OBJECTIVES

- Describe layers of skin.
- Enlist the functions of skin.
- Define appendages of skin.
- Define Fascia.
- Differentiate between Superficial and Deep Fascia.
- Applied Anatomy

Tissues of the body

- **The tissue:**

- **There are four basic tissues:**

Skin

IMPORTANCE OF SKIN

- Normal skin is a very complex organ

- The skin is one of the largest organs of the body: 7600 sq cm

FUNCTIONS OF THE SKIN

- 1-Protection
- continuous and covers the body as well as protects the deep tissues
- abrasion, invasion, water loss, UV protection
- 2-Vitamin D synthesis
- epidermal keratinocytes when exposed to UV light
- helps maintain health of skeleton by increasing absorption of Ca2+

- 3-Sensation

- receptors for heat, cold, touch, pressure, vibration and pain

- 4- Thermoregulation
- thermo receptors and sweat glands
- hypothalamus controls cutaneous arteries and sweat glands to retain or dissipate heat

5- Excretion

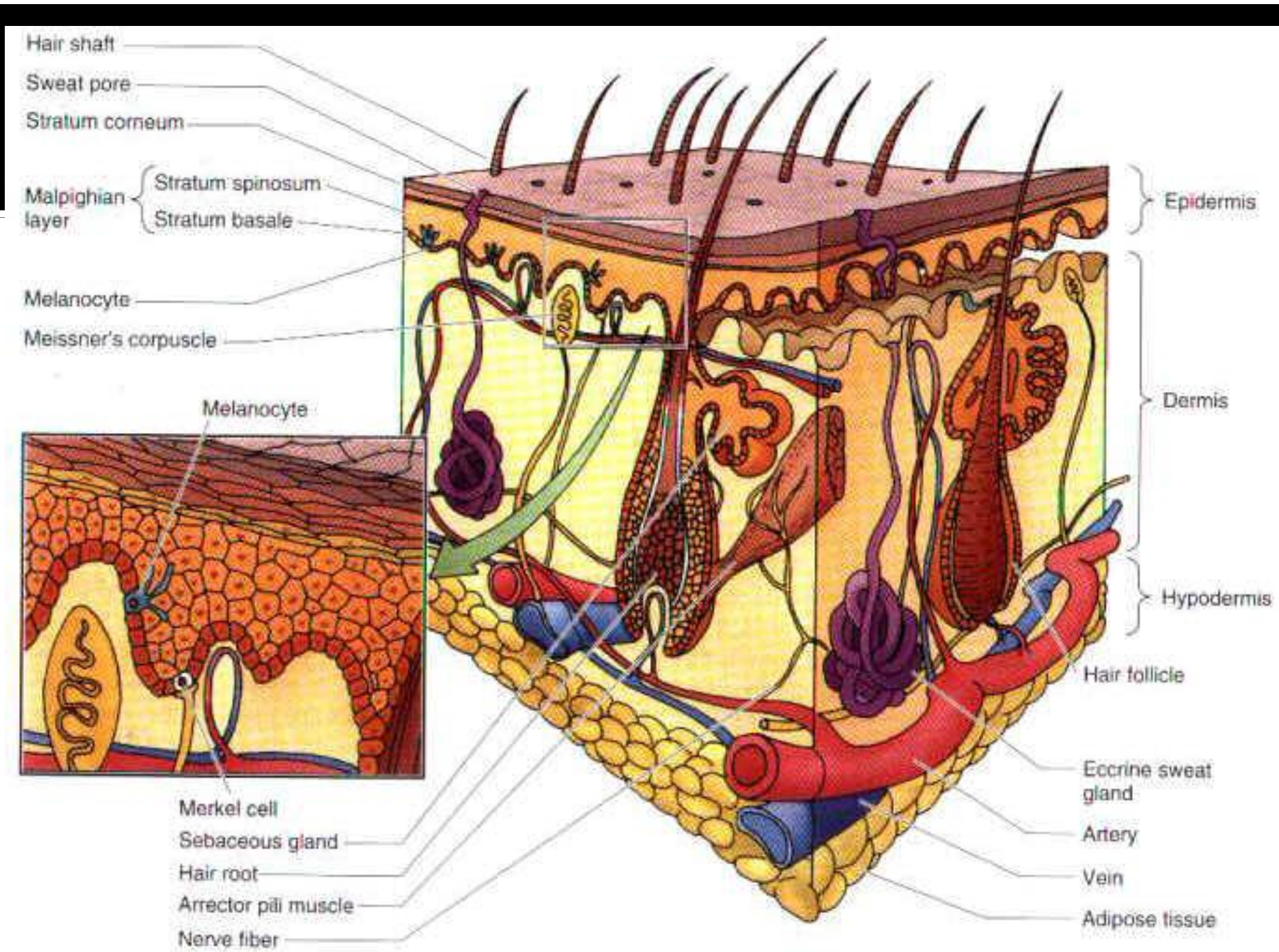
- through the secretion of sweat.
- 6- Psychological and social functions
- appearance and social acceptance
- facial expression and nonverbal communication

Structure of the skin

Superficial epithelial layer (epidermis)

Deep connective tissue layer (dermis)

Deep to the dermis is the Hypodermis :subcutaneous tissue (superficial fascia)

