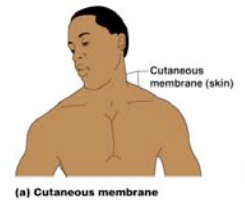


## Epithelial membranes line and cover body surfaces

Epithelial membranes are actually organs: they are made up of epithelial tissue AND connective tissue

**Serous**, **mucous**, and **cutaneous** membranes are all types of epithelial membranes

Your **Cutaneous** membrane is your skin; composed of the superficial epidermis, and the deep dermis. This is a dry membrane



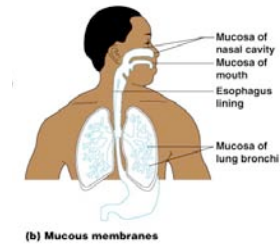
Copyright © 2006 Pearson Education, Inc., publishing as Benjamin Cummings.

## Epithelial membranes line and cover body surfaces

**Mucous** membranes are a layer of epithelial cells on a loose layer of CT called the lamina propria

Lines all body cavities that are open to the exterior environment (e.g. respiratory, digestive, urinary, reproductive etc)

These are wet membranes that are continuously bathed in secretions or other fluid (not necessarily always mucus)



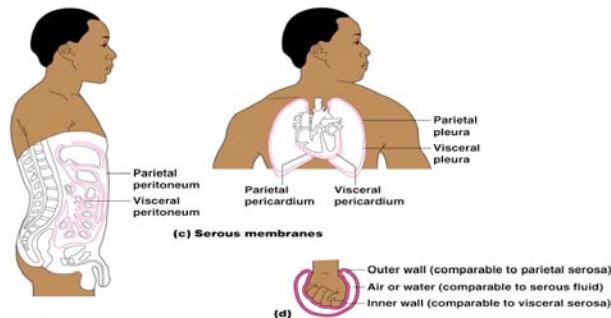
Copyright © 2006 Pearson Education, Inc., publishing as Benjamin Cummings.

## Epithelial membranes line and cover body surfaces

**Serous** membranes are composed of simple squamous epithelium on a layer of areolar CT

Line cavities that are closed to the exterior

Occur in pairs: **parietal layer** (lines wall of ventral body cavity) and **visceral layer** (lines outside of organ)



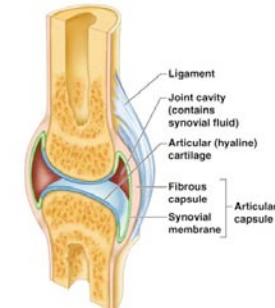
Copyright © 2006 Pearson Education, Inc., publishing as Benjamin Cummings.

## Synovial membranes line joints

Found in fibrous capsules surrounding joints

Contain NO epithelial tissue at all

Secrete a lubricating fluid to allow easy joint movement



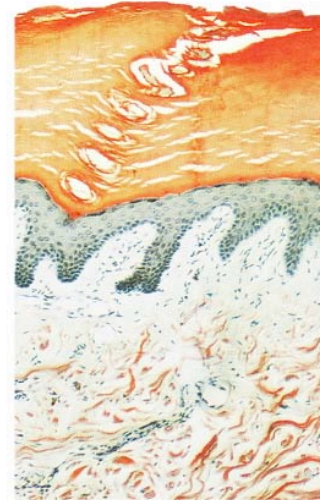
## The integument consists of the skin and its derivatives

One of the most obvious functions of the integument is protection, but it also:

**Study tip: make sure you understand the relationship between words like: skin, cutaneous membrane, integument, and integumentary system**

- resists chemical damage
- keeps out bacteria
- resists damage from UV radiation
- keratinized (cornified) upper layer of the skin resists water loss
- senses our environment
- Vitamin D synthesis

## The skin is composed of epithelial and connective tissues



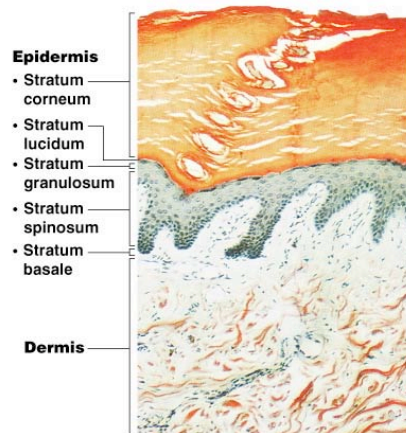
The epidermis is avascular (like all epithelial tissues)

