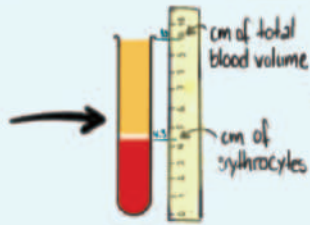


How hematocrit is measured

The blood is spun in a centrifuge to separate it into its parts



$$\frac{\text{erythrocytes (cm)}}{\text{blood volume (cm)}} = \frac{4.3 \text{ cm}}{10 \text{ cm}} = 0.43$$

Hematocrit: 43

higher viscosity than water

Can you tell I think this is important?



Professor Landry

Greg Landry's

Anatomy & Physiology Sketchnotes

How muscles work

Muscle cells have the ability to contract so they shorten the whole muscle



Muscles are connected to bones on both ends. The tissue at the end of the muscles is called "tendons". The tendons are meshed into the bones.



The connection that doesn't move when the muscle contracts is called "origin". The moving side is called "insertion".

Important superficial muscles

connection to all parts of the skull - Frontalis

Sternocleidomastoid
sternum clavicle Mastoid process

covers the whole shoulder - Deltoid

Major chest muscle - Pectoralis Major

Biceps Brachii

Major forearm muscle - Brachioradialis

Quadriceps

Rectus Femoris

Vastus Medialis
medial side

Vastus Lateralis
lateral side

There are also deep muscles they are just not visible here!

Serratus Anterior

External Oblique

Rectus Abdominis

Major abdominal muscle

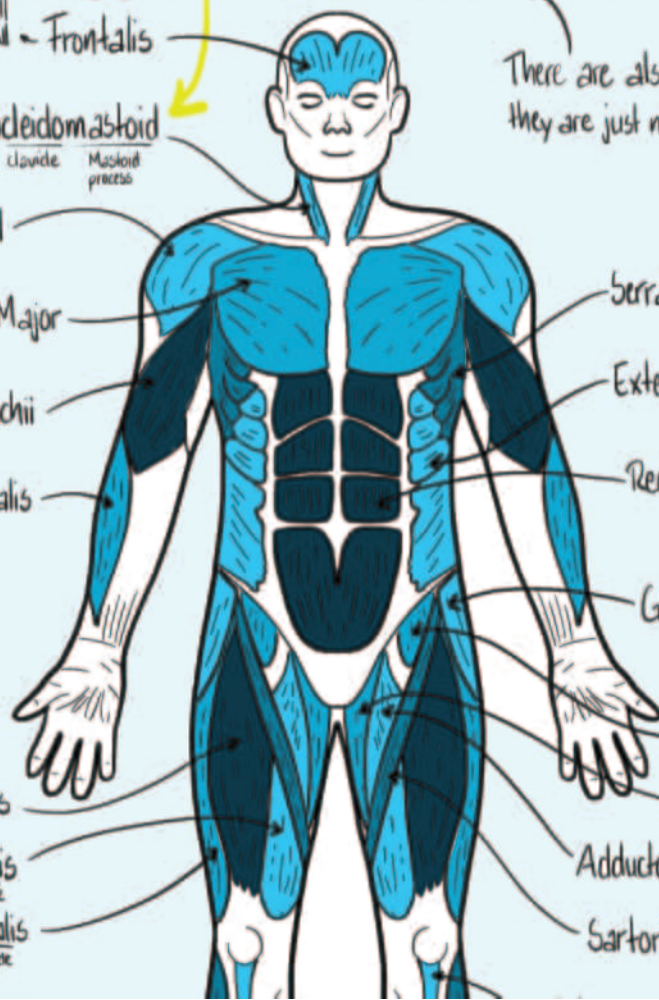
Gluteus Medius

Iliopsoas

Gracilis

Adductor Longus

Sartorius - the longest muscle



Greg Landry's

Anatomy & Physiology

Sketchnotes

© 2024 by Greg Landry

All rights reserved. No portion of this book may be reproduced in any form or by any electronic, mechanical, or other means. An exception to this is for students in Greg Landry's classes who may reproduce it for their use.

Table of Contents

Sketchnote #1	Skeletal System I	1
Sketchnote #2	Skeletal System II	3
Sketchnote #3	Muscular System I	5
Sketchnote #4	Muscular System II.....	7
Sketchnote #5	Digestive System	8
Sketchnote #6	The Heart.....	11
Sketchnote #7	Arteries & Veins	13
Sketchnote #8	The Blood	15

Skeletal System

Copyright by Greg Landry



This is one of my fav facts!

