



MED437  
KING SAUD UNIVERSITY



# Anatomy of large blood vessels - arteries

Lecture 2



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هذا العمل لا يغني عن المصدر الأساسي للمذاكرة

{وَمَنْ يَتَوَكَّلْ عَلَى اللَّهِ فَهُوَ حَسْبُهُ}

# 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 and list the branches from each part
  - List major arteries and their distribution in the head & neck, thorax, abdomen, and upper & lower extremities
  - List main pulse points
- 
- Text in **BLUE** was found only in the boys' slides
  - Text in **PINK** was found only in the girls' slides
  - **Text in RED is considered important**
  - Text in **GREY** is considered extra notes

# Arteries:

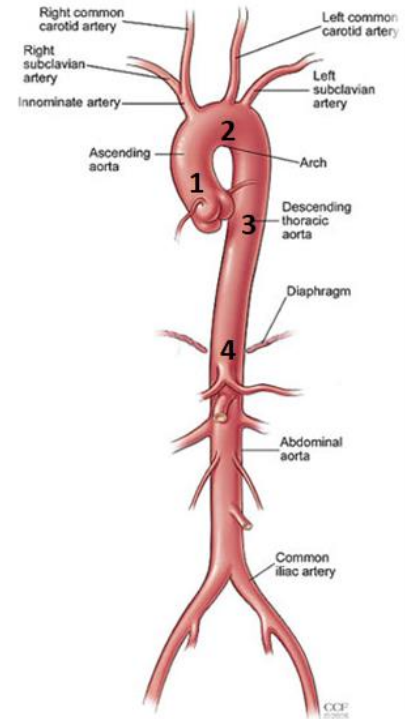
- Arteries carry blood from the heart to the body
- All arteries carry oxygenated blood, **except the pulmonary artery** which carries deoxygenated blood to the lungs

## General Principles of Arteries:

- The flow of blood depends on the **pumping action of the heart**
- Arteries have **elastic walls** with **no valves**
- Branches of arteries normally **anastomose** with one another freely, providing **backup routes** for blood to flow **if one artery is blocked** e.g. **arteries of limbs**
- Arteries whose terminal branches do not anastomose with branches of adjacent arteries are called **"end arteries"**, and have two types:
  - Anatomic (true) end artery: no anastomosis exists (**e.g. artery of retina**)
  - Functional end artery: Anastomosis exists but isn't capable of supplying enough blood (in case of block) (**e.g. renal artery, splenic artery**)

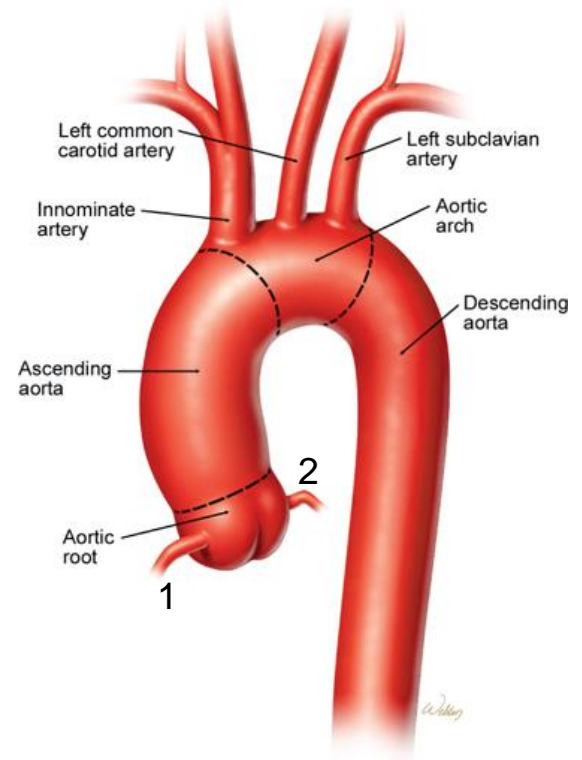
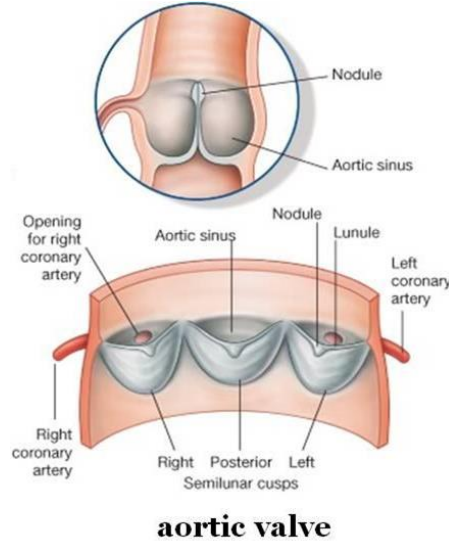
# Aorta

- The largest and longest artery in the body
- Carries oxygenated blood to all parts of the body.
- Is divided into 4 parts:
  1. Ascending aorta
  2. Arch of aorta
  3. Descending thoracic aorta
  4. Abdominal aorta