Most cells are keratinocytes, and produce keratin

The stratum basale is the closest layer to the dermis; it is constantly undergoing mitosis and replacing the cells above it as they are sloughed off

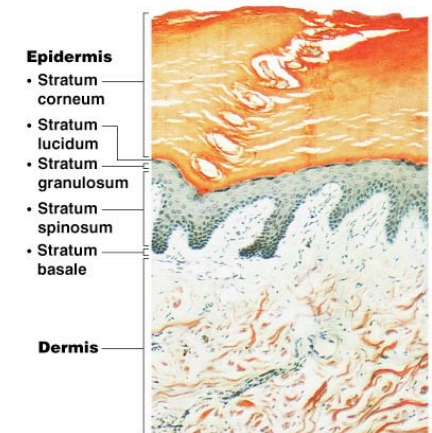
## The skin is composed of epithelial and connective tissues

- Grandpa = Germinativum (basale)
- Shagging = Spinosum
- Grandma's = Granulosum
- Love = Lucidum
- Child = Corneum



## The skin is composed of epithelial and connective tissues

Melanin is produced by melanocytes in the stratum basale, which gives skin its color

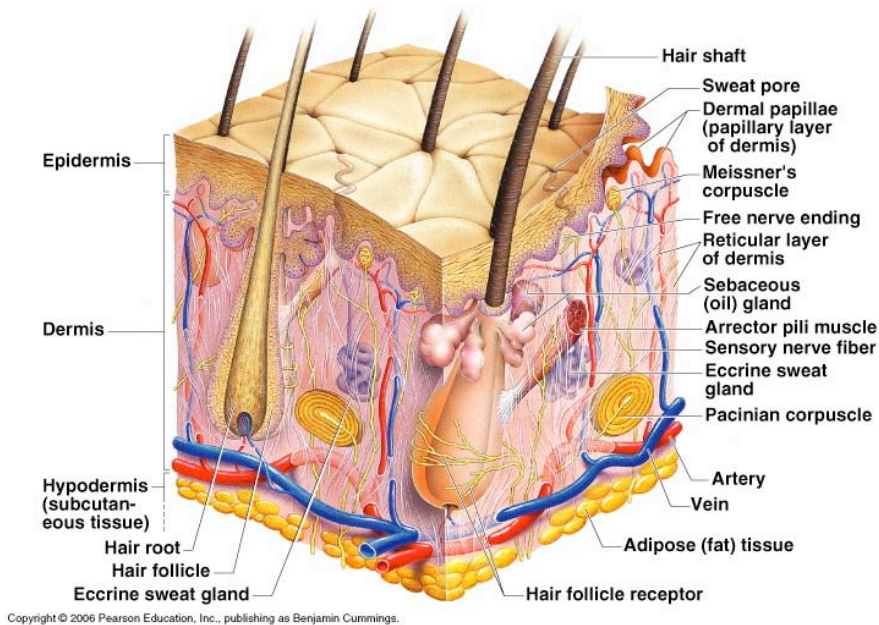
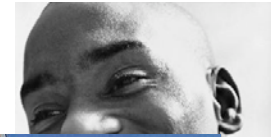


## Three pigments contribute to skin color

Amount and kind (yellow, reddish brown or black) of **melanin**

**Carotene** deposits in the stratum corneum and subcutaneous tissue

Amount of hemoglobin in dermal blood vessels



Copyright © 2006 Pearson Education, Inc., publishing as Benjamin Cummings.

## Cutaneous glands are exocrine glands and fall into two groups

All **exocrine glands** release their secretions to the skin surface via **ducts**

**Sebaceous (oil) glands** are found all over our skin, except the palms of our hands and soles of our feet

Their secretions usually empty into a hair follicle

Sebum is a mixture of oil and fragmented cells

Lubricates skin and hair; chemicals act as antibacterial

Become more active in presence of testosterone

## Cutaneous glands are exocrine glands and fall into two groups

All **exocrine glands** release their secretions to the skin surface via **ducts**

Each person contains about 2.5 million **sweat (sudoriferous) glands**

Eccrine sweat glands are found all over the body

They produce sweat, which is water, salts, vitamins, lactic acid, and some metabolic wastes

Sweat has antibacterial properties (acid inhibits growth)

