Cardiovascular System

Course
Medical Terminology

Unit V
Cardiovascular System

Essential Question
What medical terms are associated with the cardiovascular system?

TEKS
130.203 (c)
1 A-F
2A-C
3A-C
4A-B

Prior Student Learning
Basic understanding of roots, prefixes and suffixes

Estimated time
4-7 hours

Rationale
Healthcare professionals must have a comprehensive medical vocabulary in order to communicate effectively with other health professionals. They should be able to use terminology of the cardiovascular system to discuss common conditions and diseases.

Objectives
Upon completion of this lesson, the student will be able to:

- Define and decipher common terms associated with the cardiovascular system
- Identify the basic anatomy of the cardiovascular system
- Analyze unfamiliar terms using the knowledge of word roots, suffixes and prefixes gained in the course
- Research diseases which involve the cardiovascular system

Engage
Mr. Smith comes into the ER with complaints of chest pain and SOB. Dr Jones orders EKG, CXR, CBC, Cardiac enzymes, and ABG's STAT because he suspect a myocardial infarction. Mrs. Smith is nervous and is asking you to translate what does all this mean? You take her in the hallway to explain and calm her down.

Key Points

I. Cardio Terms to Know
   A. Aneurysm – widening
   B. Angina – choking pain
   C. Angio – vessel
   D. Arteri/o – artery
   E. Arti/o – atruim
   F. Ather/o – fatty plaque
   G. Cardi/o – heart
   H. Cor/o, coron/o – heart
   I. Emia – blood or blood condition
   J. Hem/a, hem/o, hemat/o – blood
   K. Phleb/o – vein
   L. Plasm/a, plasm/o – plasma (form,mold)
   M. Thromb/o – clot
   N. Valv/o – value (leaf)
   O. Vas/o – vein
   P. Ven/o – vein

II. Introduction to the heart
    A. Fully formed by the 4th week of embryonic development
    B. A hollow muscular organ that acts as a double pump
    C. A continuous pump – once pulsations begin, the heart pumps endlessly until death

III. Heart Anatomy
    A. General
        1. Size – approximately the size of a person's fist
        2. Location – in the mediastinum
    B. Coverings – Pericardium (see the Pericardial Diagram)
        1. A double-layered sac
        2. Contains 10-20cc. of pericardial fluid to reduce the friction of the beating heart
        3. Parietal layer – a fibrous membrane; the outer layer
        4. Visceral layer – serous membrane; also called the epicardium; attached to the myocardium
    C. The Heart Wall
        1. Myocardium – heart muscle; thicker on the left side of the heart
        2. Endocardium – the lining of the heart chambers
    D. Chambers
        1. Atria
            a. The two upper chambers of the heart
            b. Have thin walls and a smooth inner surface
            c. Responsible for receiving blood
            d. The right atrium receives deoxygenated (oxygen poor) blood from the body through the superior and inferior vena cava
            e. The left atrium receives oxygenated (oxygen rich) blood from the lungs through the pulmonary veins
        2. Ventricles
            a. The two lower chambers of the heart
            b. Have thicker walls and an irregular inner surface
            c. Contain the papillary muscles and chordae tendineae (prevent the heart valves from turning inside out when the ventricles contract)
            d. The left wall is 3 times as thick as the right wall; forms the apex of the heart
            e. Responsible for pumping blood away from the heart
            f. The right ventricle sends deoxygenated blood to the lungs via the pulmonary arteries
            g. The left ventricle sends oxygenated blood to all parts of the body via the aorta
        3. Accessory Structures

a. Septum – the muscular wall dividing the heart into right and left halves
b. Heart valves – prevents the backflow of blood
c. Papillary muscles
d. Chordae tendineae

E. Great Vessels (see the External Heart Diagram)
1. Superior and inferior vena cava – the largest veins in the body; receive deoxygenated blood from all parts of the body
2. Coronary sinus
3. Pulmonary arteries – carry deoxygenated blood to the lungs from the right ventricle
4. Pulmonary veins – carry oxygenated blood to the left atrium from the lungs
5. Aorta – the largest artery in the body; carries oxygenated blood to distribute to all parts of the body

F. The Pathway of Blood Through the Heart and All Body Tissues (see the Internal Heart Diagram)
1. Superior and inferior vena cava
2. Right atrium
3. Tricuspid valve
4. Right ventricle
5. Pulmonary semilunar valve
6. Pulmonary arteries
7. Lungs (O_2 and CO_2 exchange - external respiration)
8. Pulmonary veins
9. Left atrium
10. Bicuspid/Mitral valve
11. Left ventricle
12. Aortic semilunar valve
13. Aorta – all parts of the body via the arteries
14. Arterioles
15. Capillaries of the individual tissues (O_2 and CO_2 exchange - internal respiration)
16. Venules
17. Veins
18. Superior and inferior vena cava