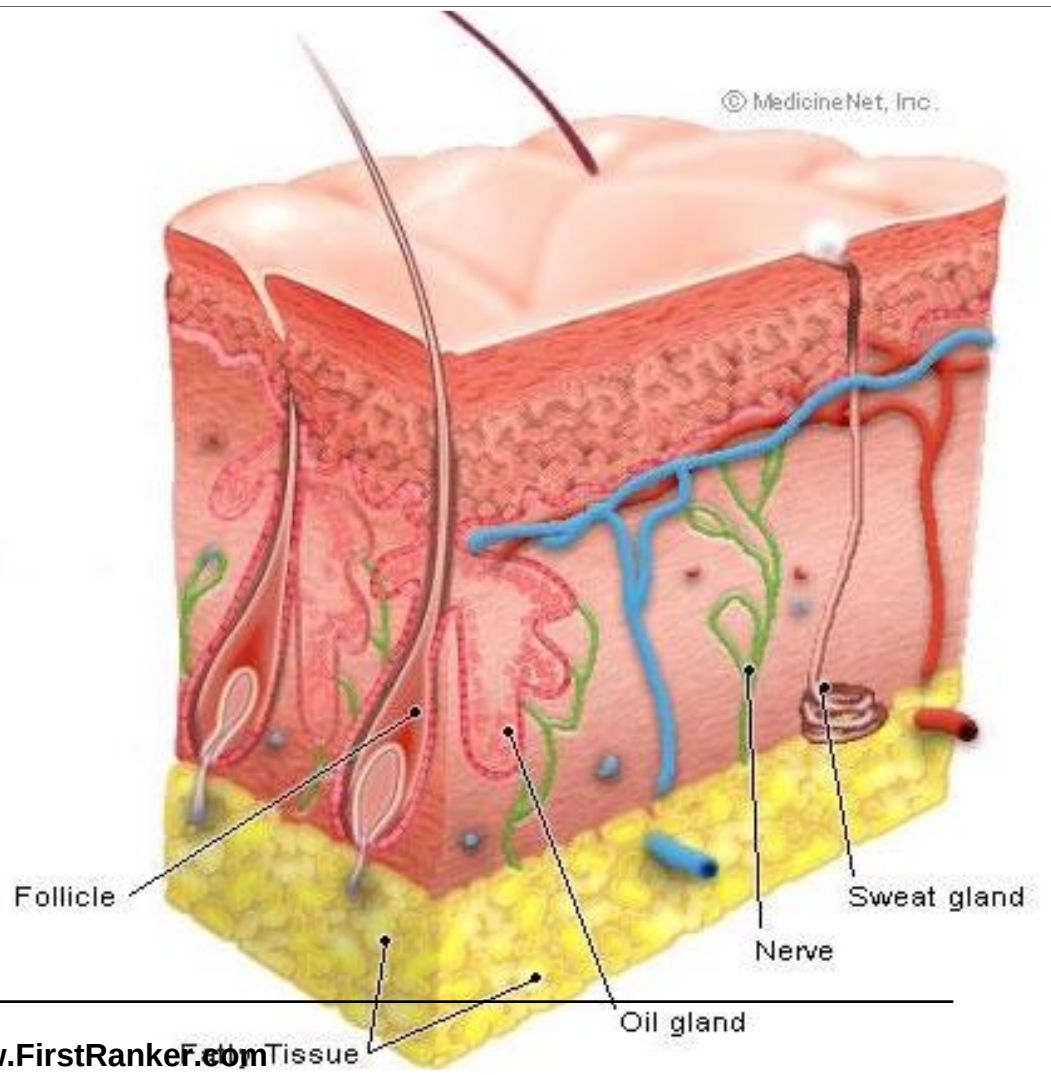


- **Keratinized stratified squamous epithelium devoid of blood vessels**

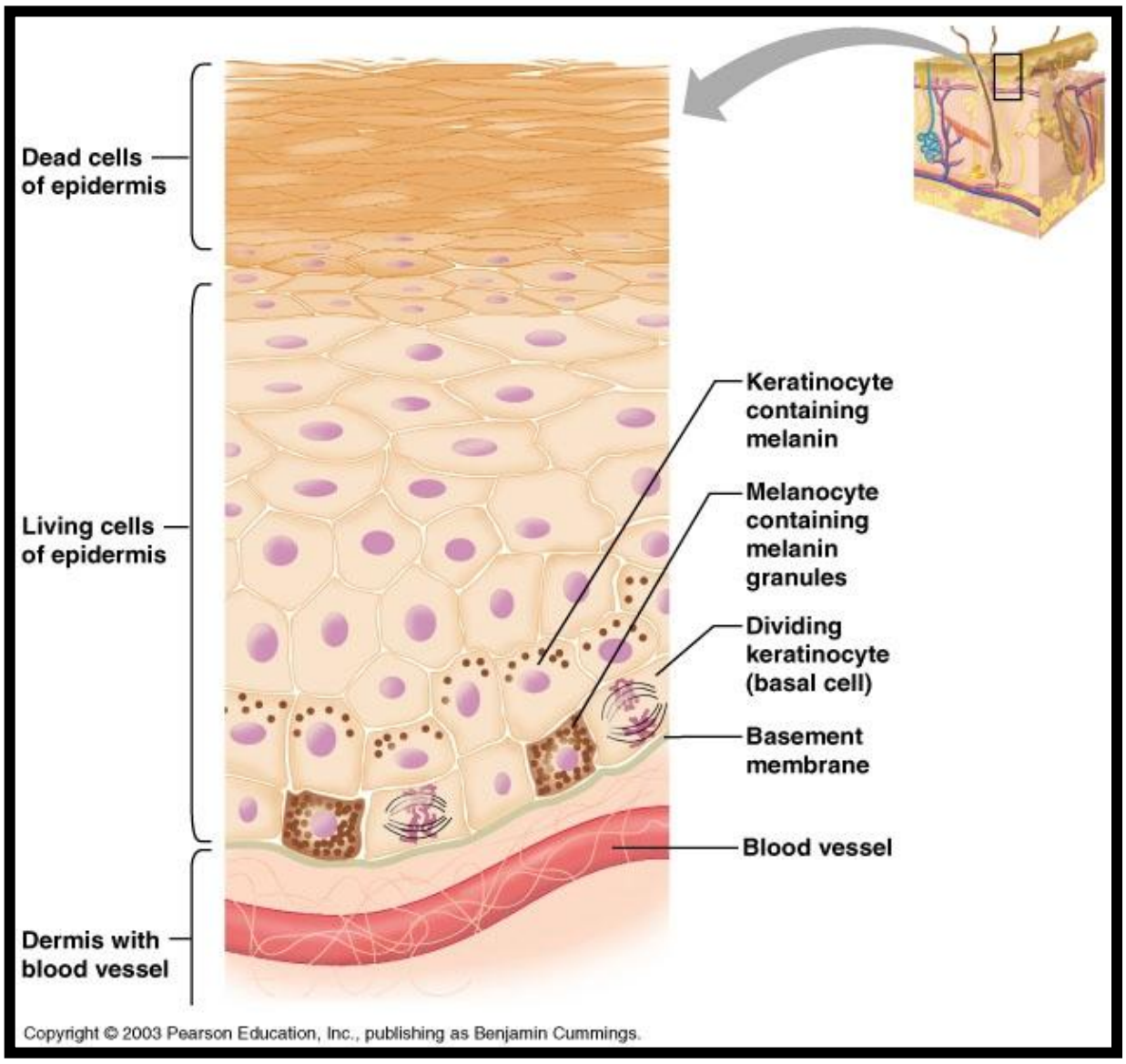
epidermis

Connective tissue containing (bl. v. lymph v., sensory nerve endings, smooth m, hair follicles, sweat and sebaceous glands)

