

Lecture 3

MAJOR ARTERIES OF THE BODY



OBJECTIVES

- Define the word 'artery' and understand the general principles of the arterial system.
- Define arterial anastomosis and describe its significance.
- Define end arteries and give examples.
- Describe the aorta and its divisions.
- List the major arteries and their distribution in the head & neck, thorax, abdomen and upper & lower extremities.
- List the main pulse points in the body.

Color Index:

- Main text
- Boys' Slides
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- Important
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 Editing File

General principles of arteries

Definition:

- ◆ Arteries carry blood **away** from the heart to the body.
- ◆ All arteries, carry oxygenated blood, except the pulmonary arteries (**postnatal**) which carry deoxygenated blood from the heart to the lungs, **and umbilical arteries to the placenta (prenatal), which carry deoxygenated blood.**

General Principles of Arteries:

- ◆ The flow of blood depends on the pumping action of the heart.
- ◆ Arteries have elastic wall containing no valves.
- ◆ The branches of arteries supplying adjacent areas normally anastomose with one another freely providing backup routes for blood to flow if one artery is blocked "**anastomosis**", e.g. **arteries of limbs.**

End arteries or **terminal arteries**:

- ◆ The arteries whose terminal branches do not anastomose with branches of adjacent arteries & they only supply of oxygenated blood to a portion of tissue.

End arteries are two types:

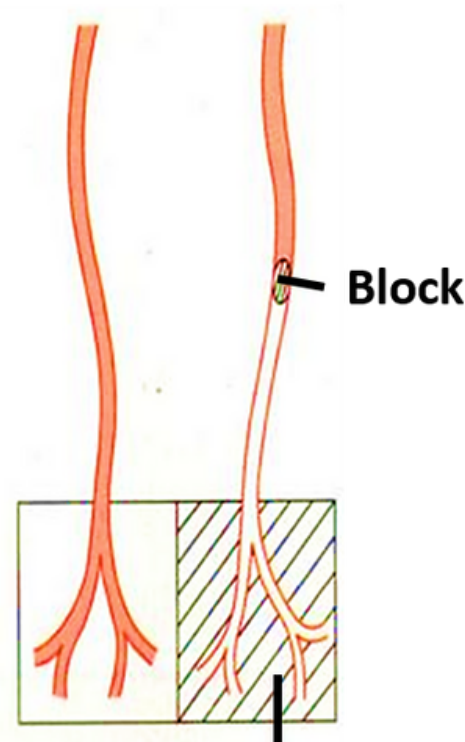
Functional End Artery:

When an anastomosis exists but is incapable of providing a sufficient supply of blood. e.g. splenic artery, renal artery & **coronary artery.**

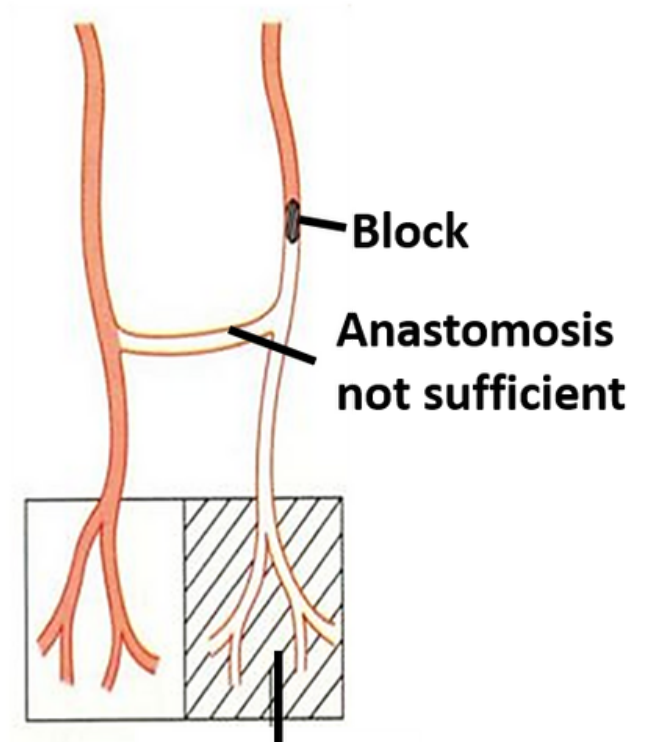
Anatomic (True) End Artery:

When no anastomosis exists **between the artery and adjacent arteries** e.g. artery of the retina.

Anatomic End Arteries



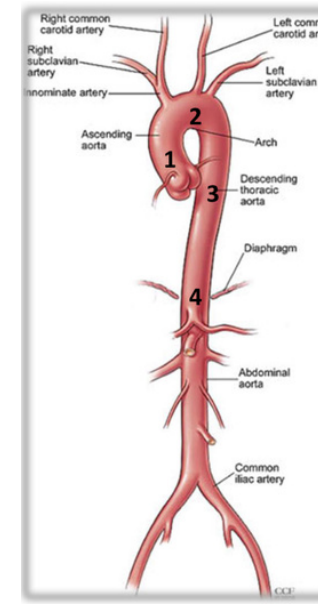
Functional End Arteries



Aorta

- ◆ It is the largest artery in the body & It carries oxygenated blood to all parts of the body.

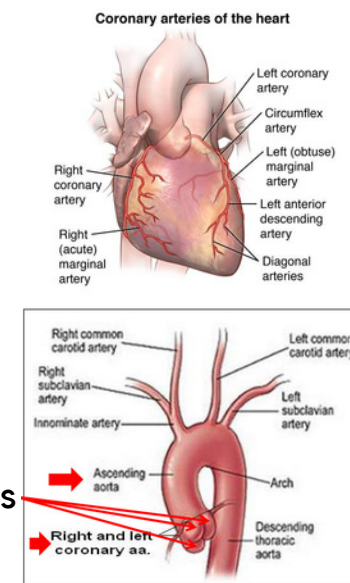
It is divided into 4 parts: **IMPORTANT!**



Ascending aorta

Supplies the heart

- It originates from the left ventricle, at the level of lower border of the 3rd left costal cartilage.
- It continues as the arch of aorta, at the level of the sternal angle (lower border of T4).
- It has three dilatations at its base, called aortic sinuses, one above each of the three aortic cusps. So, there is one anterior and two posterior aortic sinuses (right and left).