G. Cardiovascular Circuits
1. Pulmonary circuit – the transport of blood from the right side of the heart to the lungs and then back to the left side of the heart
2. Systemic circuit – the transport of blood from the left side of the heart to all parts of the body and then back to the right side of the heart
3. Coronary circuit – the transport blood from the left side of the heart to the heart tissues and back to the right side of the

heart

H. Valves
    1. Tough fibrous tissues between the heart chambers and major blood vessels of the heart
    2. Gate-like structures to keep the blood flowing in one direction and prevent the regurgitation or backflow of blood
    3. Atrioventricular valves – when ventricles contract, blood is forced upward and the valves close; attached by papillary muscles and chordae tendineae
        a. Tricuspid valve – between the right atrium and the right ventricle
        b. Bicuspid/mitral valve – between the left atrium and the left ventricle
    4. Semilunar Valves – three half-moon pockets that catch blood and balloon out to close the opening
        a. Pulmonary semilunar valve – between the right ventricle and the pulmonary arteries
        b. Aortic semilunar valve – between the left ventricle and the aortic arch/aorta

I. Cardiac Circulation (The Blood Supply to the Heart)
    1. Aorta –> coronary arteries –> capillaries in the myocardium –> coronary veins –> coronary sinus –> right atrium
    2. Blood in the chambers nourishes the endocardium
    3. The coronary circuit opens **only** during the relaxation phase of the cardiac cycle
    4. Occlusion of the coronary artery – a myocardial infarction (heart attack) occurs if collateral circulation is inadequate

IV. Heart Physiology

A. Nerve Supply to the Heart
    1. Alters the rate and force of cardiac contraction
    2. Vagus nerve (parasympathetic nervous system) – slows the heart rate
    3. Sympathetic nerves – increase the heart rate
    4. Epinephrine/norepinephrine – increases heart rate
    5. Sensory (afferent) nerves – detect atria being stretched and lack of oxygen (changes the rate of contractions)
    6. Angina – chest pain due to a lack of oxygen in coronary circulation

B. Intrinsic Conduction System – Automaticity (see the Heart Conduction System Diagram)
    1. Enables the heart to contract rhythmically and continuously without motor nerve impulses
    2. Arrhythmia – myocardial cells leak sodium faster than the SA node, causing an irregular heartbeat
    3. SA (sinoatrial) node – known as the pacemaker, located

where the superior and inferior vena cava enter the right atrium
4. AV (atrioventricular) node – sends impulses to the ventricles
5. Bundle of His/bundle branches – in the septum
6. Purkinje fibers – in the heart wall to distribute nerve impulses

C. Cardiac Cycle – Generated in the Heart Muscle
1. One (1) contraction (systole = 0.3 seconds) + one (1) relaxation (diastole = 0.5 seconds) at 75 beats per minute
2. Initiation of contraction – impulse spreads out over both atria causing them to contract together and force blood into both ventricles
3. Impulses from the SA node are sent to the AV node (between the atria in the septum)
4. Impulses from the AV node are sent to nerve fibers in the septum (bundle of His) which transmits the impulse via the right and left bundle branches to the Purkinje fibers – cause the ventricles to contract together and force blood out of the aorta and pulmonary arteries, and into the body and the lungs
5. The shift of ions along the conduction system = action potential
6. Periods of rest = polarization
7. Periods of activity = depolarization – when an impulse is transmitted; and repolarization – when a slow shift back to polarization occurs

D. EKG (see the EKG Diagram)
1. Electrical changes during the cardiac cycle are recorded as an EKG
2. To estimate heart rate using an EKG strip, count the number of QRS complexes in a 6-second strip and multiply by 10
3. P wave
   a. Impulse received by the SA node
   b. The atria depolarize (contract)
   c. Enlarged P wave = enlarged atrium or stenosed AV valve
4. QRS complex
   a. Impulse passing through the ventricles (systole)
   b. The ventricles depolarize (contract)
   c. The atria repolarize (relax)
   d. Enlarged Q = myocardial infarction
   e. Enlarged R = enlarged ventricles
5. T wave
   a. Repolarization of the ventricles (diastole)
   b. Elevated = K+ level too high
6. PR interval
   a. 0.12 – 0.2 seconds

b. Too long = rheumatic heart disease or hardening of the arteries; conduction problem or delay at the AV node

7. ST segment
    a. Elevated = acute myocardial infarction
    b. Depressed = insufficient oxygen to the heart

E. Stroke Volume and Cardiac Output
1. Cardiac out is the volume of blood pumped by the heart per minute, the function of heart rate, and stoke volume
2. Stoke volume is the volume of blood, in milliliters (ml), pumped out of the heart with each beat
3. Weak hearts have low stroke volume – they must pump faster to move an adequate amount of blood
4. Well-trained athletes have good stroke volume – can pump slower to move an adequate amount of blood

V. Overview of Blood Vessels
A. General Composition and Function
1. Allow for circulation of blood and other bodily fluids to all the body's cells
2. Three layers
    a. Tunica adventitia – outer layer of tough fibrous tissue
    b. Tunica media – smooth muscle which allows vessels to constrict and dilate
    c. Tunica intima – smooth, inner elastic layer (lumen = internal diameter)

