

Name: _____ Lab Time: _____

Tissues**Study Guide, Chapter 3****Part I. Clinical Applications**

1. Pathologists are very knowledgeable in histology. Why is histology important in medical care?

Histologists synthesize anatomical and histological observations to determine the nature and severity of the disease or illness.

2. Vitamin C is important to maintain health. What relationship does vitamin C have to tissue development in the body?

Vitamin C is required by key enzymatic reactions for proper collagen formation. Collagen is a protein substance that forms the framework of connective tissue. The connective tissue is the building material for bones, cartilage, teeth, tendons, ligaments, and blood vessels. Without the proper production of collagen many body systems are affected. Lack of vitamin C can cause the condition known as scurvy.

3. After a weight-loss program, why is the lost weight often regained quickly in the same areas of the body?

Adipocytes are metabolically active cells. Their lipids are continuously being broken down and replaced. During a weight-loss program nutrients are scarce, causing the fat cells to decrease in size. The cells are not killed but merely reduced in size. Once the weight-loss program is stopped and exercise is decreased and/or calorie intake is increased, these cells increase in size and the lost weight will be regained in the same locations.

4. The knee joint is quite susceptible to injury involving the tearing of cartilage pads within the knee joint. In most cases, why is surgery needed?

Cartilage heals poorly and in many instance does not heal or recover at all after a severe injury. Cartilage is avascular, because chondrocytes produce a chemical that discourages the formation of blood vessels. This property makes nutrient and oxygen delivery difficult. Also the chondrocytes do not readily divide. The lack of cell division and avascularity contribute to the poor healing of cartilage thus requiring surgery.

5. After many years of smoking, Mr. Butts is plagued by a hacking cough. Explain the causes of this cough.

The respiratory passages are lined by ciliated pseudostratified columnar epithelium that contains mucus producing goblet cells. The mucus traps debris and foreign material that is moved by the beating cilia to the pharynx to be swallowed. Chronic smoking initially paralyzes the cilia, resulting in a buildup of mucus in the airways. The hot air and particulates sear and burn off the cilia, which eventually do not get replaced. The epithelium responds by producing even more mucus which cannot be moved due to the lack of cilia. The only way that the respiratory system can clear the debris and mucus is with forceful bursts of air: coughing.

6. Assuming that you had the necessary materials to perform a chemical analysis of body secretions, how could you determine whether a secretion was merocrine or apocrine?

Because apocrine secretions are released by pinching off a portion of the secreting cell, you could test for the presence of cell membranes, specifically for the phospholipids in cell membranes. Merocrine secretions do not contain a portion of the secreting cell, so they would lack membrane constituents.

7. You are working in a pathology lab and are asked to develop a two-step scheme that can be used to identify the three types of muscle tissue. What would the two steps be?

Step 1: Check for striations. If striations are present, the choices are skeletal muscle or cardiac muscle. If striations are absent, the tissue is smooth muscle.

Step 2: Check for the presence of intercalated discs. If these discs are present, the tissue is cardiac muscle. If they are absent, it is skeletal muscle.

8. Mike has had a series of respiratory tract infections this winter. His doctor has just prescribed a mucus-thinning drug. Using your knowledge of the structure of the mucus membrane lining the respiratory tract, how do you think this type of drug will help Mike get better?

The drug will make it easier for the cilia on the epithelial cells to move the mucus, in which microbes are trapped, away from the lungs. Coughing up the thinned mucus should also be easier.

9. Janelle has been an anorexic for several years. As a result of her chronically low daily caloric intake, her adipocytes are storing little or no triglycerides. What structural problems might she suffer as a result?

Janelle's kidneys may drop out of position from lack of supporting fat. There would also be less fat for padding in joints, and buttocks, and eyes may appear sunken.

10. The neighborhood kids are walking around with common pins and sewing needles stuck into their fingertips. There is no visible bleeding. What type of tissue have they pierced? How do you know?

The tissue is keratinized stratified squamous epithelium, which is avascular and thus there is no bleeding.