# Ascending Aorta

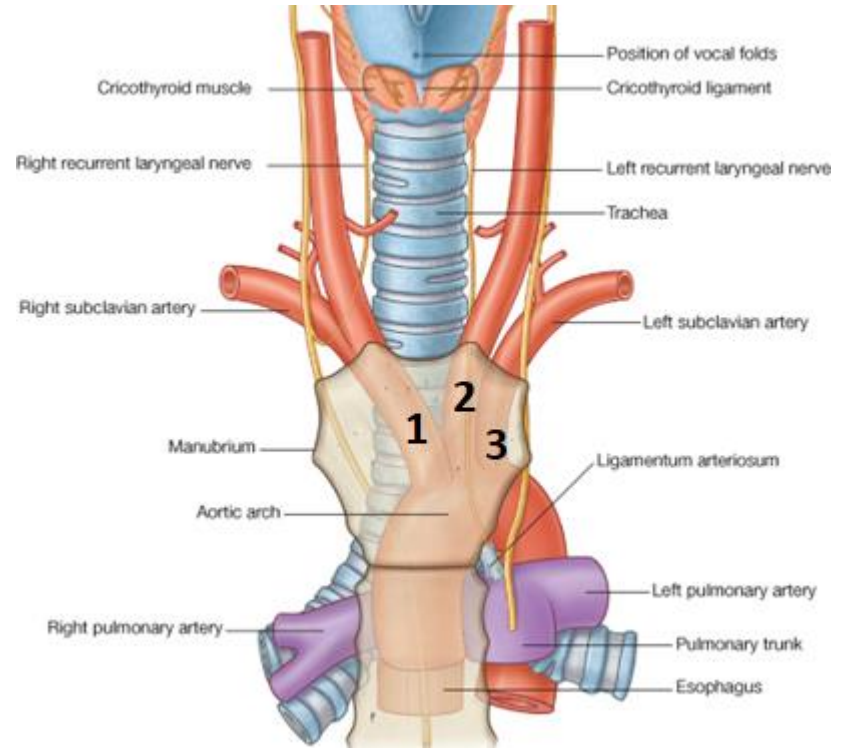
- Originates from left Ventricle.
- Continues as the arch of Aorta (at the level of T4)
- Has three dilatations at its base, called aortic sinuses
- Branches (arise from sinuses & supply heart):
  1. Right Coronary Artery
  2. Left Coronary Artery

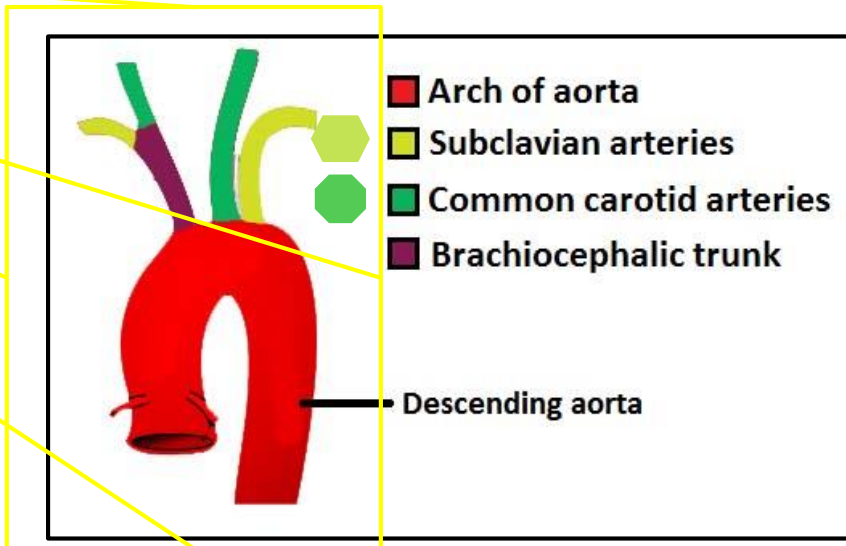
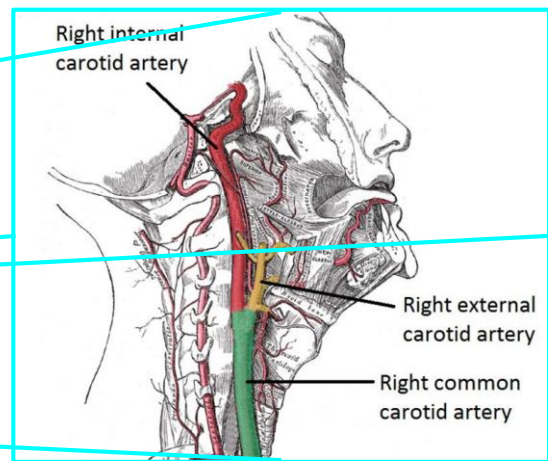
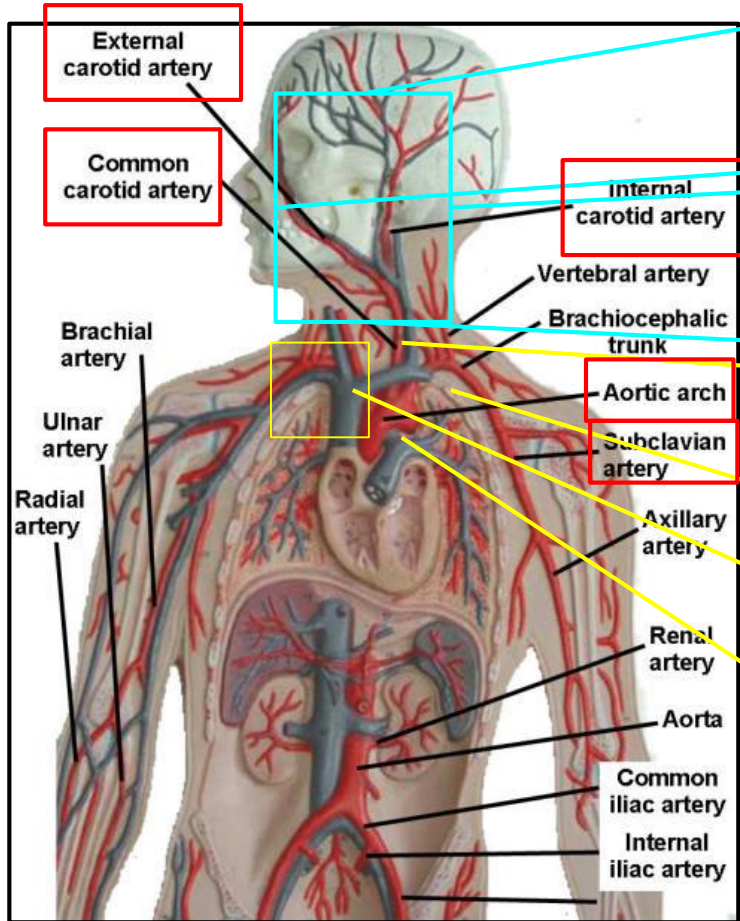


