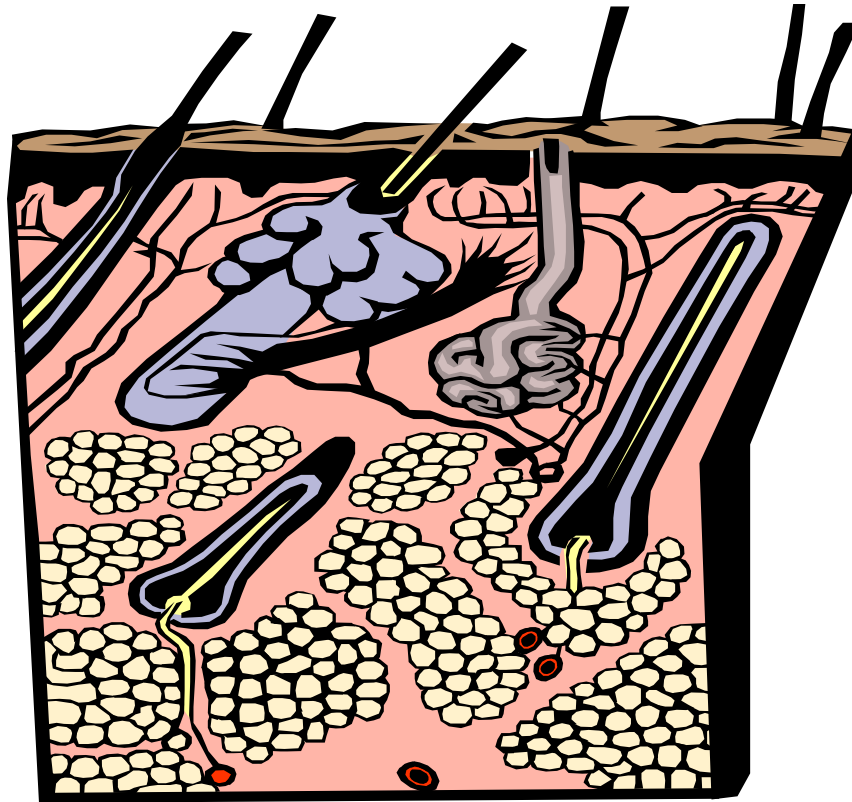


The Integumentary System



Objectives

After studying this chapter, you will be able to:

- **Name the parts of the Integumentary system and discuss the function of each part.**
- **Define the combining forms used in building words that relate to the Integumentary system.**
- **Identify the meaning of related abbreviations.**
- **Name the common diagnoses, laboratory tests and clinical procedures used in testing and treating the Integumentary system.**

Objectives cont'd

- **Define the major pathological conditions of the Integumentary system.**
- **Define surgical terms related to the Integumentary system.**
- **List common pharmacological agents used in treating the Integumentary system.**

