

Anatomy and Physiology II
Exam #2 Mix & Match

1. **Agranulocytes** - White blood cell. Have no granules in the cytoplasm and the nucleus is not lobed. Two sub types: Monocytes and Lymphocytes.
2. **Albumins** - A plasma protein. 60% of the plasma protein, made in the liver, help maintain osmotic pressure and regulate water balance between blood and tissues.
3. **Anastomoses** - interconnections between the arteries of the heart that provide alternative routs for blood flow if arteries become blocked.
4. **Anemia** - Low number of red blood cells (normal 45-52% men / 37-48% women)
5. **Aneurysm** - when the wall of an artery or vein balloons out due to high pressure in the vessel. Arteriolosclerosis increases the likelihood that an aneurysm will occur.
6. **Angina pectoris** - a tightness or pain in the chest and left arm produced by reduced blood flow to the heart
7. **Aortic semilunar valve** - Valve between the left ventricle and the aortic artery.
8. **Arrhythmia** - Lack of proper heart rhythm (Bradycardia, tachycardia, Heart flutter, Atrial fibrillation, ventricular fibrillation)
9. **Arteries** - Vessels which carry blood away from the heart.
10. **Arterioles** - The smaller vessels that arteries branch into.
11. **Arteriosclerosis** - hardening of the arteries.
12. **Atrial fibrillation** - (AF)asynchronous contractions of the atrial muscle fibers that can cause atrial pumping to stop altogether. Atrial fibrillation reduces the effectiveness of pumping of the heart by 20-30%.
13. **Atrioventricular bundles (bundles of his)** - carry the signal from the A-V node to the ventricles. They divide into right and left branches to carry the signal to the right and left ventricles.

14. Atrioventricular node - (AV Node) is located at the bottom of the right atrium and causes a short pause in the movement of the contraction signal, which allows the atria to fully contract, before the ventricles start to contract

15. Balloon angioplasty - Procedure done to increase the size of narrowed coronary arteries to increase blood flow. In this technique a small balloon is run into the narrowed artery from the larger arteries of the leg and then inflated a number of times to stretch the walls of the artery and increase its diameter.

16. Basophils - white blood cells, subtype of granulocytes. Make up less than 1% of white blood cells. Cytoplasmic granules have irregular shape and stain purple or blue/black. Nucleus is often hard to see and usually has 2 lobes. Involved in allergic reactions and inflammation of tissues. Carry heparin and histamine.

17. Bicuspid (mitral) valve - Valve between left atrium and ventricle.

18. Bilirubin - part of breakdown of dead red blood cells. Second stage of breakdown of the non iron containing heme. Orange pigment.

19. Biliverdin - part of the breakdown of dead red blood cells. The non-iron containing portion of the heme is converted into this then into bilirubin. Green pigment.

20. Bradycardia - slow heart rate (under 60 beats per minute)

21. Capillaries - the smallest vessels that connect arterioles to venules. Have permeable walls.

22. Cardiac tamponade - Caused by the accumulation of pericardial fluid which causes the heart to be compressed to the point where it can no longer beat.

23. Cardiology - the study of the heart and its function

24. Cardiovascular system - The heart and blood vessels

25. Chemotaxis - What attracts white blood cells to foreign cells in the body.

26. Cholesterol - Lipid, a waxy substance produced by the liver and found in certain foods, is needed to make vitamin D and some hormones, build cell walls, and create bile salts that help you digest fat.

27. Chordae tendineae - Chordae tendinae = the tendons that connect the valve flaps to the papillary muscles.

28. Collateral circulation - Provided when two or more branches of different arteries feed blood to the same part of the body, providing an alternate route in case of blockage. Called Anastomoses.

29. Continuous capillaries - Type of capillary, except for intercellular clefts (i.e., spaces between the cells) these capillaries have continuous walls.

30. Coronary arteries - these arteries come off the ascending aorta where blood leaves the left ventricle to travel out to the body. They supply the blood to the heart.

31. Coronary artery disease - a disease caused by inadequate blood flow through the coronary arteries due to disease such as atherosclerosis.

32. Coronary bypass - A surgical procedure performed when a coronary artery is blocked. A section of a leg artery is used to bypass the clogged portion of the coronary artery.

