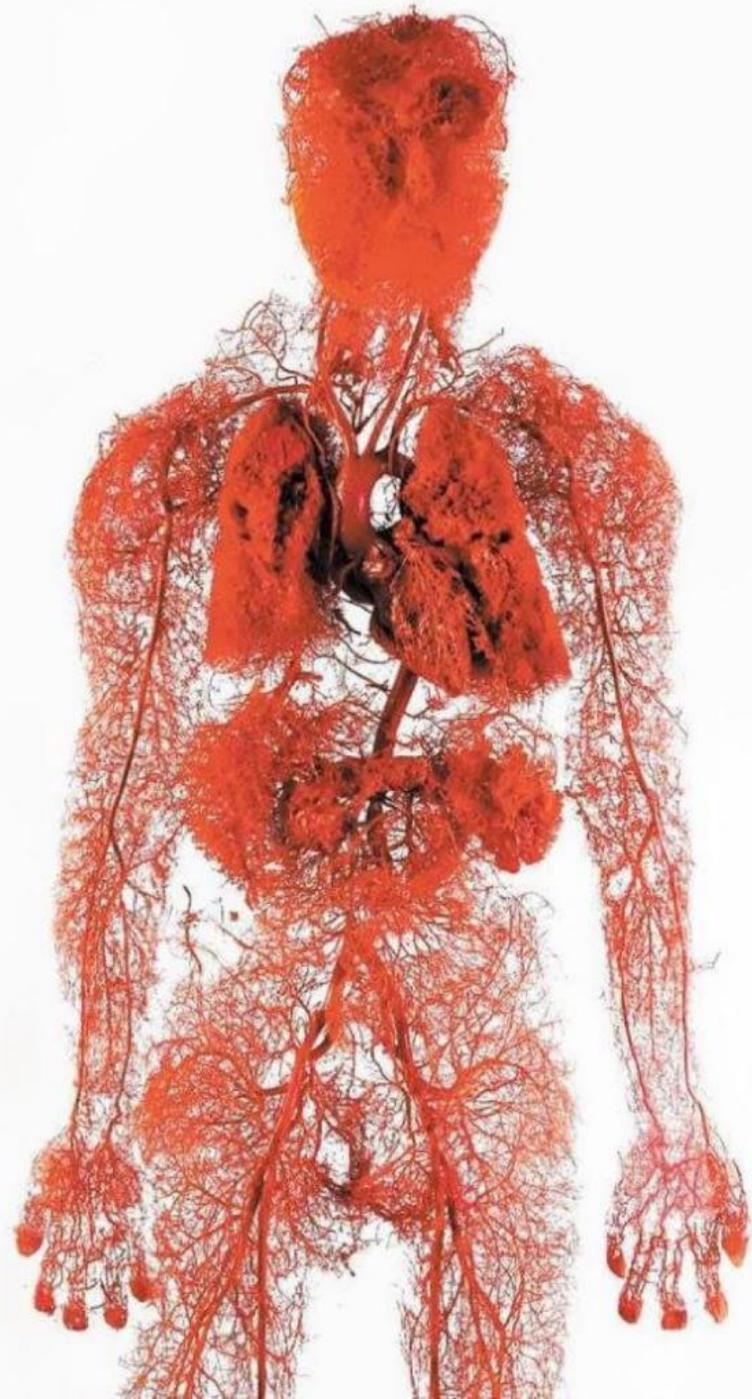


BLOOD VESSELS & BLOOD PRESSURE



Blood Vessels

The various blood vessels in the body are divided into 3 main categories:

- Arteries
- Veins
- Capillaries

Arteries

Artery = Away

The largest blood vessels in the body

Carry blood away from the heart

They have very thick walls to withstand the high pressure of the blood flowing in them

Small arteries are called arterioles

Veins

Veins = Viens

Veins carry blood to the heart

Need muscle contractions to keep the blood moving forward to the heart

Veins

Veins = Viens

- Veins have valves to prevent blood from moving backward
- Ex: blood in the legs would have tendency to flow down because of gravity but it needs to be pushed back up towards the heart