B. Arteries
1. Carry blood **away** from the heart
2. Thicker, to withstand pressure exerted during systole
3. All **but** the pulmonary arteries carry oxygenated blood
4. Aorta – the largest artery; 1 inch in diameter
5. Arterioles – the smallest arteries
6. Coronary arteries – the most important; supply blood to the heart muscle
    a. Left and right main coronary artery
    b. Left coronary artery –> left anterior descending –> left circumflex branch
    c. Right coronary artery –> right atrium and right ventricle

C. Veins
1. Carry blood **toward** the heart
2. All **but** the pulmonary veins carry deoxygenated blood
3. Layers are much thinner, and less elastic
4. A series of internal valves that work against the flow of gravity to prevent reflux
5. Superior and inferior vena cava – the largest veins
6. Venules – the smallest veins

D. Capillaries

1. Tiny, microscopic vessels
2. Walls are one cell layer thick
3. Function – to transport and diffuse essential materials to and from the body's cells and the blood

VI. Pulse
- A. The pressure of the blood pushing against the wall of an artery as the heart beats – during systole
- B. Common pulse sites
  1. Temporal – at the side of the forehead
  2. Carotid – at the neck
  3. Brachial – the inner aspect of the forearm at the antecubital space (the crease of the elbow)
  4. Radial – at the inner aspect of the wrist on the thumb side
  5. Femoral – at the inner aspect of the upper thigh or groin
  6. Dorsalis pedis – at the top of the foot arch

VII. Blood Pressure
- A. Systole – the maximum pressure formed during a ventricular contraction
- B. Diastole – the minimum pressure during ventricular relaxation (atrial contraction)
- C. Measured in mm of Hg
- D. BP = CO x PR (Blood Pressure = Cardiac Output x Peripheral Resistance)
- E. Normal Ranges
  1. Systolic = 100–140
  2. Diastolic = 60–90
- F. Hypotension – systolic < 90
- G. Hypertension – systolic > 150 and/or diastolic > 90
- H. Must be lower in the pulmonary circuit to prevent fluid from filtering out into the alveoli
- I. Factors Affecting BP
  1. Cardiac output
  2. Peripheral resistance
  3. Blood volume
- J. Circulatory Shock
  1. Hypovolemic shock
  2. Vascular shock
  3. Cardiogenic shock

VIII. Diagnostic Procedures for the Cardiovascular System
- A. History and Physical
  1. Checking for symptoms of disease
  2. Chest pain, shortness of breath, awareness of heartbeat

(palpitation), fatigue, dizziness or loss of consciousness, edema, pain in the legs while walking (claudication)

B. Electrocardiogram – a tracing of the electrical activity of the heart
C. Phonocardiogram – an electrocardiogram with heart sounds
D. Echocardiogram – ultrasound measures the size and movement of the heart structures
E. Doppler Ultrasound – measures blood flow
F. Arteriography – radiopaque dye injected into and x-ray series taken of blood flow
G. Cardiac Catheterization
    1. Right side of heart – a catheter threaded into a vein, then the vena cava, then the heart, then the pulmonary artery
    2. Left side of heart – a catheter threaded into an artery, then the left ventricle, then the aorta, then the coronary vessels
    3. X-rays taken during the procedure
    4. Dye is also injected

IX. Diseases of the Cardiovascular System
    A. Arteriosclerosis – hardening of the arteries
    B. Atherosclerosis
        1. Fatty deposits on the walls of the arteries
        2. Causes
            a. Increased blood lipids
            b. High blood pressure
            c. Smoking
            d. Obesity
            e. Physical inactivity
            f. Tension
    C. Hypertension
        1. 90% = essential hypertension – no specific cause
        2. 10% = a symptom of another disease, i.e. an adrenal tumor or kidney disease
        3. Increases the workload of the heart
        4. Leads to hypertrophy of the left ventricle, then heart failure
        5. Accelerates the development of atherosclerosis
    D. Ischemic Heart Disease
        1. The oxygen supply to the heart is inadequate
        2. Atherosclerosis is a major cause
        3. Can lead to
            a. Angina pectoris – a condition in which the coronary arteries are temporarily blocked – reduced blood supply to the heart – chest pain
            b. Heart attack – cessation of normal cardiac contraction (cardiac arrest)
            c. Myocardial infarction – necrosis (death) of the heart muscle due to severe, prolonged ischemia