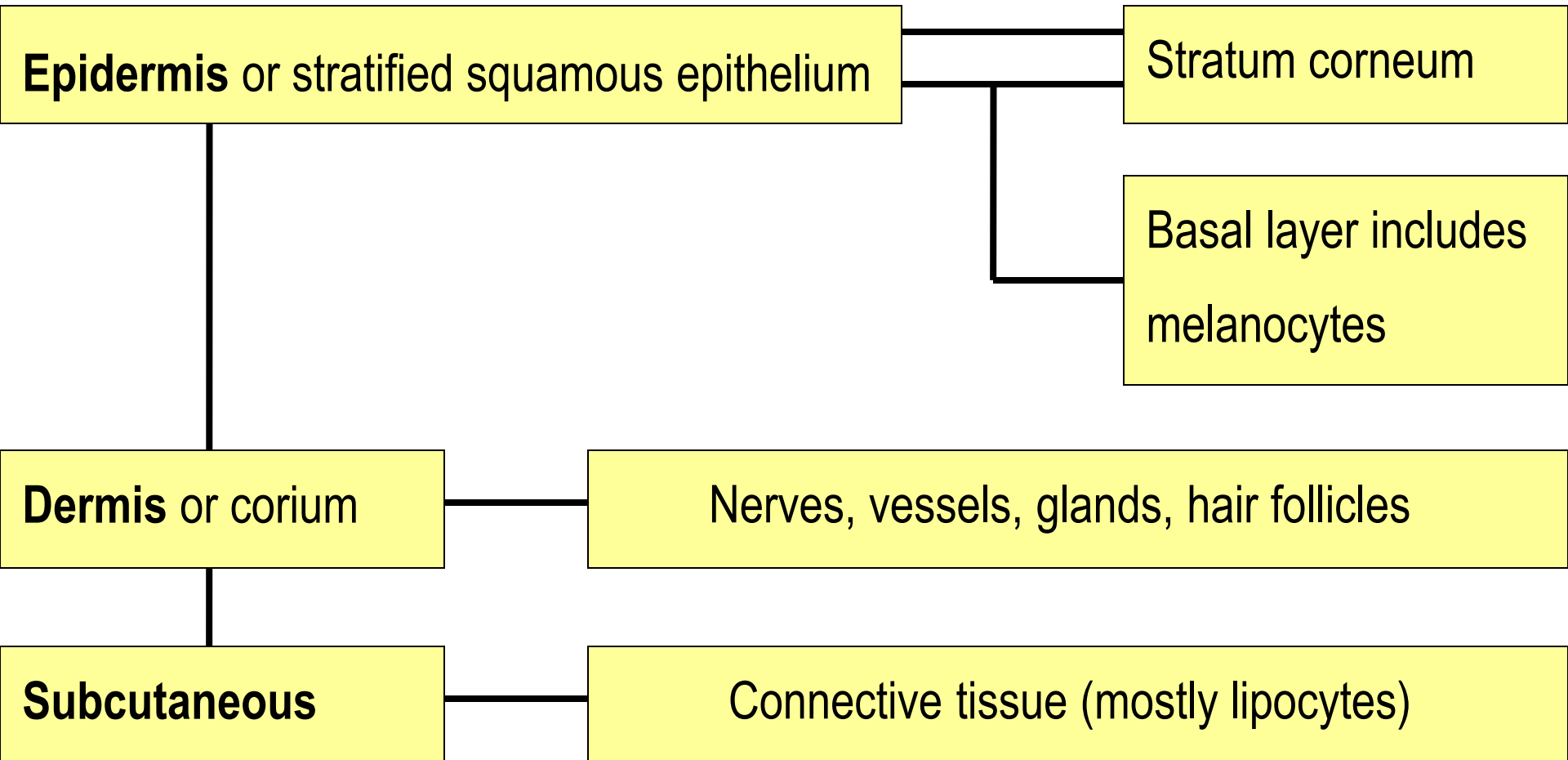
Structure and Function

Skin is the largest organ of the body, and serves to:

- **Protect against injury**
- **Protect against the sun UV rays**
- **Prevent entry of harmful microorganisms**
- **Maintain the proper internal body temperature**
- **Excrete waste materials through perspiration**
- **Function as a sense organ**