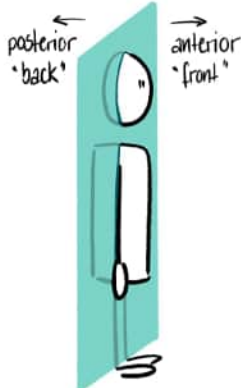
Professor Landry

Anatomical Planes

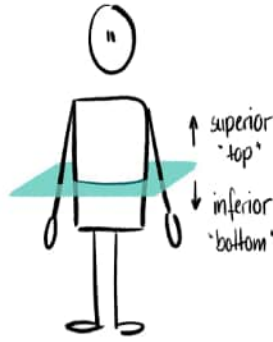
Sagittal Plane



Frontal Plane



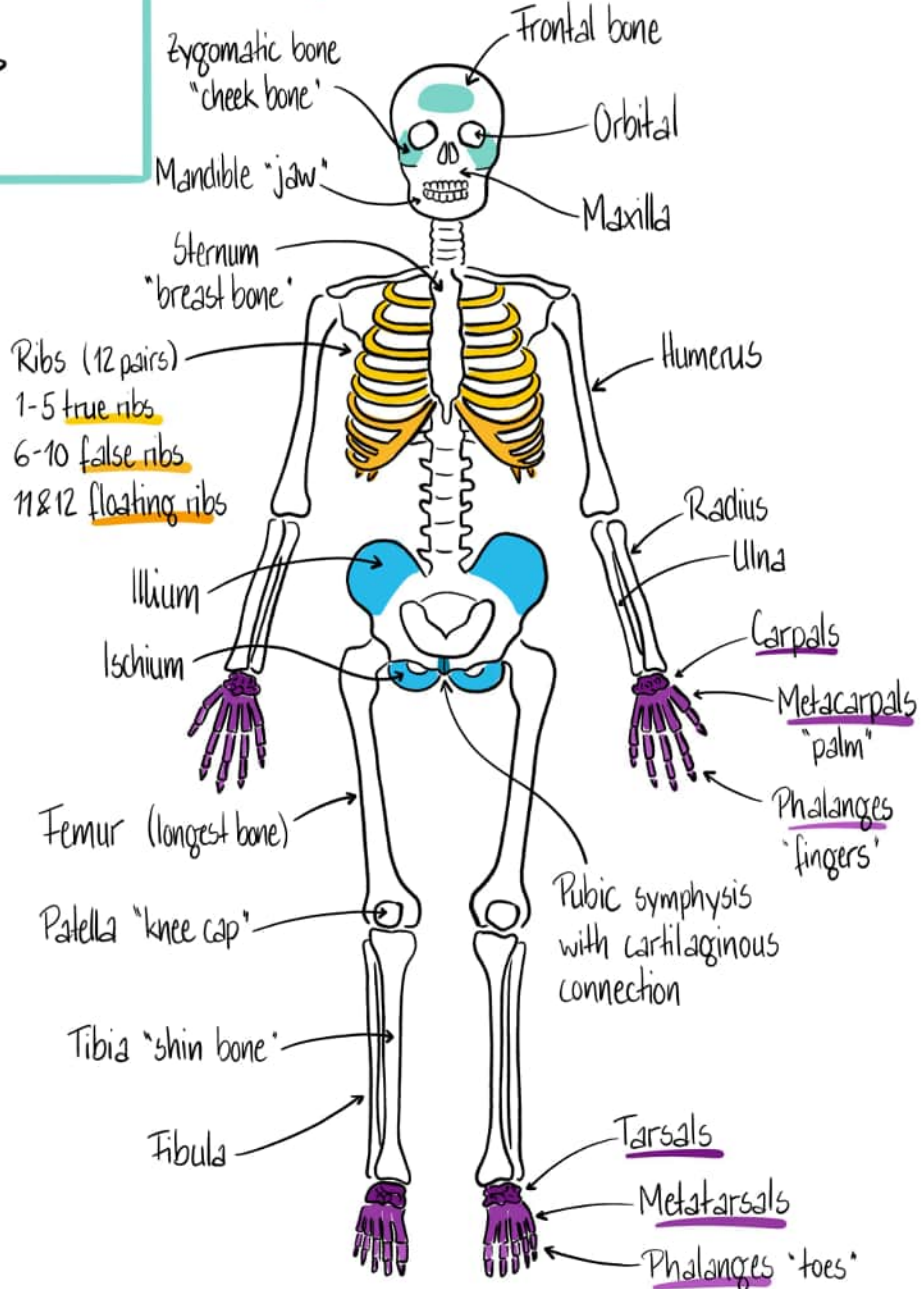
Transversal Plane



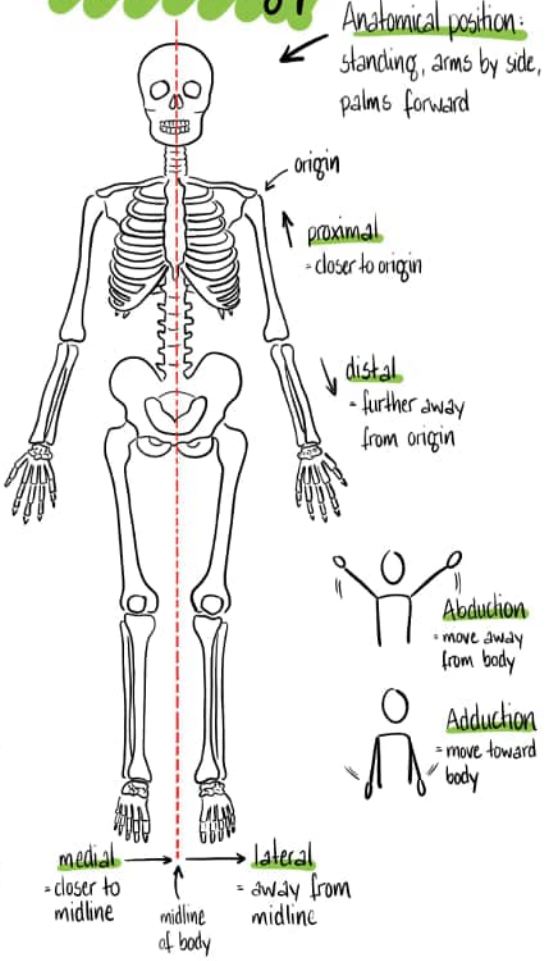
not necessarily in the middle!
But if: "mid-sagittal"

Bones provide the structure
Muscles provide the movement
Ligaments connect the bones

Important bones



Terminology



Anatomy & Physiology Notes



Skeletal System

Copyright by Greg Landry



Be careful with your neck! It's the most sensitive part of the vertebral column.

