

Component I: Core

Module B: Terminology, Anatomy and Physiology

Topic 7: Integumentary System

Statement of Purpose

To prepare the learner with basic knowledge of the integumentary system.

Student Learning Outcomes

Upon Completion of this topic, the learner will be able to:

1. Spell and define key terms.
2. Name the functions of the integumentary system.
3. Describe how skin regulates body temperature.
4. List the three layers of skin tissue and the characteristic of each layer.
5. Discuss common skin and hair disorders.
6. Identify accessory organs (includes hair follicles, oil glands, nails, and sweat glands).

Terminology

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| 1. Alopecia | 17. Melanin |
| 2. Arrector pili | 18. Pigment |
| 3. Basal cell carcinoma | 19. Receptors |
| 4. Cellulitis | 20. Regulation |
| 5. Constrict | 21. Scabies |
| 6. Dermis | 22. Sebaceous glands |
| 7. Dilate | 23. Sebum |
| 8. Epidermis | 24. Skin |
| 9. Fatty tissue | 25. Squamous cell carcinoma |
| 10. Follicle | 26. Staphylococcus |
| 11. Hair follicles | 27. Streptococcus |
| 12. Herpes simplex | 28. Subcutaneous |
| 13. Herpes zoster | 29. Sweat |
| 14. Hypodermis | |
| 15. Impetigo | |
| 16. Integument | |

References

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Websites

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| Content Outline/Theory Objectives | Suggested Learning Activities |
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| <p>Objective 1 Spell and define key terms.</p> <ul style="list-style-type: none"> A. Review the terms listed in the terminology section. B. Spell the listed terms accurately. C. Pronounce the terms correctly. D. Use the terms in their proper contexts. | <ul style="list-style-type: none"> A. Games: word searches, crossword puzzles, Family Feud, Jeopardy, bingo, spelling bee, hangman and concentration. B. Administer vocabulary pre-test and post-test. C. Discuss learning gaps and plan for applying vocabulary. |
| <p>Objective 2 Name the functions of the integumentary system.</p> <ul style="list-style-type: none"> A. Protection <ul style="list-style-type: none"> 1. Keeps fluids in. 2. Keeps infection out. B. Regulates body temperature <ul style="list-style-type: none"> 1. When hot dermal blood vessels dilate, it increases blood flow and allows heat to escape. 2. If person is cold, blood vessels constrict, preventing the heat in blood from escaping. C. Vitamin D production, when exposed to sunlight, the skin produces a molecule that turns into vitamin D (important for calcium absorption). D. Sensation, many receptors that can detect touch, heat, cold and pain. | <ul style="list-style-type: none"> A. Lecture/Discussion B. Assigned Readings C. Use anatomical diagrams/posters/DVDs/computer assisted learning/workbook activities. |
| <p>Objective 3 Describe how skin regulates body temperature.</p> <ul style="list-style-type: none"> A. Receptors detect temperature changes <ul style="list-style-type: none"> 1. Internally <ul style="list-style-type: none"> a. When body temperatures get too high, blood vessels dilate, allowing heat to escape. b. When body temperatures get too low, blood vessels constrict, reducing heat loss. 2. Externally <ul style="list-style-type: none"> a. Melanin production to increase protective layer of skin. b. Sweat production to cool off the body surface. | <ul style="list-style-type: none"> A. Lecture/Discussion B. Assigned Readings C. Use anatomical diagrams/posters/DVDs/computer assisted learning/workbook activities. |
| <p>Objective 4 List the three layers of skin tissue and the characteristics of each layer.</p> <ul style="list-style-type: none"> A. Epidermis <ul style="list-style-type: none"> 1. Outermost layer <ul style="list-style-type: none"> a. Most superficial layer of skin. b. Consists of dead and dying skin cells. 2. Melanin pigment located here <ul style="list-style-type: none"> a. Pigment traps ultraviolet light (UV) radiation from sunlight and prevents the | <ul style="list-style-type: none"> A. Lecture/Discussion B. Assigned Readings C. Use anatomical diagrams/posters/DVDs/computer assisted learning/workbook activities. D. Discussion in class <ul style="list-style-type: none"> 1. Describe the factors that determine skin color. |

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| <p>radiation from harming structures in the underlying layers of skin.</p> <p>b. The amount of melanin present determines the depth of skin color.</p> <p>B. Dermis</p> <ol style="list-style-type: none"> 1. Second layer consisting of fatty tissue, located just under the epidermis. Contains: <ol style="list-style-type: none"> a. Blood vessels. b. Hair follicles. c. Sweat glands. d. Oil glands. e. Sensory nerves. 2. Binds the epidermis to the hypodermis. 3. Thickness depends on area <ol style="list-style-type: none"> a. Eyelids have a thin fatty tissue. b. Abdomen and buttocks have thick fatty tissue. <p>C. Subcutaneous (hypodermis)</p> <ol style="list-style-type: none"> 1. Fatty tissue. 2. Blood vessels. 3. Nerves. | <ol style="list-style-type: none"> 2. Name the two layers of the epidermis and discuss the difference. |
| <p>Objective 5 Discuss common skin and hair disorders.</p> <p>A. Skin cancer develops from skin in the epidermis. It is more common to persons with light skin.</p> <ol style="list-style-type: none"> 1. Basal cell carcinoma <ol style="list-style-type: none"> a. Accounts for more than 90% of skin cancers in the U.S. b. Progresses slowly and remains local. c. Signs and symptoms <ol style="list-style-type: none"> 1) Changes in skin. 2) New growth or sore on skin that does not heal. 3) Appearance is waxy, smooth, red, pale, flat, or lumpy. 4) Potentially may not bleed. d. Treatment <ol style="list-style-type: none"> 1) Curettage and electrodesiccation 2) Moh's surgery 3) Cryosurgery 2. Squamous cell carcinoma <ol style="list-style-type: none"> a. Less common b. Progresses quickly to surrounding tissues c. Signs and symptoms are the same as basal cell carcinoma d. Treatment <ol style="list-style-type: none"> 1) Curettage and electrodesiccation 2) Moh's surgery 3) Cryosurgery 3. Melanoma | <ol style="list-style-type: none"> A. Lecture/Discussion B. Assigned Readings C. Use anatomical diagrams/posters/videos/computer assisted learning/ workbook activities. D. Students in groups of two, choose a type of skin cancer and give a report in class <ol style="list-style-type: none"> a. Description of cancer with picture. b. Symptoms. c. Interventions. d. Teaching poster for prevention. E. Assign students skin conditions and ask to bring to class pictures and descriptions of conditions. F. Develop a poster for patient education for the assigned condition. |