• Branches:

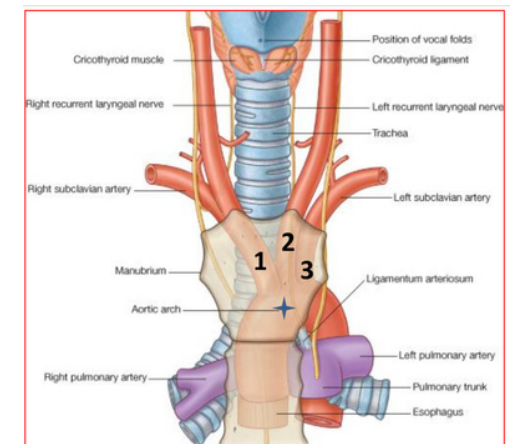
Right & Left coronary arteries (supplying the heart) that arise from anterior & left posterior aortic sinuses, respectively.

Arch of aorta

Supplies:

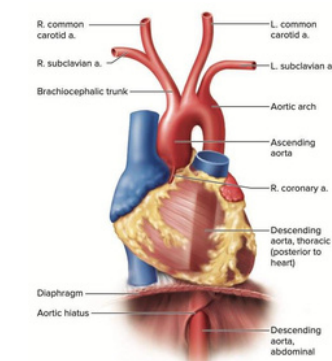
- 1- head.
- 2- neck.
- 3- upper limbs.

- Continuation of the ascending aorta.
- Continues as descending aorta.
- **Course:** Located behind the lower part of manubrium sterni and on the left side of trachea.



• Branches:

1. Brachiocephalic trunk.
2. Left common carotid artery.
3. Left subclavian artery.



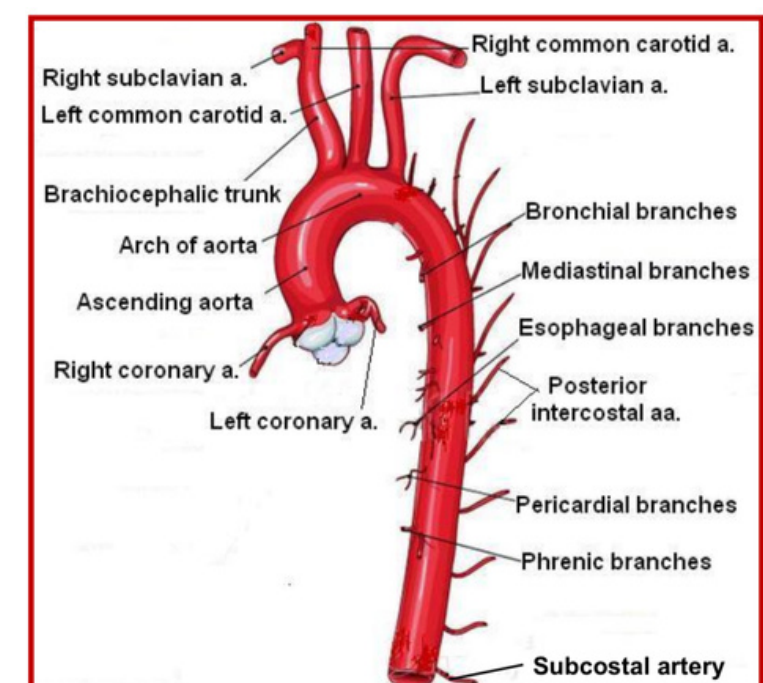
Descending thoracic aorta

Supplies all the thoracic cavity except the heart

- It is the continuation of the arch of aorta (aortic arch), at the level of the lower border of T4.
- At the level of 12th thoracic vertebrae (T12), it passes through the diaphragm and continues as the abdominal aorta.

• Branches:

- Pericardial.
- Esophageal.
- Bronchial.
- Mediastinal.
- Superior phrenic.
- Posterior intercostal & subcostal.



Abdominal Aorta

in the next slides

Branches of arch of aorta

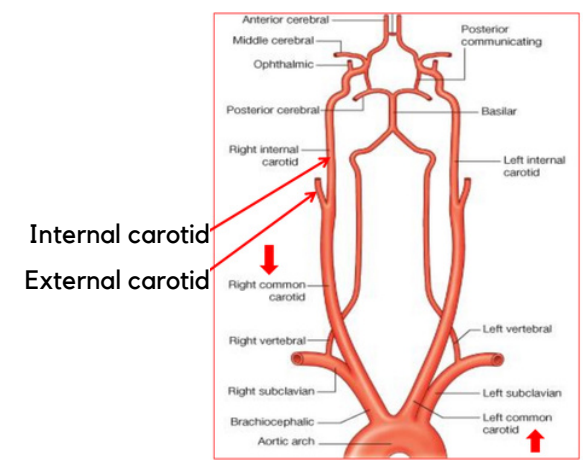
1 Common carotid artery

◆ Origin:

- ▶ **Left** from arch of aorta -directly-
- ▶ **Right** from brachiocephalic trunk.

◆ Division:

Each common carotid divides into two branches
(At the level of the disc between C3 & C4).



External carotid

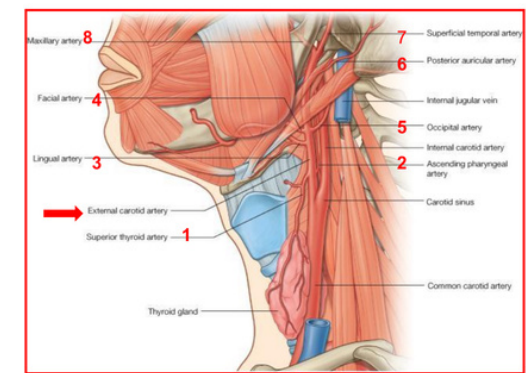
near to the neck

- It divides behind the neck of the mandible into **two terminal branches: Superficial temporal & maxillary arteries.**
- It supplies **the structures in the head & neck through the following branches:**

Mnemonic:

Some American Ladies Found Our Pyramids So Magnificent

- ▶ Scalp: Superficial temporal, occipital & posterior auricular arteries.
- ▶ Face: Facial artery.
- ▶ Maxilla & mandible: Maxillary artery.
- ▶ Tongue: Lingual artery.
- ▶ Pharynx: Ascending pharyngeal artery.
- ▶ Thyroid gland: Superior thyroid artery.



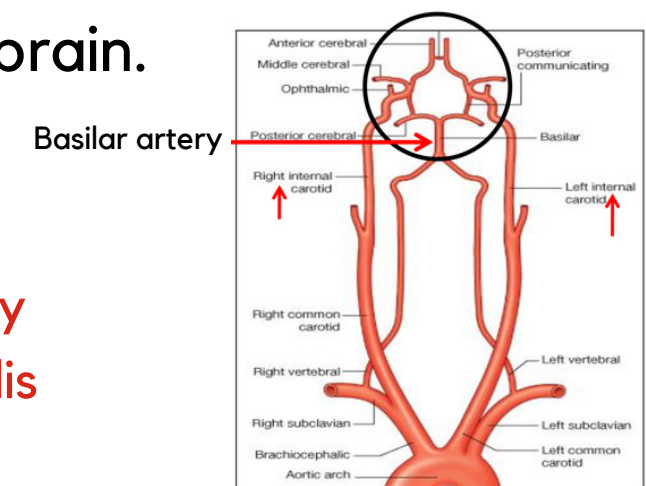
Internal carotid

- **It has no branches in the neck.**
- It enters the cranial cavity (**brain**), and joins the basilar artery (which formed by the union of two vertebral arteries) and forms the 'arterial circle of Willis' to supply the brain.