33. Coronary sinus - The vein that allows the blood from the coronary veins to return to the right atrium of the heart.

34. Coronary veins - collect up the blood from the coronary arteries and carry it to the **coronary sinus** which carries the blood back to the right atrium

35. Defibrillation - Procedure that uses electric shock to attempt to return the heart to a normal sinus rhythm.

36. Deoxyhemoglobin - hemoglobin (red blood cells) not bonded with oxygen.

37. Diastolic pressure - the lowest blood pressure that occurs between contractions of the ventricles

- 38. Edema** - when tissues swell with water because more water moves into them tissue than is reabsorbed by the blood
- 39. Elastic arteries** - Large arteries are also called elastic arteries because they have large amounts of elastic tissue in their walls and they push the blood through the arteries by elastic recoil.
- 40. Electrocardiogram (ECG)** - the electric signals produced when the heart contracts
- 41. Embolism** - a clot that has broken free and is moving in the blood stream.
- 42. Emigration** - The movement of white blood cells out of the blood and into the tissue.
- 43. End arteries** - Arteries which are the only supply to that portion of the body. I.e. there is no Anastomoses. If the artery is blocked, the tissue will die.
- 44. Endocardium** - the smooth layer of endothelium (i.e., epithelium that lines the veins and arteries) overlying a thin layer of connective tissue. It is very smooth to reduce friction as the blood moves through the heart.
- 45. Epicardium** - the outer most layer of the heart that is the visceral layer of the pericardium and is very smooth to prevent friction with the parietal layer of the pericardium when the heart contracts
- 46. Erythrocytes** - Red blood cells. 40-50% of blood volume, 98% of cellular blood volume. Carry oxygen.
- 47. Erythropoietin** - Hormone released by the kidneys & liver, in response to low blood oxygen levels. Triggers the production of red blood cells by the bone marrow. High oxygen levels in the blood inhibit the production of.
- 48. Eosinophils** - White blood cells, subtype of granulocytes. Make up 1-3%. Cytoplasmic granules stain dark red and the nucleus has 2 lobes. Help modulate allergic and inflammatory reactions. Also destroy antibody antigen complexes.
- 49. External elastic lamina** - In arteries there is a layer of elastic tissue that separates the tunica media from the tunica externa.

50. Fenestrated capillaries - Capillaries which have large pores that pass through the endothelial cell that line them. Found in the kidney, choroid plexuses, villi of the small intestine, and the ciliary processes of the eye.

51. Ferritin - An iron storage protein found in muscle cells, liver cells, and macrophages of the spleen & liver that store iron detached from transferrin.

52. Fibrillation - irregular heart beat. The heart speeds up and slows down, or the atria and ventricles do not contract in the proper sequence. Atrial Fibrillation and Ventricular Fibrillation.

53. Fibrin - A long thread-like protein that bonds to cuts in vessel walls and stops the loss of blood from the vessel during clotting process. Thrombin converts Fibrinogen (clotting factor I) into fibrin.

54. Fibrinogen - (Clotting factor I) 4% of plasma proteins. Involved in the formation of blood clots.

55. Fibrinolysis - the breaking down of blood clots

56. Fibrous pericardium - the outer most fibrous layer of the pericardium made of non-elastic dense connective tissue

57. Free radicals - charged molecules that have unpaired electrons and do molecular damage when they take electrons from other molecules

58. Gamma globulins - Antibodies produced by B-Cells. There are a number of different types IgG, IgA, IgM, IgD, and IgE.

59. Globulins - Plasma protein 36% of the plasma protein. Two types, alpha & beta, made in liver and help transport fats and fat soluble vitamins.

60. Granulocytes - Type of leukocyte, has a granular cytoplasm and a nucleus with a number of lobes. A type of polymorphonuclear leucocyte (PMN). Three subtypes (Neutrophils, eosinophils, Basophils).

61. Heart attack (myocardial infarction) - can occur when there is an ischemia in the heart, usually caused by blockage of the coronary arteries. In severe heart attacks usually atrial or

ventricular fibrillation occurs. Often part of the heart muscle dies due to lack of blood flow to it.

62. Heart flutter - arrhythmia with over 300 beats per minute at rest.

63. Heart murmur - Swishing sounds that are heard between the lub and the dub. These sounds indicate that some blood is leaking through the heart valves.

64. Hematocrit - The percentage of the total blood (plasma + cellular) made up of red blood cells. Used for testing for anemia. Determined by centrifuging the blood.

65. Hematopoiesis - The making of blood cells.

66. Hematology - The study of blood.

67. Hemocytoblast - A precursor blood cell that can develop into a red or white blood cell.

68. Hemoglobin - The proteins on the red blood cells which carry oxygen.

69. Hemolytic anemia - Anemia due to rupturing of red blood cells caused by parasites, toxins, or incompatible blood types.

70. Hemolytic disease of newborns - When a mother w/ Rh- blood has a second Rh+ baby her immune system will attack his blood. To prevent we give the mother rhogam.

71. Hemostasis - The stoppage of bleeding when a blood vessel is ruptured. Stages: 1. Vascular spasm, 2. platelet plug formation, 3. Clot formation

72. Hemophilia - (bleeders disease) = is a genetic disorder, in which the blood will not clot properly because the person does not produce clotting factor VIII, IX, or XI. The genes for the clotting factors for this disorder are carried on the "X" chromosome, which makes the disease show up more commonly in men than women.