Part II

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|-------------------------------------|-----------------------------|-------|
| 1. neural or nervous | 20. C | 41. G |
| 2. epithelial | 21. C | 42. B |
| 3. mesothelium | 22. B | 43. A |
| 4. endothelium | 23. loose CT | 44. C |
| 5. exocytosis | 24. reticular | 45. F |
| 6. connective | 25. adipose | 46. D |
| 7. collagen | 26. regular | 47. M |
| 8. reticular | 27. tendons | 48. K |
| 9. areolar or lamina propria | 28. ligaments | 49. J |
| 10. skeletal | 29. sclera | 50. D |
| 11. neuroglia | 30. fluid CT | 51. D |
| 12. necrosis | 31. blood | 52. C |
| 13. abscess | 32. lymph | 53. B |
| 14. goblet cells | 33. bone | 54. D |
| 15. chemotherapy | 34. hyaline | 55. E |
| 16. cancer | 35. chondrocytes in lacunae | 56. C |
| 17. stroma | 36. D | 57. B |
| 18. dense regular connective tissue | 37. D | 58. C |
| 19. D | 38. B | 59. B |
| | 39. E | 60. A |
| | 40. H | 61. B |

Part III

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| 1. stratified squamous (non-keratinized) | 23. pleura |
| 2. trachea mucosa (ciliated) | 24. 3 |
| 3. simple squamous | 25. 1 |
| 4. simple cuboidal | 26. 2 |
| 5. transitional | 27. 2 |
| 6. layers of column-like cells | 28. 1 |
| 7. adipose | 29. 3 |
| 8. tendons, ligaments | 30. lines body cavities that open directly to the exterior |
| 9. dense irregular fibrous CT | 31. produce mucus |
| 10. hyaline cartilage | 32. serosa |
| 11. chondrocytes in lacunae | 33. secretes a lubricating fluid |
| 12. external ear, epiglottis | 34. synovial |
| 13. bone or osseous | 35. freely movable joints, bursae and tendon sheaths |
| 14. cardiovascular system | 36. mesenchyme |
| 15. skeletal | 37. subcutaneous or superficial fascia |
| 16. heart | 38. adipocytes |
| 17. nonstriated uninucleated cells | 39. dense irregular |
| 18. neurons – axons, dendrites, neuroglia-supporting cells | 40. chondrocytes |
| 19. mesenchyme | 41. perichondrium |
| 20. perichondrium | 42. elastic cartilage |
| 21. exocrine | 43. fibrocartilage |
| 22. vascular | 44. hyaline cartilage |

Part IV

1. holocrine
2. merocrine
3. apocrine
4. secrete products into ducts that empty at the surface of covering or lining epithelium
5. secrete products into the blood stream. Do not have ducts
6. T
7. F
8. F
9. T
10. F
11. lining/ covering
12. glandular
13. F
14. T
15. T
16. F
17. T
18. T
19. pseudostratified
20. simple
21. stratified
22. exocrine
23. endocrine
24. exocrine
25. endocrine
26. tendon
27. ligaments
28. aponeurosis
29. chondro-; lacunae
30. more; fibrous; collagen
31. hyaline; most
32. less; Cartilage is avascular, so chemicals needed for repair must reach cartilage by diffusion from the perichondrium or other surrounding tissue.
33. pericardium; pleura; peritoneum
34. visceral; parietal
35. synovial; freely moveable joints, bursae, and tendon sheaths; does not; is not.
36. cutaneous
37. A
38. B
39. D
40. matrix
41. transitional
42. simple squamous
43. cartilage
44. stratified squamous (keratinized)
45. D
46. B
47. D
48. C
49. B
50. C
51. C
52. B
53. A
54. C
55. A
56. B
57. C
58. D
59. B
60. A
61. A
62. A

Part V

1. epithelium
2. muscle
3. nervous
4. connective
5. epithelium
6. nervous
7. muscle
8. epithelium
9. connective
10. connective
11. muscle
12. connective
13. nervous
14. stratified squamous
15. simple columnar
16. stratified squamous
17. pseudostratified columnar (ciliated)
18. pseudostratified columnar (ciliated)
19. transitional
20. simple squamous