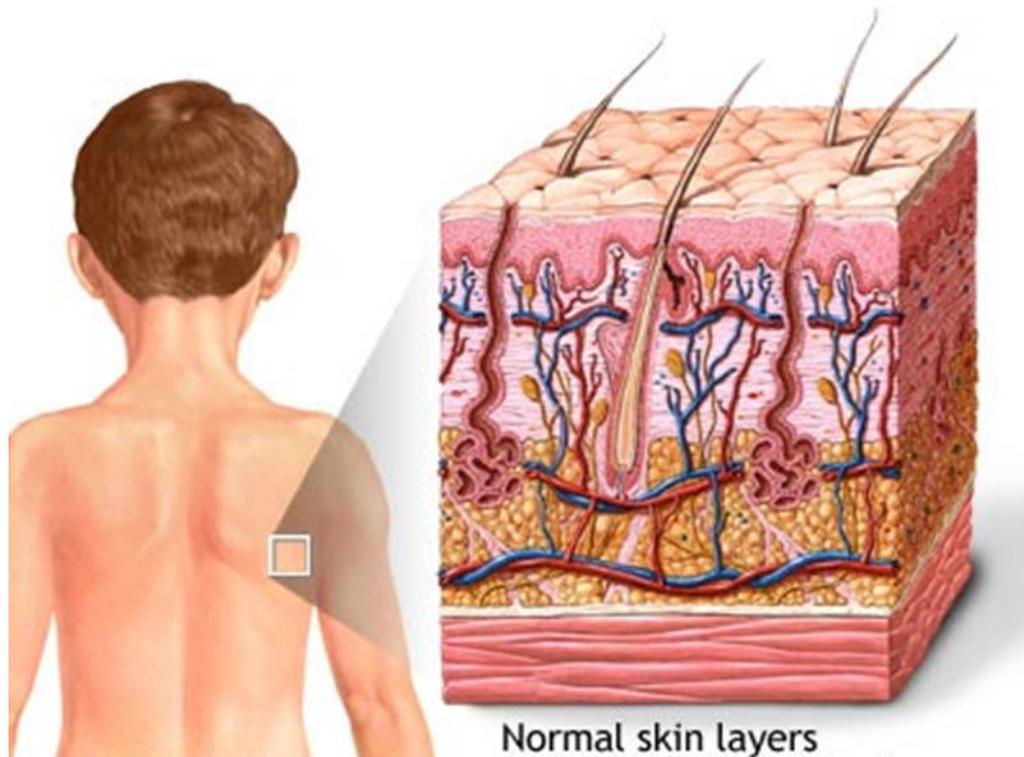


Integumentary System



The integumentary system is commonly known as the **Skin**

- Largest organ of human body
- 10% total body weight and would cover over 20 square feet

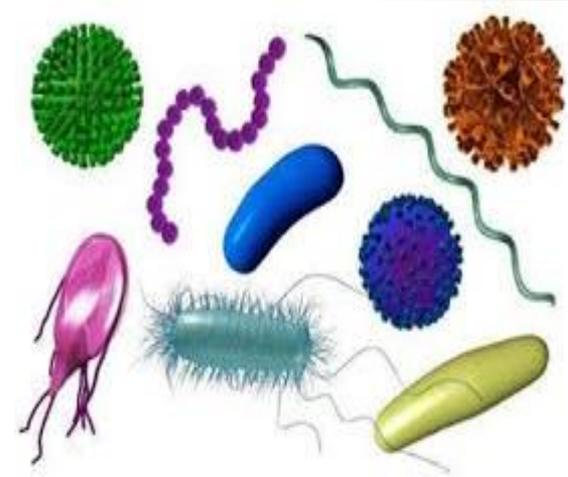


• Functions of Skin

1. Protection

➤ Barrier

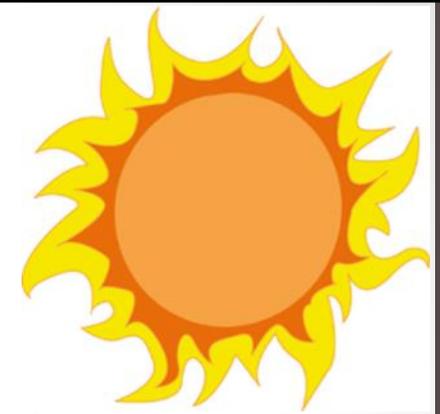
-is the body's first line of defense against **viruses and bacteria**



