the valve orifice**



Surface anatomy of the valves :

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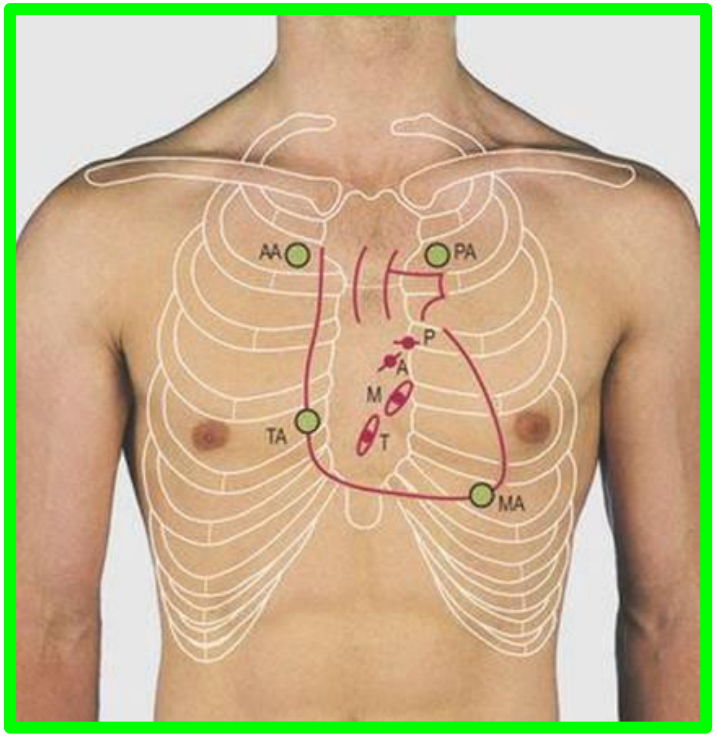
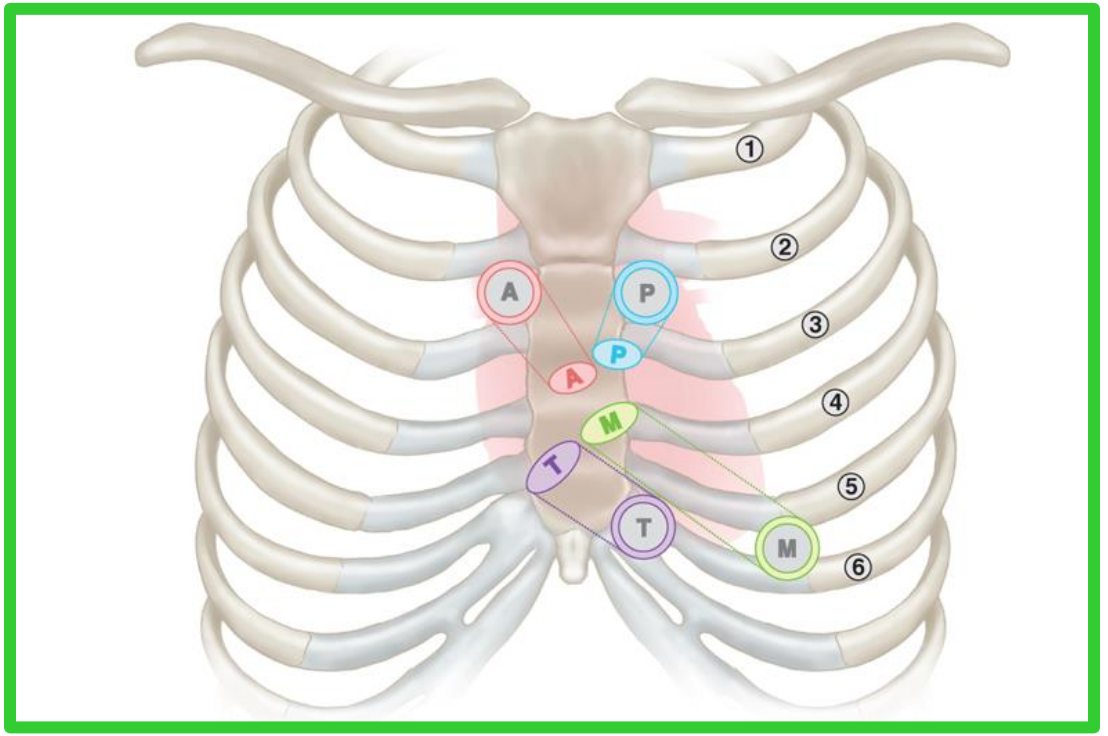
- All the valve of the heart behind the left border of the sternum except the tricuspid valve behind the center of the sternum.

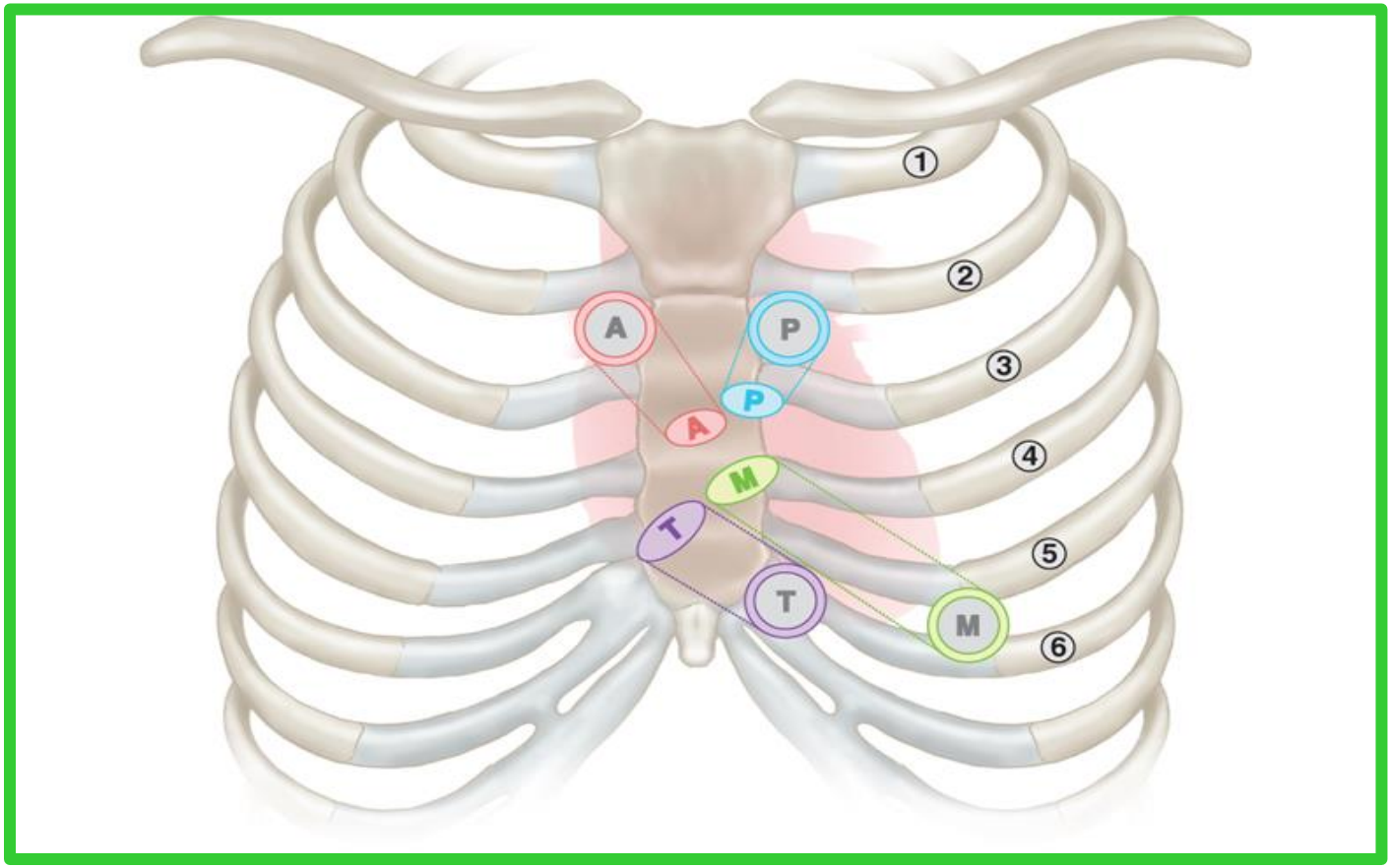




- ❖ Pulmonary valve: opposite the level of the left 3rd sterno-costal junction.
- ❖ Aortic valve: opposite the level of the left 3rd intercostal space.

Surface anatomy of the valves :

- **Mitral valve:** opposite the level of the **left 4th sterno-costal junction.**
- **Tricuspid valve:** opposite the level of the **left 4th intercostal space.**

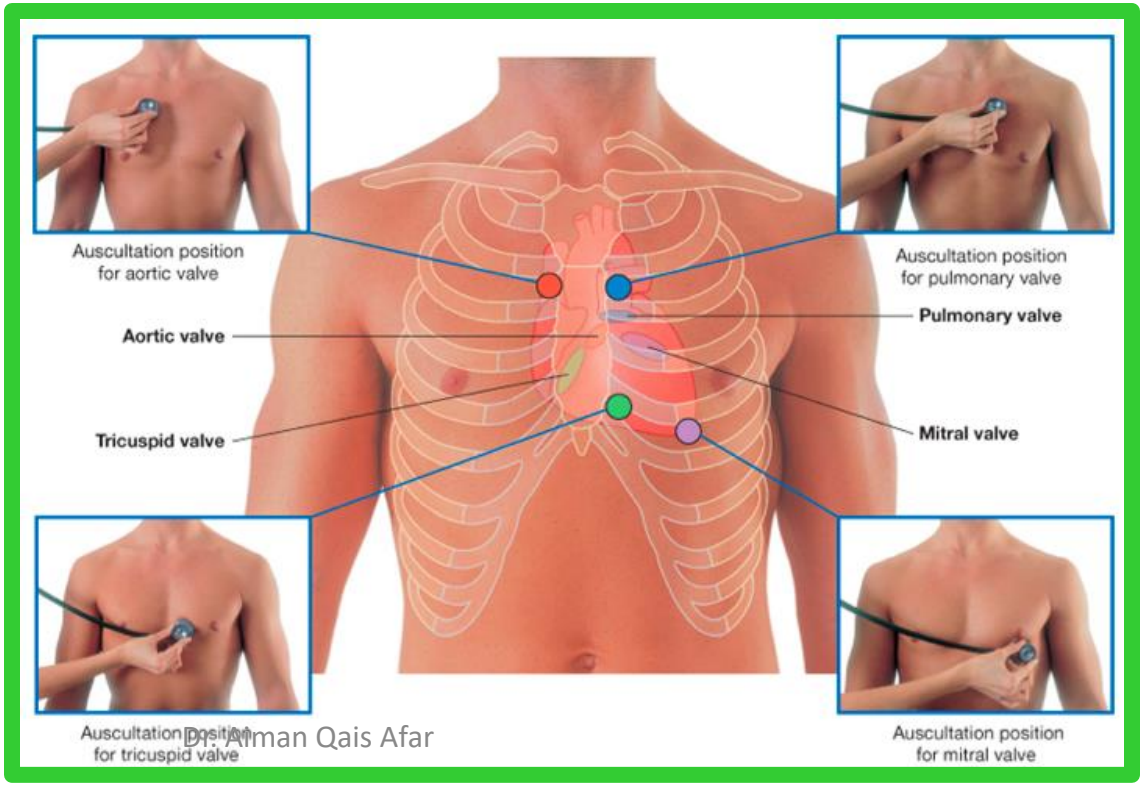


Auscultation of the Heart Valves

Dr. Aiman Q. Afar

The areas (sites) of auscultation are

- **Aortic valve (A):** 2nd intercostal space to right of sternal border
- **Pulmonary valve (P):** 2nd intercostal space to left of sternal border
- **Tricuspid valve (T):** near left sternal border in 5th or 6th intercostal space
- **Mitral valve (M):** apex of heart in 5th intercostal space in midclavicular line



Chambers of the Heart

Right Atrium

The right atrium forms the right border of the heart and receives venous blood from the SVC, IVC, and coronary sinus

The ear-like right auricle is a conical muscular pouch that projects from this chamber like an add-on room, increasing the capacity of the atrium as it overlaps the ascending aorta.

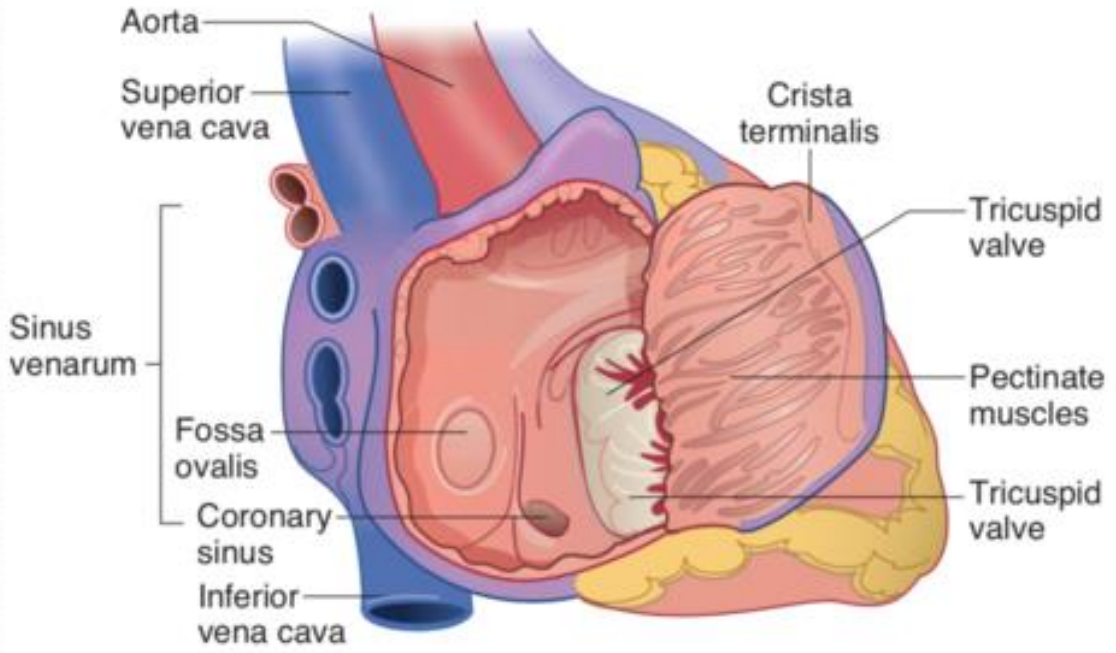
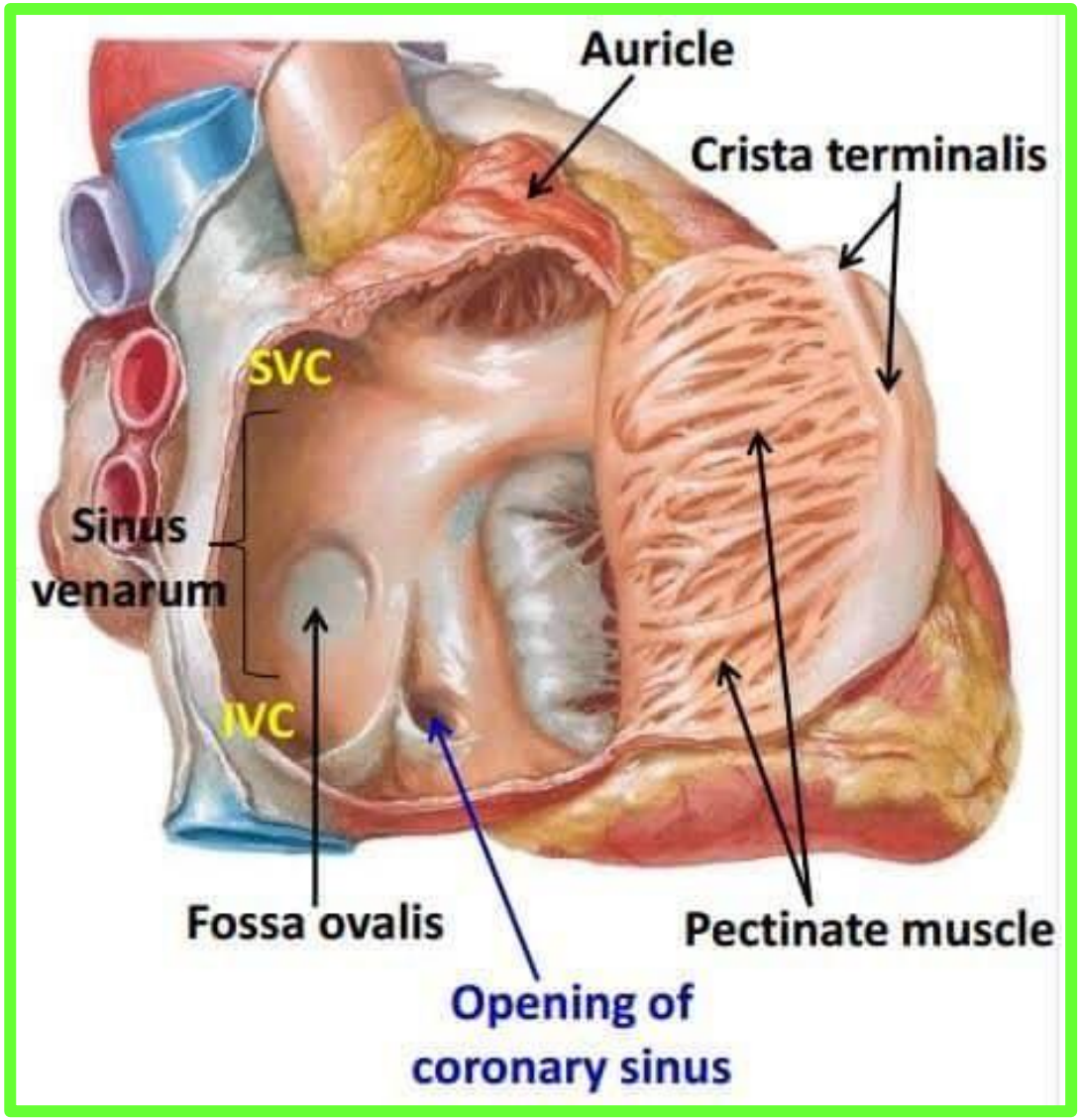


Figure II-2-36. Inside the Right Atrium

Right Atrium

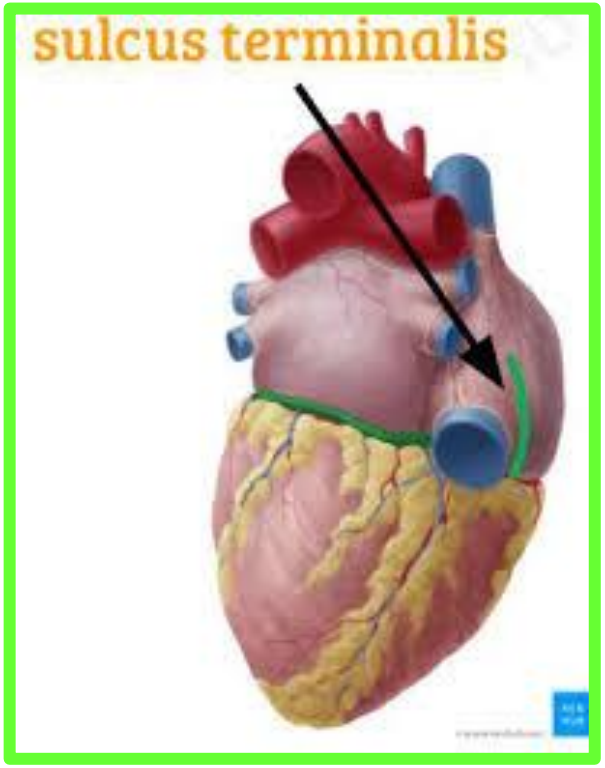
The interior of the right atrium has a:

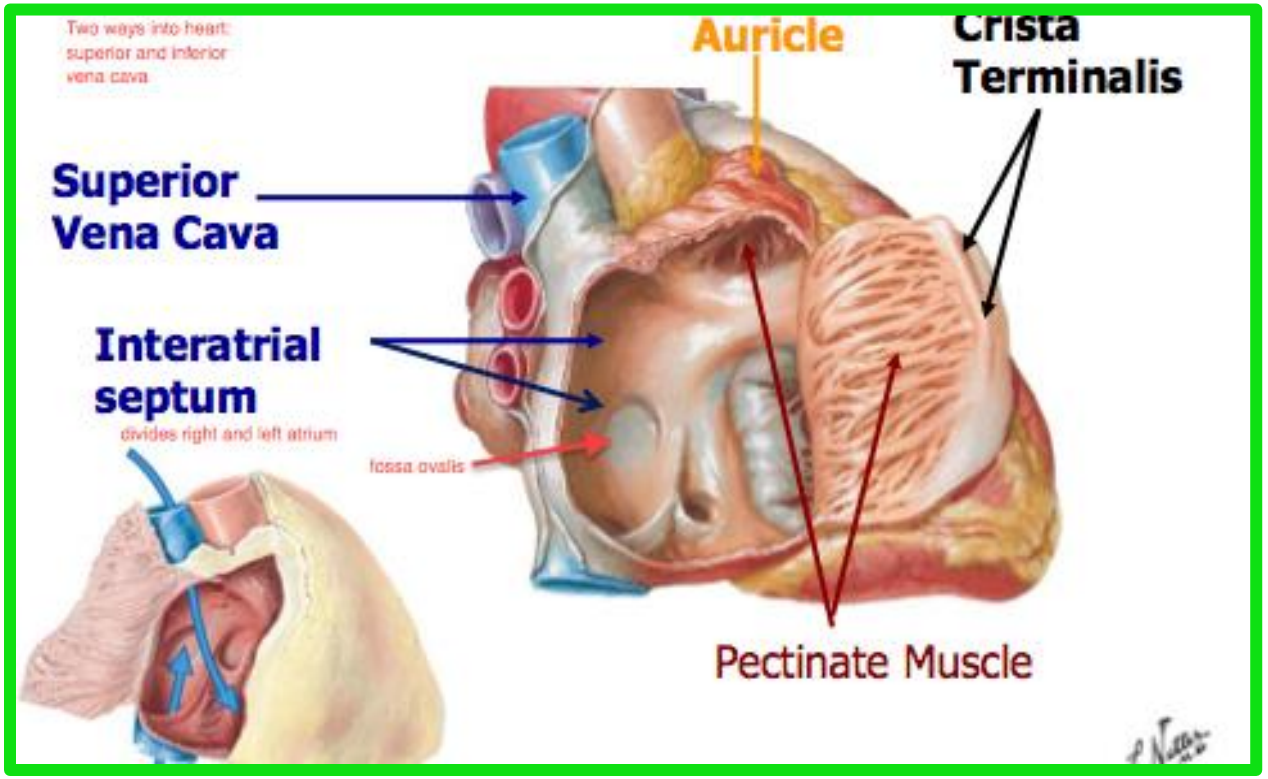
- **Smooth, thin-posterior wall,** on which the venae cavae **(SVC and IVC)** and **coronary sinus** open, bringing poorly oxygenated blood into the heart.



Right Atrium

- The smooth and rough parts of the atrial wall are separated externally by a shallow vertical groove, the sulcus terminalis or (terminal groove)
- and internally by a vertical ridge, the crista terminalis or (terminal crest).





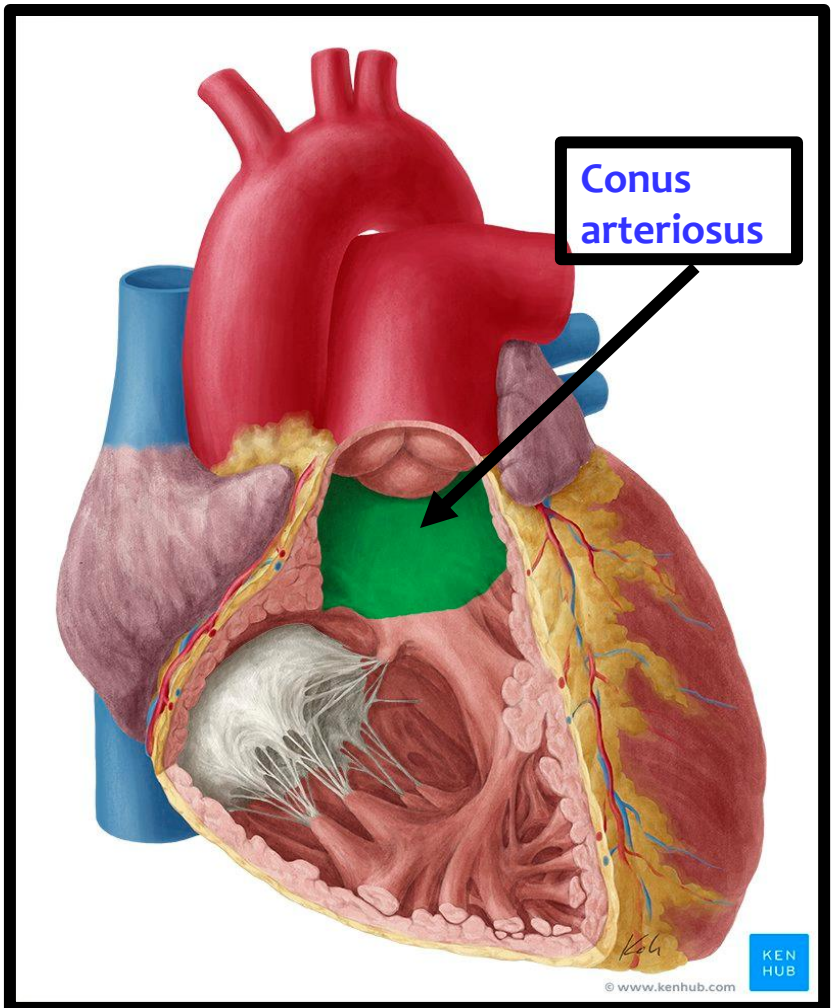
Chambers of the Heart

Right Ventricle

✓Forms the largest part of the anterior surface of the heart
✓ a small part of the diaphragmatic surface
✓ and almost the entire inferior border of the heart

✓Superiorly it tapers into an arterial cone, the conus arteriosus (infundibulum) which leads into the pulmonary trunk.

✓ The interior of the right ventricle has irregular muscular elevations (trabeculae carneae).



Right Ventricle

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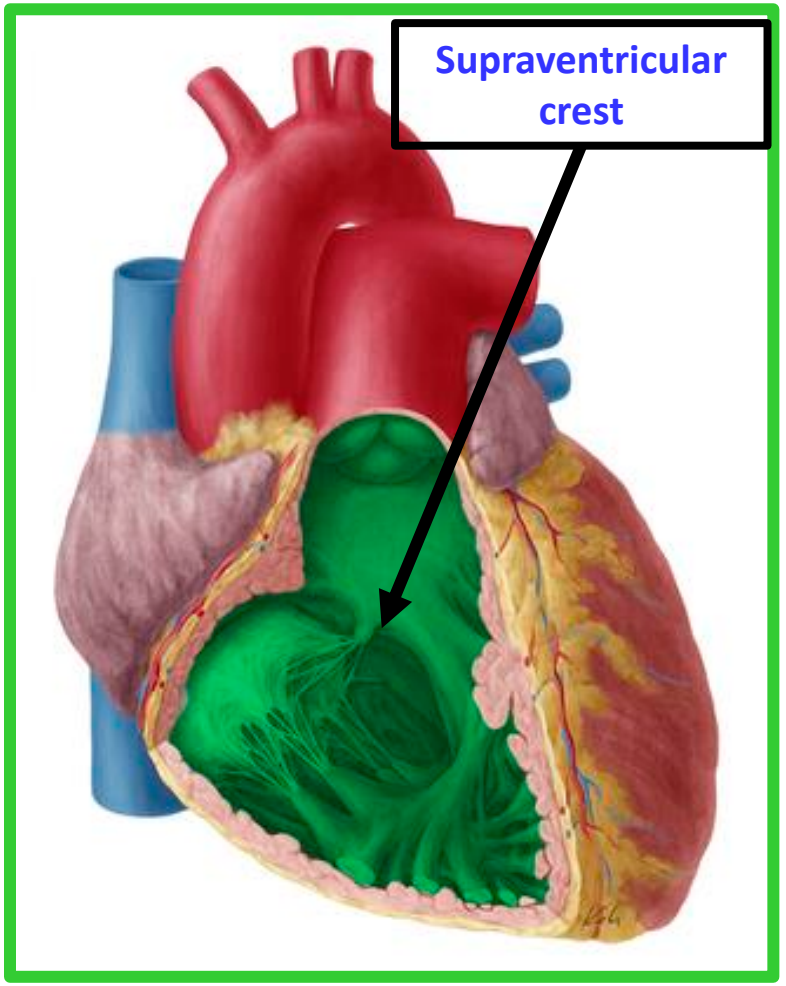
✓A thick muscular ridge, **the supraventricular crest,** separates the **ridged muscular wall** of the **inflow part** of the chamber from the **smooth wall of the conus arteriosus**, or **outflow part.**

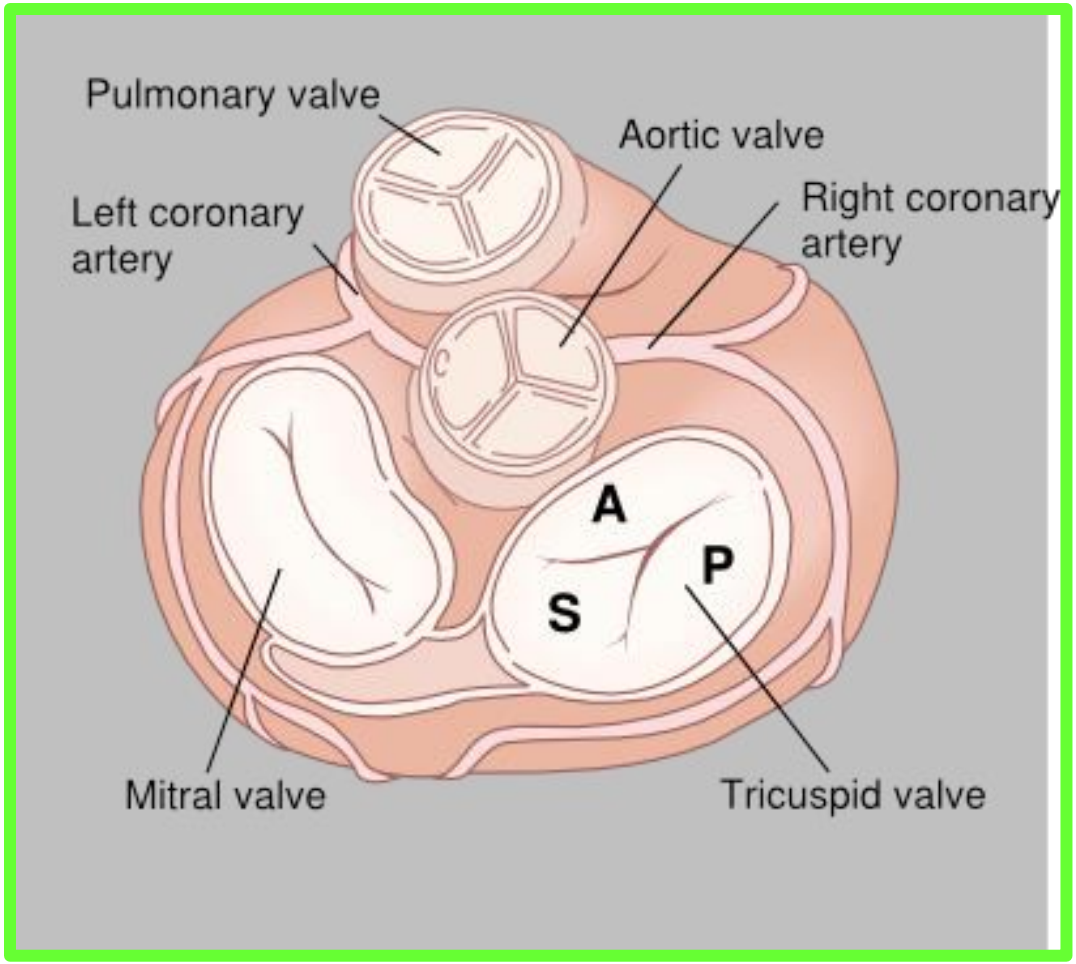


✓The inflow part of the ventricle receives blood from the right atrium through **the right AV (tricuspid) orifice** located posterior to the body of the sternum at the level of **the 4th and 5th intercostal spaces**.

Right Ventricle

The tricuspid valve guards the right AV orifice.

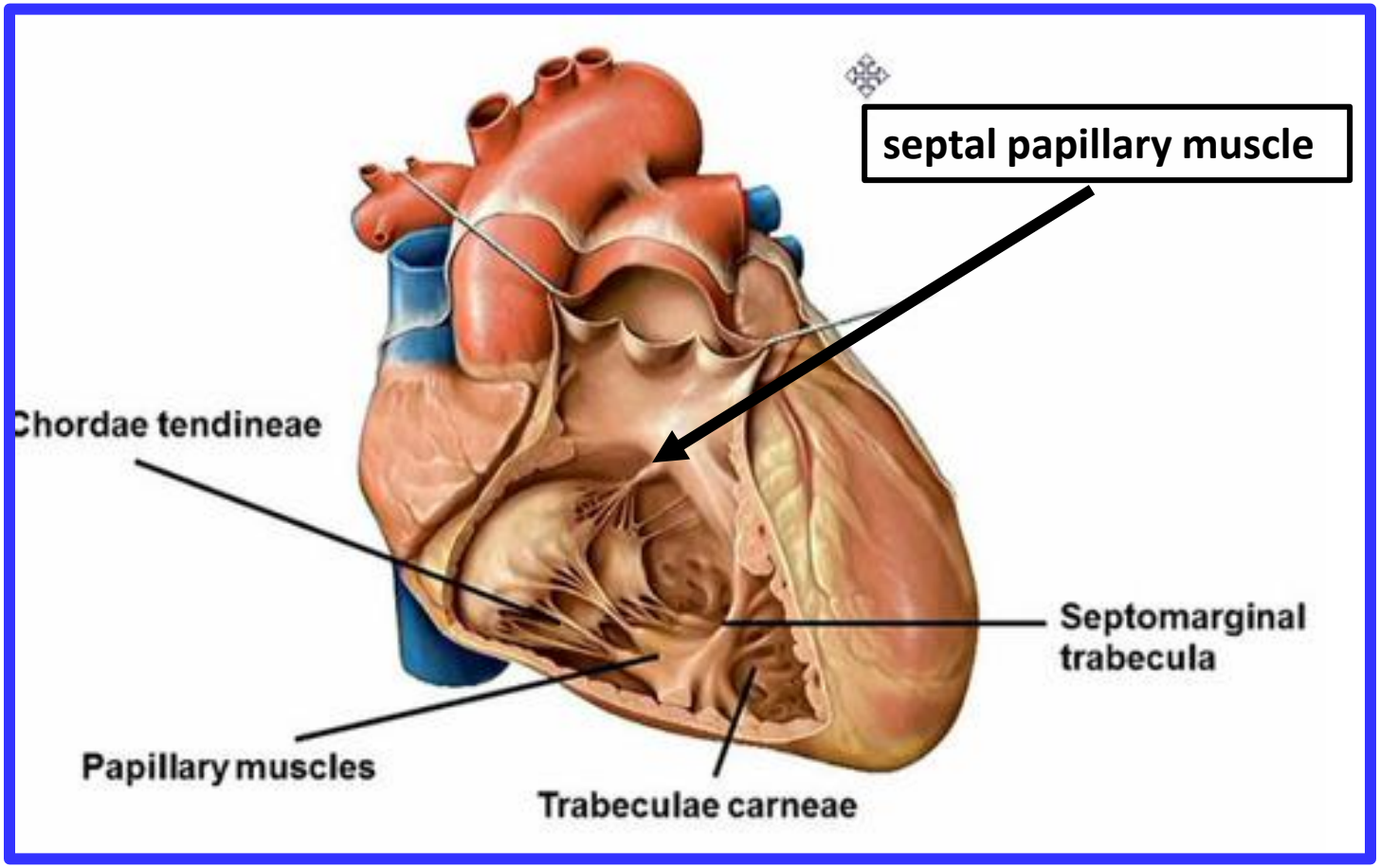
The bases of the valve cusps are attached to the fibrous ring around the orifice.



- **Because the fibrous ring maintains the caliber of the orifice, the attached valve cusps contact each other in the same way with each heartbeat.**

Right Ventricle

❖The septal papillary muscle arises from the interventricular septum, and its tendinous cords attach to the anterior and septal cusps of the tricuspid valve.



Right Ventricle

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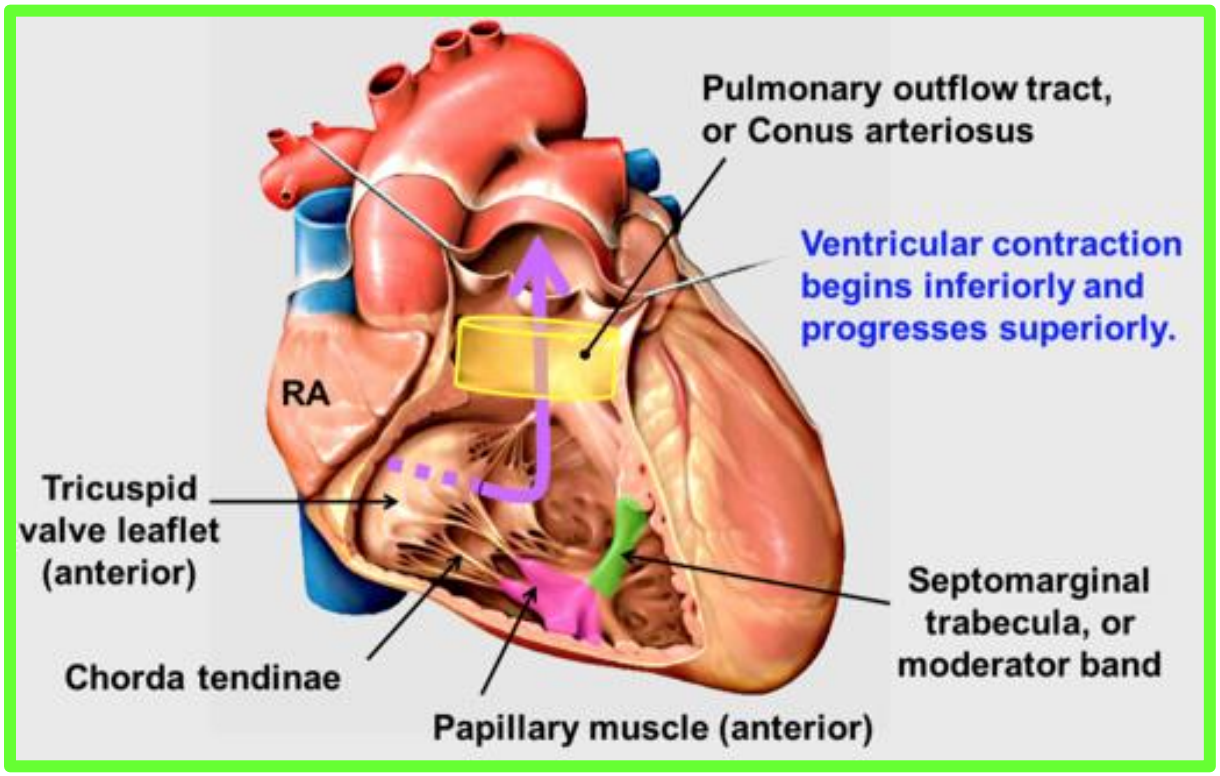
The septomarginal trabecula (moderator band) is a curved muscular bundle that traverses the right ventricular chamber from the inferior part of the IVS to the base of the anterior papillary muscle.



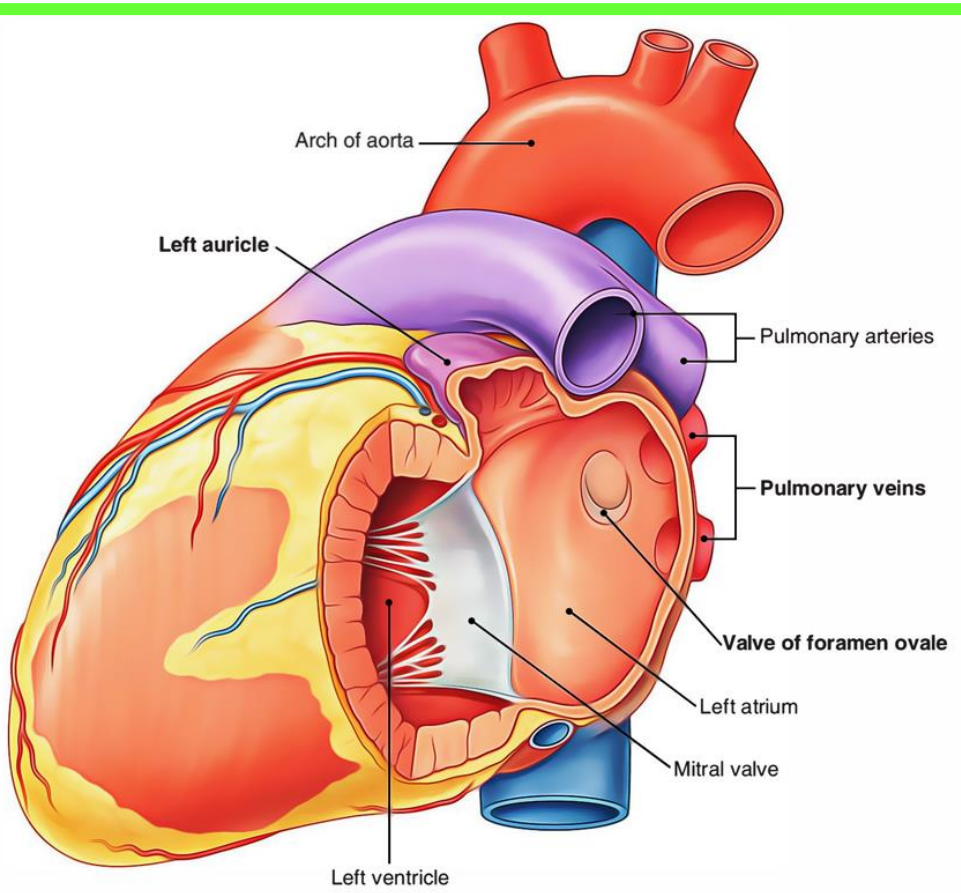
This trabecula is important because it carries part of the right branch of the AV bundle, a part of the conducting system of the heart to the anterior papillary muscle

LEFT ATRIUM

The interior of the left atrium is smooth, but the left auricle possesses muscular ridges as in the right auricle.

Openings into the Left Atrium

The four pulmonary veins, two from each lung, open through the posterior wall and have no valves. The left atrioventricular orifice is guarded by the mitral valve



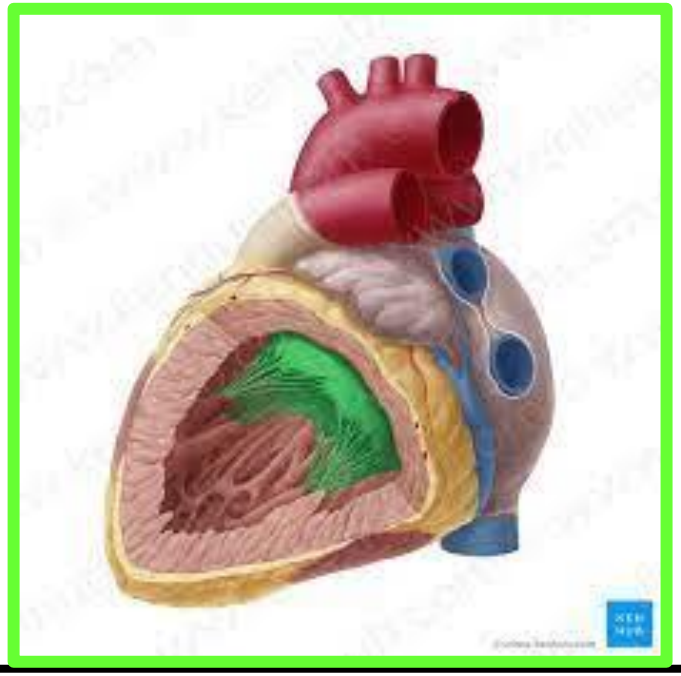
LEFT VENTRICLE

❖ Forms the apex of the heart, and most of the diaphragmatic surface.

The interior of the left ventricle has:

❖Walls that are two to three times as thick as those of the right ventricle.

❖Walls that are mostly covered with a mesh of trabeculae carneae that are finer and more numerous than those of the right ventricle



❖A conical cavity that is longer than that of the right ventricle.

LEFT VENTRICLE

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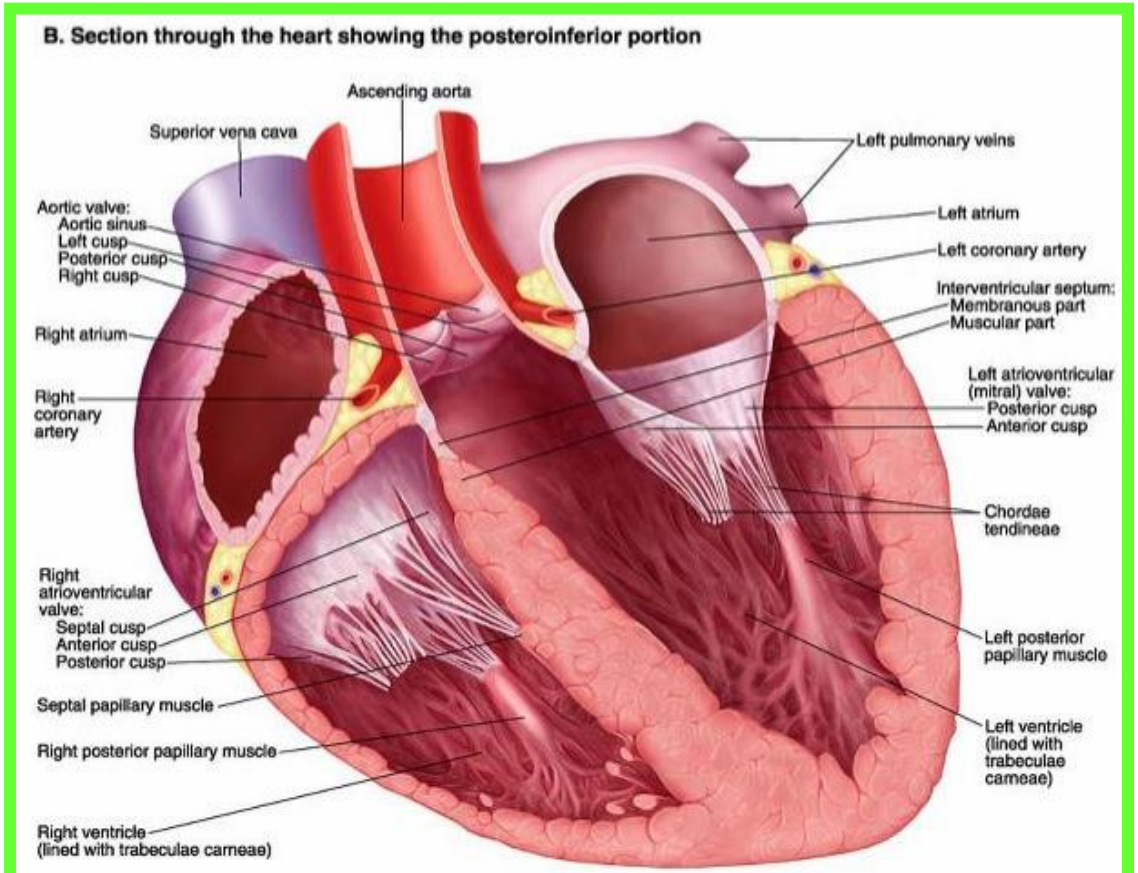
❖Anterior and posterior papillary muscles that are larger than those in the right ventricle.

❖A smooth-walled, non-muscular, superoanterior outflow part, the aortic vestibule, leading to the aortic orifice and aortic valve.

❖A double-leaflet mitral valve that guards the left AV orifice

❖An aortic orifice that lies in its right posterosuperior part . The ascending aorta begins at the aortic orifice.

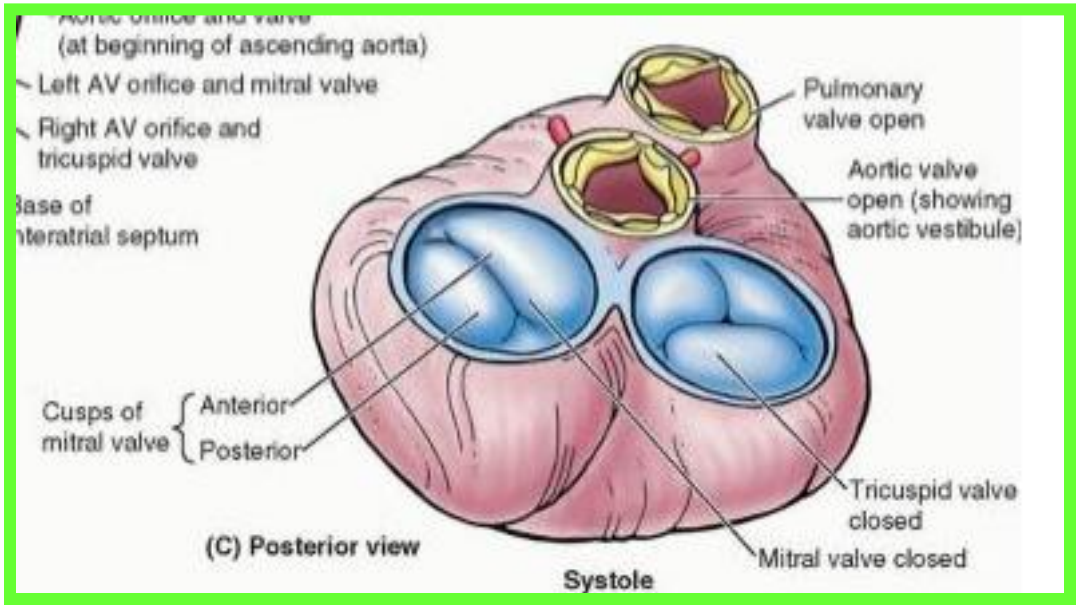


LEFT VENTRICLE

The mitral valve

guards the atrioventricular orifice. It consists of two cusps, one anterior and one posterior.