Structure and Function

Three Layers of the Skin

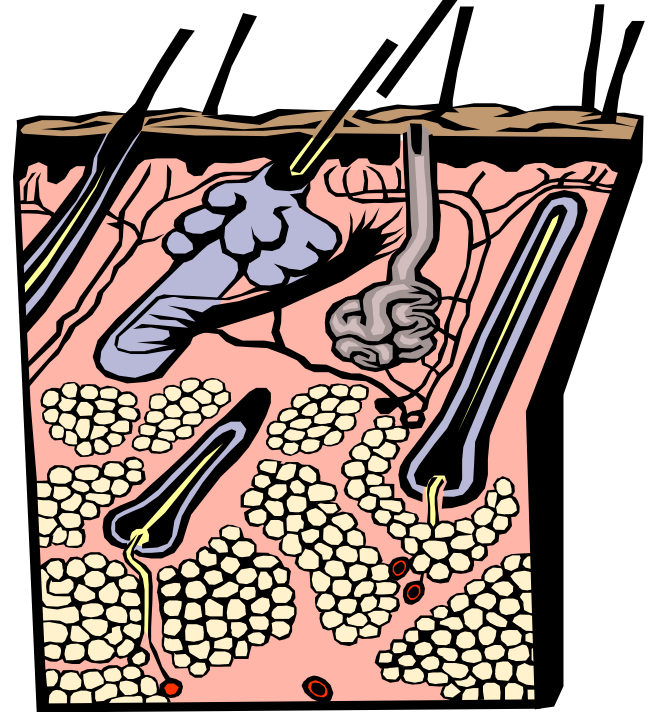


Structure and Function

epidermis

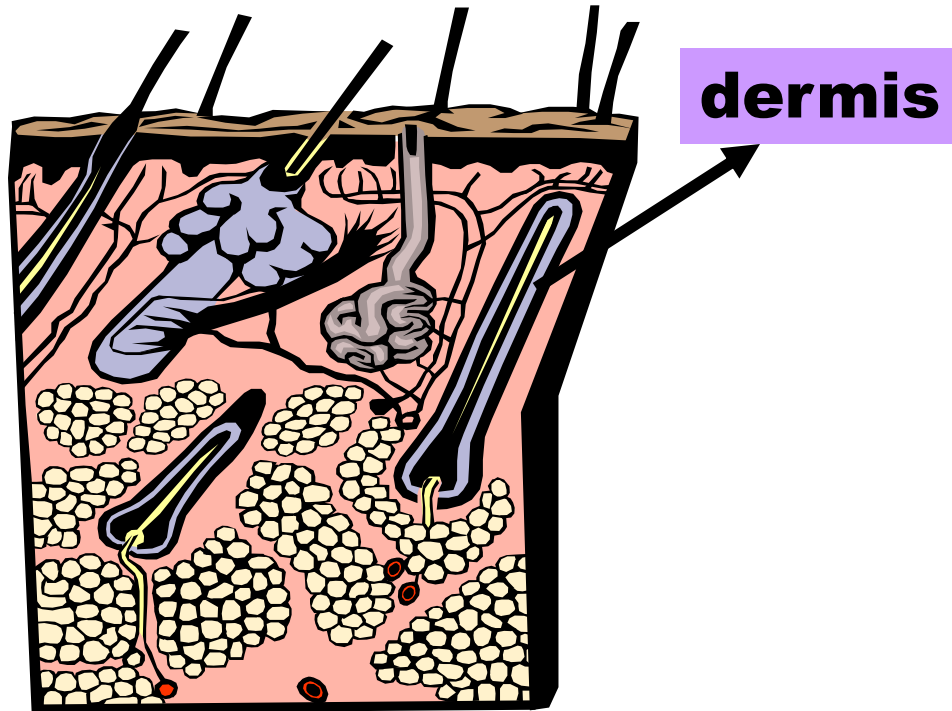
Epidermal Layer

- **Outermost skin layer**
- **Consists of several sublayers**
- **Top sublayer is called the stratum corneum**
- **Nonvascular**
- **Keratin is found in the cells**



- **Stratum germinativum is the bottom sublayer where new cells are produced that push up toward the stratum corneum**

Structure and Function



Dermal Layer

- Also called the ***corium***
- Contains two sublayers the ***papillary*** layer and the ***reticular*** layer
- Holds many capillaries, lymph cells, nerve endings, sebaceous and sweat glands and hair follicles