d. Sudden death – the heart stops and ventricular fibrillation occurs

E. Cardiac Arrhythmias
   1. An abnormality in the rate, rhythm, or conduction of the heart beat
F. Bacterial Endocarditis
   1. An inflammation of the internal lining of the heart
   2. Also involves the heart valves
G. Valvular Heart Disease
   1. Involves abnormalities of the heart valves
   2. Especially the mitral and aortic valves
   3. The leading cause – rheumatic fever with a hypersensitivity reaction to streptococcus antigens
   4. Heart valves are scarred
   5. Treatment – valve replacement
H. Congenital Heart Disease
   1. Defects in the heart that occurred during embryologic and fetal development
   2. Involves defective communication between the chambers, malformation of the valves, and malformation of the septa
   3. Cyanotic – the inability of the individual to get adequate blood oxygenation due to extensive cardiac abnormalities that cause blood to be shunted away from lungs
   4. For example “Blue Babies” – a failure of the foramen ovale to close or transposition of the great arteries or patent ductus arteriosus
I. Congestive Heart Failure (CHF)
   1. Pumping action of the heart is diminished
   2. Fluid accumulates and is retained in the tissues
   3. Compensations
      a. Increased heart rate, greater force of contraction
      b. Retention of fluid by the kidneys
      c. Enlargement of the heart
J. Cor Pulmonale
   1. Hypertrophy of the right ventricle due to hypertension in pulmonary circulation
   2. Increased BP in the lungs –a reduction in blood flow and increased resistance in the lungs – pulmonary hypertension – increased pressure in the pulmonary arteries – blood backs up into the right ventricle – hypertrophy
K. Peripheral Arterial Disease
   1. Decreased blood flow to the peripheral vessels
L. Varicose Veins
   1. Enlarged veins which can be inflamed
M. Hemorrhoids
   1. Varicose veins of the rectal and anal area

N. Aneurysm
    1. A weak section in the wall of an artery that balloons out and ruptures
O. Phlebitis
    1. Inflammation of a vein
P. Thrombus
    1. A blood clot that stays where it is formed
Q. Stroke (CVA)
    1. Brain infarct – caused by decreased oxygen supply to the brain due to a blood clot or hemorrhage
R. Raynaud's Disease
    1. A circulation disorder
S. Esophageal Varices
    1. Varicose veins of the esophagus
T. Tetralogy of Fallot
    1. Four different heart defects that occur at birth which are life threatening to the fetus

Activity

1. Students should make flash cards of Cardio terms and practice putting terms together with Prefixes and Suffixes to make new terms.
2. Complete the Cardiovascular System Worksheet.
3. Complete the Terminology Worksheet.
4. Complete the Cardiovascular System Medical Terminology Worksheet
5. Review media terms with the students using review games such as the "fly swatter game" or the "flash card drill" (See the Medical Terminology Activities Lesson Plan - http://texashste.com/documents/curriculum/principles/medical_terminology_activities.pdf).
6. Research and report on diseases and disorders of the Cardiovascular System.

Assessment

Successful completion of Activities

Materials

Cardiovascular System Worksheet
Medical Terms Worksheet
Cardiovascular System Medical Terminology Worksheet
KEY - Cardiovascular System Worksheet
KEY - Medical Terms Worksheet
KEY - Cardiovascular System Medical Terminology Worksheet

Accommodations for Learning Differences

For reinforcement, the students will practice terms of the cardiovascular system using flash cards.

For enrichment, the students will choose a disease related to the cardiovascular system and research the disease using the internet. The students will share their findings with the class.

National and State Education Standards
National Healthcare Foundation Standards and Accountability Criteria
Health care workers will know the various methods of giving and obtaining information. They will communicate effectively, both orally and in writing.

TEKS
130.203 (c)(1)(A) identify abbreviations, acronyms, and symbols;
130.203 (c)(1)(B) identify the basic structure of medical words;
130.203 (c)(1)(C) practice word-building skills;
130.203 (c)(1)(D) research the origins of eponyms;
130.203 (c)(1)(E) recall directional terms and anatomical planes related to body structure;
130.203 (c)(1)(F) define and accurately spell occupationally specific terms such as those relating to the body systems, surgical and diagnostic procedures, diseases, and treatments.
130.203 (c)(2)(A) demonstrate appropriate verbal and written strategies such as correct pronunciation of medical terms and spelling in a variety of health science scenarios;
130.203 (c)(2)(B) employ increasingly precise language to communicate;
130.203 (c)(2)(C) translate technical material related to the health science industry.
130.203 (c)(3)(A) examine medical and dental dictionaries and multimedia resources;
130.203 (c)(3)(B) integrate resources to interpret technical materials;
130.203 (c)(3)(C) investigate electronic media such as the Internet with appropriate supervision.
130.203 (c)(4)(A) distinguish medical abbreviations used throughout the health science industry; and
130.203 (c)(4)(B) translate medical abbreviations in simulated technical material such as physician progress notes, radiological reports, and laboratory reports.

College and Career Readiness Standards
English/language art
B.1 Identify new words and concepts acquired through study of their relationships to other words and concepts.
B2. Apply knowledge of roots and affixes to infer the meanings of new words.
B3. Use reference guides to confirm the meanings of new words or

concepts.
Cross- Disciplinary standards-Foundational Skills
A2. Use a variety of strategies to understand the meanings of new words

The Cardiovascular System

Name _____ Period _____

1. What is the protective membrane covering of the heart called?_____
2. Which chambers of the heart receive blood from the veins?_____
   _____
3. What chambers of the heart are known as pumping chambers?_____
   _____
4. What is the name of the blood vessel that brings venous blood from the head, neck, and arms to the right atrium?_____
5. What is the name of the blood vessel that brings venous blood from the abdomen and legs into the right atrium?_____
6. What is the name of the blood vessels that take deoxygenated blood from the right ventricle to the lungs?_____
7. What is the name of the blood vessels that take oxygenated blood from the lungs to the left atrium?_____
8. The largest artery in the body is the_____.
9. The valves are formed from the most inner heart layer, or the_____.
10. The valve between the right atrium and the right ventricle is known as the _____. The valve between the left atrium and the left ventricle is known as the _____.
11. The valves between the ventricles and blood vessels are known as the_____.
12. Complete flow of blood through the heart. Blood entering the _____ atrium flows through the tricuspid valve and into the _____. From there, the deoxygenated blood flows past the pulmonary semilunar valve and into the _, and then into the lungs.