➤ Water Loss

- Cells are extremely close together & packed with **Keratin**
= waterproof protein found in older cells





➤ Ultraviolet Radiation

- specialized cells called melanocytes produce **Melanin**
= dark pigment that absorbs ultraviolet radiation
preventing **injury**
- ranges in color from **yellow → red/brown → black**
- racial differences are due to the kind & amount of melanin produced
- concentrated accumulations = **moles & freckles!**

2. Temperature Homeostasis

- Normal temperature: **37° Celsius**
= 98.6° Fahrenheit
- if the body gets too hot, more **blood** is brought to the **surface** of the skin to **eliminate heat**
- Sweat: **vaporization of water**
= cools the body

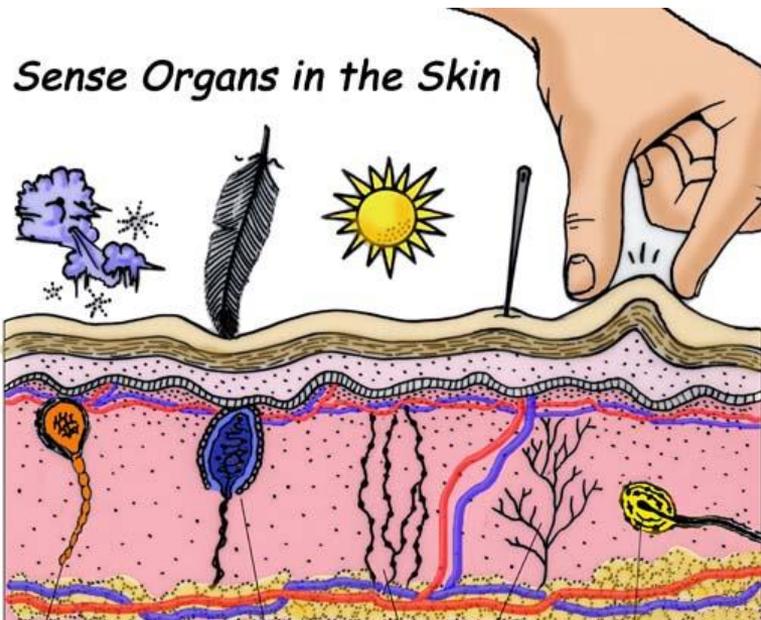


3. Excretion

- Sweat contains **water, urea, salts and other wastes**
- Skin plays only minor role

4. Synthesis of Vitamin D

- Skin needs **UV radiation for this** process to occur
- Require Vitamin D for the absorption of Calcium



5. Sensory Perception

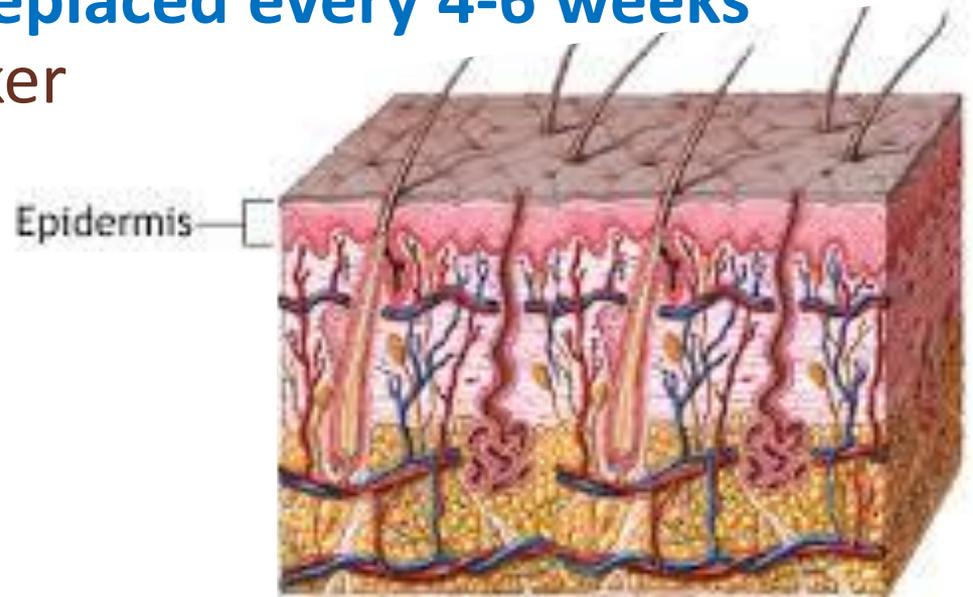
- contains **receptor cells** which are stimulated by touch, pressure, vibration, pain, and temperature = transmit information to the nervous system