Very important in regulating body temperature

## Cutaneous glands are exocrine glands and fall into two groups

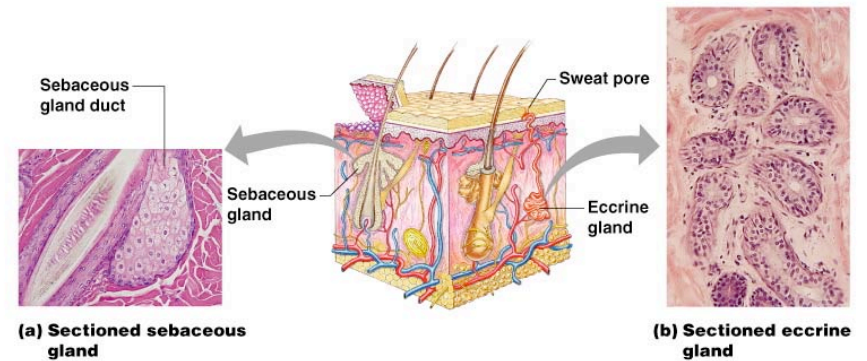
All **exocrine glands** release their secretions to the skin surface via **ducts**

Each person contains about 2.5 million **sweat (sudoriferous) glands**

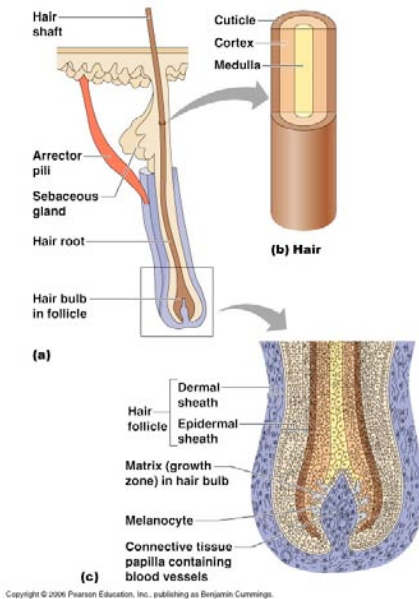
Apocrine sweat glands are confined to axillary and genital regions

Secretions are like 'sweat' but also contain proteins and fatty acids; usually milky in color and has a musky odor

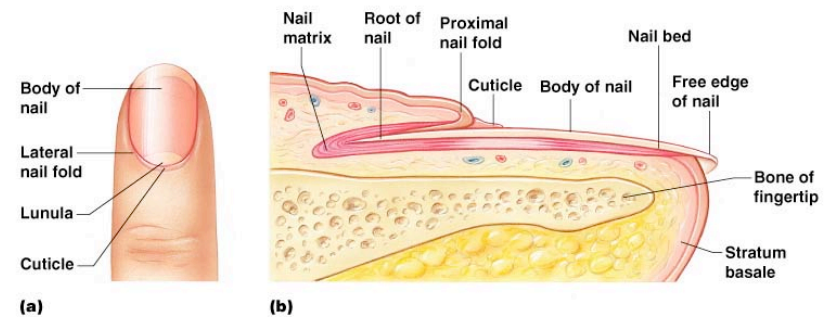
Begin function during puberty; activated during stress, pain and sexual foreplay



Copyright © 2006 Pearson Education, Inc., publishing as Benjamin Cummings.



Copyright © 2006 Pearson Education, Inc., publishing as Benjamin Cummings.



Copyright © 2006 Pearson Education, Inc., publishing as Benjamin Cummings.

## Skin allergies and infections

### 1. *Tinea pedis* (Athlete's foot)

Itchy irritation due to a fungal infection between toes



## Skin allergies and infections

### 2. Boils and carbuncles

Inflammation of hair follicles and sebaceous glands, sometimes resulting from bacterial infection (carbuncles)



## Skin allergies and infections

### 3. Cold sores (fever blisters)

Small blisters caused by herpes simplex viral infection; usually found around oral mucosa



## Skin allergies and infections

### 4. Contact dermatitis

Allergic reaction causing itching, redness, and swelling, progressing to blisters



## Skin allergies and infections

### 5. Impetigo

Raised lesions that eventually rupture, releasing a contagious *S. aureus* infection



## Skin allergies and infections

### 6. Psoriasis

Recurring overproduction of skin cells resulting in dry lesions covered in silvery scales; may be autoimmune



## Burns

Very serious threat to skin--and health:

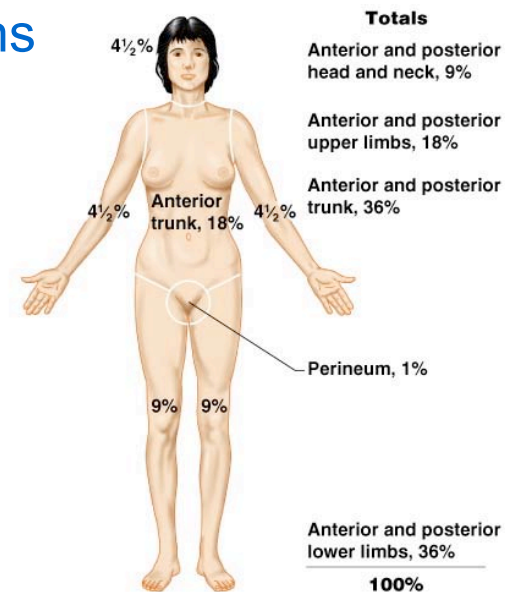
- (1) burned surfaces seep fluids and electrolytes; *dehydration* occurs
- (2) *infection* can occur after 24 hours; this is the leading cause of death in burn patients

**First degree burns** only damage the epidermis

**Second degree burns** damage the epidermis and upper dermis

**Third degree burns** destroy the entire thickness of the skin; not painful but regeneration is not possible

## Burns



(a)

## Skin cancer

- Skin cancer is the most common form of cancer in the United States
- 20% of Americans and 33% of Caucasians will develop skin cancer in their lifetime
- 90% of all skin cancers are caused by excessive sun exposure
- Your risk for skin cancer doubles if you've had 5 or more sunburns
- If you've had only 1 blistering sunburn, your chances more than double

## Basal cell carcinoma

Least *malignant*, most common  
Stratum basale cells invade the dermis  
Fully cured; 99% of lesions are removed



(a)

## Squamous cell carcinoma

Arises from stratum spinosum  
Invades the lymph nodes and can spread  
Chances of complete cure are good



(b)

## Malignant melanoma

Cancer of melanocytes; sometimes from pigmented moles  
Only 5% of all skin cancers; can be deadly  
50% chance of survival



(c)

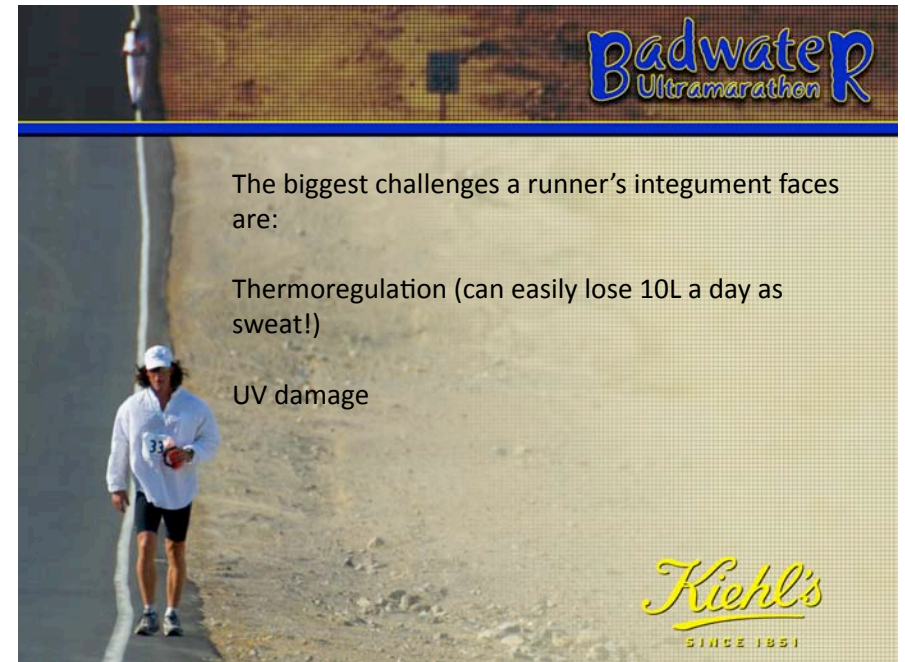
The ABCD rule:

**Asymmetry**

**Border irregularity**

**Color**

**Diameter**



**Badwater**  
Ultramarathon

The biggest challenges a runner's integument faces are:

- Thermoregulation (can easily lose 10L a day as sweat!)
- UV damage

*Kiehl's*  
SINCE 1851