

**Study Guide for Chapter 4 - the Integumentary System:**

- 1. Name the functions of the Integumentary System and be able to explain each one briefly.**

**Protects deeper tissues from:**

Mechanical damage

Chemical damage

Bacterial damage

Thermal damage

Ultraviolet radiation

Desiccation

**Temperature regulation:** blood vessel dilation, sweating

**Sensation:** (pressure, pain, etc.)

**Excretion of wastes:** urea and uric acid in sweat

**Production of vitamin D**

2. The “accessory organs” for the skin include \_\_\_\_\_.

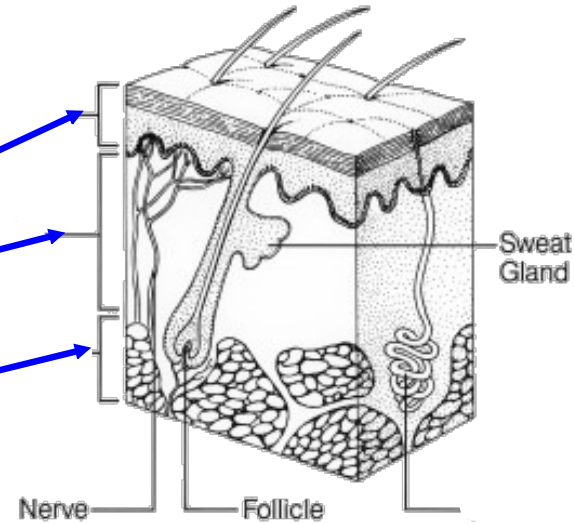
Sweat glands, oil glands, hair and nails

3. Locate and identify the three major regions of skin.

epidermis

dermis

hypodermis



4. The epidermis is composed of which type of tissue?

keratinized stratified squamous epithelium

5. What are the layers of the epidermis from innermost to outermost if you were to take a section of skin?

innermost



outermost

stratum basale

stratum lucidum

stratum corneum

6. The integumentary system acts as a barrier against \_\_\_\_ (*list 3*)  
**bacterial damage** (or from other pathogens; viruses, fungi)  
water loss (**dessication**);  
**mechanical damage** (provides cushion, responds to pain and pressure stimuli);  
(*you may also have chemical damage, UV damage or temperature damage*)
7. The outermost layer of the epidermis has the following distinguishing characteristic(s):
- Composed of stratified squamous epithelium
  - Cells are no longer undergoing mitosis.
  - Flattened cells, often hardened by keratin (a protein that provides a barrier against water loss).

- 8. The innermost layer of the epidermis has the following distinguishing characteristic(s):**

Deepest layer of epidermis; adjacent to the dermis.

These cells are undergoing mitosis

Daughter cells are pushed upward to become the other layers of the epidermis

- 9. The layer of the epidermis that is located only on certain appendages (specifically in these locations) palms of the hands,  
soles of the feet is called the stratum lucidum.**

- 10. The dermis contains many accessory structures, including \_\_ (*list 5*)**

Pain receptors, touch receptors, blood vessels, sweat glands, sebaceous glands, deep pressure receptors

**11. The hypodermis consists of which type of tissue? What is another name for this layer?**

adipose tissue;  
it is also known as the subcutaneous layer

**12. The "tanning" effect (darkening of the skin) that occurs when a person is exposed to the sun is due to what?**

Pigment (melanin) produced by melanocytes in the stratum basale.  
Color is yellow to brown to black. The amount of "tanning" is due to sun exposure and genetics.

**13. What is keratin? Where is it found (which cells, which tissues)?  
What is its main function?**

Keratin is a protective protein found in epithelial cells.  
stratum corneum, hair cuticle and nails.  
It provides a moisture barrier.

**14. In which layer are melanocytes found?**

stratum basale

**15. A splinter penetrates to the deepest layer of the epidermis on your foot. What layer is this?**

stratum basale

**16. In which layer are the epidermal cells that are actively mitotic and replace superficial cells that are continually rubbed off located?**