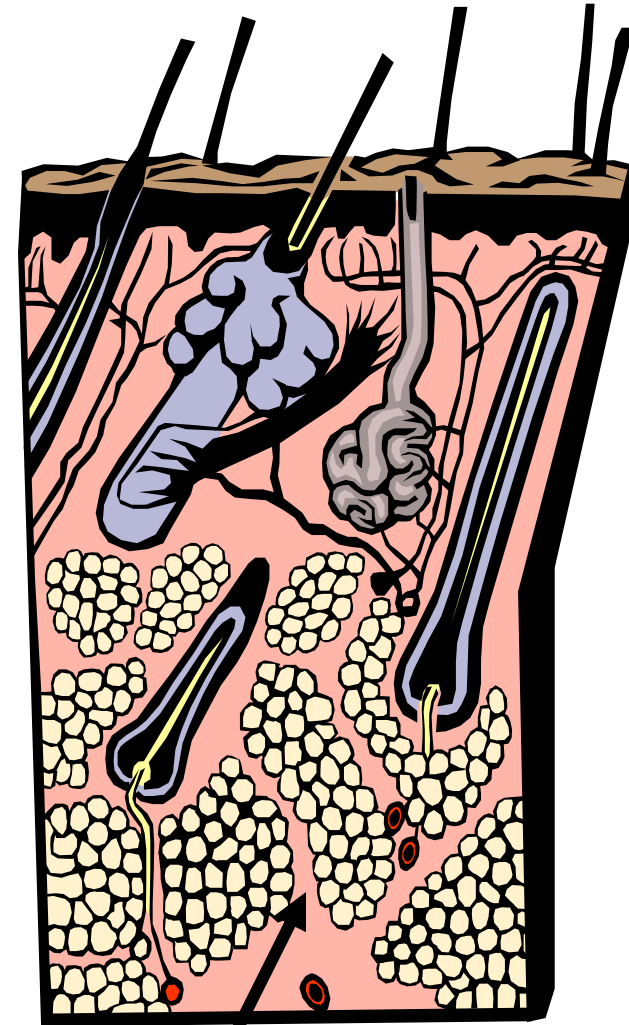
• Collagen fibers are found in the connective tissue and when collagen fibers stretch, they form ***striae***

Structure and Function

Subcutaneous Layer

- Also called the hypodermis
- Found between the dermal layer and the inner organs
- Consists of adipose or fatty tissue and some fibrous tissue

- Fatty tissue protects inner organs and maintains body temperature
- Blood vessels and nerves are present



subcutaneous 8

Structure and Function

Hair

- Hair grows out of the epidermis to cover parts of the body.
- The *shaft* is what we see and the *root* lies below the surface of the skin.



Hair color is determined by the presence of melanin.

Baldness or *alopecia* may result from heredity, disease, injury, or chemotherapy.

Structure and Function

Nails

- **Nails are plates made of hard keratin that cover the dorsal surface of the fingers and toes.**



- **At the base of most nails a lunula or whitish half-moon is an area where keratin and other cells have mixed with air.**

- **The cuticle is a narrow band of epidermis that surrounds the base or bottom of nails.**

Structure and Function

Glands

- **Sudoriferous** glands, also known as sweat glands, secrete outward toward the surface of the body (**exocrine**) and are located almost everywhere on the body.

Types of exocrine glands



- The excretion of sweat is called **diaphoresis**.

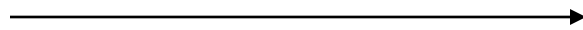
Combining Forms

Combining Form

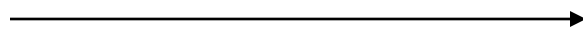
•adip(o)



•dermat(o)



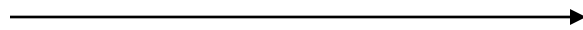
•hidr(o)



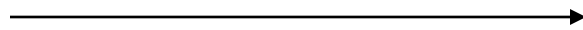
•ichthy(o)



•kerat(o)



•lip(o)



Meaning

fatty

skin

sweat, sweat glands

fish, scaly

horny tissue

fatty

Combining Forms

Combining Form

•melan(o) →

•myc(o) →

•onych(o) →

•pil(o) →

•seb(o) →

•steat(o) →

•trich(o) →

Meaning

black, very dark

fungus

nail

hair

sebum

fat

hair

Diagnostic, Procedural and Laboratory Tests



The field of **Dermatology** studies, diagnoses, and treats ailments of the skin.