In its deep part the collagen bundles are arranged in parallel rows



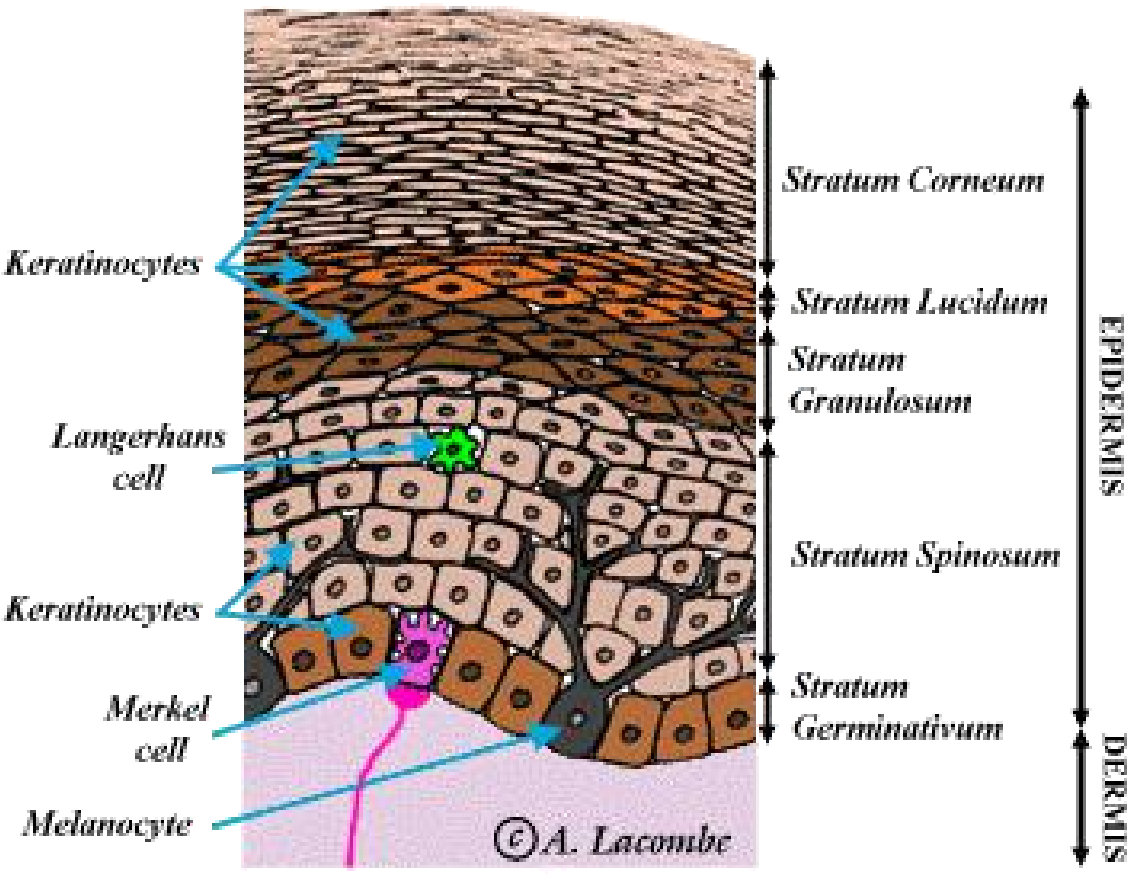
The Epidermis



Cells of the Epidermis

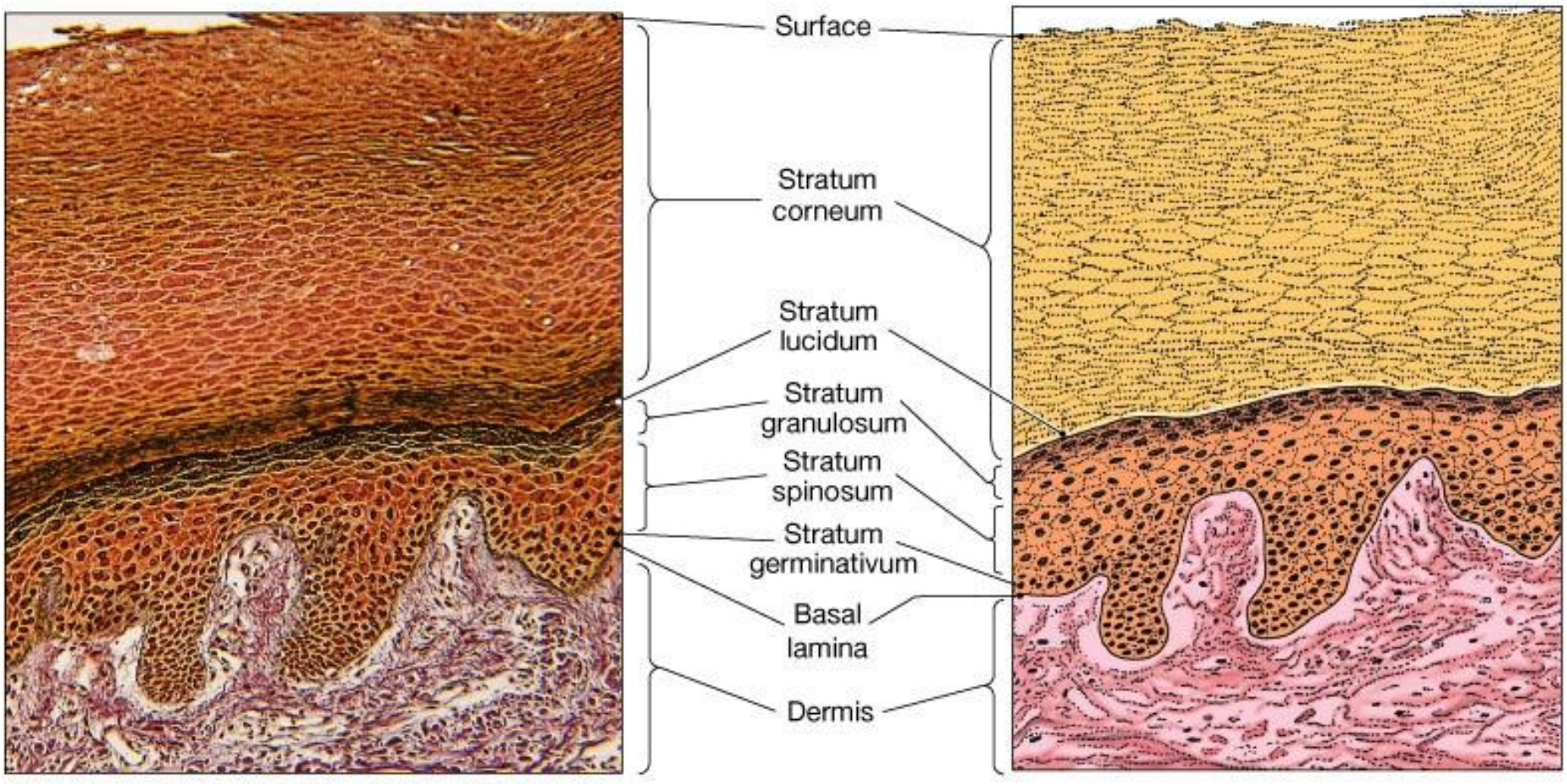
- **Keratinocytes** (90%)- waterproofs & protects skin, nails, hair, stratum corneum
- **Melanocytes** (8%)- produce melanin
- **Merkel Cells**- slow mechanoreceptors
- **Langerhans' Cells**- immunological defense

Layers of the Epidermis



- Stratum Corneum
- Stratum Lucidum
- Stratum Granulosum
- Stratum Spinosum
- Stratum Basale-(Germinativum)

Layers of the Epidermis



Epidermis

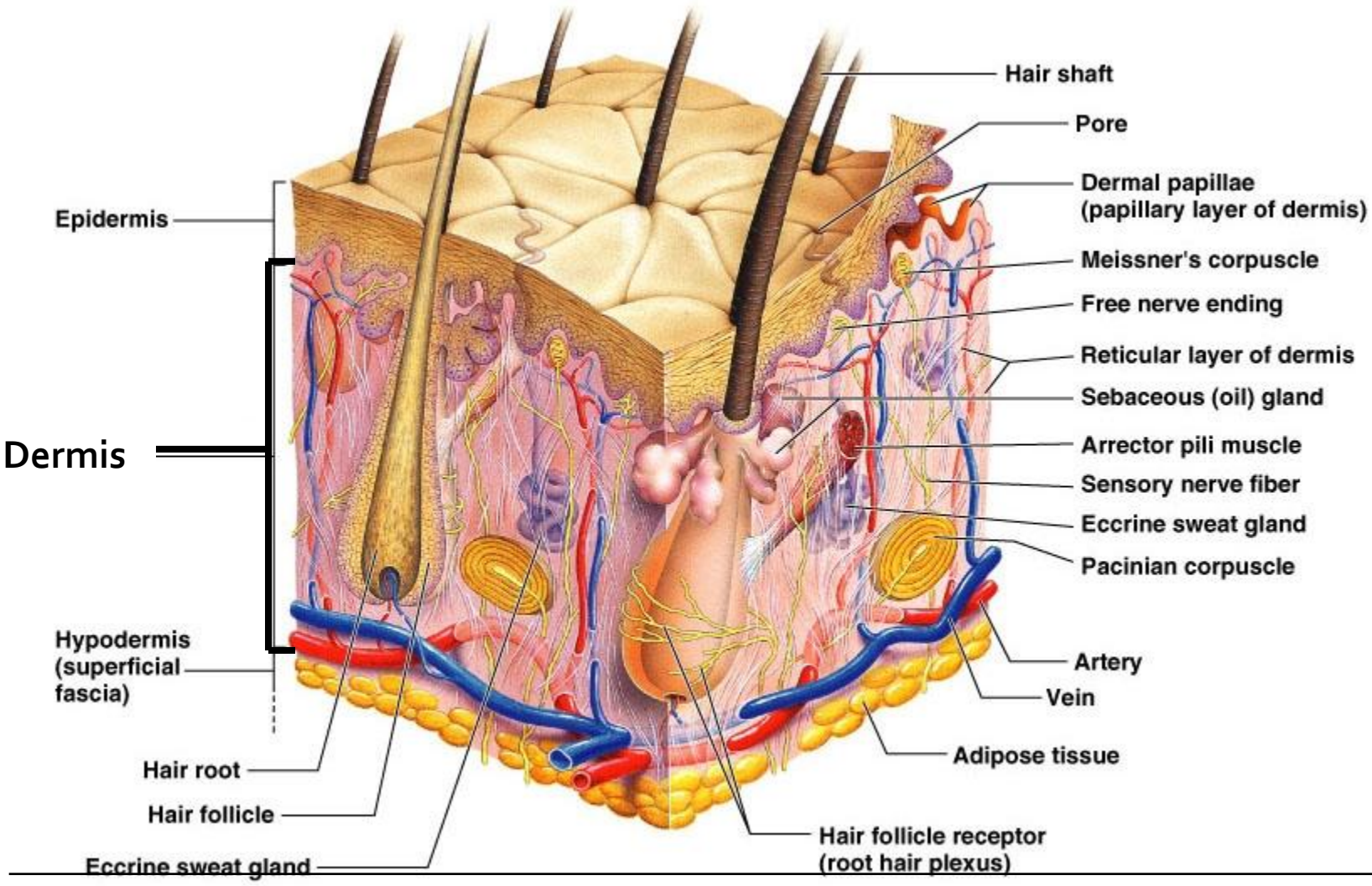
Thickness is increased:

- The palms of the hand.
- The soles of the feet.

