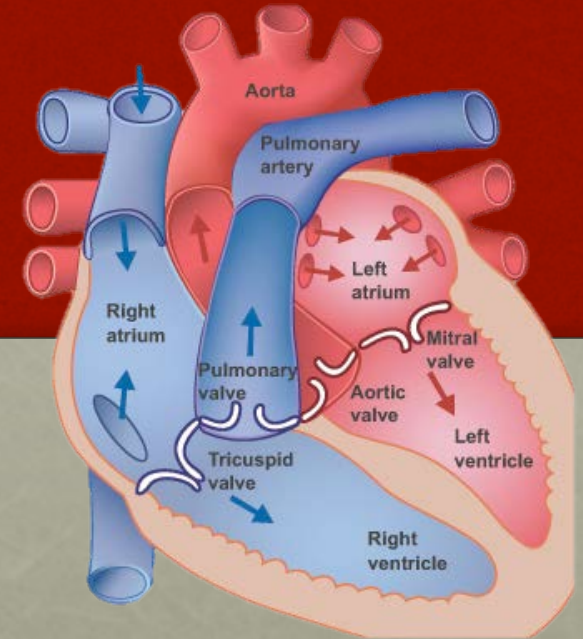


INTRO TO THE CARDIOVASCULAR SYSTEM

And when it goes wrong!

Dr. Chantal Chris



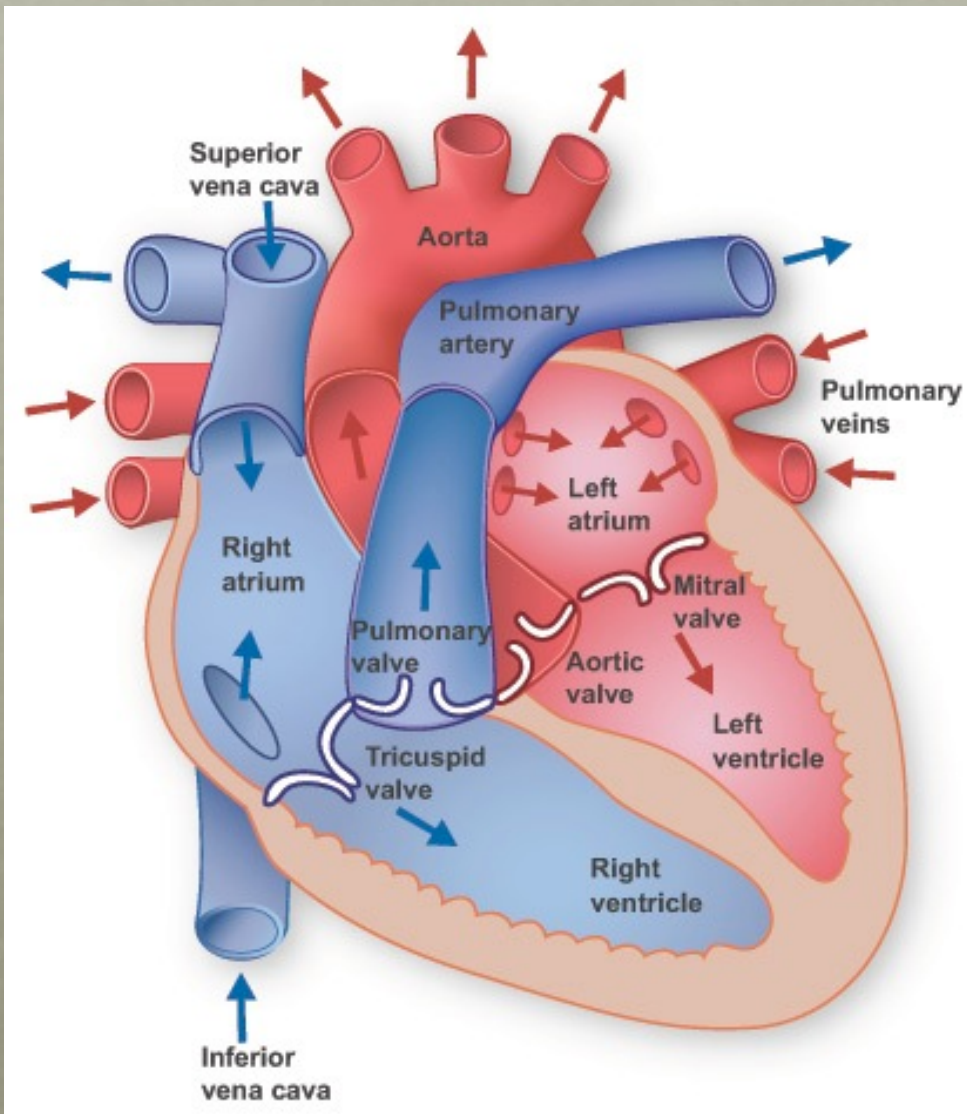
OVERVIEW

- Anatomy and physiology of the heart
- Anatomy and physiology of veins and arteries
- Pathology:
 - High cholesterol
 - High blood pressure
 - Heart attacks
 - Strokes