# Arch of Aorta

- Continuation of the ascending aorta
- Leads to descending Aorta
- 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

The right common carotid and right subclavian are branches of the Brachiocephalic trunk



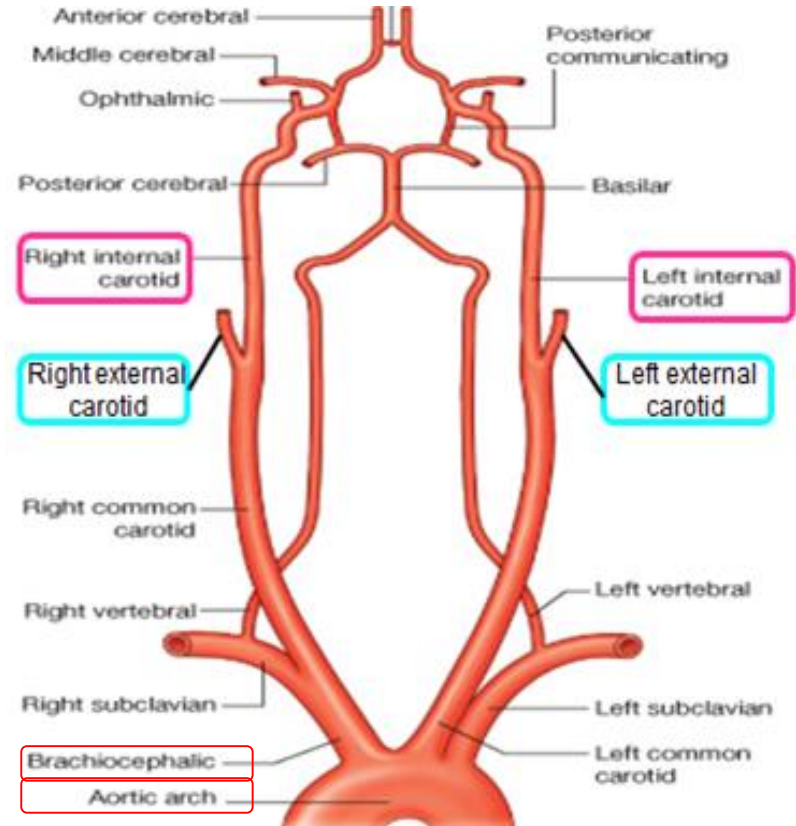


# Common carotid artery

## Origin:

- LEFT from aortic arch.
- RIGHT from brachiocephalic trunk.
- Each common carotid divides into two branches:
  - Internal carotid
  - External carotid

(At the level of the disc between C3 & C4)





