Skin
Structure
Disease
Disorder

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ANATOMY OF THE SKIN
- Dermatology—deals with the study of skin and its nature, structure, functions, diseases, and treatment
- Dermatologist—a physician engaged in dermatology
- Esthetician—a specialist in the cleansing, preservation of health, and beautification of the skin and body

The skin is the largest and one of the most important organs of the body.
- Healthy skin
  - is slightly moist.
  - is soft and flexible.
  - has smooth and fine-grained texture.
  - possesses slightly acid reaction.
  - immune responses to organism that try to enter to it
- Appendages of the skin:
  - Hair
  - Nails
  - Sweat and oil glands

HOW SKIN IS NOURISHED
- Blood and lymph circulate through skin and contribute essential material for growth, nourishment, and repair of skin, hair, and nails.

SKIN MAIN LAYERS
Epidermis
- Outermost layer, commonly called scarf skin, thinnest layer; protective layer; contains no blood vessels, has many small nerve endings

Dermis
- Inner layer of skin, called derma, corium, or true skin; about 25 times thicker than the epidermis and is highly sensitive

Hypodermis OR subcutaneous (subcutis) tissue or adipose tissue
- Inner most layer of fat and connective tissue that houses larger blood vessels and nerves. This layer is important is the regulation of temperature of the skin itself and the body. The size of this layer varies throughout the body and from person to person.
EPIDERMIS

- **Stratum corneum**: keratin, protein, dead cells; preventing water evaporation.
- **Stratum lucidum**: clear transparent layer, light can pass, most noticeably on the palms of the hands and the soles of the feet.
- **Stratum granulosum** (or granular layer): contain keratohyaline and lamellar granules.
- **Stratum spinosum** (or spinous layer): prevents dehydration. Keratinization: production of keratin. Skin shedding begins.
- **Stratum germinativum** (or basal layer, stratum basale): create daughter cells (mitosis process). Contains melanocytes -> skin pigments (melanin).

DERMIS:
derma, corium, cutis, or true skin

- **Papillary layer**—lies directly beneath the epidermis; contains melanin; contains small cone-shaped projections (called derma papillae) of elastic tissue that point upward to the epidermis. Some papillae contain looped capillaries. Others contain nerve fiber endings for the sense of touch/pressure called tactile corpuscles.
- **Reticular layer**—contains fat cells, blood and lymph vessels, sweat and oil glands, hair follicles, and arrector pili muscles. Supplies skin with oxygen and nutrients.

SKIN COLOR

- Skin color depends on blood supply.
- **Melanin**, the pigment deposited inside the stratum germinativum and the papillary layer in the dermis.
  Help protect skin from the sun’s UV (UVB, UVA) lights.
- Light skin -> pheomelain (red, yellow)
- Dark skin -> eumelanin (black, brown)

STRENGTH and FLEXIBILITY

- **Collagen**
  Fibrous protein that gives skin form and strength
- **Elastin**
  Protein base that forms elastic tissue
GLANDS OF THE SKIN

SUDORIFEROUS GLANDS: sweat glands
- Secretory coils: coiled base and tube-like duct to skin surface
- on palms, soles, forehead, and armpits
- Regulate body temperature
- Help eliminate waste
- Eliminate 1 to 2 pints of salty liquid daily; controlled by the nervous system

SEBACEOUS GLANDS: Oil glands
- They are little sacs that open to skin’s surface.
- They secrete sebum.
- They are found everywhere except on palms and soles.
- Sebum flows from ducts to follicles.
- If duct is clogged, oil will harden and a blackhead will form.