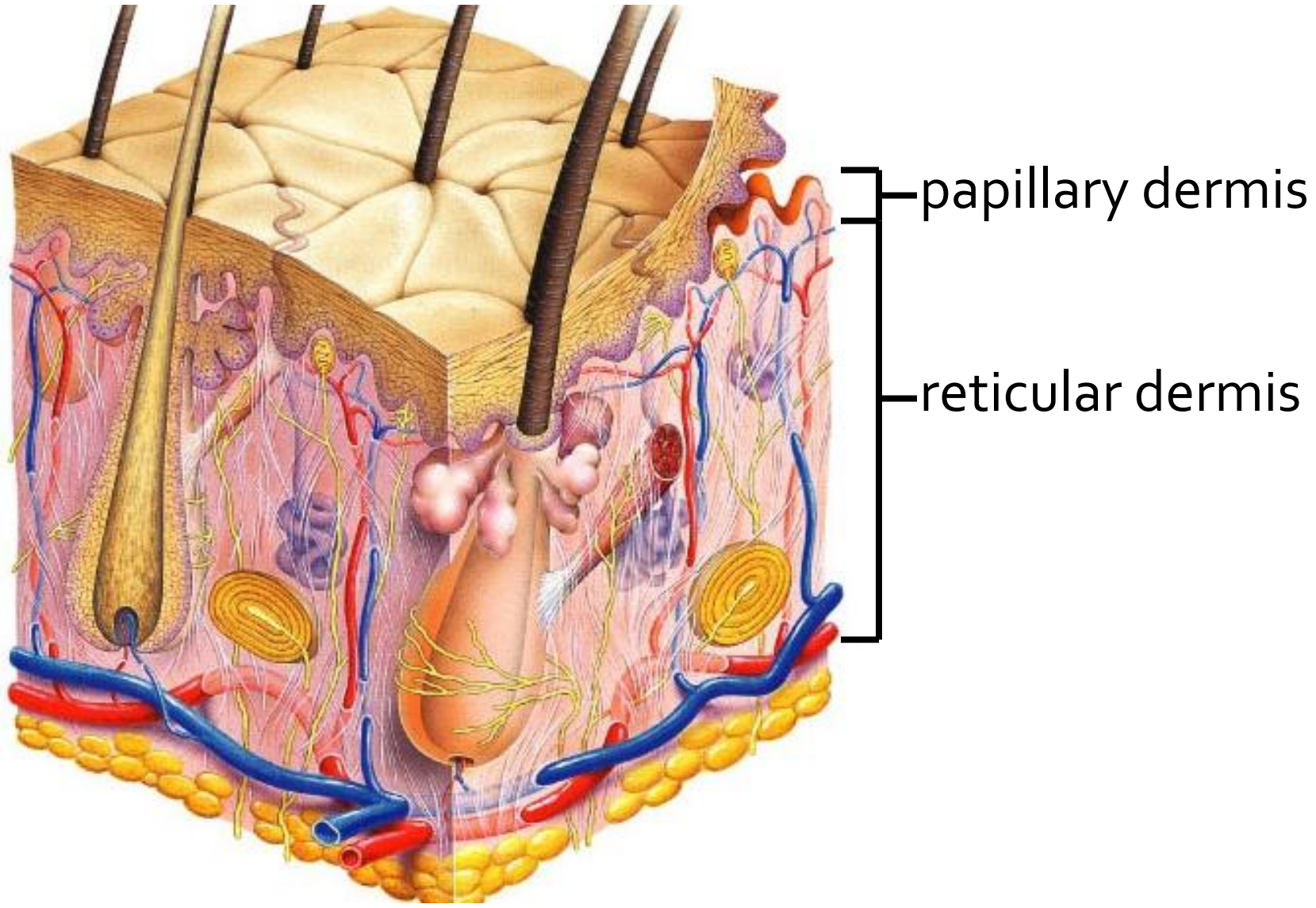
Why?

To protect these parts and withstand friction, wear and tear that occurs in these regions.

The Dermis



Layers of the Dermis



Components of the Dermis

a. Cellular

Fibroblasts (synthesize collagen, elastin, and reticulin), histiocytes, endothelial cells, perivascular macrophages and dendritic cells, mast cells, smooth muscle, and cells of peripheral nerves

b. Fibrous

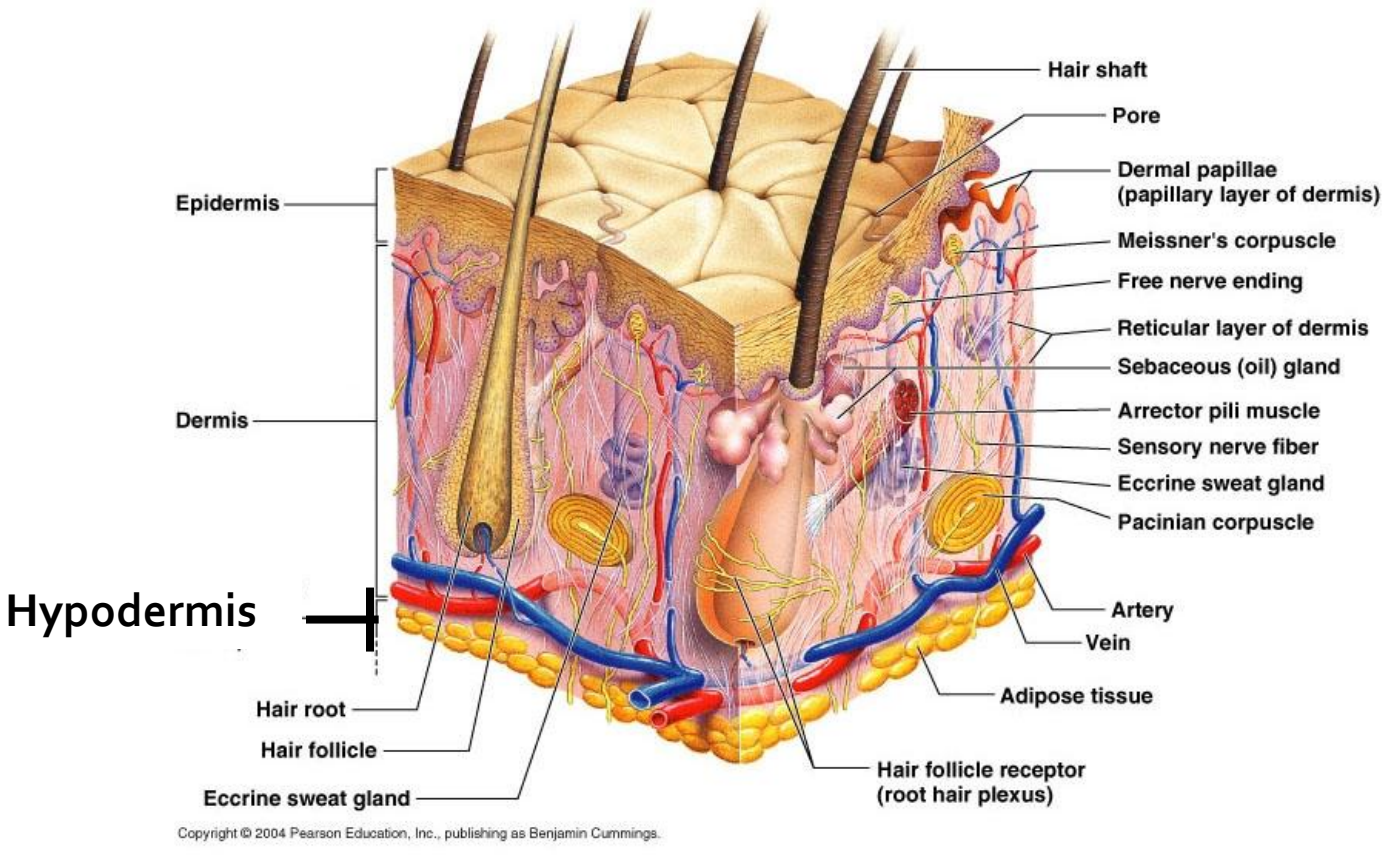
Collagen & reticulin - provide tensile strength

Elastic fibers- provide for restoration of shape after a deformation

c. Ground substance

glycosaminoglycans: hyaluronic acid, chondroitin sulfate, and dermatan sulfate.

The Hypodermis



This layer contains adipose tissue and serves to attach the dermis to its underlying tissues.

Lines of cleavage

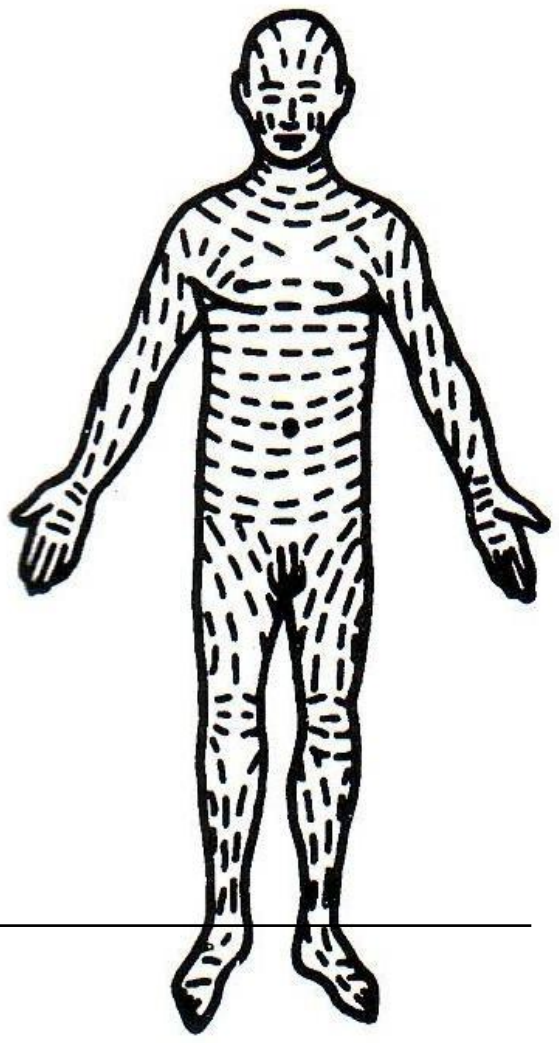
- The collagen fibers, arranged in parallel rows, called:

Lines of cleavage (langer's lines):

- The direction of the rows of collagen fibers in the dermis:

It runs

•Longitudinally in the limbs.
•Circumferentially in the neck and the trunk.