- In addition, It supplies:

- ▶ Nose.
- ▶ Scalp.
- ▶ Eye.

2 Vertebral Arteries = Basilar Artery
Basilar Artery + ICA = Circle Of Willis



2 Subclavian artery

◆ Origin:

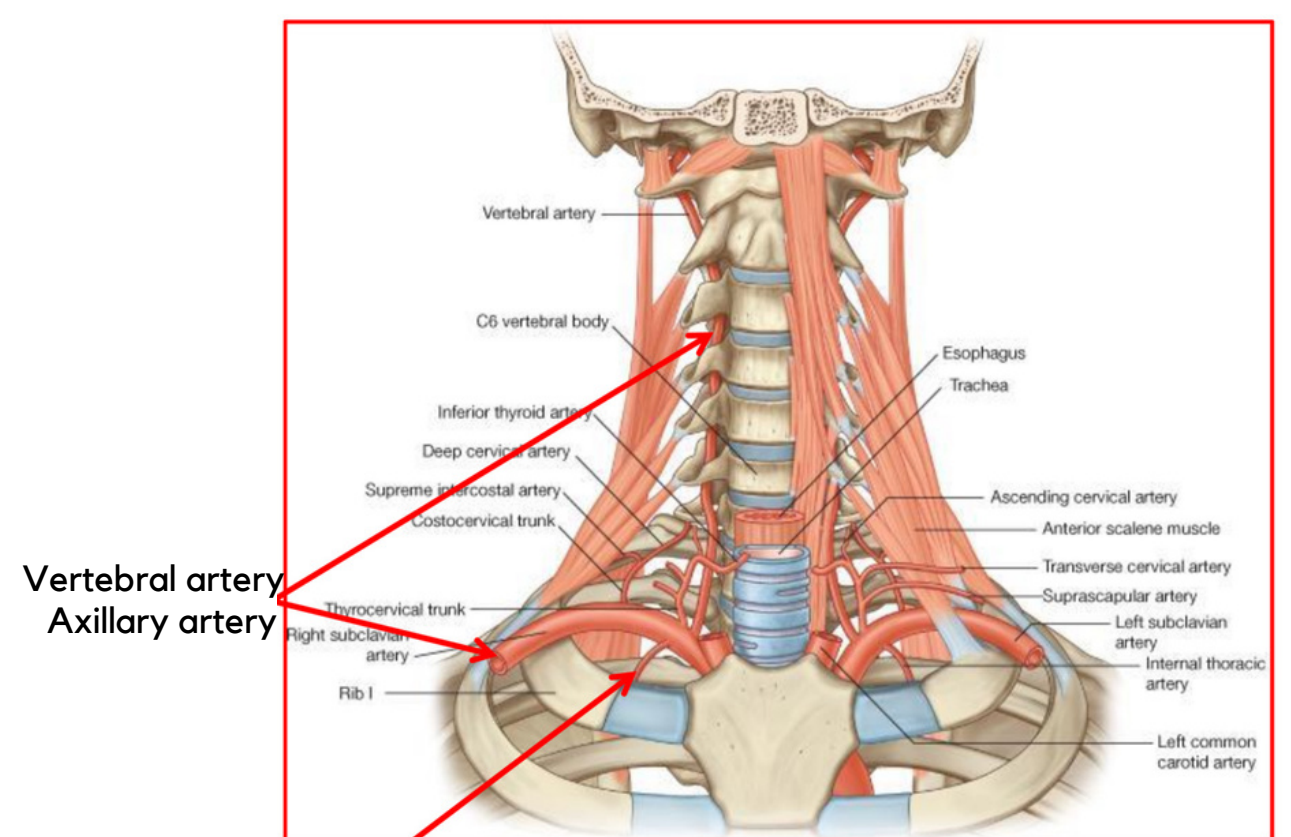
- **Left:** from arch of aorta -directly-
- **Right:** from brachiocephalic trunk.

- ◆ It continues, at the outer border of the first rib, as **axillary artery: artery of upper limb.**

- ◆ It supplies of the upper limb.

◆ Main branches:

- **Vertebral artery:** supplies brain & spinal cord.
- **Internal thoracic artery:** supplies thoracic wall & **breast.**
- **Thyrocervical trunk:** supplies thyroid gland & neck.



Internal thoracic artery

Arteries of upper & lower limb

Girls' Slides

Arteries of Upper limb:

Axillary Artery:

- Begins at the lateral border of the first rib, as continuation of the subclavian artery.
 - It passes through the Axilla.
- It continues in the arm, ends at the lower border of teres major muscle, as brachial artery.

Brachial Artery:

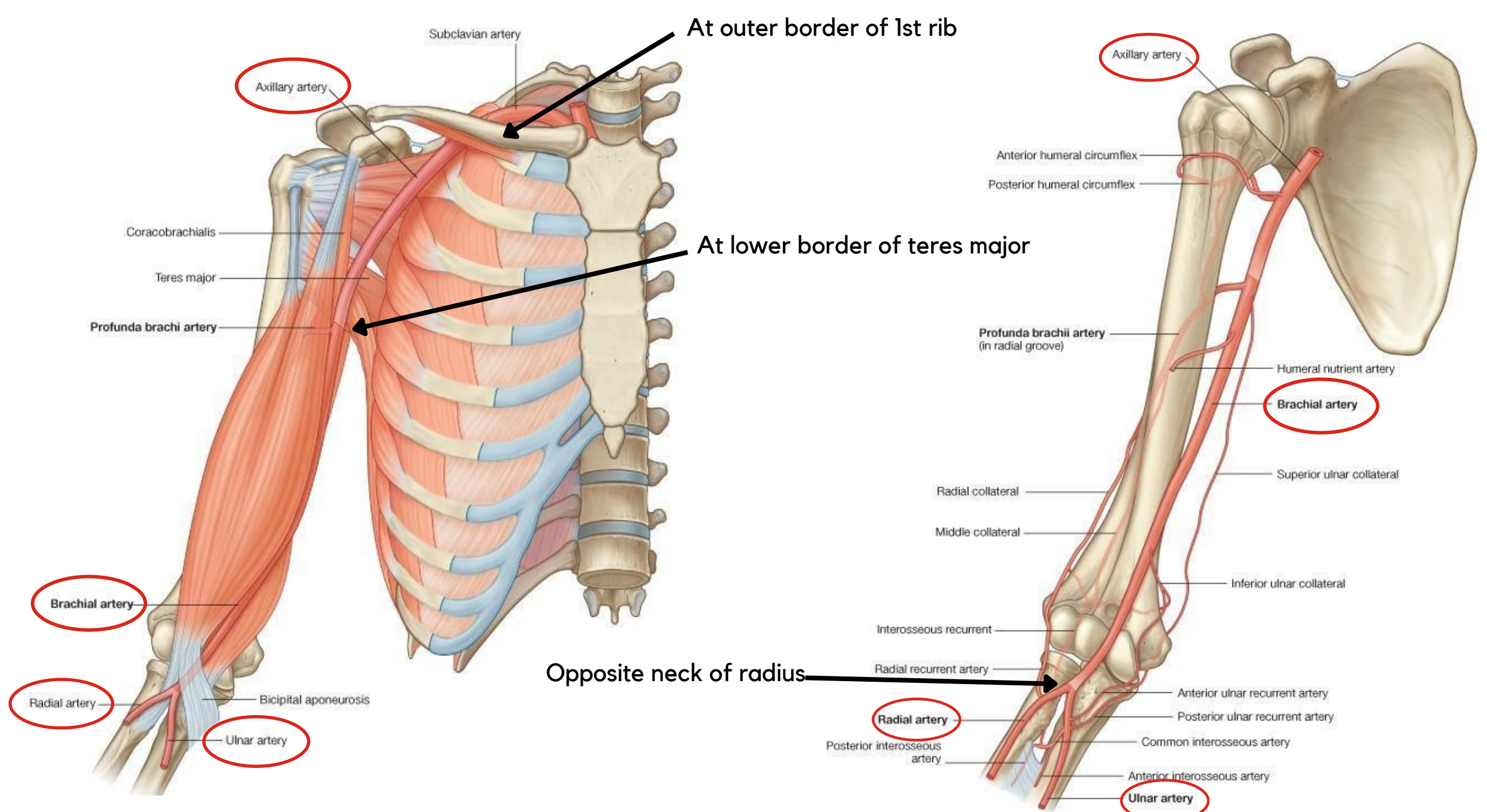
- It passes in front of the elbow joint (cubital fossa).
- At the level of neck of radius, it divides into two terminal branches: Ulnar & Radial.
- The ulnar & radial arteries descend in the forearm, enter the hand and form the palmar arches.

Ulnar Artery: Radial Artery:

- Ulnar Artery: The larger terminal branch.
Close to medial area
- Radial Artery: The smaller terminal branch.
Close to thumb

Palmar Arches:

- Superficial & deep Palmar arches are formed by both Ulnar & Radial arteries.



Arteries of upper & lower limb

Arteries of lower limb:

Femoral Artery:

- It is the artery of the lower limb.
- It enters the thigh by passing behind the midpoint of the inguinal ligament as a continuation of the external iliac artery.

The femoral artery passes through adductor hiatus, then in popliteal fossa and continues as ▶ Popliteal Artery

Girls' Slides

Anterior Tibial Artery:

- It continues as dorsalis pedis artery on the dorsum of foot.

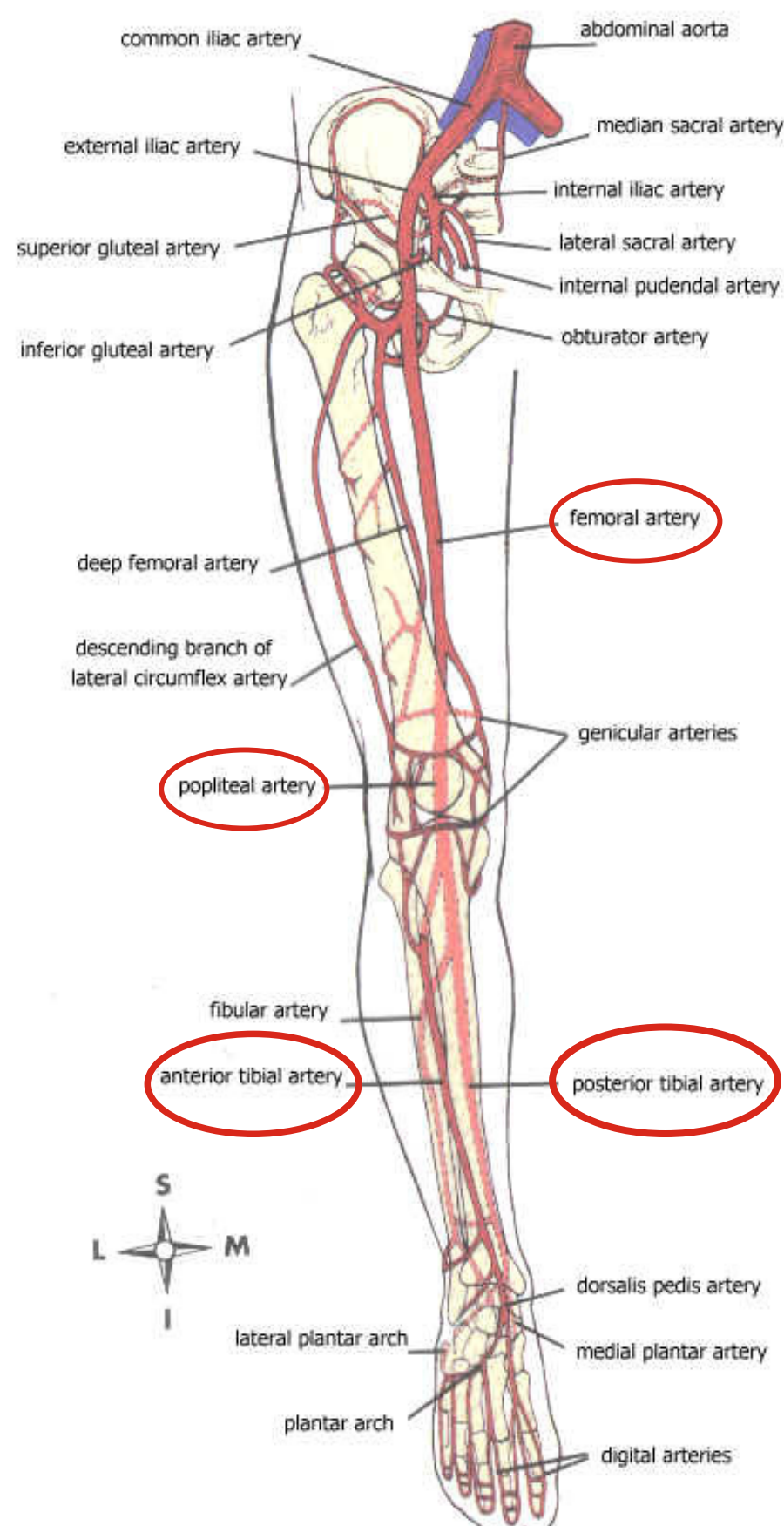
Popliteal Artery:

- It runs deeply placed in the popliteal fossa.
- It divides at the lower end of (popliteus muscle) popliteal fossa into:
 - ▶ Anterior Tibial Artery
 - ▶ Posterior Tibial Artery

Girls' Slides

Posterior Tibial Artery:

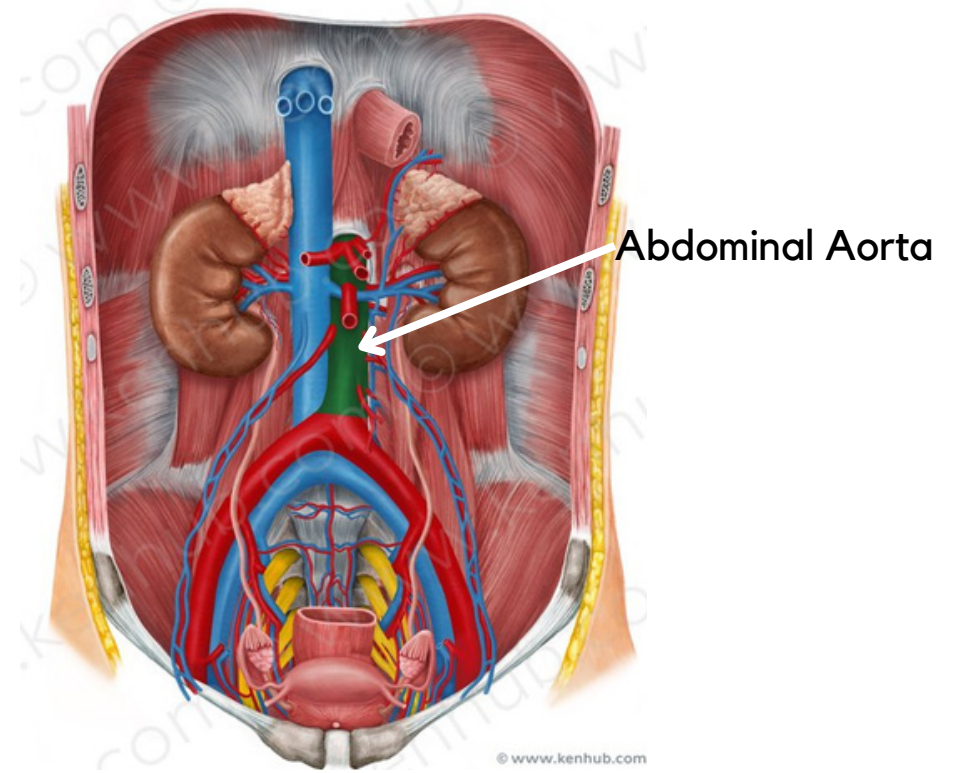
- It divides into medial and lateral planter arteries to supply the sole of foot.



Aorta Helpful Video

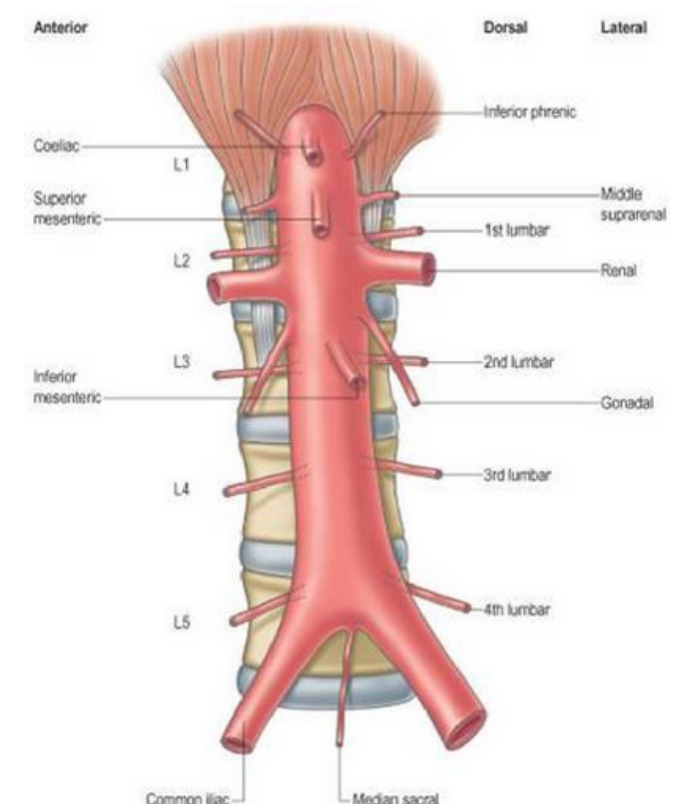
Abdominal Aorta IMPORTANT!

- It enters the abdomen through the aortic opening of diaphragm (T12). (aortic opening at level of T12)
- Terminates at the level of lower border of L4, and at same level it divides into two common iliac arteries.
- Branches are divided into two groups:



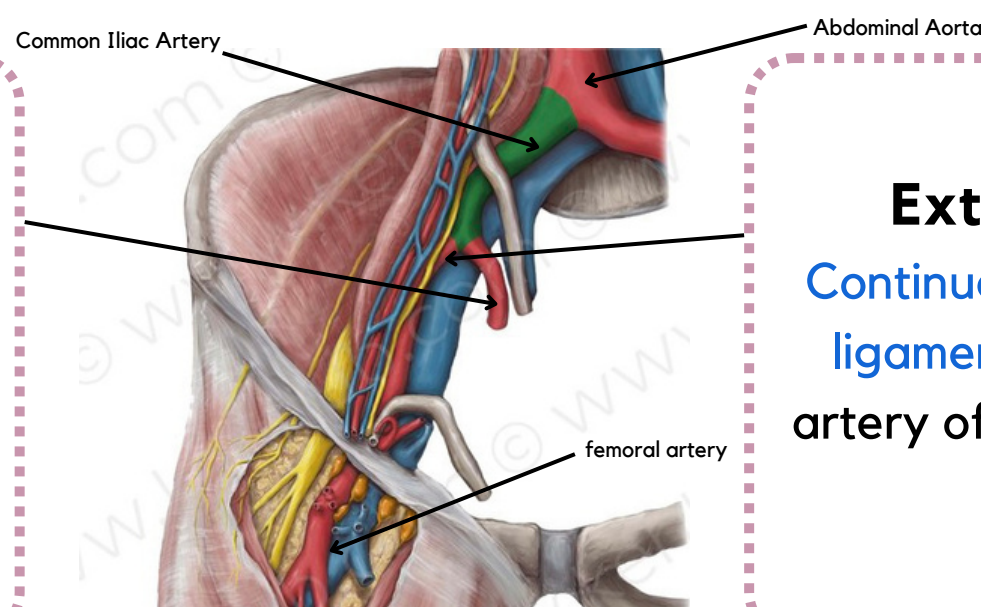
Single Branches: to supply gastrointestinal tract			
Celiac Trunk (Coeliac)	Superior mesenteric artery	Inferior mesenteric artery	Median sacral: Supplies pelvis & sacrum.