# External carotid artery

**It divides behind neck of mandible into:**

1. Superficial temporal
2. Maxillary arteries

**It supplies:**

**Scalp:** Superficial temporal, occipital, & posterior auricular arteries

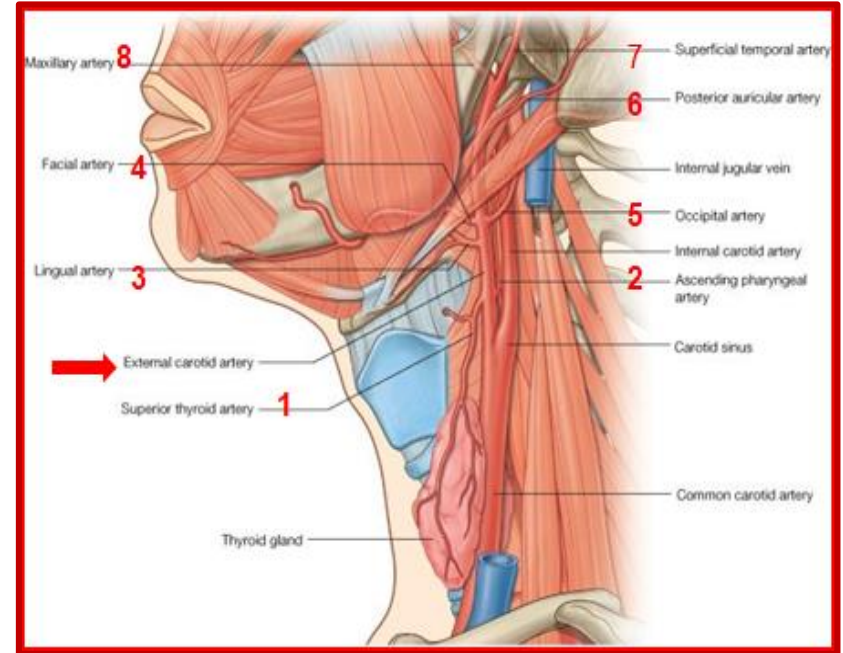
**Face:** Facial artery

**Maxilla & mandible:** Maxillary artery

**Tongue:** Lingual artery

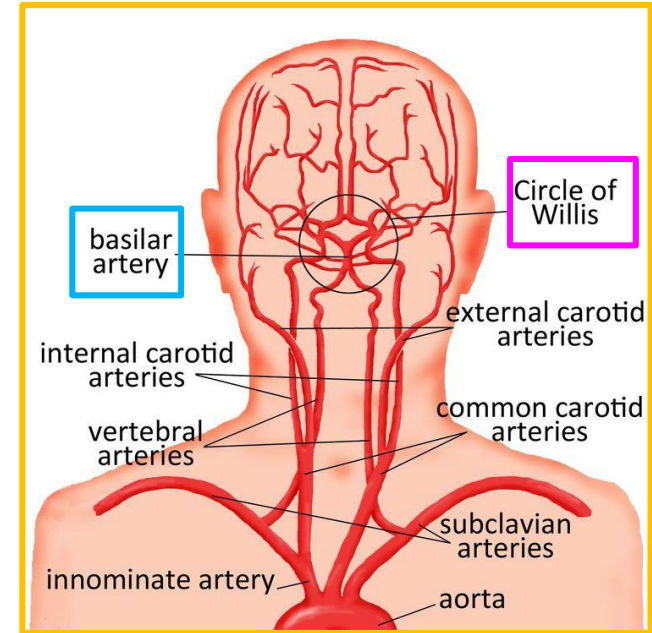
**Pharynx:** ascending pharyngeal artery

**Thyroid gland:** Superior thyroid artery



# ◆ Internal carotid artery ◆

- **Has NO branches in the neck.**
- Enters the cranial cavity, joins the **basilar artery** (formed by the union of two vertebral arteries) and forms '**arterial circle of Willis**'\*so important\* to supply **brain**.
- In addition, it supplies
  - Nose
  - Scalp
  - Eye



# External carotid artery

\*mnemonics\*

Some **A**merican **L**adies **F**ound **O**ur **P**ythons  
So **M**agnificent

Some: **S**uperior temporal artery

American: **A**scending pharyngeal artery

Ladies: **L**ingual artery

Found: **F**acial artery

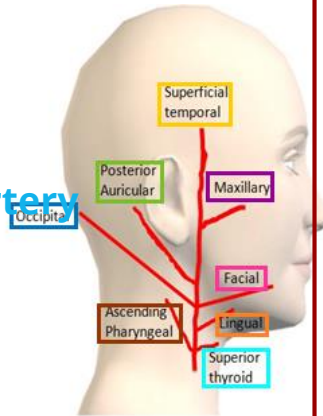
Our: **O**ccipital artery

Pythons: **P**osterior auricular artery

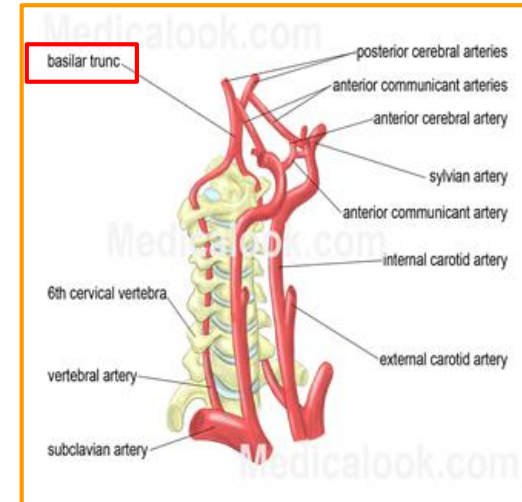
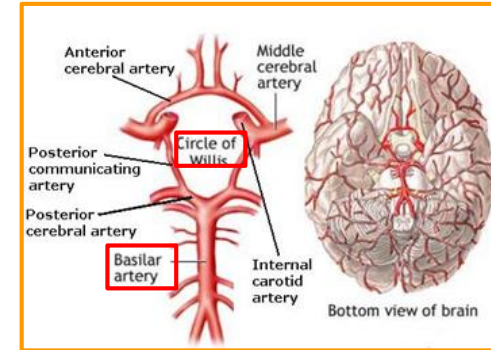
So: **S**uperior thyroid

Magnificent: **M**axillary

\*436 anatomy team\*



# Internal carotid artery





## Subclavian artery

### -Origin:

LEFT: **from arch of aorta**

RIGHT: **from brachiocephalic trunk**

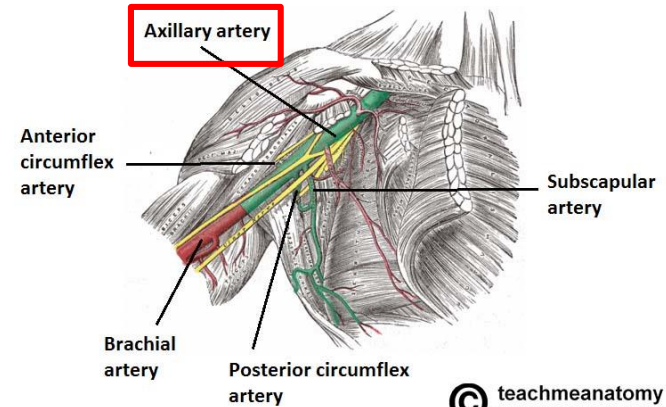
- It continues, at lateral border of first rib, as axillary artery (artery of upper limb)

### - Main branches:

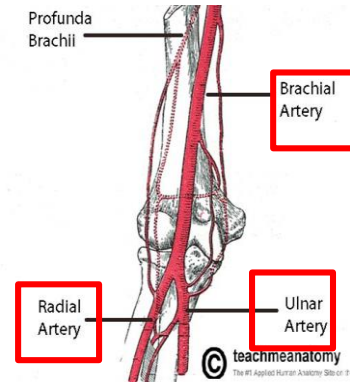
- Vertebral artery: supplies brain & spinal cord
- Internal thoracic artery: supplies thoracic wall