Lines of cleavage

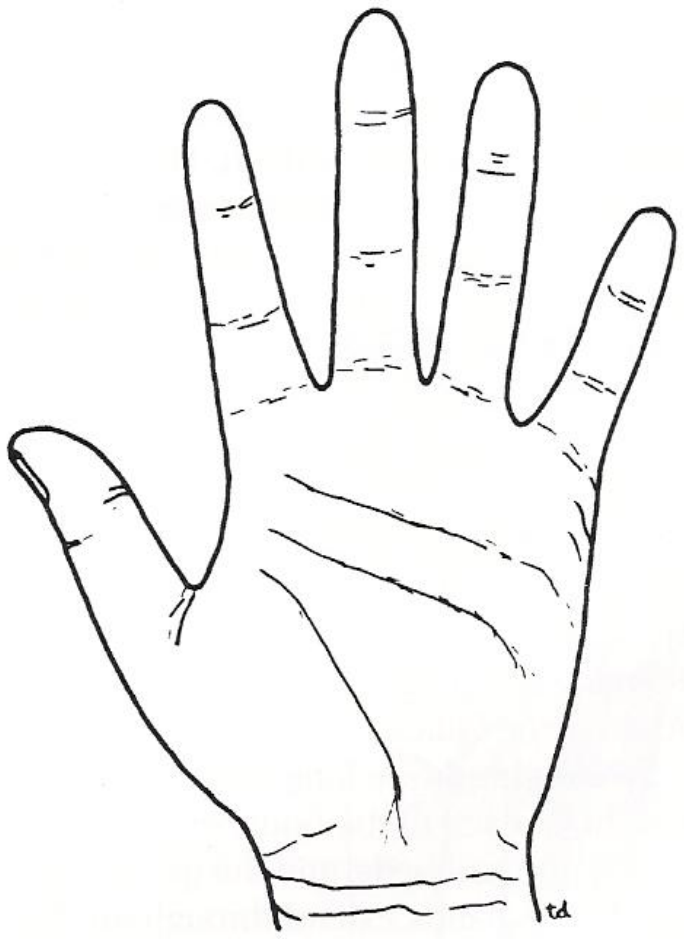
These lines are important to determine the direction for an incision (cut) during a surgery to avoid obvious scars.

- **A surgical incision along or between these lines causes the minimum disruption of collagen so that the wound heals with a small scar.**

- **Conversely, an incision made across the rows of collagen makes a disruption resulting in the massive production of fresh collagen and the formation of a broad scar.**

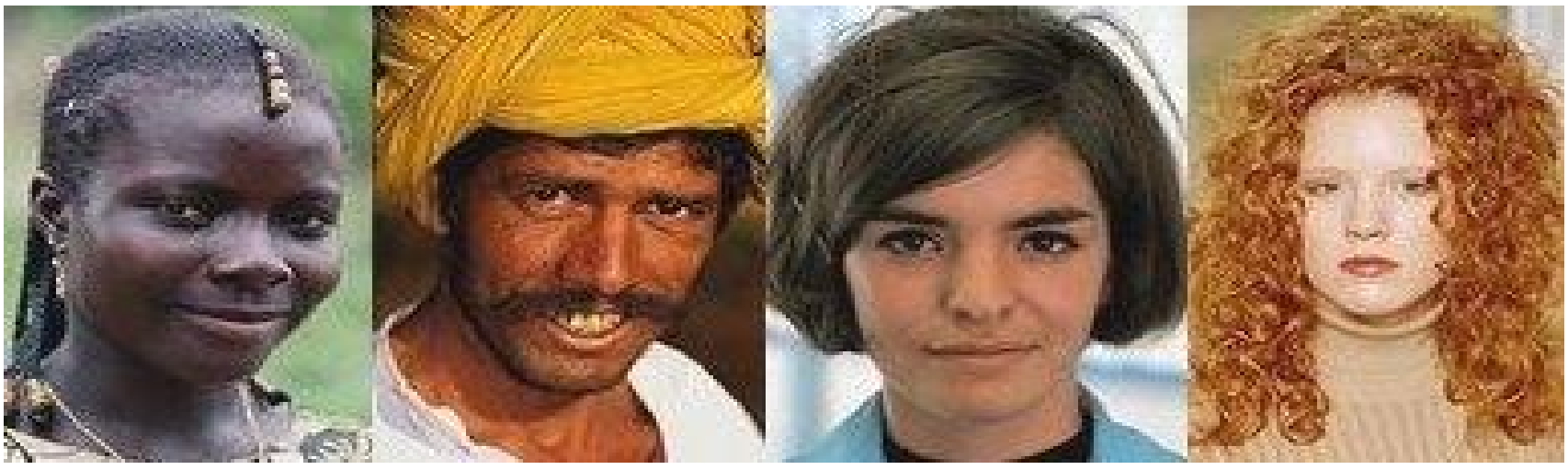
Skin creases

- Folded skin over the joints.
- Skin is thin and is firmly adherent to underlying structures.



Skin Color

Some variations in human skin color



Sub-Saharan African, Indian, Southern European, Northwest European

Skin Color

- Due to Melanin, a pigment in the epidermis and Carotene,
- Melanin is synthesized in cells called Melanocytes (found in basal layer).
- Number of Melanocytes is essentially the same in all races.
- The differences in skin color is due to the amount of pigment the melanocytes produce.

Skin Color Conditions

- Cyanotic
- Jaundice
- Erythema
- Pallor

Skin/Hair Color: Pigmentation

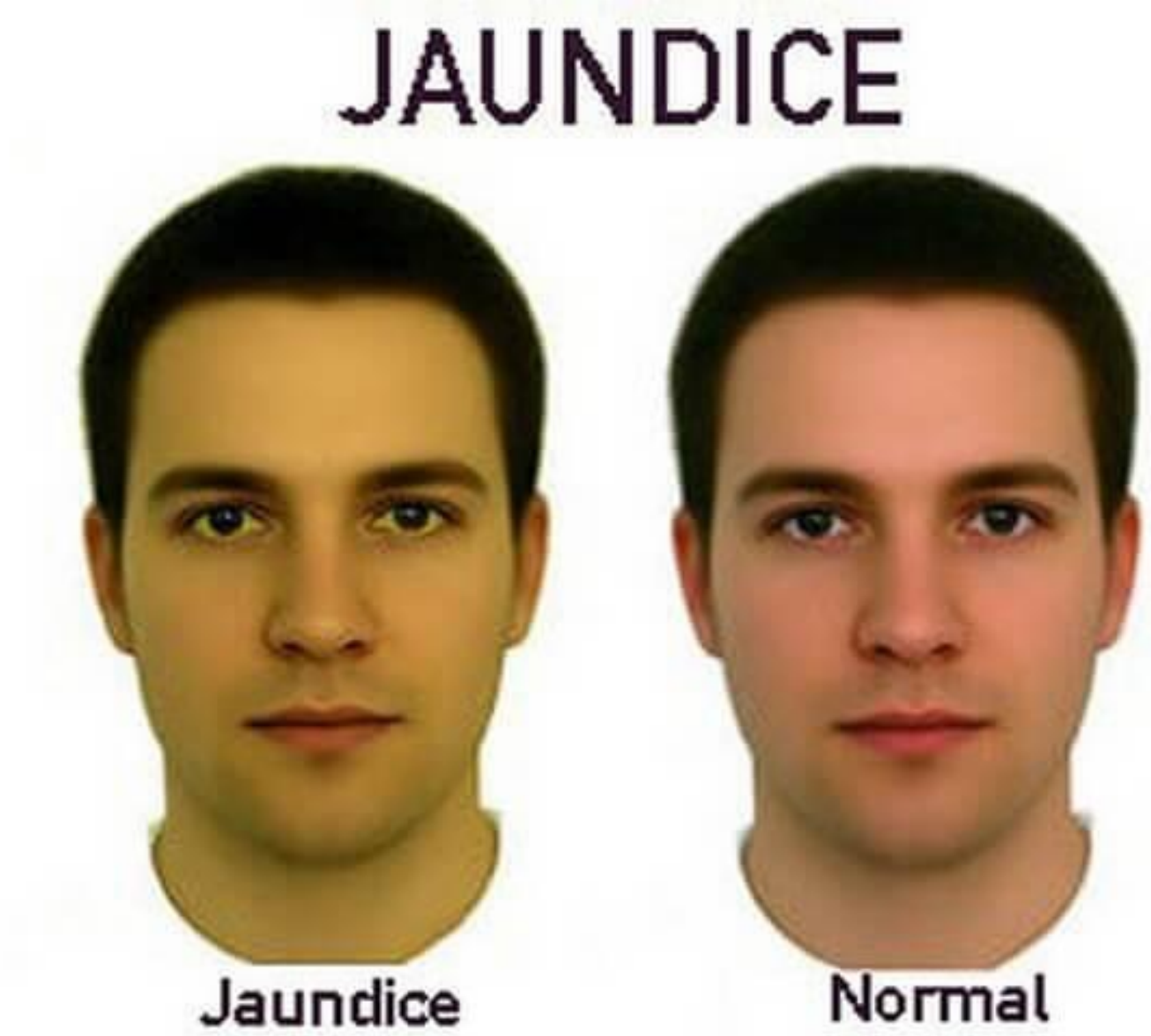
- Pigmentation levels usually increase with age.
  - exception: premature graying
- Normal pigmentation may be altered by
- genetic defects or by acquired diseases.
  - -Hyperpigmentation- age spots
  - -Hypopigmentation- vitiligo, albinism

Skin/Hair Color: Pigmentation

External agents can also alter skin color.