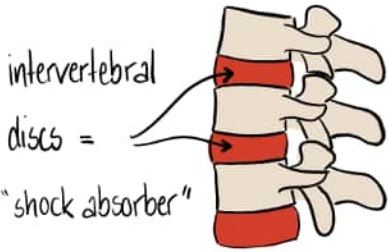
Professor Landry

Vertebrae



hole in all vertebrae for the spinal cord = good protection

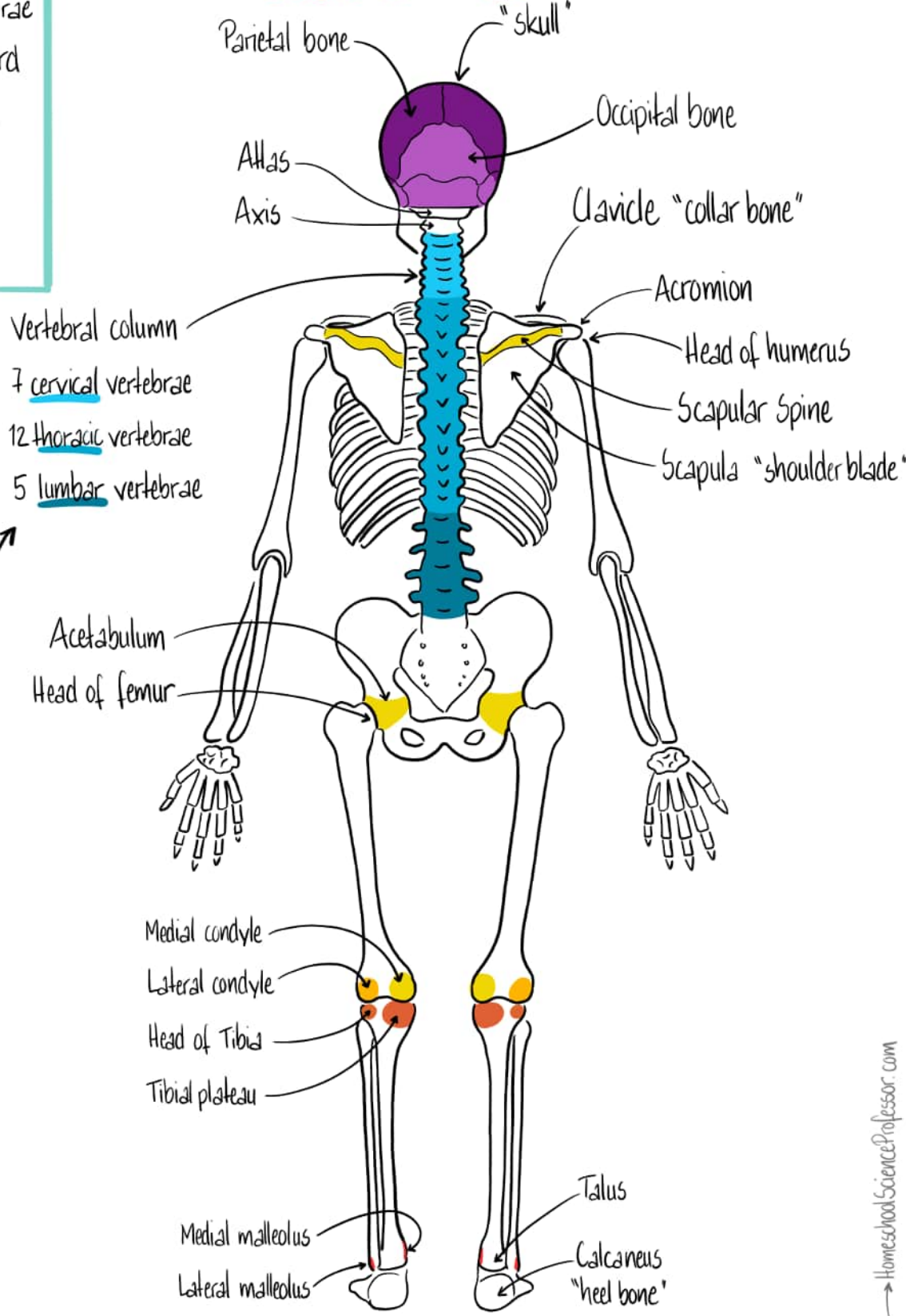
24 separate vertebrae
bones held together by tough ligaments & muscles



Remember the numbers.

- breakfast at 7
- lunch at 12
- dinner at 5

Important bones



Joints

- Shoulder: shallow joint
big range of movement
less stable
- Hip: deep joint
stable joint
less movement

Anatomy & Physiology Notes



Muscular System

-Anterior-

Copyright by Greg Landry

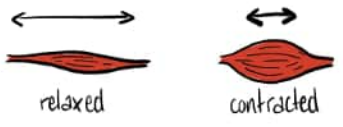
I like this!



Muscle cells are ~60,000 nm in size

How muscles work

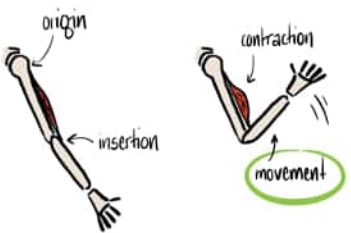
Muscle cells have the ability to contract so they shorten the whole muscle



Muscles are connected to bones on both ends. The tissue at the end of the muscles is called "tendons". The tendons are meshed into the bones.