Paired Branches					
Inferior phrenic	Middle suprarenal	Renal	Gonadal (testicular, ovarian)	Four pairs of lumbar arteries	Common iliac (Terminal branches)

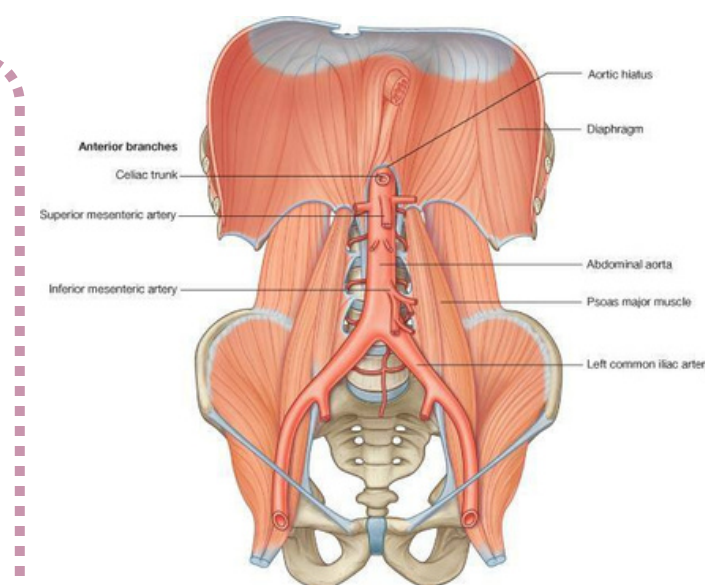


Common iliac arteries

Internal iliac artery:
which supplies the
1. Pelvis
2. Perineum



External iliac artery:
Continues (at midpoint of inguinal ligament) as femoral artery the artery of the lower limb, (to supply lower limb).



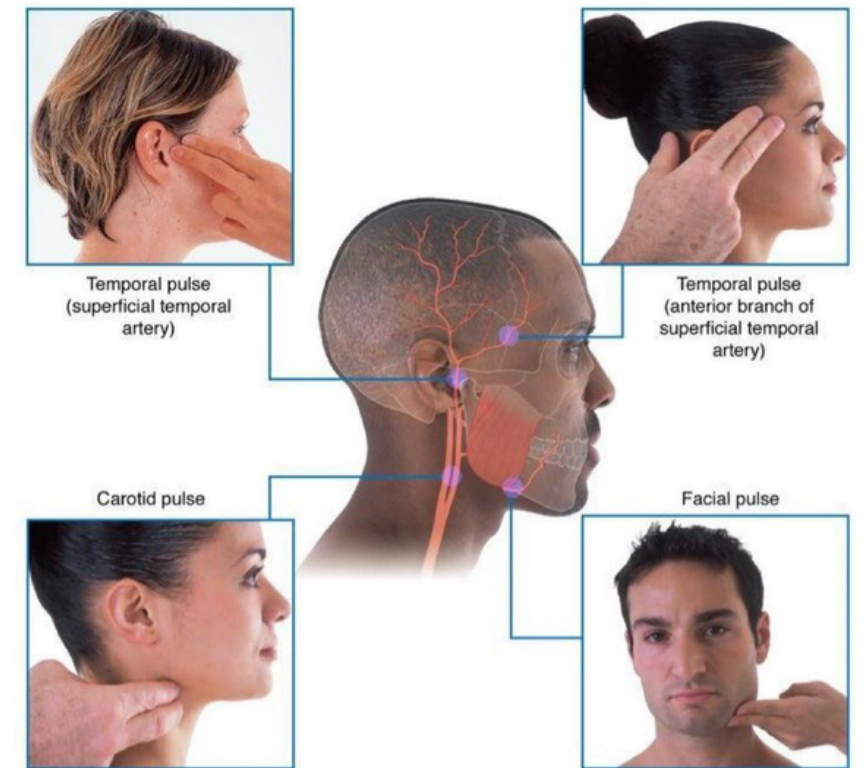
Which organ in the female pelvis is supplied by a branch of the abdominal aorta?

All of the organs in the female pelvis are supplied by the internal iliac artery, except for the ovary, which is supplied by the gonadal (ovarian) branch of the abdominal aorta.

