3.06 Understand the functions and disorders of the integumentary system
Essential Questions:

- What are the functions of the integumentary system?
- What are some disorders of the integumentary system?
- How are integumentary system disorders treated?
- How do you relate the integumentary system to the body’s communication systems?
Functions of the integumentary system

What are the 7 functions of the skin?

- Protection
- Regulate body temperature
- Manufacture vitamin D
- Touch reception
- Provide temporary storage of fat, glucose, H₂O, and salts
- Screen out harmful ultraviolet radiation
- Absorb certain drugs and chemical substances

3.06: Understand the functions and disorders of the integumentary system
Functions of the integumentary system

- **EPIDERMIS**
  - 2 Layers:
    - Stratum corneum: Consists of dead cells rich in keratin
      - Keratin: a protein that provides a waterproof covering
    - Stratum germinativum: Undergoes continuous cell division
      - Constantly reproducing and replacing cells
  - What do melanocytes do?
    - Produce melanin that affect skin color
  - What is a major function of intact skin?
    - Protection
  - The continuous replacement of cells is important to allowing quick repair in an injury

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Functions of the integumentary system

- **EPIDERMIS**
  - Why are some people dark and others fair?

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Functions of the integumentary system

**DERMIS**

- How is the dermis different from the epidermis in its function?
  - Holds many structures that are important for function
  - Allows flexibility and movement

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Functions of the integumentary system

- **Subcutaneous Layer**

  - **Hypodermal Layer**

- What are the benefits of the subcutaneous layer of skin?
  - Contains the fat cells that are needed to provide padding and protection of the deeper tissues of the body.
  - Insulation for temperature regulation

3.06: Understand the functions and disorders of the integumentary system
Functions of the integumentary system

- **HAIR**
  - What is the function of hair?
    - To look pretty!! 😊 (no, not really!)
    - To provide warmth and protection
  - What factors influence hair type and color?
    - The cortex contains pigment granules
    - A round follicle makes straight hair
    - A flat follicle makes curly hair
  - What happens to your hair when you are cold? Why?
    - The arrector pili muscle is stimulated and contract the skin around the hair, making it stand up; goosebumps

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Functions of the integumentary system

- **NAILS**
  - Matrix: where the nail is formed
  - Some disease conditions may be revealed by the color of a person’s nails.

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Functions of the integumentary system

- **GLANDS**
  - Sudoriferous glands
    - Sweat glands
  - Why does sweat smell bad?
    - Sweat is 99% water, but when mixed with the bacteria on the skin, giving off a strong smell
  - Sebaceous glands
    - Secrete sebum (oil) which lubricates skin
    - Can block pores and produce pimple
Functions of the integumentary system

REVIEW

• What are the functions of the skin?

• What structures are involved in these functions?

3.06: Understand the functions and disorders of the integumentary system
Functions of the integumentary system

The skin has remarkable ability to heal itself.

How does this happen?

3.06: Understand the functions and disorders of the integumentary system
Disorders of the integumentary system

**ACNE VULGARIS:**

- A disorder of the sebaceous glands.
  - The sebaceous glands secrete excess oil or sebum, which is deposited at the openings of the glands
- How is it treated?
  - Topical medications
  - Antibiotics
- Can it be prevented?
Disorders of the integumentary system

**Athlete’s Foot**

- What causes athlete’s foot?
  - A contagious fungal infection

- How is it treated?
  - Thorough cleansing and drying affected area
  - Antifungal powders
Disorders of the integumentary system

**BURNS:**

- **First-degree**: Involves only the epidermis
  - Symptoms: redness, swelling, and pain
- **Second-degree**: Involves the epidermis and dermis
  - Symptoms: redness, swelling, and pain
- **Third-degree**: Involves complete destruction of the epidermis, dermis, and the subcutaneous layers
  - Symptoms: loss of skin, blackened skin, possibly no pain.
  - Life threatening
Disorders of the integumentary system

**BURNS:**
- First-degree

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Disorders of the integumentary system

**BURNS:**
- Second degree
Disorders of the integumentary system

**BURNS**:

- Third-degree

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Disorders of the integumentary system

**BURNS:**

- Compare the different degrees of burns.
Disorders of the integumentary system

**BURNS:**

**RULE OF NINES**

- Used to quickly assess percentage of body surface burned.
- Can be used to determine extent of treatment needed.