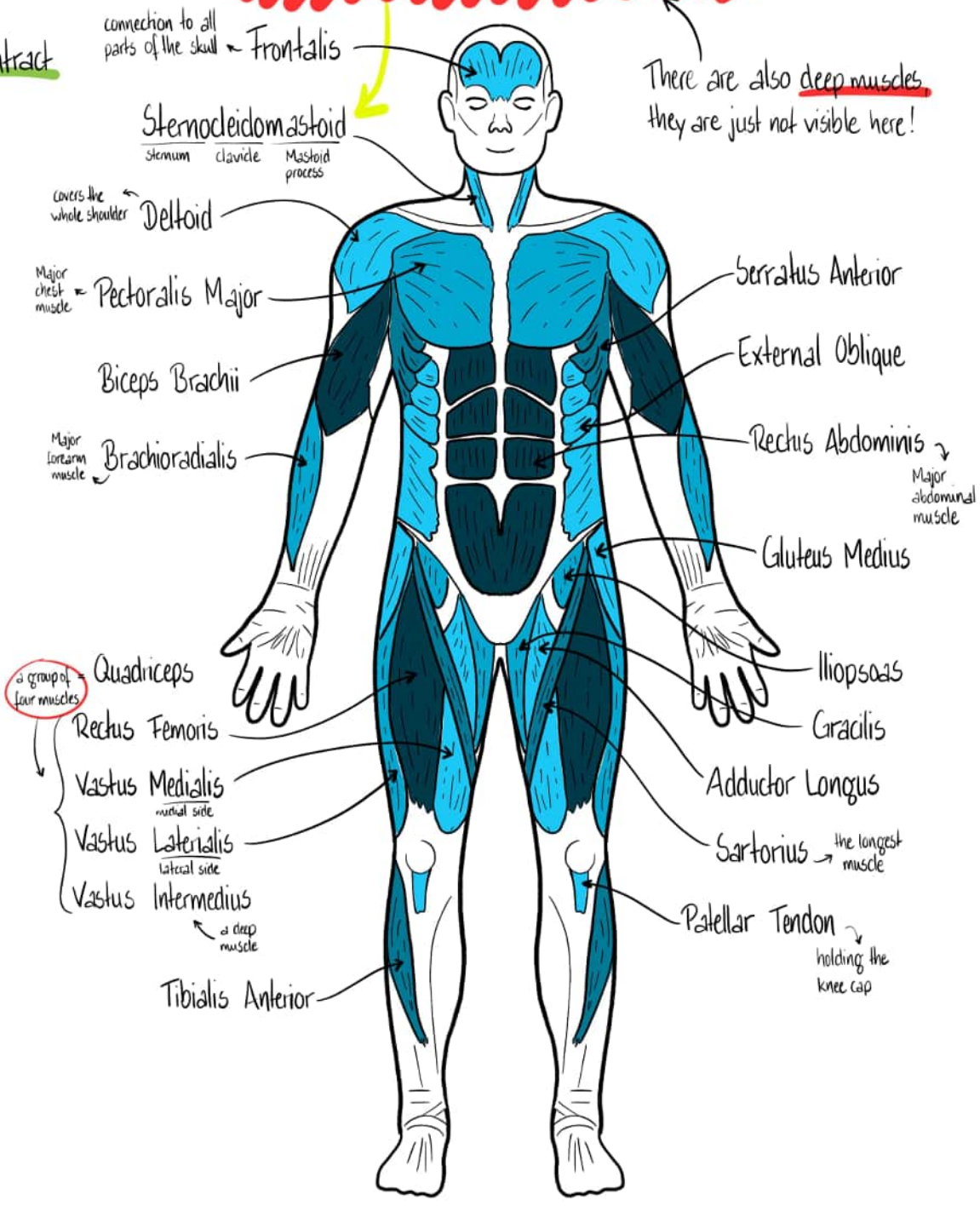


The connection that doesn't move when the muscle contracts is called "origin". The moving side is called "insertion".



Important superficial muscles

There are also deep muscles they are just not visible here!