NERVES OF THE SKIN
- Motor nerve fibers—distributed to arrector pili muscles; carry impulses from the brain to the muscles
- Sensory nerve fibers—sensory receptors; send messages to the brain; react to heat, cold, touch, pressure, and pain; found in papillary layer; abundant in fingertips
- Secretory nerve fibers—distributed to sweat and oil glands; regulate excretion of perspiration and control flow of sebum to the surface of the skin

FUNCTIONS OF THE SKIN

<table>
<thead>
<tr>
<th>PROTECTION</th>
<th>SENSATION</th>
<th>HEAT REGULATION</th>
<th>ABSORPTION</th>
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<tbody>
<tr>
<td>- Injury</td>
<td>- Heat</td>
<td>- Protects the body from environment</td>
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<tr>
<td>- Bacteria</td>
<td>- Touch</td>
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<td>- Limited but will absorb</td>
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<td></td>
<td>- Pressure</td>
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<td>- Female hormones</td>
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<td></td>
<td>- Pain</td>
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<td>- Creams</td>
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<td>EXCRETION</td>
<td>SECRETION</td>
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<tr>
<td>- Perspiration takes salt and other chemicals with it</td>
<td>- Oil lubricates skin will increase the flow</td>
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</table>
| FUNCTION OF THE SKIN | SENSORY NERVE ENDINGS OF THE SKIN

Cold receptor  Pain receptor  Touch receptor  Heat receptor  Pressure receptor
AGING OF THE SKIN

- The sun
- The environment
- Health habits
- General lifestyle
  - Cigarette smoking has been linked to premature aging and wrinkling.

The thickness of skin: minimum 1.2 mm

- Eyelids: thinnest skin ~ 0.5 mm
- Palms and soles: thickest skin ~ 4.0 mm
- Callus: body’s reaction to protect skin from damage and infection

SUN AND ITS EFFECTS

SUN EFFECT

- 80% to 85% of aging is caused by the sun’s rays.
- UVA rays
  - Aging rays
  - 90% of sun’s ultraviolet rays
- UVB rays
  - Burning rays
  - Effects on melanocytes, cells that produce melanin

PRECAUTIONS

- Wear protective lotion: SPF 30
- Avoid sun exposure during peak hours (between 10 a.m. and 4 p.m)
- Apply sunscreen liberally after swimming
- Avoid exposing children under six months
- Wear hat and protective clothing outdoors
- Skip the tanning bed, use a self-tanning lotion or spray-on tanning

SKIN AGING AND THE ENVIRONMENT

ENVIRONMENTAL FACTORS

- Pollutants from factories
- Emissions from automobiles
- Secondhand cigarette smoke

DEFENSE

- Good daily skin care routine
- Washing and exfoliating
- Using moisturizers, protective lotions, foundation

Tanning bed

- sun tanning bed is a device which emits ultraviolet radiation (typically 97% UVA and 3% UVB, +/-3%)
- home tanning beds usually have 12 to 28 100 watt lamps
- tanning salons can consist of 24 to 60 lamps, each of 100 to 200 watts.
- Most tanning beds emit mainly UVA rays — which may increase the risk of melanoma (skin cancer)
MAINTAINING HEALTH OF THE SKIN

Water
- Composes 50% to 70% of body’s weight
- Sustains health of the cells
- Aids in elimination of toxins and waste
- Helps regulate body’s temperature

Dehydration
- Slows metabolism
- 75% of Americans chronically dehydrated

Daily water/fluid intake (at least)

- "8 by 8" rule:
  8-ounce glasses of water ~ 1.9 liters ~ 64 oz
- By body weight:
  0.5 ounces x Body Weight in Pounds = Daily Fluid Requirement in ounces
  Eg.
  0.5 oz x 120 pounds = 60 oz ~ 7.5 cups
  1 cup = 8 oz

DISORDERS OF THE SKIN

- Primary lesions: different color or raise above the skin
### DISORDERS OF THE SKIN

- **Secondary lesions:** piling or depression on the skin surface

- **Comedone**—blackhead; worm-like mass of hardened sebum in hair follicle

- **Milia**—whiteheads caused by accumulation of sebaceous matter beneath skin

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#### Sebaceous (oil) glands

- **Sebaceous cyst** is a large protruding pocket-like lesion filled with sebum. Appear on the scalp and the back.

- **Seborrheic dermatitis**
  - inflammation of the sebaceous glands; characterized by redness, dry or oily scaling, crusting, and/or itchiness

- **Asteatosis**—excessive dryness; scaly skin; partial deficiency of sebum

- **Rosacea**—chronic congestion appearing primarily on the cheeks and nose

- **Steatoma**—tumor in the subcutaneous tissue filled with sebum ranging in size from a pea to an orange

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**The main food source for acne bacteria is fatty acids**

**Heredity acne**

- Retention hyperkeratosis - retain dead cells in the follicle, lesions such as papules and pustules.