✓The anterior cusp is the larger and intervenes between the atrioventricular and aortic orifices.

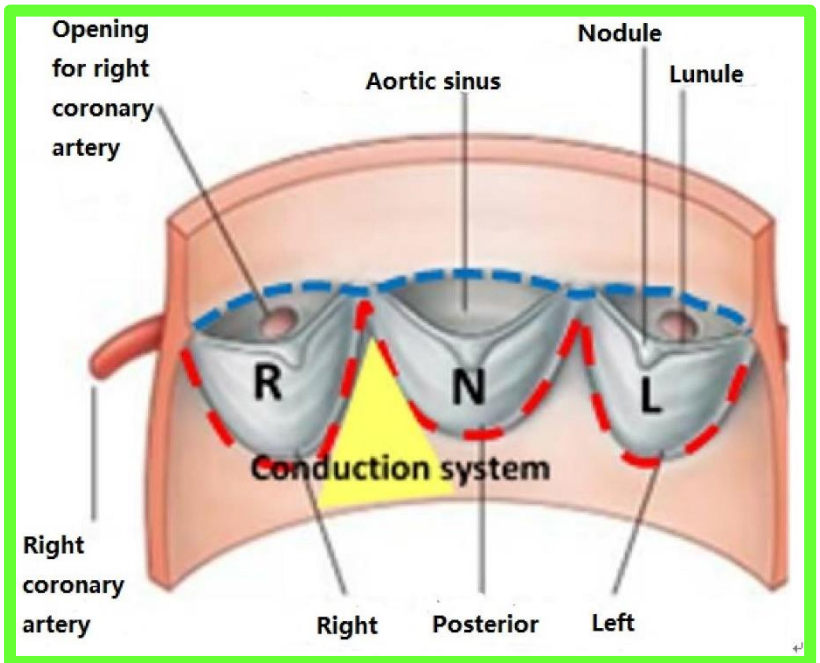


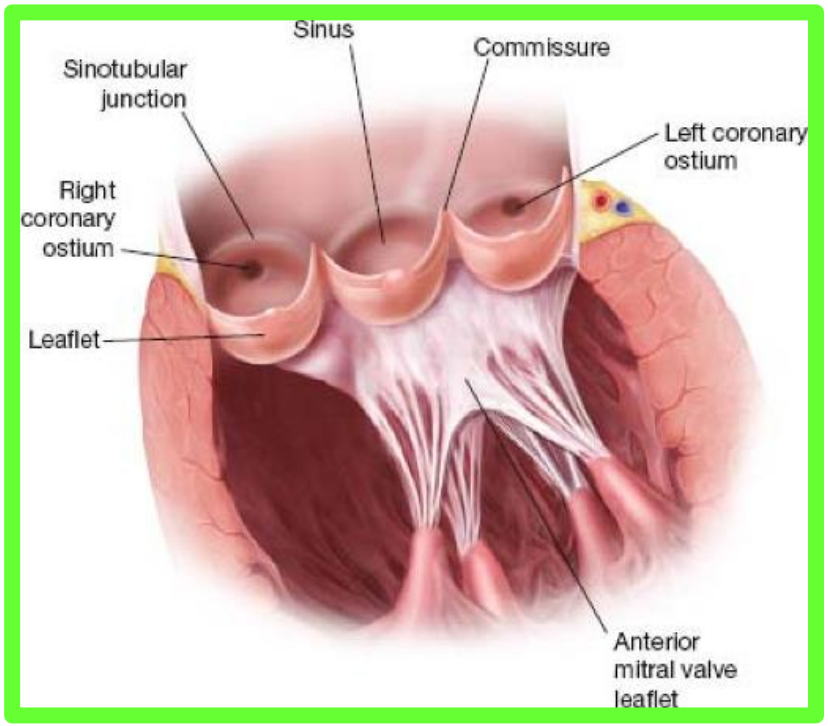
✓The mitral valve is located posterior to the sternum at the level of the 4th costal cartilage.

LEFT VENTRICLE

The aortic valve

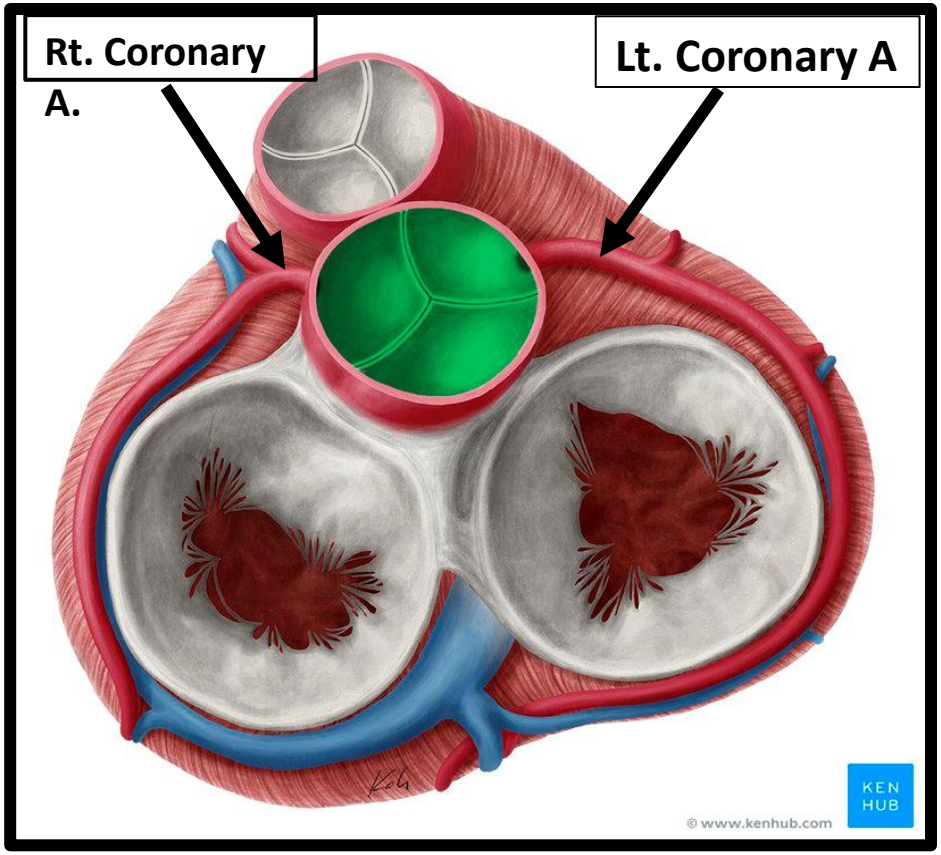
- ✓guards the aortic orifice
- ✓One cusp is situated on the anterior wall (right cusp) and two are located on the posterior wall (left and posterior cusps).
- ✓Behind each cusp, the aortic wall bulges to form an aortic sinus.



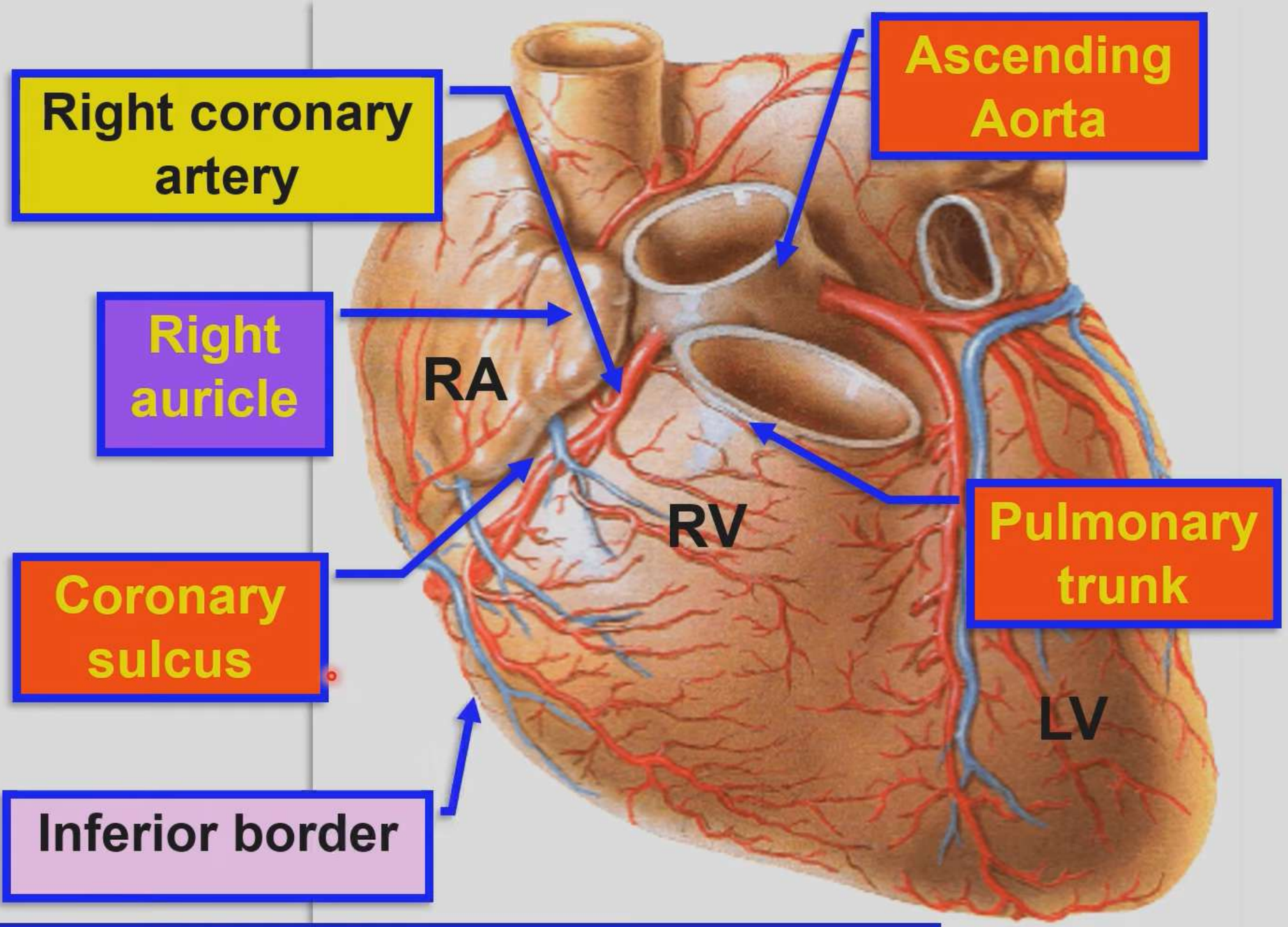


The aortic valve

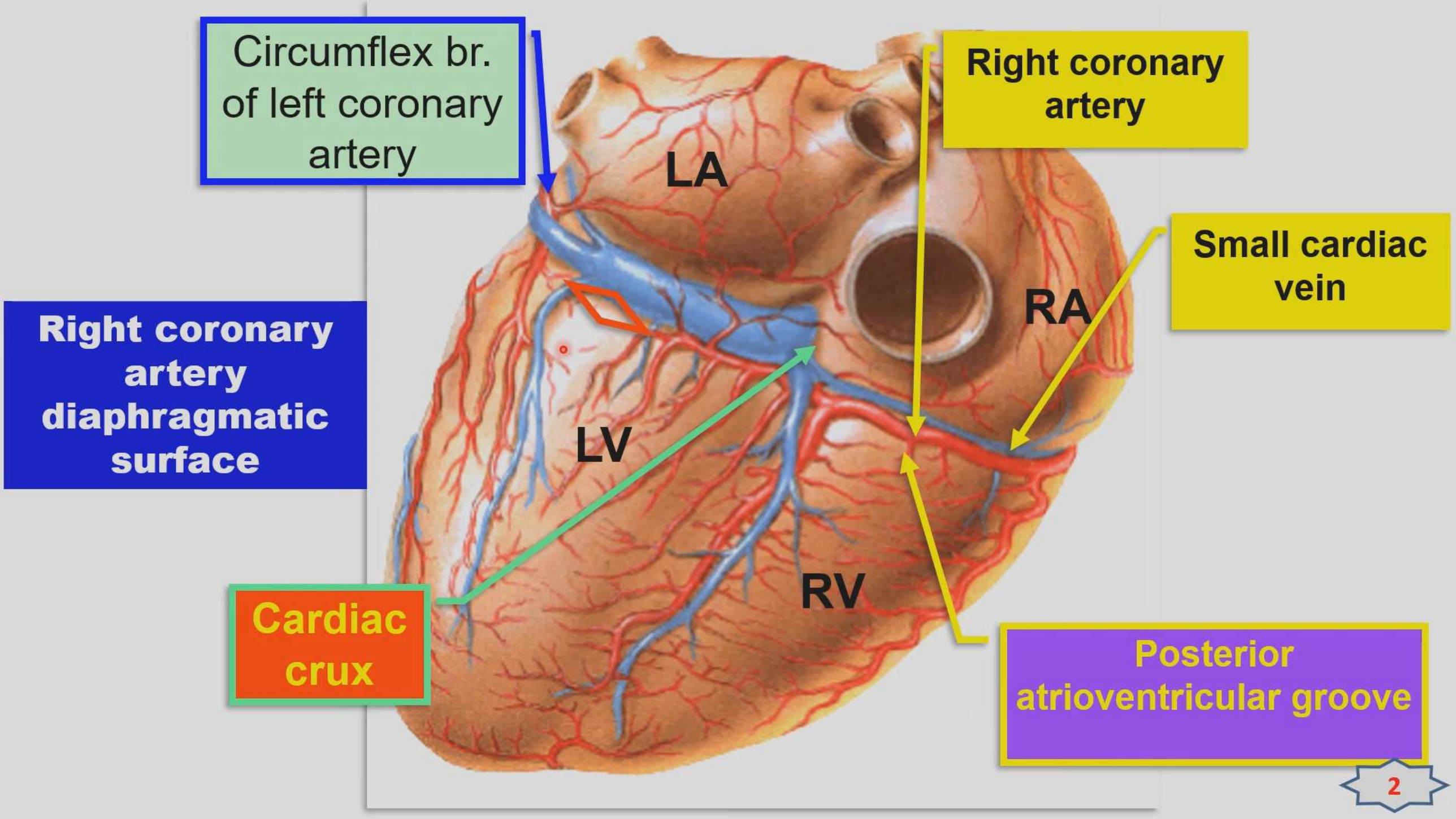
✓The anterior aortic sinus gives origin to the right coronary artery, and the left posterior sinus gives origin to the left coronary artery

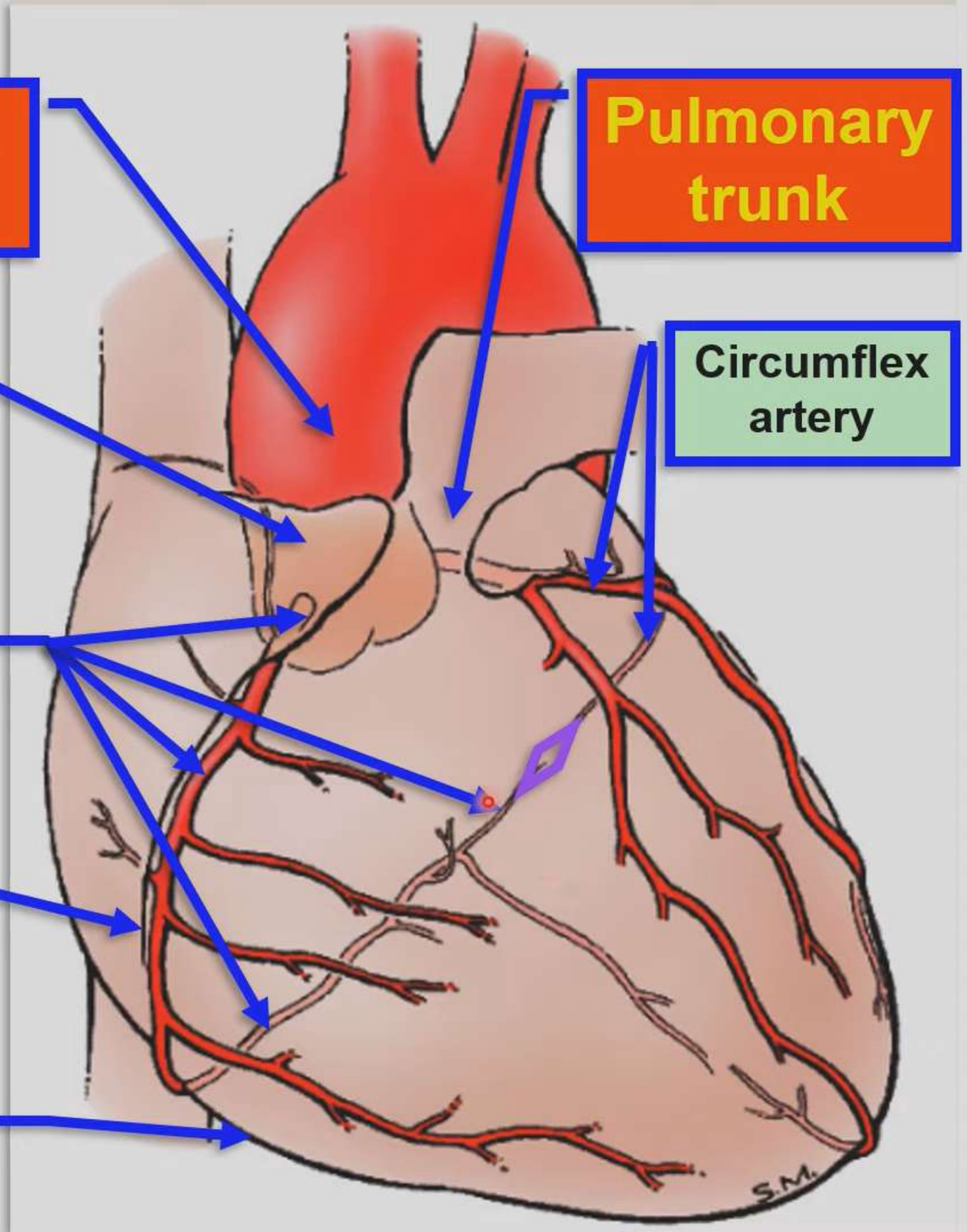


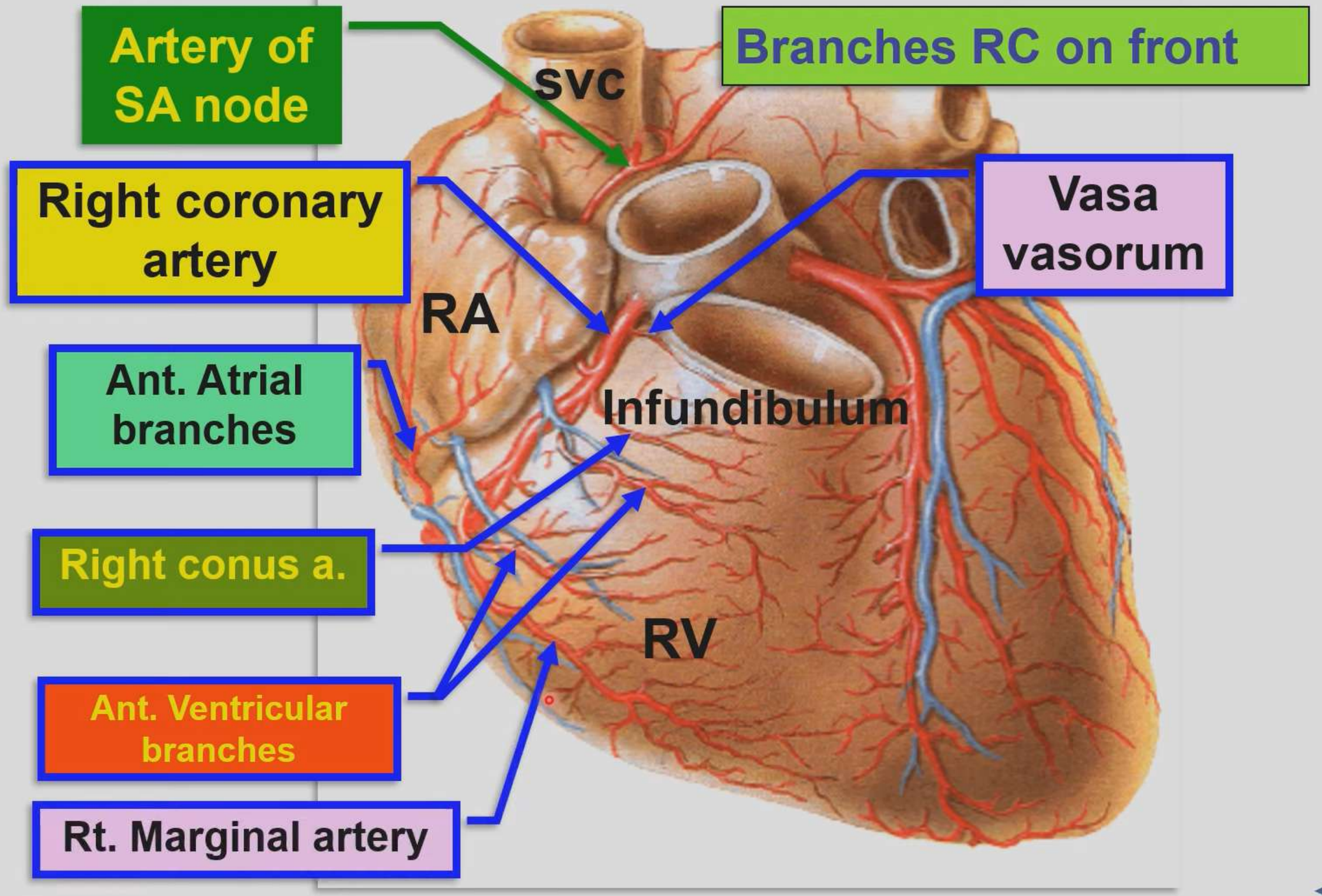
✓It is located posterior to the left side of the sternum at the level of the 3rd intercostal space.



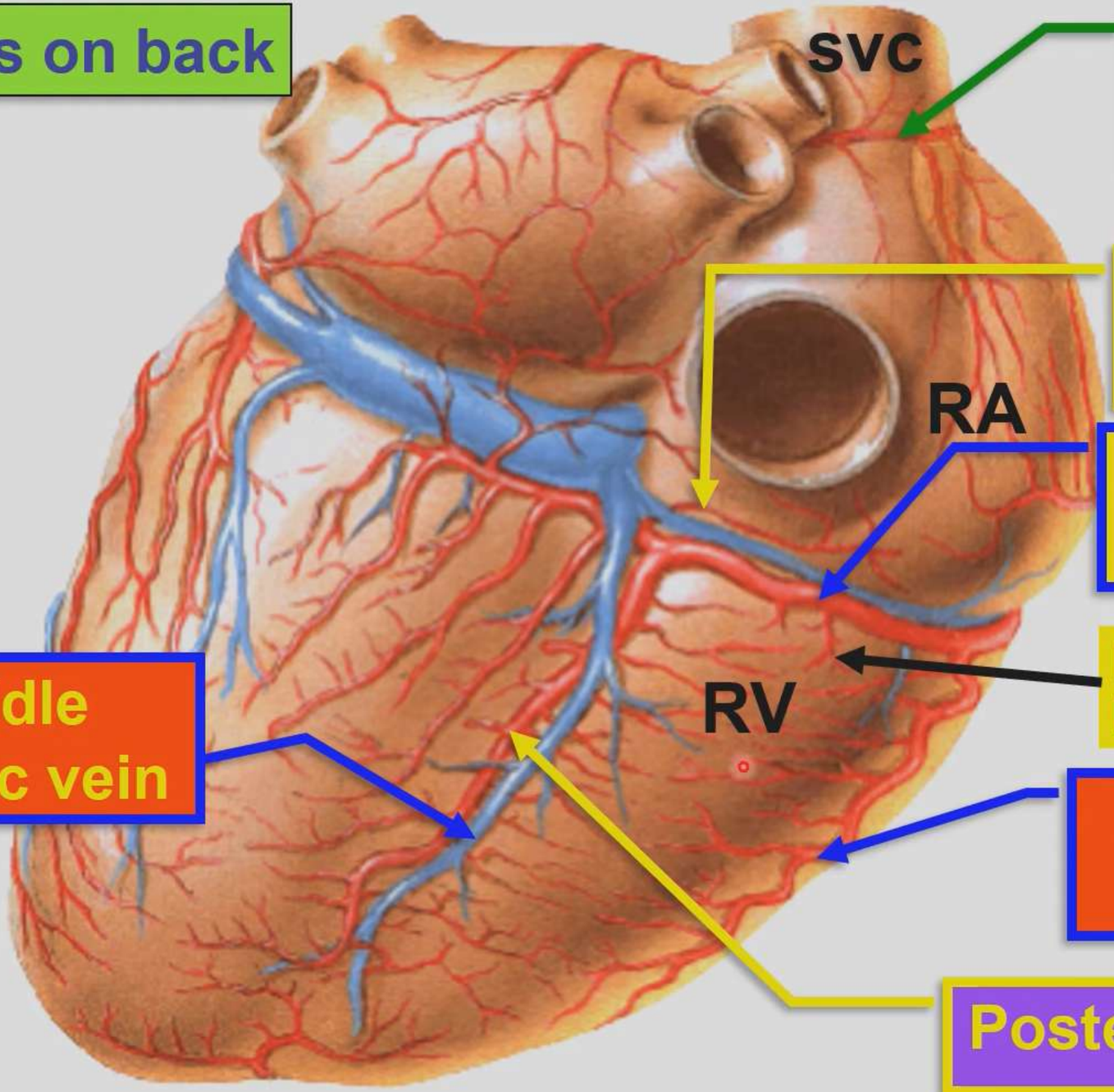
Right coronary artery sternocostal surface


Circumflex br. of left coronary artery
Right coronary artery
LA
Small cardiac vein
RA
Right coronary artery diaphragmatic surface
LV
Cardiac crux
RV
Posterior atrioventricular groove


Ascending Aorta
Pulmonary trunk
Right auricle
Circumflex artery
Right coronary artery
Coronary sulcus
Inferior border


Artery of SA node
Branches RC on front
SVC
Right coronary artery
Vasa vasorum
RA
Ant. Atrial branches
Infundibulum
Right conus a.
RV
Ant. Ventricular branches
Rt. Marginal artery

Branches on back



Artery of SA node

Post. Atrial branches

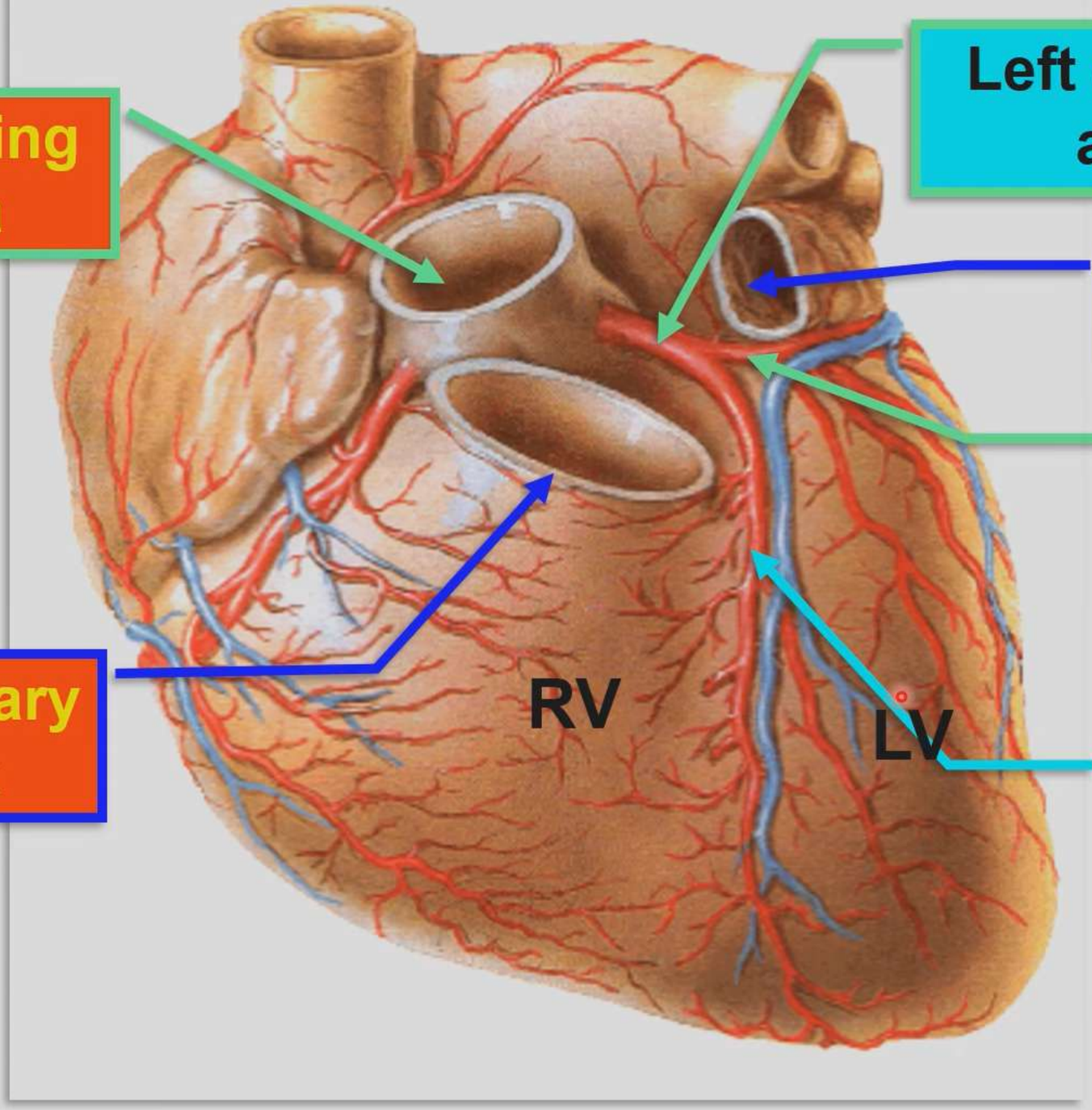
Right coronary artery

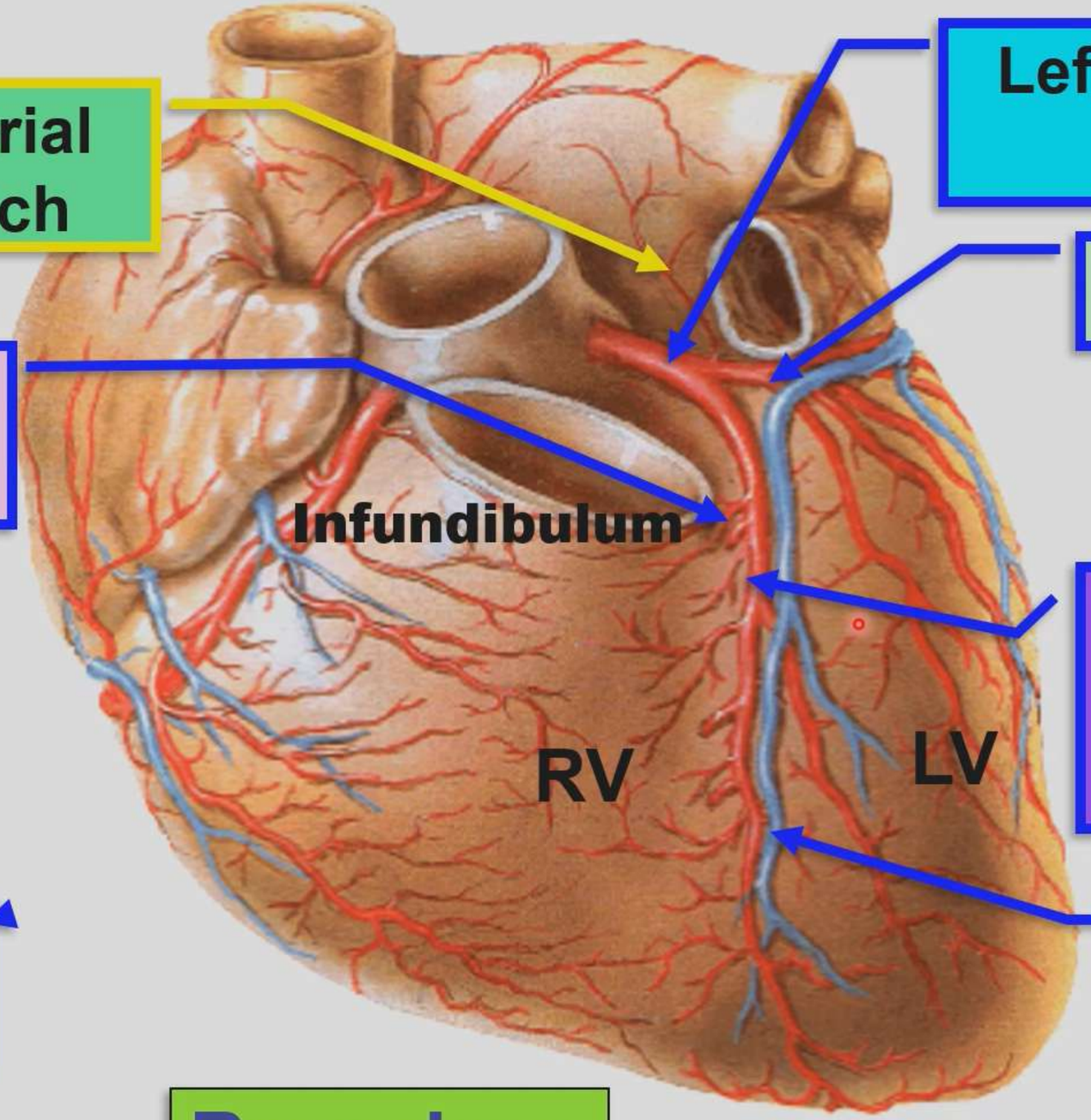
Post ventricular branches

Rt. Mrginal artery

Posterior IV a.

Middle cardiac vein


Ascending Aorta
Left coronary artery
Left auricle
Circumflex cardiac artery
Pulmonary trunk
RV
LV
Anterior Interventricular artery



Lt. Atrial branch

Left coronary artery

Circumflex artery

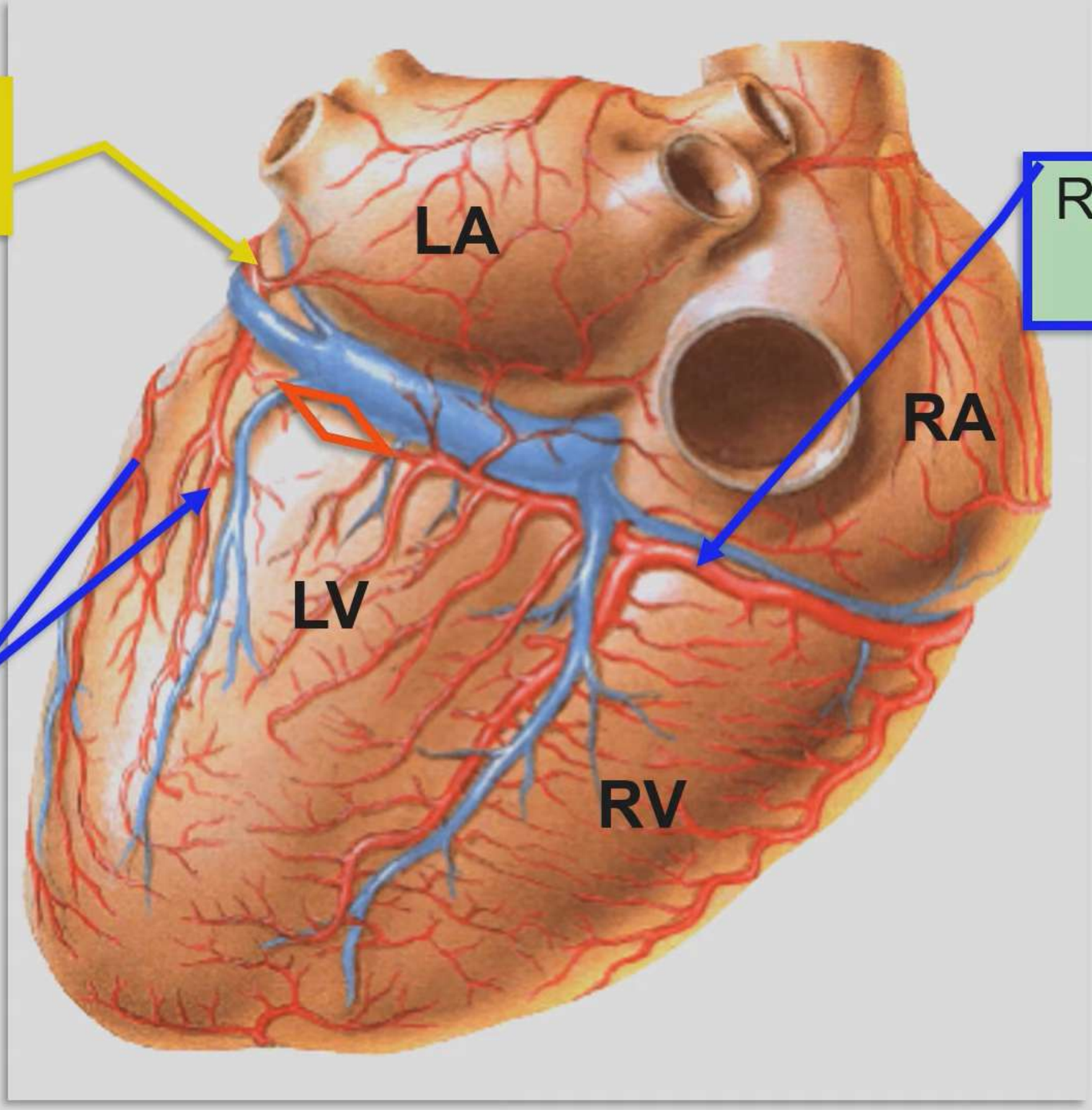
Vasa vasorum

Anterior Interventricular artery

Nodal 35%

Great cardiac vein

Branches


Circumflex cardiac artery
Right coronary artery
Lt. Marginal artery
LA
RA
LV
RV

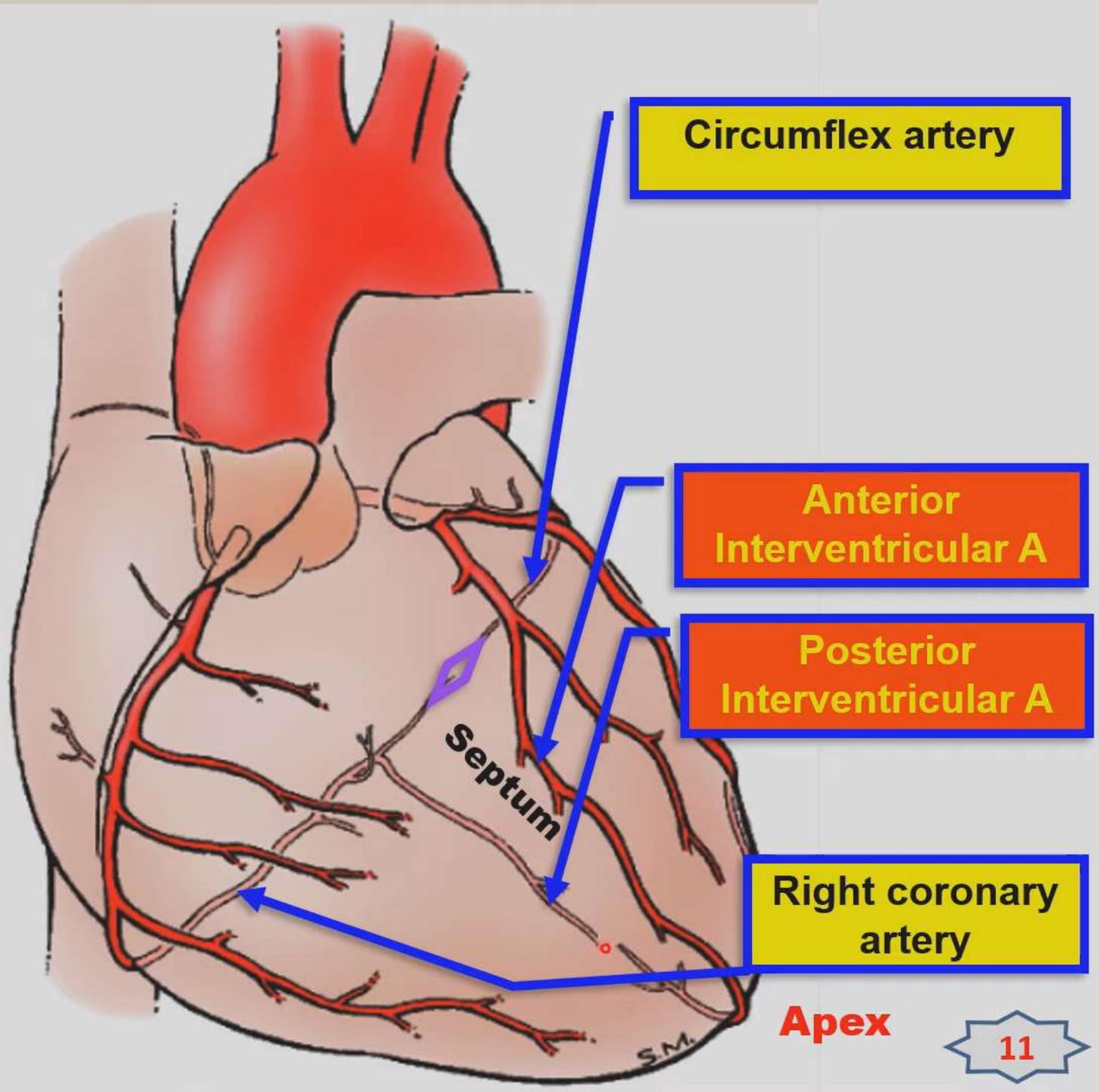
- **Anastomosis between branches of coronary arteries**

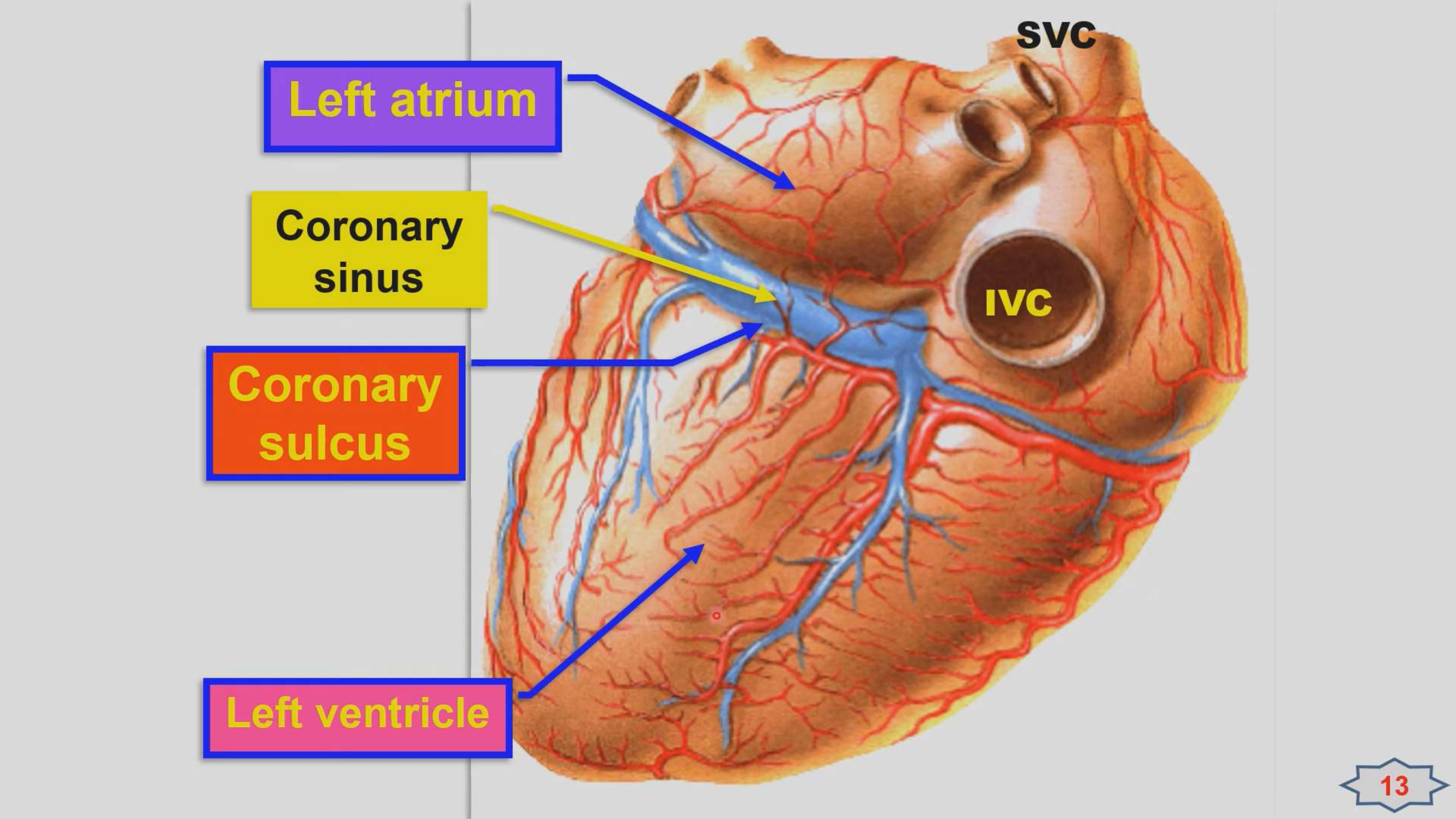
. It is **poor Sites of anastomosis; and not adequate** compensate any obstruction of a large artery.

1- In the posterior atrio-ventricular groove, between right coronary and circumflex arteries.

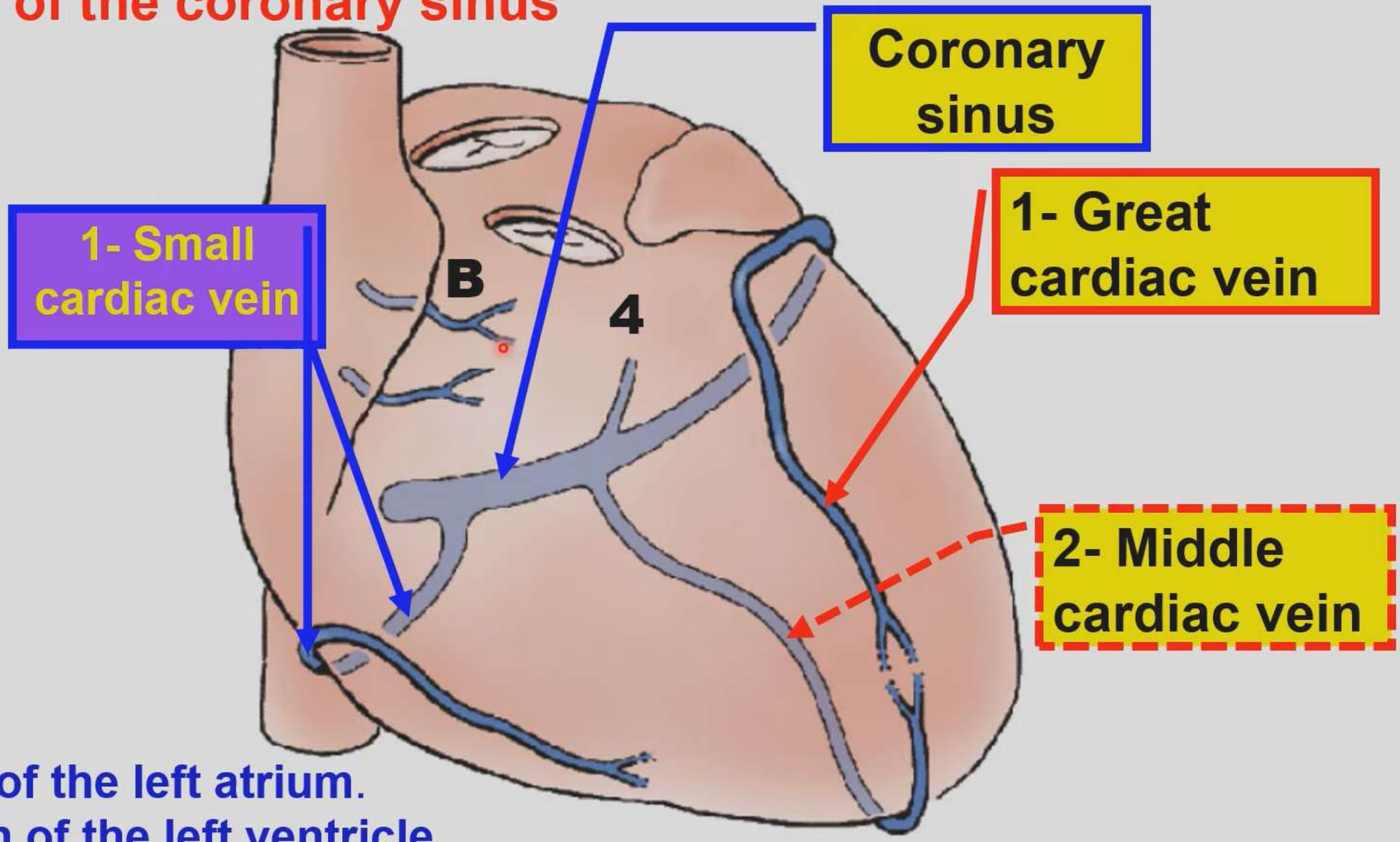
2- In the inter-ventricular septum; between anterior and posterior inter-ventricular arteries.