## Arteries of upper limb



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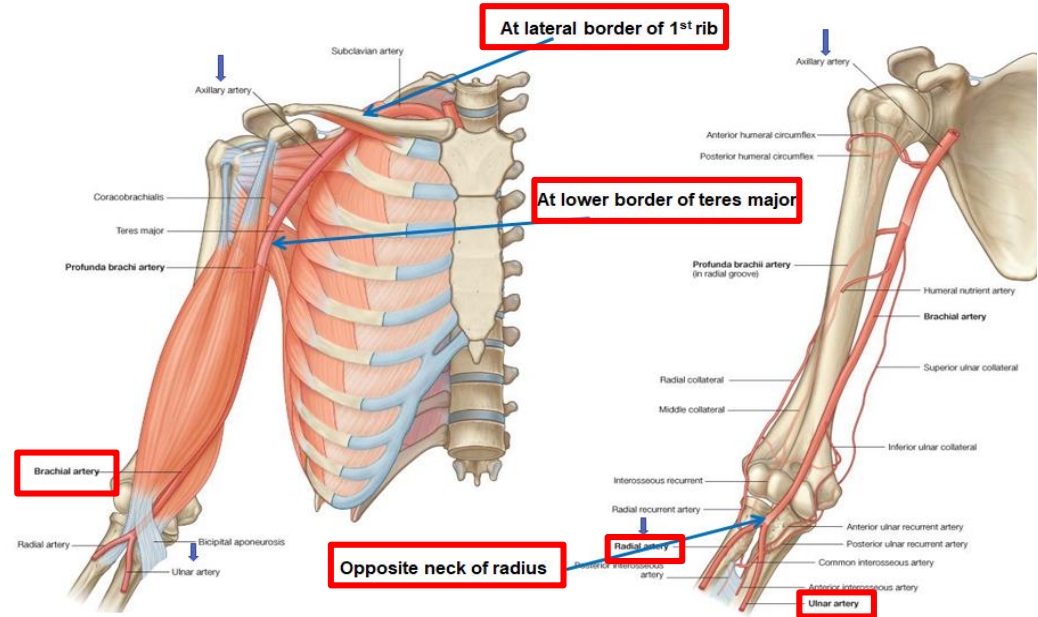
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# Arteries of upper limb

Recall the arteries of the upper limb:

- At the lateral border of the first rib the **subclavian** artery continues as the **axillary** artery.
- The **axillary** artery ends at the lower border of teres major and becomes the **brachial** artery.
- The **brachial** artery bifurcates into **radial** and **ulnar** arteries opposite the neck of radius.

\*436 anatomy team\*



# Descending thoracic aorta

- It is the **continuation of aortic arch**
- At the level of the **12<sup>th</sup> thoracic vertebra**, it passes through the diaphragm and continues as the **abdominal aorta**

- **Branches of descending thoracic aorta:**

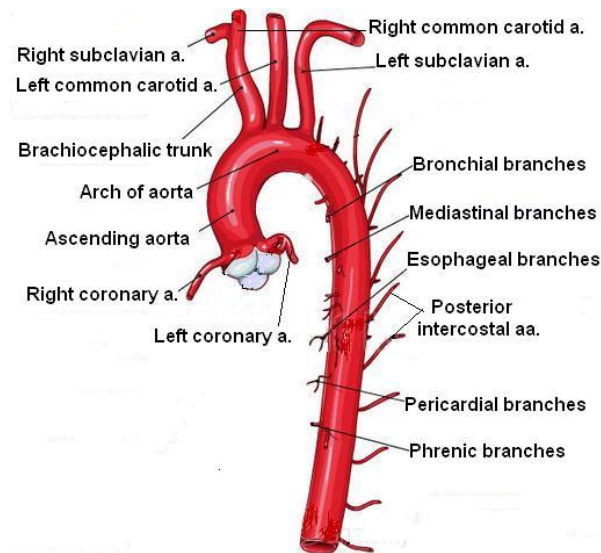
1- **Pericardial**

2- **Esophageal**

3- **Bronchial**

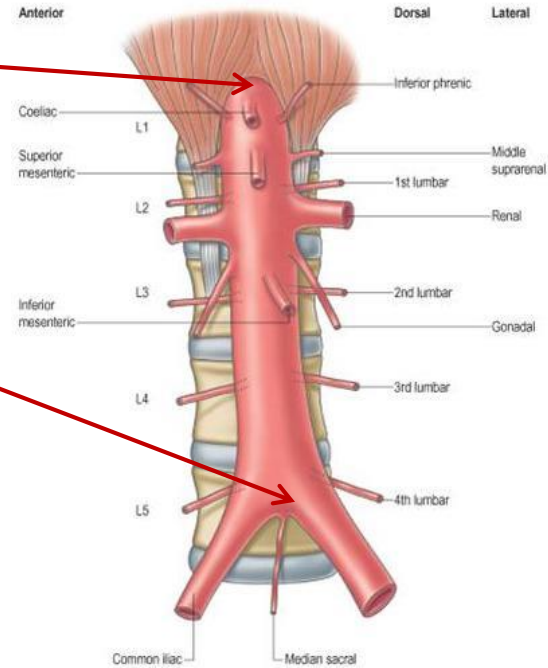
4- **Posterior intercostal**

Supplies all structures in the thorax except the heart



# Abdominal aorta

- It enters the abdomen through the **aortic opening of diaphragm**.
- **At the level of lower border of L4**, it divides into **two common iliac arteries**.
- **Branches:** divided into two groups:
  - A-Single branches
  - B-Paired branches