stratum basale

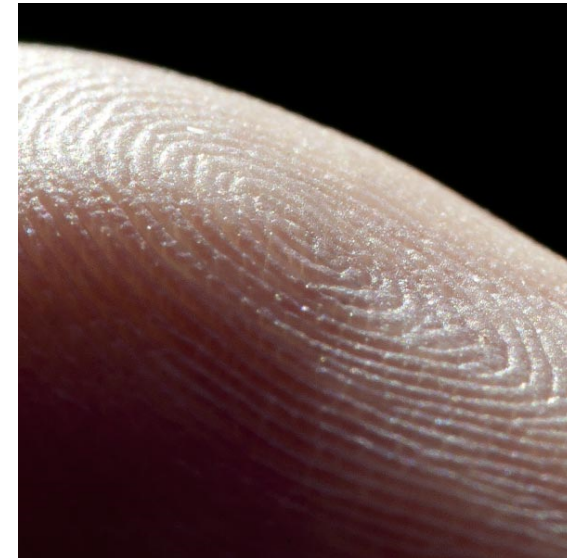
**17. OMIT**

**18. Describe how the skin can warm the body up when cold.**

The constriction of blood vessels helps reduce heat loss from the body. It keeps the blood circulating closer to the body center.

**19. Finger-like upward projections of the dermis into the epidermis are called what?**

dermal papillae



**20. What are nails composed of?**

Modified epidermis (heavily keratinized)

Grow from stratum basale under the nail bed

Lack of pigment makes them colorless

**21. Describe the secretions of the sweat glands. [composition]**

Mostly water

Salts and vitamin C

Some metabolic waste

Fatty acids and proteins (apocrine only)

**22. Inflammation of the hair follicles and sebaceous glands is called what? acne**

**23. Sudoriferous (sweat) glands are important for what?**

Helps dissipate excess heat (evaporation)

Excretes waste products (urea, uric acid)

Acidic nature inhibits bacteria growth



**24. Describe the characteristics of 1st, 2nd, and 3rd degree burns.**

**First-degree burns** - skin is red and swollen

> Only epidermis is damaged

**Second-degree burns** - skin is red with *blisters*

> Epidermis and upper dermis are damaged

**Third-degree burns - (full thickness burn)**

> This burn is gray-white or black.

> Destroys entire skin layer

**25. What is the first threat to life from a massive third-degree burn?**

dehydration (deseccation)

**26. A physician estimates the volume of fluid lost in a severely burned patient by using what technique?**

the rule of nines

*(more detail on  
the next page)*

## Rule of Nines

**Who uses it?** medical professionals

**When is it used?** when assessing and treating burn victims

**What does it indicate (why is it useful)?**

Body is divided into 11 areas for quick estimate of the extent of the burns. Each area represents about **9% of total body surface area.**

## Critical Burns

The percent damaged and the severity of the burn indicate whether it is a **critical burn.**

**Over 25% of body has second-degree burns**

**Over 10% of the body has third-degree burns**

**There are third-degree burns of the face, hands, or feet**

**27. Differentiate between the following forms of skin cancer:**

**a. basal cell carcinoma**

**Most common type of skin cancer and the least malignant  
Arises from stratum basale**

**b. squamous cell carcinoma**

**Metastasizes to lymph nodes if not removed  
Early removal allows a good chance of cure  
Believed to be sun-induced  
Arises from stratum spinosum**

**c. malignant melanoma**

**Most deadly of skin cancers  
Cancer of melanocytes  
Metastasizes rapidly to lymph and blood vessels  
Detection uses ABCD rule**

**28. Describe how melanoma is diagnosed [what process is used to identify melanoma?] A correct answer will include a detailed description of the significance of the letters "A, B, C and D."**

**A = Asymmetry** (the mole is not uniform in shape)

Two sides of pigmented mole do not match

**B = Border irregularity** (jagged or uneven edges)

Borders of mole are not smooth

**C = Color** (colors have changed, multiple colors present)

Different colors in pigmented area

**D = Diameter** (greater than a pencil eraser)

Spot is larger than 6 mm in diameter

**29. Acne and seborrhea are caused by problems with what structure?**

sebaceous glands

**30. What is the effect of evaporation of sweat upon body heat?**

Evaporation of sweat helps to dissipate body heat.

*This is related to the high heat capacity of water!*

**31. Which type of burn is being described by each of the following;**

a. reddening of the skin and some swelling **1<sup>st</sup> degree**

b. blisters, swelling and fluid buildup beneath epidermis  
**2<sup>nd</sup> degree**

c. damage to top layers of skin only **2<sup>nd</sup> degree**

d. skin is charred and epidermis is missing **3<sup>rd</sup> degree**

**Chapter 4 Integumentary System REVIEW for the TEST.notebook**