3- Near the apex of the heart, between the anterior and posterior inter-ventricular arteries.




Left atrium
Coronary sinus
Coronary sulcus
Left ventricle
SVC
IVC

A- Tributaries of the coronary sinus

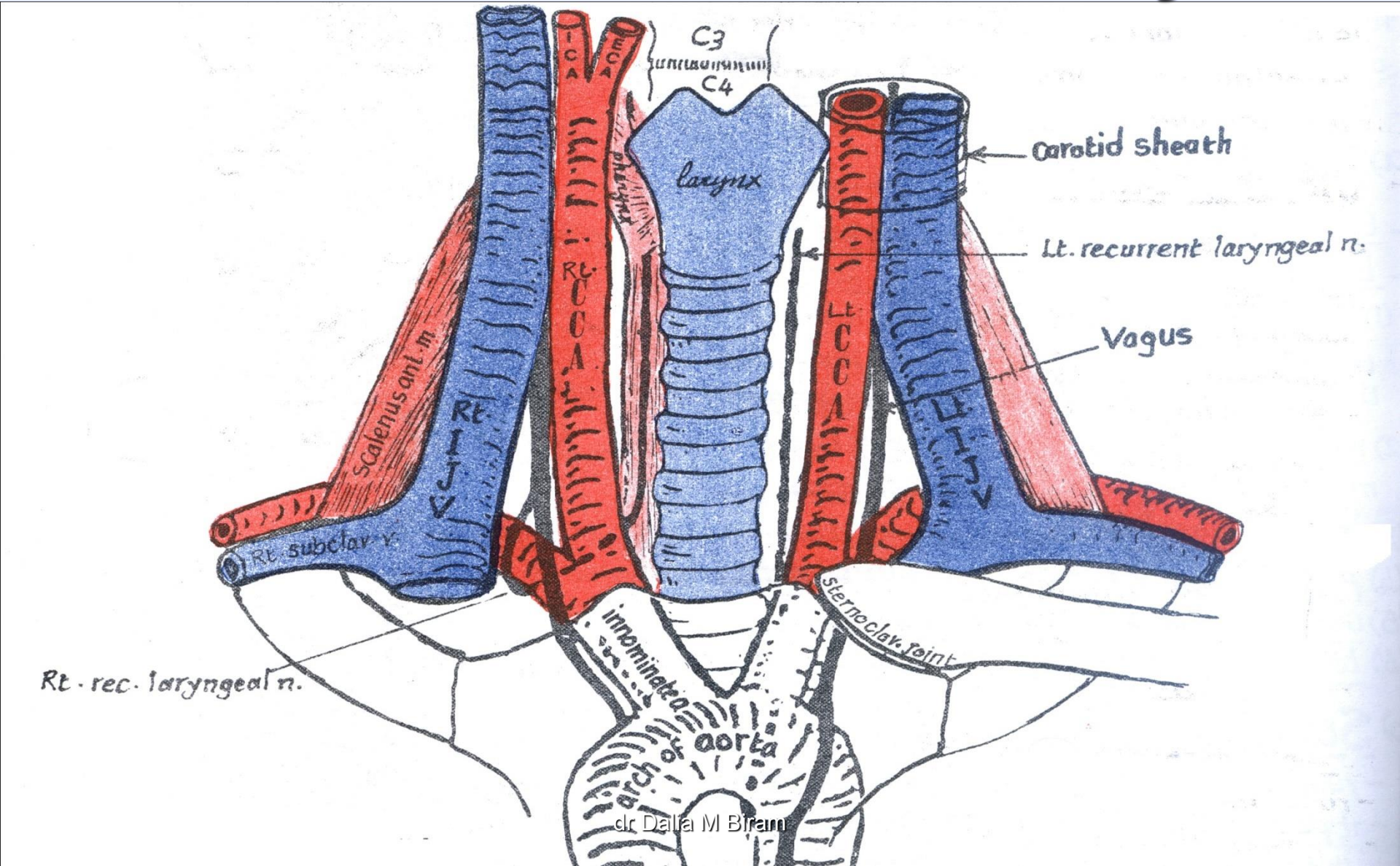


4- Oblique vein of the left atrium.

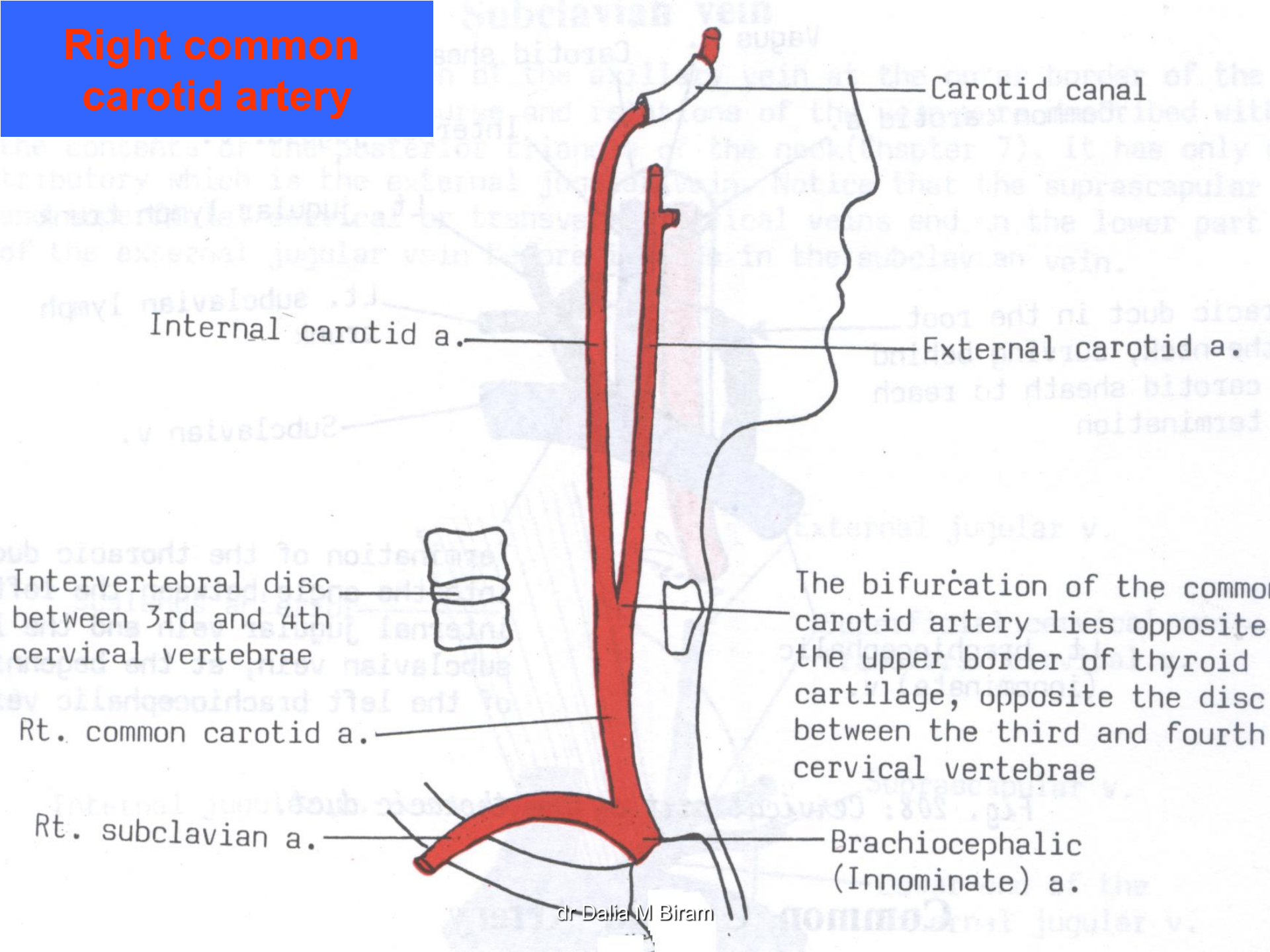
5- Posterior vein of the left ventricle.

B- Anterior cardiac vein

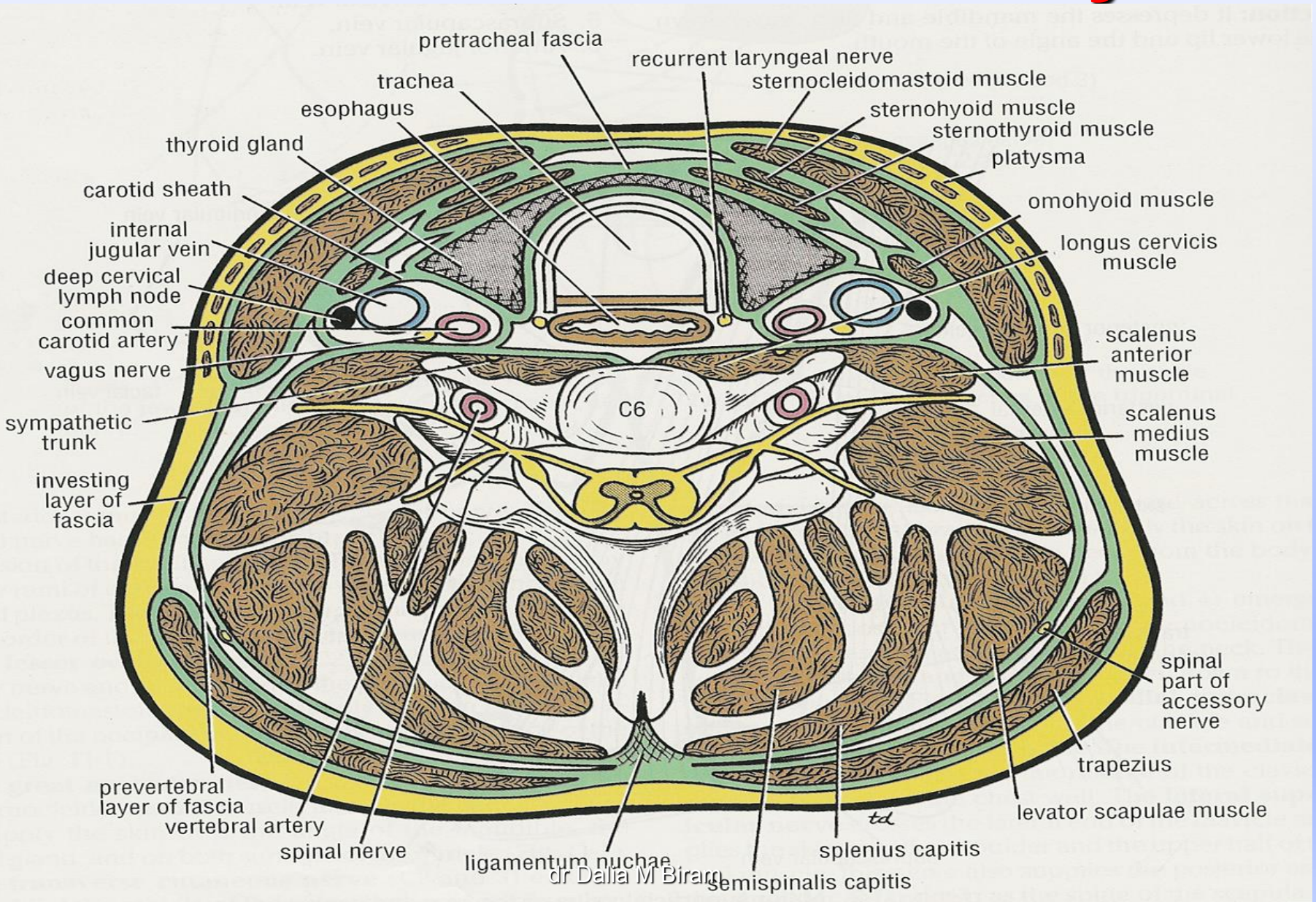
Common Carotid Artery



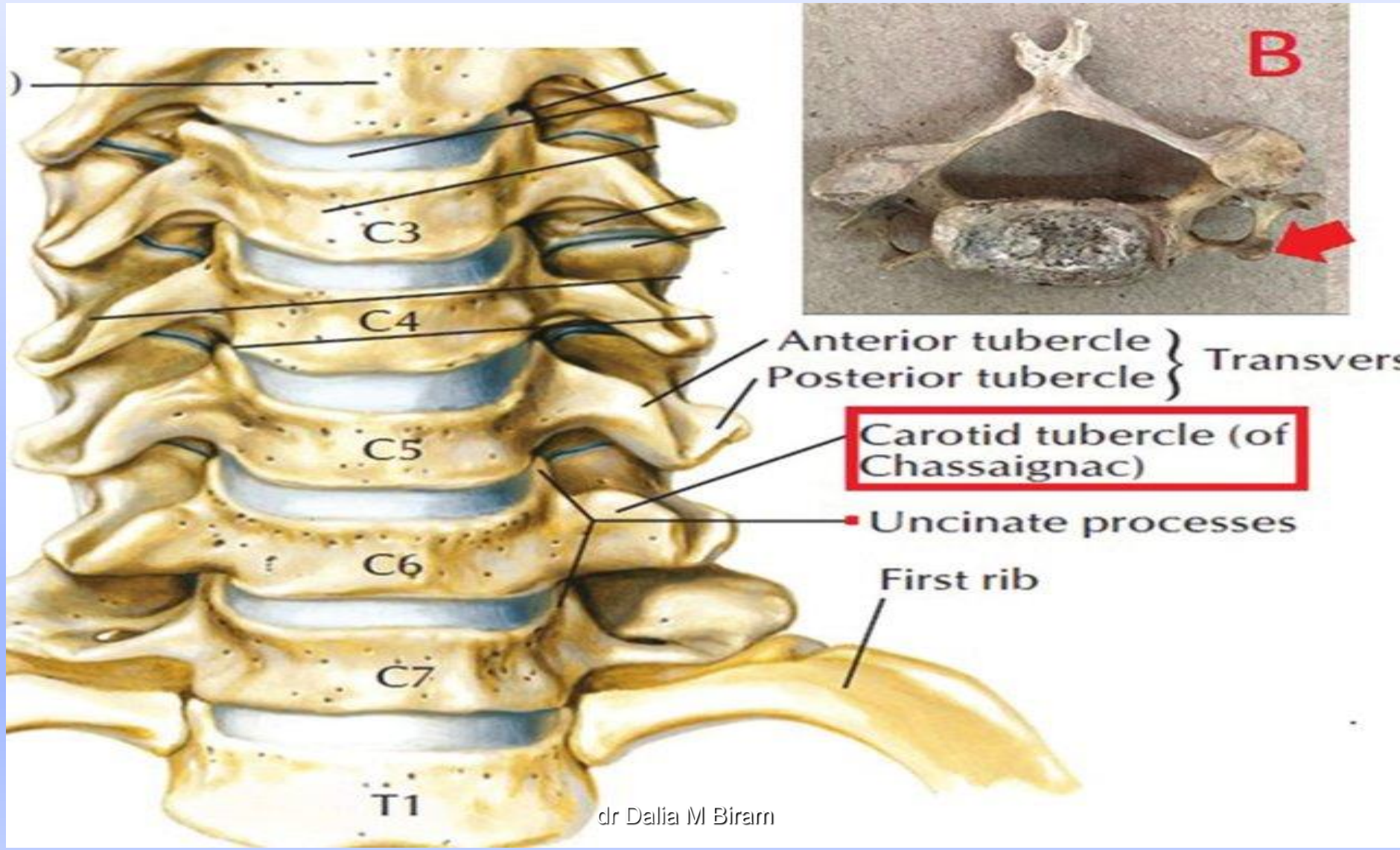
Right common carotid artery



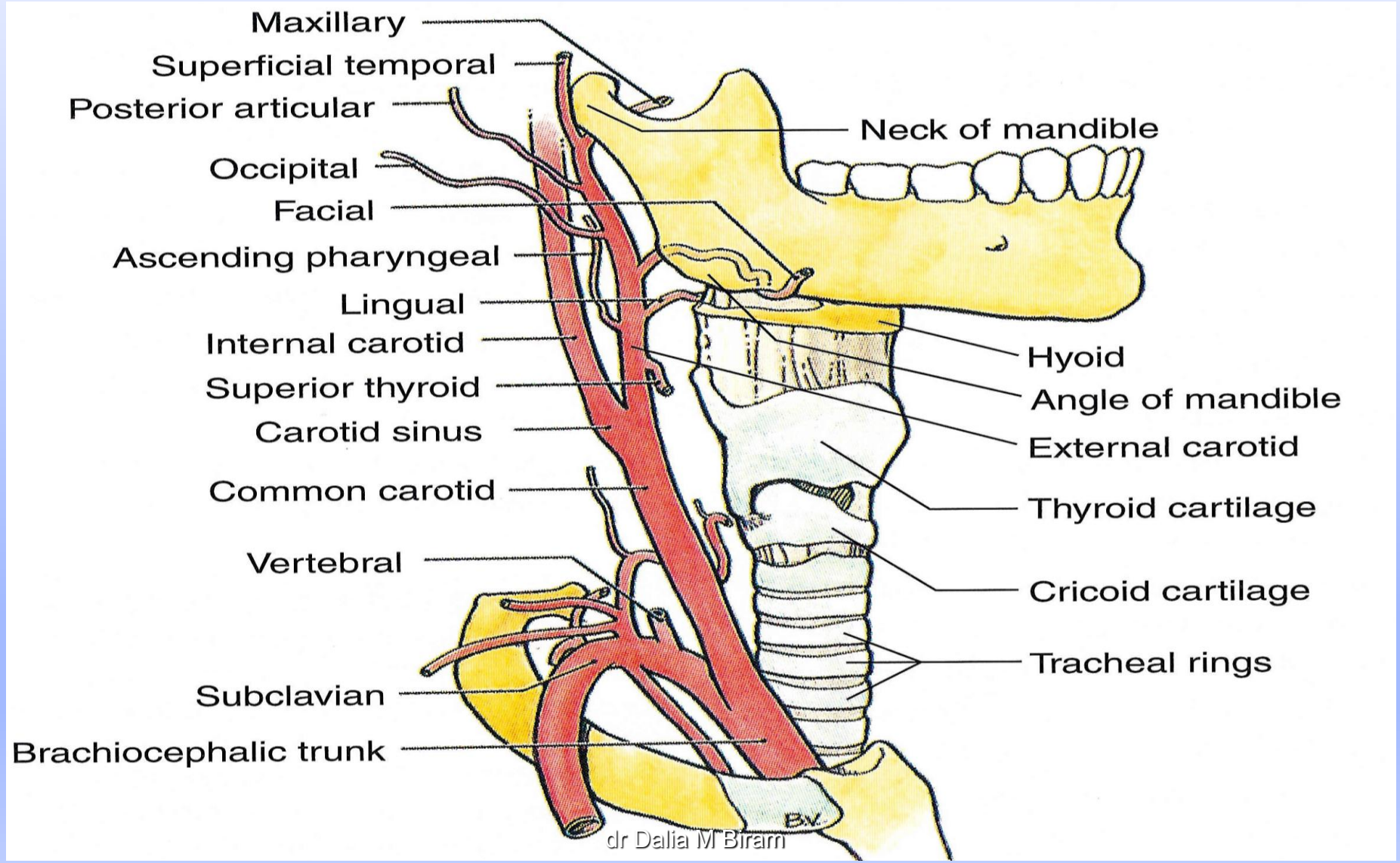
Common Carotid Artery

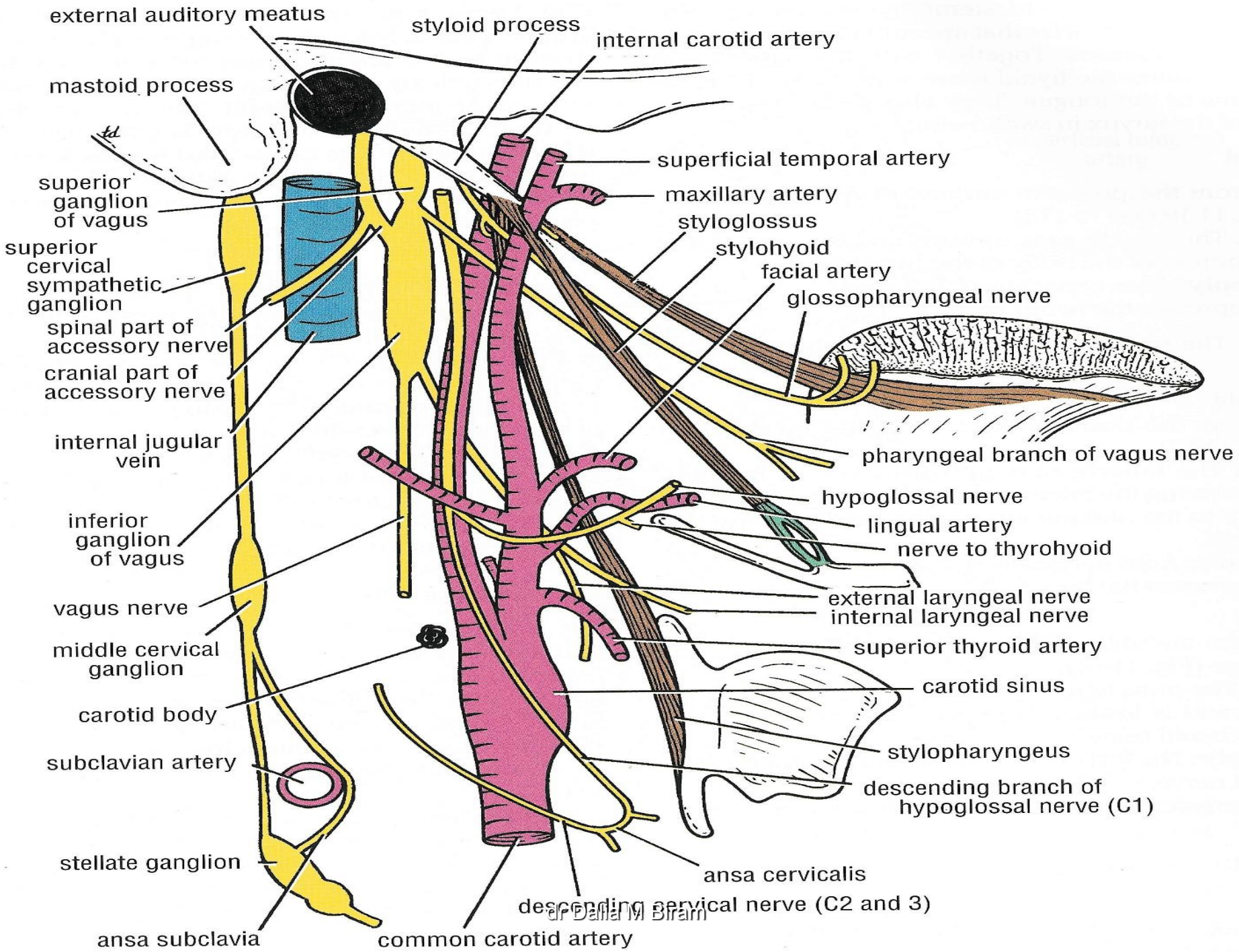


Where to feel the pulsation of common carotid artery CCA

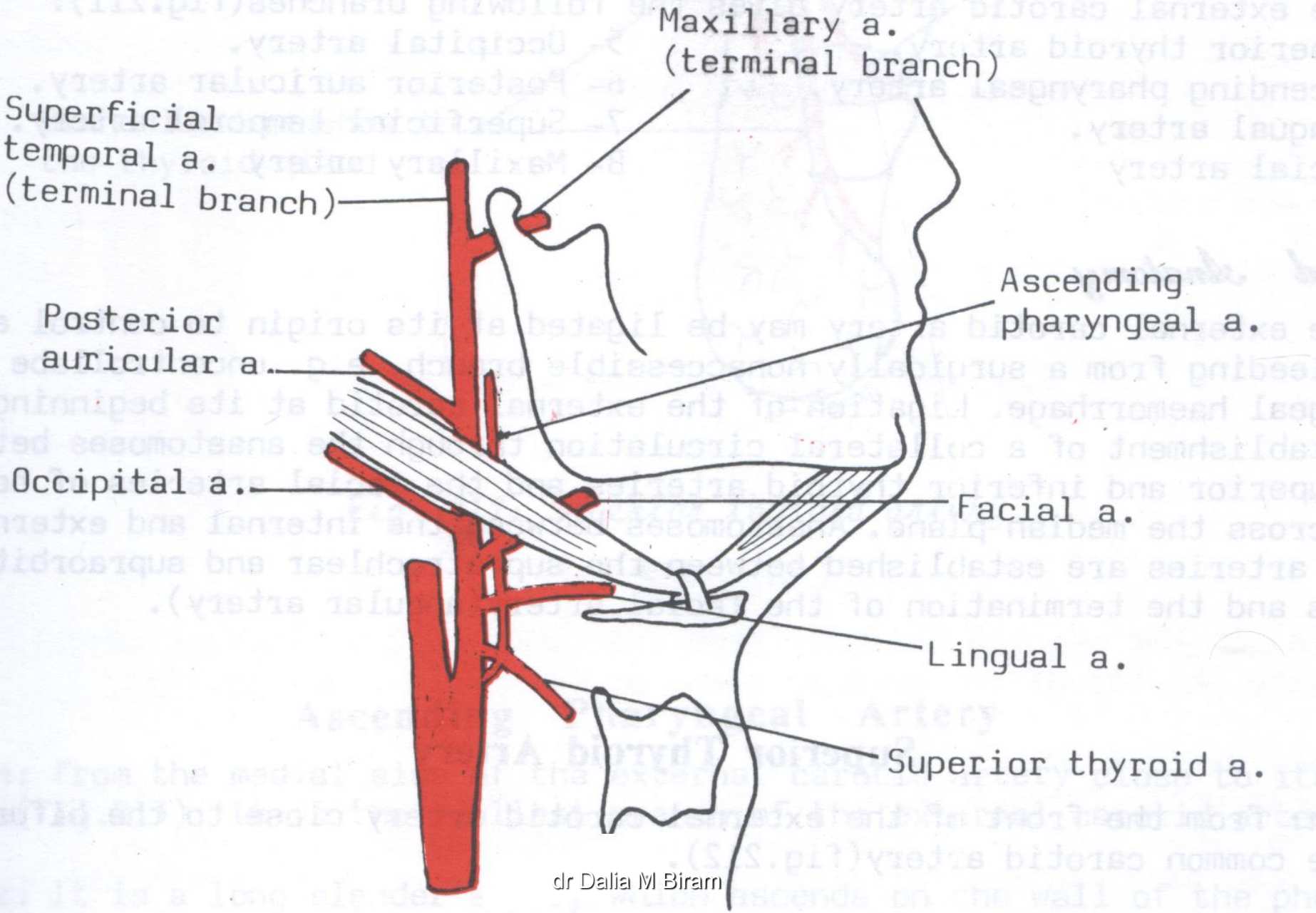


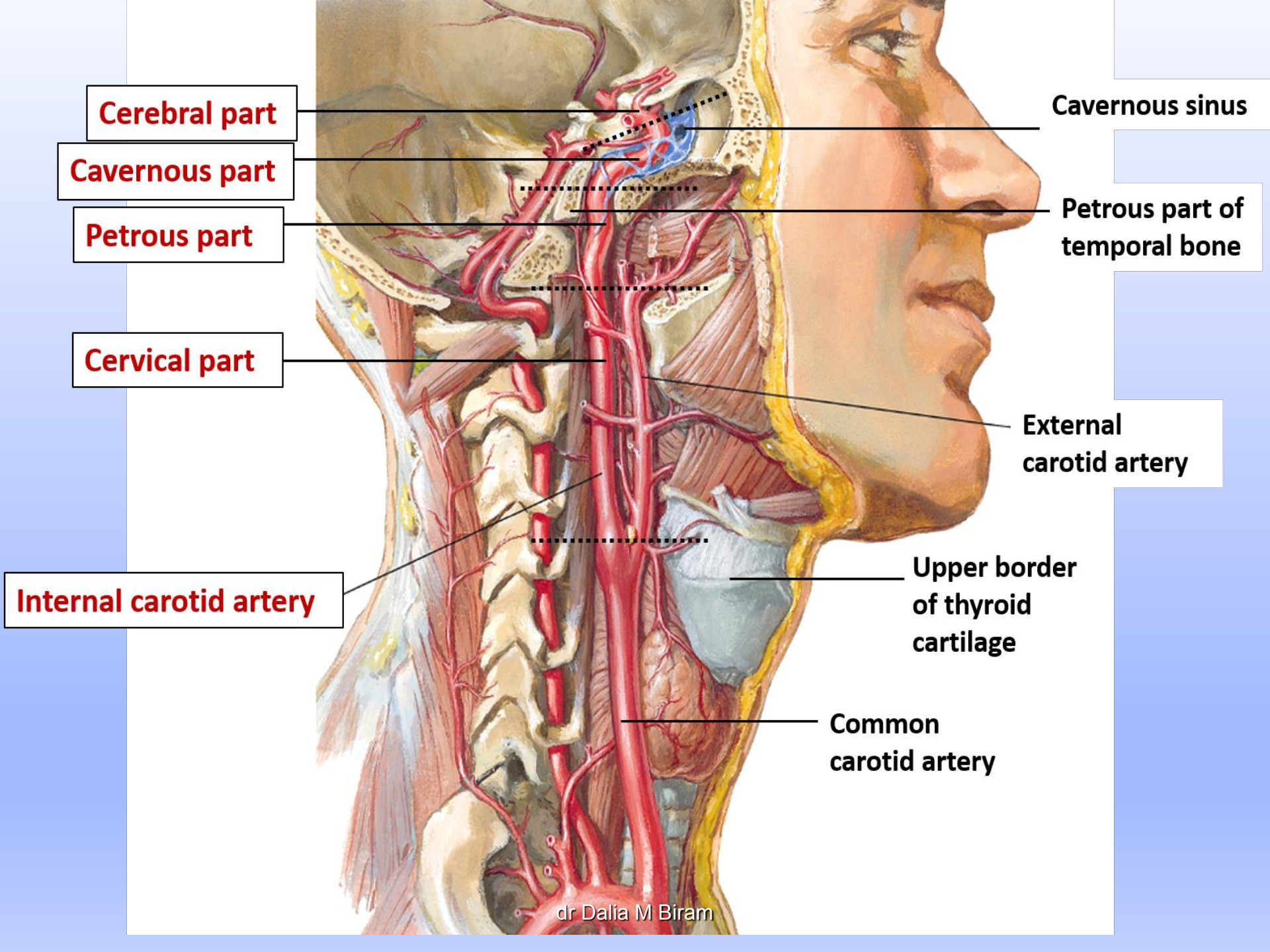
External Carotid Artery





Branches of external carotid artery





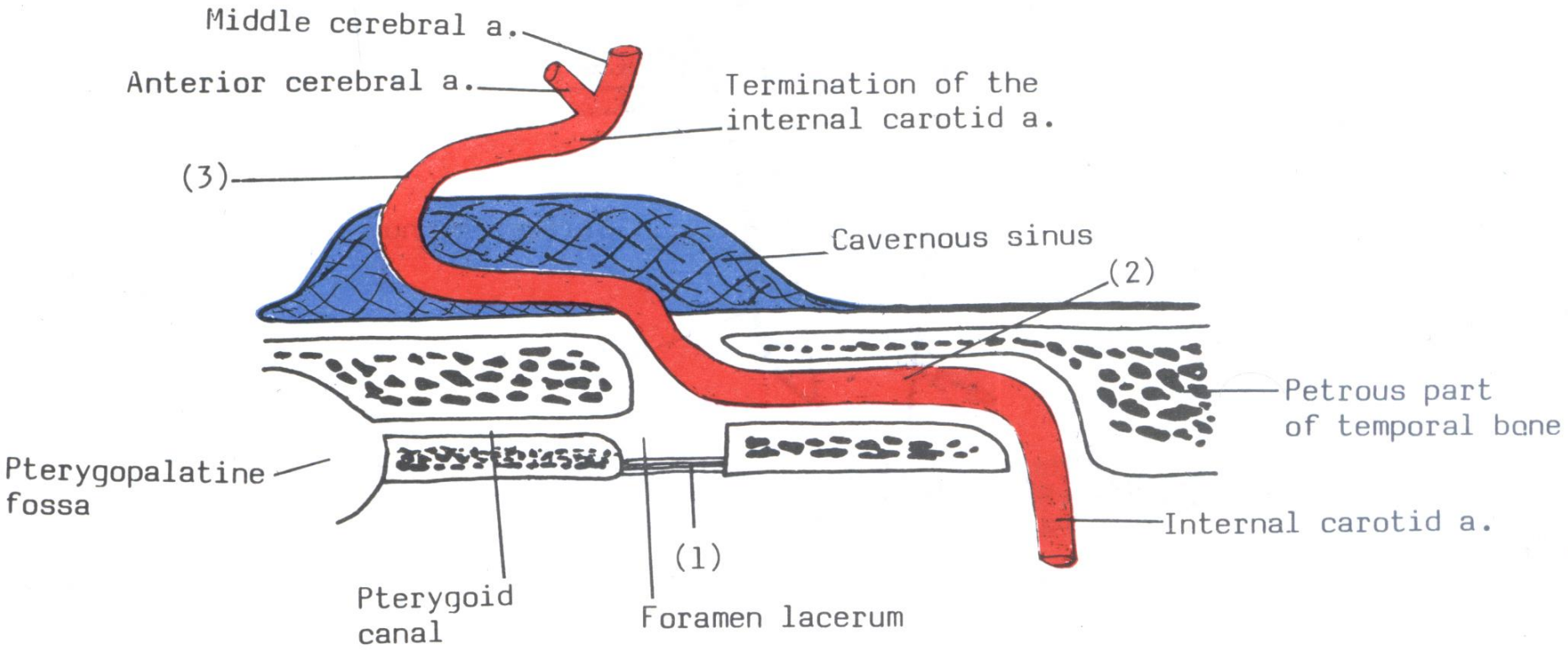
Course,parts of ICA:

A- Cervical part.

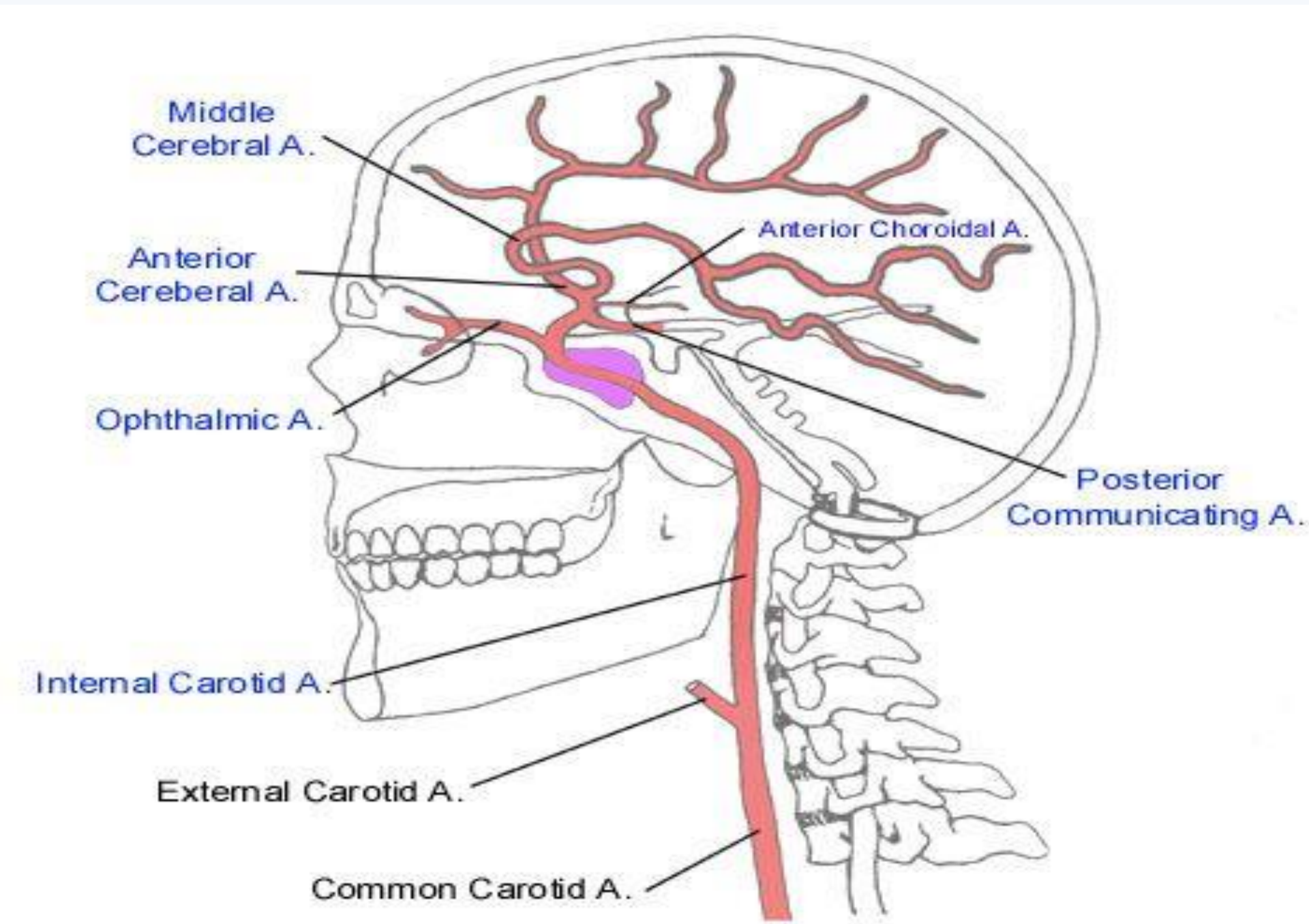
B- Petrous part.

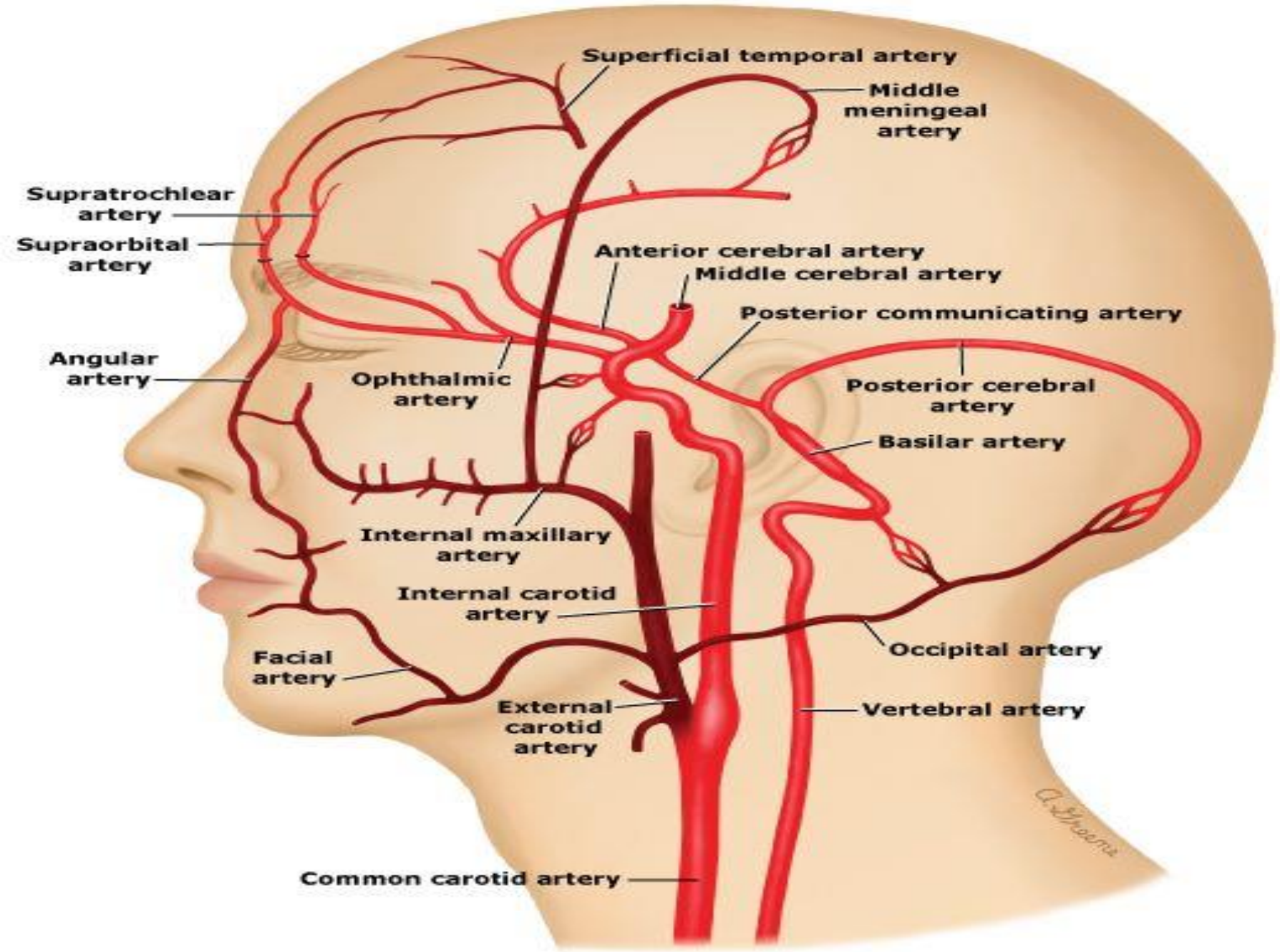
C- Cavernous part.

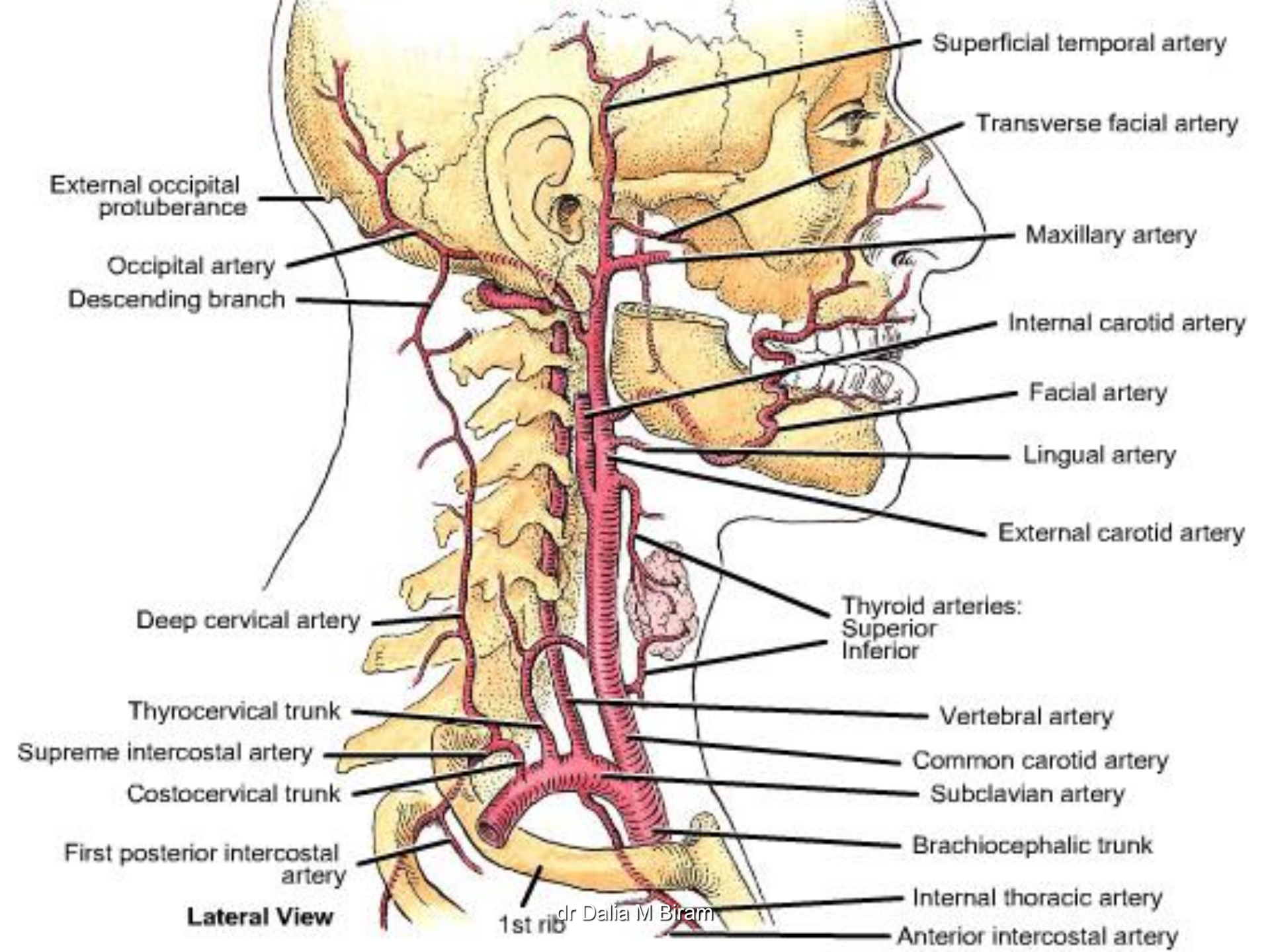
D- Cranial part.

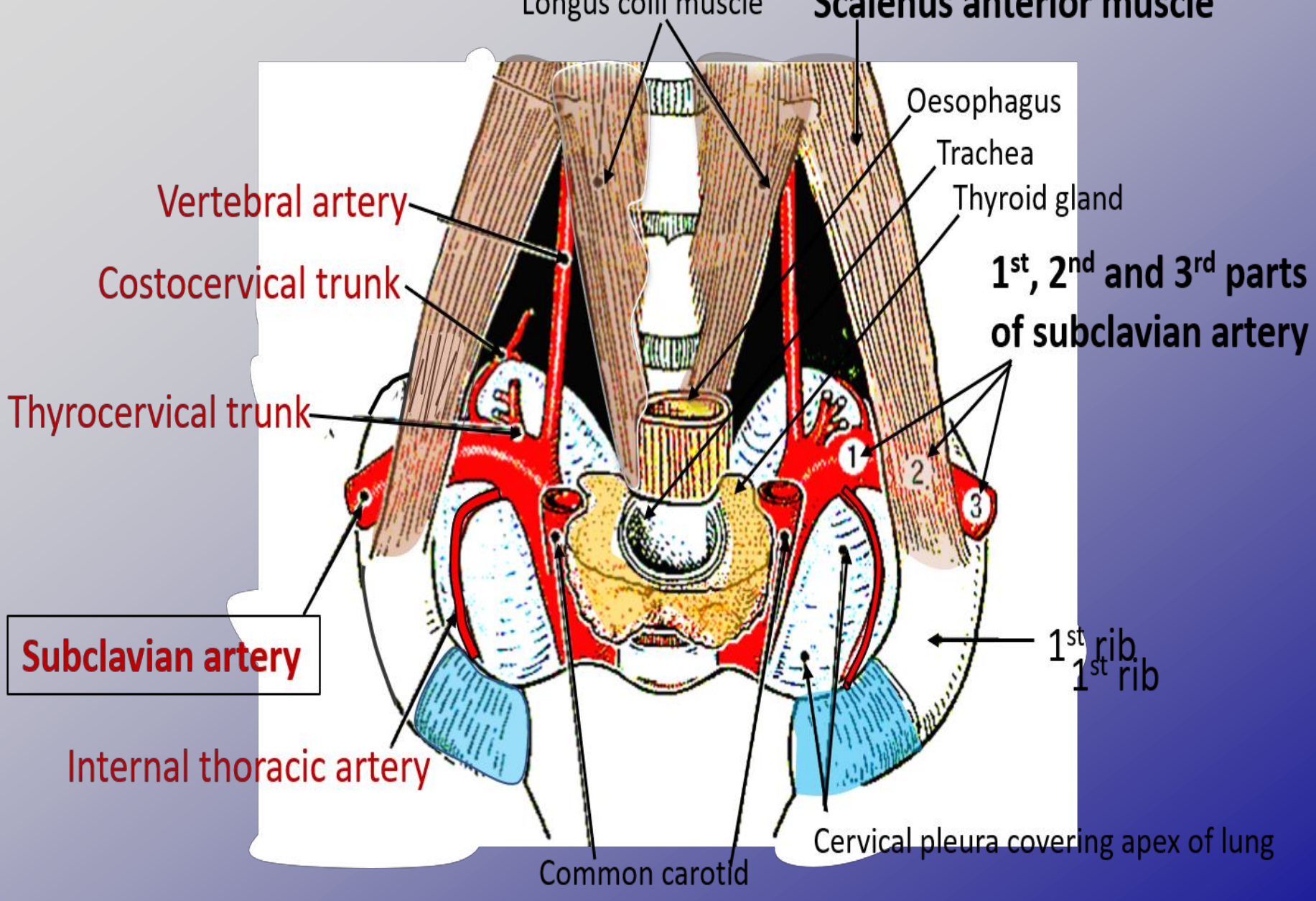


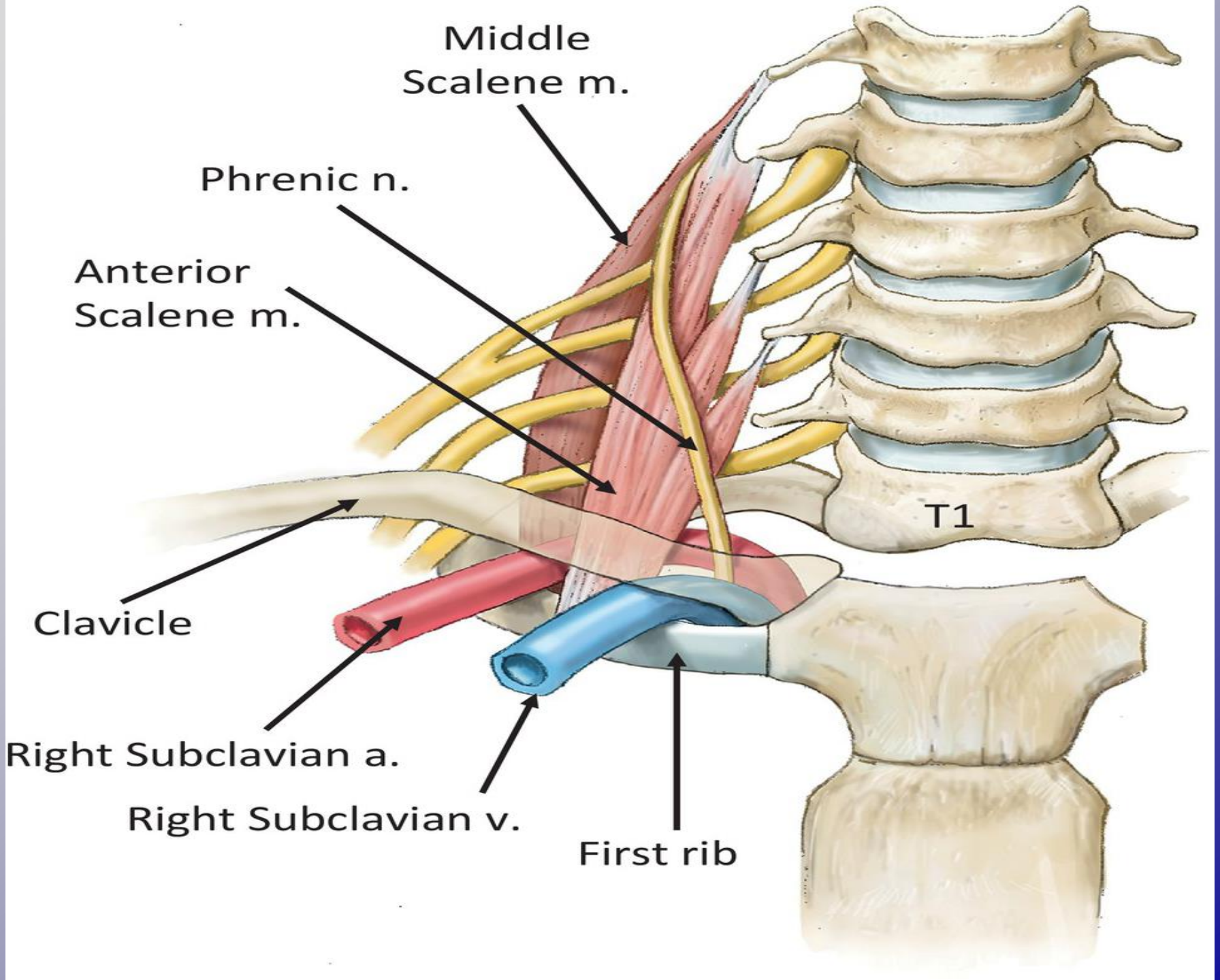
Intracranial course of the internal carotid artery.
(1)=Cartilage plate closing the foramen lacerum.
(2)=Internal carotid artery in the carotid canal.
(3)=Internal carotid artery after piercing the roof of the cavernous sinus.