3.06: Understand the functions and disorders of the integumentary system
Disorders of the integumentary system

DERMATITIS/ECZEMA

• dermat- -itis

• What is dermatitis? Inflammation of the skin. It is non-specific

• How are dermatitis and eczema similar? Eczema is also an inflammatory skin disease.

• What is the treatment? Dermatitis is treated with washing the area, applying topical ointments to reduce inflammation.
Disorders of the integumentary system

**HERPES**

Herpes simplex virus

- Two types of HSV:
  - HSV type 1: cold sore
  - HSV type 2: genital herpes

- How is it spread?
  - Type 1 is spread by direct contact.
  - Type 2 is spread by sexual contact

- What is the prognosis? It is your foe for life.
Disorders of the integumentary system

**IMPETIGO**

- What two bacteria cause impetigo?
  - *Staphylococcus*
  - *Streptococcus*

- How is it treated?
  - Topical antibacterial cream
  - Oral antibiotics

3.06: Understand the functions and disorders of the integumentary system
Disorders of the integumentary system

**PSORIASIS**

- Describe this picture.
- What is the treatment?
  - No real treatment
  - Moisturizers to keep skin soft
Disorders of the integumentary system

RINGWORM

- How is it spread?
  - Direct contact with the parasitic fungus
- What causes ringworm?
  - Fungus
- What is the medical term?
  - Tinea Corporis
- How is it treated?
  - Antifungal drugs

Two examples of ringworm
How would this be diagnosed?
Disorders of the integumentary system

SCABIES

- What is the cause of scabies? Mites that burrow into the skin to lay eggs.
- Is it contagious? Yes, it can be spread from direct contact.
- How is it treated? A medicated topical cream
- How is it prevented? Seek treatment right away

3.06: Understand the functions and disorders of the integumentary system
Disorders of the integumentary system

**SHINGLES**

- What is the cause of shingles? The varicella virus
- Is it contagious? YES!
- Who is most at risk? It is especially serious in the elderly or debilitated.

3.06: Understand the functions and disorders of the integumentary system
Disorders of the integumentary system

**SKIN CANCER**

- What are the risk factors for developing skin cancer?
  - Exposure to ultraviolet light
  - Skin cancer is the most common type of cancer in people

- How can it be prevented?

- Three types:
  - Basal cell carcinoma
  - Squamous cell carcinoma
  - Malignant melanoma

3.06: Understand the functions and disorders of the integumentary system
Disorders of the integumentary system

**SKIN CANCER**

**Basal cell carcinoma**
- Most common type and least malignant

- **Where does it usually form?**
  - Abnormal cells start in the epidermis and extend to dermis or subcutaneous layer
Disorders of the integumentary system

**Skin Cancer**

*Squamous cell carcinoma*

- Arises from the epidermis
- Occurs most often on the scalp and lower lip
- Grows rapidly and metastasizes to the lymph nodes
- Chances for recovery good if found early.

3.06: Understand the functions and disorders of the integumentary system
Disorders of the integumentary system

SKIN CANCER

Malignant melanoma

- How is malignant melanoma different from the other skin cancers?
  - It is a cancer of the melanocytes
  - Metastasize to other areas quickly
  - A brown or black patch that appears suddenly

- How are skin cancers treated?
  - Surgical removal
  - In some cases, chemotherapy
Disorders of the integumentary system

SKIN LESIONS:

- **Macule**: change in skin color (i.e. freckle)
- **Pustule**: A pus filled vesicle (i.e. acne)
- **Papule**: solid elevated lesion
- **Ulcer**: A depressed lesion of the epidermis (i.e. Pressure ulcer)
- **Vesicle**: fluid filled bump (blister)
Disorders of the integumentary system

**SKIN LESIONS:**

Compare these types of skin lesions.

- Macule
- Papule
- Pustule
- Vesicle
- Ulcer

3.06: Understand the functions and disorders of the integumentary system
Disorders of the integumentary system

SKIN LESION:

DECUBITUS ULCER

- What is an ulcer? A lesion of the epidermis and upper layer of the dermis
- What are decubitus ulcers? Bedsores. Due to constant pressure against the area.
- How can they be prevented? Frequent turning and repositioning

3.06: Understand the functions and disorders of the integumentary system
Disorders of the integumentary system

**warts**

- **What causes warts?** An infection caused by the human papilloma virus.
- **Are they contagious?** Yes. Can be spread by coming in contact with a wart on another person’s body or touching surfaces that touched someone’s warts such as towels or bath mats.
- **Can they be prevented?** Skin warts can’t be prevented, but precautions can be taken such as washing hands frequently.

There are many different types!
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