

Anatomy and Physiology  
Chapter 4: Skin and Body Membranes

Name: \_\_\_\_\_

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**Objectives-** By the end of this chapter I will be able to:

1. List the general functions of each membrane type; cutaneous, mucous, serous, and synovial, and give its location in the body.
2. Compare the structure (tissue makeup) of the major membrane types.
3. List several important functions of the integumentary system, and explain how these functions are accomplished.
4. Recognize and name the following skin structures: epidermis, dermis (papillary and reticular layers), hair and hair follicle, sebaceous gland, and sweat gland.
5. Name the layers of the epidermis, and describe the characteristics of each.
6. Name the factors that determine skin color, and describe the function of melanin.
7. Differentiate first-, second-, and third-degree burns.
8. Explain the importance of the "rule of nines."
9. Summarize the characteristics of basal cell carcinoma, squamous cell carcinoma, and malignant melanoma.
10. List several examples of integumentary system aging.

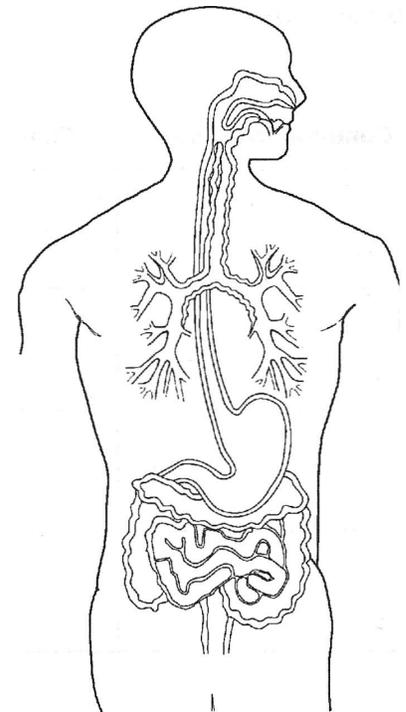
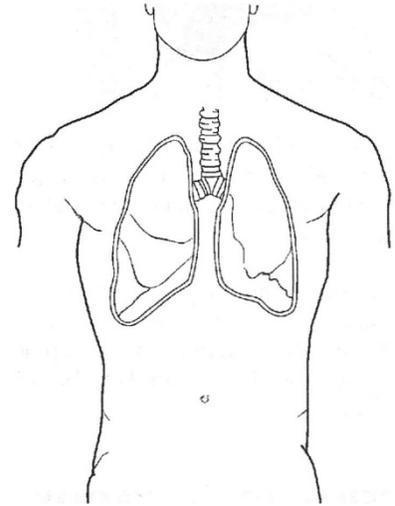
**Objectives continued-** Answer each of the objectives on a separate sheet of paper to demonstrate content mastery. Attach answers to back of packet.

**Notes Outline**

- I. Body membranes
- II. Classification of body membranes
- III. Cutaneous membrane
- IV. Mucous membranes
- V. Serous membranes
- VI. Connective tissue membrane
- VII. Integumentary system
- VIII. Skin structure
- IX. Skin structure

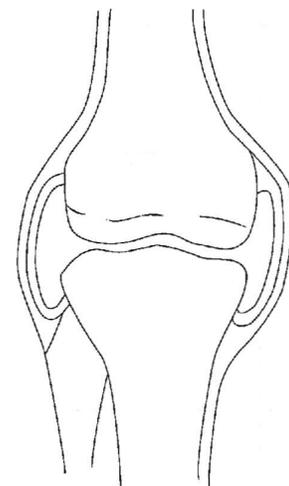
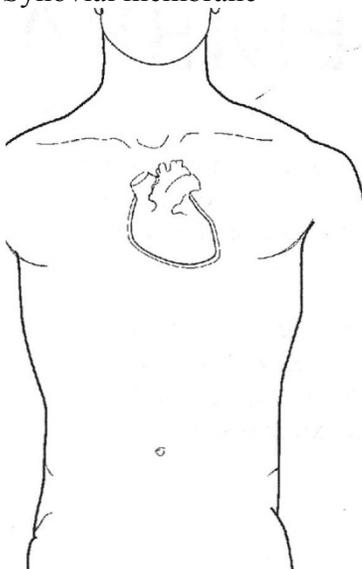
1. Complete the following table relating to body membranes

Membrane	Tissue type	Common locations	Functions
Mucous			
Serous			
Cutaneous			
Synovial			



2. Four diagrams are shown below. Select different colors for the membranes listed below, and use them to color the coding circles and the corresponding structures