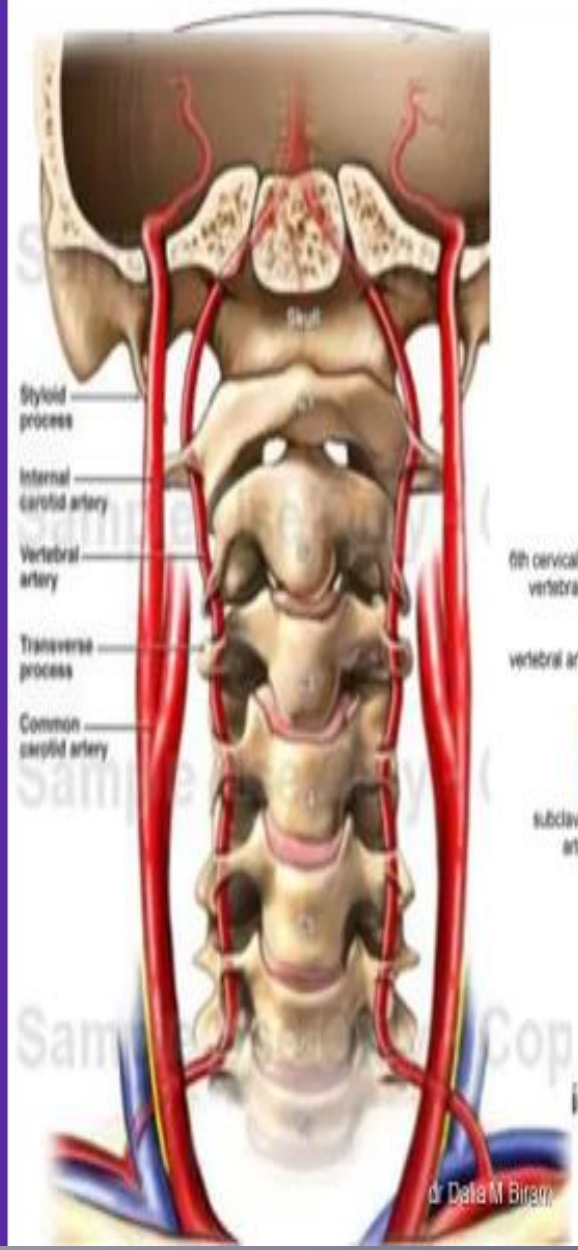

Middle
Cerebral A.
Anterior
Cereberal A.
Ophthalmic A.
Anterior Choroidal A.
Posterior
Communicating A.
Internal Carotid A.
External Carotid A.
Common Carotid A.

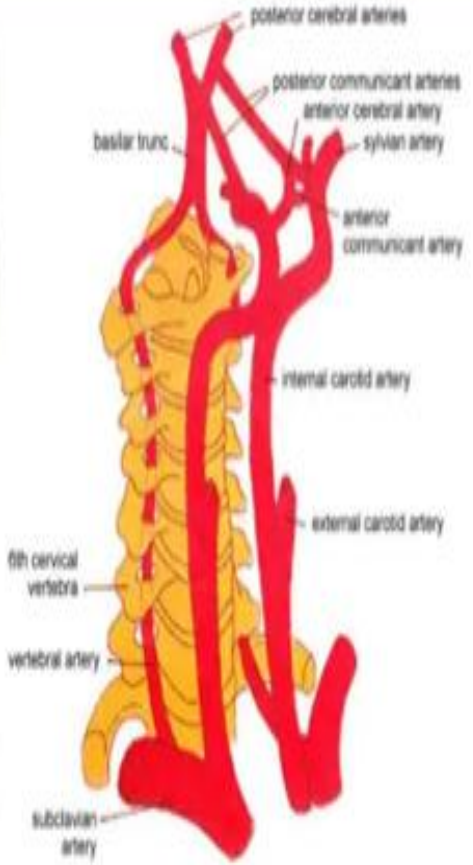

Superficial temporal artery
Middle meningeal artery
Supratrochlear artery
Supraorbital artery
Anterior cerebral artery
Middle cerebral artery
Posterior communicating artery
Angular artery
Ophthalmic artery
Posterior cerebral artery
Basilar artery
Internal maxillary artery
Internal carotid artery
Occipital artery
Facial artery
External carotid artery
Vertebral artery
Common carotid artery




Longus colli muscle
Scalenus anterior muscle
Oesophagus
Trachea
Thyroid gland
Vertebral artery
Costocervical trunk
1st, 2nd and 3rd parts of subclavian artery
Thyrocervical trunk
1
2
3
Subclavian artery
1st rib
1st rib
Internal thoracic artery
Cervical pleura covering apex of lung
Common carotid


Middle
Scalene m.
Phrenic n.
Anterior
Scalene m.
T1
Clavicle
Right Subclavian a.
Right Subclavian v.
First rib



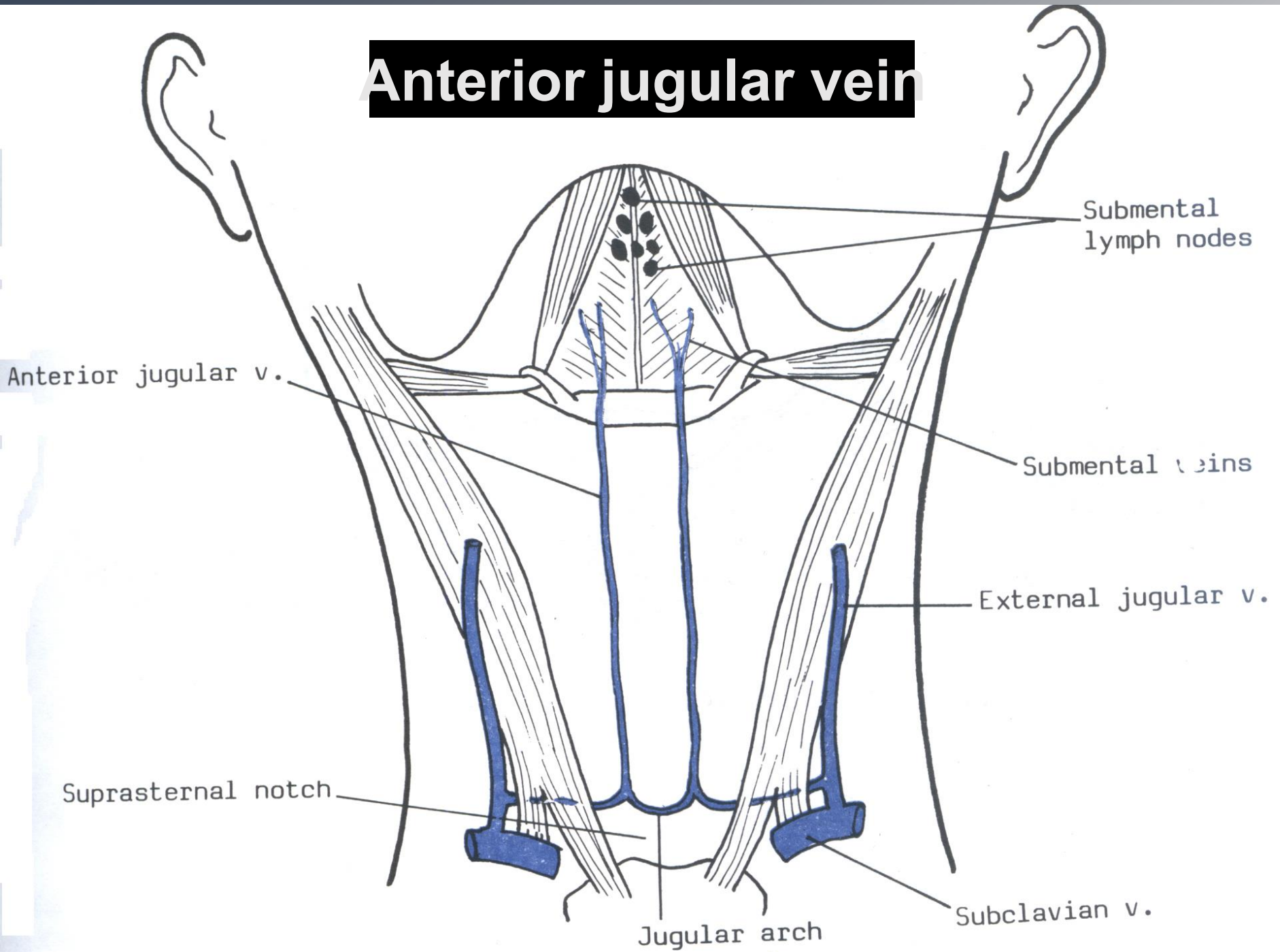


ight subclavian artery

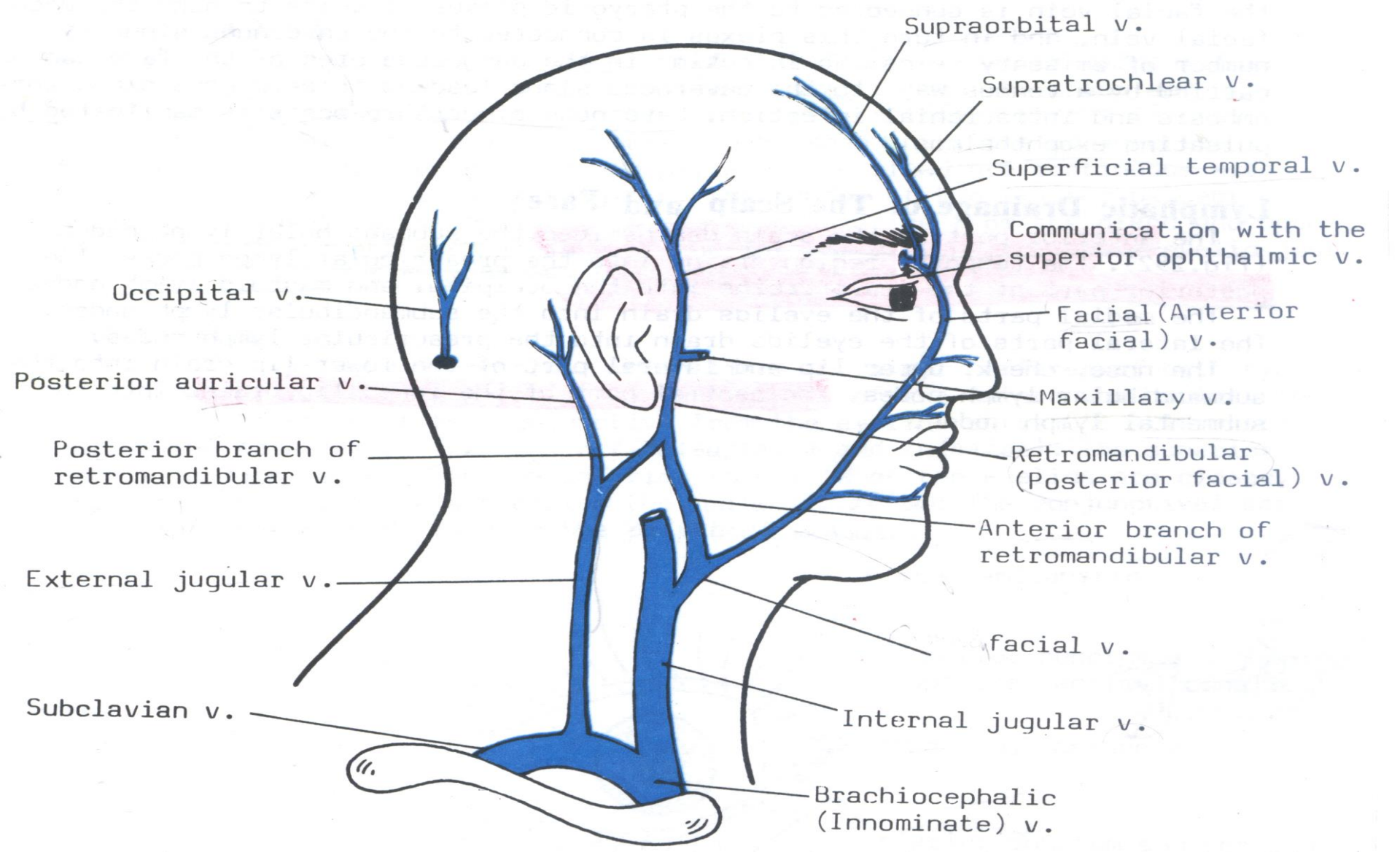
VERTEBRAL ARTERY

- It ascends in the neck through the foramina in the transverse processes of the upper six cervical vertebrae. It passes medially above the posterior arch of the atlas and then ascends through the foramen magnum into the skull, at the level of the lower border of the pons it joins the vessel of the opposite side to form the basilar artery.
-

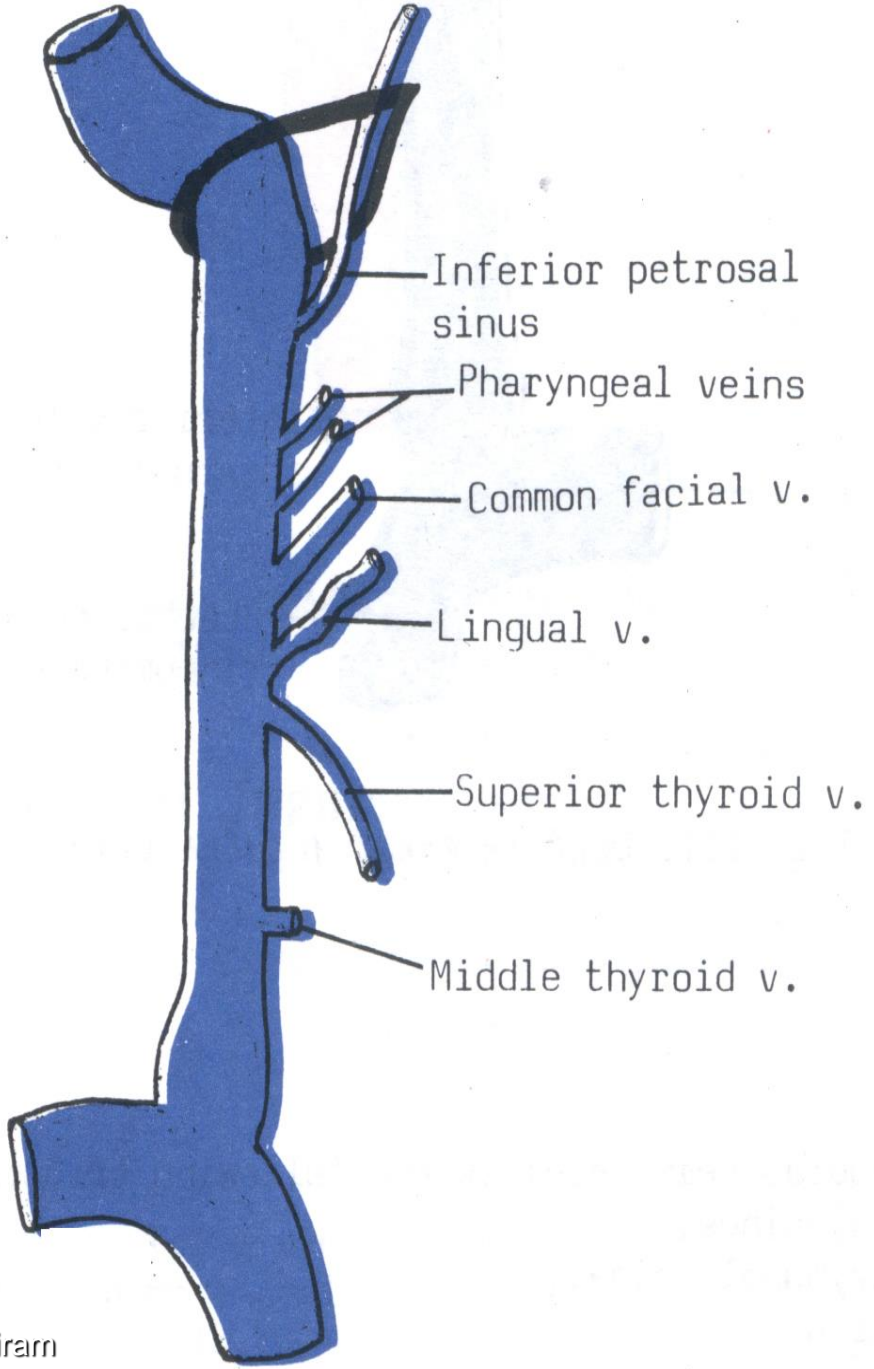
Anterior jugular vein



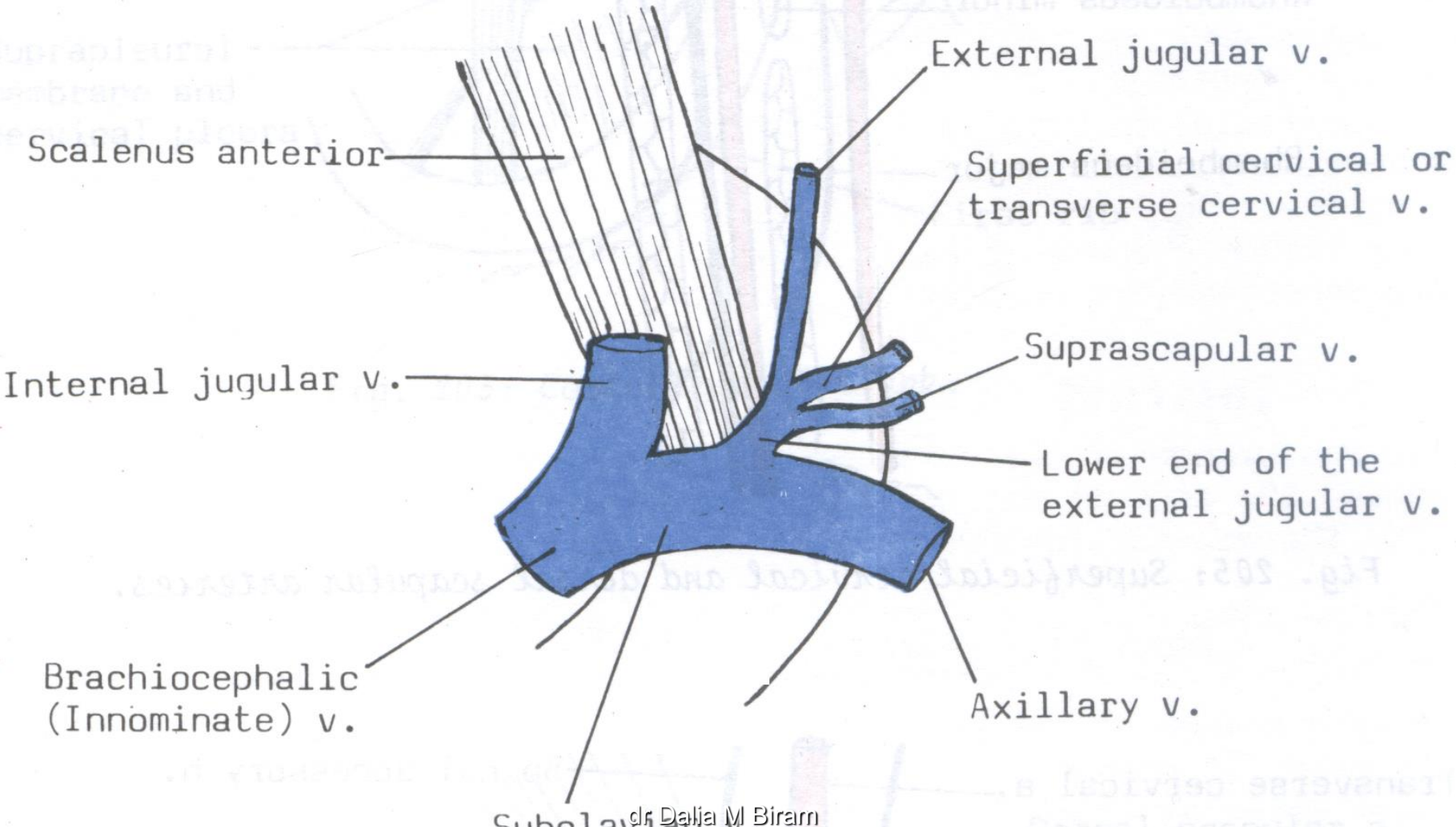
External jugular vein



- **Tributaries:** the internal jugular vein receives the following tributaries:
  - Inferior petrosal sinus.
  - Two or more pharyngeal veins.
  - Common facial vein.
  - Lingual vein.
  - Superior thyroid vein.
  - Middle thyroid vein.



Subclavian vein

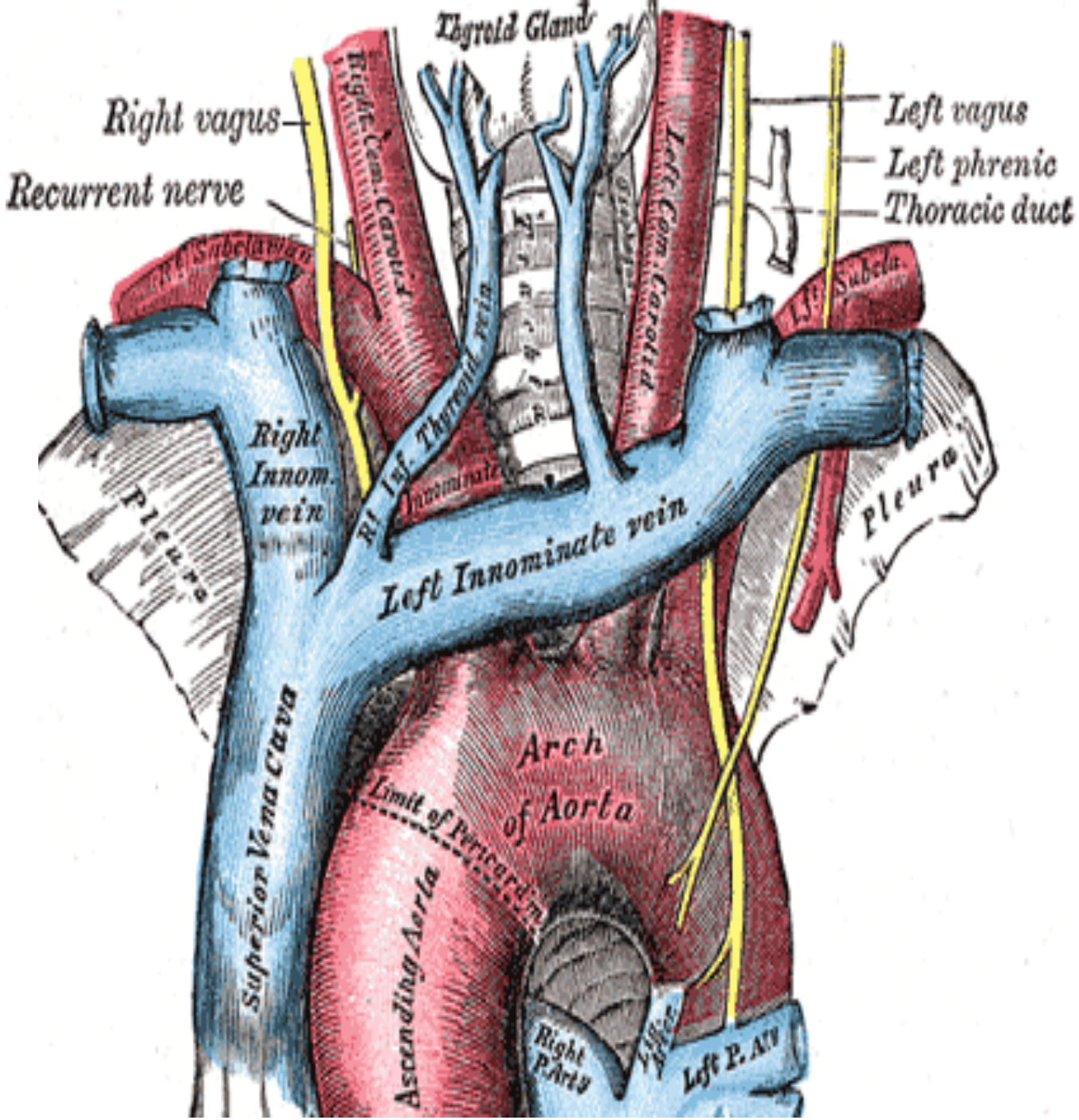


BRANCHES

- A. Brachiocephalic (innominate) artery.
- B. Left common carotid artery.
- C. Left subclavian artery.
- Occasionally, a fourth branch referred to as thyroidea ima artery may originate from the arch of aorta.

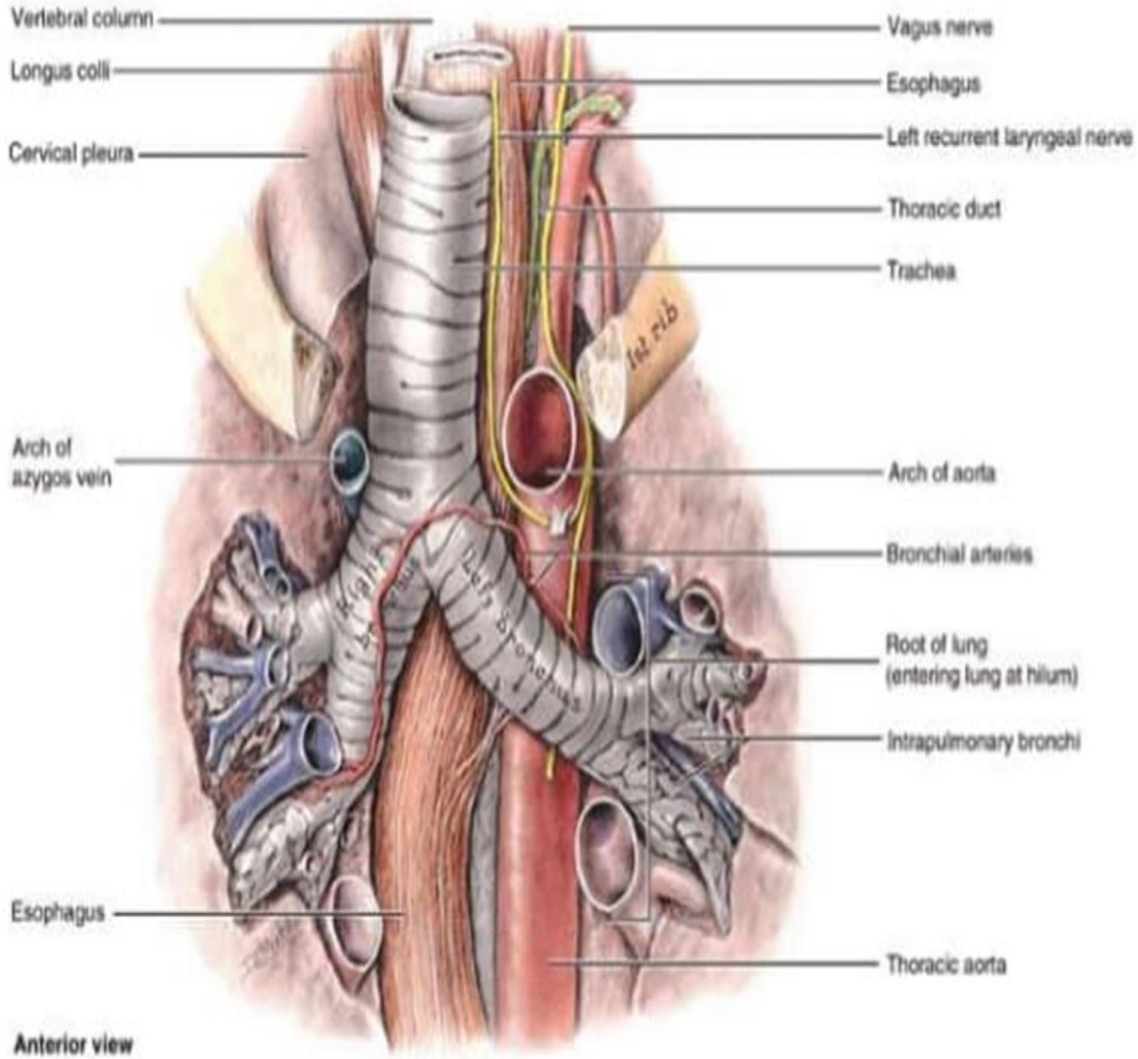
Points to be noted in the course of arch of aorta

- A. The arch of aorta arches over the root of left lung.
- B. It begins and ends at the same level, i.e., at sternal angle.
- C. It begins anteriorly and ends posteriorly.



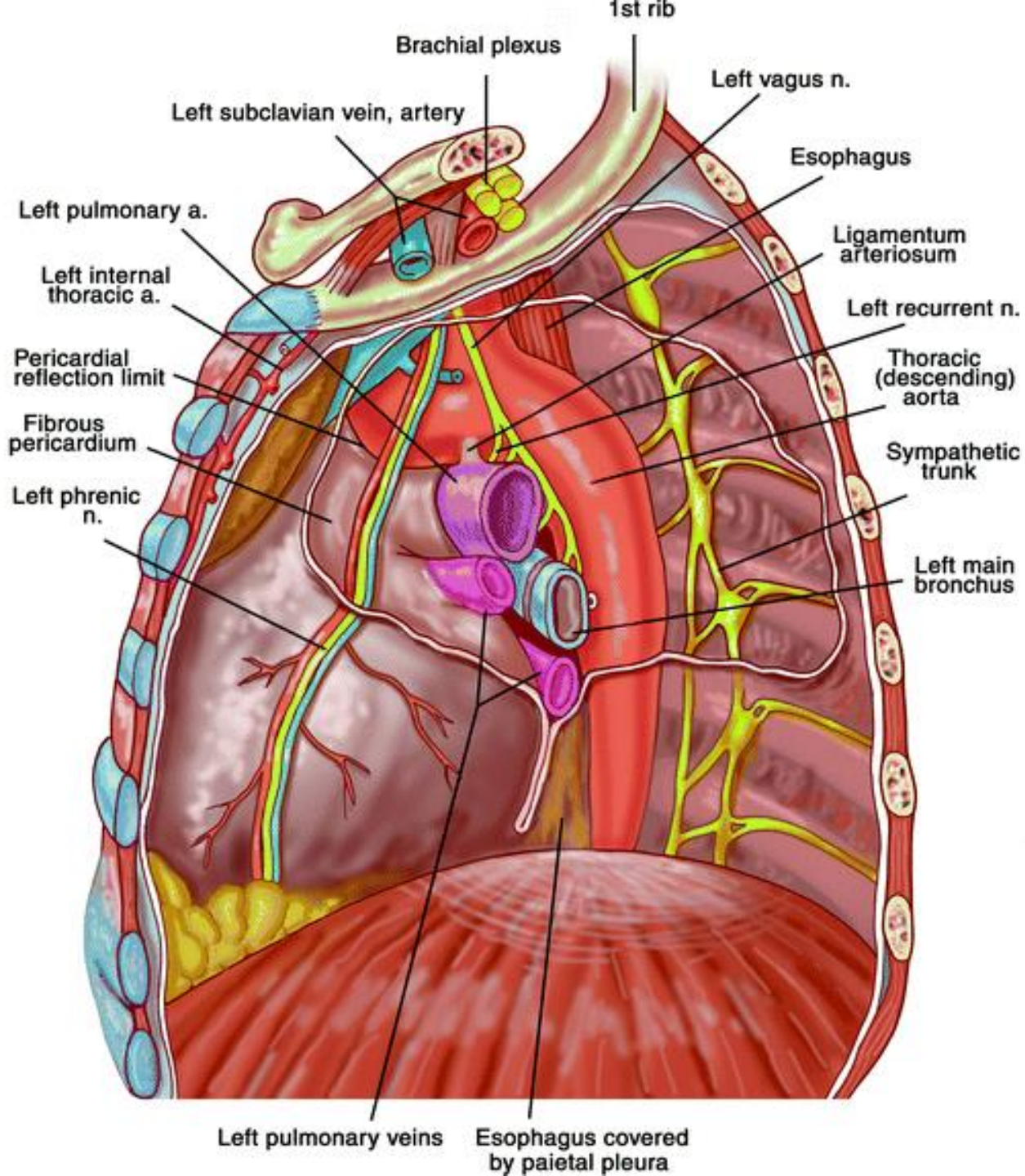
RELATIONS OF AORTIC ARCH

- **ANTERIORLY AND TO THE LEFT**
  - PLEURA
  - LUNG
  - PHRENIC N.
  - PERICARDIACOPHRENIC VESSELS
  - VAGUS N.
- **POSTERIORLY AND TO THE RIGHT**
  - TRACHEA
  - ESOPHAGUS
  - LEFT RECURRENT N.
  - THORACIC DUCT
  - DEEP CARDIAC PLEXUS



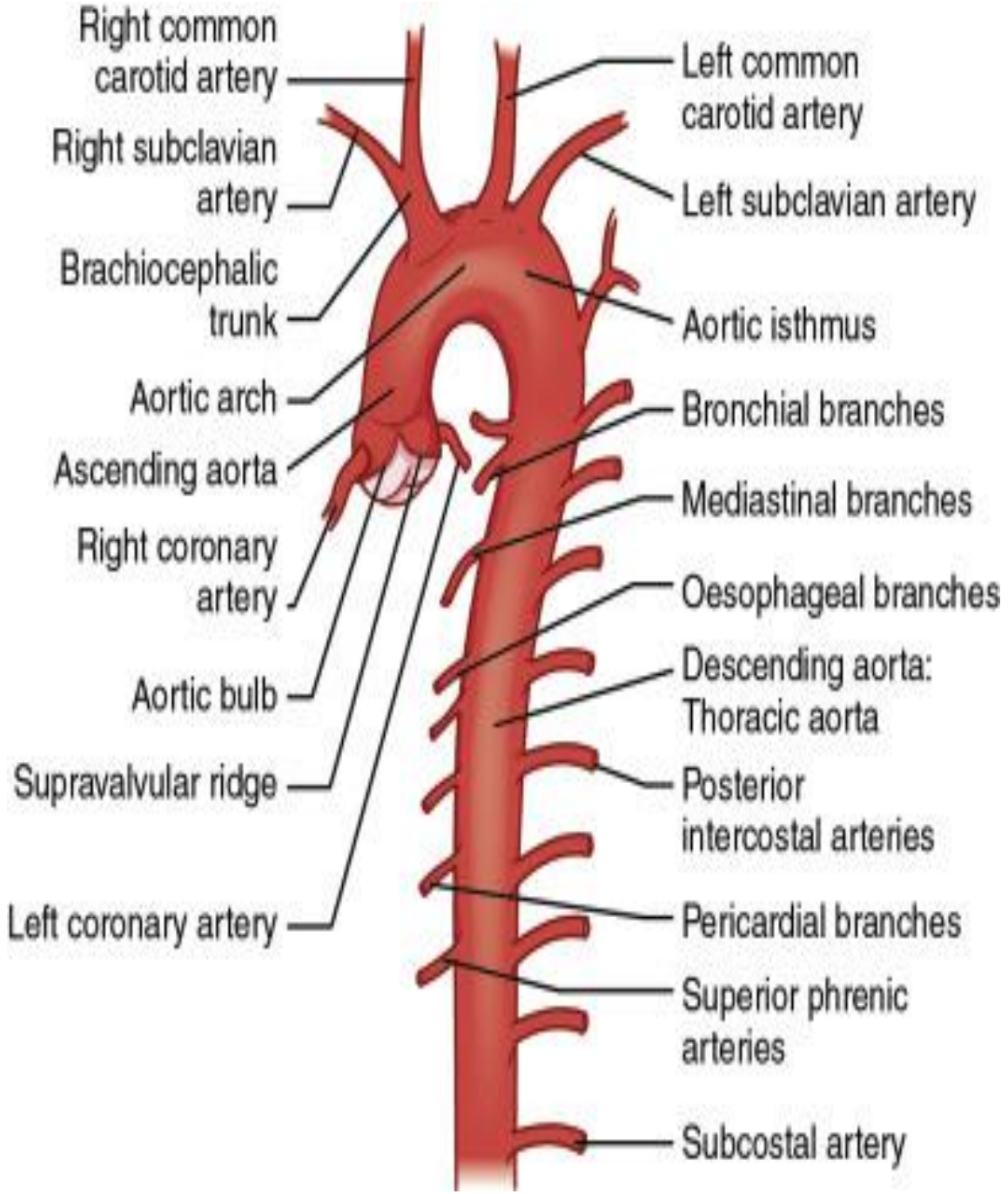
DESCENDING AORTA

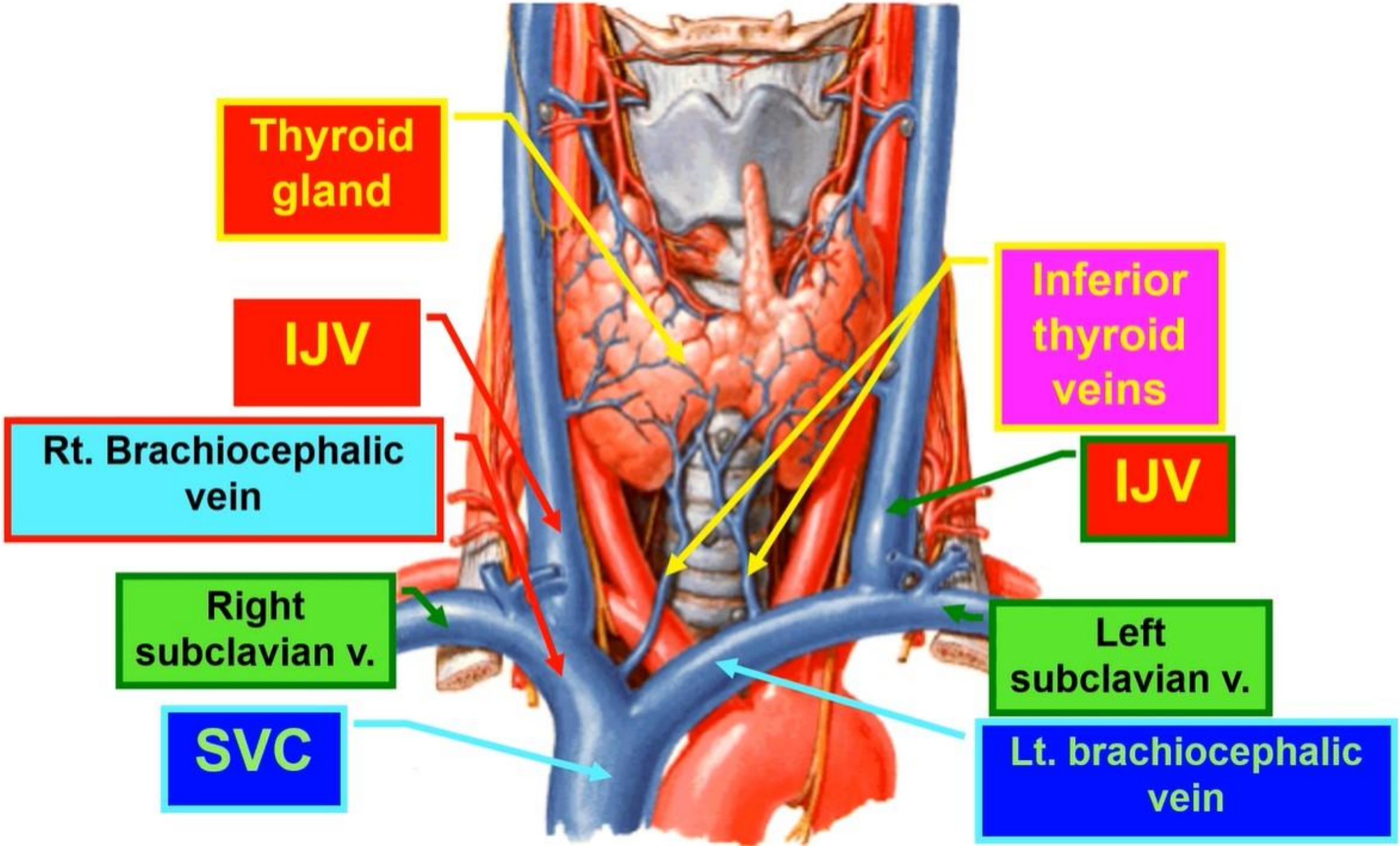
- The descending aorta is the section of the **thoracic aorta** which is contained in the posterior mediastinum.
- It originates leveled along with the lower boundary of the **T4 vertebra**, consistent with the aortic arch, and also terminates anterior to the lower boundary of the **T12 vertebra** within the **aortic hiatus**.
- it initially begins to the left of the vertebral column but approaches the midline as it descends. It leaves the thorax via the **aortic hiatus** in the diaphragm, and becomes the abdominal aorta.



- **Branches**
- **A. Parietal branches:**
- **1. Posterior intercostals arteries**
- **2. Subcostal artery**
- **3. Phrenic branches**

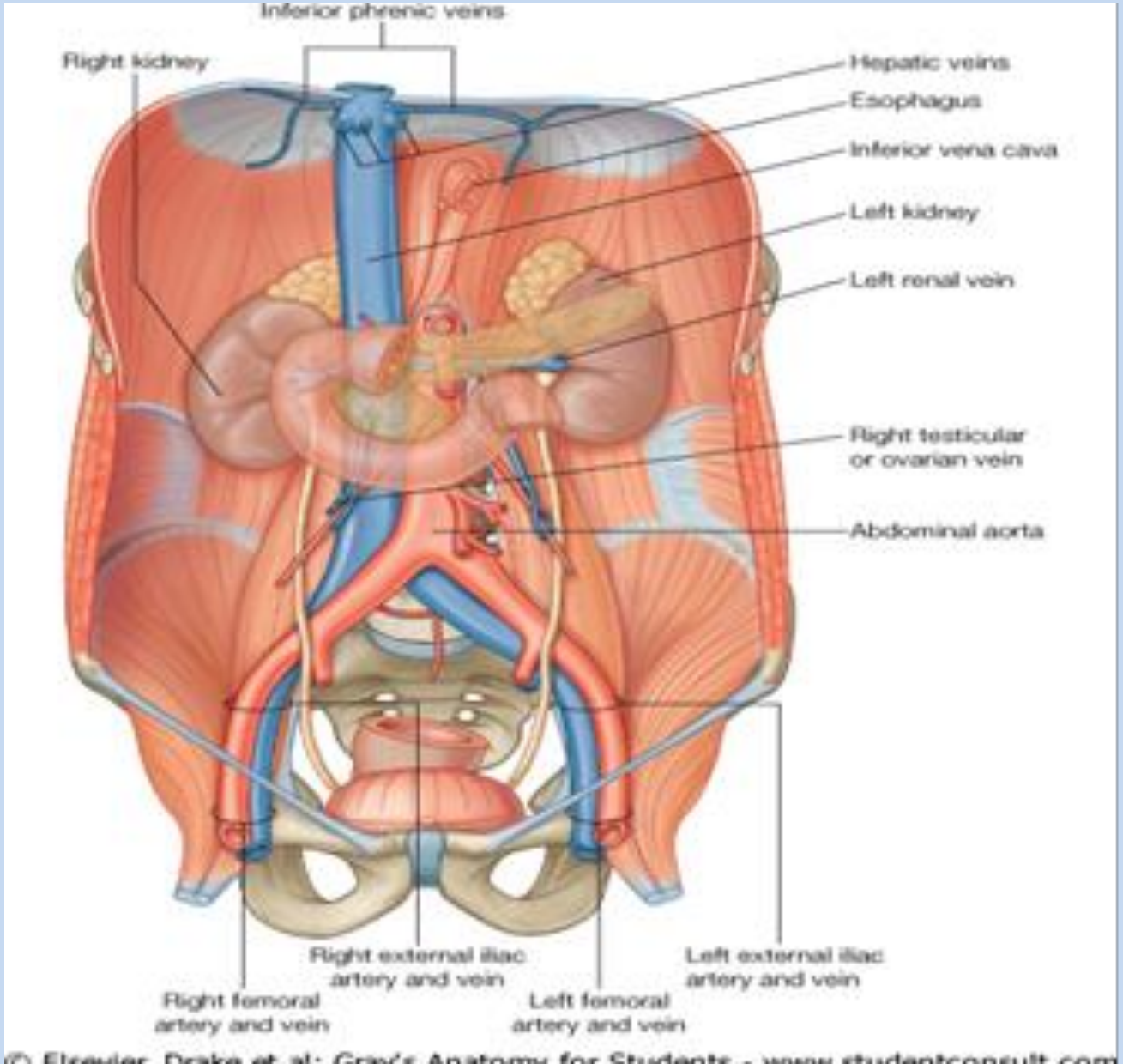
- **B. Visceral branches**
- **1. Pericardial branches**
- **2. Bronchial arteries**
- **3. Mediastinal branches**
- **4. Esophageal**



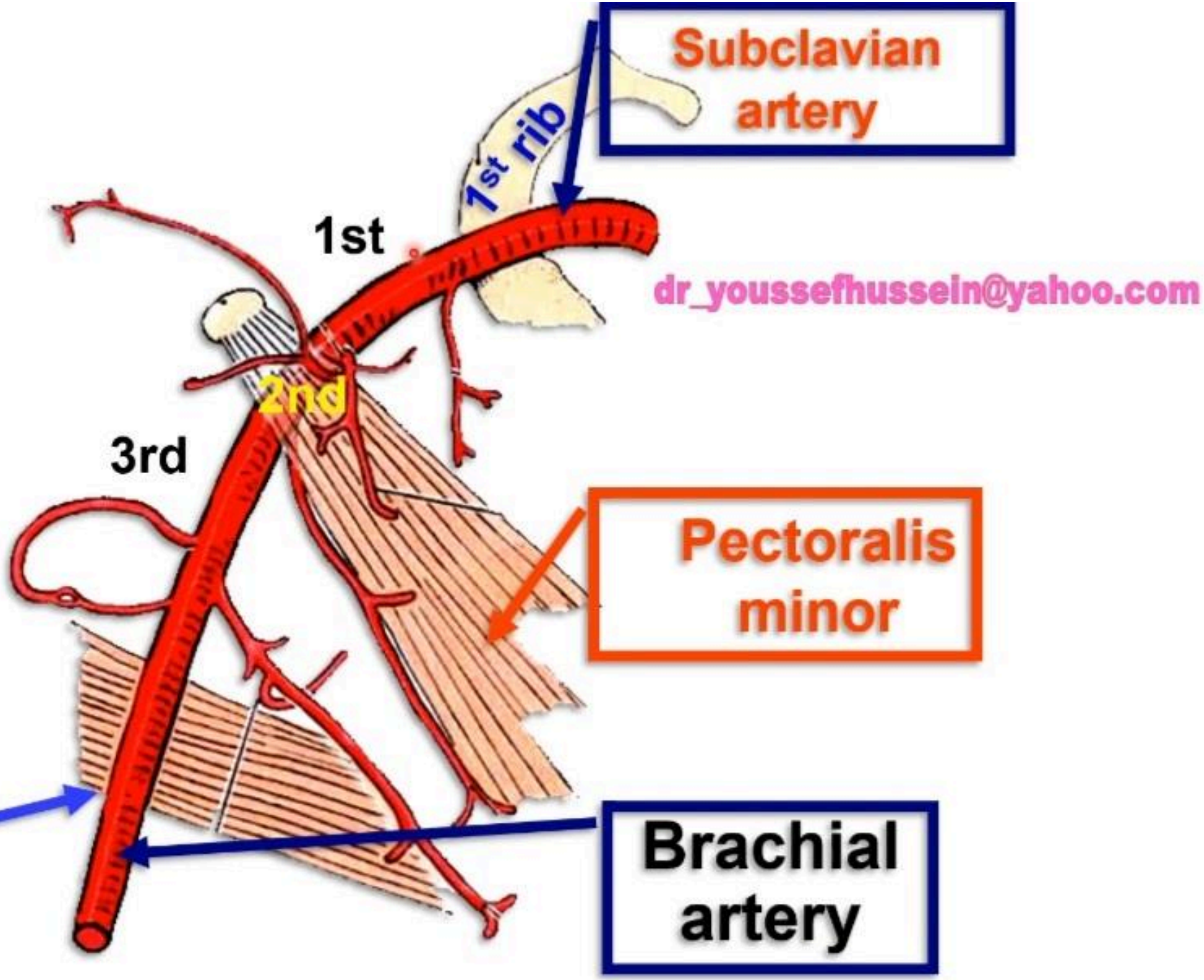

Thyroid gland
IJV
Rt. Brachiocephalic vein
Right subclavian v.
SVC
Inferior thyroid veins
IJV
Left subclavian v.
Lt. brachiocephalic vein

Anterior relations from superior to inferior:

1. Celiac ganglia and plexus.
2. Body of the pancreas.
3. Splenic and left renal veins.
4. (3rd part) of the duodenum.
5. Superior mesenteric vessels and root of mesentery.
6. coils of small intestine.



