CARDIOVASCULAR SYSTEM

system made up of **vessels** that **transport O2, CO2, nutrients and waste products** through the body

CLOSED SYSTEM:

- blood never touches liquid between cells

- exchange through capillaries

VESSELS

ARTERIES

- vessels that bring blood **from the heart to the organs**

(usually oxigenated blood with nutrients)

VEINS

- vessels that bring blood **from the organs to the heart**

(usually not oxigenated)

CAPILLARIES

- **small** blood vessels **around the organs**

- **delivery of oxygen and nutrients** to the organs

- **absorb and carry out waste** products

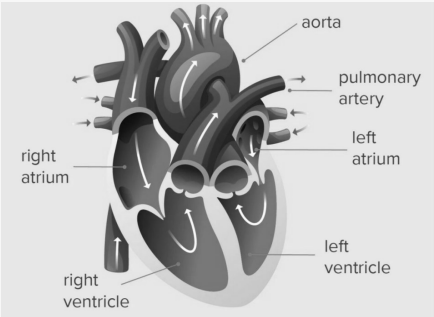
BLOOD VESSEL ARCHITECTURE

ARTERIES	=	*VEINS*
TUNICA ADVENTITIA=	external layer	**fibrous connective tissue**
TUNICA MEDIA=	middle layer	**smooth muscle**
TUNICA INTIMA=	internal layer	**endothelium**
between layers of tunica=		**elastic tissue**: elastine
	≠	
bigger smooth muscle		**VALVE**
		stops the blood from going down
CAPILLARIES		
endothelial cell	thin for exchange of substances	
smooth muscle cell	small layer	
PERICYTE:	**feeds endothelial cells**	--> like connective tissue

CIRCULATION SYSTEMS

SMALL CIRCULATION=	connects the heart and the **lungs**	pulmonary circulation
BIG CIRCULATION=	connects the heart and the **organs**	systemic circulation

HEARTH



BLOOD CIRCULATION

RIGHT ATRIUM gets **not oxigenated** blood from the **SUPERIOR and INFERIOR VENA CAVA**

blood passes **through TRICUSPID VALVE into** the **RIGHT VENTRICLE**, most of the blood passes while the *hearth is relaxed (passive filling)*, then *small contraction* for the *last drop*

CONTRACTION pushes the blood into the **PULMONARY ARTERIES** through the **PULMONARY VALVE**

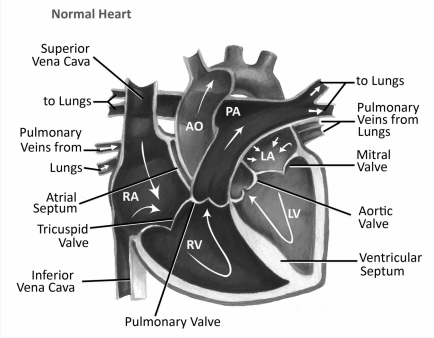
lungs where the blood exchange carbon dioxide for oxigen

LEFT ATRIUM gets **oxigenated** blood from the **PULMUNAR VEINS**

blood passes **through BICUSPID or MITRAL VALVE into** the **LEFT VENTRICLE**, most of the blood passes while the *hearth is relaxed (passive filling)*, then *small contraction* for the *last drop*

CONTRACTION pushes the blood into the **AORTA** through the **AORTIC VALVE**

BLOOD CIRCULATION



WALLS OF THE HEART

three+ one layer		
EPICARDIUM=	thin external membrane	**connective tissue**
MYOCARDIUM=	pumping action, most present	**cardiac muscle tissue**
↳gets nutriment and oxigen from:	**CORONARY ARTERIES**	
ENDOCARDIUM=	thin internal layer	**endothelium**
PERICARDIUM=	**protective, fluid-fille sac** that **surrounds** the heart	↳ provides **lubrification**
↳ protect the heart from **infections**	↳ hold the heart in **place**	↳ keep the heart **from expanding**

CARDIAC CYCLE

DIASTOLE=	myocardio relaxed, atrium-ventricular valves open, blood circulates in atrio and ventricle, semilunar valves closed
ATRIAL SISTOLE =	contraction of the atries
VENTRICULAR SISTOLE =	ventricles starts to contract, pressure grows, atrioventricular valves closes, semilunar valves open

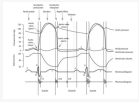
CARDIAC CYCLE AND ELECTROCARDIOGRAM

PACEMAKER=	SINOATRIAL NODE= generates a signal that spreads through the heart
SISTOLE=	relaxation
DIASTOLE=	CONTRACTION
ATRIAL SISTOLE	
P wave=	depolarization of the atrias with the spread of first signal
	atrial contraction→ increase the pressure→ pushes the blood into the ventricle
ISOVOLUMETRIC VENTRICULAR CONTRACTION	

CARDIAC CYCLE AND ELECTROCARDIOGRAM (cont)

QRS complex=	depolarization of the ventricles with the spread of signal
	ventricular contraction
	ventricle contracts but the blood in the ventricle stays the same
first sound: atrioventricular valves shutting	valve are closed until the increase in the pressure is bigger thanthe pressure in the aorta
EJECTION FASE	rapid ejection: high pressure and first blood
	slow ejection: slower pressure and resistance from the vessels
T wave=	polarization of the ventricle for a new signal
ISOLVOLUMETRICAL VENTRICLE RELAXATION	ventricle relax
	pressure goes down
	valve closes and second sound

CARDIAC CYCLE



MOST IMPORTANT FUNCTIONS

respiratory sistem=	get rid of CO2 and capture O2
digestive system=	bring nutrition to all the organs
kidneys and urinary system=	filtration of waste (nitrogenous substances)
temperature control=	vasodilatation to cool down

CAUSES OF HEART AND CARDIOVASCULAR DISEASES

excessive smoking and	**consumption of alcohol**
diabetes	**cholesterol too high**
overweight	**hypertension**
genes	**stress**
atherosclerosis=	**build up** in vessels of **platelets**: they think **fat** is like an injury that has to be **closed**
blood clot=	vessels closed by a **group of red cells**
trauma or injury	

DISEASES

heart disease	**vascular disorders**
congenital heart defects	
strokes	

STROKES (ictus)

TIA=	**symptoms** only last for a **short amount of time**, **temporary blocage**
ischaemic stroke=	**blockage cutting off the blood supply** to the **brain**
haemorrhagic stroke=	**bleeding in or around the brain**

HEART DISEASE

cardiac failure=	heart **fails to circulate blood** properly
heart attack=	one of the **coronary arteries** becomes **blocked**
cardiac arrest=	**hearth doesn't work**
cardiac arrhythmia=	problem with the **rate or rhythm of heartbeat**

VASCULAR DISORDERS

aneurysm=	weak or expanded part of an artery
atherosclerosis=	buildup of fats, cholesterol and other substances in and on the artery walls
thrombosis=	blood clots block veins or arteries