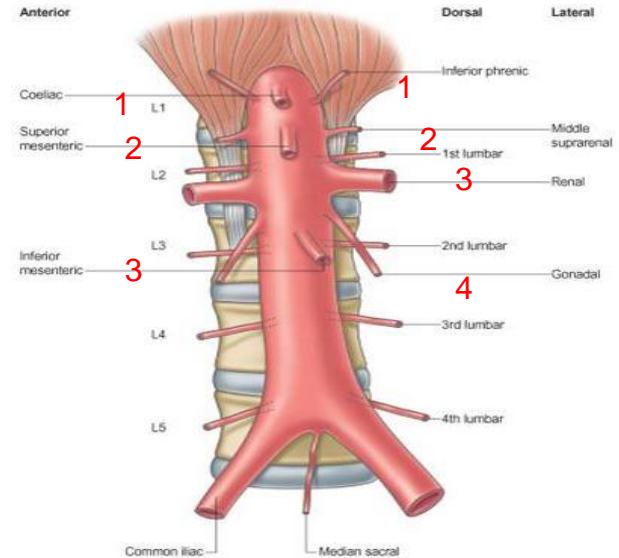
# Main branches of abdominal aorta

## SINGLE BRANCHES :SUPPLYING GASTROINTESTINAL TRACT

- 1- coeliac artery
- 2-superior mesenteric artery
- 3-inferior mesenteric artery
- 4-median sacral

## PAIRED BRANCHES

- 1-inferior phrenic arteries
- 2-middle suprarenal arteries
- 3-renal arteries
- 4-gonadal arteries



In addition to that for lumbar paired arteries



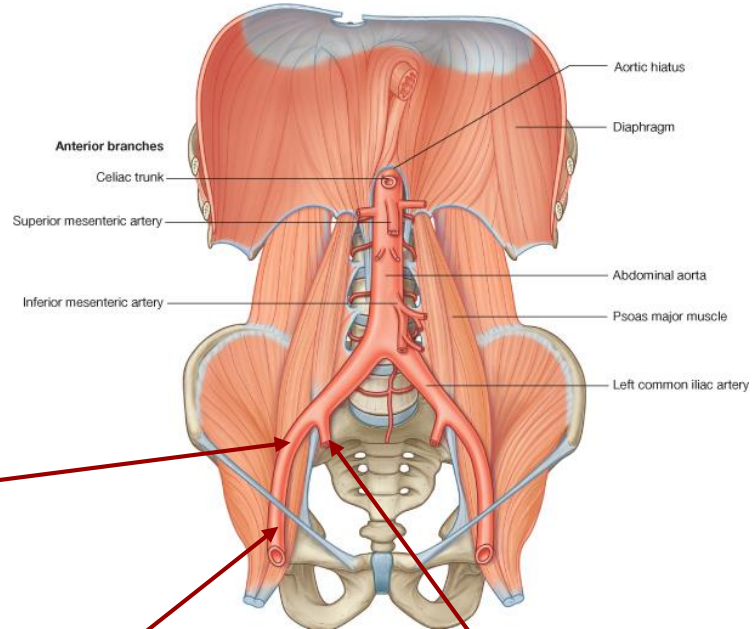
# Branches of common iliac artery

## A-EXTERNAL ILIAC ARTERY:

continues (*beneath midpoint of inguinal ligament*) as **femoral artery** the main supply for **lower limb**

## B-INTERNAL ILIAC ARTERY:

supplies **pelvis**



External iliac artery

Femoral artery

Internal iliac artery

# Arteries of lower limb

## I. Femoral Artery

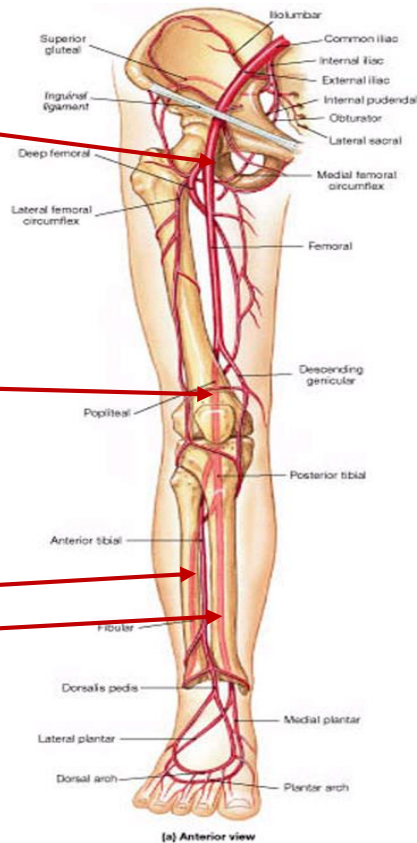
- 1- Is the main arterial supply to lower limb
- 2- Is the continuation of external iliac artery **behind the midpoint of the inguinal ligament**
- 3- Passes **through adductor hiatus** and continues as:

## I. Popliteal Artery

- 1- Deeply placed **in the popliteal fossa.**
- 2- Divides, **at lower end of popliteal fossa** into:

**1-Anterior Tibial Artery**

**2-Posterior Tibial Artery**



[a] Anterior view

# Arteries of lower limb

## I. Femoral Artery

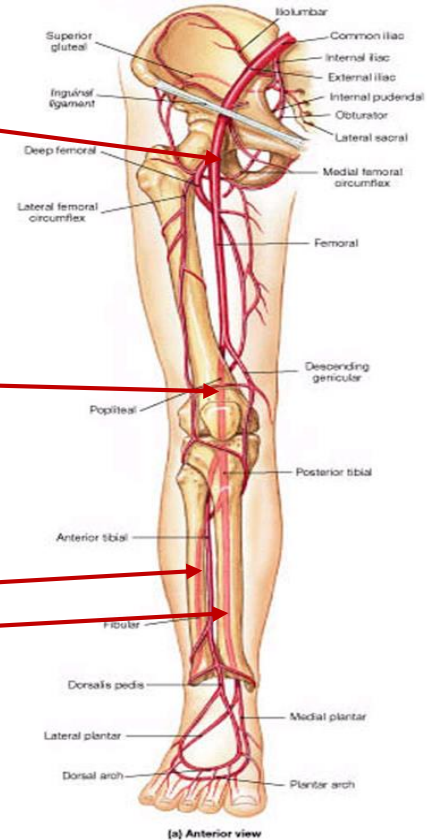
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[a] Anterior view