- Beginning
- End
- Parts



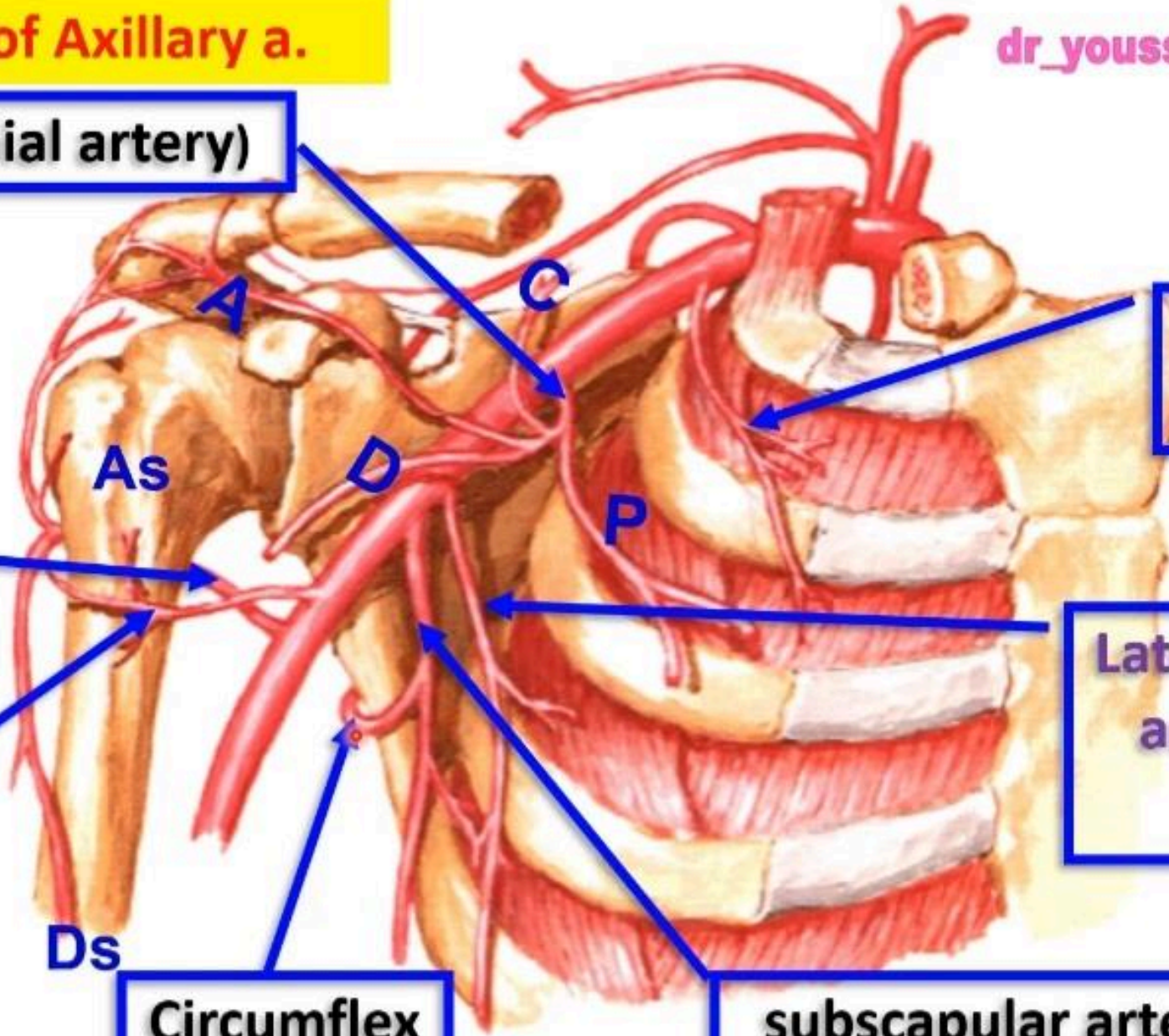
dr_youssefhussein@yahoo.com

Branches of Axillary a.

dr_youssefhussein@yahoo.com

Thoracoacromial artery)

Acromial,
Pectoral,
Clavicular
Deltoid



Superior thoracic artery (1st)

Posterior circumflex artery (3rd)

Lateral thoracic artery (2nd)

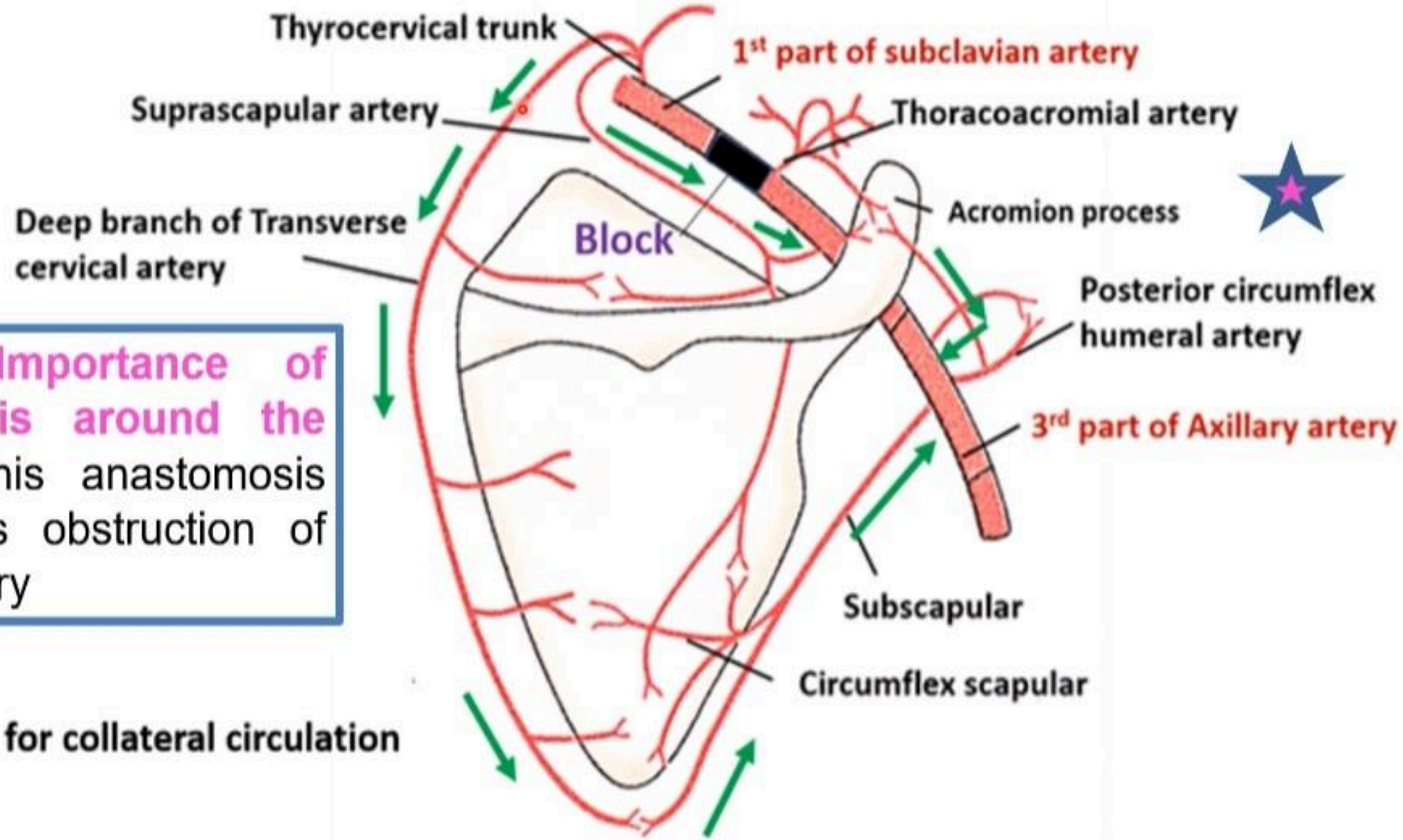
Anterior circumflex artery (3rd)

Circumflex

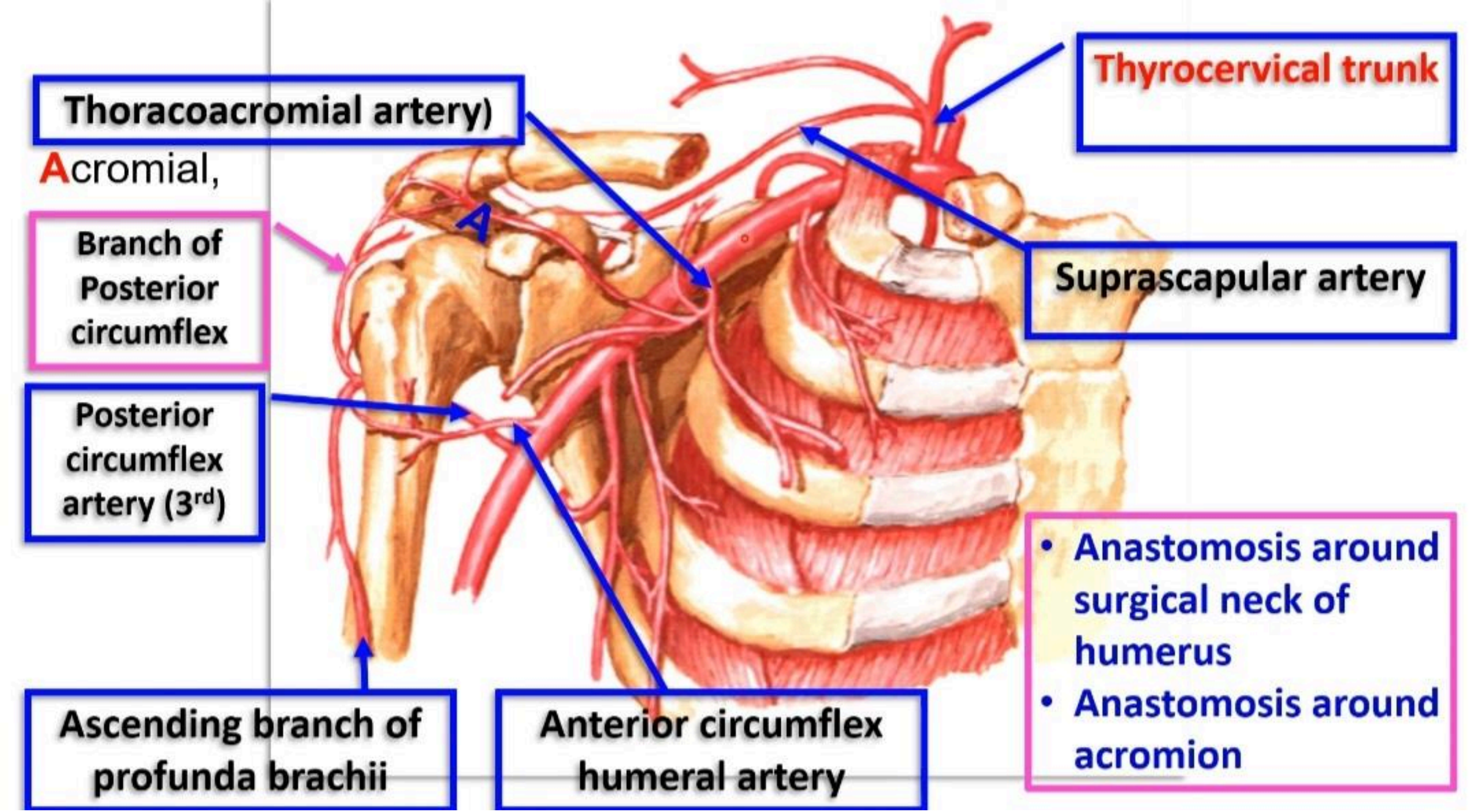
subscapular artery (3rd) largest branch

Anastomosis Around Scapula

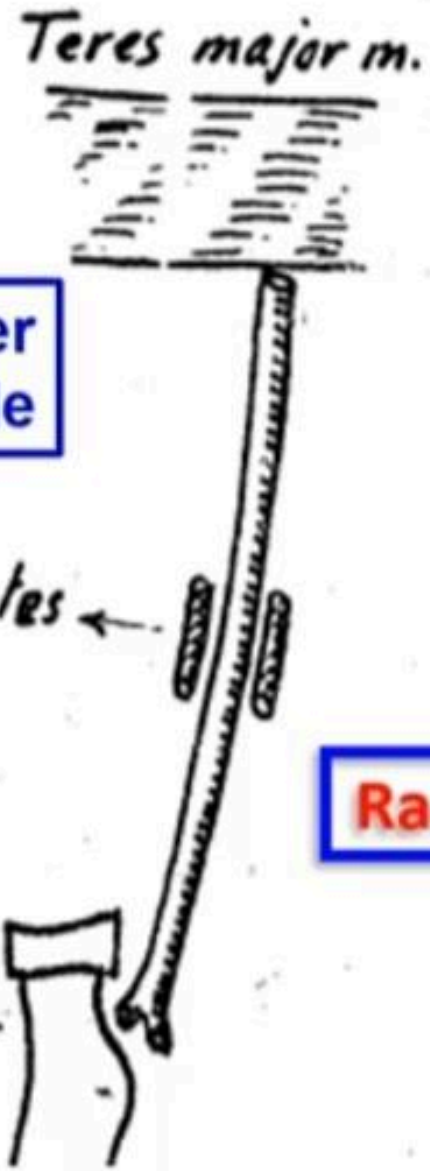
dr_youssefhussein@yahoo.com



Surgical Importance of anastomosis around the scapula, this anastomosis can bypass obstruction of Axillary artery

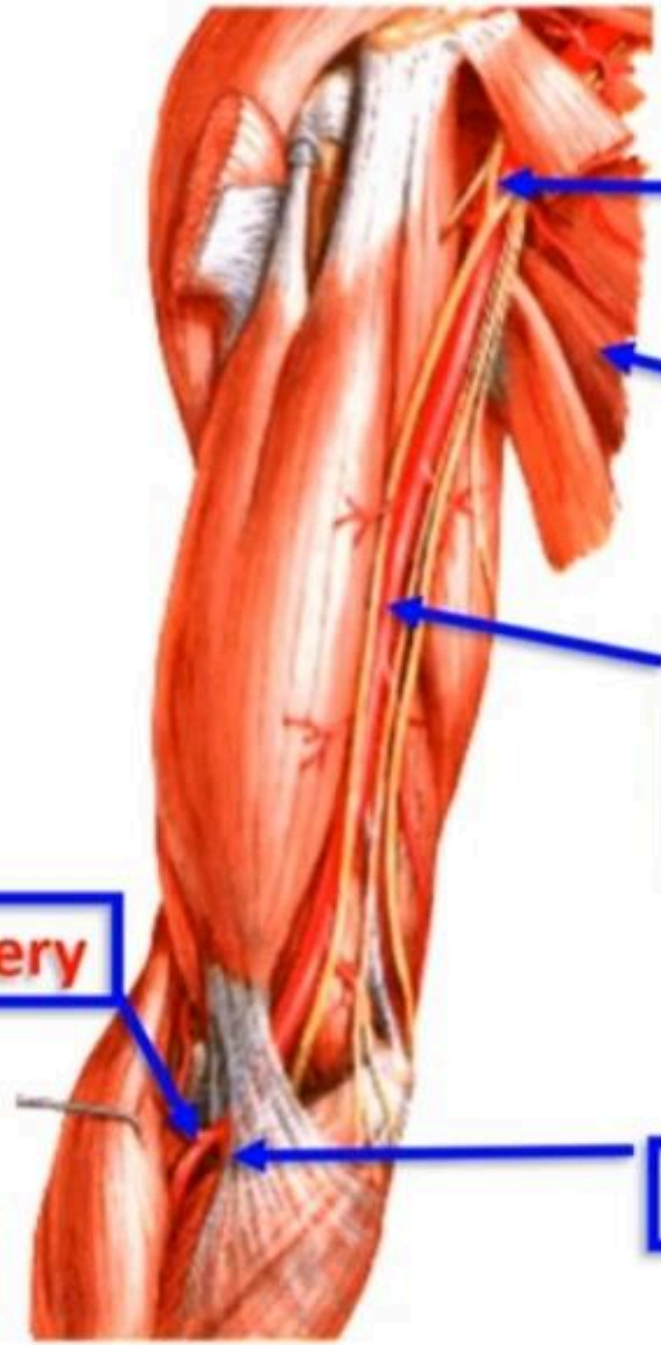

Thoracoacromial artery)
Acromial,
Thyrocervical trunk
Branch of Posterior circumflex
Suprascapular artery
Posterior circumflex artery (3rd)
• Anastomosis around surgical neck of humerus
• Anastomosis around acromion
Ascending branch of profunda brachii
Anterior circumflex humeral artery

Begin – End



Begin at lower border of teres major Muscle

End opposite the neck of the radius



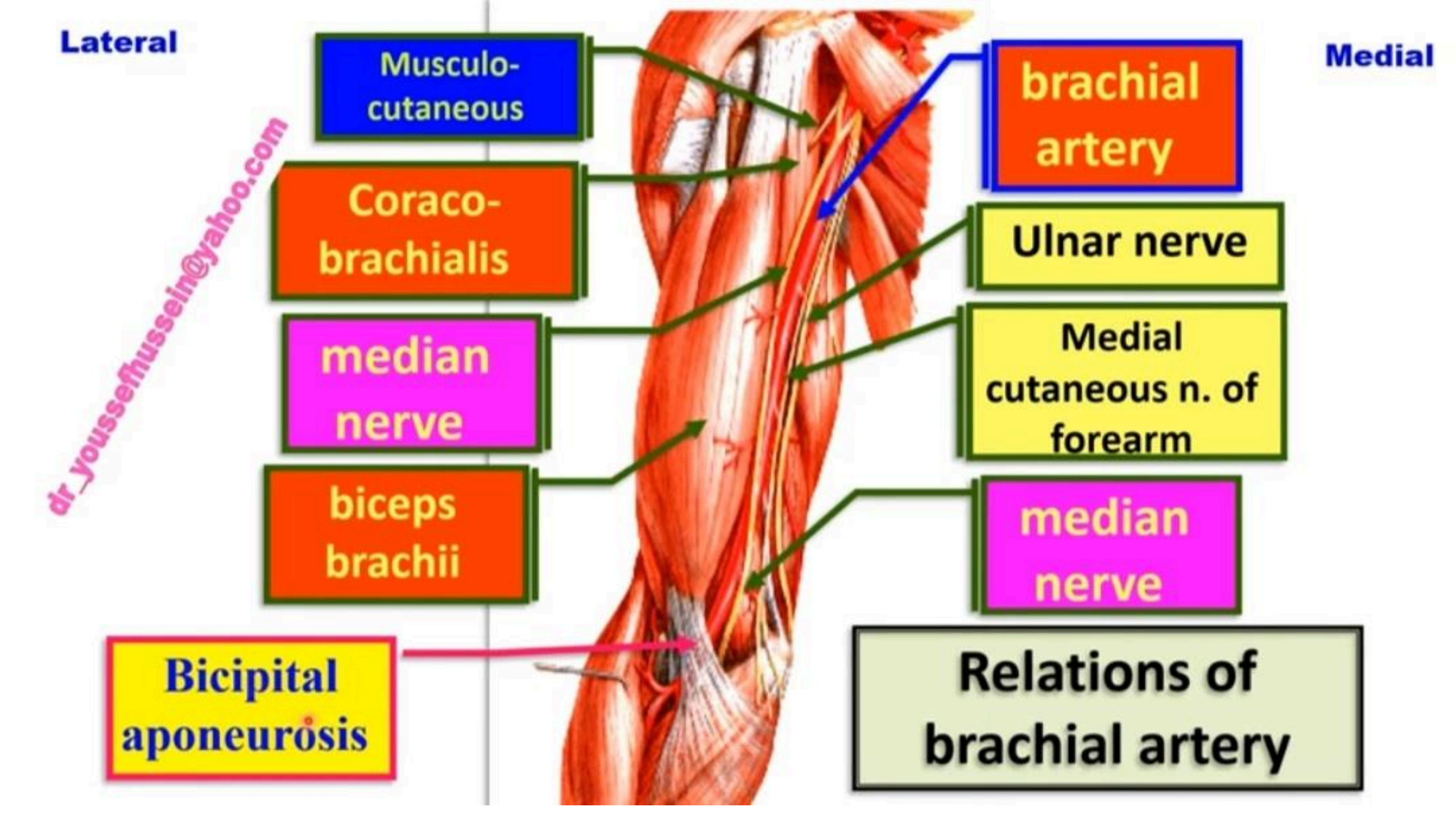
Axillary artery

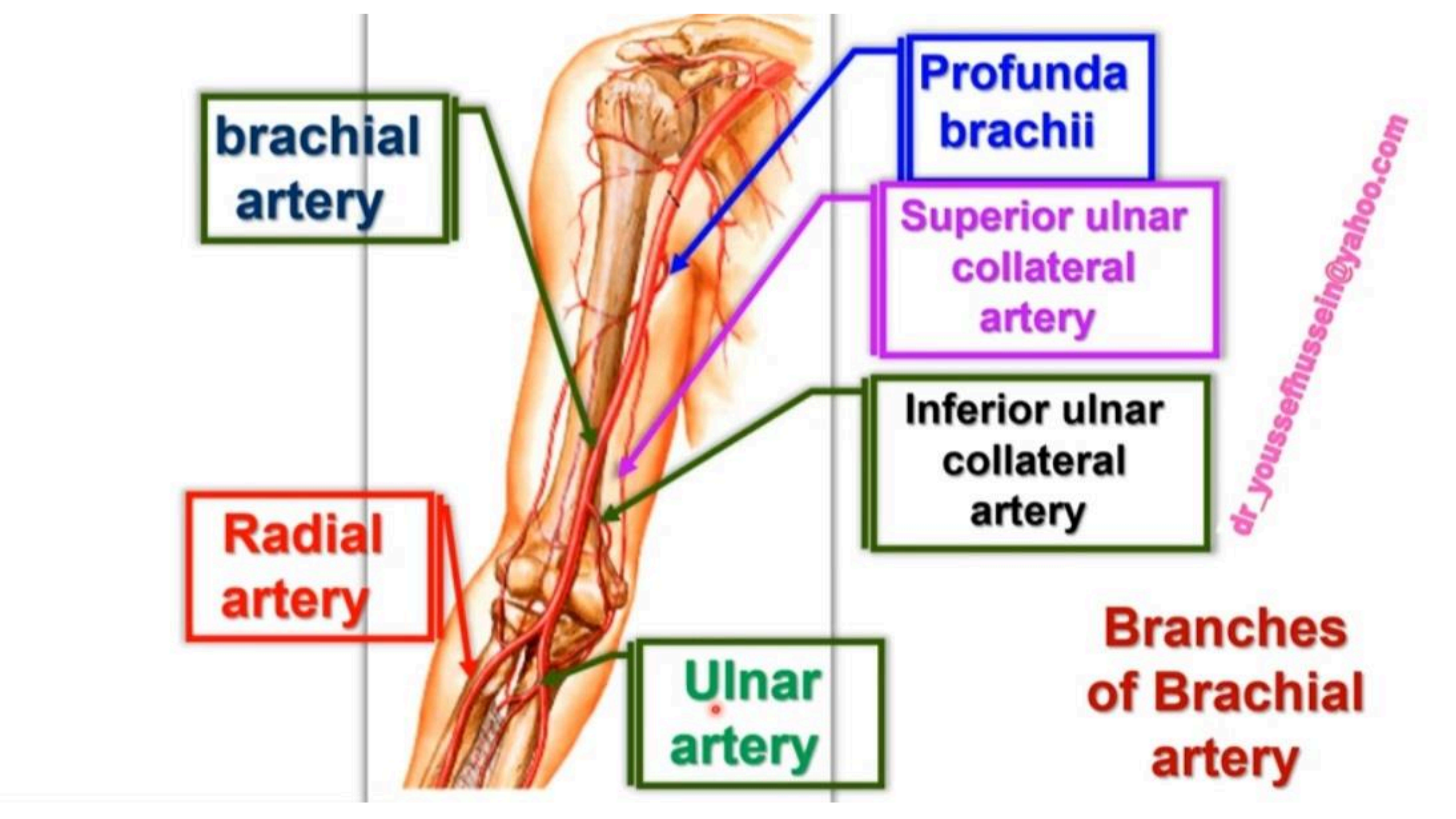
Teres major

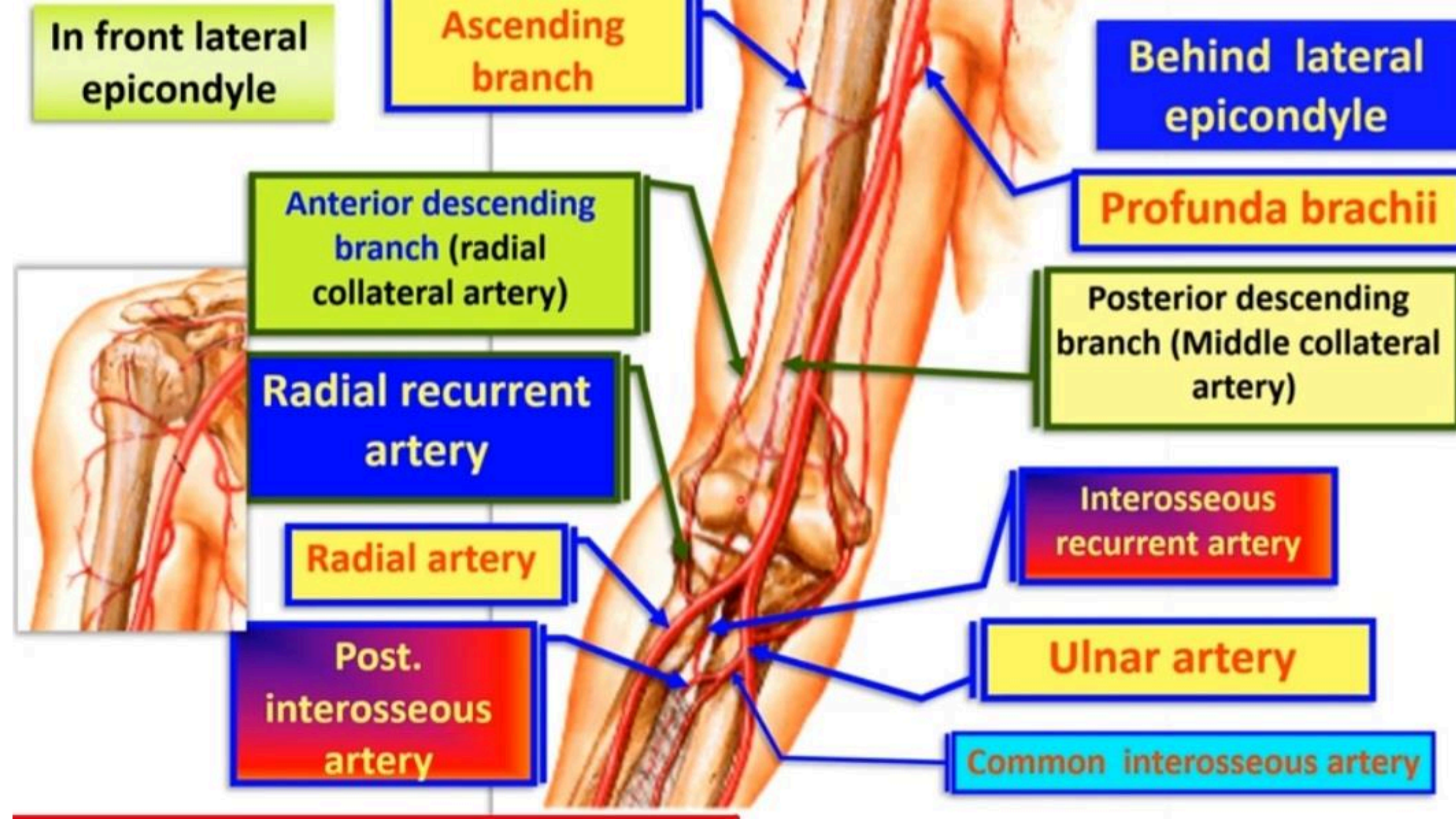
Brachial artery

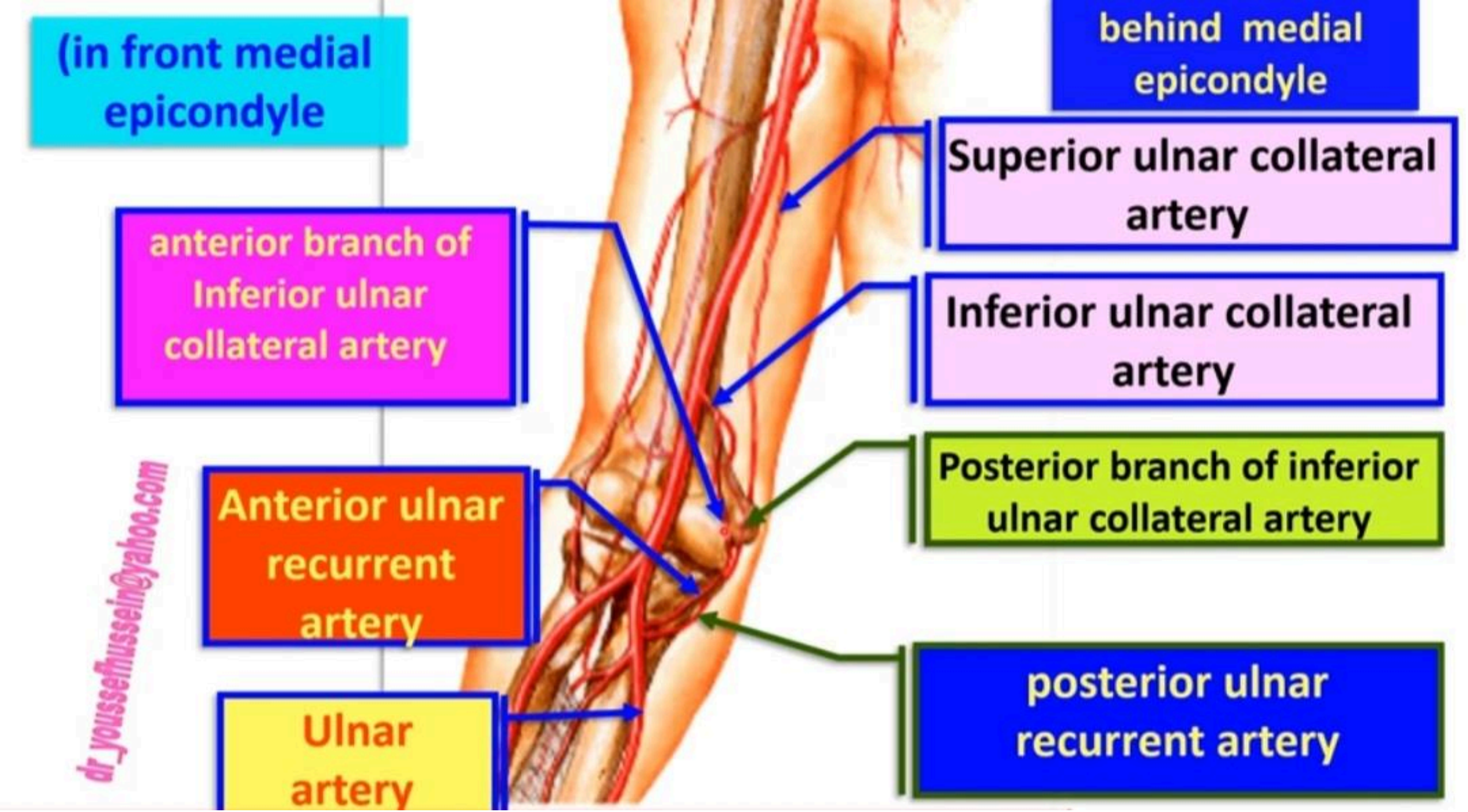
Radial artery

Ulnar artery


Lateral
Medial
Musculo-cutaneous
Coraco-brachialis
median nerve
biceps brachii
Bicipital aponeurosis
brachial artery
Ulnar nerve
Medial cutaneous n. of forearm
median nerve
Relations of brachial artery
dr_youssefhussein@yahoo.com


brachial artery
Profunda brachii
Superior ulnar collateral artery
Inferior ulnar collateral artery
Radial artery
Ulnar artery
Branches of Brachial artery
dr_youssefhussein@yahoo.com


In front lateral epicondyle
Ascending branch
Behind lateral epicondyle
Anterior descending branch (radial collateral artery)
Profunda brachii
Posterior descending branch (Middle collateral artery)
Radial recurrent artery
Interosseous recurrent artery
Radial artery
Ulnar artery
Post. interosseous artery
Common interosseous artery

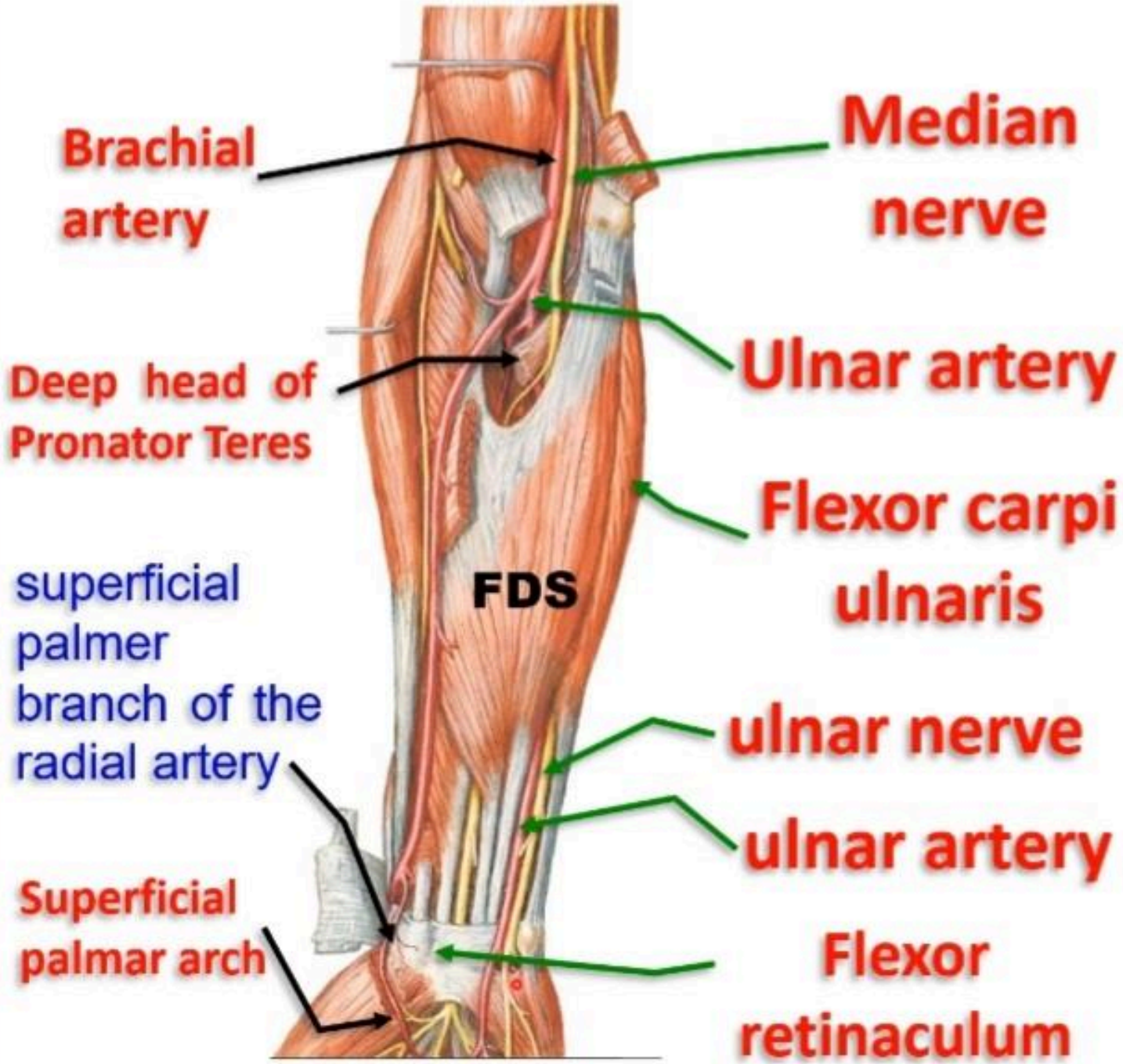

(in front medial epicondyle
behind medial epicondyle
Superior ulnar collateral artery
anterior branch of Inferior ulnar collateral artery
Inferior ulnar collateral artery
Posterior branch of inferior ulnar collateral artery
Anterior ulnar recurrent artery
posterior ulnar recurrent artery
Ulnar artery
dr_youssefhusseln@yahoo.com

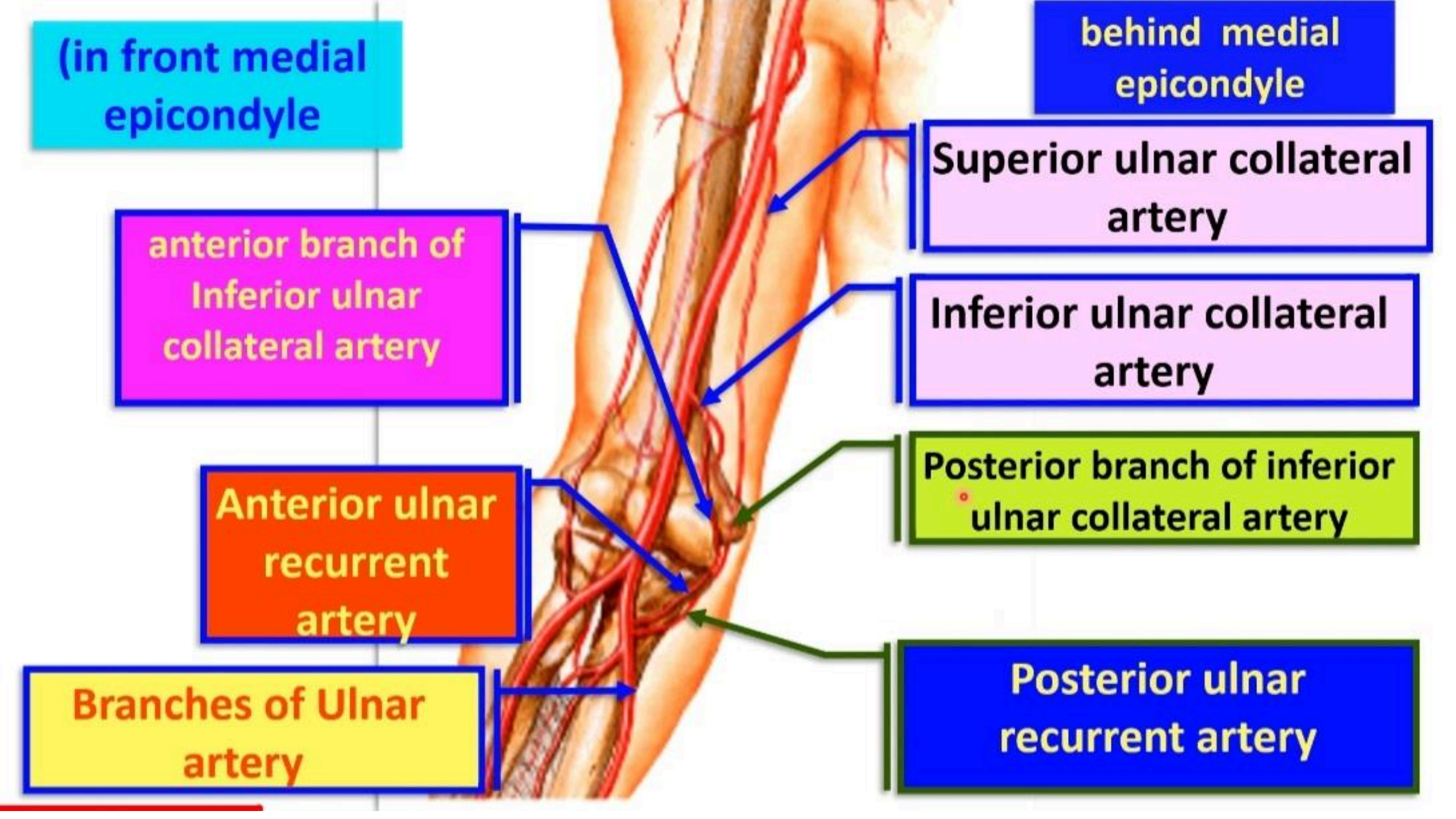
• Ulnar Artery

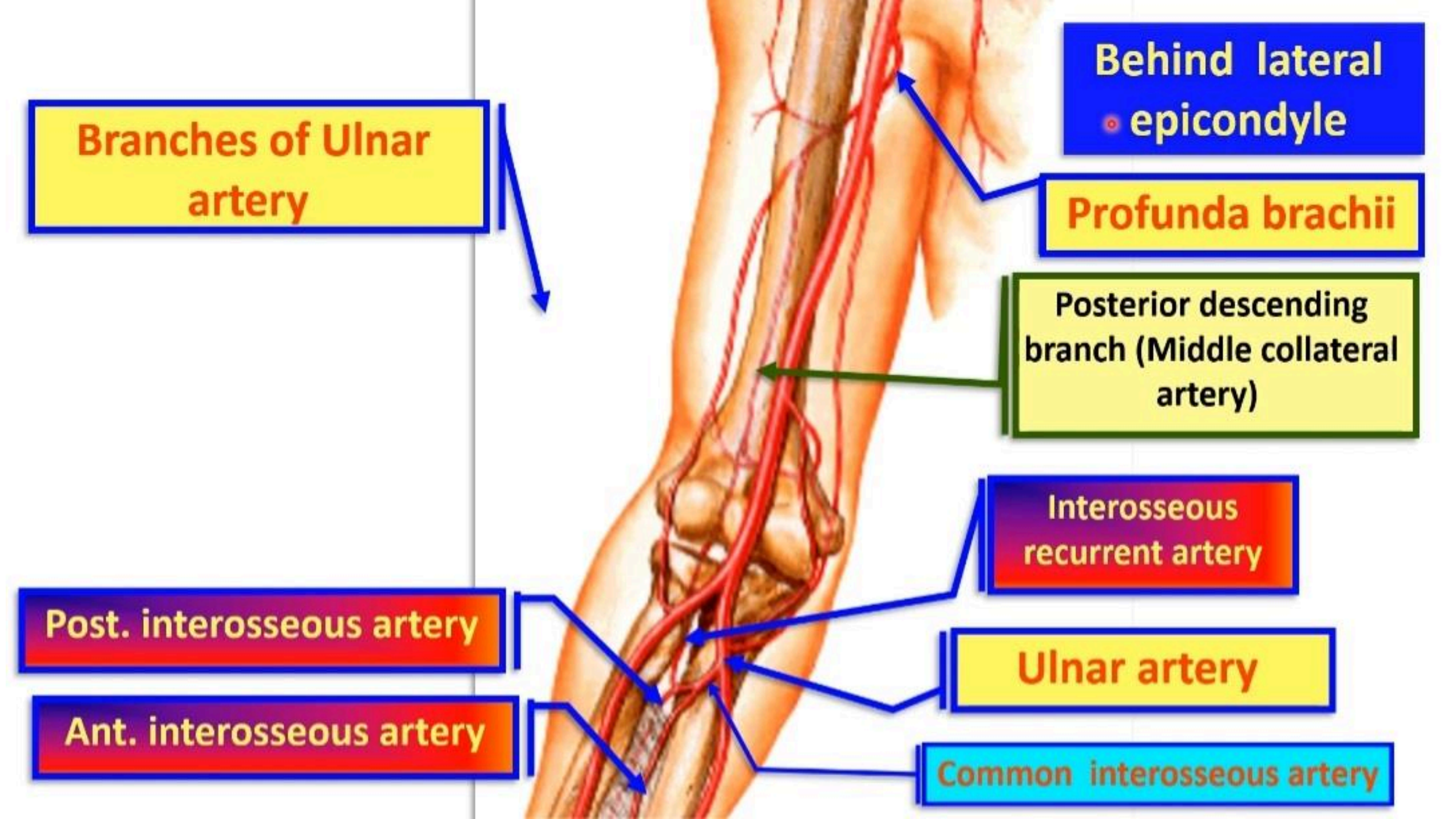
** **Beginning:** the larger of two terminal branches of brachial artery in the cubital fossa at the level of the neck of radius.

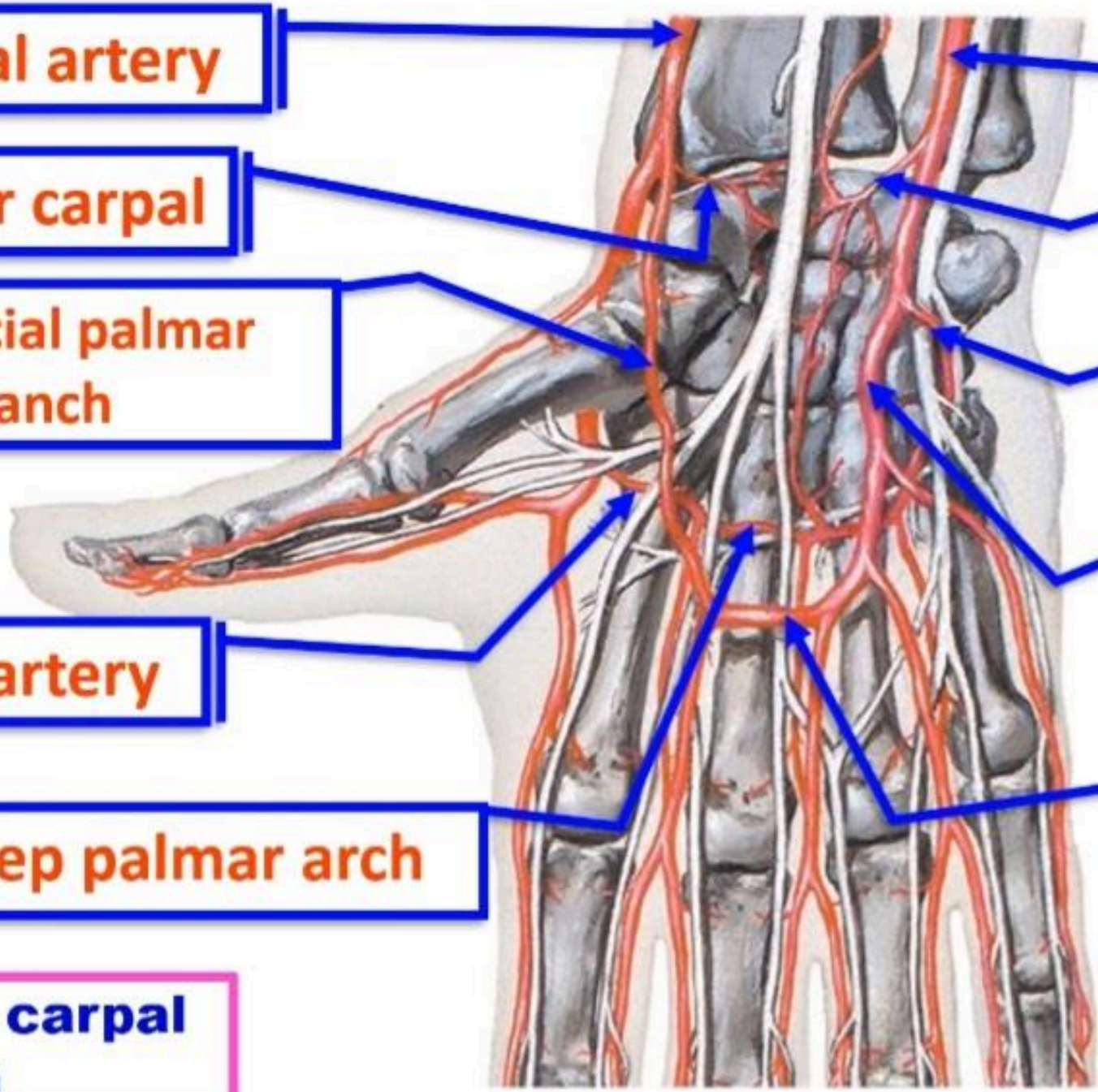
** **Course:**

- It descends medially deep to the deep head of pronator teres that separates it from the median nerve.
- It descends vertically deep to Flexor carpi ulnaris and lateral to ulnar nerve.
- **Above wrist joint**: between Flexor carpi ulnaris and flexor digitorum superficialis, covered by skin, superficial fascia, deep fascia (**dangerous position**). FDP (post)
- It **enters the hand** superficial to flexor retinaculum and anastomosis with superficial palmer branch of radial artery to form **superficial palmar arch**.