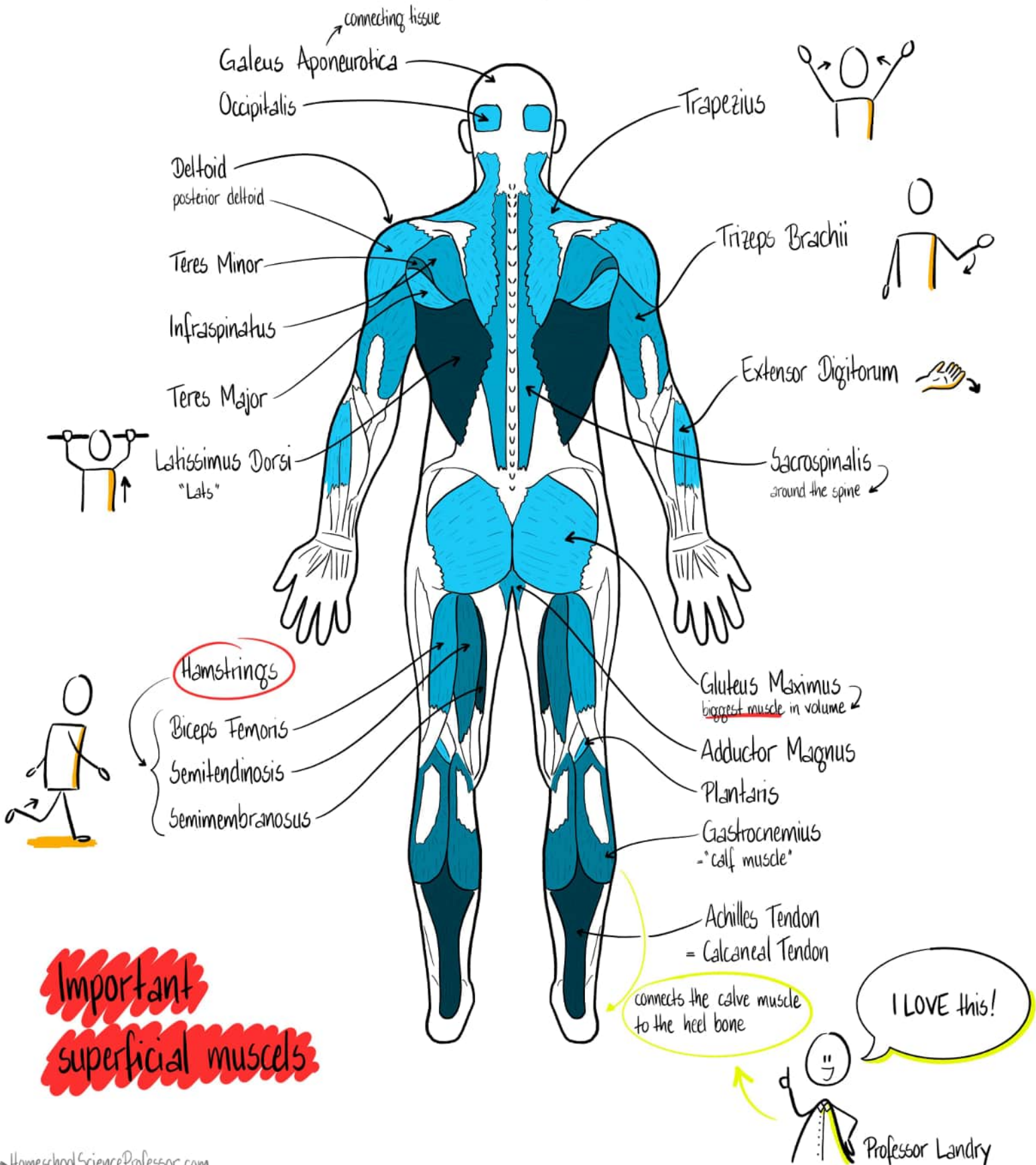
Anatomy & Physiology Notes



Muscular System

-Posterior-

Copyright by Greg Landry



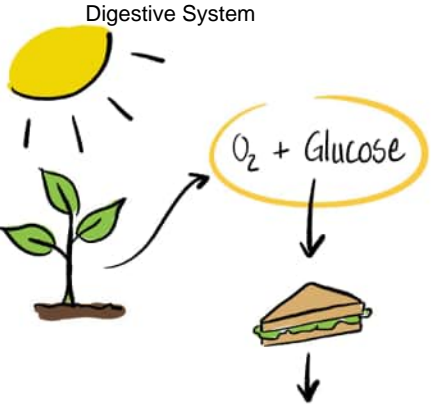
Important superficial muscles

I LOVE this!