Oxygenated blood leaves the lungs through the _____ and enters the _____ _____.

13. What is the semilunar valve?_____.

14. What is the pacemaker of the heart? _____

15. List and describe the heart's cardiac conduction system.
    a. _____
    b. _____
    c. _____
    d. _____

16. a. What is systole?_____
    b. What is diastole?_____

17. If the patient has an elevated blood pressure we say they have_____.

18. What is the stroke volume?_____

19. What is cardiac output?_____

20. a. What vessel carries blood away from the heart?_____
    b. What vessel carries blood to the heart?_____
    c. What vessel is responsible for gas and nutrient exchange within each of the body's cells?_____

21. Describe each of the following vessels:
    a. arteries _____
    _____
    b. veins _____
    _____
    c. capillaries _____
    _____

22. What is a pulse?_____

23. Identify the location of the following pulse points:
    a. What pulse is felt on the upper surface of the foot?_____
    b. What pulse is felt in the antecubital space?_____
    c. What pulse is felt in the groin?_____
    d. What pulse is found in the neck?_____
    e. What pulse is found on the wrist side of the arm?_____

24. Answer the following questions about blood pressure.
    a. What is the first measurement of blood pressure?_____
    b. What does it measure?_____
    c. What is the second measurement of blood pressure?_____
    d. What does it measure?_____

25. a. What circulation route takes deoxygenated blood to the lungs where it can pick up oxygen?_____
    b. What circulation route takes oxygenated blood through the body?_____
    _____

WORKSHEET - Cardiovascular Review - KEY

1. What is the protective membrane covering of the heart called? Pericardium
2. What chambers of the heart receive blood from veins? Atria
3. What chambers of the heart are known as pumping chambers? Ventricles
4. What is the name of the blood vessel that brings venous blood from the head, neck, and arms to the right atrium? Superior Vena Cava
5. What is the name of the blood vessel that brings venous blood from the abdomen and legs to the right atrium? Inferior Vena Cava
6. What is the name of the blood vessels that take deoxygenated blood from the right ventricle to the lungs? Pulmonary arteries (which branch from the pulmonary trunk)
7. What is the name of the blood vessels that take oxygenated blood from the lungs to the left atrium? Pulmonary veins
8. The largest artery in the body is the Aorta
9. The valves are formed from the most inner heart layer or the Endocardium.
10. The valve between the right atrium and the right ventricle is known as the Tricuspid Valve. The valve between the left atrium and the left ventricle is known as the Bicuspid Valve (also called the Mitral Valve).
11. The valves between the ventricles and blood vessels are known as the Pulmonary and Aortic Semilunar Valves.
12. Complete flow of blood through the heart. Blood entering the Right atrium flows through the tricuspid valve and into the Right ventricle. From there, the deoxygenated blood flows past the pulmonary semilunar valve and into the Pulmonary Arteries, and then into the lungs. Oxygenated blood leaves the lungs through the Pulmonary Veins and enters the Left atrium of the heart. Blood continues to flow through the Mitral/Bicuspid valve and into the Left ventricle. From there, blood will flow past the aortic semilunar valve and into the Aorta.
13. What is a semilunar valve? Semilunar Valves: 3 half-moon pockets that catch blood and balloon out to close the opening
14. What is the pacemaker of the heart? SA node

15. List and describe the heart's cardiac conduction system.
    a. SA (sinoatrial) node: known as the pacemaker, located where the superior and inferior vena cava enter the right atrium
    b. AV (atrioventricular) node: sends impulses to the ventricles
    c. Bundle of His/bundle branches: in the septum
    d. Purkinje fibers: in the heart wall to distribute nerve impulses

16. a. What is systole? Maximum pressure formed during a ventricular contraction
    b. What is diastole? Minimum pressure during ventricular relaxation (atrial contraction)

17. If the patient has an elevated blood pressure we say they have Hypertension.

18. What is the stroke volume? Stroke volume is the volume of blood, in milliliters (ml), pumped out of the heart with each beat

19. What is cardiac output? Cardiac output is the volume of blood pumped by the heart per minute – the function of heart rate and stroke volume

20. a. What vessel carries blood away from the heart? Arteries
    b. What vessel carries blood to the heart? Veins
    c. What vessel is responsible for gas and nutrient exchange within each of the body's cells? Capillaries

21. Describe each of the following vessels:
    a. arteries — carry blood away from the heart. Thicker to withstand the pressure exerted during systole. All but the pulmonary arteries carry oxygenated blood
    b. veins — carry blood toward the heart. All but the pulmonary veins carry deoxygenated blood. Layers are much thinner, less elastic. A series of internal valves that work against the flow of gravity to prevent reflux.
    c. capillaries — tiny, microscopic vessels. Walls one cell layer thick. Function – to transport and diffuse essential materials to and from the body's cells and the blood