# Pulse points in head & neck

**Temporal pulse:  
(superficial temporal artery).**



Temporal pulse  
(superficial temporal artery)

**Temporal pulse  
(anterior branch  
of superficial  
temporal artery )**



Temporal pulse  
(anterior branch of  
superficial temporal artery)

**Carotid pulse**

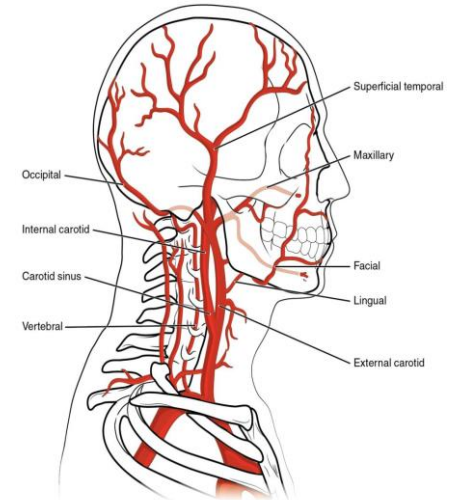
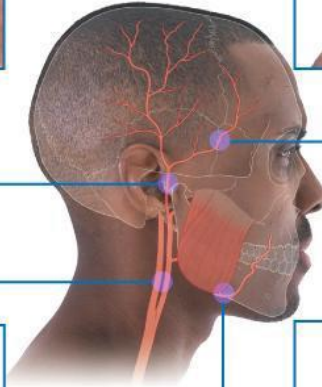