(in front medial epicondyle
behind medial epicondyle
Superior ulnar collateral artery
anterior branch of Inferior ulnar collateral artery
Inferior ulnar collateral artery
Posterior branch of inferior ulnar collateral artery
Anterior ulnar recurrent artery
Branches of Ulnar artery
Posterior ulnar recurrent artery


Branches of Ulnar artery
Behind lateral epicondyle
Profunda brachii
Posterior descending branch (Middle collateral artery)
Interosseous recurrent artery
Post. interosseous artery
Ulnar artery
Ant. interosseous artery
Common interosseous artery

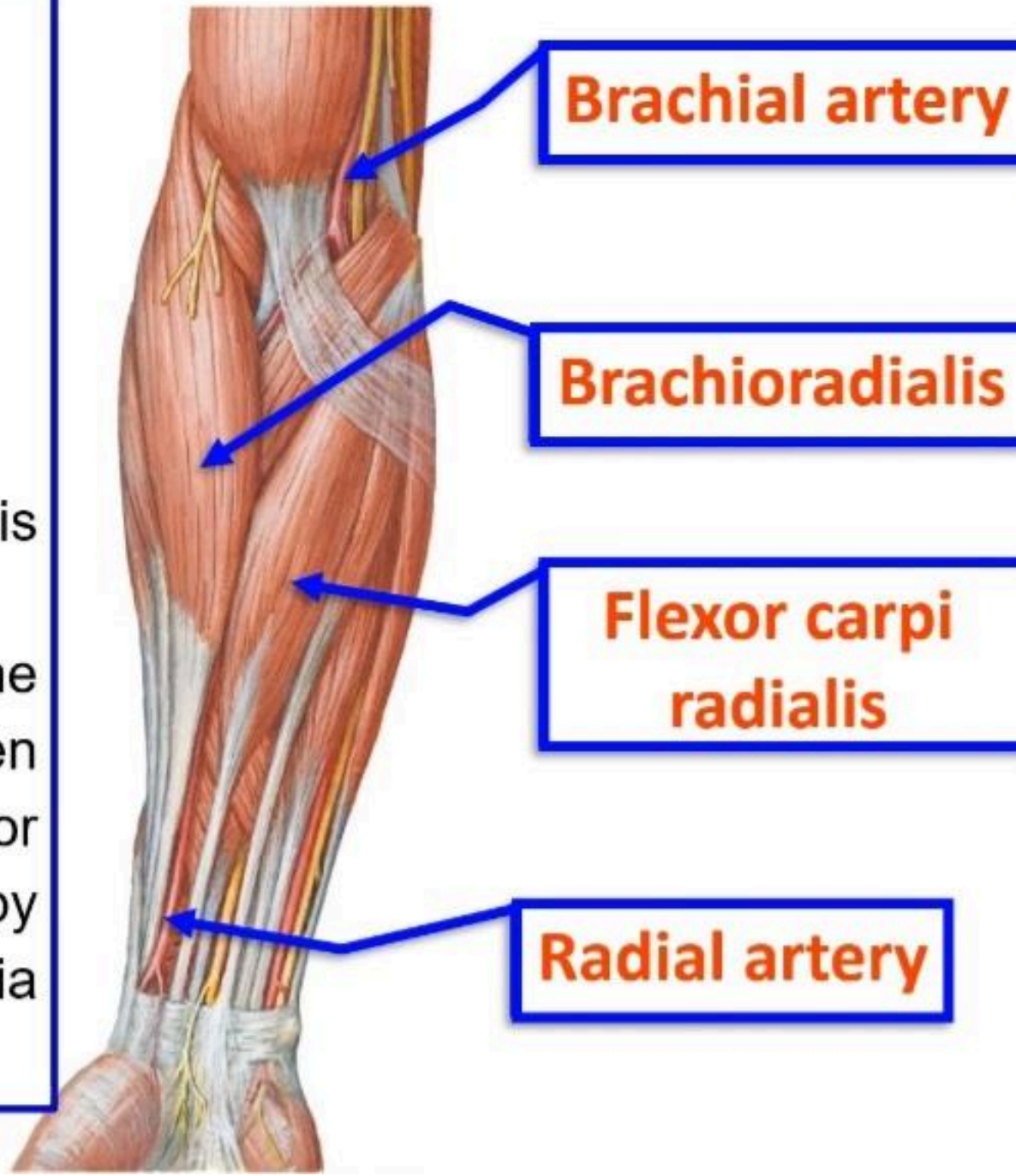

Radial artery
Palmar carpal
Superficial palmar branch
Radial artery
Deep palmar arch
Dorsal carpal branch
Ulnar artery
Palmar carpal
Deep palmar branch
Superficial palmar branch
Superficial palmar arch
Branches of ulnar artery

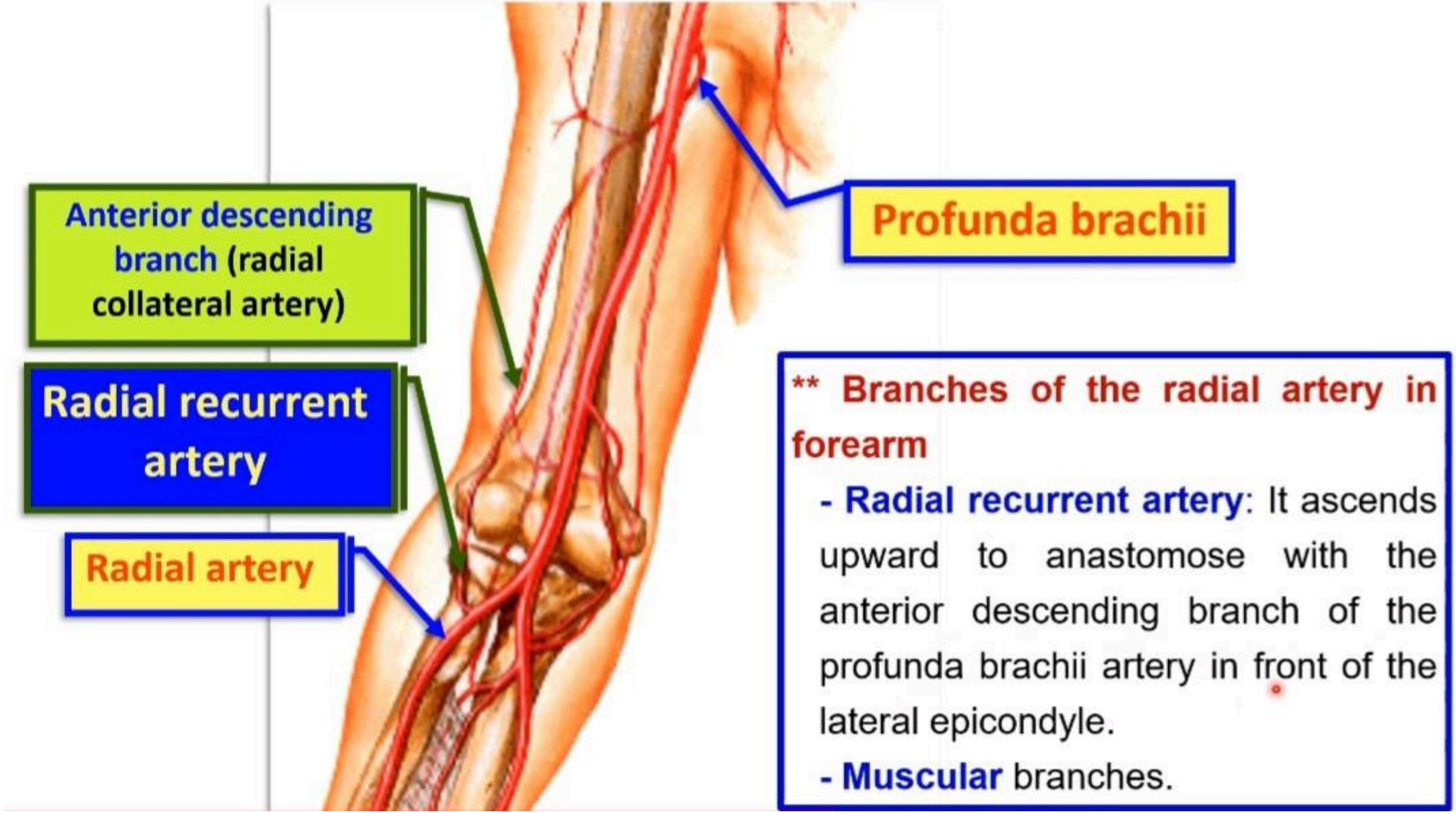
- **Radial Artery of the forearm**

** **Begin**: one of the two terminal branches of the brachial artery in the cubital fossa at the level of the neck of the radius.

** **End**; in the palm of the hand as **deep palmer arch**.

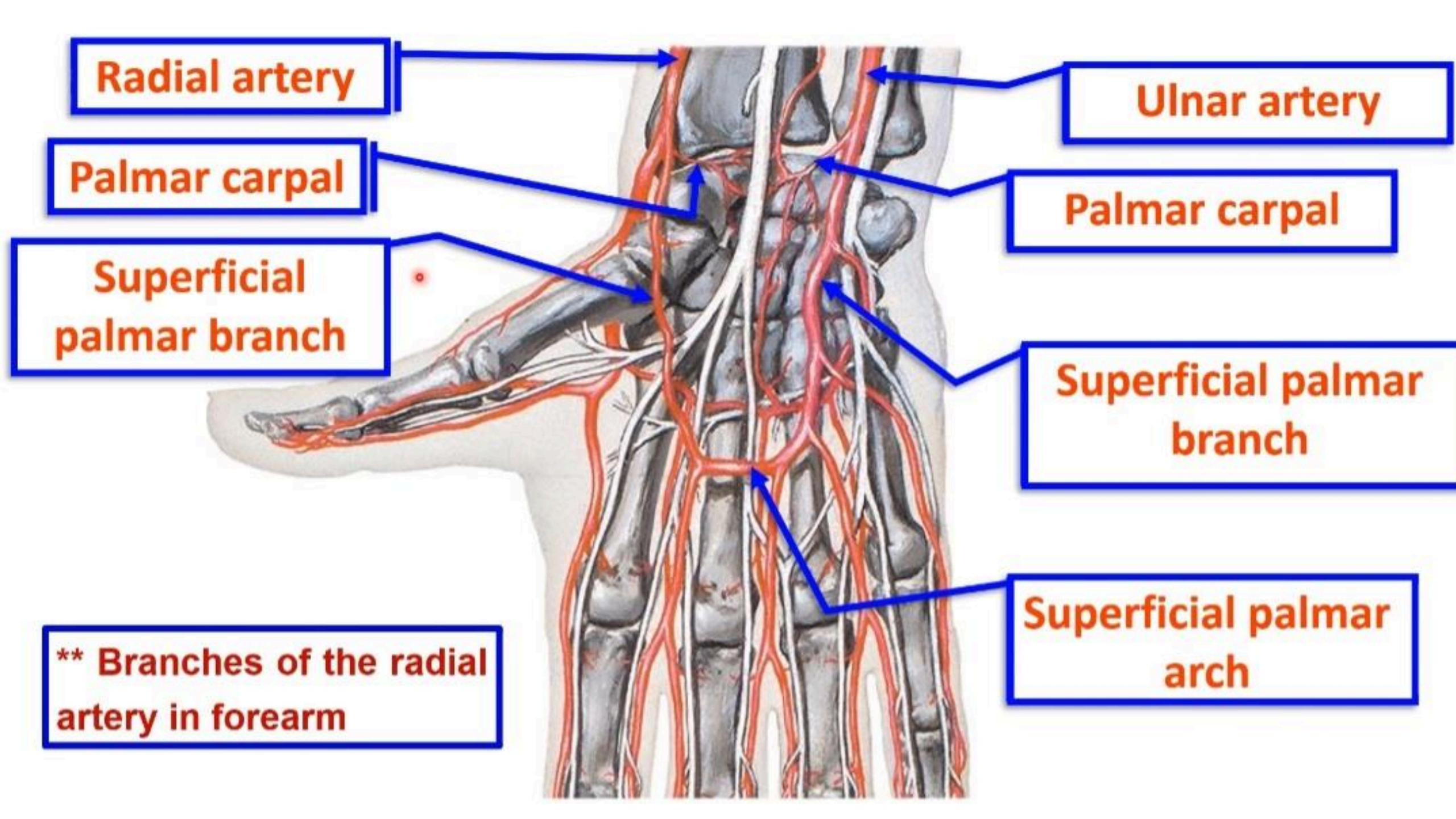
- **Course:** It passes deep to brachioradialis muscle with the radial nerve
- **In the lower one third**, it descends on the distal end of the radius between brachioradialis muscle (**laterally**) and flexor carpi radialis (**medially**) and covered only by skin, superficial fascia and deep fascia (**where you can feel arterial pulsation**) .





** **Branches of the radial artery in forearm**

- **Radial recurrent artery**: It ascends upward to anastomose with the anterior descending branch of the profunda brachii artery in front of the lateral epicondyle.
- **Muscular** branches.


Radial artery
Palmar carpal
Superficial palmar branch
Ulnar artery
Palmar carpal
Superficial palmar branch
Superficial palmar arch
** Branches of the radial artery in forearm

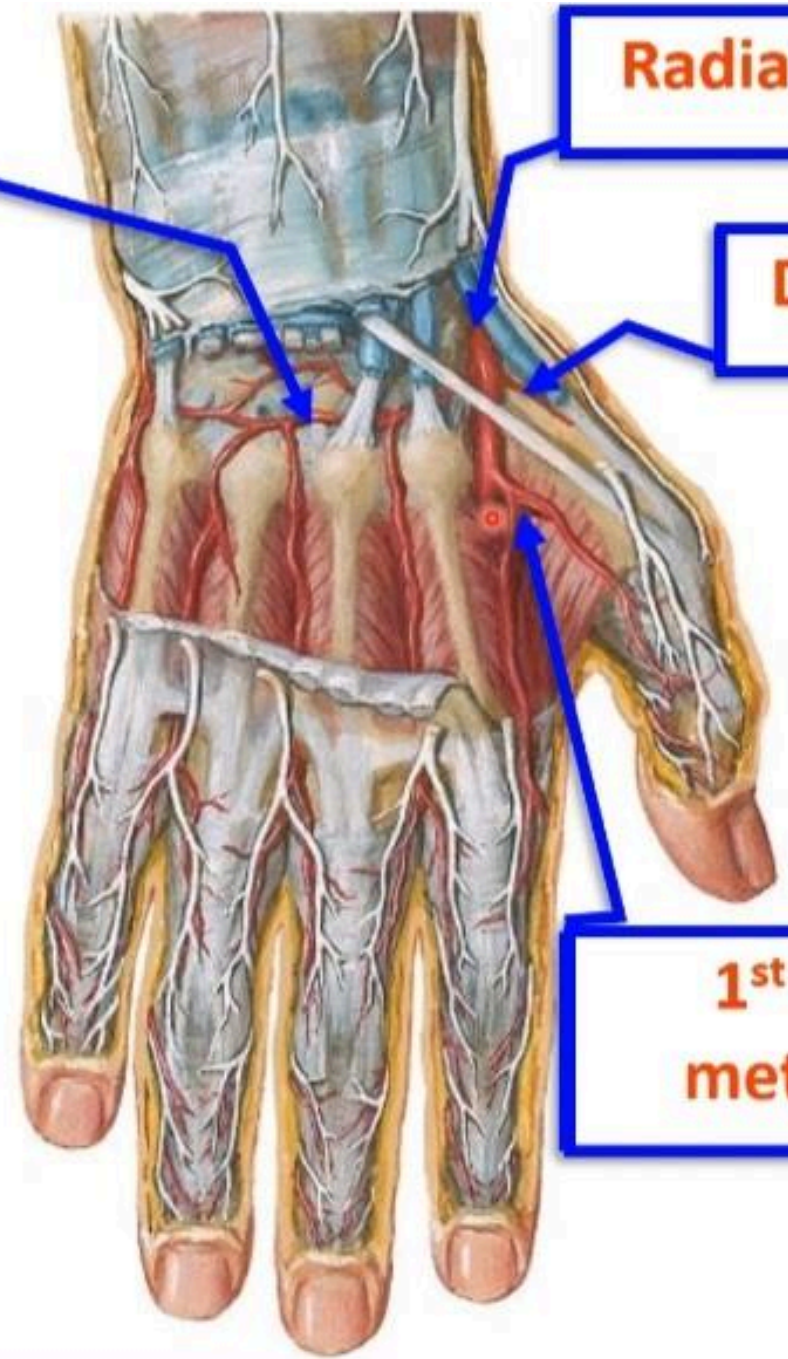
Dorsal carpal arch

- **Branches of radial artery in the dorsum of the hand:**

1- Dorsal carpal branch: anastomoses with the dorsal carpal branch of the ulnar artery to form the **dorsal carpal arch.**

2- Dorsal digital branch to the **lateral** side of the thumb.

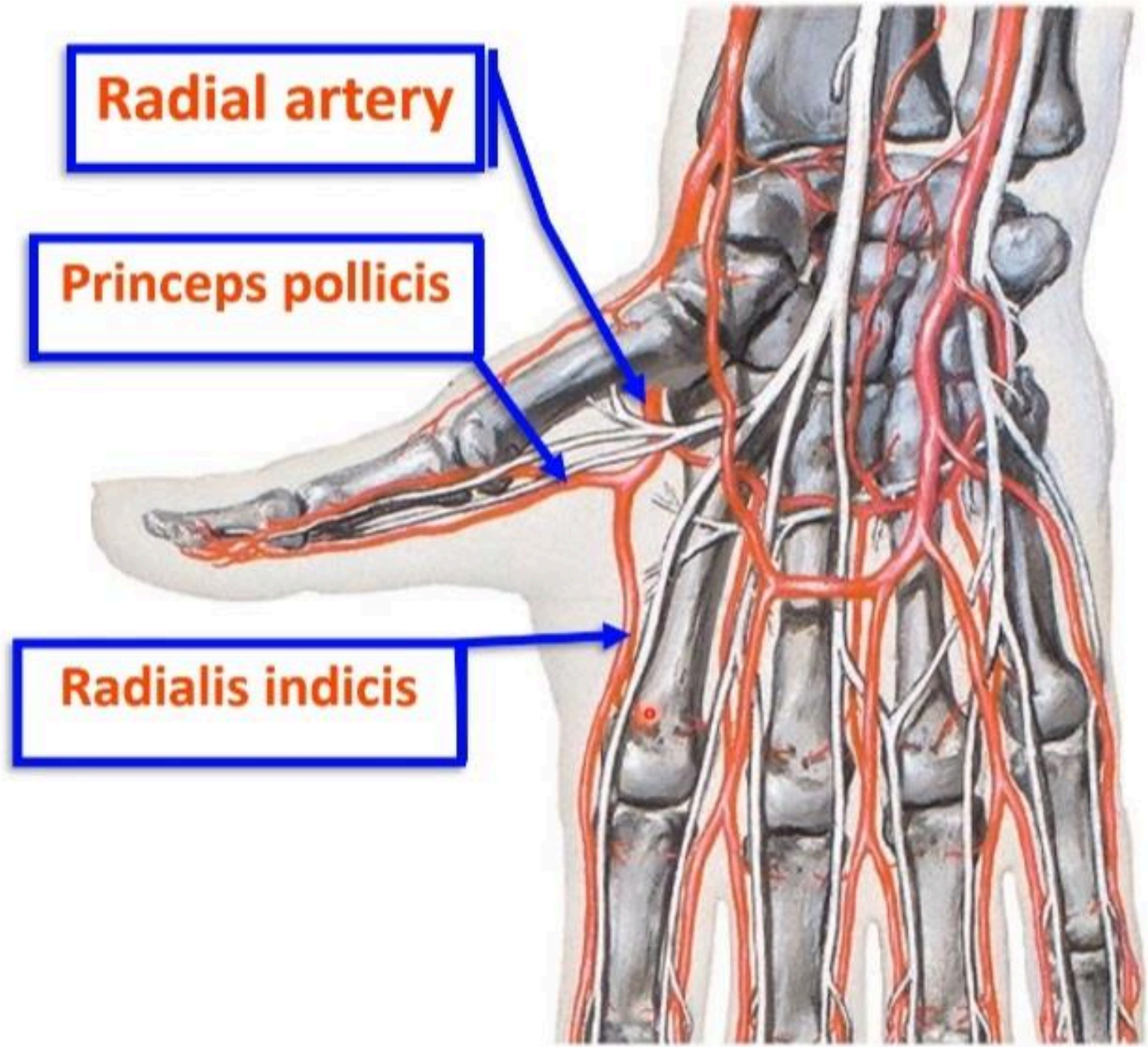
3- First dorsal metacarpal artery to the adjacent sides of the thumb and index.



- **Branches of radial artery in Palm of the hand:**

  1- Princeps pollicis artery to the palmar aspect of the thumb.

  2- Radialis indicis artery: to the radial side of the index finger.



OBTURATOR ARTERY

O. :- br. from ant. division of int. iliac art.

Inside the pelvis

C. & r. :

-enters the thigh through obturator canal

-at ant. end of canal →

medial & lateral divisions

that from arterial circle

at margins of obturator membrane

branches :

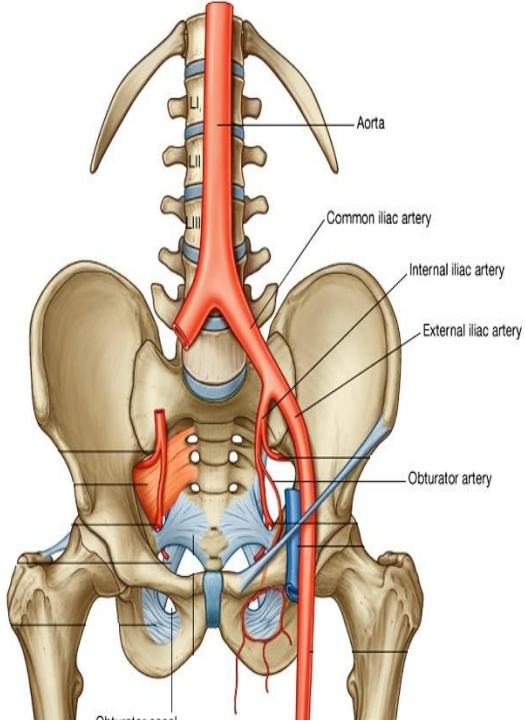
-acetabular br.:-

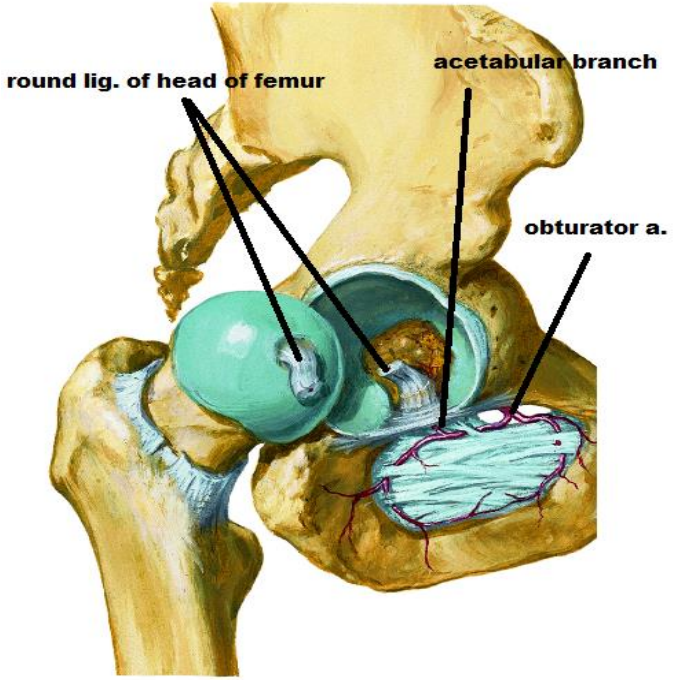
pass through acetabular notch

to supply head of femur

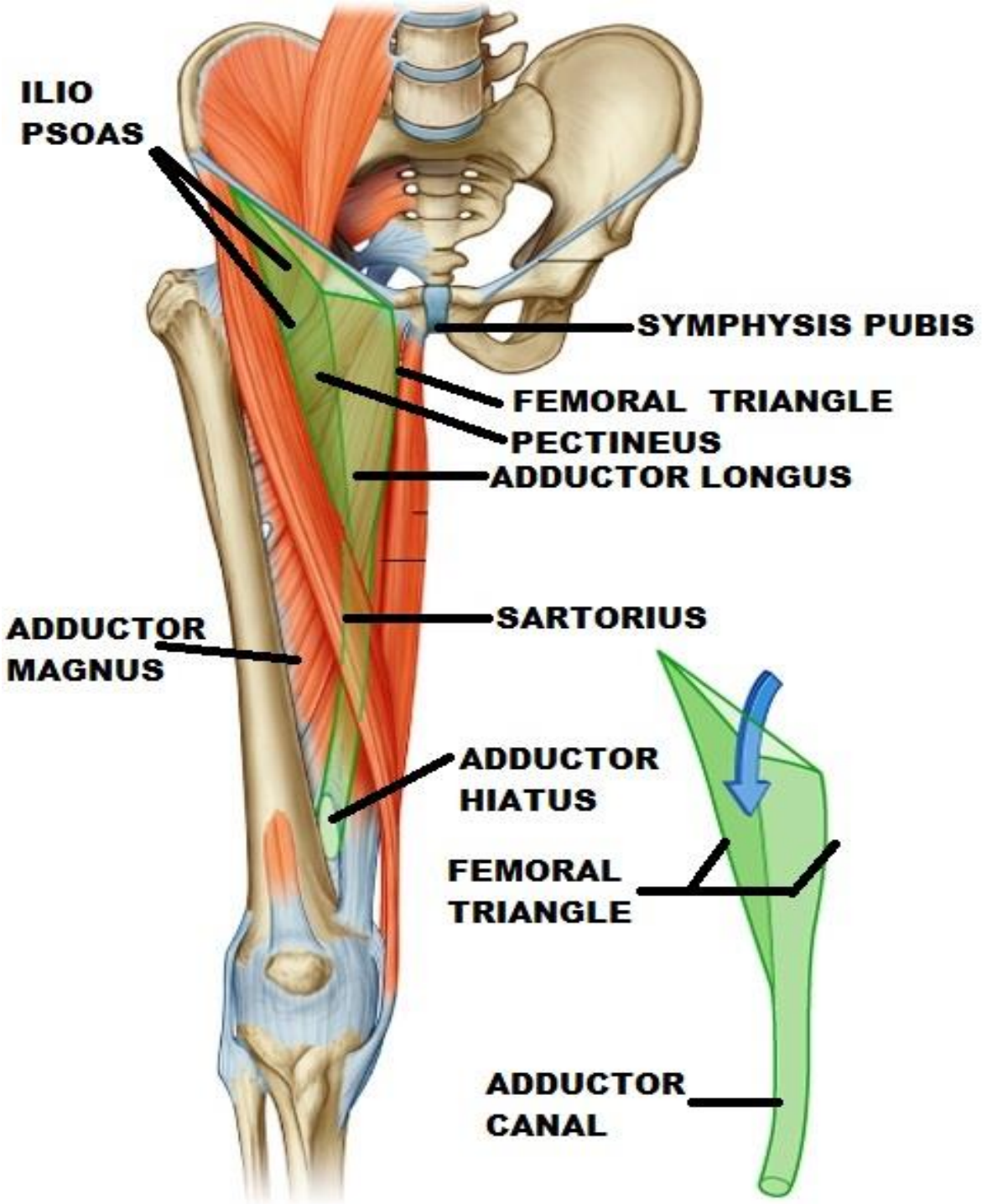
-muscular branches:-

to medial compartment of thigh





REV.


ILIO
PSOAS
SYMPHYSIS PUBIS
FEMORAL TRIANGLE
PECTINEUS
ADDUCTOR LONGUS
SARTORIUS
ADDUCTOR
MAGNUS
ADDUCTOR
HIATUS
FEMORAL
TRIANGLE
ADDUCTOR
CANAL

FEMORAL ARTERY

Origin:-

continuation of ext. iliac art. deep to inguinal lig

at midinguinal point(midway between ASIS & symphysis pubis)

Course:

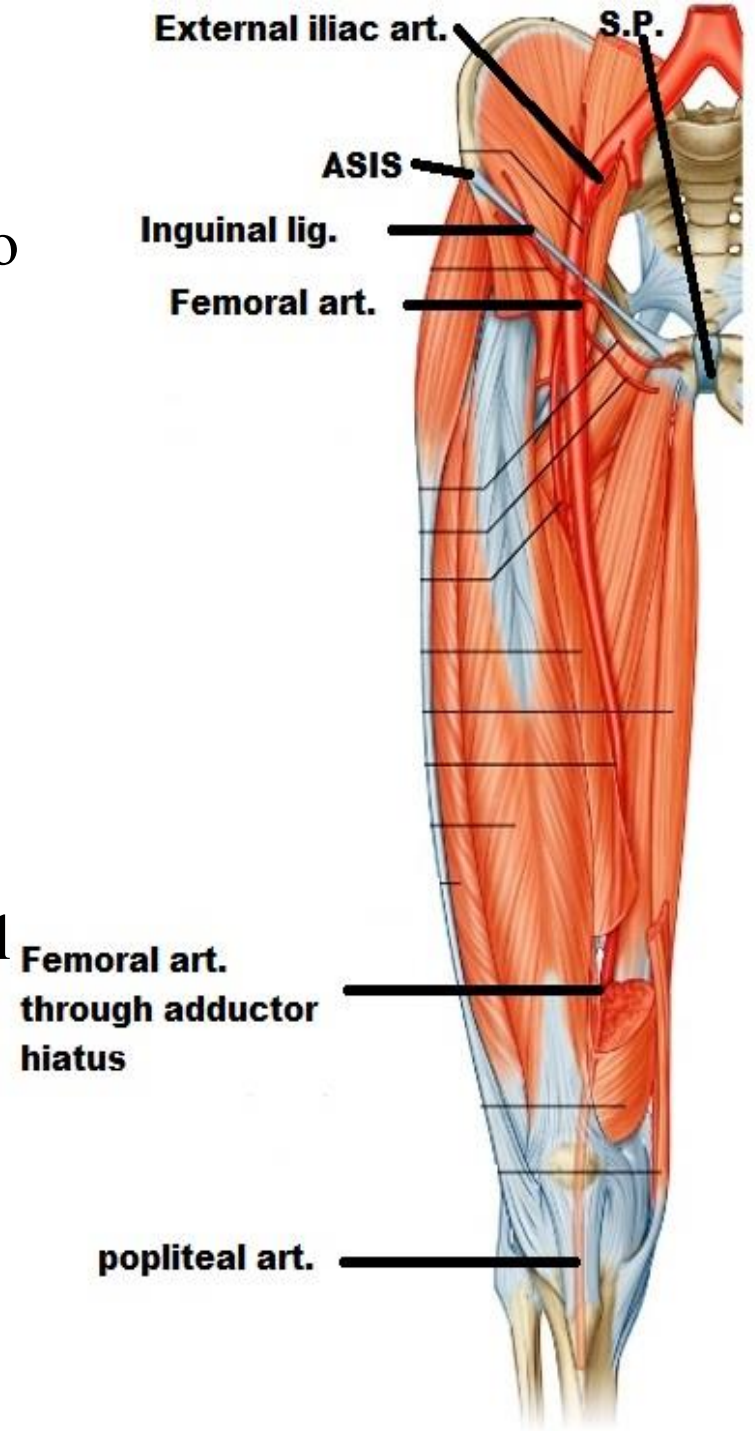
descend vertically

-upper part (superficial) in femoral Δ from base to apex

-lower part (deep) in adductor canal From upper end to lower end

End: -

at adductor opening (hiatus) to continue as popliteal art.



FEMORAL ARTERY

Relations:

medial: Femoral V.

Lateral:- Femoral n.

-saphenous n.,

-nerve to vastus medialis

superficial (ant.) -skin

-superficial fascia

-deep fascia

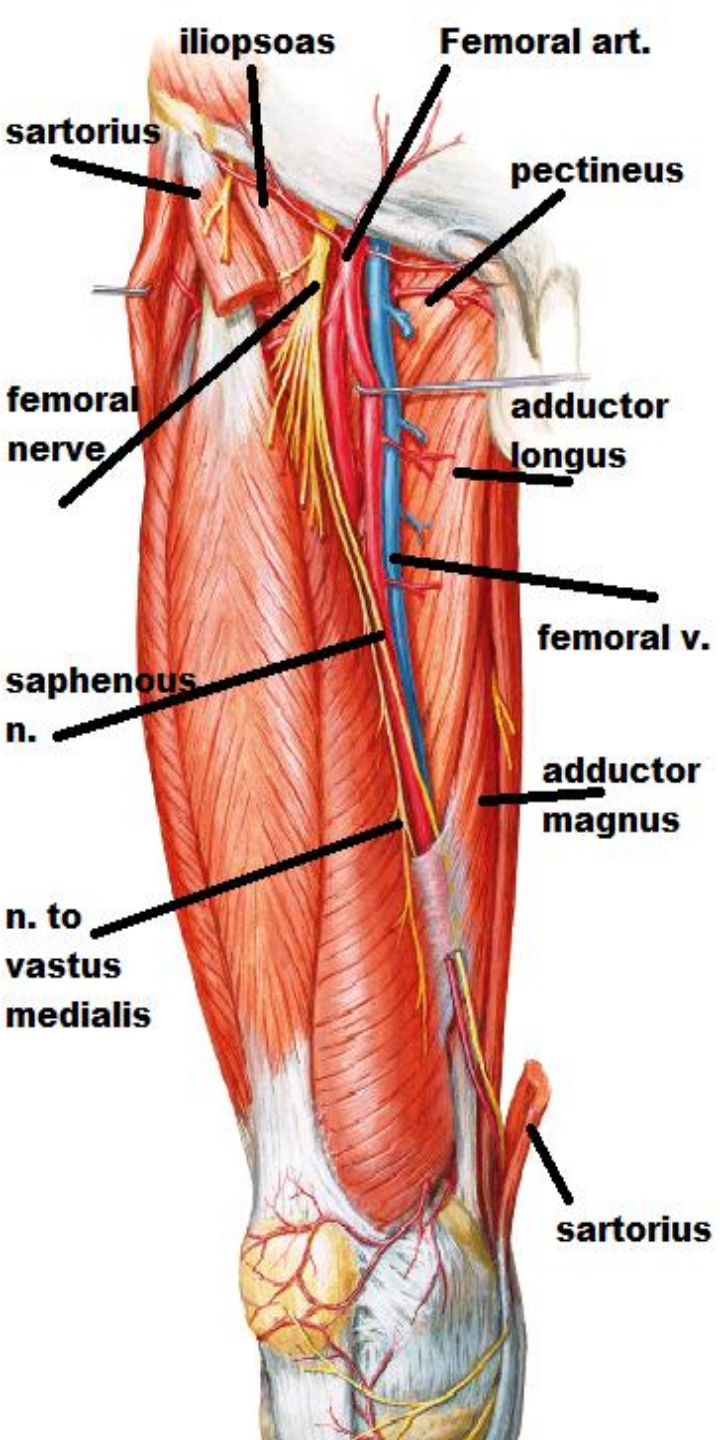
-Sartorius

deep (post.)

-iliopsoas separates it from hip joint

-pectineus: with profunda femoris in between

-adductor longus -Adductor magnus



FEMORAL ARTERY

Branches :

Superficial brs:(Superf. inguinal arteries)

1-superficial circumflex iliac :

to anastomose around ASIS

2-superficial epigastric :

cross the inguinal ligament to enter the ant. abd. Wall till umbilicus

3-superficial ext. pudendal :

to ext. genitalia (scrotum or labia majora)

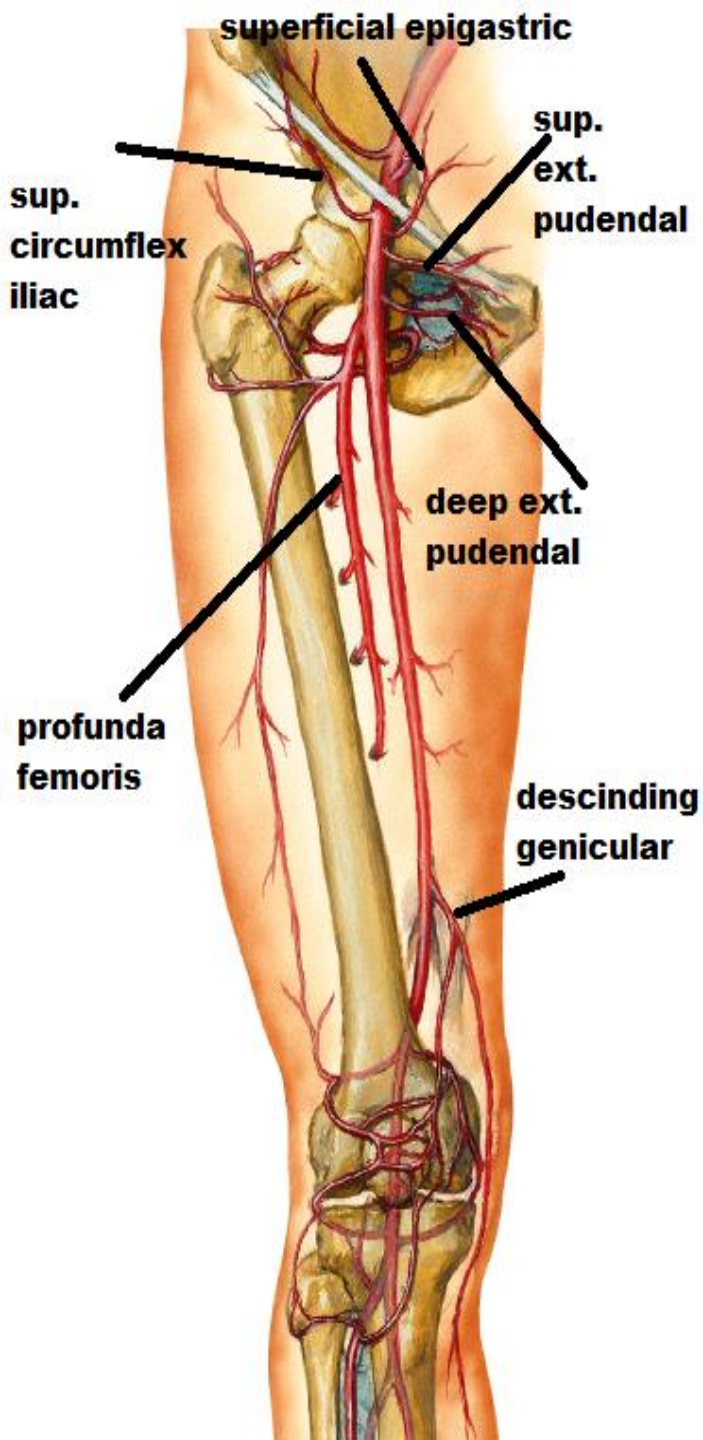
Deep brs:

4-deep ext. pudendal :

To ext. genitalia

5-descending genicular :

Only br. of femoral art. Inside adductor canal.it ends by sharing in anastomosis around knee



FEMORAL ARTERY

Branches :

Deep brs:

6-Profunda femoris art (the art. To thigh)

O.:- lateral side of femoral art

4 cm below ing. lig.

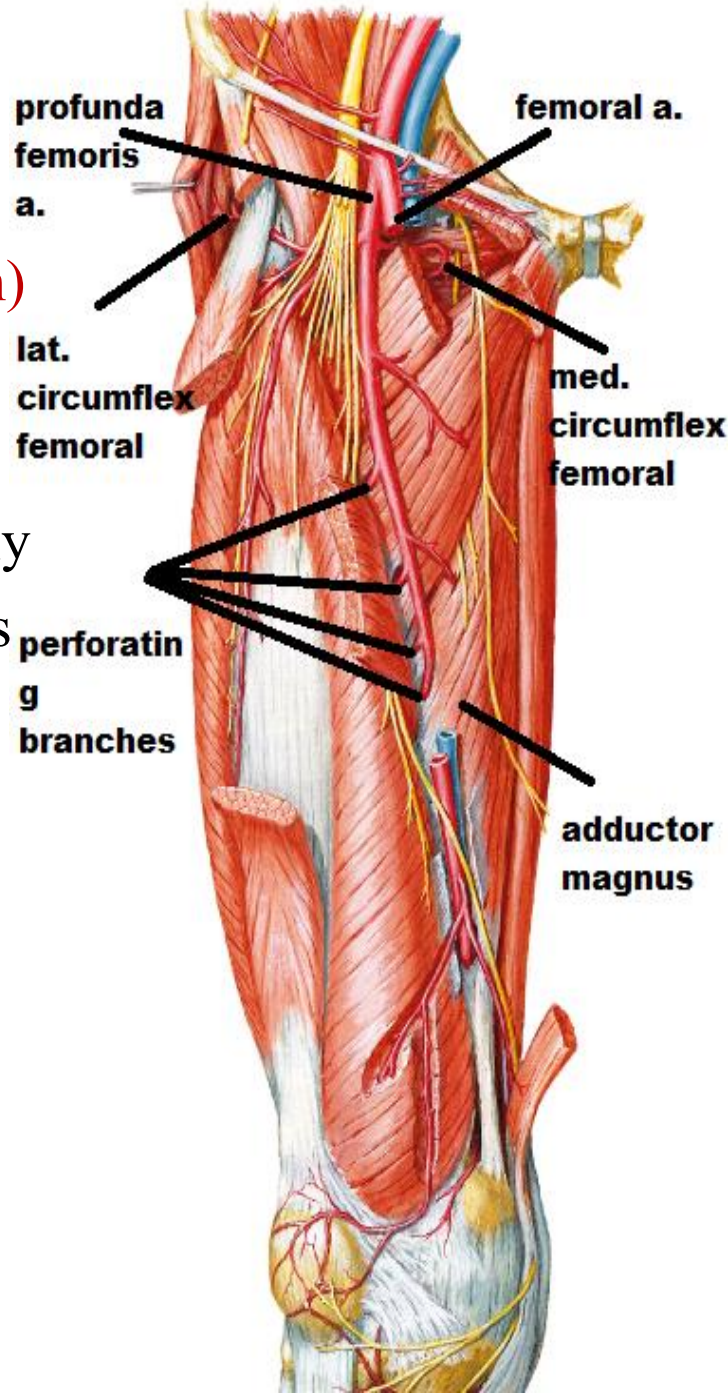
C & R:- -descend downward & medially

( ) femoral vessels & pectineus

- ( ) adductor longus & brevis

- then on adductor magnus

E: perforate adductor magnus near its insertion as the 4th perforating art.



FEMORAL ARTERY

Branches :

Deep brs:

6-Profunda femoris art (the art. To thigh)

Branches :

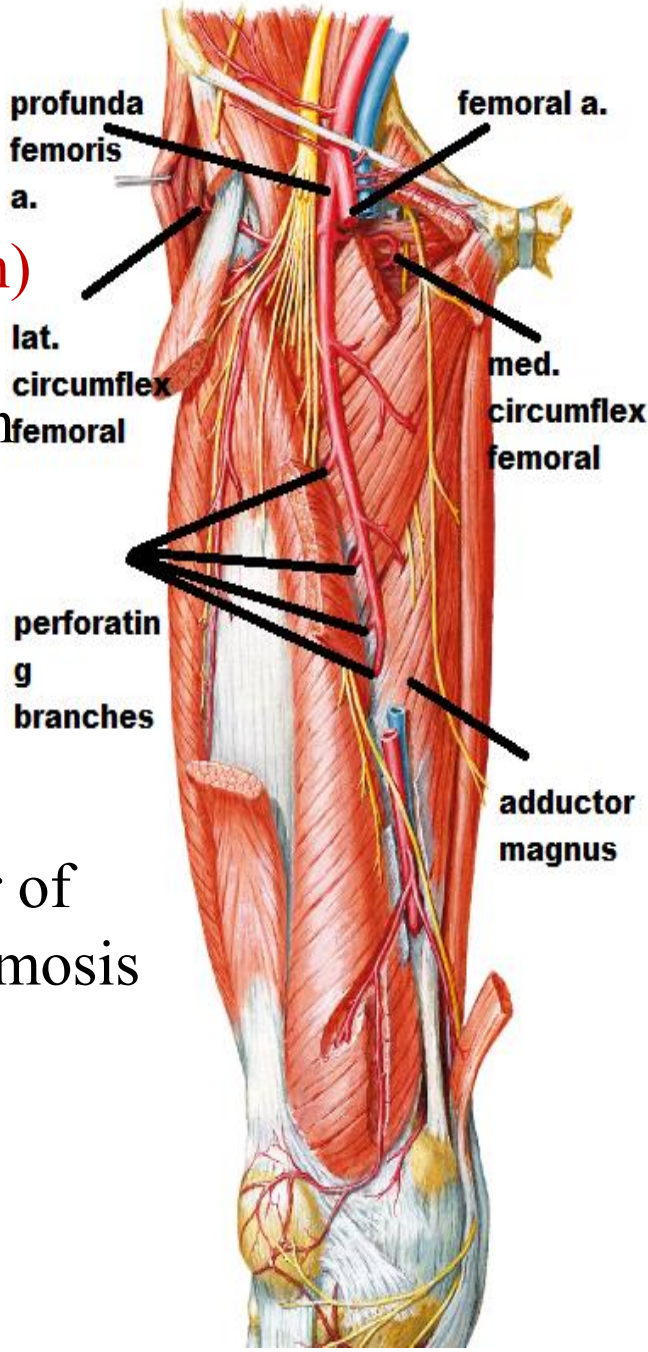
<u>lateral circumflex femoral:-</u> at the origin

•give : 3 brs :

-ascending :ascend to anastomosis around ASIS

-transverse: circle around femur to cruciate anastomosis.

-descending: descend along ant. border of vastus lateralis to anastomosis around knee



FEMORAL ARTERY

Branches :

Deep brs:

6-Profunda femoris art (the art. To thigh)

Branches :

<u>medial circumflex femoral:-</u>at the origin

•give 3 brs :

-acetabular :

-ascending : to trochanteric anastomosis.

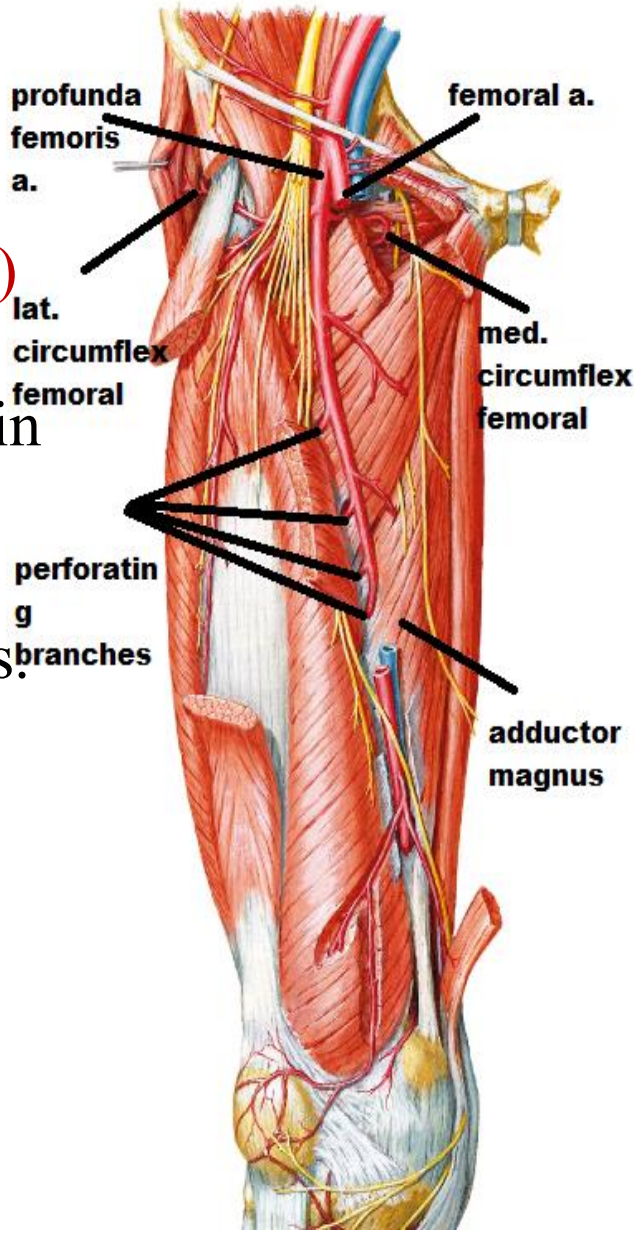
-transverse : to cruciate anastomosis.