22. What is a pulse? The pressure of the blood pushing against the wall of an artery as the heart beats during systole.

23. Identify the location of the following pulse points:
    a. What pulse is felt on the upper surface of the foot? Dorsalis pedis
    b. What pulse is felt in the antecubital space? Brachial

c. What pulse is felt in the groin? Femoral
d. What pulse is found in the neck? Carotid
e. What pulse is found on the wrist side of the arm? Radial

24. Answer the following questions about blood pressure.
    a. What is the first measurement of blood pressure? Systole
    b. What does it measure? Pressure as the ventricles contract
    c. What is the second measurement of blood pressure? Diastole
    d. What does it measure? Pressure remaining in the artery as the ventricles rest

26. a. What circulation route takes deoxygenated blood to the lungs where it can pick up oxygen? Pulmonary
    b. What circulation route takes oxygenated blood through the body? Systemic

Medical Terminology Worksheet

Please write the meaning of the terms in the right column.

Prefixes, Suffixes, and Root Words

an	
anti	
-apheresis	
-blast	
-crit	
cyt/o	
-cyte	
-emia	
erythr/o	
ferr	
fibr/o	
-gen	
hem/o	
hemat/o	
-ic	
-in	
-is	
kary/o	
leuk/o	
lys/o	
-lysis	
macr/o	
mega	
mon/o	
myel/o	
-ologist	
-ology	
-oma	
-osis	
-penia	
-phage	
-philia	
plasm/o	
-plasty	
-poiesis	
poly	
pro	

reticul/o	
-rrhage	
sepsis	
septic	
-stasis	
thromb/o	
Medical Terms	
anemia	
aplastic	
erythrocyte	
erythropoiesis	
ferrous	
fibrinogen	
fibrinolysis	
hematocrit	
hematocytoblast	
hematologist	
hematology	
hematoma	
hematopoiesis	
hemolytic	
hemophilia	
hemorrhage	
hemostasis	
leukemia	
leukocyte	
leukocytosis	
leukopenia	
macrophage	
megakaryocyte	
monocyte	
myelofibrosis	
plasmapheresis	
polycythemia	
proerythroblast	
reticulocyte	
sepsis	
septicemia	
thrombocyte	

thrombocytopenia	
thrombolysis	
thromboplastin	
thrombosis	
Medical Abbreviations	
AIDS	
BP	
CBC	
CO_2	
CVA	
DVT	
FBS	
GTT	
HBV	
Hct	
Hg	
hgb	
HIB	
HIV	
ml	
mm	
O_2	
RBC	
S&S	
SOB	
stat	
WBC	
WNL	

KEY - Medical Terminology Worksheet

Prefixes, Suffixes, and Root Words

an	without
anti	against
-apheresis	removal of
-blast	developing cell
-crit	to separate
cyt/o	cell
-cyte	cell
-emia	blood condition
erythr/o	red
ferr	iron
fibr/o	fiber
-gen	producing
hem/o	blood
hemat/o	blood
-ic	pertaining to
-in	pertaining to
-is	pertaining to
kary/o	body, nucleus
leuk/o	white
lys/o	destruction of
-lysis	destruction of
macr/o	large
mega	large
mon/o	one
myel/o	bone marrow (also spinal cord)
-ologist	one who studies, specialist
-ology	study of
-oma	tumor, mass
-osis	condition of
-penia	deficiency of
-phage	eating
-philia	love, affection, affinity
plasm/o	plasma
-plasty	(surgical) repair
-poiesis	making of/production of
poly	many
pro	before
reticul/o	netlike

-rrhage	burst forth
sepsis	infection
septic	pathogenic
-stasis	standing still
thromb/o	clot
Medical Terms	
anemia	without blood (generally used to describe a lack of red blood cells)
aplastic	failing to develop into new tissue (Aplastic anemia is a term used to describe when red blood cells are not produced by the bone marrow)
erythrocyte	red (blood) cell
erythropoiesis	production of red (referring to the production of red blood cells)
ferrous	pertaning to iron
fibrinogen	producing fibers (which will be used in the blood clotting process)
fibrinolysis	destruction of fibers
hematocrit	to separate blood
hematocytoblast	blood-developing cell (this is the “stem” cell that is responsible for forming the three types of blood cells)
hematologist	one who specializes in the study of blood
hematology	the study of blood
hematoma	blood tumor or mass (bruise also called ecchymosis)
hematopoiesis	the production of blood
hemolytic	the destruction of blood
hemophilia	pertaining to an affinity or love of blood (has evolved to refer to a number of blood coagulation disorders)
hemorrhage	blood bursting forth
hemostasis	blood standing still (Refers to the stopping of the bleeding)
leukemia	“white blood” (cancer of the blood with many immature white blood cells)
leukocyte	white (blood) cell
leukocytosis	condition of white cells (used to refer to a high number of white blood cells: higher than 10,000 WBC per mm^3)
leukopenia	deficiency of white cells (used to refer to a low number of white cells; lower than 5,000 WBC per mm^3)
macrophage	large eater (refers to the white blood cell, the monocyte, that is found in the tissues and is an integral part in the immune response).
megakaryocyte	large, nucleated cell (will break apart to form the platelets or thrombocytes)
monocyte	one cell (refers to a specific type of WBC)