73. Hemorrhagic anemia - Anemia due to excess loss of blood, often due to ulcers or heavy menstrual bleeding.

74. Hemosiderin - An iron storage protein found in muscle cells,

liver cells, and macrophages of the spleen & liver that store iron detached from transferrin.

75. Heparin - Inhibits blood clotting and helps destroy blood clots in areas where they are not needed.

76. High density lipoproteins - HDL - collect excess cholesterol released from cells and take it back to the liver where it is burned or stored. 50% protein, 37% triglycerides 13% cholesterol

77. Histamine - Causes the tissue to swell with water as a result of tissue damage or an immune response. The swelling makes it easier for immune cells can move into the tissue.

78. Hypertension - High blood pressure.

79. Internal elastic lamina - In arteries there is a layer of elastic tissue between the tunica interna and the tunica media.

80. Iron-deficiency anemia - anemia due to lack of adequate absorption or excessive loss of iron.

81. Ischemia - a temporary decline in blood flow to an organ due to a blockage in circulation

82. Junctional fibers - connect the S-A node to the A-V node and also carry the contraction signal to the atria

83. Leukemia - Bone marrow cancer. A disease characterized by uncontrolled growth and lack of specialization of leukocytes and their precursors in the tissues. Each type of this disease is identified by the type of white blood cell that is affected.

84. Leukocytes - White blood cells.

85. Leukocytosis - An increase in the number of white blood cells above the normal number.

86. Leukopenia - An abnormally low number of white blood cells.

87. Leukopoiesis - The process of forming white blood cells. They are formed from the same undifferentiated hemocytoblasts, but after they are formed, they move to they lymph nodes, spleen, or tonsils where they specialize to form white blood cells.

- 88. Low density lipoproteins** - LDL Fats that are used to transport cholesterol in the blood/tissues. 25% protein, 20% triglycerides, 55% cholesterol
- 89. Lymphocytes** - White blood cells, subtype of Agranulocytes. Make up 25-33% of white blood cells. Nucleus is large and round and the cytoplasm around it is very narrow. Form T-Cells and B-Cells
- 90. Monocytes** - White blood cells, subtype of Agranulocytes. Make up 3-9% of the white blood cells. Nucleus is round, kidney bean shaped or bilobed. They are among the largest of the blood cells, 2-3x red blood cells. Margin is often irregular, not round. Form macrophages which phagocytize foreign cells and particles in the blood and tissues.
- 91. Muscular arteries** - Medium sized arteries. They have more smooth muscle tissue than large arteries and use this muscle tissue to propel the blood through the arteries.
- 92. Myocardium** - The middle layer of the heart wall, made up of heart muscle.
- 93. Neutrophils** - White blood cells, subtype of granulocytes. Make up 54-62% of white blood cells. Cytoplasmic granules stain pink and the nucleus has 2-5 lobes. Phagocytize foreign cells and particles in the blood and tissue.
- 94. Oxyhemoglobin** - Hemoglobin bonded with oxygen.
- 95. Pace makers** - Device placed just below the skin over the heart that produce small pulses of electricity, that keep the sinoatrial node producing contraction signals at the proper rate.
- 96. Papillary muscles** - the muscles at the base of the chordae tendinae (heart valves). They are relaxed when the valve is open and contract as the valve closes to prevent the valve from everting
- 97. Pericardial cavity** - the space between the parietal layer and the visceral layers of the serous pericardium. It is filled with pericardial fluid.
- 98. Pericarditis** - Inflammation of the pericardium. Can cause cardiac tamponade and heart failure.
- 99. Pericardium** - The three layer sack that holds the heart and

helps maintain the proper chemical balance in the heart.

100. Parietal layer - the outer layer of the serous pericardium that is fused to the fibrous pericardium (middle layer of pericardium).