- lightening agents
- carotene
- dyes
- Some internal compounds--such as the byproduc of hemoglobin metabolism--may color the skin.

SKIN IN ANAEMIA



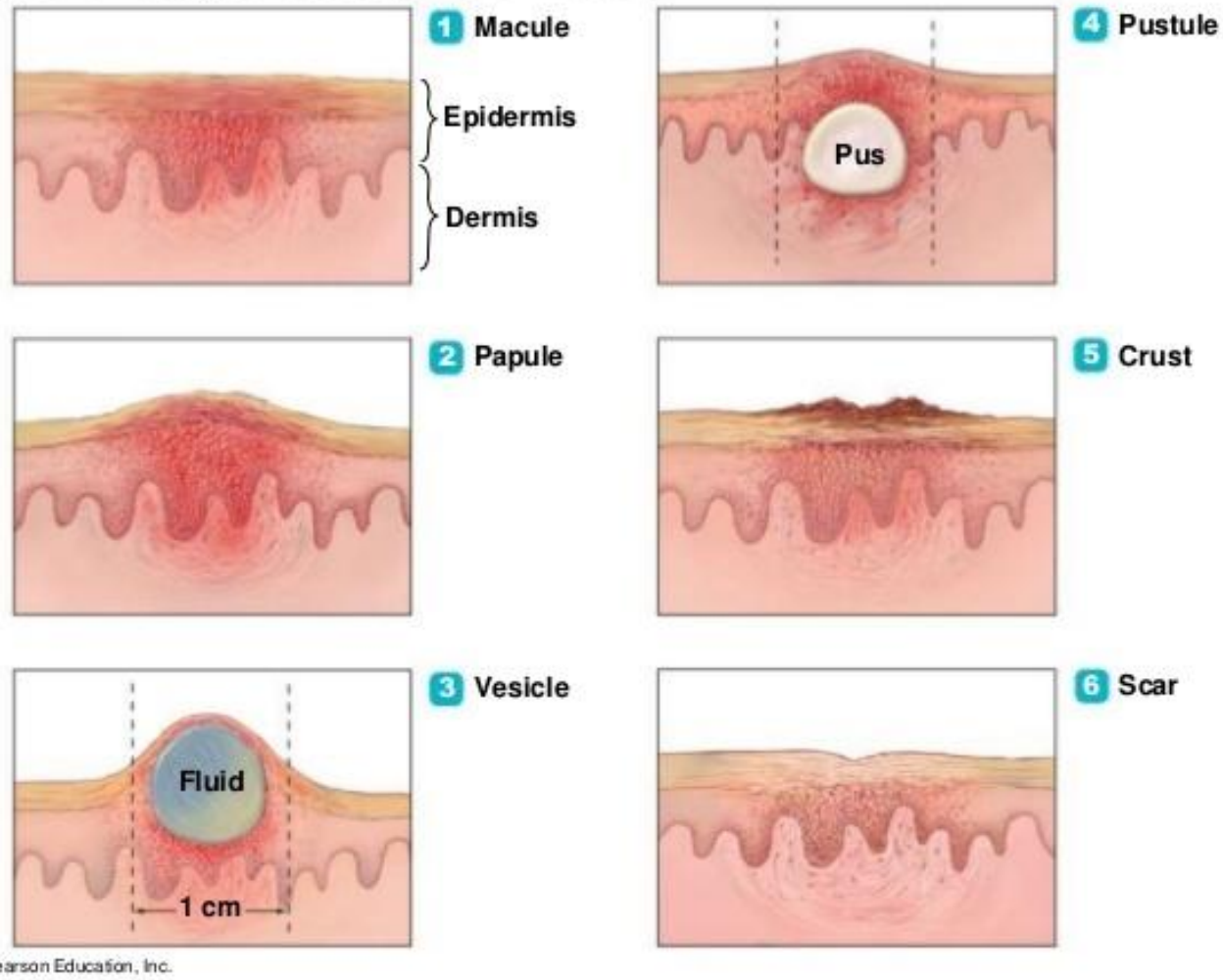
HEALTHY NAILS

should be consistent in coloring
with no odd spots or discolored parts.

CHICKEN POX

SKIN ERUPTIONS

Figure 19.10 The stages of lesions of poxviral skin infections.

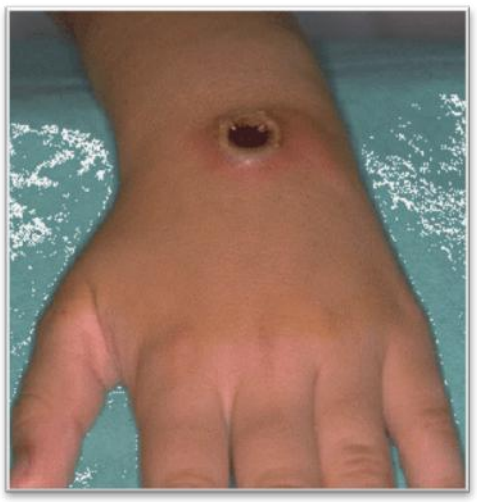


ACNE

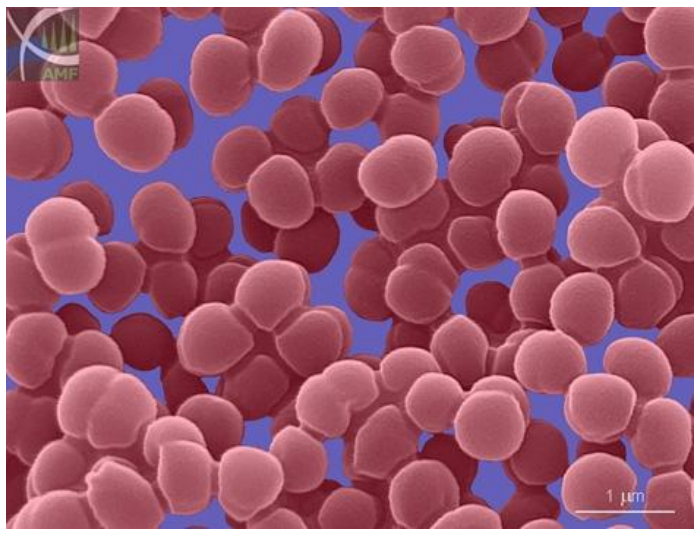
Skin infections

Pathogenic organisms can enter to the tissue through :

- **Nail Folds**



Staphylococcus:



Ring worm

Skin Cancer

Malignant melanoma

- 2% of all cancers

Risks:

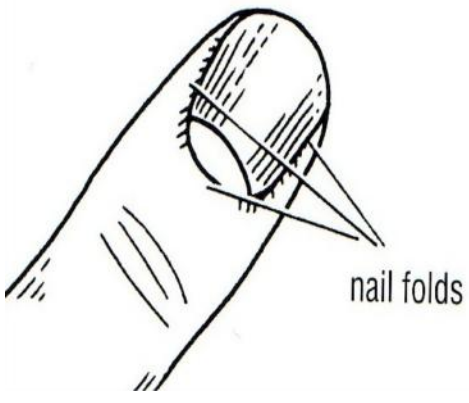
1. Skin type
2. Sun exposure
3. Family history
4. Age
5. Immunological status

