

Module 4: Class Notes (Krc)

MODULE 4: INTEGUMENTARY SYSTEM

Instructions: Complete the notes from power point slides. Type in the answers/ fill in the blanks. Print in your name. Save the document in pdf format.

MODULE 4: INTEGUMENTARY SYSTEM

1. What does integument mean? covering
2. Components: skin, hair, nails, & glands
3. Functions: 1. Protection: water loss, microbes, UV light: 2. Sensation: hot, cold, pain, pressure; 3. Temperature regulation: helps maintain homeostasis 4. Excretion: removes waste; 5. Vitamin D **production**: UV light stimulates production
4. Skin Facts: Weighs 9lbs. Used to determine bodyfat; 2 main regions: epidermis & dermis
5. **Epidermis**: 1st major skin region (outside). Composed of stratified squamous epithelium.
6. **Keratinization**: process in which new cells (with keratin) push old cells to surface. produces cells filled with keratin. produces an outer layer of epidermal cells that resist abrasion.
7. **Strata of Epidermis**: A. Stratum corneum: outermost layer of epidermis. 20-30 layers of dead squamous cells filled with keratin; accounts for 75% of epidermal thickness. dandruff is this layer flaking off scalp. Callus forms when stratum corneum has frequent friction. B. Stratum basale: deepest layer of epidermis. single layer of cells. Firmly attached to dermis.
8. **Dermis**: 2nd major skin region. Dense connective tissue. Contains collagen and elastic fibers. Contains fibroblasts, fat cells, macrophages, nerve endings, smooth muscle, glands, blood vessels, and hair follicles. It is responsible for most of the structural strength of the skin.
9. Cleavage lines: area where skin is most resistant to stretching due to orientation of collagen fibers;
10. **Layers of Dermis**: A. Papillary layer: thin connective tissue layer that contains blood vessels. B. Dermal papillae: projections that extend up into epidermis. Remove waste and help regulate body temp. pattern is genetically determined. Fingerprints and footprints are produced by dermal projections into the epidermis called papillae. C. Reticular layer: deepest layer of dermis; accounts for 80% of dermis.
11. **Hypodermis**: Below dermis; Foundations of skin; Attaches skin to underlying muscle and bone. Contains

adipose tissue. Contains 1/2 of body's fat. Body fat for females 20-23%, males 13-25%

12. **Skin Color and Variations:** Determined by: pigments, genetics, blood circulation, thickness of stratum corneum. All races have same number of melanocytes. Melanocytes of darker skinned people produce more and darker melanin than fairer skinned people. Dark-skinned children are more susceptible to rickets (weak bones, bowed legs) than fair-skinned children because dark skin has more melanin and melanin absorbs more ultraviolet light allowing less UV radiation to penetrate into the skin and therefore less Vitamin D production.
13. **Skin Pigments: A. Melanin:** produced by melanin; ranges from yellow to reddish-brown to black; responsible for hair and eye color; provides protection against UV light. Amount produced is determined by genetics, UV light, hormones. freckles are accumulation of melanin. albinism is absence of melanin. **B. Carotene:** yellow-orange pigment found in plants; Accumulates in stratum corneum. **C. Hemoglobin:** gives pinkish red color. Found in red blood cells. A decrease in the blood oxygen content produces a bluish color of the skin, called cyanosis.
14. **Tanning and Sunburns:** Exposure to UV light stimulates melanocytes to increase production of melanin. Melanin builds up to help protect skin against UV radiation (tan). A sunburn is the skin reacting to UV exposure. UV light can alter DNA in cells causing them to mutate (cancer). A safe and effective, sunscreen preparations should block both UVA and UVB.
15. **Skin Color and Disease: Redness:** fever, hypertension, inflammation, allergies

Pallor: anemia or low blood pressure. **Jaundice:** liver disorder (yellow) caused by collection of abnormal bile pigment in the skin. **Bronzing:** Addison's disease (kidney disease) Bruising: broken blood vessels

16. **Hair Components: A. Hair/shaft:** flexible strands of keratinized cells. B. **Root:** below skin (scalp) C. **Hair Bulb:** base of root; where hair is produced. D. **Hair follicle:** group of cells that surround root and bulb; gives hair different shapes.
17. **How is Hair Produced?** Hair is produced in hair bulb. Hair bulb rests on blood vessels to supply it with nutrients. Hair grows longer as cells are added to base of hair bulb.
18. **Hair Facts:** Testosterone and good nutrition promote hair growth. Growth occurs in cycles: active and resting. Scalp hair grows for 3 years and rests for 1 year. Eyelashes grow for 30 days and rest for 105 days. We lose about 90 scalp hairs/day. Gey hair is the loss or fading of melanin. Male pattern baldness is from the loss of the hair follicle.
19. **Hair Muscles: Arrector Pili:** smooth muscle that surrounds each hair follicle; contracts and hair stands on end (goose bumps)