Anatomy & Physiology Notes






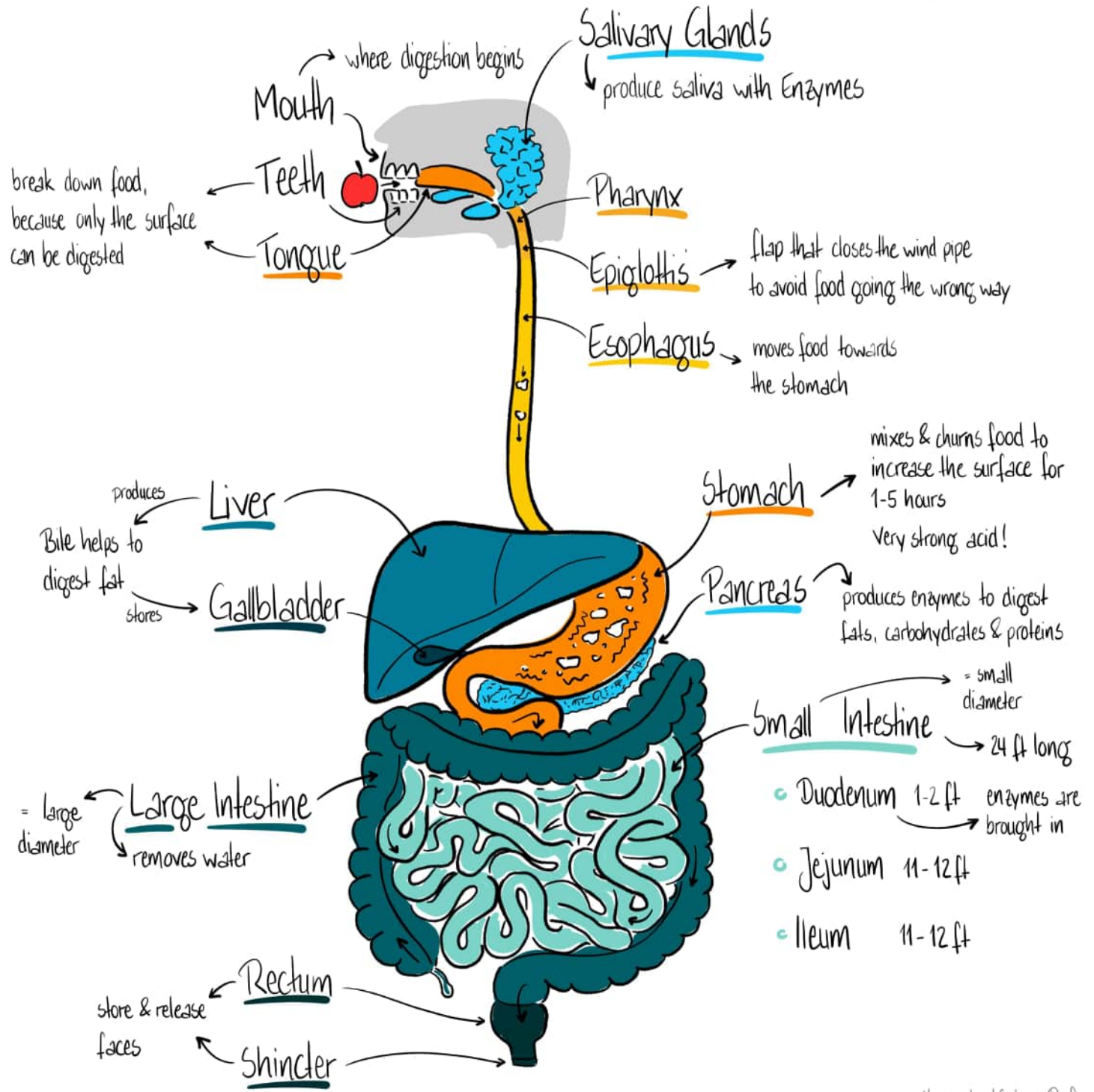
Digestive System

Copyright by Greg Landry



Nutrients in food are processed in the digestion

Peristalsis
The muscles push the food through the digestive system



Anatomy & Physiology Notes



Be careful!

Right & left are named from the patients view



vein: blood to heart → ♥
 artery: blood from heart ♥ →


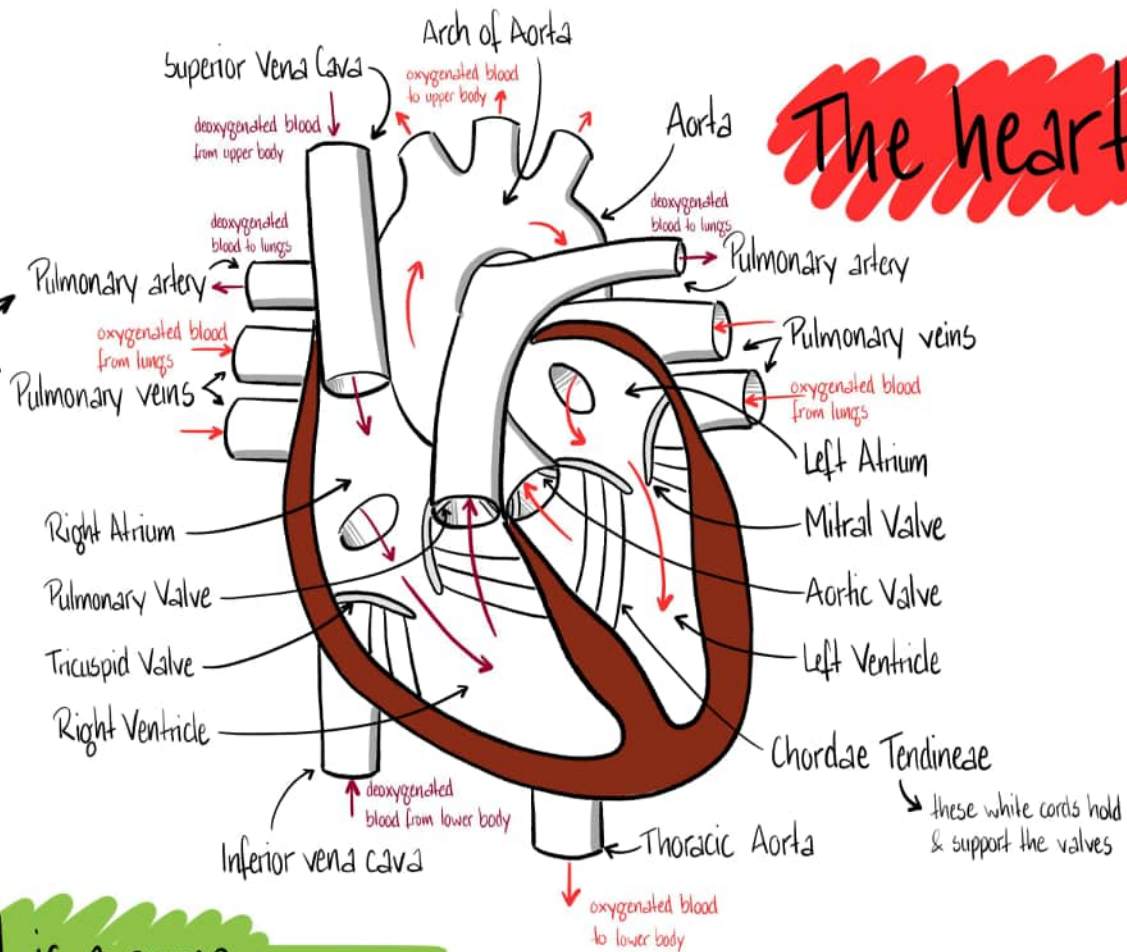
I think this is very important!