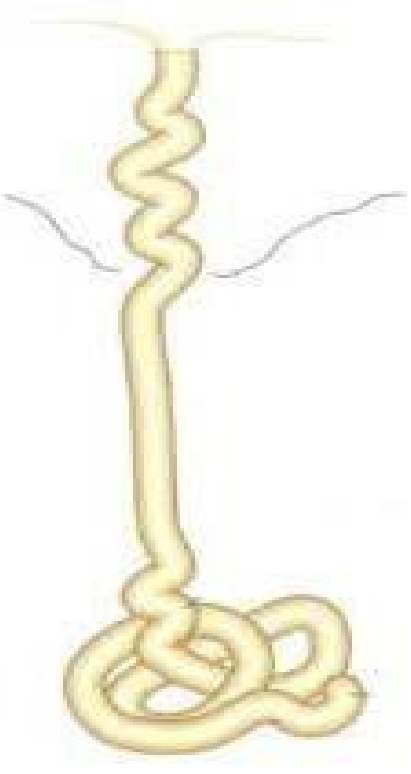
Normal mole Melanoma

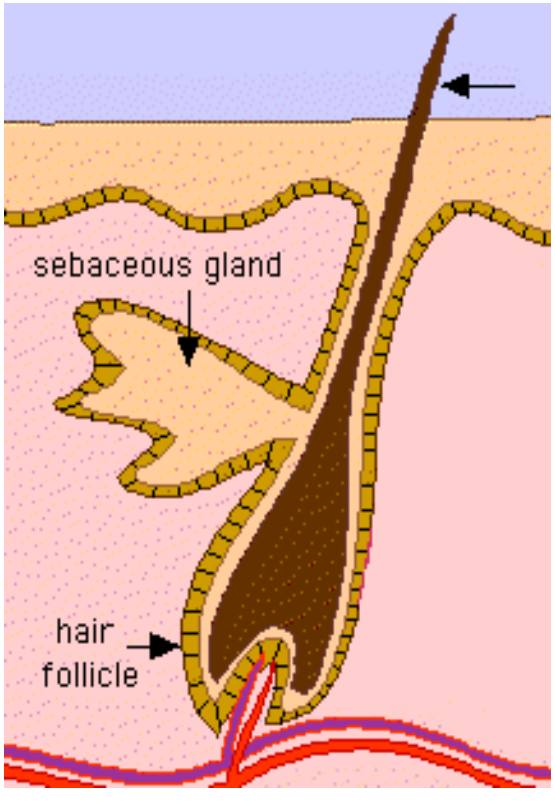
- A= asymmetry
- B= border
- C= color
- D= diameter

Skin Cancers

The appendages of the skin







Nails

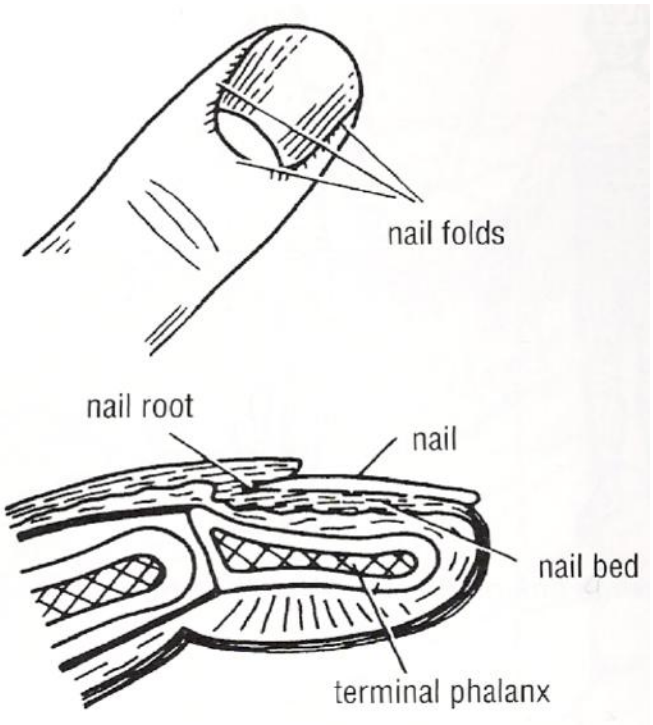
- A nail is a flat horny plate on the dorsal surface of tips of the fingers and toes

- It has:

Root: proximal edge (part embedded in skin)

body: exposed part & has a free distal edge

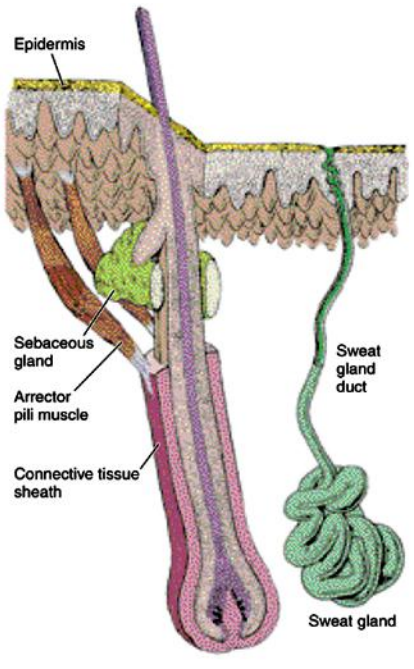
Nail fold: folds of skin surround and overlap the nail



- Nail bed is very vascular causing pink color of the nail
- The germinative zone lies beneath the root& is responsible for growth of nail

Hair

Cover whole surface of the body except some areas as lips, palms, soles, some genital areas



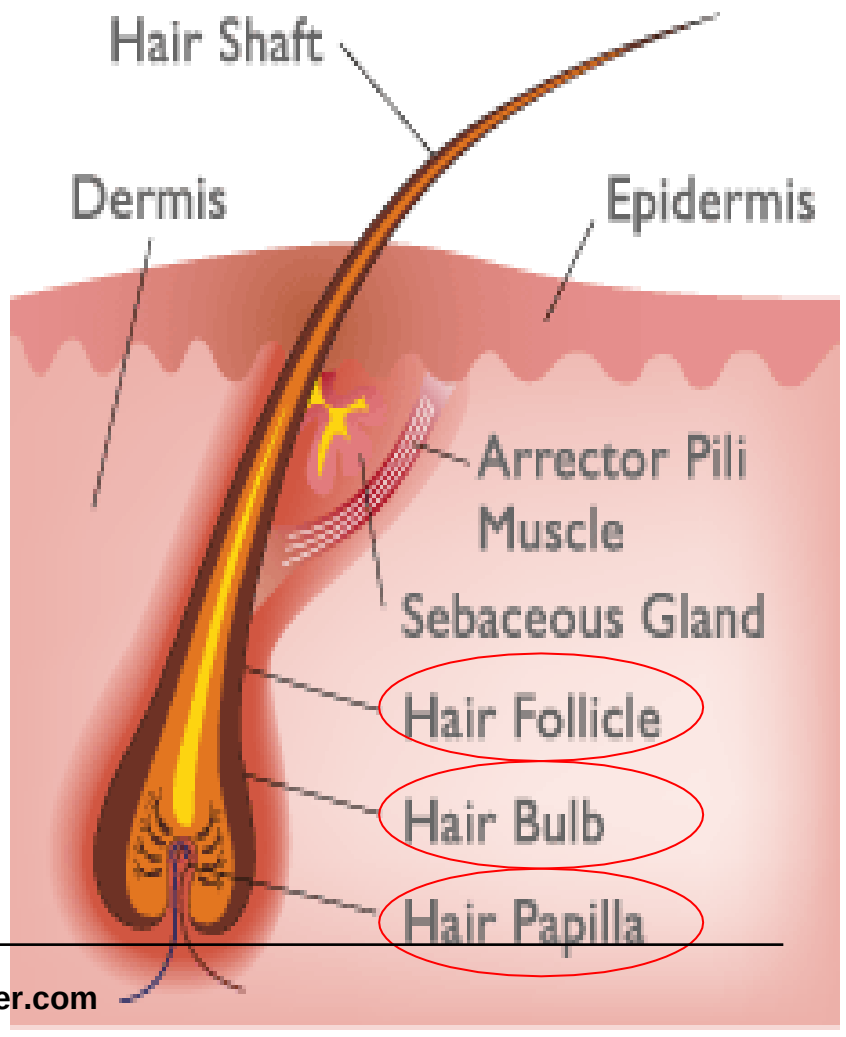
. Relationships between the skin hair follicle, arrector pili muscle, and sebaceous and sweat glands. The arrector pili muscle originates in the connective tissue sheath of the hair follicle and inserts into the papillary layer of the dermis, where it ends.