Small veins are called venules

Capillaries



The **smallest** blood vessels

- They are so **narrow** that red blood cells can only pass through them in **single file!**

Capillaries

They have the **thinnest walls** (only 1 layer of cells)

- This allows for the **exchange** of substances between the blood and other cells (remember **diffusion**....)
- Ex: **oxygen, carbon dioxide, nutrients, etc.**

Blood Pressure

- To circulate throughout your body, the heart pumps the blood
- For the blood to be able to make it all the way to the tips of your toes and fingers it needs to be pumped with a lot of pressure!



Which blood vessel has the highest pressure?

- The aorta!
- It's the blood vessel that leads from the heart to the rest of the body, so it makes sense that the pressure is highest there

Which blood vessel has the lowest pressure?

- The vena cava!
- It's the blood vessel that is the last point the blood flows through from the body before making it back to the heart, so it makes sense that it has the lowest pressure

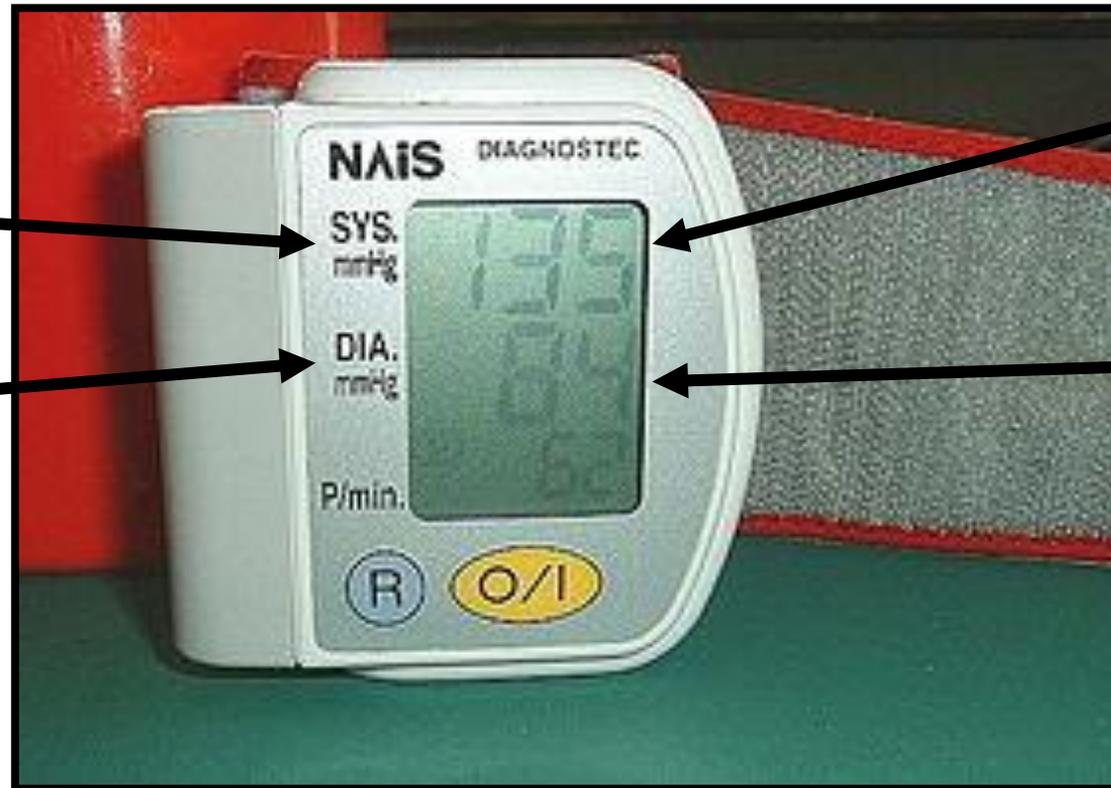
Blood Pressure

- *When you get a blood pressure reading there's always two numbers*
- *It's a ratio between the highest pressure and the lowest pressure*