Carotid pulse

Facial pulse



**Facial pulse**



# Pulse points in upper limb

**Axillary pulse**



Axillary pulse

**Brachial pulse in mid-arm**



Brachial pulse in mid-arm

**Radial pulse in distal forearm**



Radial pulse in distal forearm

**Brachial pulse in the cubital fossa**



Brachial pulse in the cubital fossa

**Ulnar pulse in distal forearm**



Ulnar pulse in distal forearm

**Radial pulse in the anatomical snuffbox**



Radial pulse in the anatomical snuffbox



B

# Pulse points in lower limb

**Femora pulse**



Femoral pulse

**Popliteal pulse**



Popliteal pulse

**Posterior tibial pulse**



Posterior tibial pulse

**Dorsalis pedis pulse**



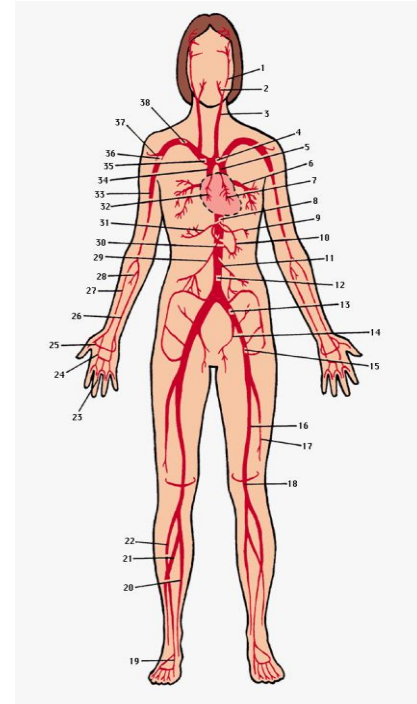
Dorsalis pedis pulse



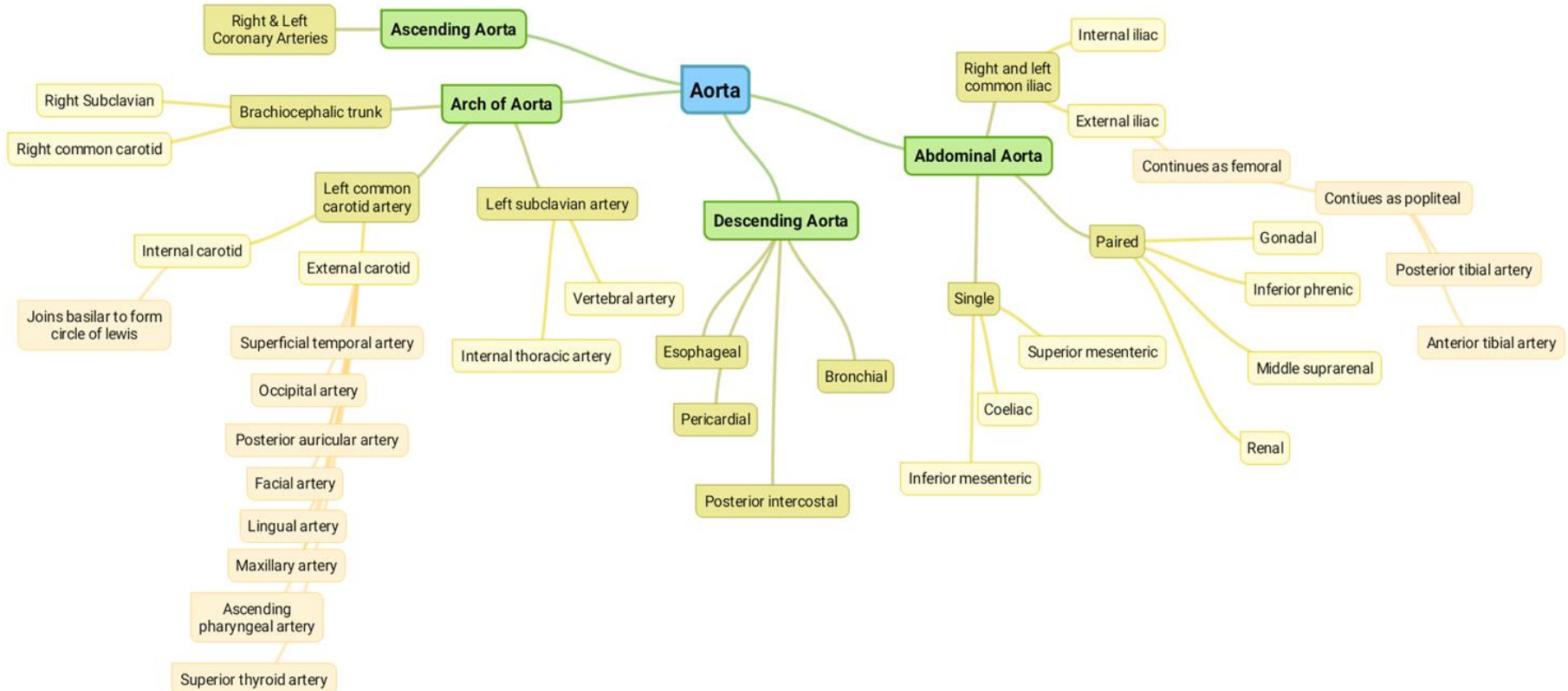
# Summary

## Principal arteries of the human body

1 internal carotid artery	11 inferior mesenteric artery	<b>21 peroneal artery</b>	<b>31 hepatic artery</b>
2 external carotid artery	12 abdominal aorta	<b>22 anterior tibial artery</b>	<b>32 right coronary artery</b>
3 common carotid artery	<b>13 common iliac artery</b>	<b>23 digital artery</b>	<b>33 brachial artery</b>
4 arch of the aorta	<b>14 internal iliac artery</b>	<b>24 superficial palmar arch</b>	<b>34 ascending aorta</b>
5 descending aorta	<b>15 external iliac artery</b>	<b>25 deep palmar arch</b>	<b>35 brachiocephalic artery</b>
6 pulmonary vein	<b>16 femoral artery</b>	<b>26 ulnar artery,</b>	<b>36 axillary artery</b>
7 left coronary artery	<b>17 profunda femoris artery</b>	<b>27 radial artery</b>	<b>37 anterior circumflex humeral artery</b>
8 celiac artery	<b>18 popliteal artery</b>	<b>28 common interosseous artery</b>	<b>38 subclavian artery</b>
9 splenic artery	<b>19 dorsalis pedis</b>	<b>29 superior mesenteric artery</b>	<b>31 hepatic artery</b>
10 left gastric artery	<b>20 posterior tibial artery</b>	<b>30 right gastric artery</b>	<b>32 right coronary artery</b>



# Summary





# MCQs

**(1) Which of the following arteries doesn't carry oxygenated blood?**

- A) Brachial Artery
- B) Femoral Artery
- C) Internal Carotid Artery
- D) Pulmonary Artery

**(2) Which of the following is an example of a true end artery?**

- A) Retinal Artery
- B) Splenic Artery
- C) Renal Artery
- D) Radial Artery

**(3) Which of the following gives the coronary arteries?**

- A) Ascending Aorta
- B) Arch of Aorta
- C) Descending Aorta
- D) Abdominal Aorta

**(4) Which of the following is a branch of the arch of aorta?**

- A) Right Common Carotid Artery
- B) Right Subclavian Artery
- C) Brachiocephalic Trunk
- D) External Carotid Artery

**(5) When the internal carotid artery enters the cranial cavity and joins the basilar artery it forms which one of these?**

- A) Superficial temporal artery
- B) Arterial circle of Willis
- C) Occipital artery
- D) Ophthalmic Artery

# MCQs

**(6) Which of the following arteries is an upper limb artery?**

- A) Posterior auricular artery
- B) Basilar artery
- C) Lingual artery
- D) Axillary artery

**(7) Which of the following is NOT a branch of descending thoracic aorta?**

- A) Pericardial
- B) Esophageal
- C) Anterior intercostal
- D) Bronchial

**(8) Internal iliac artery supplies which of the following?**

- A) Abdomen
- B) Gluteal region
- C) Pelvic
- D) Thigh

**(9) What is the main arterial supply to the lower limb?**

- A) arterial supply to lower limb
- B) anterior tibial artery
- C) ulnar artery
- D) Femoral Artery

**(10) Which one of the following is a pulsation on the upper limb?**

- A) Femoral pulse
- B) Axillary pulse
- C) Carotid pulse
- D) Dorsalis pedis pulse

# Answers

- |       |        |
|-------|--------|
| (1) D | (6) D  |
| (2) A | (7) C  |
| (3) A | (8) C  |
| (4) C | (9) D  |
| (5) B | (10) B |

# Team Members

## **Team leader: Faisal Fahad Alsaif**

Abdulaziz Al dukhayel  
Abdulelah Aldossari  
Abdulrahman Alduhayyim  
Hamdan Aldossari  
Fahad Alfaiz  
Zeyad Al-khenaizan  
Abdullah Almeaither  
Abduljabbar Al-yamane  
Abdulmajeed Alwardi  
Abdulaziz Al-drgam  
Ali Alammari  
Saleh Almoaiqel  
Majed Aljohani

## **Team leader: Rawan Mohammad Alharbi**

Abeer Alabduljabbar  
Afnan Almustafa  
Ahad Algrain  
Albandari Alshaye  
AlFhadah alsaleem  
Ghaida Alsanad  
Lojain Azizalrahman  
Majd AlBarrak  
Maha barakah  
Nouf Alotaibi  
Rinad Alghoraiby  
Wejdan Albadrani