- Cutaneous membrane
- Mucosae
- Visceral pleura (serosa)
- Parietal pleura (serosa)
- Visceral pericardium (serosa)
- Parietal pericardium (serosa)
- Synovial membrane



3. The skin protects the body by providing three types of barriers. Classify each of the protective factors below using: chemical, mechanical, biological

A. Langerhans' cells and macrophages

B. Intact epidermis \_\_\_\_\_

C. Bactericidal secretions \_\_\_\_\_

D. Keratin \_\_\_\_\_

E. Melanin \_\_\_\_\_

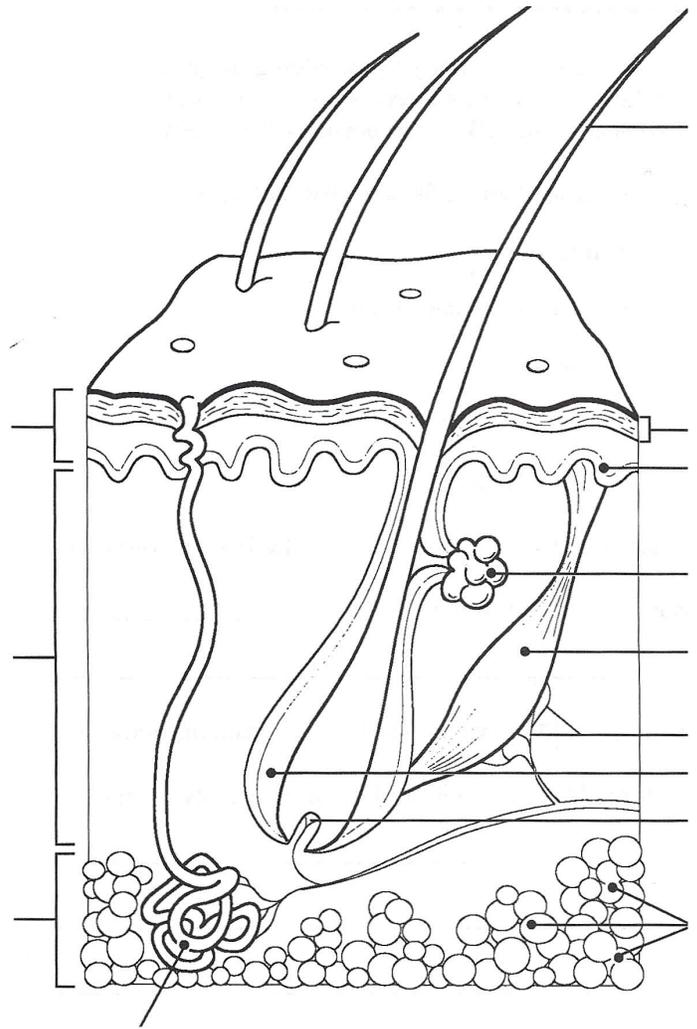
F. Acid mantle \_\_\_\_\_

4. In what way does a sunburn impair the body's ability to defend itself (mild burn)

5. Explain the role of sweat glands in maintaining body temperature homeostasis. In your explanation, indicate how their activity is regulated.

6. A longitudinal section of the skin is below. Label the skin structures and areas. Select different colors for the structures below and color coding circles and the corresponding structures on the figure

- Arrector pili muscle
- Adipose tissue
- Hair follicle
- Nerve fibers
- Sweat (sudoriferous gland)
- Sebaceous gland



7. The more superficial cells of the epidermis become less viable and ultimately die. What two factors account for this natural demise of the epidermal cells?

8. Enter the appropriate responses that apply to the following:

A. Translucent cells, contain keratin  
\_\_\_\_\_

B. Strata containing all or mostly dead cells  
\_\_\_\_\_

C. Dermis layer responsible for fingerprints  
\_\_\_\_\_

D. Vascular region \_\_\_\_\_

E. Epidermal region involved in rapid cell division; most inferior epidermal layer  
\_\_\_\_\_

F. Scale like cells full of keratin that constantly flake off  
\_\_\_\_\_

G. Site of elastic and collagen fibers  
\_\_\_\_\_

H. Site of melanin formation  
\_\_\_\_\_

I. Major skin area from which the derivatives (hair, nails) arise  
\_\_\_\_\_

J. Epidermal layer containing the oldest cells \_\_\_\_\_

K. When tanned becomes leather  
\_\_\_\_\_

9. For each true statement write T. For each false statement correct the *italicized* word (s)

A. A saltwater solution is secreted by *sebaceous* glands \_\_\_\_\_

B. The most abundant protein in dead epidermal structures such as hair and nails is *melanin* \_\_\_\_\_

C. *Sebum* is an oily mixture of lipids, cholesterol, and cell fragments  
\_\_\_\_\_

D. The externally observable part of a hair is called the *root* \_\_\_\_\_

E. The *epidermis* provides mechanical strength to the skin \_\_\_\_\_

10. Using the following terms, insert appropriate term in answer blanks. *Arrector pili, hair, sebaceous gland, sweat gland (eccrine), cutaneous receptors, hair follicle, sweat gland (apocrine)*