Pulse Points

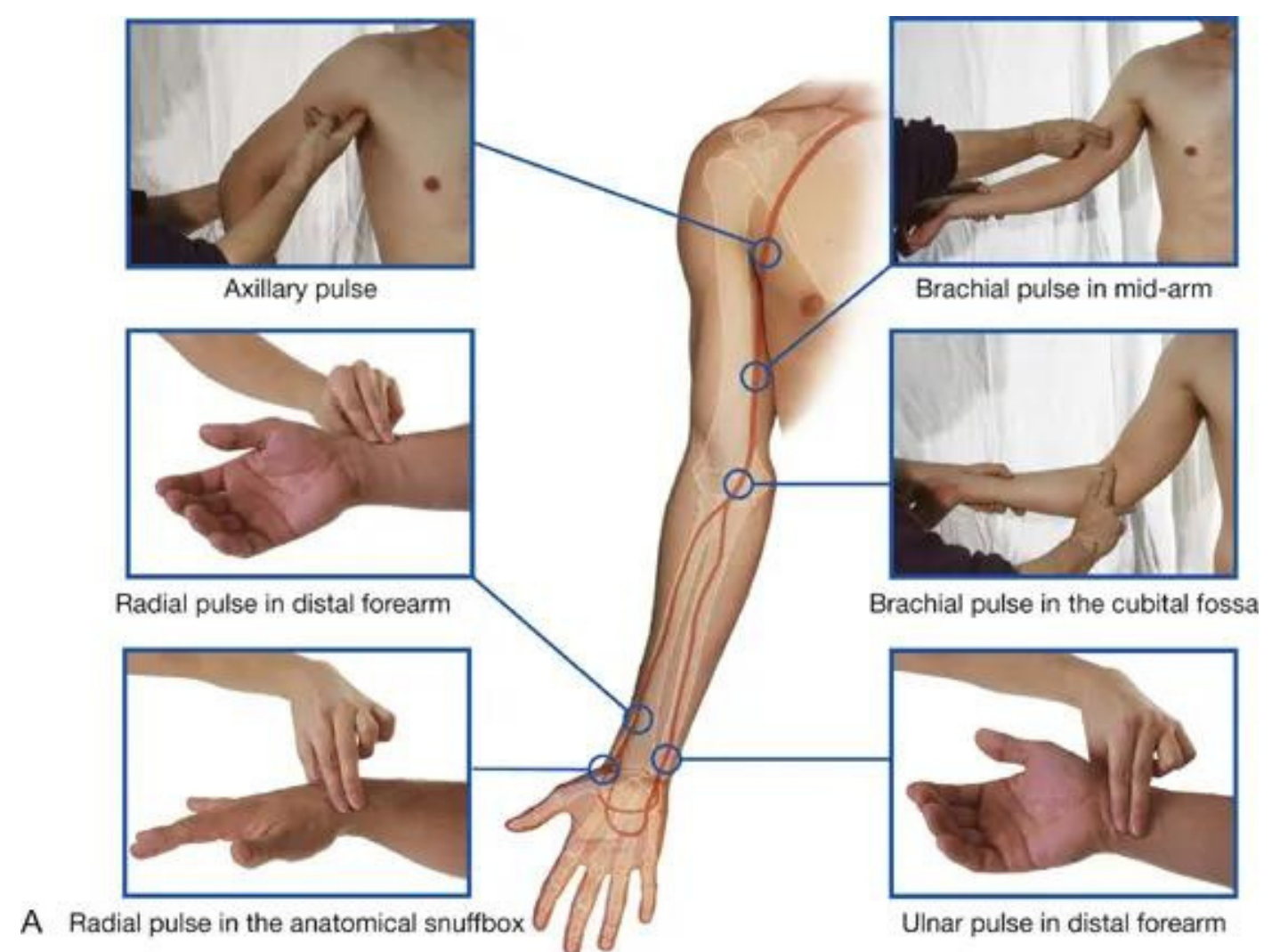
Head and Neck

1. Temporal pulse (Superficial temporal artery):
 - It is felt in front of the ear.
2. Temporal pulse (Anterior branch of superficial temporal artery)
3. Carotid pulse:
 - It is felt at the upper border of thyroid cartilage.
4. Facial pulse:
 - It is felt at the lower border of mandible.



Upper Limb

1. Axillary pulse
2. Brachial pulse:
It can be felt in:
 - Mid arm
 - Cubital fossa
3. Radial pulse:
It can be felt in:
 - Distal forearm.
 - Anatomical snuffbox.
4. Ulnar pulse:
It can be felt in:
 - Distal forearm.



Lower Limb

1. Femoral artery:
 - palpated within the femoral triangle
2. Popliteal artery:
 - palpated within the popliteal fossa
3. Posterior tibial artery:
 - best palpated posterior to the medial malleolus
4. Dorsalis pedis artery:
 - best palpated on the dorsum of the foot