Blood Pressure

Systolic

Diastolic



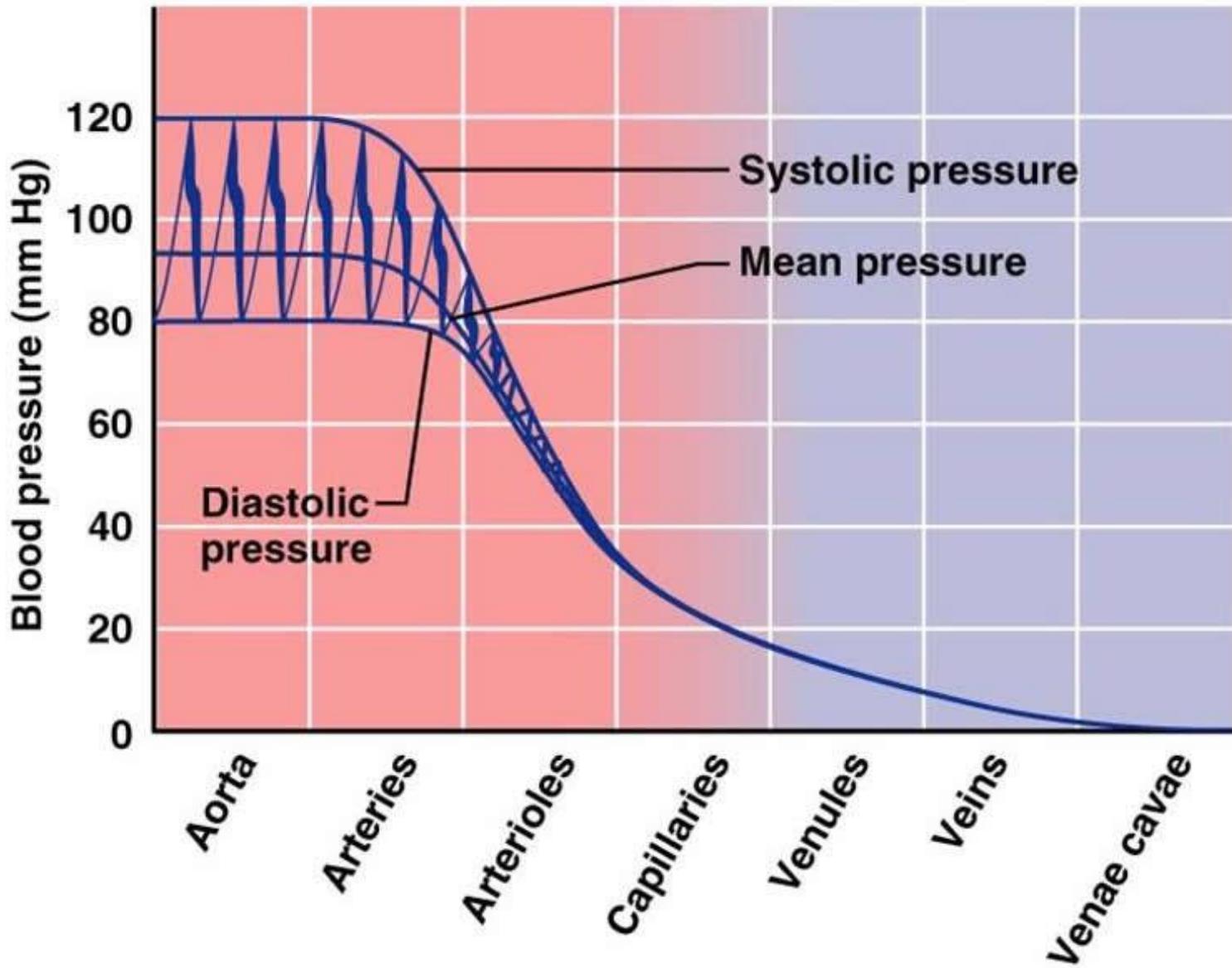
Highest

Lowest

Blood Pressure is a ratio

Highest Pressure = when the ventricles contract = **SYSTOLIC**

