



uBEATS –

uBEATS Teacher's Guide:

Medical Terminology Module #9

Cardiovascular System

This teacher guide is a supplementary text to support the use of the uBEATS Medical Terminology Module #9 – Cardiovascular System for grades 6-12.

To help students develop the knowledge necessary for an incredible future in health care, we created UNMC Building Excellence in Academics Through STEM (uBEATS), an online health science resource for students.

UNMC uBEATS modules are short (15 minutes or less), interactive online health science modules to support curriculum taught in grades 6 – 12. These do not replace curriculum but provide support for teachers and students incorporating evidence-based information and UNMC expert guided material. Each module is chunked into sections with formative and summative assessments with immediate feedback provided.

Tips on how to utilize uBEATS modules:

- **Internet access is required to view uBEATS modules.**
 - For those who have access to one-to-one technology, modules can be used in or outside of the classroom as a topic introduction, extension, or review. For classrooms without individual student devices, modules can be used in whole group instruction. Formative assessment questions can use the teacher's preferred call-and-response method and summative assessment questions can be displayed on the board and answered individually by students or printed and distributed to students after viewing the module.

Objectives

- Define and pronounce medical terms for the cardiovascular system.
- Identify presented vocabulary for the anatomy and pathology of the cardiovascular system.
- Describe diagnostic tests and treatment procedures related to the cardiovascular system.

Introduction

Medical personnel use specialized terminology when describing body systems. Each system has its own anatomy, diseases, laboratory tests, diagnostic procedures, and treatment procedures.

In this module you will encounter specialized medical terminology for the Cardiovascular System. The terms can be complex—and even scary—but you will use your knowledge of word structure, prefixes, suffixes, root words, and combining forms to analyze the terms and figure out the meanings.

Prior Knowledge

Before beginning this module, the teacher should understand the Next Generation Science Standards (NGSS) featuring [Three-Dimensional Learning](#).

Disciplinary Core Ideas—Life Sciences. [A Framework for K-12 Science Education](#)

Multicellular organisms have a hierarchical structural organization, in which any one system is made up of numerous parts and is itself a component of the next level. Feedback mechanisms maintain a living system's internal conditions within certain limits and mediate behaviors, allowing it to remain alive and functional even as external conditions change within some range. Outside that range (e.g., at a too high or too low external temperature, with too little food or water available), the organism cannot survive. Feedback mechanisms can encourage (through positive feedback) or discourage (negative feedback) what is going on inside the living system.

National Academies of Sciences, Engineering, and Medicine. 2012. A Framework for K-12 Science Education: Practices, Crosscutting Concepts, and Core Ideas. Washington, DC: The National Academies Press. <https://doi.org/10.17226/13165>.

Science and Engineering Practices [NGSS](#)

8. Obtaining, evaluating, and communicating information

Crosscutting Concepts [NGSS](#)

- 4. Systems and system models
- 6. Structure and function

Key Terms/Vocabulary

Cardiovascular system, anatomy, pathology, diagnostic test, treatment procedure, angioplasty, aortic stenosis, arteriosclerosis, arteriolitis, cardiomyopathy, pericardium, coronary arteries, phlebotomy, intravenous, venulitis, tissue capillaries, venules, veins, heart, lung capillaries, aorta, arteries, arterioles, aneurysm, angina, arrhythmia, atherosclerosis, congestive heart failure, hypertension, myocardial infarction, shock, angiography, cardiac catheterization, cardiac enzyme tests, Doppler ultrasound, echocardiography, electrocardiography, Holter monitoring, lipid tests, lipoprotein tests, magnetic resonance imaging (MRI), MUGA scan, positron emission tomography (PET) scan, stress test, Technetium Tc 99m sestamibi scan, Thallium-201 scan, cardiac catheter ablation, cardioversion, coronary artery bypass grafting (CABG), endarterectomy, heart transplantation, percutaneous coronary intervention (PCI), thrombolytic therapy.

Standards

Nebraska's College and Career Ready Standards for Science 2024 [Nebraska Science Standards](#)

- SC.HSP.6.6 Structure and function: Anatomy and physiology
 - Gather, analyze, and communicate evidence of the relationship between structures and physiological processes of the cardiovascular/respiratory systems.

National Consortium for Health Science Education [NCHSE](#)

- Foundation Standard 1. Academic Foundation
 - 1.1.2 Identify basic structures and describe functions of human body systems.
 - d. Cardiovascular
 - 1.2.1 Describe etiology, pathology, diagnosis, treatment, and prevention of common diseases.

Extensions of the lesson

To help students become more familiar with the Key Terms of this module, the teacher can use the vocabulary list for a classroom Word Wall or integrate the vocabulary into review sessions.

As student misconceptions become apparent, the teacher may need to reinforce these concepts:

- Blood inside the body is always red. When the blood is rich in oxygen, it is bright red. When the blood is low in oxygen, it is dark red. Students are often confused by textbook diagrams and video animations that use the color blue to represent deoxygenated blood.
 - The reason for using blue in cardiovascular diagrams is that diagrams using the true colors (different shades of red) are difficult to follow.
 - People sometimes believe that blood inside the veins is blue because the dark red deoxygenated blood appears bluish when seen through the walls of the blood vessels and through the skin.
- Arteries carry blood from the left side of the heart to the smaller blood vessels throughout the body. Arterial blood is usually bright red because it is rich in oxygen. However, the arteries carrying blood from the right side of the heart to the lungs (the pulmonary arteries) are carrying dark red blood that is low in oxygen. This blood is on its way to the lungs to pick up oxygen.
- Veins deliver blood to the heart by collecting blood from the body's tissue capillaries. This dark red blood is low in oxygen and is transported back to the heart which pumps it to the lungs for a fresh supply of oxygen. The pulmonary veins are the only veins that carry bright red blood from the lungs to the heart.
- The heart does not give oxygen to the blood. The heart is only a pump that moves blood from one place to another.
- A healthy cardiovascular system depends on:
 - Properly functioning heart muscles, valves, and electrical impulses.
 - Unobstructed vessels for good circulation.
 - Healthy blood nutrition and oxygen levels.

Enrichment

- KidsHealth.org offers a variety of classroom activities to promote understanding of the [Cardiovascular System](#).
- Search online for available videos for cardiovascular system terminology.
- Edmond Hui presents a 4-minute [TedTalk](#) about [How the Heart Actually Pumps Blood](#).
- Watch the 15-minute [TedTalk](#) presented in 2011 by Noel Bairey Merz explaining heart disease in women: [The single biggest health threat women face](#).
- Dr. Ananya Mandal, MD has written a helpful article about [Cardiovascular Disease Diagnosis](#).