- a. Aggressive.
 - b. Can occur anywhere in the body, but mostly in the trunk, head and neck in men. For women, mostly in the arms and legs.
 - c. Signs and symptoms
 - 1) Mole that itches or bleeds.
 - 2) New moles develop near it which may change to have any sign of the ABCD rule
 - Asymmetry.
 - Border irregular.
 - Color may change or become a mixture of colors.
 - Diameter may grow or not grow larger than the diameter of a pencil eraser.
 - d. Five stages
 - 1) Stage 0 found only in the epidermis.
 - 2) Stage 1 spread to the epidermis and dermis and has a thickness of 1-2 mm.
 - 3) Stage 2 thickness of 2-4 mm.
 - 4) Stage 3 spread to one or more nearby lymph nodes.
 - 5) Stage 4 spreads to other body organs or lymph nodes far away from original melanoma site.
 - e. Treatment depends on the stage.
- B. Alopecia is a disorder that specifically targets hair, resulting in hair loss.
- 1. Causes
 - a. Primarily inherited.
 - b. Can be due to hormonal changes, chemotherapy, stress, burns and fungal infections of the skin.
 - 2. Signs and symptoms
 - a. Baldness both in the scalp and other places on the skin.
 - 3. Treatment
 - a. If hereditary, no treatment.
 - b. Hair transplants.
 - c. Some drugs may slow down progression.
- C. Cellulitis is the inflammation of connective tissues in skin and primarily occurs on the face and legs.
- 1. Caused by staphylococcal and streptococcal bacteria.
 - 2. Signs and symptoms
 - a. Skin appears red and tight and is often painful.
 - b. Inflammation may trigger a fever.

3. Treated with antibiotics.
- D. Herpes simplex Type I and II
1. Herpes simplex types I and II are the most common types of herpes simplex.
 2. Caused by a virus
 - a. Type 1 is very contagious.
 - b. Spread through saliva.
 - c. Type 2 is spread sexually.
 3. Signs and symptoms
 - a. Type I causes painful sores on the lips and the mouth.
 - b. Type II causes painful sores on the genitals.
 4. Treatment
 - a. No cure for herpes simplex and skin lesions.
 - b. Usually recurs throughout life.
 - c. Antiviral drugs prevent frequent outbreaks.
- E. Herpes Zoster is a disorder commonly known as shingles
1. Causes
 - a. Virus that also causes chickenpox.
 - b. Virus stays inactive but can become active again later in life and can cause shingles.
 2. Signs and symptoms
 - a. Inflammation that follows the nerve pathways.
 - b. Extreme sensitivity or pain in a broad band on one side of the body.
 - c. Sensation of itching, tingling, burning, aching or shooting pain.
 - d. Rash with raised red bumps and blisters.
 3. Treatment
 - a. Some antiviral medications shorten the duration of the disease.
 - b. Symptomatic treatment.
- F. Impetigo causes the formation of oozing skin lesions that eventually crust over
1. Causes
 - a. Staphylococcal bacteria.
 - b. Streptococcal bacteria.
 2. Signs and symptoms
 - a. Skin develops oozing lesions that eventually crust over.
 - b. Sores may spread to other parts of the body by direct contact.
 3. Treatment
 - a. Treated with antibiotics.
 - b. Removal of exudate by washing two to three times a day.
- G. Scabies is a contagious skin condition
1. Causes

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| <ul style="list-style-type: none"> a. Scabies is caused by mites that burrow beneath skin. b. Sometimes the burrows of the mites, which look like red pencil marks, can be seen. <p>2. Signs and symptoms</p> <ul style="list-style-type: none"> a. Redness. b. Severe itching. c. Small blister at the burrow site. <p>3. Treatment</p> <ul style="list-style-type: none"> a. Most cases are easily treated with medications. b. Contagious. c. Treat entire family. <p>H. Warts (verrucae) are harmless skin growths that can appear almost anywhere on the body surface but most commonly occur on the hands, feet or face.</p> | |
| <p>Objective 6 Identify accessory organs</p> <p>A. Hair Follicles</p> <ul style="list-style-type: none"> 1. Tube-like depressions in the dermis of skin. 2. Made of epithelial tissue and function to generate hairs. 3. Arrector pili muscles are attached to most hair follicles. <p>B. Sebaceous Glands</p> <ul style="list-style-type: none"> 1. Oil glands. 2. Produce oily substance called sebum. 3. Secreted on hairs to keep soft and pliable. 4. Deposited on skin to keep soft. 5. Prevents bacteria from growing on skin. <p>C. Sweat glands</p> <ul style="list-style-type: none"> 1. Located in the dermis of skin, with their ducts in the epidermis. 2. Important for cooling body. | <ul style="list-style-type: none"> A. Lecture/Discussion B. Assigned Readings C. Use anatomical diagrams/posters/videos/computer assisted learning/workbook activities. |