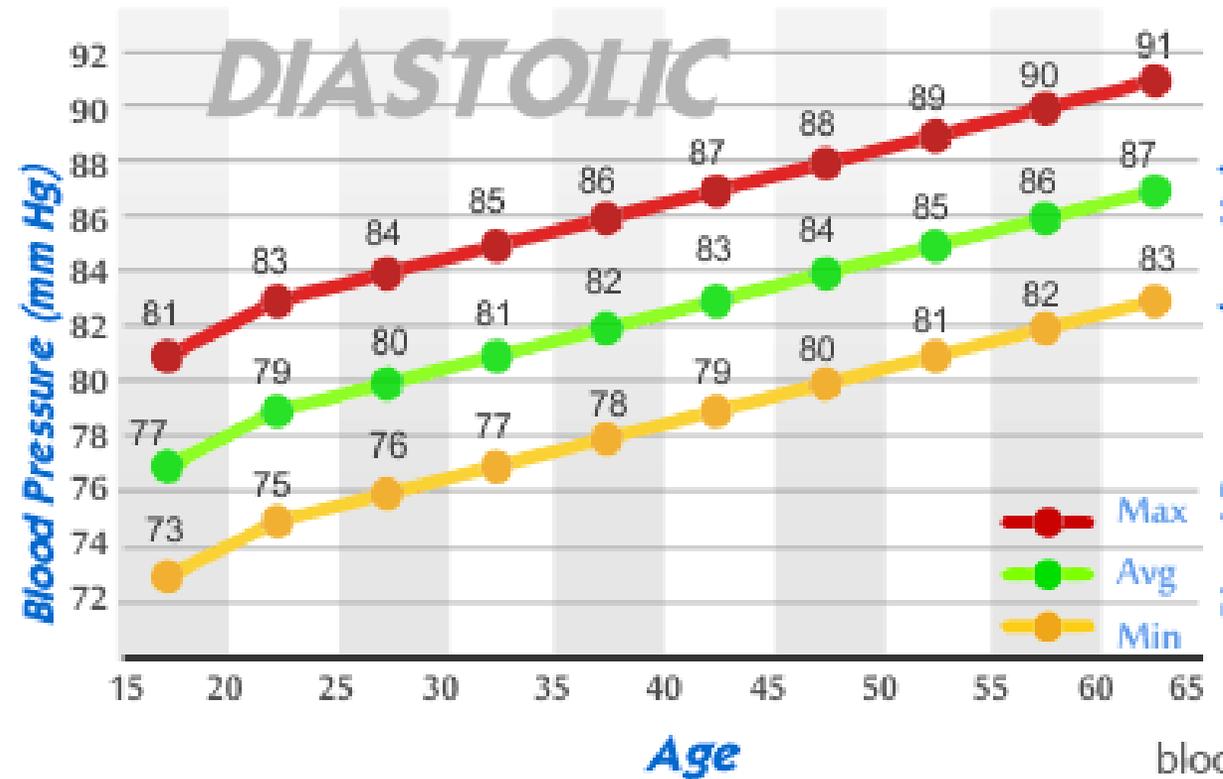
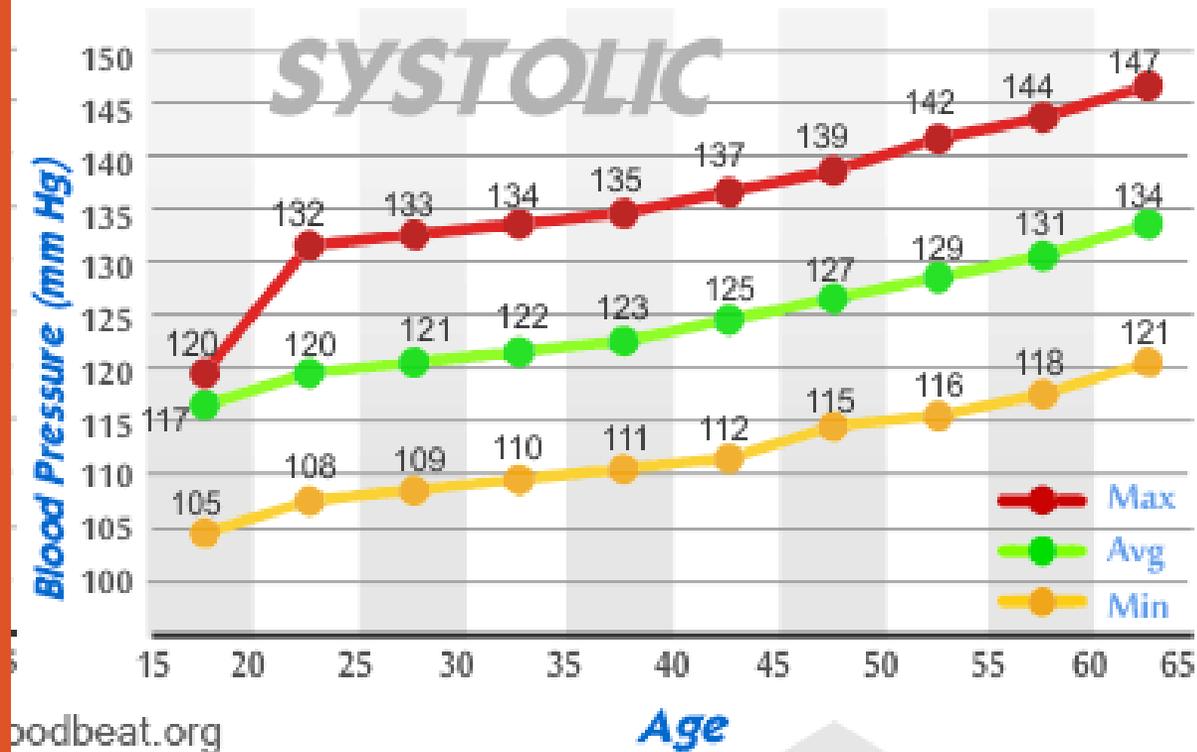
Lowest Pressure = when the ventricles relax = **DIASTOLIC**