Professor Landry

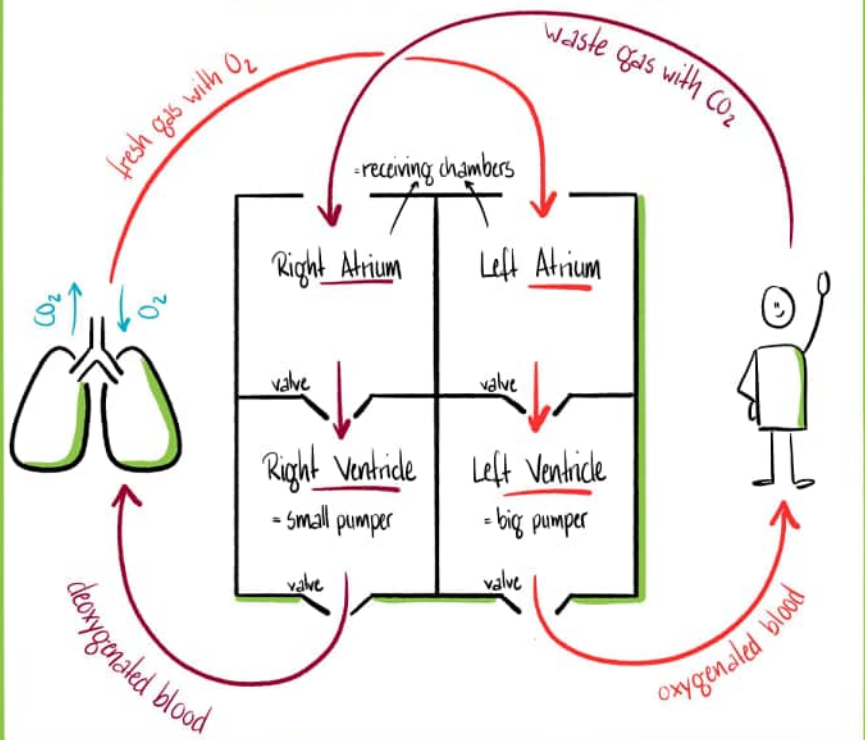
The only vein with oxygenated blood & artery with deoxygenated blood!

In uterus the baby doesn't need it's lungs because the mother does the breathing & the right ventricle is not needed until birth there is a hole between the atriums.

The heart

The heart is a pump



The heart tissue itself is not supplied by the blood flowing through the heart. It's supplied by the coronary arteries that emerge from the aorta.

If the coronary arteries get too narrow or even clogged, that causes a heart attack = myocardial infarction



Anatomy & Physiology Notes

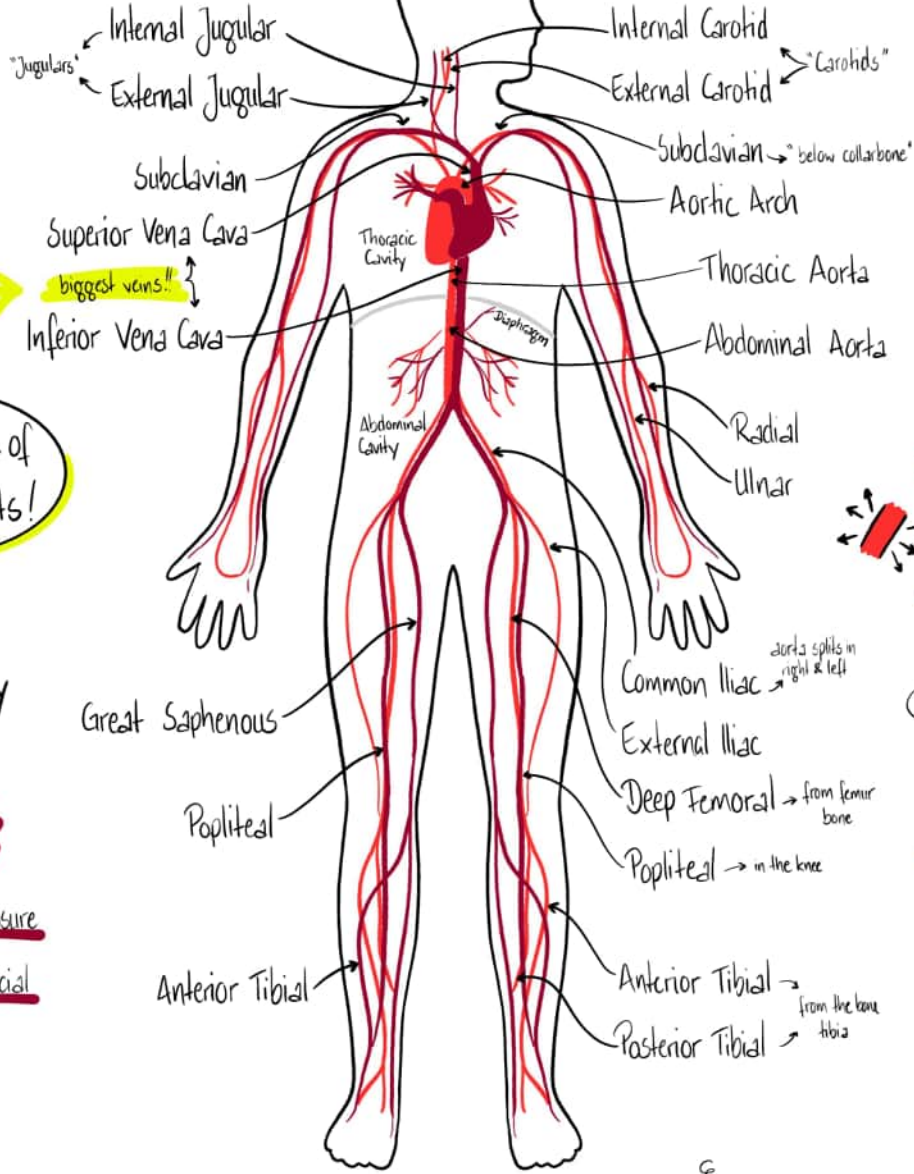


Arteries & Veins

Copyright by Greg Landry

to the heart → **Veins**

Arteries → from the heart



This is one of my fav facts!

