

UNIT 2 -SUPPORT SYSTEMS

Integumentary System

Lecture Notes

THE BASIC FUNCTIONS OF THE INTEGUMENTARY SYSTEM

- A. Functions of Skin
 - 1. Protection: Provides a physical barrier between the environment and underlying tissues. Provides protection from bacterial invasion.
 - 2. Synthesis of Vitamin D: In the presence of ultraviolet radiation (sunlight), the skin synthesizes Vitamin D, which is necessary for the absorption of calcium.
 - 3. Reception of Stimuli: Contains numerous nerve endings and receptors to detect touch, pressure, and pain.
 - 4. Temperature Regulation: Produces perspiration by the sudoriferous glands (sweat glands) to help maintain normal body temperature
 - 5. Protection against ultraviolet radiation.
 - a. Melatonin produced by melanocytes protects the skin from sunlight and is also responsible for giving the skin its color

THE LAYERS OF THE SKIN AND APPENDAGES

- A. The layers of the skin
 - 1. Epidermis-outermost layer of the skin
 - a. contains no blood vessels (avascular) and is nourished by diffusion from the dermis.
 - b. composed of dead (keratinized) skin cells
 - 2. Dermis-the middle layer of skin
 - a. characterized by a thick layer of fibrous and elastic tissue that gives the skin flexibility and strength.
 - b. Contains nerve endings, sweat glands, oil glands, hair follicles, and blood vessels.
 - 3. Subcutaneous layer- the 3rd layer of the skin
 - a. Composed of fat that helps insulate the body from heat and cold, provides protective padding, and serves as an energy storage area.
 - b. Also referred to as the hypodermis.
- B. Appendages of the skin
 - 1. Nails
 - a. Composed of dead (keratinized) skin cells.
 - b. Helps us grasp and manipulate small objects

2. Sweat (sudoriferous) glands
 - a. Sweat is produced by sudoriferous glands in order to cool the body through evaporation
3. Oil (sebaceous) glands
 - a. Associated with hair follicles.
 - b. Secretes sebum, a mixture of fats, cholesterol, protein, and inorganic salts.
 - c. Keeps hair and skin from drying out and becoming brittle.
4. Hair
 - a. Primary function is protection—
 - guards scalp from injury and sunlight
 - eyebrows and eyelashes protect the eyes
 - hair in the external ear and nostrils prevent insects and dust from entering.
 - b. Composed of dead (keratinized) skin cells

DISEASES AND DISORDERS OF THE INTEGUMENTARY SYSTEM

- A. Acne
 1. An inflammatory disease of the sebaceous glands and hair follicles of the skin.
 2. Primarily affects teenagers due to increased hormonal activity which causes the sebaceous glands to be over-active.
 3. Treated with topical creams that dry out the skin and oral antibiotics that decrease the inflammation of the sebaceous glands
- B. Athletes foot – A common infection caused by the tinea fungus.
 1. Symptoms include itching, burning, and cracked, scaly skin between the toes and on the feet.
 2. It grows best in damp, dark, warm places.
 3. Treatment includes over-the-counter antifungal creams for most cases and prescription medicines for more serious infections.
- C. Ringworm – Also caused by the tinea fungus.
 1. Causes a red skin rash that forms a ring on normal looking skin.
 2. This is not caused by a worm.
 3. Common treatment includes over-the-counter antifungal creams.
- D. Jock itch – Also caused by the tinea fungus.
 1. Causes an itchy, burning rash in the groin area.
 2. Common treatment includes over-the-counter antifungal creams.
- E. Skin Cancer - Uncontrolled cell growth of the skin. The sun is responsible for over 90 percent of all skin cancers. There are three most common types of skin cancer:

1. Basal cell carcinoma (BCC) is the most common form of cancer, with about a million new cases estimated in the U.S. each year. BCC's occur most frequently on the sun-exposed areas of the body: face, ears, neck, scalp, shoulders and back.
2. Squamous cell carcinoma (SCC) is the second most common form of skin cancer, with over 250,000 new cases per year estimated in the United States. Most cases of squamous cell carcinoma are caused by chronic overexposure to the sun. Tumors appear most frequently on the sun-exposed face, neck, bald scalp, hands, shoulders, arms and back. The rim of the ear and the lower lip are especially vulnerable to these cancers.
3. Melanoma is the third type of skin cancer which originates in the melanocytes. Melanoma is not as common as BCC and SCC but it is a more serious form of skin cancer. In men, melanoma is often found on the trunk or the head and neck. In women, it typically develops on the lower legs. Melanoma is rare in dark skinned people but when it does develop, it tends to occur under the fingernails or toenails, or on the palms of the hands or the soles of the feet.

The American Dermatology Association recommends the ABCDE method to assess skin lesions for skin cancer.

- A = asymmetry- normal moles or freckles are completely symmetrical whereas cancerous moles or freckles do not look the same on both sides,
- B = border- a mole or spot with blurry and/or jagged edges,
- C = color- a mole that is more than one color including lightening or darkening of the mole,
- D = diameter- if it is larger than a pencil eraser including areas that do not have any abnormalities (color, border, asymmetry), and
- E = evolution or elevation- evolution is the changing of a mole or spot and elevation is a mole that is raised above the surface and has an uneven surface.