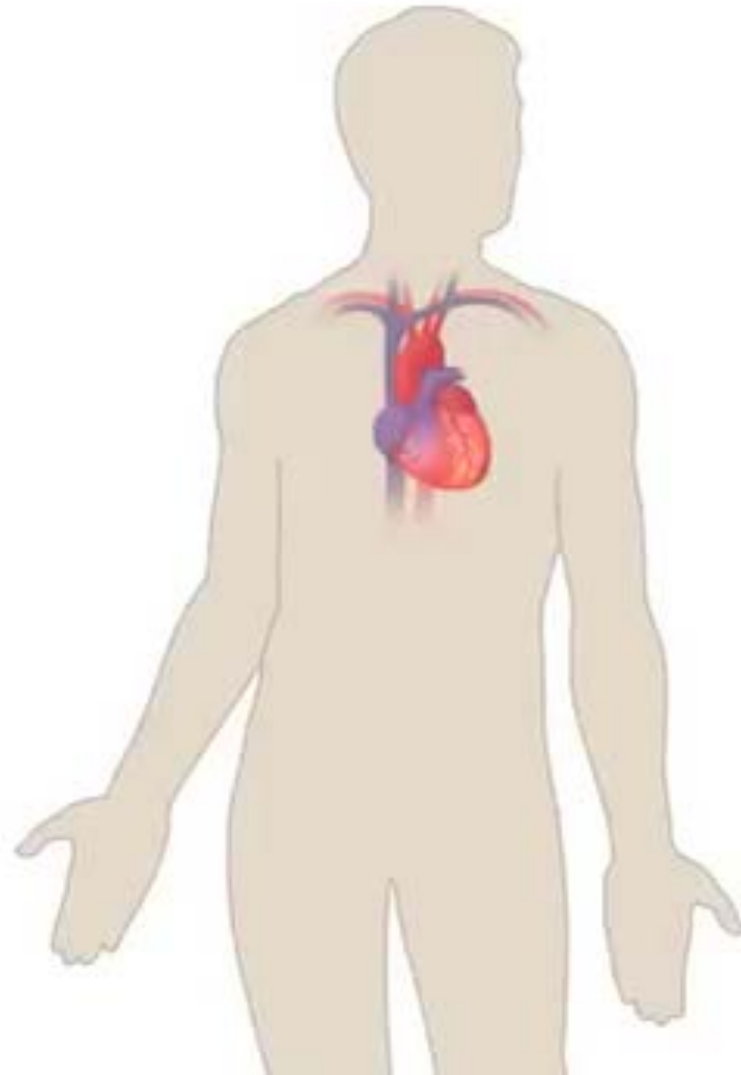
SOME DEFINITIONS

- Anatomy: a study of the **structure** or internal workings of living organisms
- Physiology: the way in which a living organism or bodily part **functions**.
- Pathology: the typical behavior (causes and effects) of a **disease**.