• Layers of the Skin

The skin is composed of 2 layers

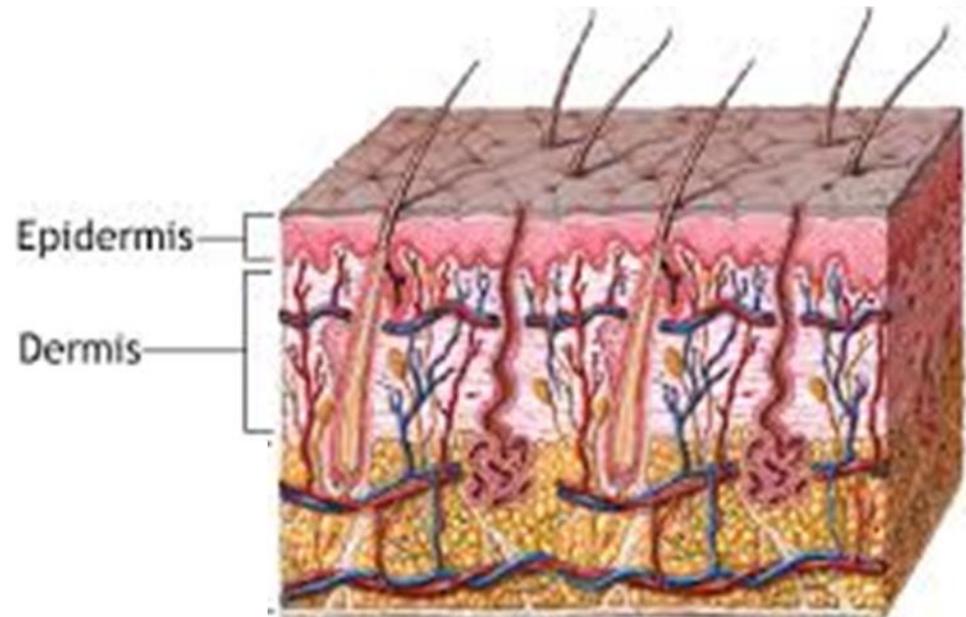
1. Epidermis

- **Outermost layer** of skin
- Composed of 5 layers of cells including:
 - : melanocytes
 - : keratinocytes (produce **keratin** for strength)
- Avascular (**no blood supply**)
- Cellular division occurs in innermost layer continually
 - = Outermost layer **replaced every 4-6 weeks**
- Some regions are thicker than others
 - : ie. sole of foot



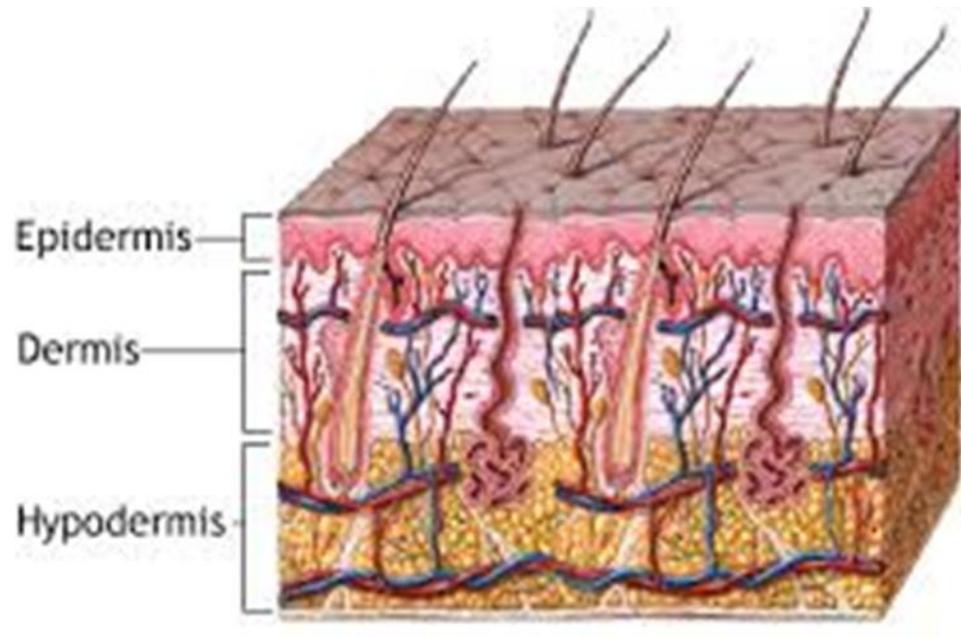
2. Dermis = 'True Skin'