- 101. Pernicious anemia** - Anemia caused by a insufficient hematopoiesis usually caused by a lack of vitamin B-12 due to the inability of the stomach to make enough intrinsic factor.
- 102. Plasma** - The fluid portion of the blood (50-60% of the blood). It's 92% water. Carries nutrients, gasses, vitamins, ions, urea, hormones and some proteins.
- 103. Plasmin** - Formed from plasminogen when needed to help break down clots.
- 104. Plasminogen** - an inactive plasma enzyme that is incorporated into blood clots when they are formed
- 105. Platelet plug formation** - Platelets plug the hole in the ruptured vessel to stop the bleeding. Second stage of hemostasis.
- 106. Platelets (thrombocytes)** - 1% of the total blood volume, 1% of the cellular portion of the blood. Formed when larger cells break apart. Very small, a fraction of the size of red blood cells and have very irregular margins. Stick together to the rough margin of broken vessels and help with the formation of blood clots. Release thromboplastin.
- 107. Polymorphonuclear leukocytes** - Any white blood cell with a number of lobes on its nucleus
- 108. Precapillary sphincters** - Sphincters which are just prior to the capillaries and can shut down the blood flow to that capillary when needed.
- 109. Prothrombin** - An inactive enzyme used in clot formation. Thromboplastin is activated by calcium and it converts this into thrombin (an active enzyme).
- 110. Pulmonary semilunar valve** - the valve where the blood leaves the right ventricle to go to the lungs
- 111. Purkinje fibers** - carry the signal from the atrioventricular bundles to the ventricle muscles and papillary muscles causing them to contract.
- 112. Reticulocyte** - Juvenile red blood cells released from the red bone marrow that eject their nucleus to form mature red blood cells. Usually make up 1-2% of all red blood cells.

113. Serous pericardium - a two part inner membrane that surrounds the heart (Parietal layer & Visceral layer). The Parietal layer is tightly attached to the pericardium and the visceral layer is tightly attached to the heart (epicardium). Between is the pericardial cavity which contains the pericardial fluid.

114. Sickle cell anemia - Anemia from a genetic disorder more common in people of African decent, in which the blood cells do not carry sufficient oxygen. People with one normal gene and one sickle cell gene don't have sickle cell anemia and are resistant to malaria.

115. Sinoatrial node - (SA node) is located above the right atrium and produces the signal that causes the heart to contract

116. Sinusoid capillaries - One of three types of capillaries. Wider than other capillaries and have large spaces between the endothelial cells. The basement membrane is incomplete or absent. Also, their lining often contains special phagocytic cells called Kupffer's cells (i.e., stellate reticuloendothelial). Found in the spleen, liver, anterior pituitary, parathyroid, and bone marrow.

117. Stercobilin - Involved in the breakdown of dead red blood cells. Brown pigmentation, gives the feces their color.

118. Stroke (cerebrovascular accident, CVA) - A stroke is the rapidly developing loss of brain functions due to a disturbance in the blood vessels supplying blood to the brain

119. Systolic pressure - the maximum blood pressure that occurs when the ventricles contract

120. Tachycardia - fast heart rate(over 100 beats per minute at rest)

121. Thrombin - Created from prothrombin by thromboplastin when needed for clot formation. An active enzyme that will help to form the clot.

122. Thromboplastin - An enzyme used in clot formation, released from cells when they are damaged or ruptured. Also released by platelets.

123. Thrombosis - a clot that stays where it was formed in a vessel. Embolism is a clot that moves.

- 124. Transferrin** - A plasma protein found in the blood stream that carries iron.
- 125. Tricuspid valve** - the valve between the right atrium and right ventricle.
- 126. Tunica externa** - (adventitia) The external layer of vessel walls. Made of elastin and collagen fibers.
- 127. Tunica interna** - The inner most layer of vessel walls.. The inner most portion of this layer is made of endothelium cells (surrounded by a basement cell membrane).
- 128. Tunica media** - Middle layer of vessel walls. Made up of smooth muscle. Contracts when stretched helping to move the blood through the vessel.
- 129. Urobilin** - Some of the urobilinogen is reabsorbed into the blood and converted into this (yellow pigment) which is then excreted in the urine.
- 130. Urobilinogen** - In the large intestine bilirubin from the gall bladder is converted into this. Most of this is converted into stercobilin (brown pigment).
- 131. Varicose veins** - occurs when the one-way valves in the veins don't work the way they should. This causes blood to accumulate in the veins of the lower body, particularly the legs. The veins, swollen with blood, protrude out on the lower parts of the body.
- 132. Vascular sinuses** - veins with thin walls and no smooth muscle to alter their diameter. In these vessels the tunica media is made up of connective tissue for support rather than muscle. They function as collection sites for blood that is being returned to the heart.
- 133. Vascular spasm** - First stage of hemostasis. Contraction of the ruptured blood vessel to reduce blood loss. This reduces vessel diameter greatly reducing blood flow through the vessel.
- 134. Vasoconstriction** - When the arteries contract. Caused by the sympathetic nervous system, increases blood pressure.
- 135. Veins** - The vessels that carry the blood back to the heart.

136. Venules - The smallest veins, connect the veins to the capillaries.

137. Ventricular fibrillation - (VF) Irregular beating of the ventricles. A type of fibrillation.

138. Very low density lipoproteins - (triglycerides) Transport triglycerides made by the liver to adipose cells. VLDL can be converted into LDL which is how they contribute to plaque formation. 10% protein, 65% triglycerides, 25% cholesterol

139. Visceral layer - (epicardium) The inner most layer of the pericardium, attached to the heart muscle itself.