myelofibrosis	a condition of the fibers in the bone marrow (a condition caused when fibrous tissue replaces the bone marrow)
plasmapheresis	removing plasma
polycythemia	blood condition of many cells (refers to an overproduction of all blood cell types)
proerythroblast	developing red cell that comes before
reticulocyte	net cell (refers to one of the stages of red blood cell development)
sepsis	condition of infection
septicemia	condition of infected blood
thrombocyte	clotting cell (platelets)
thrombocytopenia	deficiency of clotting cells
thrombolysis	destruction of a clot
thromboplastin	pertaining to forming a clot
thrombosis	condition of a clot (or clots)
Medical Abbreviations	
AIDS	Acquired Immunodeficiency Syndrome
BP	blood pressure
CBC	complete blood count
CO_2	carbon dioxide
CVA	cerebrovascular accident (a stroke)
DVT	deep vein thrombosis
FBS	fasting blood sugar
GTT	glucose tolerance test
HBV	hepatitis B virus
Hct	hematocrit
Hg	mercury
hgb	hemoglobin
HIB	haemophilus influenzae type B
HIV	human immunodeficiency virus
ml	milliliter
mm	millimeter
O_2	oxygen
RBC	red blood cell(s)
S&S	signs and symptoms
SOB	shortness of breath
stat	immediately
WBC	white blood cell(s)
WNL	within normal limits

Cardiovascular System Medical Terminology Worksheet

Please write the meaning of the terms in the right column.

Prefixes, Suffixes, Root Words

a	
-ac	
-al	
angi/o	
aort/o	
-ar	
arteri/o	
-ary	
ather/o	
atri/o	
bi	
brady	
calc/i	
cardi/o	
clavicul/o	
coronary	
dys	
ech/o	
-ectomy	
electr/o	
-emia	
end/o	
epi	
femor/o	
furc	
-gram	
-graph	
-grapher	
-graphy	
hem/o	
hemat/o	
hepat/o	
homeo	
hyper	
hypo	

inter	
intra	
isch/o	
-itis	
kal/i	
lip/o	
-logy	
medi	
-megaly	
-meter	
my/o	
natri	
-odynia	
-ologist	
-ology	
-oma	
-osis	
-pathy	
-penia	
peri	
phleb/o	
-plasty	
poly	
-rrhexis	
-sclerosis	
-scope	
semi	
sphygm/o	
-stasis	
-stenosis	
stern/o	
steth/o	
-stomy	
sub	
-tachy	
-tension	
thromb/o	
tibi/o	
-tomy	
valve	
vas/o	

ven/o	
ventricle	
Medical Terms	
angiocardiography	
angioma	
angioplasty	
aortogram	
arteriorrhexis	
arteriosclerosis	
atherectomy	
atherosclerosis	
atrioventricular	
bifurcation	
bradycardia	
cardiac	
cardiodynia	
cardiologist	
cardiology	
cardiomegaly	
cardiomyopathy	
coronary	
coronary ischemia	
coronary thrombosis	
echocardiogram	
electrocardiogram	
electrocardiograph	
electrocardiography	
endarterectomy	
endocarditis	
endocardium	
epicardium	
femoral	
homeostasis	
hypercalcemia	
hyperkalemia	
hyperlipidemia high blood levels of fat	
hypernatremia	
hypertension	

hypocalcemia	
hypokalemia	
hyponatremia	
hypotension	
interventricular	
intravenous	
ischemia	
myocarditis	
myocardium	
pericardium	
pericarditis	
pericardiostomy	
phlebitis	
phlebotomy	
stethoscope	
subclavian	
sphygmocardiograph	
sphygmomanometer	
tachycardia	
thrombophlebitis	
thrombosis	
tibial	
valvulitis	
venogram	
Medical Abbreviations	
av	
BP	
CBC	
CPR	
CVA	
DNR	
DVT	
ECG	
EKG	
ER	
ETA	
Hg	

HR	
IV	
K+	
MI	
Na+	
NCR	
P	
PE	
RBC	
SA	
stat	
TPR	
VS	
VSS	
WBC	

KEY - Cardiovascular System Medical Terminology Worksheet

Prefixes, Suffixes, Root Words

a	without the absence of
-ac	pertaining to
-al	pertaining to
angi/o	vessel
aort/o	aorta; largest artery
-ar	pertaining to
arteri/o	artery
-ary	pertaining to
ather/o	fatty plaque
atri/o	atrium
bi	two
brady	slow
calc/i	calcium
cardi/o	heart
clavicul/o	clavicle (collarbone)
coronary	circling the heart
dys	bad, painful, difficult
ech/o	reflected sound
-ectomy	removal or excision
electr/o	electricity
-emia	blood condition
end/o	within
epi	on, upon
femor/o	femur
furc	branch; forked
-gram	record a picture
-graph	instrument that records
-grapher	one who records
-graphy	the process of recording a picture
hem/o	blood
hemat/o	blood
hepat/o	liver
homeo	same
hyper	above
hypo	below
inter	between
intra	within
isch/o	deficiency, blockage