Professor Landry

Artery facts

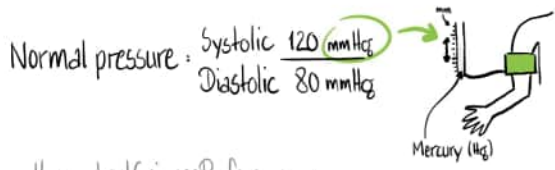
- arteries are thicker walled
- because the pressure is higher
- arteries have smooth muscles that are able to dilate & constrict
- depending on where the blood is needed the arteries dilate
- the arteries lie deeper

Vein facts

- veins have a lower pressure
- veins are more superficial

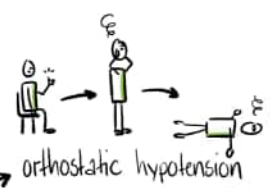
Blood pressure

Systolic - pressure while the heart beats (high)
Diastolic - pressure between heart beats (low)



Low pressure
 okay to a certain degree, below dizziness & faintings

High pressure
 a constantly too high pressure is not good for the health!!



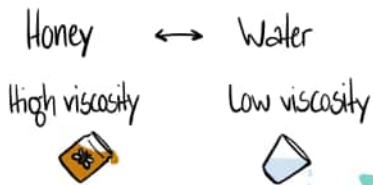
Heart Rate

Average heart rate (beats per minute) is 50 - 80 bpm
Maximum heart rate = 220 bpm - age



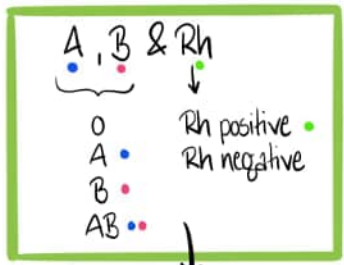
Anatomy & Physiology Notes



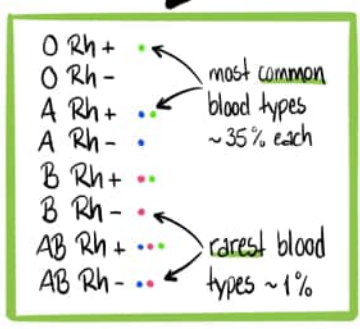


Antigens

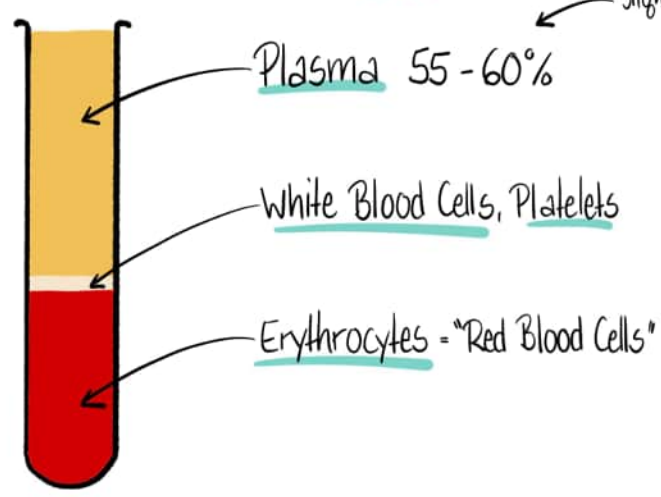
There are three possible antigens on the surface of the erythrocytes.



these possible antigens are combined to the blood types



What's in the blood?



slightly higher viscosity than water

Can you tell I think this is important?

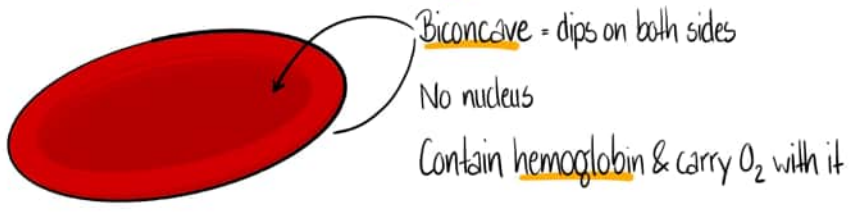


Knowing the blood type is essential for transfusions!

An incompatible type is seen as an invader



Erythrocytes

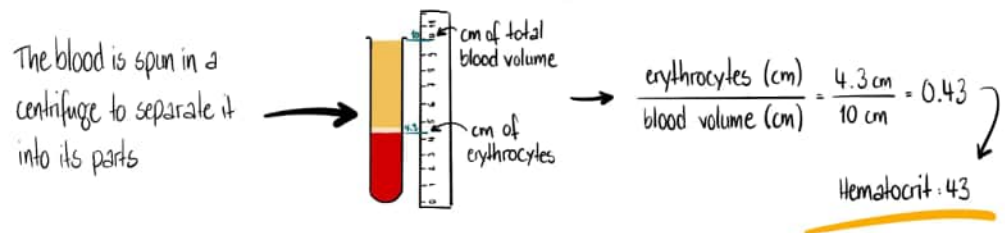


Hematocrit = percentage of erythrocytes as a function of total blood volume
 the '%' is not needed as unit

Normal range
 male: 40-50
 female: 35-45

A too low hematocrit is called anemia & can cause tiredness & dizziness

How hematocrit is measured





Anatomy & Physiology Notes

