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

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)

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:

- 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

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

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

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

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

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 (suduiferous) 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
1. **Tinea pedis** (Athlete’s foot)  
   Itchy irritation due to a fungal infection between toes

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

3. Cold sores (fever blisters)  
   Small blisters caused by herpes simplex viral infection; usually found around oral mucosa

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

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

Psoriasis

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

Squamous cell carcinoma

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

Malignant melanoma

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

**Asymmetry**
**Border irregularity**
**Color**
**Diameter**

The biggest challenges a runner’s integument faces are:

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