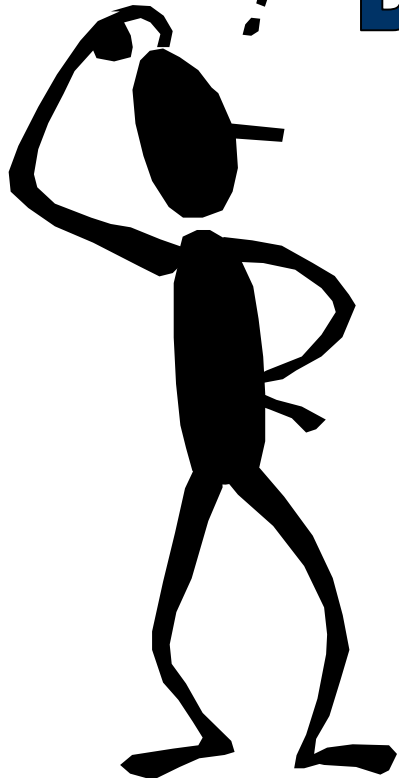
Diagnostic, Procedural and Laboratory Tests

- **Exudate** (pus) is material that passes out of tissues. The laboratory can use this to determine the types of bacteria present.



- A scraping can also be done and placed on a growth medium to identify the presence of **fungi**.

? Diagnostic, Procedural and Laboratory Tests



Did you know that the skin can be tested for various diseases and allergies?

Tests for Allergies

- Patch test
- Scratch test
- Intradermal tests

Tests for Diseases

- Mantoux test used to detect **tuberculosis**.
- Schick test used to detect **diphtheria**.

Pathological Terms

Both abnormalities and certain internal diseases show dermatological symptoms.

Skin Lesions

- **Primary** lesions are areas of tissue that are altered because of a pathological condition.
- **Secondary** lesions result from changes in the primary lesions.
- **Vascular** lesions are blood vessel lesions that show through the skin.

Pathological Terms

Types of Skin Lesions

PRIMARY LESIONS

Flat discolored, nonpalpable changes in skin color



Macule



Patch

Elevation formed by fluid in a cavity



Vesicle



Bulla



Pustule

Elevated, palpable solid masses



Papule



Plaque



Nodule



Tumor



Wheal

SECONDARY LESIONS

Loss of skin surface



Erosion



Ulcer

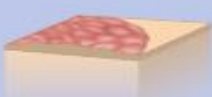


Excoriation



Fissure

Material on skin surface



Scale



Crust



Keloid

VASCULAR LESIONS



Cherry angioma



Telangiectasia



Petechiae



Ecchymosis

Pathological Terms

Symptoms, Abnormalities, and Conditions

- **Exanthematous** viral diseases are rashes that appear during a viral infection.

Other Viral Rashes

rubeola

rubella

roseola

varicella

Pathological Terms

Other Conditions

- **Impetigo**, a highly contagious skin condition is caused by staphylococci and characterized by the presence of pus.
- Ringworm or **tinea** is caused by fungi, and is characterized by intense itching or pruritis.
- Common rashes such as diaper rashes are also caused by fungi known as **Candidiasis**.