20. **Glands: A. Sebaceous glands:** connected _____ to hair follicle; sebum _____: oily substance that lubricates hair and skin to prevent _____ drying; lubricate skin and hair and protect _____ against some bacteria. **B. Eccrine sweat glands:** Present all over _____ body and open into sweat _____ pores. Helps in water _____ and salt _____ secretions. **C. Apocrine sweat glands:** open _____ into hair follicle; present only in armpits _____ and genitalia _____; thick _____ rich secretions; become active _____ during puberty _____ and cause body odor _____.
21. **Nails. What are they?** thin plate _____ with layers of dead _____ stratum corneum cells with hard keratin _____. **Nail Structure: A. Nail body:** visual _____ part. **B. Nail root:** covered _____ by skin. **C. Cuticle:** stratum corneum that extends _____ into nail body _____. **D. Nail matrix:** continuation of nail root; gives rise to most of nail. **E. Nail bed:** attaches _____ to nail and is distal _____ to nail matrix. **F. Lunula:** part of nail matrix; whitish _____, crescent _____ shaped area; base _____ of nail
22. **Vitamin D Production: 1.** UV light _____ causes skin to produce a precursor _____ molecule of vitamin D _____. **2.** Precursor is carried _____ by blood to the liver _____ where it is modified _____. **3.** Next to kidneys _____ where it is modified again to form active _____ vitamin D. Vitamin D can also be ingested _____ through fish oils, fortified milk, eggs, and butter.
23. Vitamin D stimulates _____ intestine to absorb _____ calcium _____ and phosphate _____ (bone _____ growth and muscle _____ function)
24. **Temperature Regulation:** Body temp. should be 98.6 Fahrenheit _____. Rate of chemical reactions (metabolism _____) is altered by changes in temperature. **To cool body:** blood _____ vessels _____ in dermis dilate _____ and heat is transferred _____ from deep in tissues to skin _____ and sweat _____ is produced. Evaporation _____ of sweat from the surface _____ of the skin reduce _____ body temperature. **To heat body:** blood vessels constrict _____ to reduce blood flow to skin and heat is retained _____.
25. **Ageing and the Integument:** Blood flow _____ decreases and skin becomes thinner _____ due to decreased amounts of collagen _____. Decreased activity of sebaceous _____ and sweat _____ glands make temperature regulation _____ more difficult. Loss of elastic _____ fibers cause skin to sag _____ and wrinkle _____.
26. **Classification of Burns: 1st degree:** damages only epidermis _____. Causes redness _____, slight swelling, pain _____. Heals within 2-3 days (usually no scar); includes sunburns _____ or exposure to cold
2nd degree: damages epidermis _____ and upper dermis _____; causes redness, swelling, pain, blisters _____; heals in 2 weeks _____ with some scarring _____ **3rd degree:** destroys _____ epidermis and dermis; burned areas are cherry _____ red to black _____; nerve _____ endings are destroyed _____; skin _____ graft _____ might be necessary.
27. **Skin Cancer:** Most common cancer. Mainly caused by UV light _____ exposure. Fair-skinned people more prone; Prevented by limiting _____ sun exposure and using sunscreens _____. UVA _____ rays cause tan _____ and is associated with malignant _____ melanomas _____. UVB _____ rays cause

_____sunburns_____. _____Sunscreens_____ should block _____UVA_____ and _____UVB_____ rays.

28. **Types of Skin Cancer:** **A. Basal cell carcinoma:** cells in _____stratum_____ _____basale_____ affected; cancer removed by _____surgery_____. **B. Squamous cell carcinoma:** cells _____above_____ stratum basale affected; can cause _____death_____. **C. Malignant melanoma:** arises from _____melanocytes_____ in a _____mole_____; _____rare_____ type; can cause _____death_____.
29. **INTEGUMENTARY SYSTEM AS A DIAGNOSTIC AID:** The integumentary system is useful in diagnosis because it is observed easily and often reflects events occurring in other parts of the body. _____cyanosis_____, a _____bluish_____ color to the skin caused by decreased blood oxygen content, is an indication of impaired _____circulaory_____ or _____respiratory_____ function. A _____yellowish_____ skin color, called _____jaundice_____ (jawn'dis), can occur when the liver is damaged by a disease, such as _____viral_____ _____hepatitis_____. _____Rashes_____ and lesions in the skin can be symptoms of problems elsewhere in the body. The development of a _____rash_____ can also indicate an _____allergic_____ reaction to _____foods_____ or to _____drugs_____, such as _____penicillin_____.