The Cardiovascular System
Objectives

After studying this chapter you will be able to:

• Name the parts of the cardiovascular system.

• Define combining forms used in building words that relate to the cardiovascular system.

• Analyze, define & pronounce the new terms introduced in this Chapter.

• Comprehension of English language
Lectures can be downloaded and viewed from this site

Student Duties

• 1- Read the lecture before attending

• 2- Print out the exercises of this lecture and hand it to the lecturer ‘solved’. It is your homework. You should write on it your name, the date, your group and the name of your lecturer.

• A piece of advice: Take a look at the exercises of the lecture before your actual reading, it will help you design your strategy of studying.

• Note (1): The methodology of your exercises of your formative assessment in this lecture and in the other lectures of the terminology module are similar to Summative exams.

• Note (2): If you encounter new terms, please use your e-learning skills or a dictionary to identify them.
The Heart

- Pumps blood through the blood vessels to all body cells.

- Is covered by a protective sac called the peri(surrounding); cardi/o(heart). This is divided into two layers the visceral and parietal pericardium.

- Is divided into right and left sides by the septum. From the Latin word saeptum.

- Each side consists of an atria and a ventricle.
Inside the pericardium, the heart has three layers of tissue.

- **Epicardium**: *epi-* (on, upon); *cardi/o* (heart). The outermost layer

- **Myocardium**: *my/o* (muscle); *cardi/o* (heart). The heart muscle that includes nerves and blood vessels. It is the (middle layer of the heart that is muscular tissue)

- **Endocardium**: *endo* (within); *cardi/o* (heart). (inner layer)
Structure and Function

Heart Chambers

• Atria (singular atrium). A Latin word meaning entry hall. Upper two of the four heart chambers composed of the Right and left atria.

• Ventricles, from the Latin *Venter* (little belly) Right and left ventricles are the lower chambers of the heart.

• Fibers in the ventricles (Purkinje fibers) cause the ventricles to contract.
Arteries

- From the Greek word *arteria* (windpipe) Carry blood *away* from the heart.

Veins

- From the Latin word *Vena*. It Carries blood from tissue *toward* the heart.
Valves of the Heart

Atrioventricular Valves

• Bicuspid valve (mitral): From the Latin word *mitra* (turban); from the Latin word *valva* (that which turns); bi- (two); from the Latin *cuspiderm* (cusp or point)

• Tricuspid valve: *tri*- (three); from the Latin *cuspiderm* (cusp or point)

Semilunar Valves

• Pulmonary valve: pulmon/o (lung); from the Latin word *valva* (that which turns)

• Aortic valve

Cross Sectional Top View of Heart
Blood Pressure

- Measures the force of the blood surging against the walls of the arteries.

Systole

A Greek word means Contraction. It is the Contraction phase of the heart.

Diastole

From the Greek word *diastole*. It is the Relaxation phase of the heart.
Combining Form

- angi (o)  →  blood vessel
- aort (o)  →  aorta
- arteri (o)  →  artery
- ather (o)  →  fatty matter
- atri (o)  →  atrium
- cardi (o)  →  heart
- hemangi (o)  →  blood vessel
Combining Forms & Abbreviations

<table>
<thead>
<tr>
<th>Combining Form</th>
<th>Meaning</th>
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<tr>
<td>pericardi(o)</td>
<td>pericardium</td>
</tr>
<tr>
<td>phleb(o)</td>
<td>vein</td>
</tr>
<tr>
<td>sphygm(o)</td>
<td>pulse</td>
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<tr>
<td>thromb(o)</td>
<td>blood clot</td>
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<tr>
<td>vas(o)</td>
<td>blood vessel</td>
</tr>
<tr>
<td>ven(o)</td>
<td>vein</td>
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</table>
Diagnosis, Procedural and Laboratory Tests

*Cardiology* is the treatment of cardiovascular diseases and the physician who specializes in heart conditions is called a *cardiologist*. 
Electrocardiography

• Electr/o (electricity); cardi/o (heart); -gram (record or picture). Produces an electrocardiogram which measures the amount of electricity that flows through the heart.
Blood Pressure abnormalities can damage the heart and other body systems.

- Hypertension *hyper-* (high); *-tens-* (pressure) ..........(too high)

- Hypotension *hypo-* (low); *-tens-* (pressure) ...........(too low)
Pathology

Different Inflammatory conditions of the heart

- endocarditis
- myocarditis
- bacterial endocarditis
- pericarditis
The goal of most cardiovascular surgery is to improve blood flow to all body cells.
Percutaneous transluminal coronary angioplasty (PTCA) is a surgical procedure in which a balloon catheter is inserted into a blocked blood vessel to increase the blood flow of that vessel.
Cardiac Catheterization *cardi/o* (heart); *-ac* (pertaining to); from the Greek word *kathienai* (to let down, thrust in) is the most common type of operation performed.

**Balloon valvuloplasty:** from the Latin word *valva* (that which turns); *-plasty* (surgical repair)
- Surgical repair to open narrowed cardiac valve openings.

**Coronary angioplasty:** *angi/o* (blood vessel); *-plasty* (surgical repair).  
- Surgical repair of a blood vessel.

**Angioscopy:** *angi/o* (blood vessel); *-scopy* (to view)  
- Uses a fiberoptic catheter to view the interior of a blood vessel.
Antianginals

Drugs used to treat chest pain and prevent attacks of angina

Antianginals:

*Anti- (against)*; *angi/o* (blood vessel); *-al* (adjective suffix).
Rhythm disorders are treated with medications that normalize the heart rate by affecting the nervous system that controls the heart rate.