- below the epidermis
- Made of a connective tissue called **collagen & elastic fibers** which decreases as you age
= wrinkles
- contains:
 - **sebaceous (oil) glands**
 - **sweat glands**
 - **nerve fibers**
 - **blood vessels**
 - **hair follicles**



Subcutaneous Layer = Hypodermis

- not considered a true layer of skin (**cannot regenerate**)
- connects **skin to underlying muscles**
- composed of connective & adipose (fatty) tissue
= **insulates and cushions**
- contains blood vessels
- medication is injected into this layer
= hypodermic needle



• Auxiliary Structures

= structures derived from dermal tissue

1. Hair

- grows from **follicles** located in the dermis
- as new hair cells are produced older ones push up through the scalp & die
 - = most of a hair shaft is **dead material**
- follicle shape (round or oval) determines hair texture



2. Nails

- nail cells are produced in a region called the '**nail bed**' and, like hair, are pushed outward
- are **transparent** but appear pink because of the blood vessels beneath the skin







• Skin Injuries, Conditions and Diseases

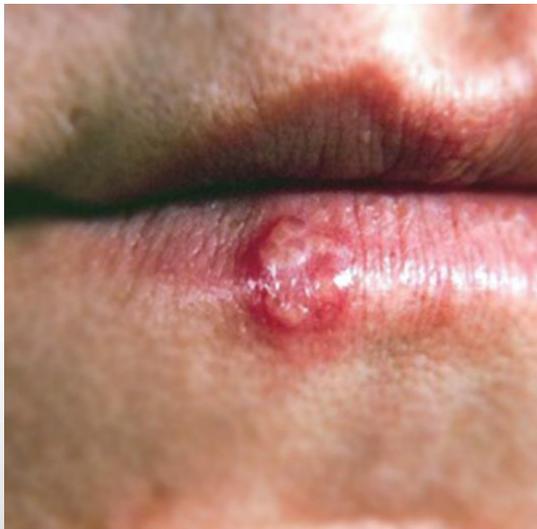
1. Acne

- caused by blocked sebaceous gland
- If it becomes infected, it will form a cyst (pimple)



2. Cold Sores

- Small fluid filled blisters
- Contagious
 - = caused by herpes simplex virus
- activated by stress, fever, or exposure to extreme weather may activate virus



5. Skin Cancer

- Uncontrolled cell division due over expression or under expression of specific genes
- Due to long term or acute exposure to UV radiation
- 3 types:
 - **basal cell carcinoma**: least malignant & most common – slow growing, rarely metastasizes, lesions are usually removed and recovery is 99%
 - **Squamous cell carcinoma**: appears most often on the scalp, ears, dorsum of the hands and lower lip – sun-induced
 - **Malignant Melanoma**: cancer of the *melanocytes* – occurs in only 5% of skin cancer cases but is increasing due to sun exposure, tanning beds, etc. – spreading brown to black patches that metastasize rapidly to lymph nodes and blood vessels. Survival rates = 50%

Skin Cancer (continued)

▶ ABCD rule:

- ▶ Asymmetry (irregular shape)
- ▶ Border irregularity (not smooth)
- ▶ Color (contain different colors – blacks, browns, tans, blues, reds)
- ▶ Diameter (larger than 6mm in diameter)