Pathological Terms

Other Common Fungi

- tinea **pedis** (athlete's foot)



- tinea **capitis** (scalp ringworm)



- tinea **barbae** (ringworm of the beard)



Pathological Terms

Vascular Conditions

- **Ecchymosis** **Bluish-purple skin mark may be due to injury.**
- **Petechiae** **Tiny pinpoint ecchymosis.**
- **Purpura** **Extensive skin hemorrhages covering a wide area.**
- **Rosacea** **Appears as red blotches on the skin, especially the nose and cheeks.**

Pathological Terms

Skin Conditions Related to Pigmentation

- **Leukoderma**
- **Vitiligo**
- **Albinism**
- **Chloasma**



Vitiligo

Pathological Terms

Other Diseases caused by Viruses:

- **Herpes simplex Type 1 (cold sores)**
- **Herpes simplex Type 2 (genital herpes)**
- **Herpes zoster (shingles)**

Other Skin Conditions:

• **acne vulgaris**

• **scleroderma**

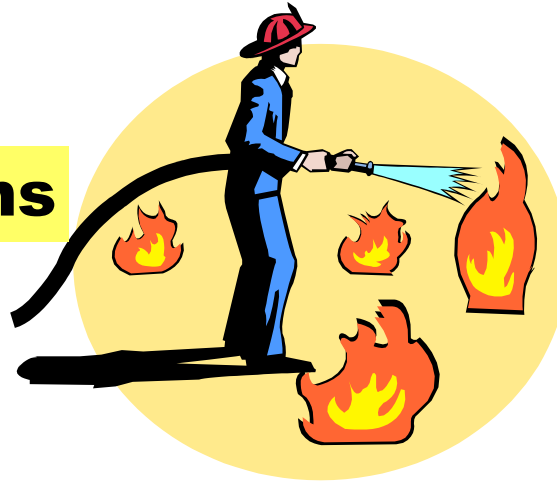
• **psoriasis**

• **seborrhea**

Pathological Terms

Burns to the skin may result from exposure to heat, chemicals, electricity, radiation or other irritants.

Categories of Burns



• **First Degree**

is superficial, without blistering, but with redness and swelling.

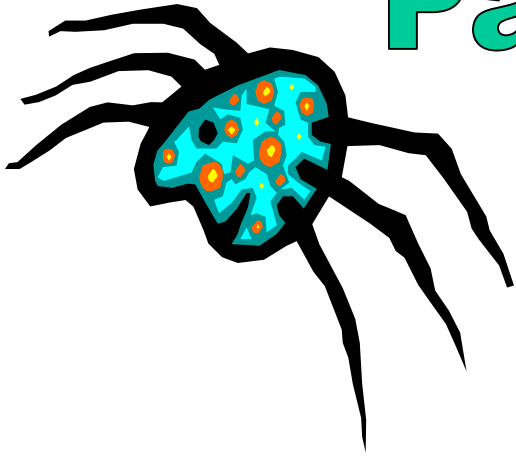
• **Second Degree**

involves the epidermis and dermis and blistering.

• **Third Degree**

involves complete destruction of skin and sometimes reaches muscle and bone.

Pathological Terms



Some skin conditions are caused by insects.

Pediculosis

An inflammation with lice usually on the head or genitals.

Scabies

Contagious skin eruption that often occurs between fingers, on areas of the trunk, or male genitalia and is caused by mites.

Pathological Terms

The term onychia or onychitis means nail inflammation.