Medications for: RHYTHM DISORDERS

• Antiarrhythmics: anti- (against); a (without) rhythm: heart rhythm
### Other terms

<table>
<thead>
<tr>
<th>Term</th>
<th>Analysis</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>Arteriosclerosis</td>
<td>From the Greek word <em>arteria</em> (windpipe); <em>scler/o</em> (hardness); <em>-osis</em> (abnormal condition of)</td>
<td>Hardening of the arteries</td>
</tr>
<tr>
<td>Arteriostenosis</td>
<td>From the Greek word <em>arteria</em> (windpipe); from the Greek word <em>spastikos</em> (afflicted with spasm)</td>
<td>Narrowing of an artery</td>
</tr>
<tr>
<td>Atrial fibrillation</td>
<td>From the Latin word <em>atrium</em> (entry hall) <em>-al</em> (adjective suffix); from the Latin word <em>fibra</em> (fiber, string, thread)</td>
<td>Rapid, random, ineffective contraction of the heart.</td>
</tr>
<tr>
<td>Cardiorrhesis</td>
<td><em>Cardi/o</em> (heart); <em>-rrhexis</em> (rupture)</td>
<td>Rupture in the wall of the heart</td>
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<tr>
<td>Dyscrasia (dys-KRAY-sha)</td>
<td><em>Dys-</em> (bad, difficult); from the Greek word <em>krasis</em> (mingling)</td>
<td>General term for a blood disorder</td>
</tr>
</tbody>
</table>
Artery
Muscle cells
Narrowed lumen

Normal artery lining (endothelium)
Damaged artery
Plaque (accumulation of fat deposits and muscle cells)
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<tr>
<td>Hemophilia (Haemophilia)</td>
<td><em>Hem/o</em> (blood); <em>philia</em> (abnormal attraction)</td>
<td>Congenital disorder affecting the coagulation process</td>
</tr>
<tr>
<td>Hemorrhage (Haemorrhage)</td>
<td><em>Hem/o</em> (blood); -rrhage (burst forth)</td>
<td>Discharge of blood</td>
</tr>
<tr>
<td>Hyperlipidemia (hyperlipidaemia)</td>
<td><em>Hyper</em> (above normal); <em>lip/o</em> (fat); <em>demia</em> (from the hema (blood))</td>
<td>Elevated cholesterol, triglycerides, lipoproteins in the blood</td>
</tr>
<tr>
<td>Ischemia</td>
<td>From the Greek word <em>iskhaimos</em> (a stopping of the blood); <em>ia</em> (condition)</td>
<td>Deficiency in blood supply</td>
</tr>
<tr>
<td>Myocardial infarction (MI)</td>
<td><em>My/o</em> (heart); <em>cardi/o</em> (heart); -al (adjective suffix); from the Latin word <em>infractionem</em> (a breaking)</td>
<td>Heart attack</td>
</tr>
<tr>
<td>Tachycardia</td>
<td><em>Tachy-</em> (fast); <em>cardi/o</em> (heart); <em>ia</em> (condition)</td>
<td>Abnormality rapid heartbeat</td>
</tr>
<tr>
<td>Diuretic</td>
<td>From the Greek word <em>diouretikos</em> (prompting urine)</td>
<td>A drug used to increase urine production or urination</td>
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</table>
Hemorrhage

[Image showing a medical illustration of a brain with labeled parts: Blood clot or hematoma beneath dura, Bone, Dura mater]
Xanthelasma (Hyperlipidemia)
Ischemia
• The Formative assessment of the Cardiovascular system
Q1. Case study-MI

• Read the following excerpt from an Emergency Room. Present this case to your colleagues out loud. Explain your Case then in your (Native) Mother tongue.

• **Chief complaint:** Crushing chest pain x 1 hr.
• **Present illness:** this patient is 67-year-old male who experienced sudden pain in his chest with radiation to his left arm. He said he broke out in sweat and has trouble breathing. When paramedics arrived, patient was sitting and feeling slightly better. ECG showed slight abnormalities. O2 applied via mask. Patient transported via Emergency Room where appropriate investigations were done.
• **Examination:** alert and oriented in acute distress, complaining of crushing chest pain, cardiac monitor reveals left ventricular abnormalities, possible infarct, diaphoresis, tachypnea, and flushed face also noted.
• **Impression:** Acute myocardial infarction

• **Plan:**
  1- repeat cardiac enzymes x 8 hrs.
  2- oxygen via nasal canula
  3- state cardiology consult
  4- prepare for cardiac catheterization
<table>
<thead>
<tr>
<th>Inner surface of the heart</th>
<th>-gram</th>
<th>-itis</th>
<th>-um</th>
<th>Angi/o</th>
<th>Arter-</th>
</tr>
</thead>
<tbody>
<tr>
<td>Inflammation of heart muscle</td>
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<td>Inflammation of artery</td>
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<tr>
<td>Heart muscle</td>
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<td>Inflammation of the heart</td>
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<tr>
<td>Inflammation of outer layer of heart</td>
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<td>Printed record of blood vessels</td>
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<td>Graphic tracing of electrical activity of heart</td>
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Queen Puabi (Also called: Shubad)
Photo from the British museum
Thank You
Thank You
Thank You
Thank You!!!!