Summary

Boys'
Slides

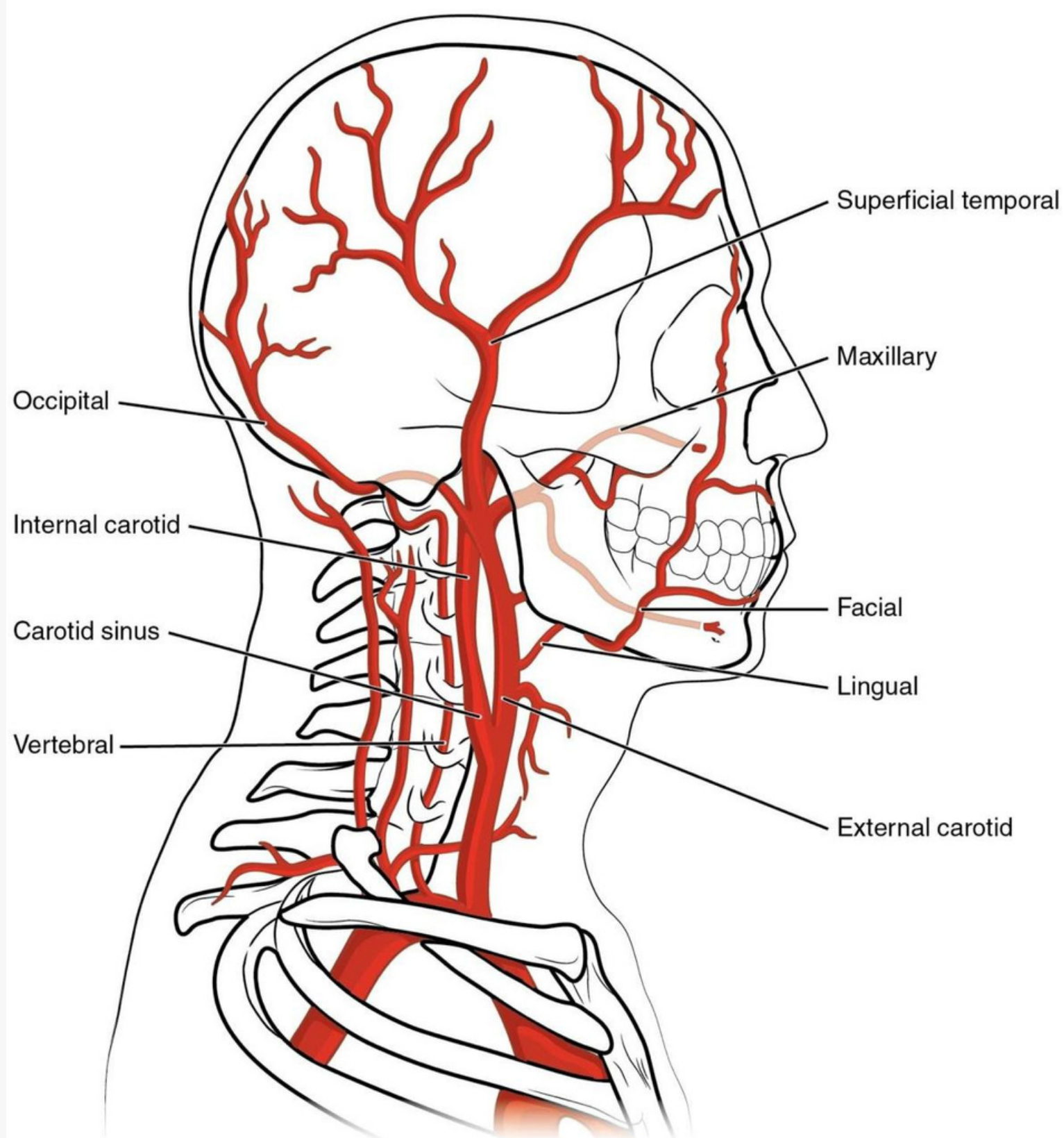
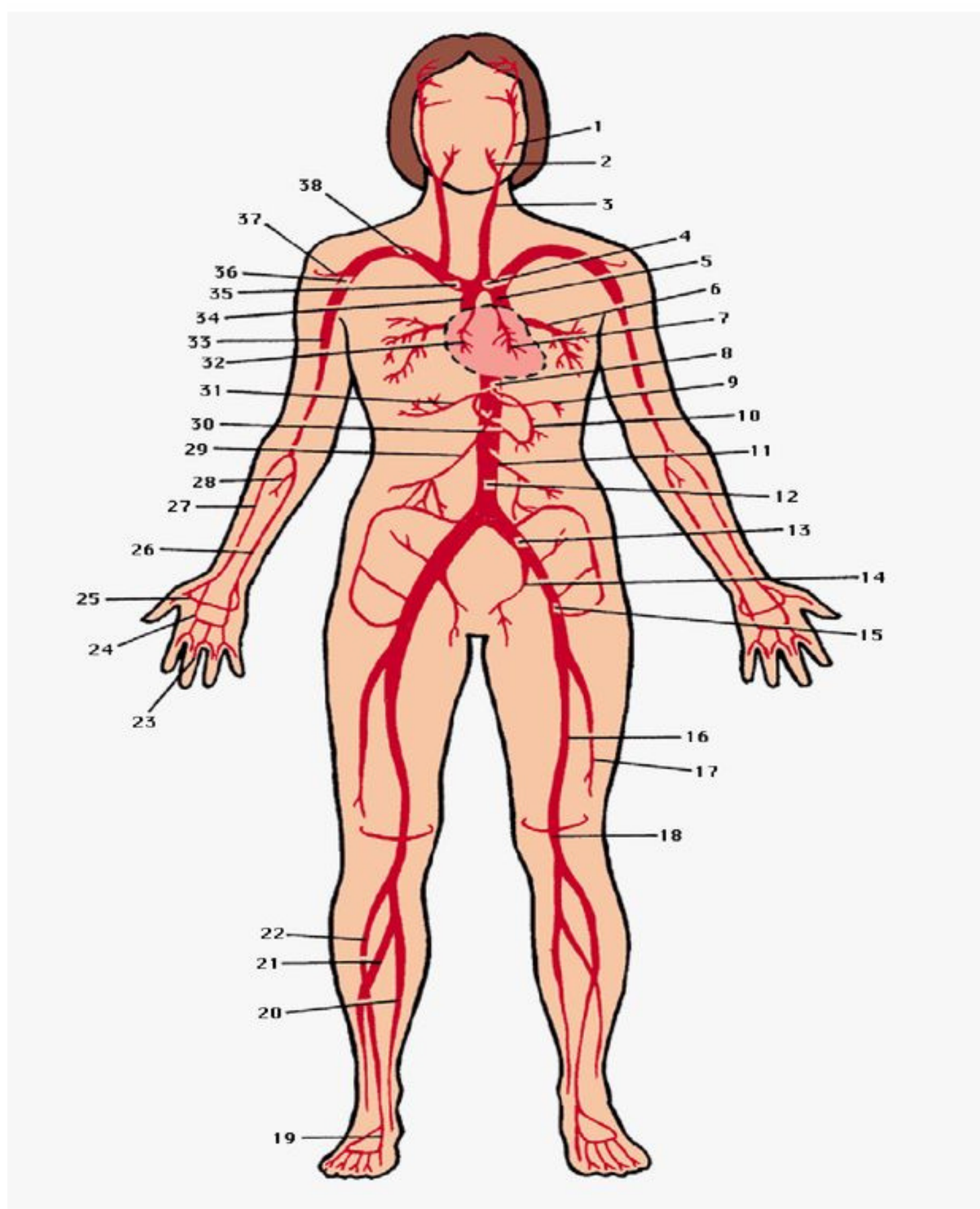
Principal arteries of the human body:

- 1- internal carotid artery.
- 2- external carotid artery.
- 3- common carotid artery.
- 4- arch of the aorta.
- 5- descending aorta.
- 6- pulmonary vein.
- 7- left coronary artery.
- 8- celiac artery.
- 9- splenic artery.
- 10- left gastric artery.

- 11- inferior mesenteric artery.
- 12- abdominal aorta.
- 13- common iliac artery.
- 14- internal iliac artery.
- 15- external iliac artery.
- 16- femoral artery.
- 17- profunda femoris artery.
- 18- popliteal artery.
- 19- dorsalis pedis.
- 20- posterior tibial artery.

- 21- peroneal artery.
- 22- anterior tibial artery.
- 23- digital artery.
- 24- superficial palmar arch.
- 25- deep palmar arch.
- 26- ulnar artery.
- 27- radial artery.
- 28- common interosseous artery.
- 29- superior mesenteric artery.
- 30- right gastric artery.

- 31- hepatic artery.
- 32- right coronary artery.
- 33- brachial artery.
- 34- ascending aorta.
- 35- brachiocephalic artery.
- 36- axillary artery.
- 37- anterior circumflex humeral artery.
- 38- subclavian artery.



MCQs

1

Girls' Slides

At which vertebral level that abdominal aorta terminates?

A) T10	B) T12	C) L4	D) L5
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2

Girls' Slides

Which one of the following arteries is a branch of external carotid artery?

A) Lingual artery	B) Basilar artery	C) Inferior thyroid artery	D) Vertebral artery
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3

Girls' Slides

Which artery of the following can be palpated against the angle of the mandible?

A) Facial artery	B) Axillary artery	C) Superficial temporal artery	D) Brachial artery
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4

Which organ in the female pelvis is supplied by a branch of the abdominal aorta? Males' Dr

A) Renal artery	B) Ovarian artery	C) Superior mesenteric	D) Inferior phrenic artery
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5

Which one of the following is the coreesponding to the median sacral artery? Males' Dr

A) Gonadal artery	B) Common iliac	C) Superior mesenteric	D) Inferior phrenic artery
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1)C 2)A 3)A 4)B 5)B

SAQs


What forms the arterial circle of Willis?

1

 Basilar Artery + ICA = circle of Willis.


Posterior Tibial artery terminates by dividing into?

2

 Medial & Lateral Plantar Arteries
to supply the sole of the foot.


What are the origins of Subclavian artery?

3

 - Left from arch of aorta.
- Right from brachiocephalic trunk.

What are the branches of Arch of aorta?

4

 1. Brachiocephalic trunk.
2. Left common carotid artery.
3. Left subclavian artery.

More questions? [Click here!](#)



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