ANATOMY OF THE HEART

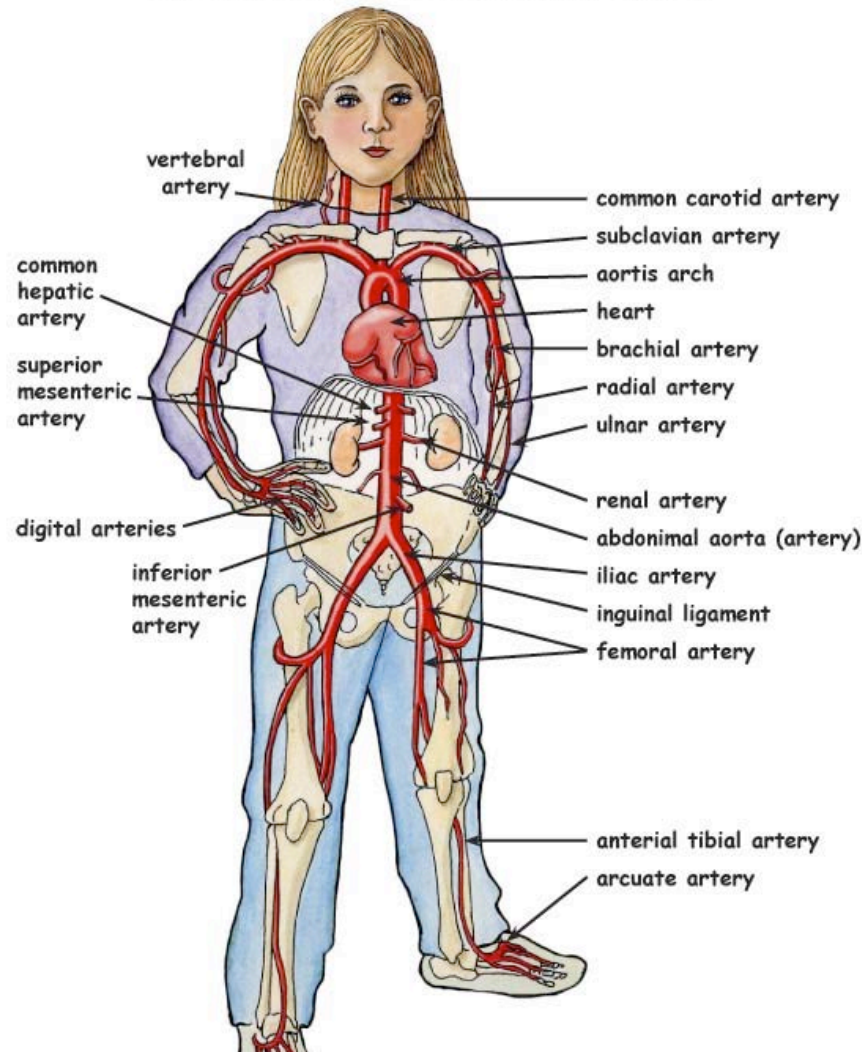


HEART PHYSIOLOGY

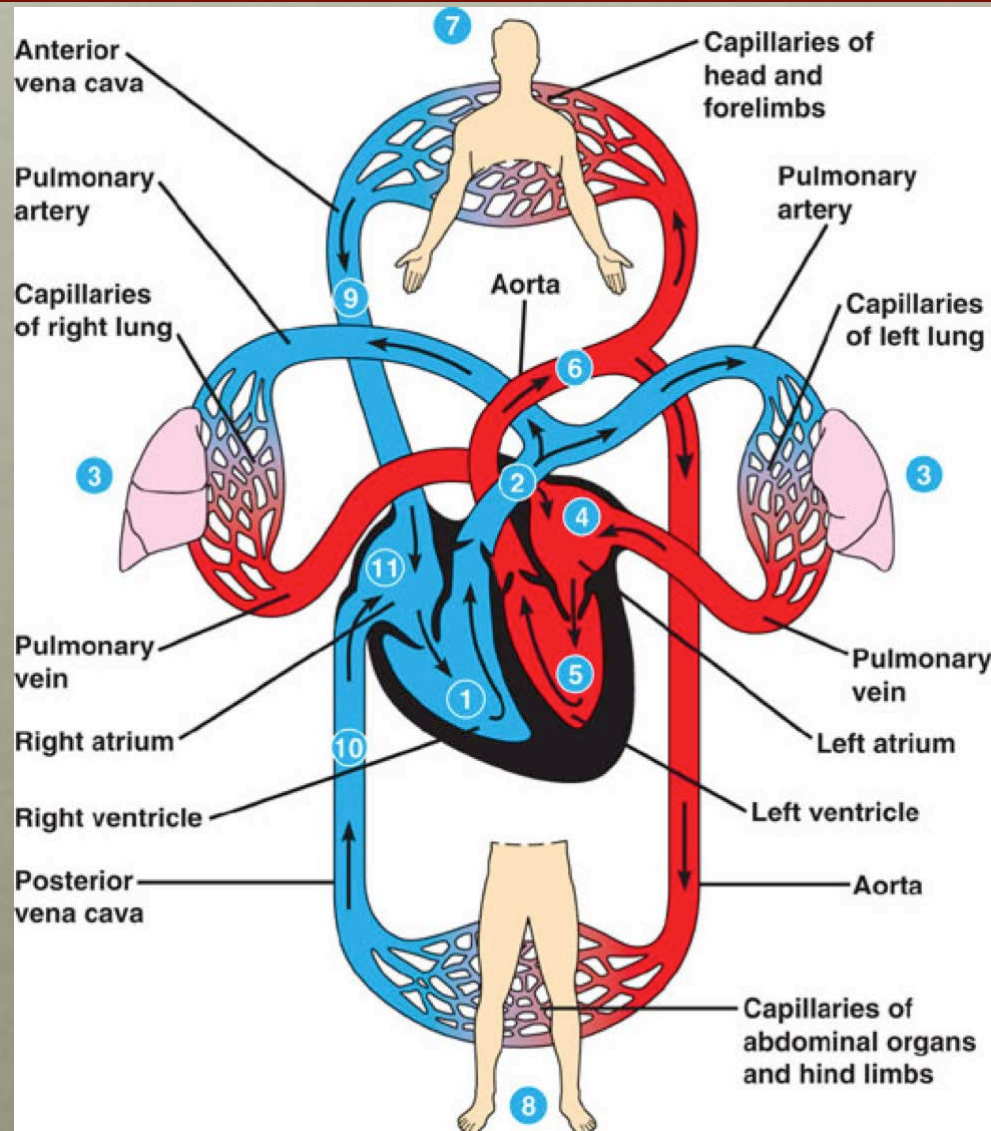


ANATOMY OF THE BLOOD VESSELS

Blood Vessels of the Circulatory System



PHYSIOLOGY OF THE BLOOD VESSELS

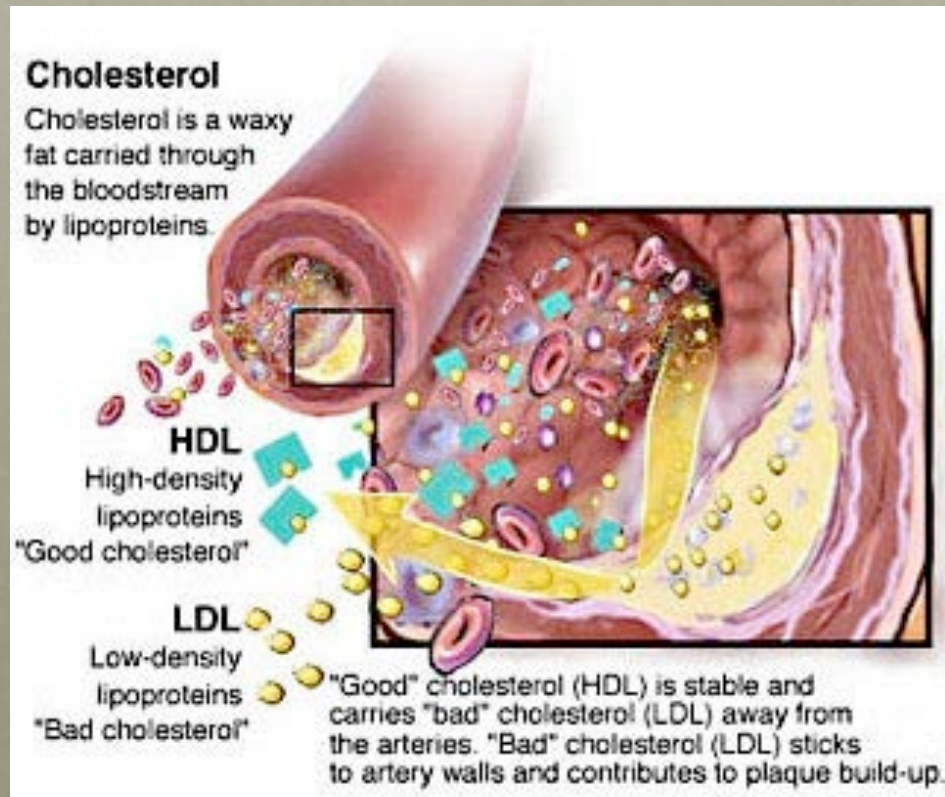


CARDIOVASCULAR SYSTEM PHYSIOLOGY



HIGH CHOLESTEROL DYSLIPIDEMIA OR HYPERLIPIDEMIA

- elevated *total* or *low-density lipoprotein (LDL)* cholesterol levels
and/or
- low levels of *high-density lipoprotein (HDL)* cholesterol.



HIGH CHOLESTEROL DYSLIPIDEMIA OR HYPERLIPIDEMIA

Systolic Blood Pressure (mmHg)	Non-Smoker					Smoker				
	4	5	6	7	8	4	5	6	7	8
180	3	3	4	5	6	6	7	8	10	12
160	2	3	3	4	4	4	5	6	7	8
140	1	2	2	2	3	3	3	4	5	6
120	1	1	1	2	2	2	2	3	3	4

Cholesterol (mmol/L)

HIGH CHOLESTEROL DYSLIPIDEMIA OR HYPERLIPIDEMIA

Table 3. Intervention strategies as a function of Framingham total CVD risk score and LDL-C levels^{3*}

Total CVD risk score [†]	LDL-C levels			
	<1.8 mmol/l	1.8 - <2.5 mmol/l	2.5 - 4.9 mmol/l	>4.9 mmol/l
<3% Low risk	No lipid intervention	No lipid intervention	Lifestyle intervention	Lifestyle intervention, consider drug if uncontrolled
3 - 15% Moderate risk	Lifestyle intervention	Lifestyle intervention	Lifestyle intervention, consider drug if uncontrolled	Lifestyle intervention, consider drug if uncontrolled
15 - 30% High risk	Lifestyle intervention, consider drug [‡]	Lifestyle intervention, consider drug [‡]	Lifestyle intervention and immediate drug intervention	Lifestyle intervention and immediate drug intervention
>30% Very high risk	Lifestyle intervention, consider drug [‡]	Lifestyle intervention and immediate drug intervention	Lifestyle intervention and immediate drug intervention	Lifestyle intervention and immediate drug intervention

