

Name: \_\_\_\_\_ Lab Time: \_\_\_\_\_

## Integumentary System Study Guide, Chapter 5

### Part I. Clinical Applications

1. Mrs. Ibanez volunteered to help at a hospital for children with cancer. When she first entered the cancer ward, she was upset by the fact that most of the children had no hair. What is the explanation for their baldness?

Chemotherapy drugs used to treat cancer kill the most rapidly dividing cells in the body, including many matrix cells in the hair follicles; thus the hair falls out.

2. A new mother brings her infant to the clinic, worried about a yellowish, scummy deposit that has built up on the baby's scalp. What is this condition called, and is it serious?

The baby has seborrhea, or cradle cap, a condition of overactive sebaceous glands. It is not serious; the oily deposit is easily removed with attentive washing and soon stops forming.

3. Bed ridden patients in hospitals are generally rotated every 2 hours to prevent decubitus ulcers or "bedsores". What is a bedsore and why is this effective?

Bedsore are a result of circulatory restrictions. They can be prevented by frequent changes in body position; thus, bed ridden patients are turned at regular intervals so that no region of their body is pressed against the bed long enough to deprive the blood supply to the skin.

4. Eric and his wife are of northern European descent. Eric is a proud new father who was in the delivery room during his daughter's birth. He tells you that when she was born, her skin was purple and covered with a cream-cheese-like substance. Shortly after birth, her skin turned pink. Can you explain his observations?

The baby was cyanotic from lack of oxygen when born, a problem solved by breathing. **Vernix caseosa**, a cheesy substance made by the sebaceous glands covered her skin. This substance helps to protect the fetus's skin in utero.

5. After studying the skin in anatomy class, Alex grabbed the large "love handles" at his waist and said, "I have too thick hypodermis, but that's okay because this layer performs some valuable functions!" What are the functions of the hypodermis?

Besides storing fat as a source of nutrition, the hypodermis anchors the skin to the underlying structures (such as muscles) and acts as an insulator against heat loss.

6. A man had his finger caught in a machine at the factory. The damage was less serious than expected, but nonetheless, the entire nail was torn from his right index finger. The parts lost were the body, root, bed, matrix, and cuticle of the nail. First, define each of these parts. Then, tell if this nail is likely to grow back.

The body of a nail is its visible, attached part (not its white free edge). The root is the proximal part that is embedded in the skin. The bed is the part of the epidermis upon which the nail lies. The matrix is the proximal part of the nail bed, and is responsible for nail growth. The cuticle is the skin fold around the perimeter of the nail body. Because the matrix is gone, the nail will not grow back.

7. Mrs. Gaucher received second-degree burns on her abdomen when she dropped a kettle of boiling water. She asked the clinical physician (worriedly) if she would have to have a skin graft. What do you think she told her?

She probably told her that regeneration would occur, and grafts would not be needed if infection was avoided.

8. What two factors in the treatment of critical third-degree burn patients are absolutely essential?

Replacing lost fluid and electrolytes and prevention of infection.

9. Rebecca and her friend are at a New Year's Eve party and decide to step outside to smoke. The temperature is below freezing and they are not wearing jackets. Rebecca tells her friend that you don't need coats because they are drinking alcoholic beverages, which will keep them warm enough. You have learned that alcohol dilates the blood vessels in the skin. Do you think Rebecca and her friend have chosen an effective way to control their body temperature? Why or why not?

Dilation of the blood vessels in the skin increases blood flow, which means more body heat will reach the surface of the skin and be radiated away. Therefore, although they will feel warmer superficially, body temperature will decrease. They should wear their coats.

10. A hypodermic needle is used to introduce drugs into the loose connective tissue of the hypodermis. Beginning on the surface of the skin in the region of the thigh, list, in order, the layers of the tissue the needle would penetrate to reach the hypodermis.

Stratum corneum, stratum granulosum, stratum spinosum, stratum germinativum, dermis (papillary layer, reticular layer).

11. Two teenagers are discussing their problems with acne. One says to the other, "Sure wish I could get rid of these whiteheads." The other replies, "At least you don't have blackheads like I do." What is the differences between a "whitehead" and a "blackhead"?

"Whiteheads" contain accumulated, stagnant secretions. "Blackheads" contain more solid material that has been invaded by bacteria.

12. Even though the skin is water resistant, it is not waterproof. When the skin is immersed in water, osmotic forces may move water in or out of the epithelium. Long-term exposure to seawater endangers survivors of a shipwreck by accelerating dehydration. How and why does this occur?

The ocean is a hypertonic solution, thus causing water to leave the body by crossing the epidermis from the underlying tissues

13. Tretinoin (Retin-A) has been called the anti-aging cream. Since it is applied topically, how does it affect the skin?

Retin-A increases blood flow to the dermis and stimulates dermal repairs resulting in a decrease in wrinkle formation and existing wrinkles become smaller.