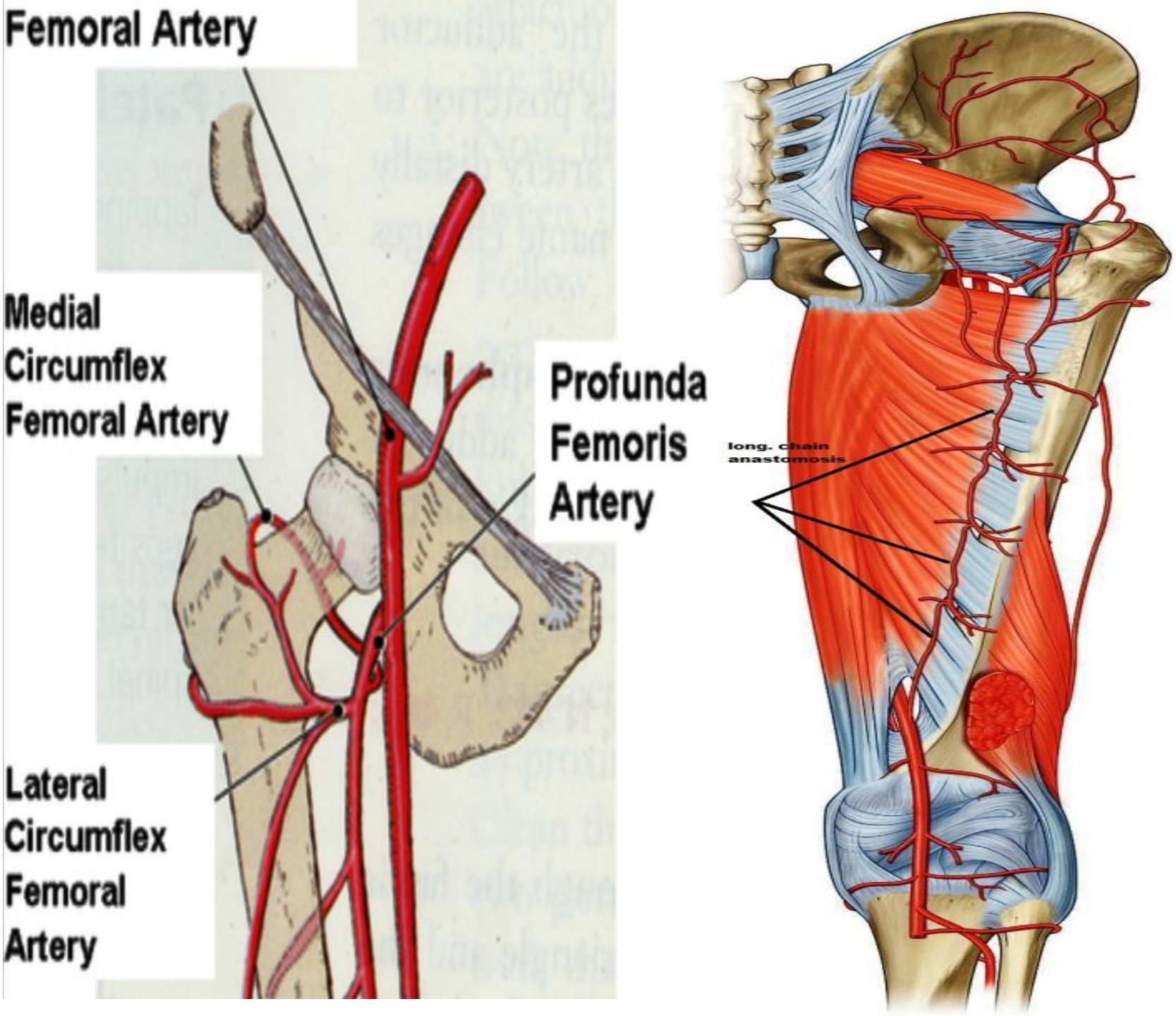
<u>3perforating branches:</u>

Perforate insertion of adductor magnus

The perforating arteries

form longitudinal chain anastomosis to supply back of thigh




Femoral Artery
Medial Circumflex Femoral Artery
Profunda Femoris Artery
Lateral Circumflex Femoral Artery
long. chain anastomosis

FEMORAL ARTERY

Trochanteric anastomosis

-It is the main blood supply to the head of the femur

-formed by Superior, inferior gluteal arteries &

Medial, lateral circumflex femoral arteries

cruciate anastomosis

-Between internal iliac & femoral

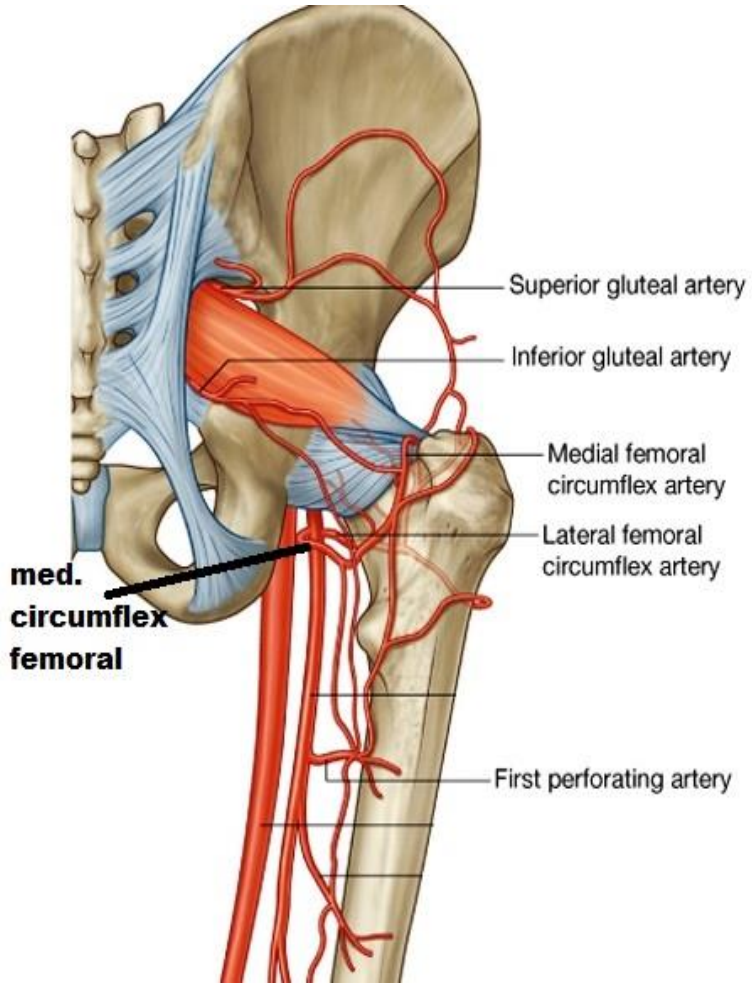
-formed by

1-1st perforator of profunda

2-inferior gluteal

3-Medial circumflex femoral

4-lateral circumflex femoral



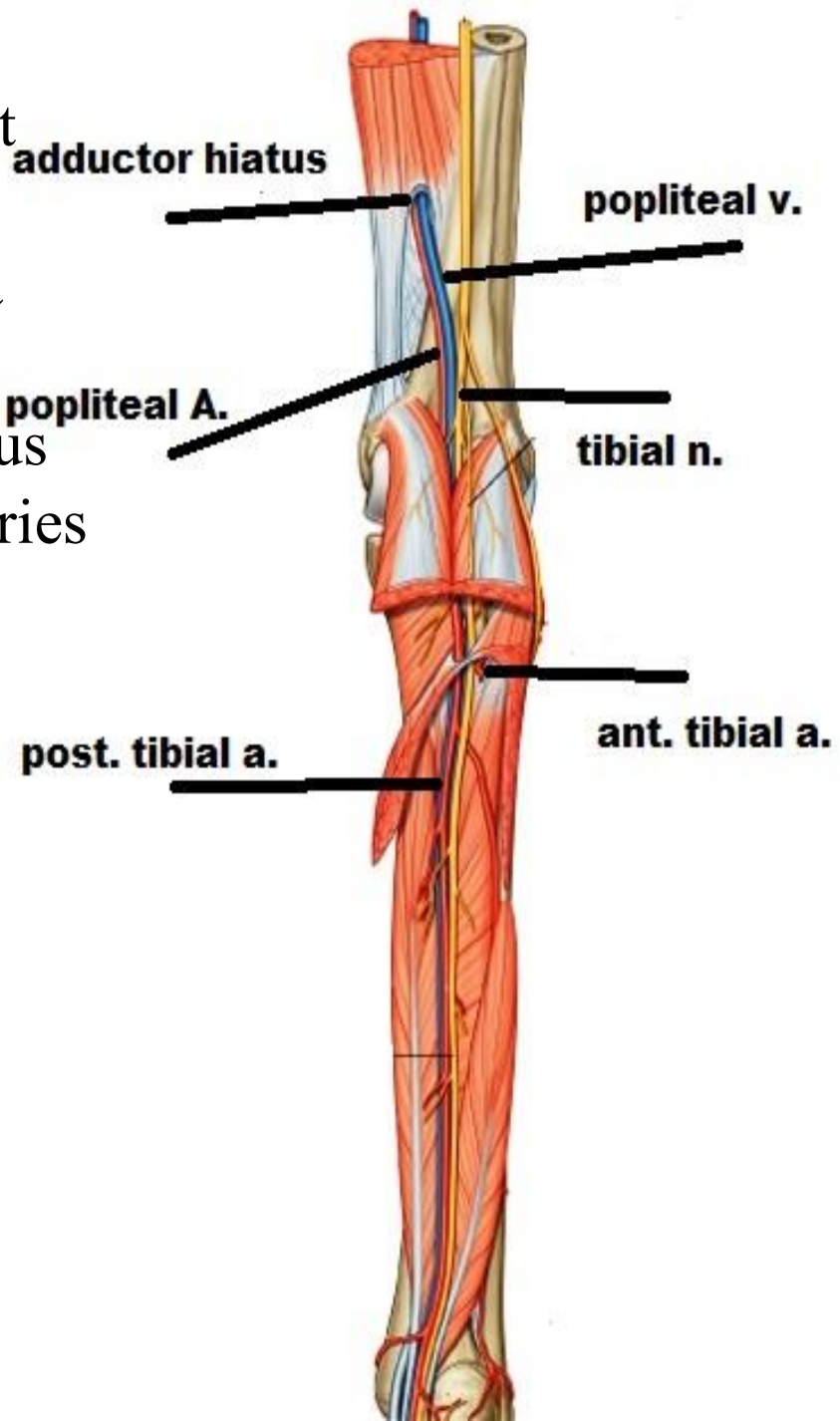
POPLITEAL ARTERY

O : -continuation of femoral art
-at adductor opening

C. : descends in popliteal fossa
as deepest structure

E. : -at lower border of popliteus
-give ant. &post tibial arteries

R.:
crossing over
popliteal surface of femur
capsule of knee joint
popliteus muscle
- crossed superficially by
popliteal v & tibial n
fasciae & skin
-separated from the tibial n
by popliteal v



POPLITEAL ARTERY

branches :

A-muscular brs : to near muscles

B-genicular brs : 5

superomedial , superoLateral

inferomedial , inferolateral

middle

they share in anastomosis

around knee joint

anastomosis around knee

descending genicular (femoral)

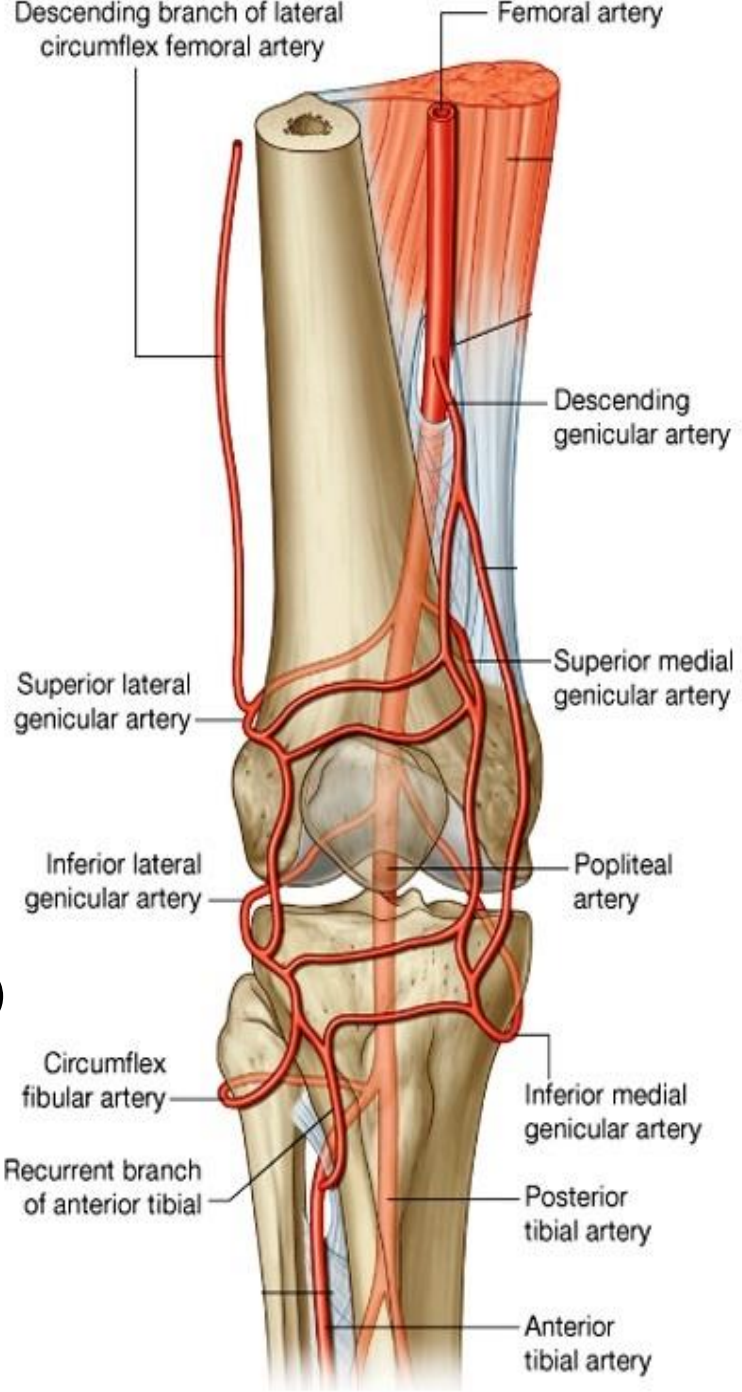
br of lateral cir femoral (profunda)

5 genicular branches (popliteal)

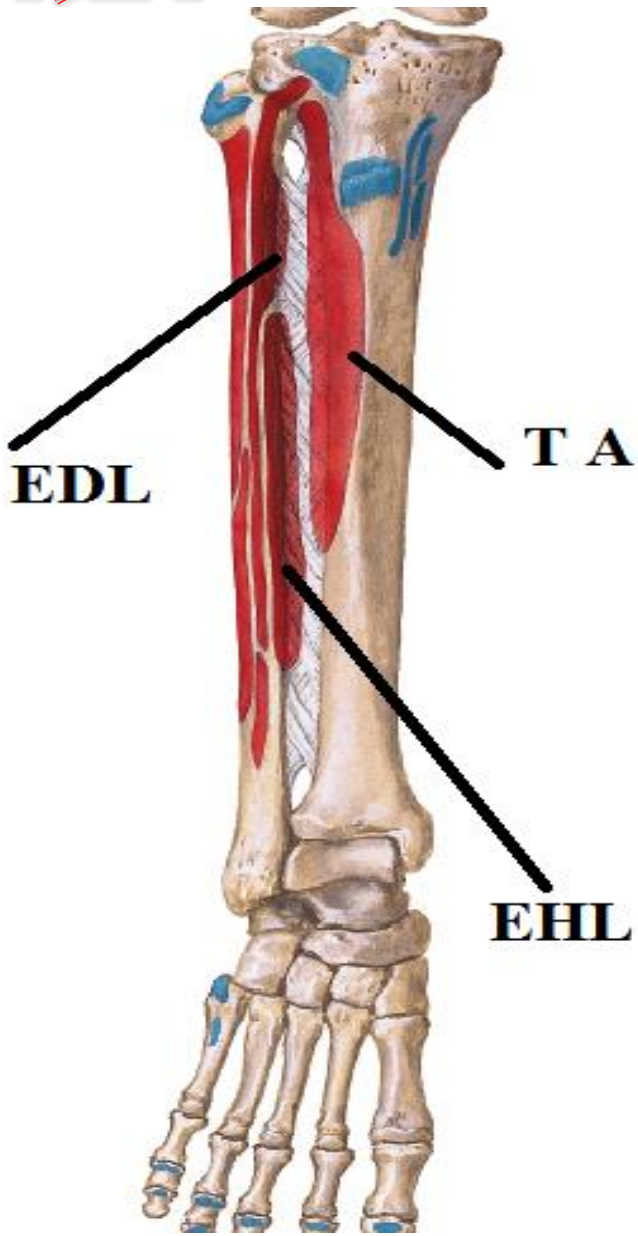
ant. & post. tibial recurrent

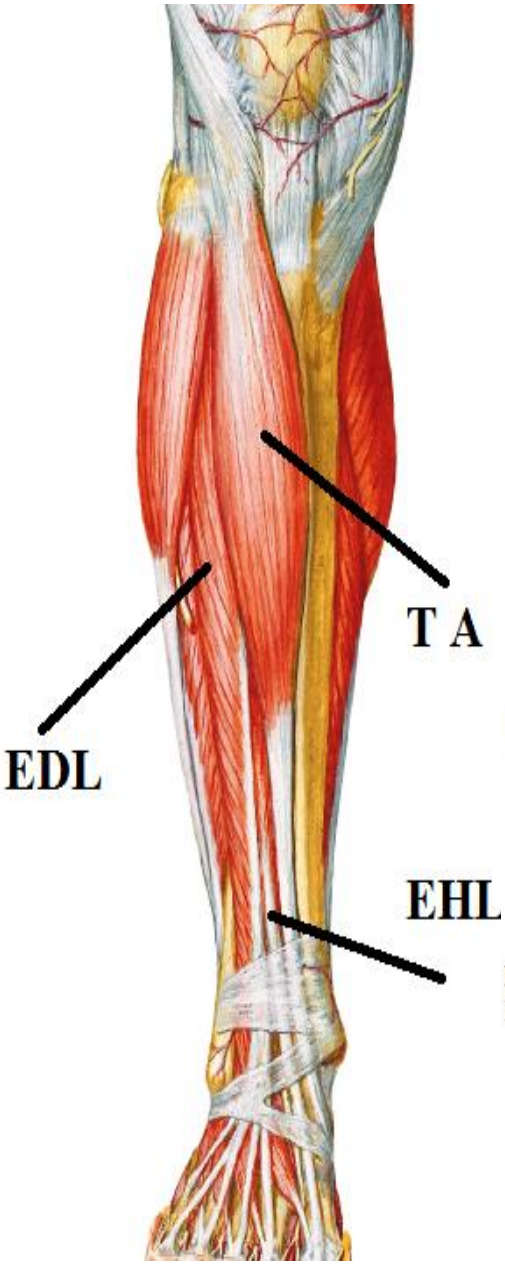
(ant. tibial)

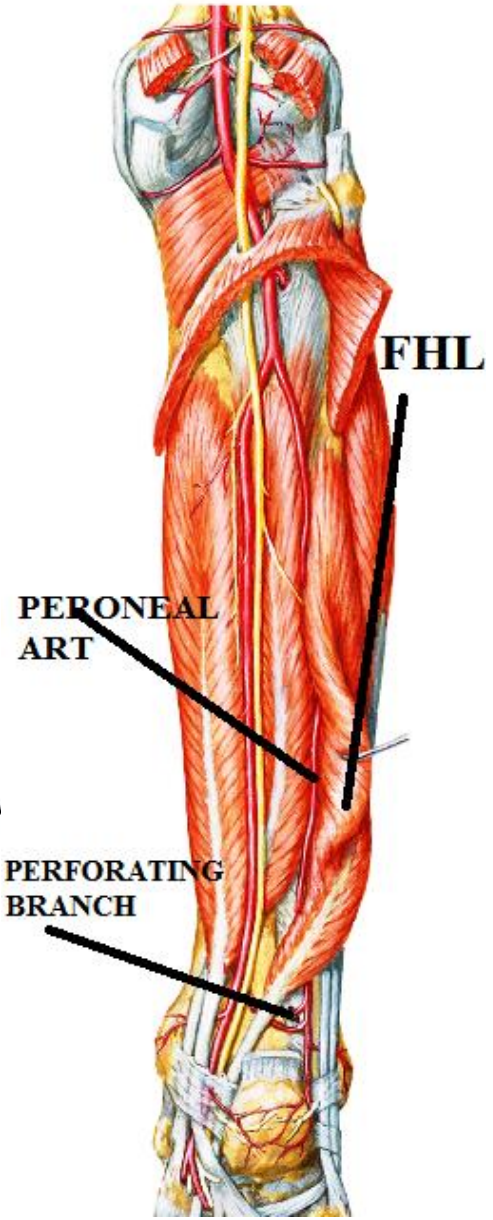
circumflex fibular (post. tibial)



REV







ANT. TIBIAL ARTERY

O. : - smaller terminal br. of popliteal art.

- at lower border of popliteus

C. & R.:

- at first it lies in post. compartment of leg

then pass forward through opening in upper part of interosseous membrane to enter ant. compartment.

- descends in front of interosseous membrane

( ) tibialis ant. & ext. digit. Longus then

( ) tibialis ant. & ext. hallucis longus then

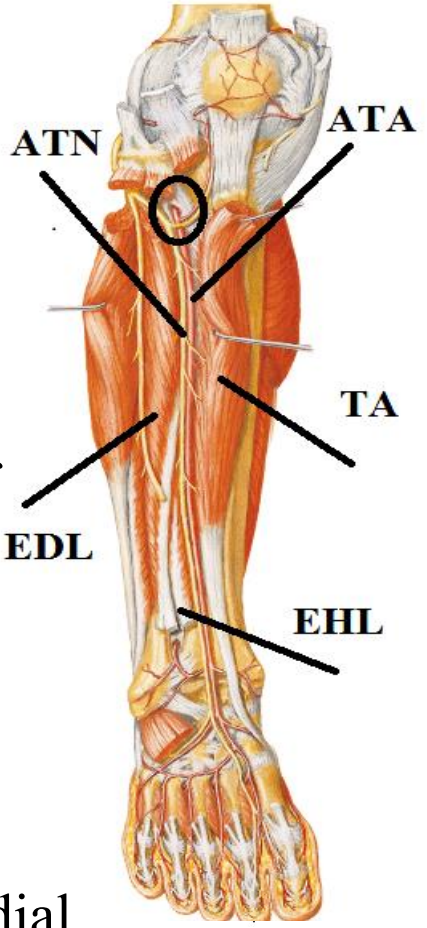
crossed by ext. hallucis longus from lateral to medial

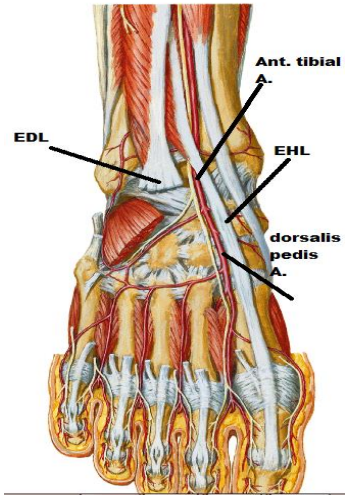
- descend in front of tibia

( ) tendons of ext. hallucis longus(medially)

& ext. digit. Longus (laterally)

- along its course it is accompanied by ant. tibial n.





ANT. TIBIAL ARTERY

E: -midway ( ) 2 malleoli,

to be dorsalis pedis art.

branches :

-muscular :

to muscles of ant. compartment

- post. tibial recurrent:

-ant. tibial recurrent:

both brs share in

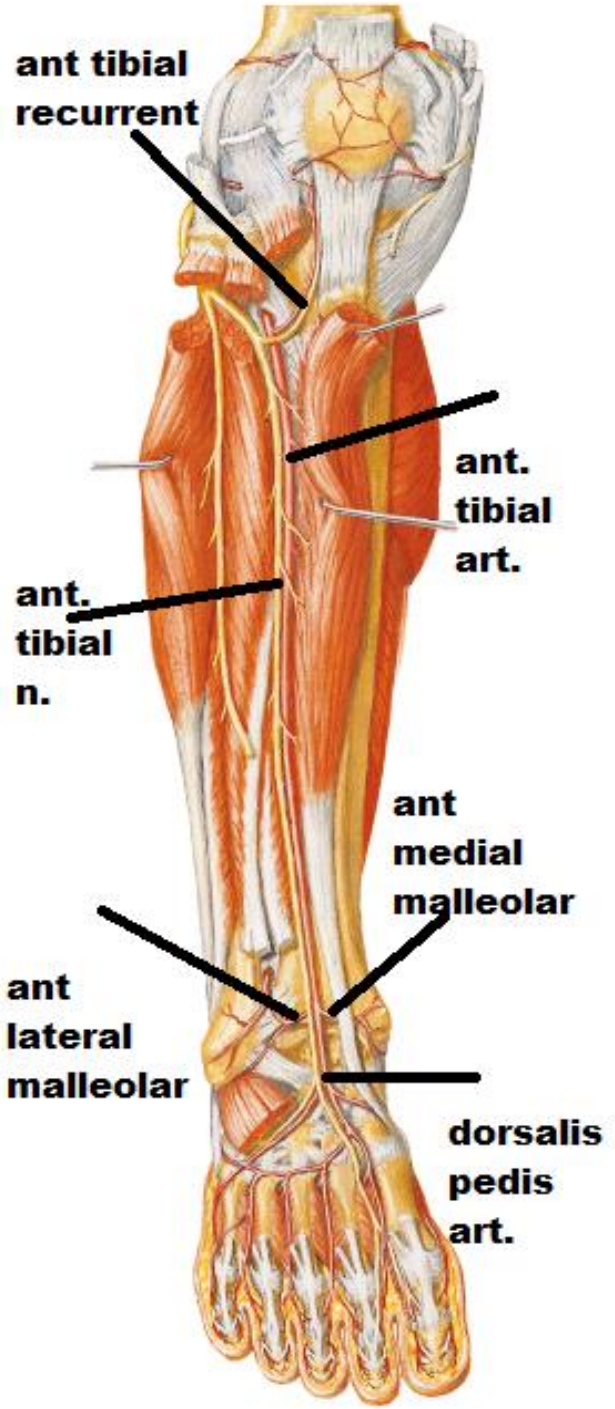
anastomosis around knee

-ant. medial malleolar

-ant. lateral malleolar

both share in

anastomosis around ankle



DORSALIS PEDIS ARTERY

O : -midway ( ) 2 malleoli

as continuation of ant. tibial art

C.& R.:

- run forward on dorsum of foot in line with 1st interdigital cleft
- Then downward ( ) 2 heads of 1st dorsal interosseous to enter sole

E. : - in sole

- anastomose with plantar arch

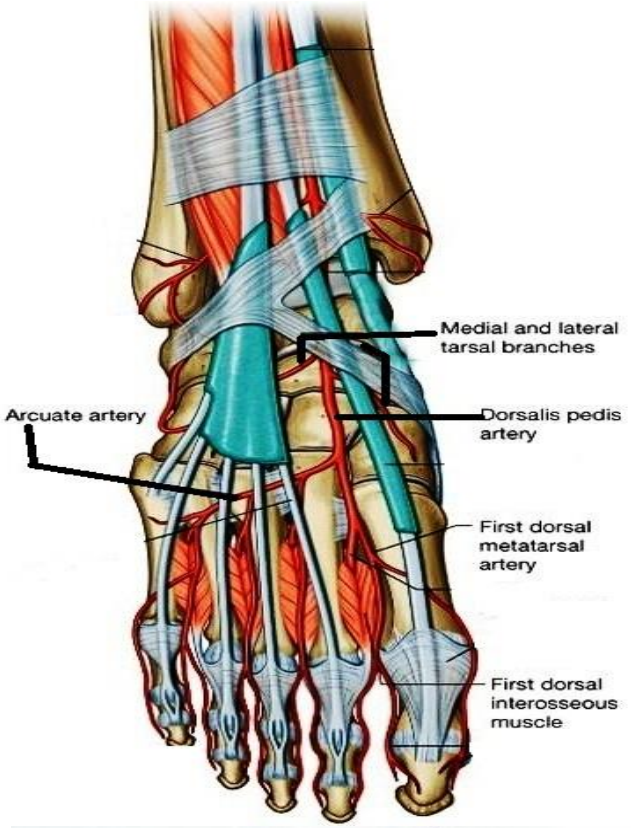
branches :

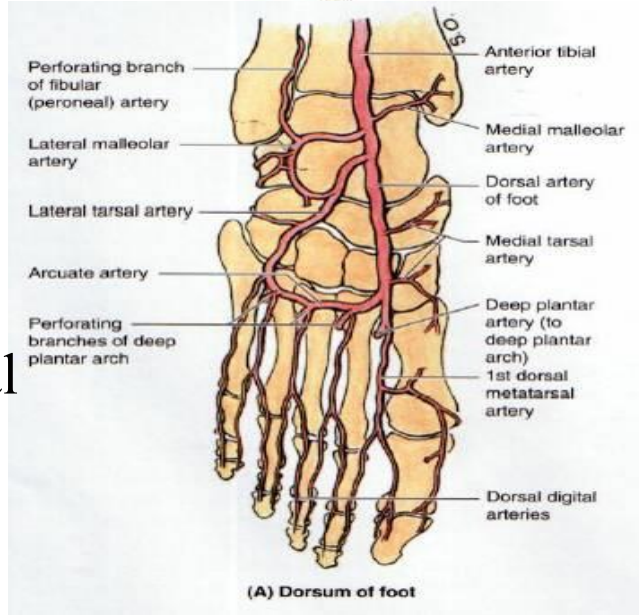
1- medial & lateral tarsal

2- 1st dorsal metatarsal

3- Arcuate → 2nd, 3rd, 4th dorsal metatarsal

4- 1st plantar metatarsal.





POSTERIOR TIBIAL ARTERY

O. : -larger terminal branch of popliteal art

-at lower border of popliteus.

-It supplies post. &lateral compartments of leg

C. & R. :

- descends in posterior compartment of the leg

accompanied by posterior tibial nerve

- **in upper part of leg**

descends vertically ( ) soleus & tibialis post.

- **in lower part of leg**

the art. become superficial covered by skin, fascia**e**

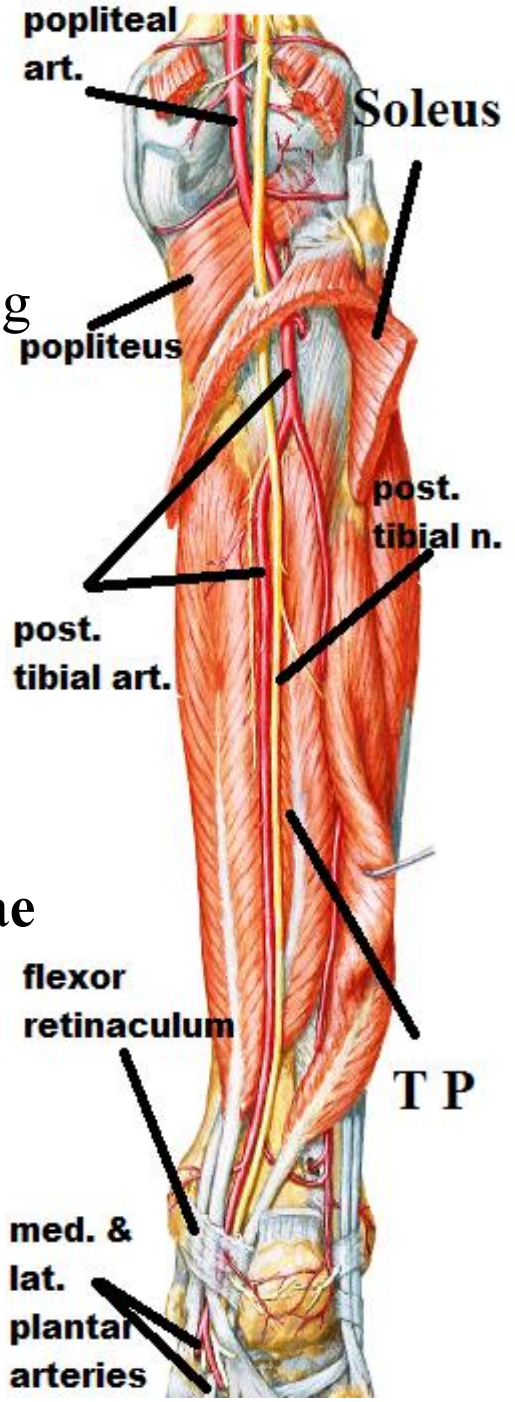
lying on back of lower end of tibia

& capsule of ankle

E : -deep to flexor retinaculum

(behind medial malleolus) (pulsation felt)

-give medial & lateral plantar arteries



POSTERIOR TIBIAL ARTERY

branches :

1-circumflex fibular:-

share in anastomosis around knee

2-peroneal art. :

The largest & longest branch

that supply lateral compartment

3-terminal brs :

medial & lateral plantar arteries

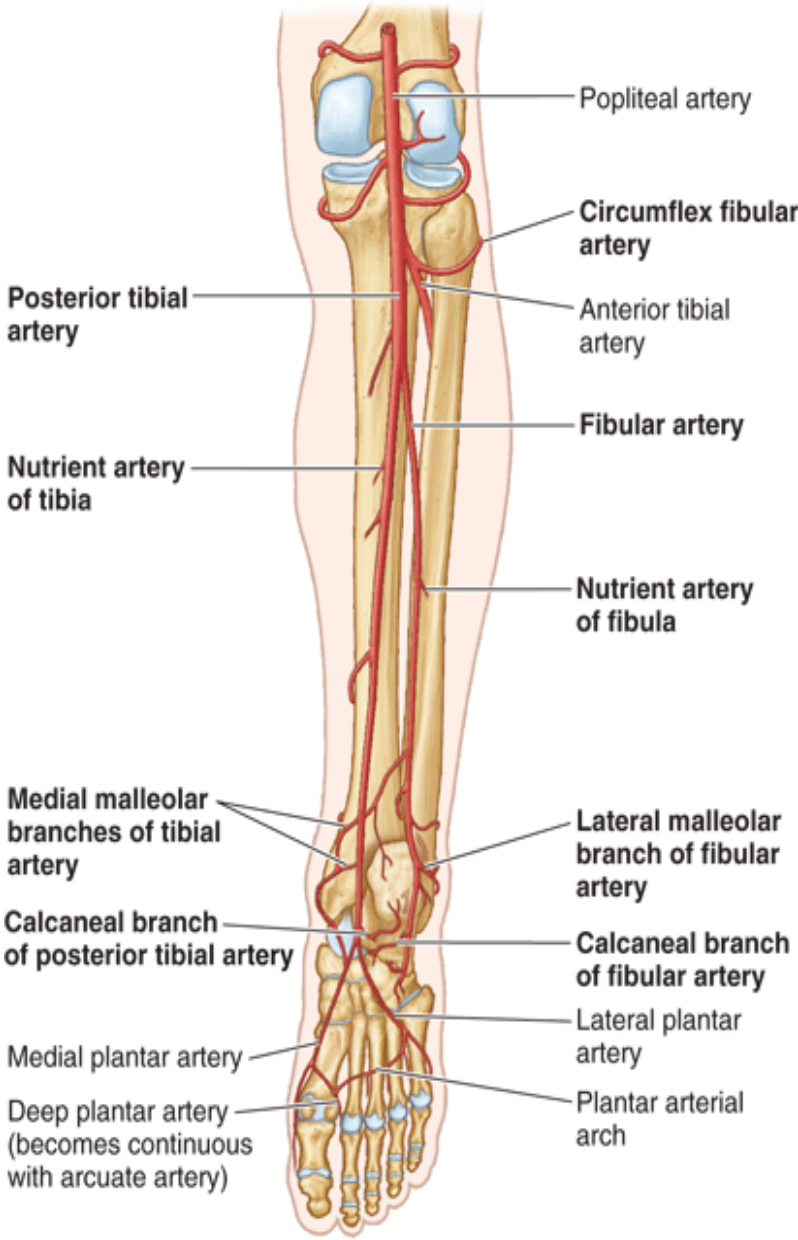
4-muscular brs :

to muscles of post. compartment

5-nutrient br: to tibia

6-medial calcanian & malleolar brs :

anastomosis around ankle



Posterior view with foot plantar flexed

POSTERIOR TIBIAL ARTERY

Peroneal (fibular) art.:

O : - near to origin of post. tibial art

C : -descend vertically

behind the fibula

close to flexor hallucis longus

brs :

1-perforating br.:

pierce interosseous membrane

to reach ant. Compartment of leg

May replace anterior tibial art.

2-muscular brs :

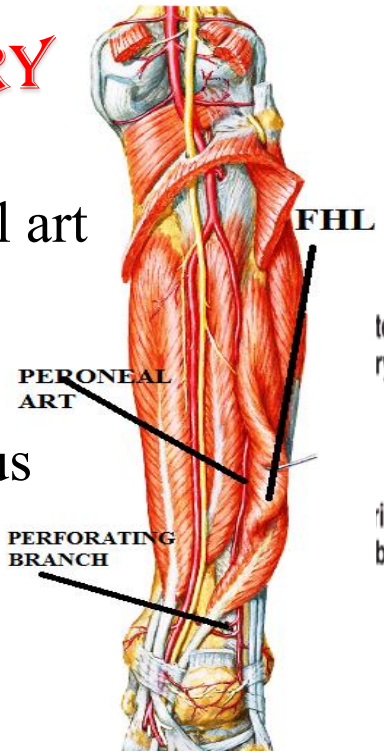
to muscles of

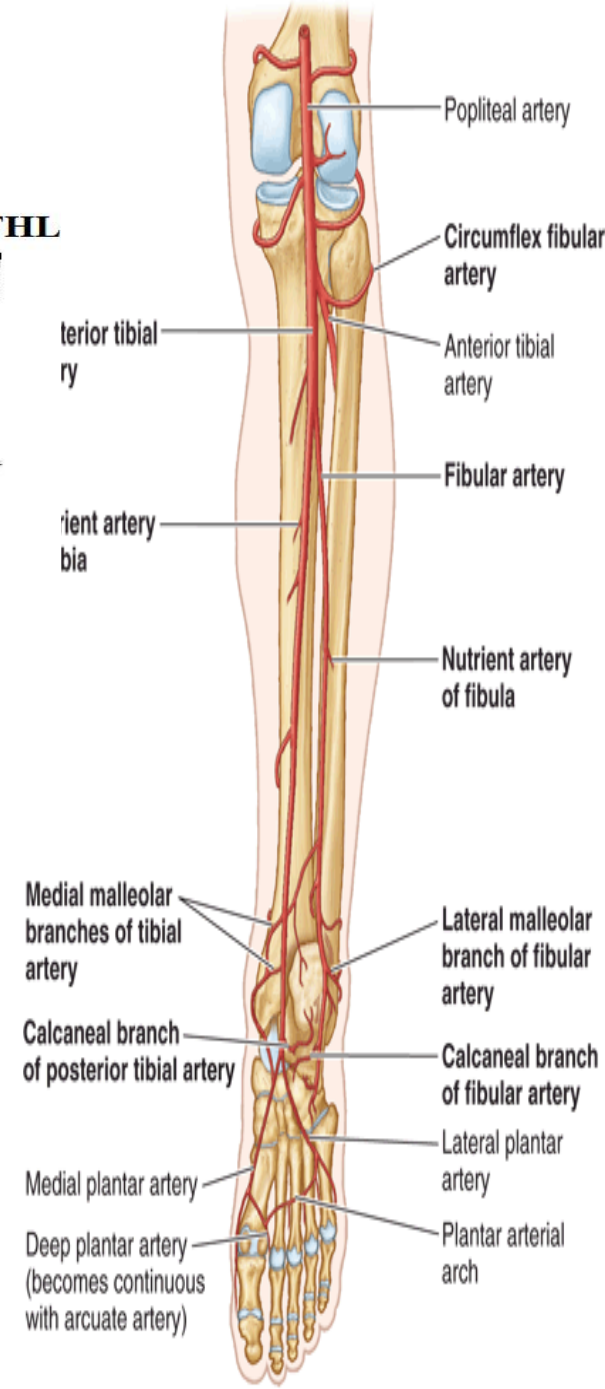
lateral compartment of leg

3-nutrient br. to fibula

4- lateral calcanean &malleolar brs :

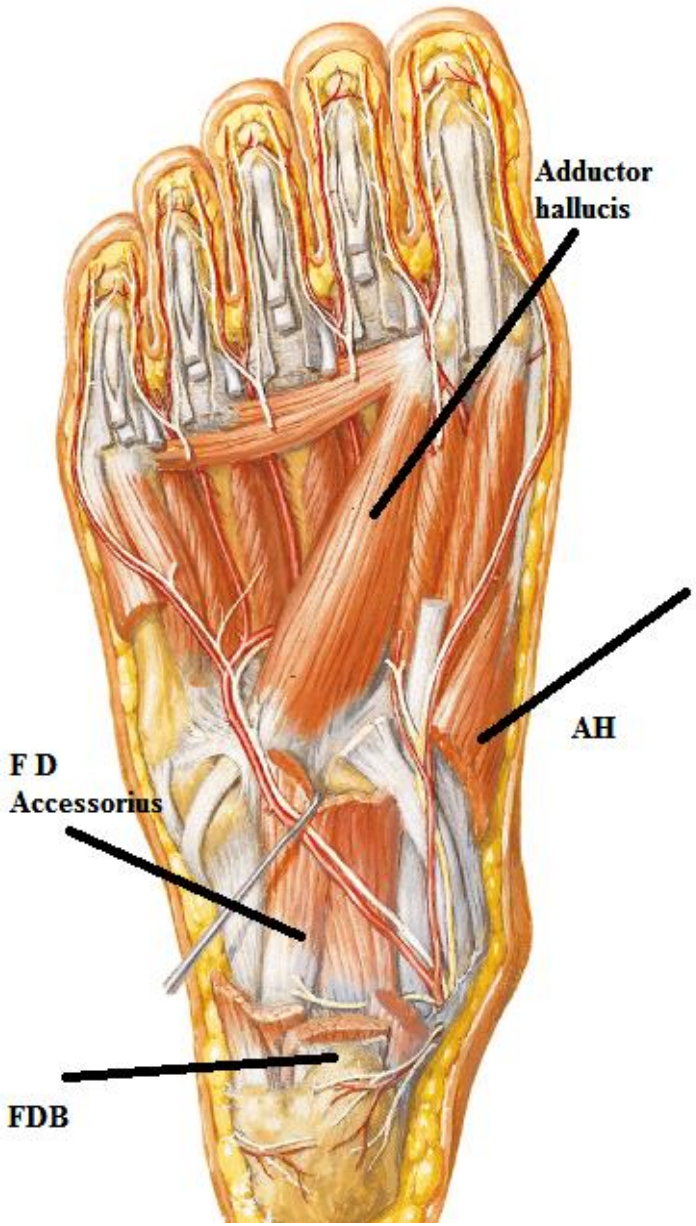
to anastomosis around ankle

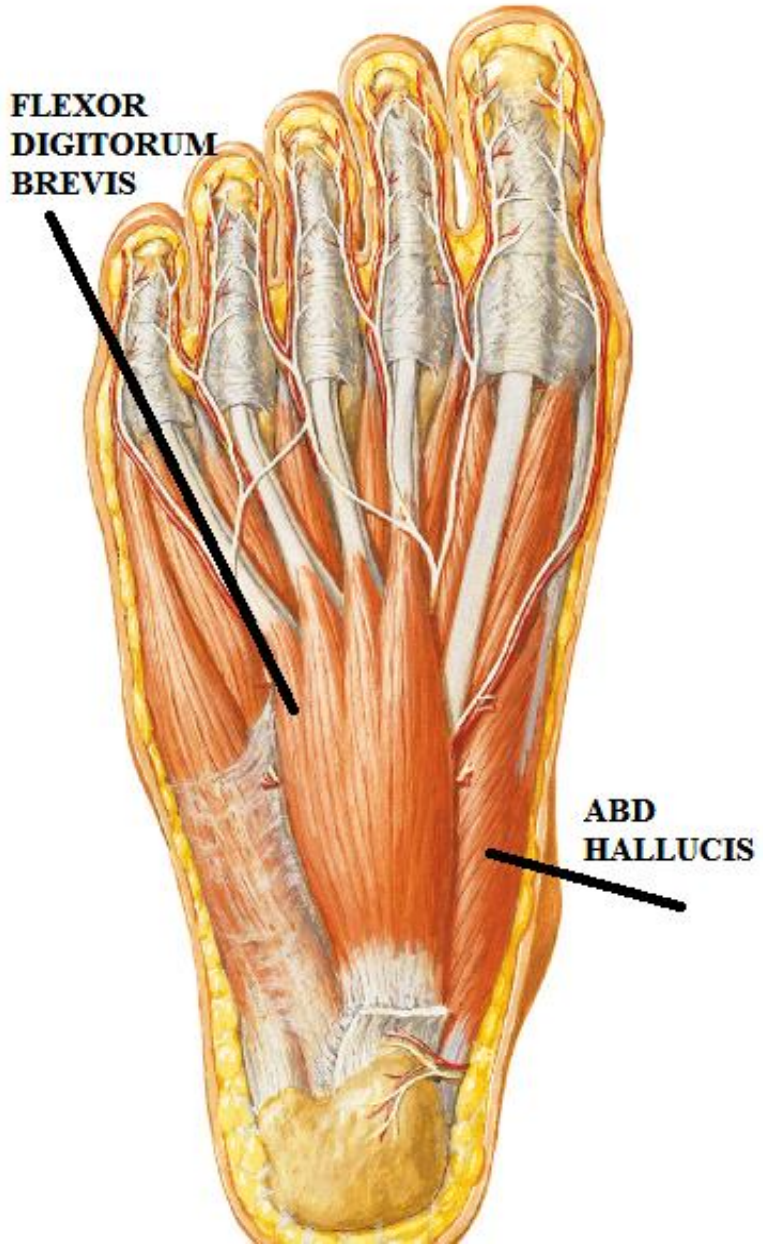




Posterior view with foot plantar flexed

REV.


Adductor hallucis
AH
F D Accessorius
FDB


FLEXOR DIGITORUM BREVIS
ABD HALLUCIS

MEDIAL PLANTAR ARTERY

O: - small terminal br.

of post. tibial art.

-deep to flexor retinaculum

C & r: with medial plantar n.

(The nerve lateral to the artery)

- pass deep to abductor hallucis

- then ( ) it & flexor digi. brevis

E.: by supplying medial side

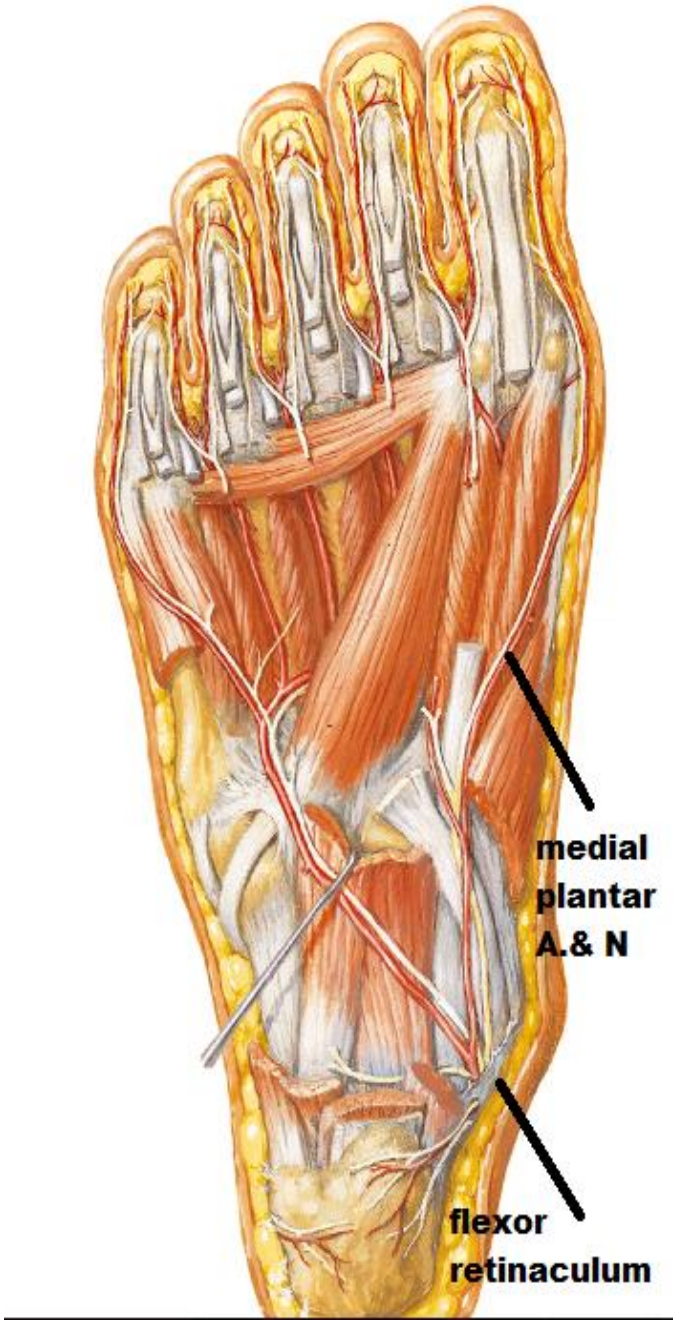
of big toe

Brs:

Cutaneous &

Muscular &

Articular branches:



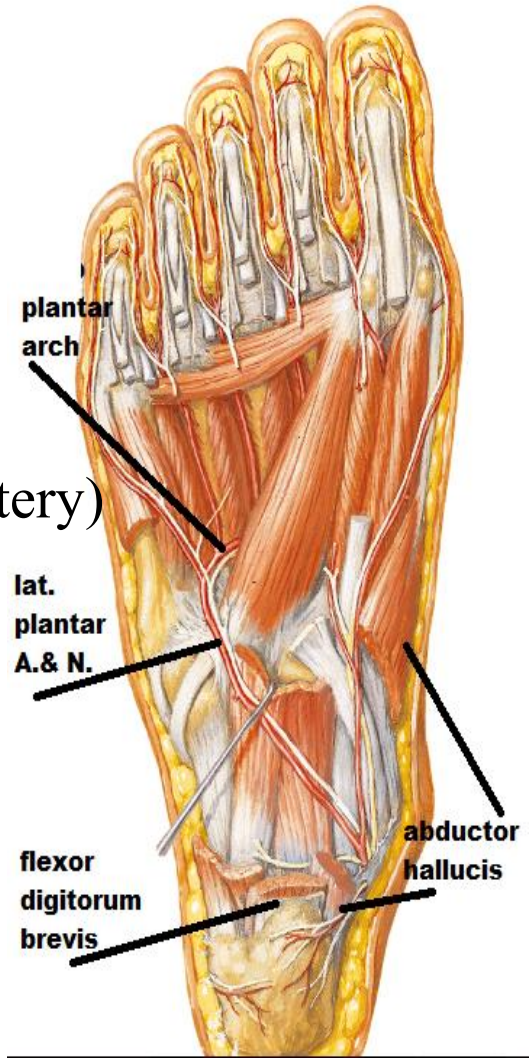
LATERAL PLANTAR ARTERY

O: - large terminal br
of post. tibial art.
-deep to flexor retinaculum

C & r:

With lateral plantar n. (the nerve medial to the artery)
-Pass deep to abductor hallucis.
-then( ) FDB & flexor digitorum accessories
till the base of 5th metatarsal
-At base of 5th metatarsal it curve medially
to form plantar arch
that pass ( ) the 3rd layer (adductor hallucis)
and the 4th layer (tendons of peroneus longus & tibialis post.)

