Cardiovascular System Notes: Heart Disease & Disorders
The Electrocardiograph (ECG) was invented in 1902 by Willem Einthoven Dutch Physiologist. This test is still used to evaluate the heart's rate and rhythm.
Review

What are the 3 parts of the cardiovascular system?

heart – blood – blood vessels

What do arteries do?

Take blood AWAY from the heart

What are the 3 layers of an artery?

Tunica externa /connective tissue (elastin) – tunica media/smooth muscle – tunica intima/endothelium

What do veins do?

Bring blood TOWARD the heart

What do veins have that arteries don’t?

VALVES – (veins & arteries both have the same layers except the muscular layer is smaller)
What exchanges material between blood and the body’s cells?

**CAPILLARIES**

How big are they?

**microscopic in size**

What is the outer membrane of the heart called?

**Pericardium**

What is the function of the pericardium? (there are 3)

1. protection

2. anchors heart to other structures

3. provides lubrication for heartbeat
What are the 3 layers of the heart wall?

1. Epicardium – outside layer
2. Myocardium – middle layer (cardiac muscle)
3. Endocardium – inner layer

What does the septum do?

Divides the heart into right and left sides

What are the 4 chambers of the heart?

1. Right Atria
2. Left Atria
3. Right Ventricle
4. Left Ventricle
What is the function of the right atria?
receives blood from inferior & superior vena cava (oxygen poor)

What is the function of the left atria?
receives blood from pulmonary veins (oxygen rich blood from the lungs)

What does the function of the left ventricle?
receives blood from left atria & pumps it to the body (through the aorta)

What is the function of the right ventricle?
receives blood from the right atria and pumps it to the lungs (through the pulmonary arteries)
Where is the tricuspid valve located?
between right atria and right ventricle

Where is the bicuspid (mitral) valve located?
between left atria and left ventricle

Where is the pulmonary semilunar valve located?
between pulmonary artery and right ventricle

Where is the aortic semilunar valve located?
between aorta and left ventricle

What is the pacemaker of the heart?
Sinoatrial node or SA node (begins each heartbeat)
What does the atrioventricular node (AV node) do?

Receives the impulse from the SA node (sinoatrial node)

Trace the impulse of a heartbeat beginning at the SA node

SA node – AV node – Purkinje Fibers (network) – up the sides of the ventricles

What is systole? What is diastole?

Systole = contraction of the ventricle

Diastole = relaxation of the ventricle

What is an electrocardiogram?

Amplification of heart’s electric current that produces distinct wave patterns: P wave = depolarization of atria

QRS complex = depolarization of ventricle

T wave = repolarization of ventricles
• HEART DISORDERS & DISEASES

• Risk Factors:
  • cholesterol – diet, genetics
  • hypertension (high blood pressure)
  • smoking – excessive drinking
  • obesity – lack of exercise
  • heredity
• Heart Disease

• **Coronary Artery Disease (CAD) or Coronary Heart Disease (CHD)**

• term covers many different types of heart problems

• involves inadequate blood supply to heart muscle

• can lead to:

• **ANGINA** – severe chest pain due to brief lack of oxygen to heart muscle (can be mistaken for a heart attack)
• **ISCHEMIA** – a decrease in blood supply to heart

• **INFARCTIONS** – dying of tissue due to lack of blood supply and oxygen
• Myocardial Infarction
  • M.I. aka: heart attack
  • blood supply to the heart is cut off (ischemia) resulting in heart tissue dying

• Treatments:
  • medical emergency – nitroglycerin (vasodilator) – angioplasty – bypass surgery
• Fibrillation
• Atrial Fibrillation

• problem with the SA node or AV node
• atria “quiver” or do not contract normally
Ventricular Fibrillation is very dangerous, death is usually a result.
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<th>Condition</th>
<th>Description</th>
<th>Treatment</th>
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<td>Bradycardia</td>
<td>a slowing of the heart rate due to SA or AV node problems</td>
<td>Treatment: pacemaker implantation to regulate heart beat</td>
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<tr>
<td>Heart Murmur</td>
<td>valves don’t close correctly and blood leaks back through the valve</td>
<td>Treatment: medication, new valve</td>
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<td>Stenosis</td>
<td>valves become calcified, rough, narrow and do not close properly</td>
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