[‡]Based on Table 3 from Reiner Z, et al., *Eur Heart J* 2011;32:1769-1818.³

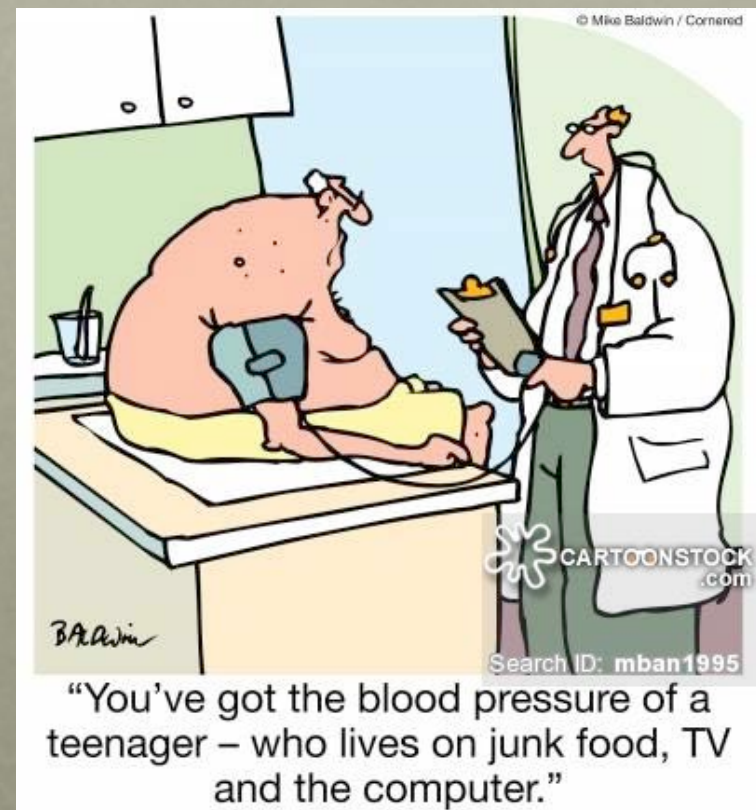
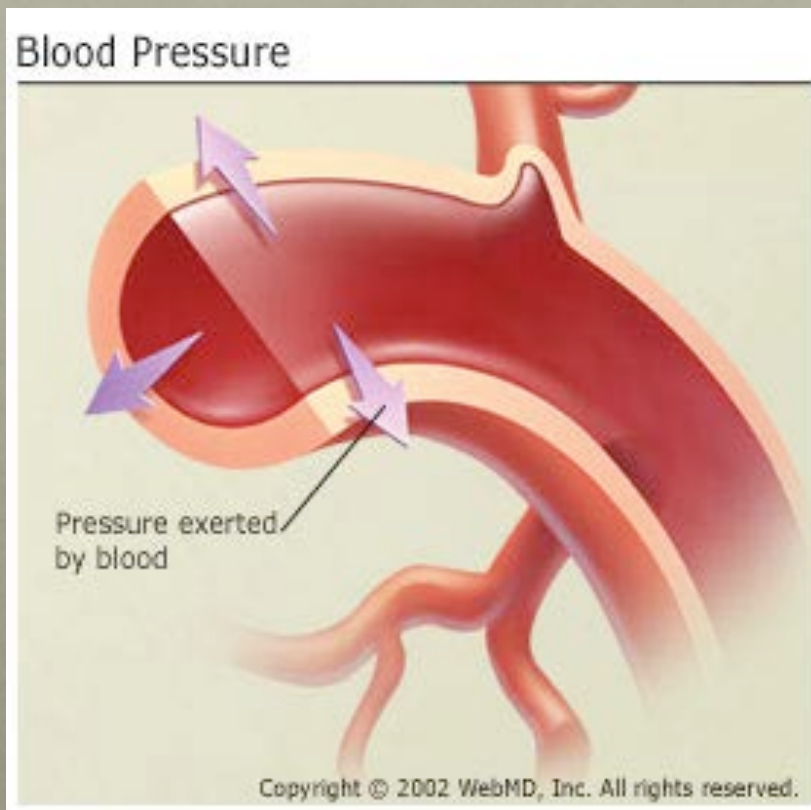
[†]Based on the Framingham CVD risk tables.^o

[‡]In patients with MI, statin therapy should be considered regardless of LDL-C levels.