-itis	inflammation of
kal/i	potassium
lip/o	fat
-logy	study of
medi	middle
-megaly	enlargement
-meter	instrument that measures
my/o	muscle
natri	sodium
-odynia	pain
-ologist	one who studies, specialist
-ology	study of
-oma	mass, tumor
-osis	condition of
-pathy	disease
-penia	deficiency
peri	around
phleb/o	vein
-plasty	surgical repair
poly	many
-rrhexis	rupture
-sclerosis	hardening
-scope	instrument to view or examine
semi	half
sphygm/o	pulse
-stasis	standing still
-stenosis	narrowing, constriction
stern/o	chest, sternum
steth/o	chest
-stomy	create a new opening
sub	below, under
-tachy	fast, rapid
-tension	pressure
thromb/o	clot
tibi/o	tibia; lower leg bone
-tomy	to cut into, incision
valve	structure to permit one-way flow
vas/o	vessel
ven/o	vein
ventricle	a small cavity

Medical Terms	
angiocardiography	the process of recording pictures (x-rays) of the heart and vessels
angioma	tumor of the vessels
angioplasty	repair of the vessels
aortogram	picture (x-ray) of the aorta
arteriorrhexis	rupture of an artery
arteriosclerosis	hardening of an artery
atherectomy	removal of the fatty plaque
atherosclerosis	condition of hardening (of a blood vessel) due to fatty plaque
atrioventricular	pertaining to the atria and the ventricles
bifurcation	two branches (a blood vessel splits into two blood vessels)
bradycardia	slow heart beat (less than 60 beats per minute)
cardiac	pertaining to the heart
cardiodynia	pain in the heart
cardiologist	a specialist of the heart
cardiology	study of the heart
cardiomegaly	enlargement of the heart
cardiomyopathy	disease of the heart muscle
coronary	circling the heart (also used when referring to a heart attack or MI)
coronary ischemia	lack of blood flow in the heart due to a blockage
coronary thrombosis	condition of a blood clot within the heart's own blood vessels
echocardiogram	using sound waves to visualize the heart
electrocardiogram	recording of the heart's electricity (electrical pattern)
electrocardiograph	machine that records the heart's electricity (electrical pattern)
electrocardiography	the process of recording the heart's electricity (electrical pattern)
endarterectomy	removal from within an artery (used to describe the process of removing fatty plaque from an artery, such as the carotid artery)
endocarditis	inflammation within the heart (the inner lining of the heart).
endocardium	pertaining to the inner layer of the heart
epicardium	pertaining to upon the heart (the outer layer of the heart; also known as the visceral pericardium)
femoral	pertaining to the femur
homeostasis	"standing the same" (the body's ability to keep its internal environment constant)

hypercalcemia	high blood levels of calcium
hyperkalemia	high blood levels of potassium
hyperlipidemia high blood levels of fat	
hypernatremia	high blood levels of sodium
hypertension	high blood pressure
hypocalcemia	low blood levels of calcium
hypokalemia	low blood levels of potassium
hyponatremia	low blood levels of sodium
hypotension	low blood pressure
interventricular	pertaining to between the ventricles
intravenous	pertaining to within the veins
ischemia	deficiency of blood (to a muscle or an organ)
myocarditis	inflammation of the heart muscle
myocardium	pertaining to the heart muscle (the middle layer of the heart, composed of cardiac muscle)
pericardium	around the heart
pericarditis	inflammation around the heart (an inflammation of the membranes surrounding the heart)
pericardiostomy	formation of an opening in the pericardium (for drainage of extra fluid or blood)
phlebitis	inflammation of a vein
phlebotomy	to cut (make an incision) into a vein
stethoscope	instrument used to listen to sounds produced in the body
subclavian	pertaining to below the clavicle (collarbone)
sphygmocardiograph	machine used to record the pulse (usually the radial) with the heartbeat
sphygmomanometer	instrument used to measure the pulse (as in blood pressure)
tachycardia	rapid heartbeat (usually above 100 beats per minute)
thrombophlebitis	inflammation of a vein associated with a clot
thrombosis	condition of clotting
tibial	pertaining to the tibia
valvulitis	inflammation of the valves
venogram	picture (x-ray) of a vein or veins
Medical Abbreviations	
av	atrioventricular
BP	blood pressure
CBC	complete blood count

CPR	cardiopulmonary resuscitation
CVA	cerebrovascular accident
DNR	do not resuscitate
DVT	deep vein thrombosis
ECG	electrocardiogram
EKG	electrocardiogram
ER	emergency room
ETA	estimated time of arrival
Hg	mercury
HR	heart rate
IV	intravenous
K+	potassium
MI	myocardial infarction
Na+	sodium
NCR	no cardiac resuscitation
P	pulse
PE	pulmonary embolus
RBC	red blood cell
SA	sino-atrial
stat	immediately
TPR	temperature, pulse, respiration
VS	vital signs
VSS	vital signs stable
WBC	white blood count