N.B. the deep branch of lateral plantar n. lies in concavity of the plantar arch



LATERAL PLANTAR ARTERY

E.: -at proximal end of 1st intermetatarsal space

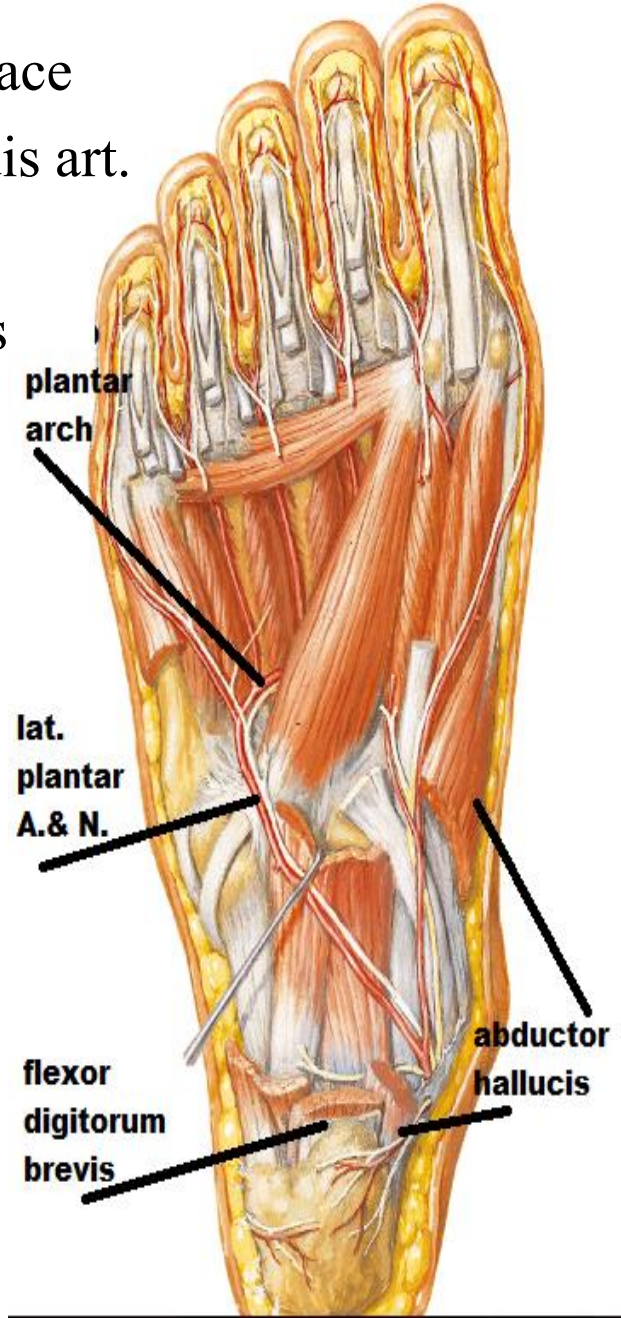
-anastomose with the end of dorsalis pedis art.

brs:

1-cutaneous & muscular & articular branches

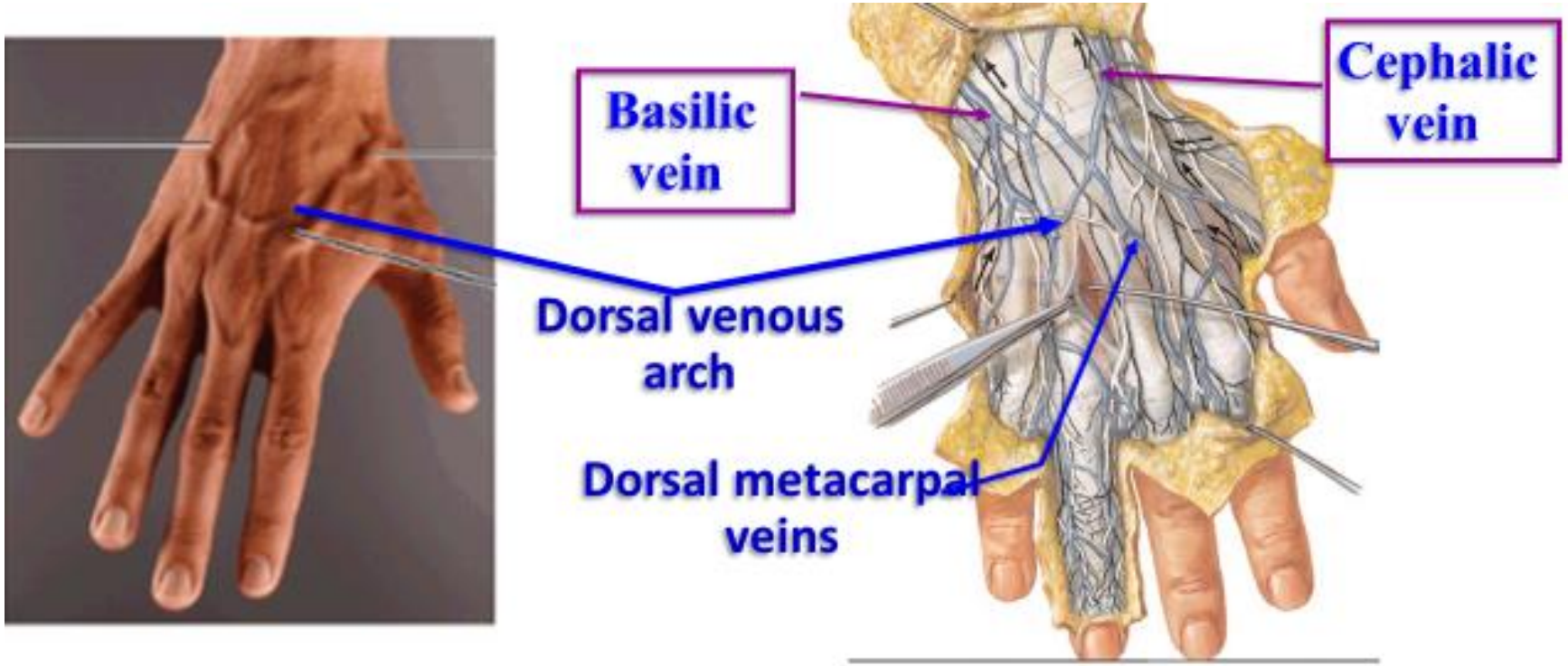
2-The plantar arch give:

plantar digital arteries to toes.



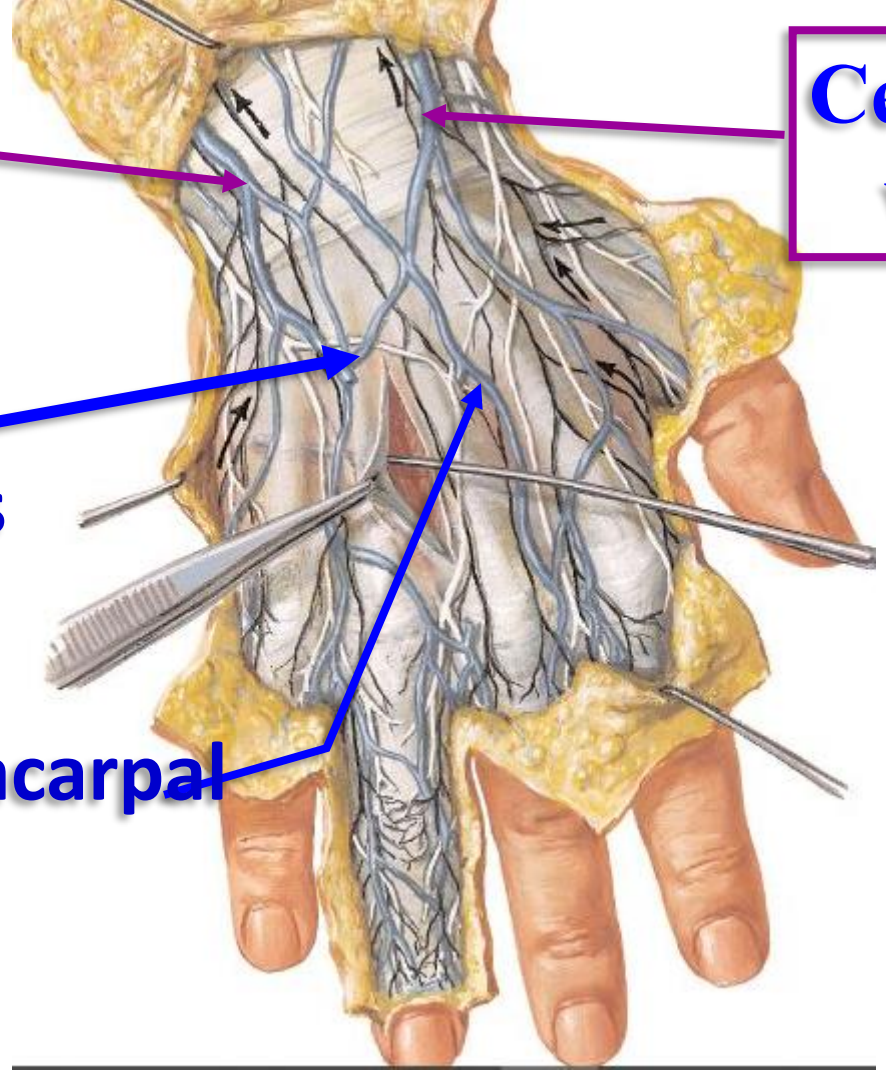
VEINS OF UPPER LIMB

SUPERFICIAL VEINS



- **Dorsal Venous arch**

- This is a venous plexus in the superficial fascia of the dorsum of the hand.
- It receives three dorsal metacarpal veins which are formed by the union of dorsal digital veins from adjacent sides of the fingers.



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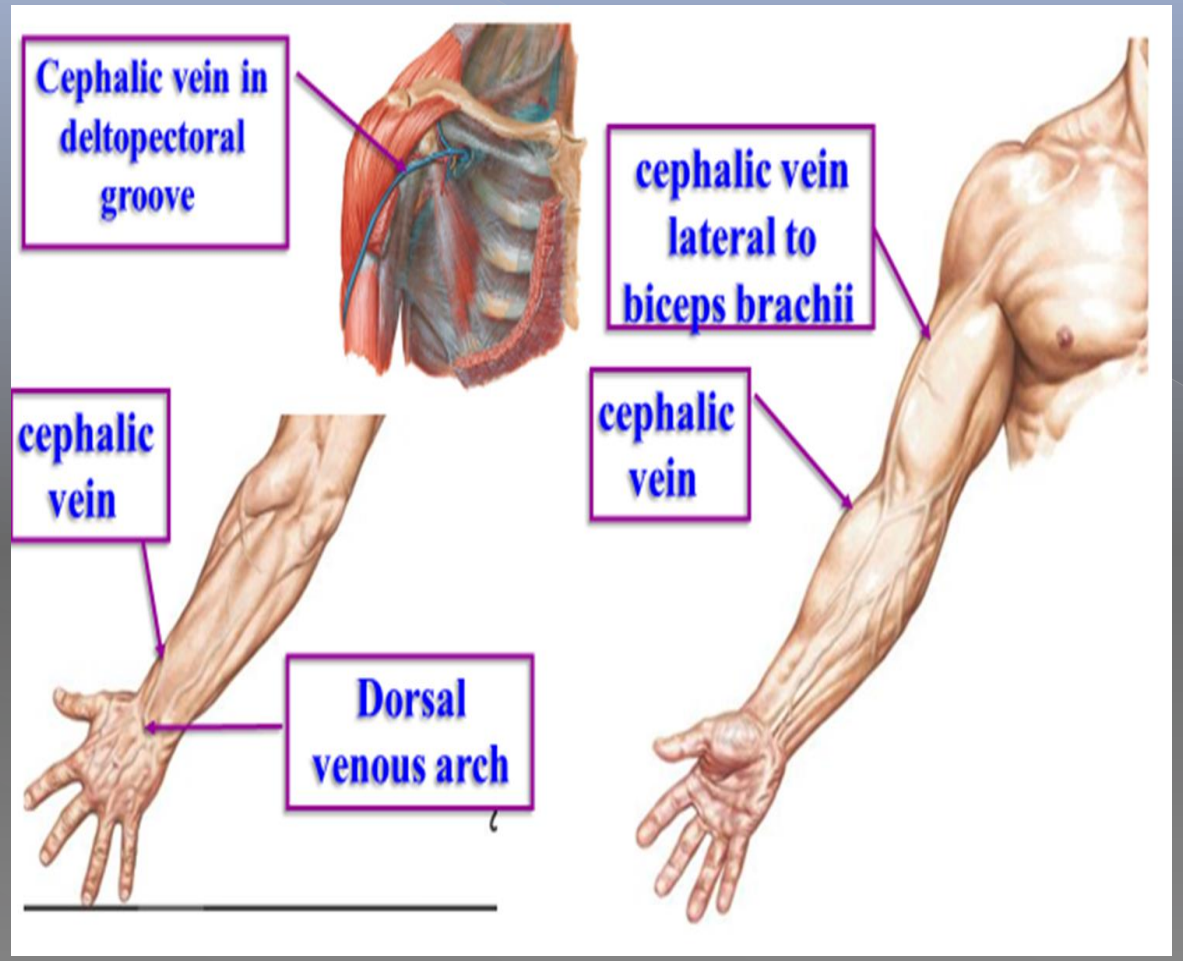


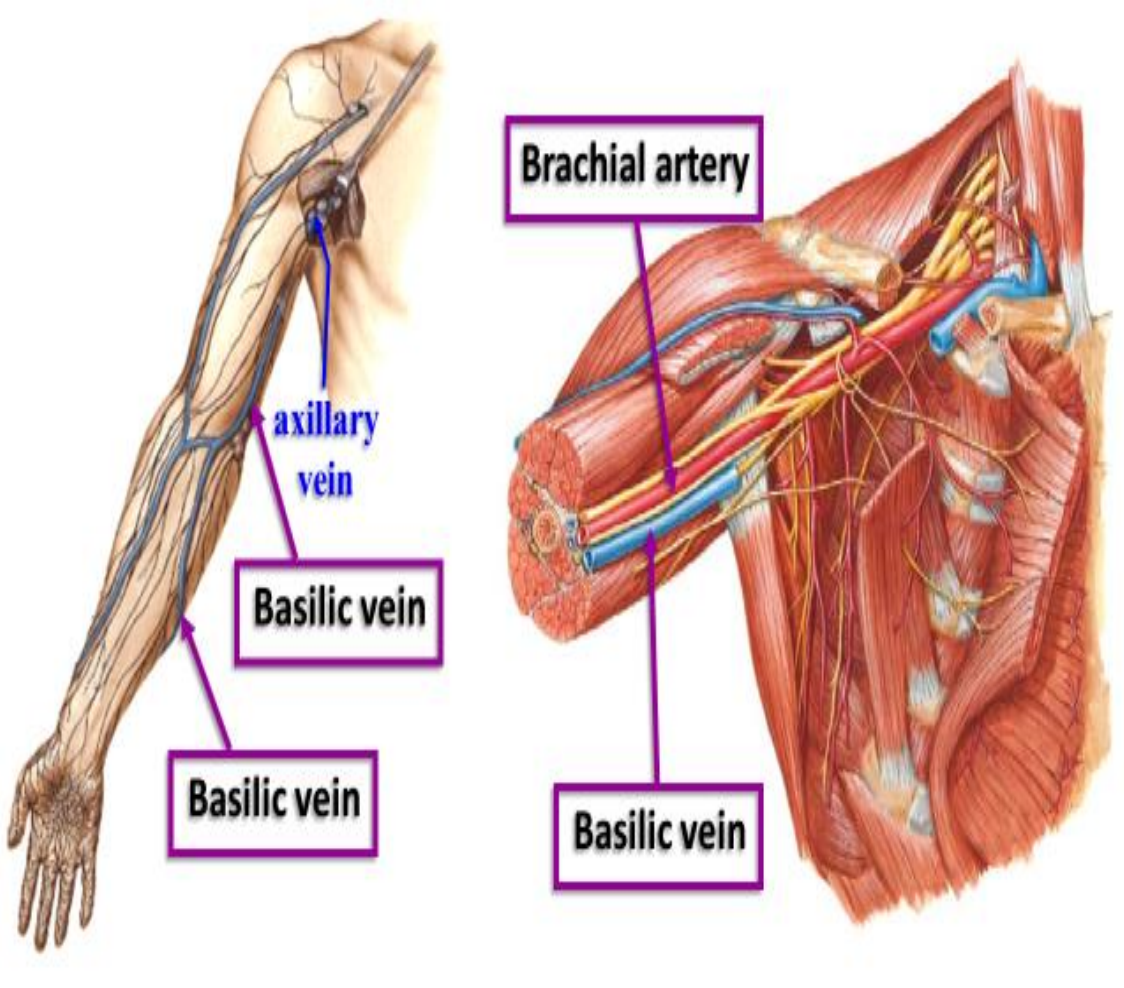
• Cephalic Vein

** Origin; union of the lateral end of the dorsal venous arch with the dorsal digital veins of the radial side of the thumb.

** Course; It is formed over the anatomical snuff-box.

- It curves around the lateral side of the forearm to ascend on the lateral part of the front of the forearm up to the front of the elbow,.
- It ascends close to the lateral side of the biceps brachii muscle.
- It pierces the deep fascia and ascends in the deltopectoral groove.

** Termination; It ends in the upper part of the axillary vein.



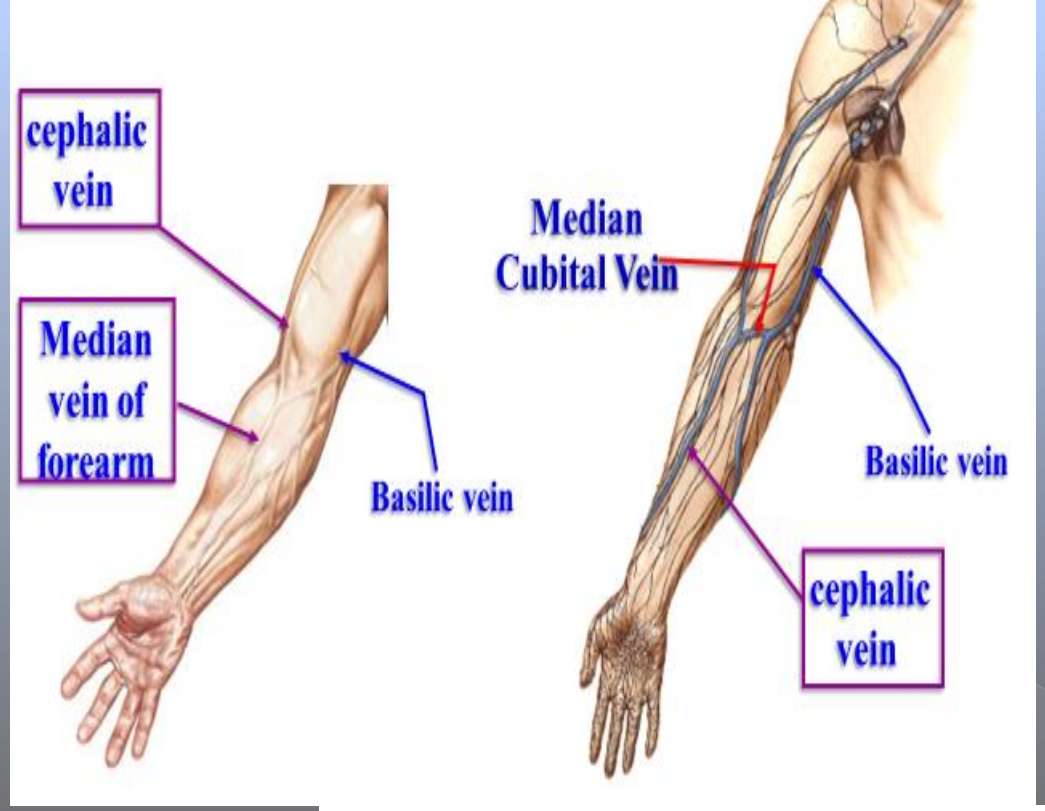
• Basilic Vein

** **Origin;** by the union of the medial end of the dorsal venous arch with the dorsal digital vein of the ulnar side of the little finger.

** **Course;** It ascends along the medial side of the back of the forearm; and near the elbow it inclines forwards to reach the front of the elbow.

- At the insertion of coracobrachialis muscle, it pierces the deep fascia and ascends close to the medial side of the brachial artery.

** **Termination;** it continues up into the axilla as the axillary vein at the lower border of teres major muscle.



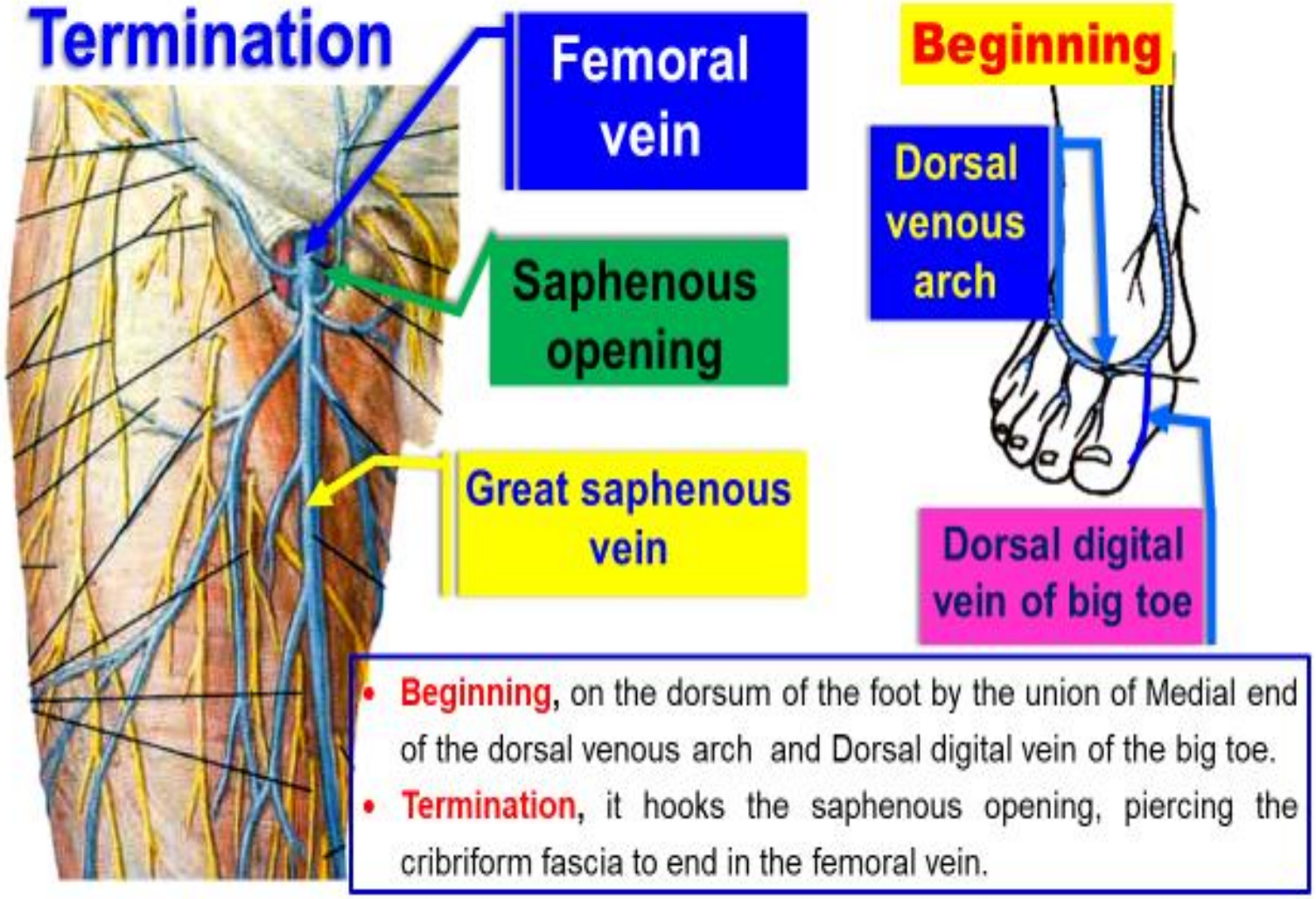
- **Median Cubital Vein**

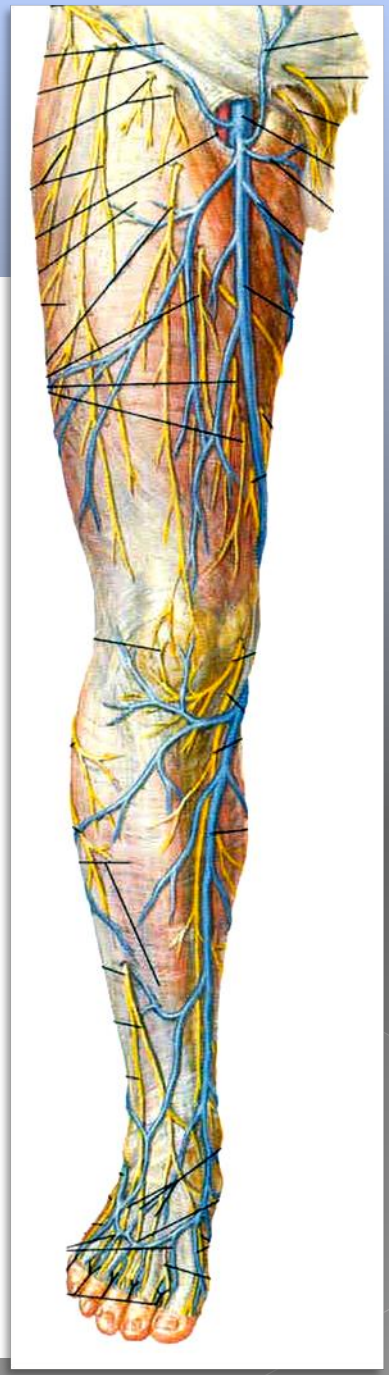
- This is a short oblique vein which lies across the front of the elbow.
- It **arises** from the cephalic vein, it runs upwards and medially to **join** the basilic vein.
- The **bicipital aponeurosis** separates the vein (superficial) from the end of the brachial artery and median nerve (deep).

- **Median Vein of the Forearm**

- This vein is commonly present on the front of the forearm.
- It arises from a superficial venous plexus in the palm and ascends to the front of the forearm.
- At the front of the elbow it joins the median cubital vein or basilic vein.
- But, **commonly** it divides into a **lateral** branch joins the cephalic vein and a **medial** branch joins the basilic vein (**NO Median cubital vein**).

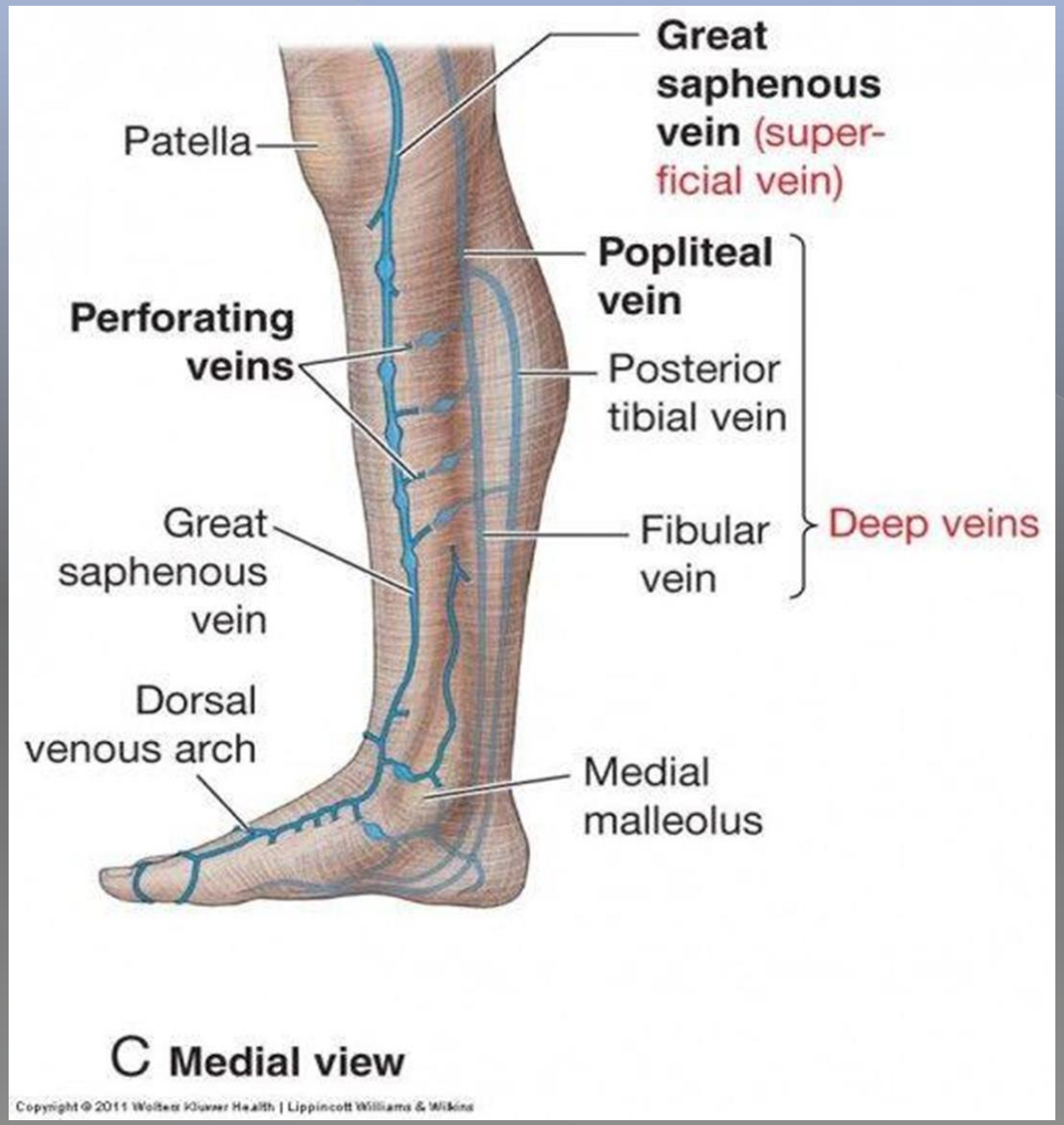
VEINS OF LOWER LIMB
A-Superficial veins





- **saphenous nerve** accompanied it Along its course on the dorsum of foot, infront of the medial malleolus and medial side of the leg,

Tributaries of great saphenous vein



perforating veins connect the **great saphenous vein** with deep veins .

-also it receives:

1- superficial circumflex iliac vein .

2- superficial epigastric vein .

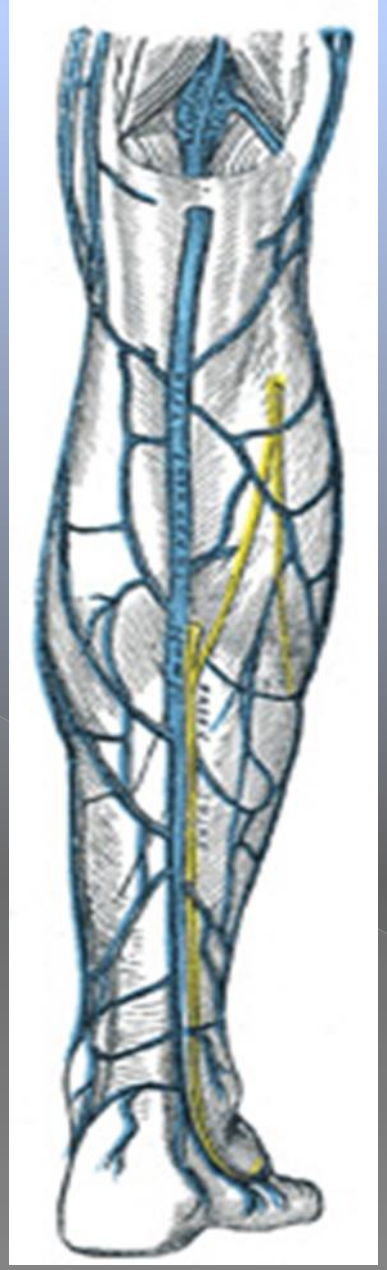
3- superficial external pudendal vein .

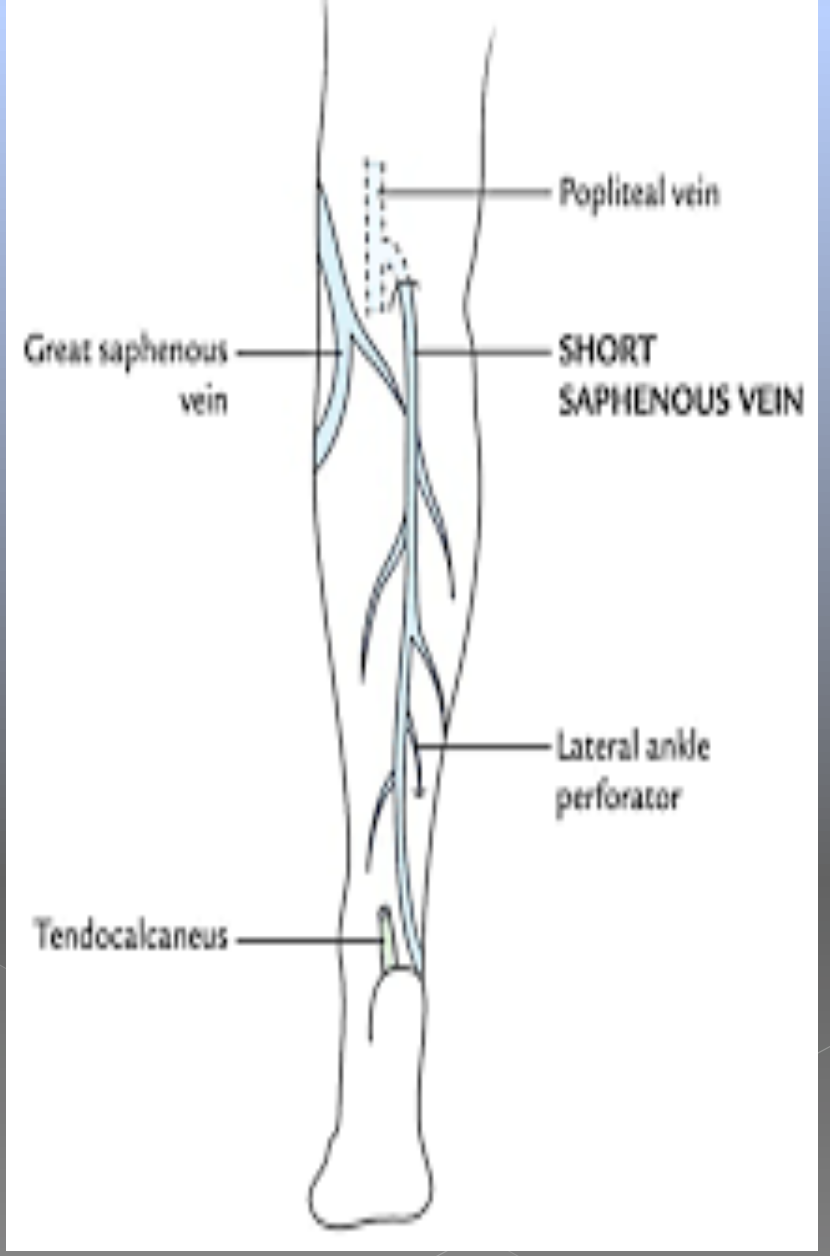
• Small Saphenous Vein

** **Origin**: on the dorsum of the foot by the union of the lateral end of the dorsal venous arch with the lateral dorsal digital vein of the little toe.

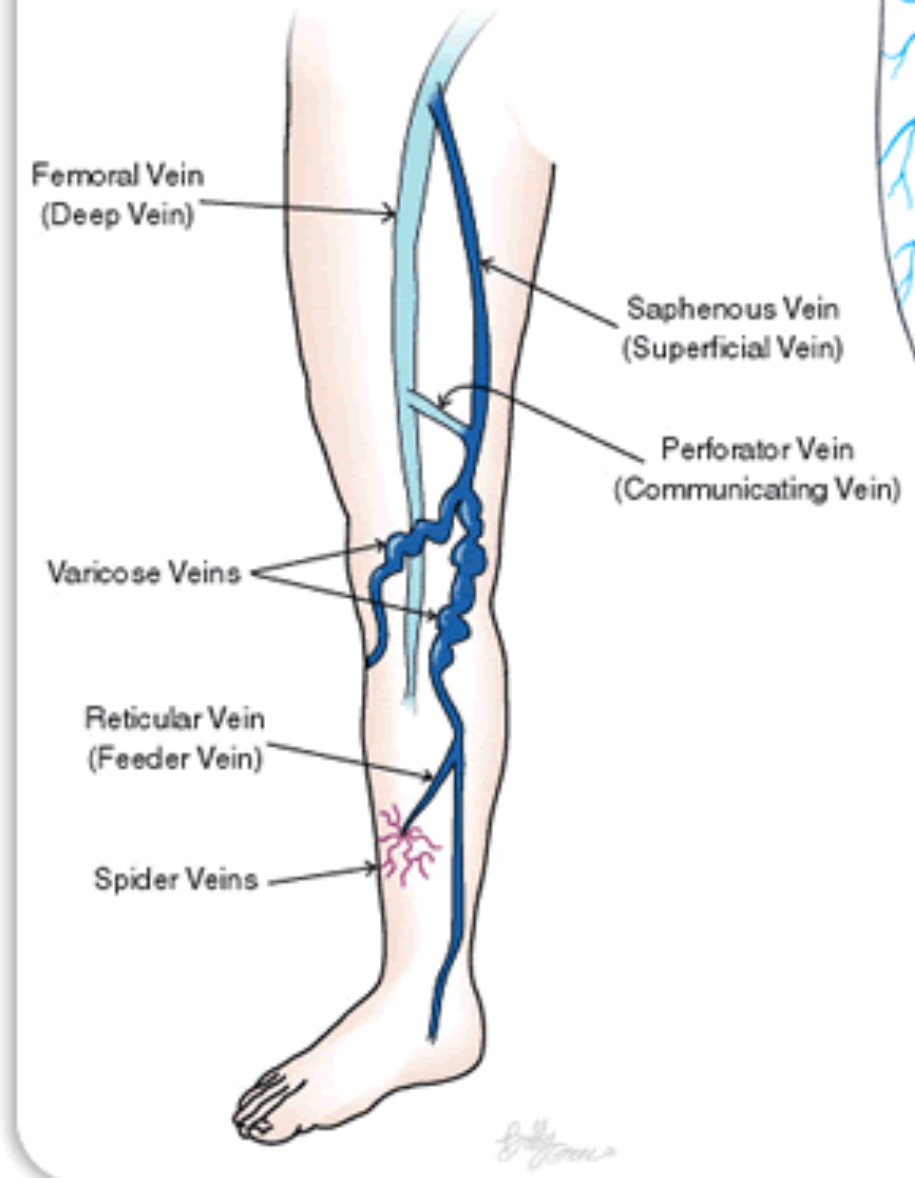
** **Course and relations**:

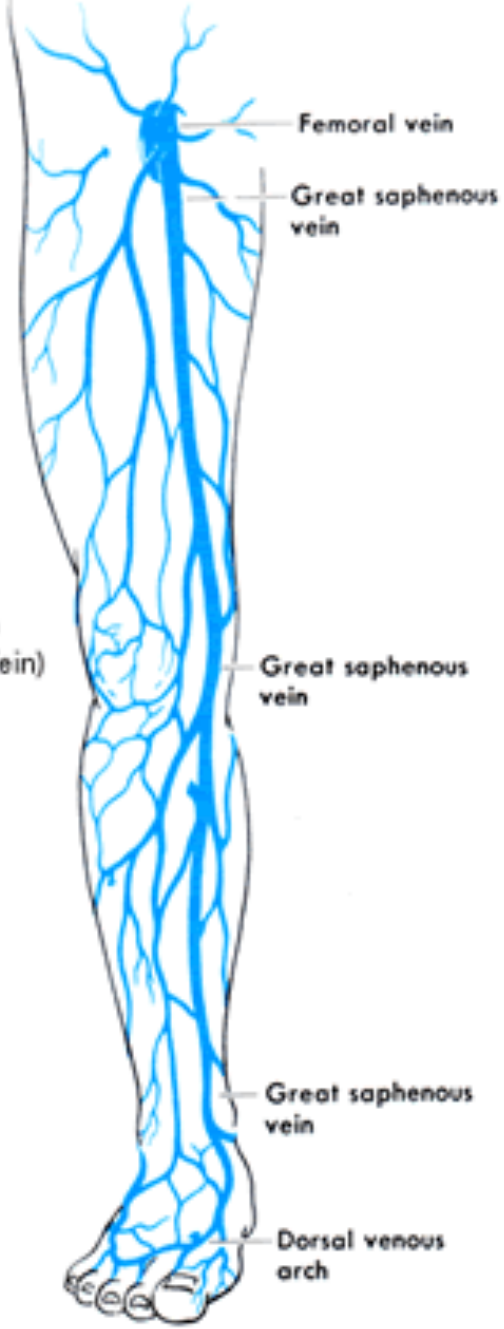
- It passes backwards along the lateral border of the dorsum of the foot.
- Then, it curves up passing **behind the lateral malleolus** and ascends on the back of the leg.
- About the middle of the popliteal fossa, it pierces the popliteal fascia to end in the **popliteal vein**.
- Along its course it is closely accompanied by the **sural nerve**.

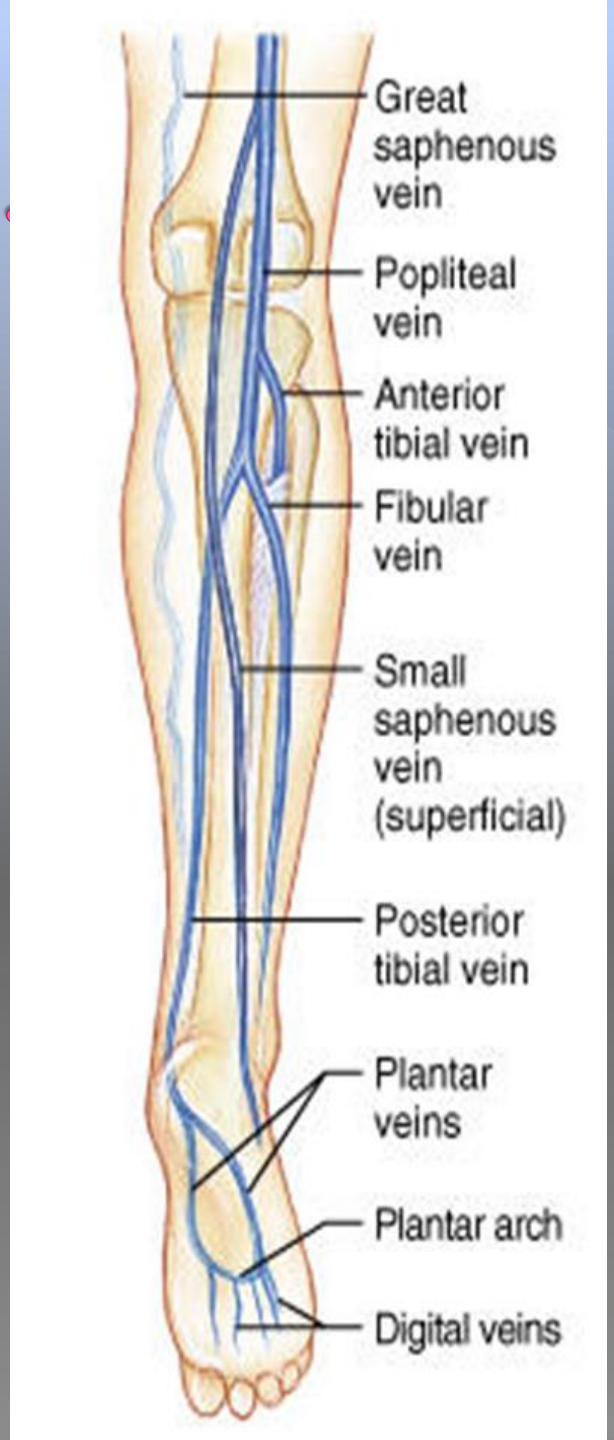




Vein Anatomy

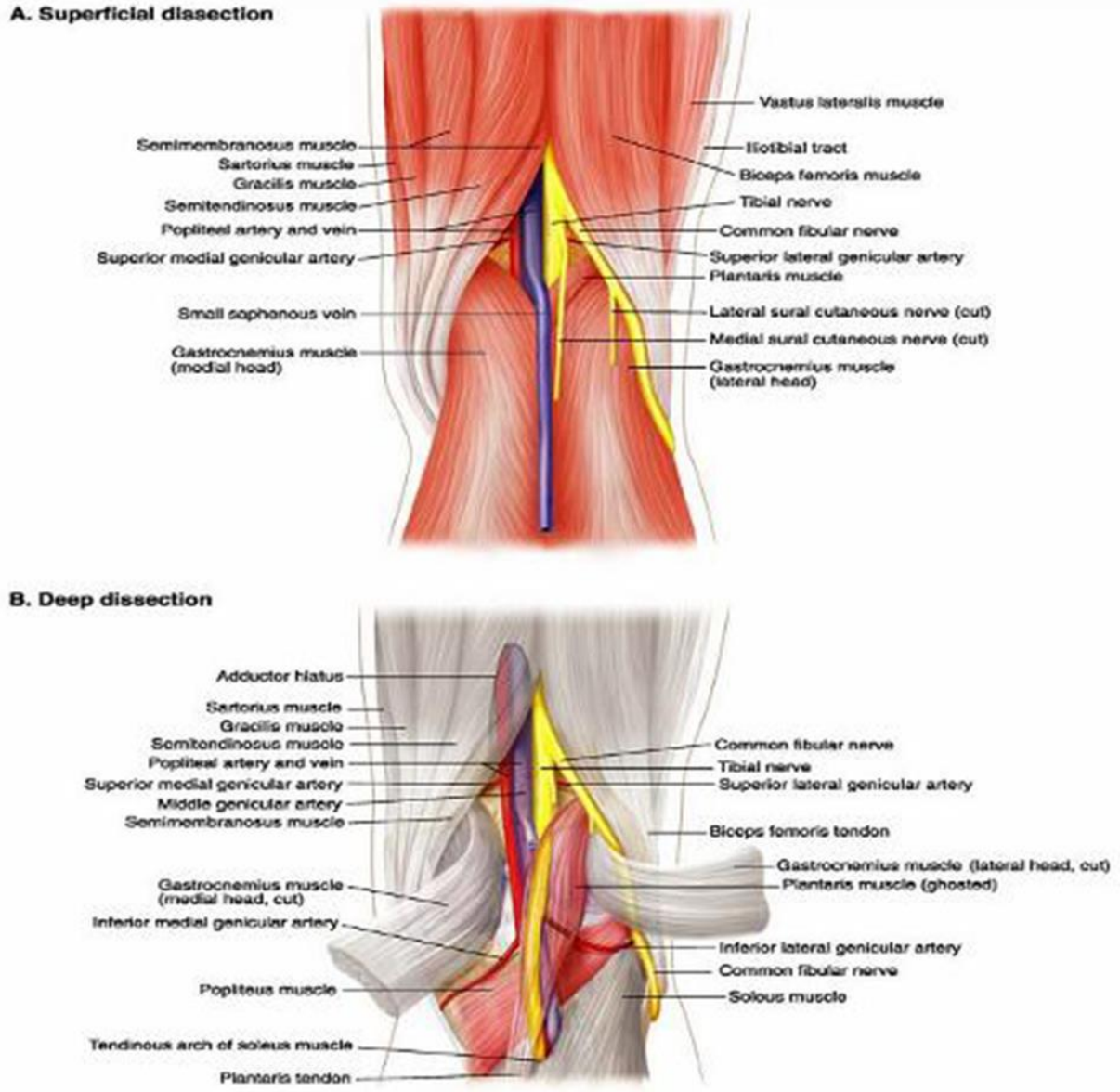






- The **posterior tibial veins** accompany the posterior tibial artery, and are joined by the **peroneal veins.**
- The **anterior tibial veins** are the upward continuation of the venæ comitantes of the dorsalis pedis artery. They leave the front of the leg by passing between the tibia and fibula, over the interosseous membrane, and unite with the posterior tibial, to form the **popliteal vein.**

Popliteal vein



Beginning:

union of the vena comitantes of the anterior and posterior tibial arteries at the lower border of popliteus

Termination:

the adductor opening and continues as the femoral vein.

Tributaries:

Muscular veins,

genicular veins corresponding to the arteries

the small saphenous vein.

Femoral vein

Beginning:

continuation of the popliteal vein at the adductor opening.

It **terminates** as the external iliac vein after passing behind the inguinal ligament medial to the femoral artery.