HIGH BLOOD PRESSURE

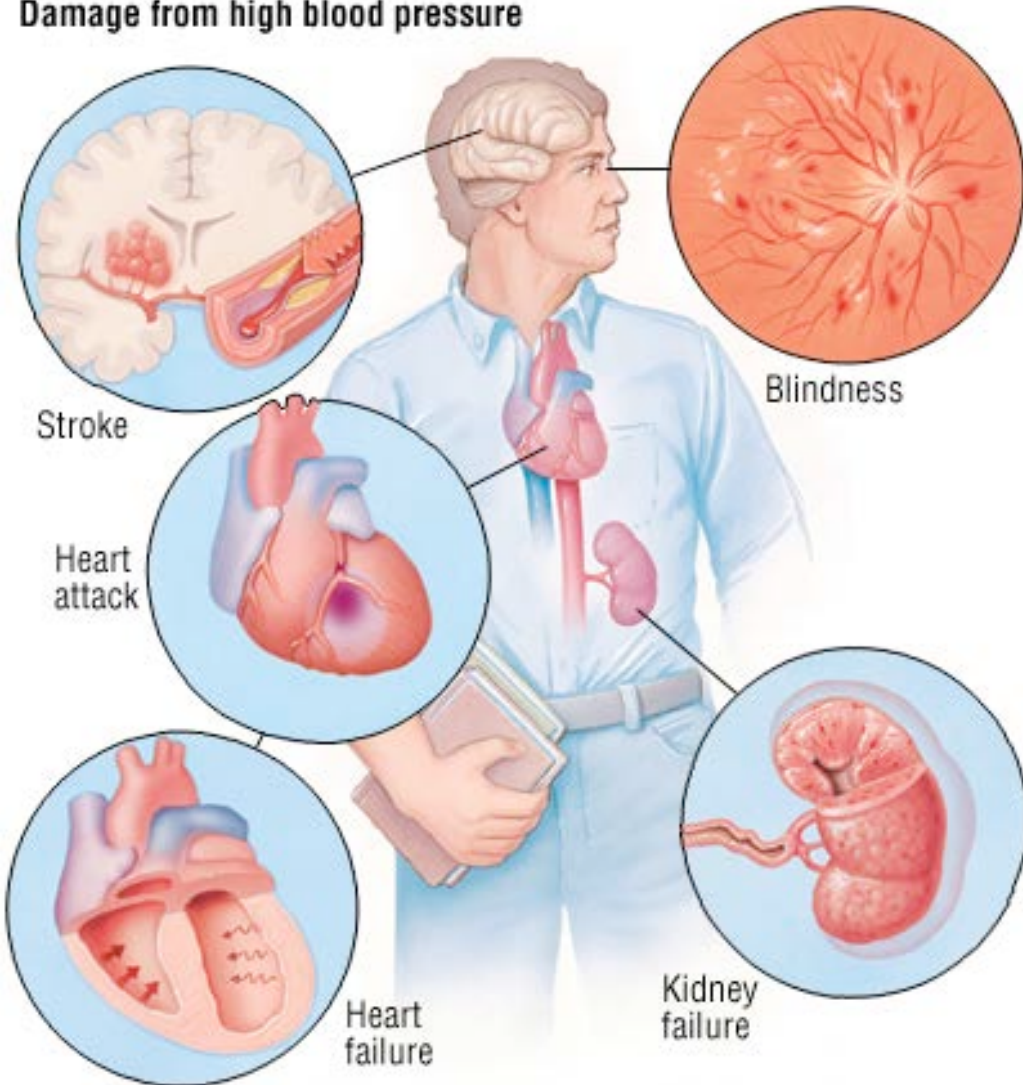
HYPERTENSION

- Blood Pressure $>140/90$ (after 3-5 office visits) or $>135/85$ (average of 4 readings/d x 7 days) at home.



HIGH BLOOD PRESSURE HYPERTENSION

Damage from high blood pressure



Blood pressure



When your heart beats it pumps blood around your body. As the blood moves it pushes against the sides of the blood vessels, which are called arteries. The strength of this pushing is your blood pressure

Most people don't know if they have high blood pressure as often there are no symptoms. The only way to find out is to get it checked



HIGH blood pressure

also called hypertension, puts too much force on your artery walls. Over time this can lead to damaged arteries and increase your risk of heart attack and stroke