A. A blackhead is an accumulation of oily material produced by \_\_\_\_\_

B. Tiny muscles attached to hair follicles that pull the hair upright during fright or cold are \_\_\_\_\_

C. The most numerous variety of perspiration gland is the \_\_\_\_\_

D. A sheath formed of both epithelial and connective tissue is the \_\_\_\_\_

E. A less numerous variety of perspiration gland is the \_\_\_\_\_. Its

secretion contains proteins and other substances that favor bacterial growth

F. \_\_\_\_\_ is found everywhere on the body except the palms of the hands, soles of feet, and lips, and it primarily consists of dead keratinized cells

G. \_\_\_\_\_ are specialized nerve endings that respond to temperature and touch, for example

H. \_\_\_\_\_ Become more active at puberty

I. Part of the heat-liberating apparatus of the body is the \_\_\_\_\_

J. Secretin contain bacteria-killing substance \_\_\_\_\_

11. Overwhelming infection is one of the most important causes of death in burn patients. What is the other major problem they face, and what are its possible consequences?

12. Using 1st degree, 2nd degree, or 3rd degree burns; write the appropriate choice for each blank below

- A. Full-thickness burn; epidermal and dermal layers destroyed \_\_\_\_\_
- B. Blisters form \_\_\_\_\_
- C. Epidermal damage, redness, and some pain (brief) \_\_\_\_\_
- D. Epidermal and some dermal damage; pain; regeneration possible \_\_\_\_\_
- E. Regeneration is impossible; requires grafting \_\_\_\_\_
- F. Pain is absent because nerve endings in area are destroyed \_\_\_\_\_

13. Fill in the type of skin cancer that matches each of the following:

- A. Epithelial cells, not in contact with the basement membrane, develop lesions; metastasize \_\_\_\_\_
- B. Cells of the lowest level of the epidermis invade the dermis and hypodermis; exposed areas develop ulcer; slow to metastasize \_\_\_\_\_
- C. Rare but often deadly cancer of pigment producing cells \_\_\_\_\_

14. Patients in hospital beds are rotated every 2 hours to prevent bedsores. Exactly why is this effective?

15. Eric and his wife are of northern European descent. When his daughter was born, her skin was purple and covered with a cream-cheese-like substance. Shortly after birth she turned pink. Explain his observations

16. Would you expect to find the highest rate of skin cancer among the Blacks of tropical Africa, scientists in the Arctic, Norwegians in the Southern US, or Blacks in the US. Explain your choice.

17. After studying the skin in anatomy class, Toby grabbed the large "love handle" at his waist and said, "I have too thick a hypodermis, but that's ok because this layer performs some valuable functions!" What are those functions?

18. In cases of a ruptured appendix, what serous membrane is likely to become infected? Why can this be life threatening?

#### **Define Chapter 4 Vocabulary**

1. Epithelial membrane
2. Cutaneous membrane
3. Mucous membrane
4. Serous membrane
5. Serous fluid
6. Peritoneum
7. Pleura
8. Pericardium
9. Synovial membranes
10. Skin
11. Integument

12. Keratin
13. Epidermis
14. Dermis
15. Subcutaneous tissue (hypodermis)
16. Keratinocytes
17. Melanin
18. Melanocytes
19. Herpes simplex
20. Papillary layer
21. Dermal papillae
22. Reticular layer
23. Decubitus ulcers
24. Cyanosis
25. Skin appendages
26. Exocrine glands
27. Sebaceous glands
28. Sebum
29. Seborrhea
30. Sweat glands
31. Sudoriferous glands
32. Eccrine glands
33. Sweat
34. Apocrine glands
35. Hairs
36. Matrix
37. Arrector pili
38. Nail
39. Cold sores
40. Contact dermatitis
41. Impetigo
42. Psoriasis
43. Burn
44. Rule of nines
45. First-degree burn
46. Second-degree burn
47. Partial-thickness burns
48. Third-degree burns
49. Full-thickness burns
50. ABCD rule