- **Oiliness of the skin** - overproduction of sebum

- **Propionibacterium acnes are anaerobic** - bacteria cannot survive in the presence of oxygen. When the follicles are obstructed, oxygen is blocked from the bottom of the follicles, allowing acne bacteria to multiply.
**DISORDERS OF THE SKIN**

- **Sudoriferous (Sweat) glands**
- **Anhidrosis** (hypohidrosis) — lack of perspiration, often a result of fever or certain skin diseases
- **Bromhidrosis** — foul smelling perspiration; in the armpits or on the feet, that is caused by bacteria
- **Hyperhidrosis** — excessive perspiration
- **Miliaria rubra** — prickly heat; an acute disorder characterized by eruption of small red vesicles resulting in burning and itching; caused by excessive heat

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**DISORDERS OF THE SKIN**

- **Inflammations and Common Infections of the Skin**
- **Dermatitis** — inflammatory condition of skin with lesions
- **Conjunctivitis** (pinkeye) — is a common bacterial infection of the eyes/eyelids. It is extremely contagious
- **Eczema** — skin inflammation of acute or chronic nature, presenting many forms of dry or moist lesions; accompanied by itching or burning
  
- **Impetigo** — a contagious bacterial skin infection

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**DISORDERS OF THE SKIN**

**OCCUPATIONAL DISORDERS**

- Abnormal conditions can result from contact with chemicals or tints.
- Allergies can be developed to ingredients in cosmetics, antiseptics, perm solutions, and aniline derivative tints.
- These can cause **dermatitis venenata**—eruptive skin infections.
- To prevent, use rubber gloves and protective creams.

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**DISORDERS OF THE SKIN**

**PIGMENTATIONS OF THE SKIN**

- **Lentigines** — freckles; small yellow- to brown-colored spots on parts exposed to sunlight and air
- **Leukoderma** — abnormal white patches in the skin due to congenital defective pigmentation
- **Nevus** — birthmark
- **Stains** — abnormal brown skin patches having a circular or irregular shape; occur during aging, after certain diseases, and after disappearance of moles, freckles, and liver spots
DISORDERS OF THE SKIN

PIGMENTATIONS OF THE SKIN

- **Tan**—caused by exposure of the sun
- **Chloasma**—increased deposits of pigment in the skin; found mainly on forehead, nose, and cheeks; also called moth patches or liver spots
- **Albinism**—the absence of melanin pigment of the body, skin, hair, and eyes
- **Vitiligo**—acquired condition of leukoderma affecting skin or hair

DISORDERS OF THE SKIN

HYPERTROPHIES OF THE SKIN

- **Keratoma**—an acquired thickened patch of skin or epidermis due to pressure of friction on hands and feet. If it grows inward, it is called a corn.
- **Mole**—small, brownish spot or blemish on the skin, believed to be inherited; range in color from pale tan to brown to bluish black. Some are small and flat; others are raised and darker. DO NOT REMOVE HAIR FROM MOLES.
- **Skin tag**—small brown or flesh-colored outgrowth of the skin
- **Verruca** (vuh-ROO-kuh) or wart—caused by a virus and is infectious; can spread from one location to another, particularly along a scratch in the skin

SKIN CANCER

- **Basal cell carcinoma**
- **Squamous cell carcinoma**
- **Malignant melanoma**

DISORDERS OF THE SKIN

- **Contact Dermatitis**
  - **Allergic contact dermatitis (ACD)** - an allergy to an ingredient or a chemical, usually caused by repeated skin contact with the chemical.
  - **Sensitization** is an allergic reaction created by repeated exposure to a chemical or a substance. Monomer liquids, haircolor, and chemical texture solutions all services must be discontinued
  - **Irritant contact dermatitis (ICD)** - occurs when irritating substances temporarily damage the epidermis; not usually chronic if precautions are taken