it can also lead to problems with your eyes and kidneys

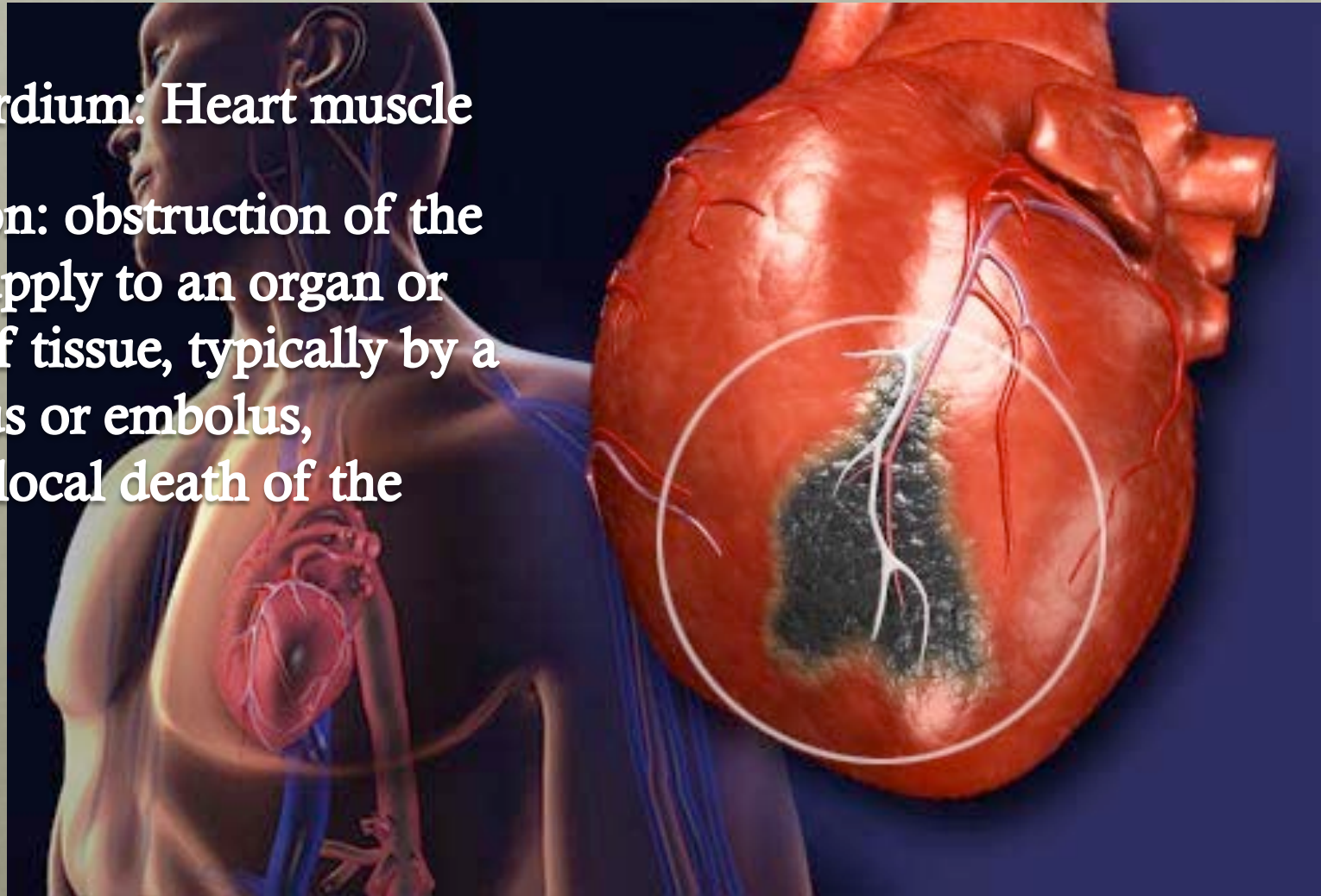


Blood pressure is only one of the risk factors for heart attack and stroke. Ask your health professional what your overall risk is

HEART ATTACK

MYOCARDIAL INFARCTION (MI)

- Myocardium: Heart muscle
- Infarction: obstruction of the blood supply to an organ or region of tissue, typically by a thrombus or embolus, causing local death of the tissue.
















HEART ATTACK

MYOCARDIAL INFARCTION (MI)

- Signs and Symptoms:

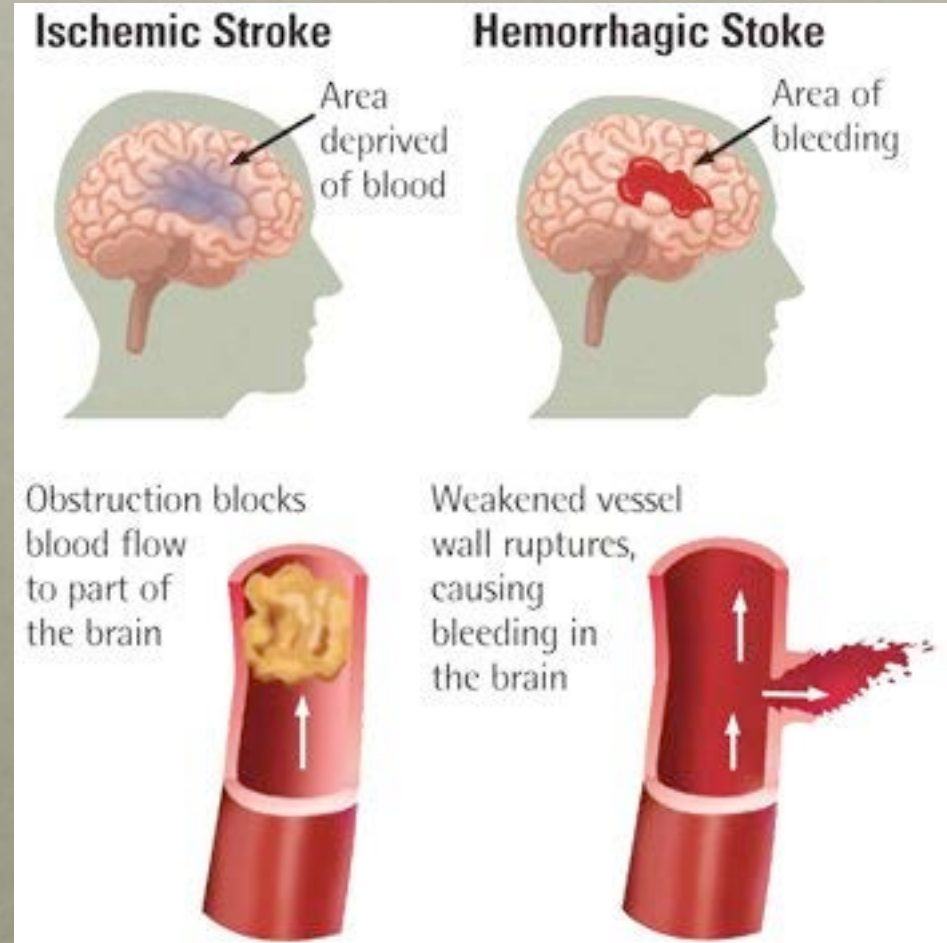
HEART ATTACK WARNING SIGNS

MEN		WOMEN
Chest pain/discomfort 	 <p>If you have any of these signs, don't wait. Call 911</p> <p>froedtert.com/heart</p>	Chest pressure 
Rapid or irregular heartbeat 		Unusual fatigue for several days 
Feeling dizzy, faint or light-headed 		zzz Anxiety and sleep disturbances 
Breaking out in a cold sweat 		Back, neck, arm or jaw pain 
Stomach discomfort or indigestion 		Nausea, feeling sick to stomach 
Shortness of breath 		Shortness of breath 

STROKE

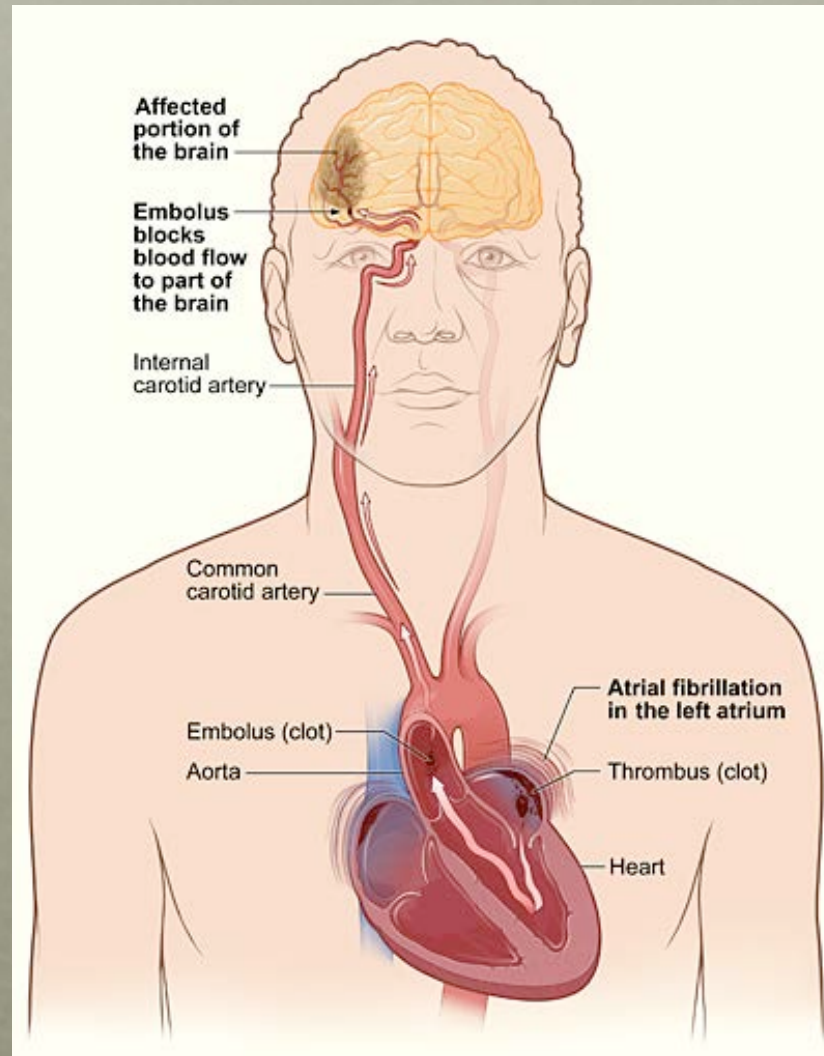
CEREBROVASCULAR ACCIDENT (CVA)

- Cerebro: of or relating to the brain.
- Vascular: of, relating to, affecting, or consisting of a vessel or vessels
- Ischemia: inadequate blood supply to an organ
- Hemorrhage: an escape of blood from a ruptured blood vessel, especially when profuse



STROKE

CEREBROVASCULAR ACCIDENT (CVA)



STROKE

CEREBROVASCULAR ACCIDENT (CVA)

Stroke: Spot it **F.A.S.T.**



FACE DROOPING: Ask the person to smile. Does one side of the face droop?

ARM WEAKNESS: Ask the person to raise both arms. Does one arm drift downward?

SPEECH DIFFICULTY: Ask the person to repeat a simple phrase. Is their speech slurred or strange?

TIME TO CALL 911: If you observe any of these signs, call 911 immediately.