Causes of Nail Inflammation

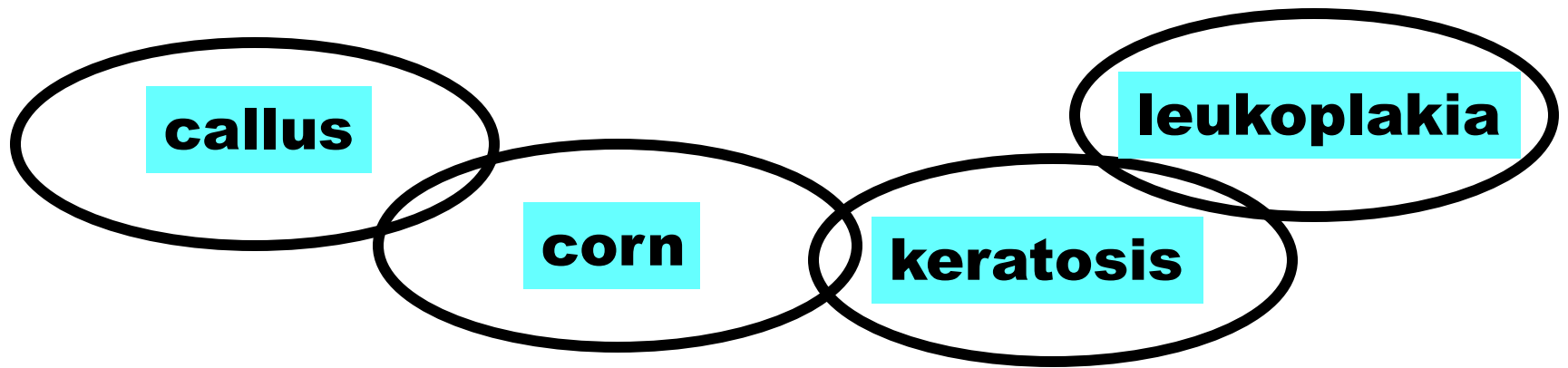
- infection**
- irritation**
- fungi**

Paronychia is an inflammation of the flap of skin overlapping the nail.

Pathological Terms

Abnormal growths, also called neoplasms are benign.

Common benign neoplasms:



Malignant neoplasms:

• **Basal Cell carcinoma**

• **Kaposi's sarcoma**

Surgical Terms



Various types of plastic surgery may involve reconstructing areas of the skin. Other types involve removing part of a growth to test for cancer or removing the entire cancerous growth.

Surgical Terms

Plastic surgery may involve the use of skin grafts.

Types of skin grafts

- **Autograft** - skin from own body.
- **Allograft** or homograft - donor skin from another person.
- **Heterograft** or xenograft - donor skin from one species to another.

Surgical Terms

Methods used to remove unwanted growths or scrape tissue or discolorations include:

- ***Cryosurgery***

Removal of tissue by applying cold liquid nitrogen.

- ***Dermabrasion***

Use of brushes and emery paper to remove wrinkles, scars, and tatoos.

- ***Debridement and Curettage***

Removal of dead tissue from a wound by scraping.

Surgical Terms

Surgical Procedures of the Skin

Many procedures involve the use of electricity or lasers to stop bleeding, remove tissue, or excise tissues for examination.

•Cauterize

•Needle biopsy

•Fulguration

•Shave biopsy

Moh's surgery

Pharmacological Terms



Treatment of skin disorders involves the use of various medications.

Types of Medications

- **Chemotherapy** uses chemicals that destroy malignant cells.
- **Antibiotics** kill or slow the growth of microorganisms on the skin.
- **Emollients** are agents that soothe the skin by moistening it or adding oils to it.
- **Astringents** decrease the formation of oily material on the skin.

Apply Your Knowledge

Amanda's mother tells her not to put on too much of her cream deodorant because it may "clog up her pores."

Which glands may be affected if excessive creams or other substances are applied under the arms?

- A. Eccrine**
- B. Apocrine**
- C. Sebaceous**

Answer: Apocrine

Apply Your Knowledge

Which of the following patients would experience the most pain following their burn injury?

Patient A accidentally spilled hot grease on his his right hand and arm resulting in first and second degree burns to the entire area.

-OR-

Patient B was in his home when his kerosene heater fell on his left lower leg causing complete third degree burns to the area.

Answer: Patient A

Apply Your Knowledge

Use the following meanings and build the correct term for each.

Medical Term

Meaning

dermatitis



1. Inflammation of the skin.

hidrosis



2. Production and excretion of sweat.

mycosis



3. Any condition caused by fungus.

Apply Your Knowledge

Ellen notes a small elevated pimple on her forehead and you realize this lesion is called a:

A. macule

Answer: B. papule

B. papule

C. keloid

Is this lesion considered a primary, secondary or vascular lesion?

Answer: primary