14. Why do calluses form on the palms of the hands when doing manual labor?

When the skin is subjected to mechanical stresses, stem cells in the germinativum divide more rapidly, and the depth of the epithelium increases.

15. People always say, "It's not the heat; it's the humidity," when complaining about summer weather. Why do you think people feel hotter when it's 95 degrees Fahrenheit and 95% humidity than when it's 95 degrees and 30% humidity?

Humidity refers to the amount of water vapor in the air. The higher the humidity, the less evaporation can occur, which means the less cooling can occur. Therefore people perceive the same temperature as hotter at a higher humidity.

**Part II**

1. B
2. M
3. C
4. C,M
5. C
6. C
7. epidermis
8. dermis
9. hypodermis (subcutaneous tissue or superficial fascia)
10. eccrine sweat gland
11. hairshaft
12. stratum corneum
13. stratum basale
14. sebaceous gland
15. arrector pili muscle
16. nerve fibers
17. hair follicle
18. hair papilla
19. adipose tissue
20. stratum lucidum
21. stratum corneum and lucidum
22. papillary layer
23. dermis as a whole
24. stratum basale
25. stratum corneum
26. dermis as a whole
27. stratum basale
28. epidermis as a whole
29. stratum corneum
30. dermis as a whole
31. melanin
32. carotene
33. melanin
34. hemoglobin
35. melanin
36. hemoglobin

**Part III**

1. heat
2. subcutaneous (hypodermis or superficial fascia)
3. vitamin D
4. elasticity
5. oxygen (blood flow)
6. cyanosis
7. sebaceous glands
8. arrector pili
9. eccrine sweat gland
10. hair follicle
11. apocrine sweat gland
12. hair
13. cutaneous receptors
14. sebaceous glands and apocrine sweat gland
15. eccrine sweat gland
16. sebaceous gland
17. third-degree burn
18. second-degree burn
19. first-degree burn
20. second- degree burn
21. third-degree burn
22. third-degree burn
23. Thought to have antibacterial properties and protect the skin from amniotic fluid
24. squamous cell carcinoma
25. basal cell carcinoma
26. malignant melanoma
27. Pigmented areas that are **Asymmetric**, have irregular **Borders**, exhibit several **Colors**, and a have **Diameter** greater than 6 mm are likely to be cancerous.
28. B and D
29. D
30. B
31. D
32. C
33. A
34. D
35. D
36. lucidum
37. basale
38. corneum
39. granulosum
40. spinosum
41. deep; connective; papillae; touch; hot, cold, pain, tickle, and itch.
42. dense; collagen; elastic; striae
43. melanin, carotene, hemoglobin
44. melanin; epidermis; albinism
45. orange
46. shock or anemia
47. yellow; liver; blue
48. sudoriferous
49. sebaceous
50. ceruminous
51. sebaceous
52. eccrine or sudoriferous

53. sudoriferous
54. Look at your own nails for this
55. yes; yes; epidermis
56. they both bring about growth of the nails and hair respectively
57. The pink color is related to visibility of blood vessels deep to the nail body; the free edge has no tissue deep to it, whereas the thickened stratum basale obscures blood vessels deep to the lunula.
58. A
59. B
60. B,A,C
61. B,A,C
62. D
63. D
64. B
65. B

66. D
67. B
68. C
69. A
70. A
71. B
72. stratum spinosum
73. stratum corneum
74. stratum lucidum
75. stratum granulosum
76. stratum basale
77. hair follicle
78. cuticle
79. shaft
80. medulla
81. cortex
82. hair bulb
83. papilla

#### Part IV

1. accessory
2. integumentary system
3. stratum lucidum
4. stratum corneum
5. Langerhan's cells
6. MSH
7. melanin
8. connective
9. reticular layer
10. vellus
11. sebaceous glands
12. follicle
13. sebum
14. eccrine
15. apocrine
16. decrease
17. eponychium
18. cyanosis
19. hirsutism
20. merkel cells
21. keloid
22. D
23. L
24. K
25. H
26. J

27. A
28. G
29. M
30. I
31. G
32. E
33. B
34. F
35. free edge
36. hyponychium
37. nail bed
38. lateral nail groove
39. lunula
40. eponychium
41. nail root
42. eponychium
43. lunula
44. nail body
45. hyponychium
46. phalanx (bone of fingertip)
47. apocrine
48. sudoriferous
49. sebaceous
50. ceruminous
51. sebaceous
52. eccrine sweat gland
53. sebaceous

**Part V**

1. accessory
2. hyponychium
3. lunula
4. cuticle
5. keratin
6. stratum lucidum
7. eleidin
8. keratohyalin
9. stratum granulosum
10. desmosomes
11. stratum spinosum
12. stem cells
13. mitosis
14. epidermal ridges
15. papillary
16. dermal papillae
17. sebaceous
18. reticular layer
19. collagen
20. elastin
21. hypodermis
22. F
23. T
24. F
25. T
26. T
27. T
28. F
29. T
30. B
31. D
32. A
33. D
34. A
35. C
36. C
37. A