Measuring Blood Pressure

- *We measure blood pressure using a sphygmomanometer*
 - *It's an inflatable cuff that cuts off the circulation in your arm*
 - *When the pressure drops, you can HEAR blood forcing through the artery with a stethoscope (Systolic)*
 - *When you HEAR NOTHING, it means blood is flowing easily with no resistance in the arteries (Diastolic)*

Measuring Blood Pressure



For teens, it ranges between 105/73 and 120/81

What can affect your blood pressure?

- **Volume of blood**
 - More blood = higher pressure
- **Heart Rate (a bit)**
- **Diameter of arteries**
 - Smaller diameter = higher pressure
- **Loss of elasticity of arteries**
 - Loss of elasticity = higher pressure
- **Viscosity of blood**
 - More viscous = higher pressure

Hypertension

High Blood Pressure = Hypertension

High blood pressure damages arteries. They can become blocked and prevent proper blood flow or even burst! This can increase risk of:

- Heart attack
- Stroke
- Heart failure (from working so hard to pump the blood)
- Heart disease
- Kidney failure
- Vision loss

Smoking & Hypertension

Smoking causes high blood pressure

- Thickens blood
- Speeds up the heart
- Constricts the blood vessels
- Over time, causes loss of elasticity of arteries

Stress & Hypertension

Stress causes high blood pressure

- Stimulates adrenal gland which speeds up the heart rate
- Constricts blood vessels