Hair

***Hair follicles*: invaginations of the epidermis into**

***Hair bulb*: the expanded extremity of the follicle, concaved at the end (located deep in the dermis).**

***Hair papilla*: a vascular tissue that occupies the concavity of the bulb.**

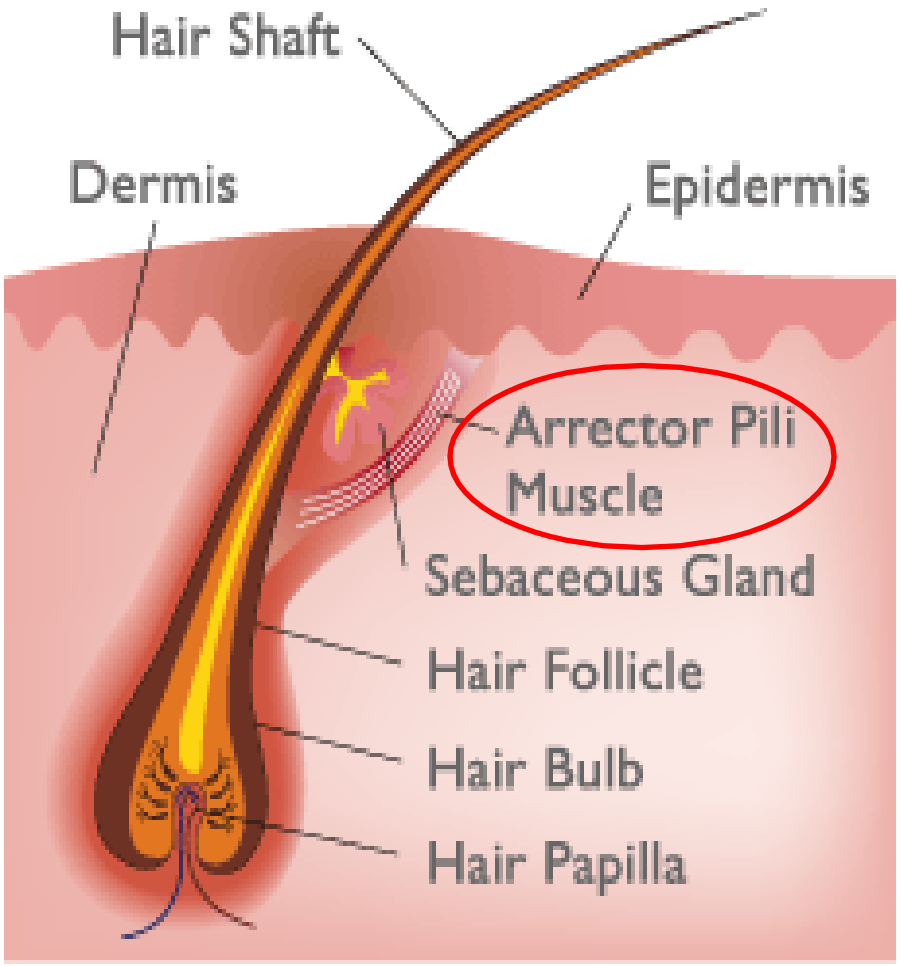


Arrector Pilli muscle

- A band of smooth muscle connects the undersurface of the follicle to the superficial part of the dermis.

- It is innervated by sympathetic nerve fibers.

- It is involuntary.

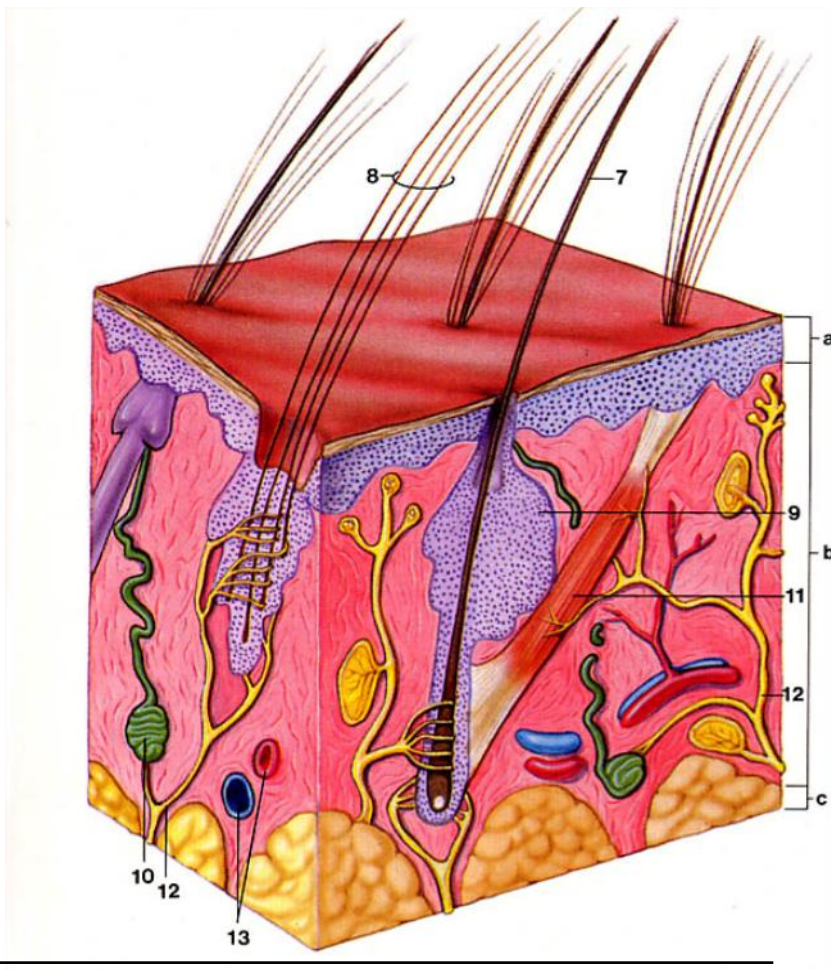


Arrector Pilli muscle

Functions:

- Its contraction causes the hair to move into a more vertical position.

- It compresses the sebaceous gland and causes it to extrude sebum

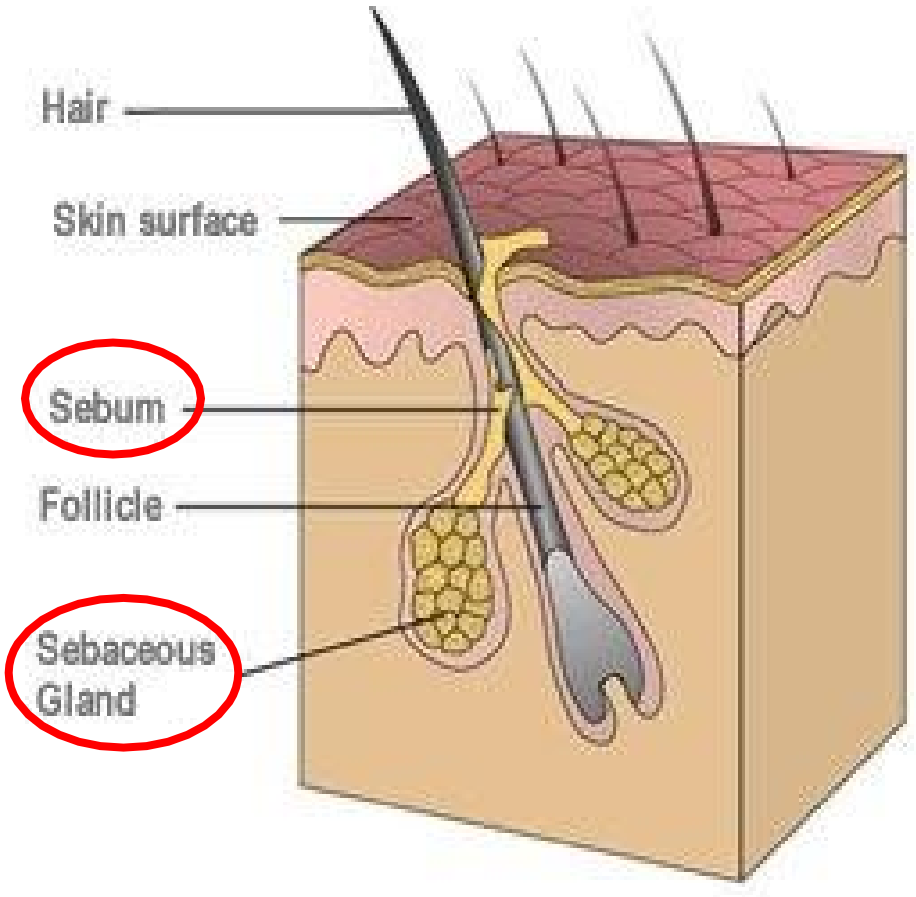


B

Sebaceous glands

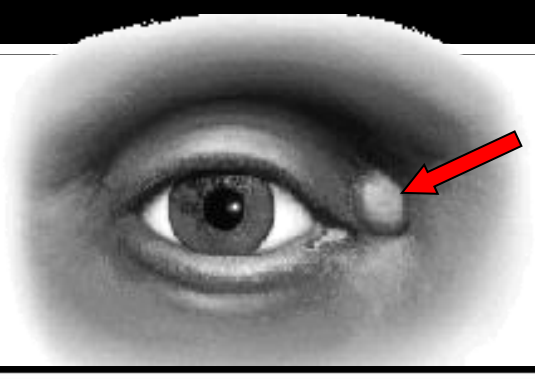
Function

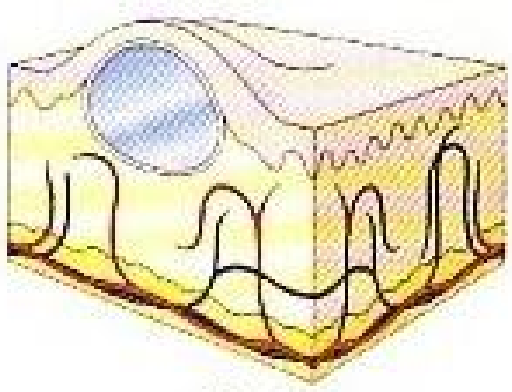
Sebum



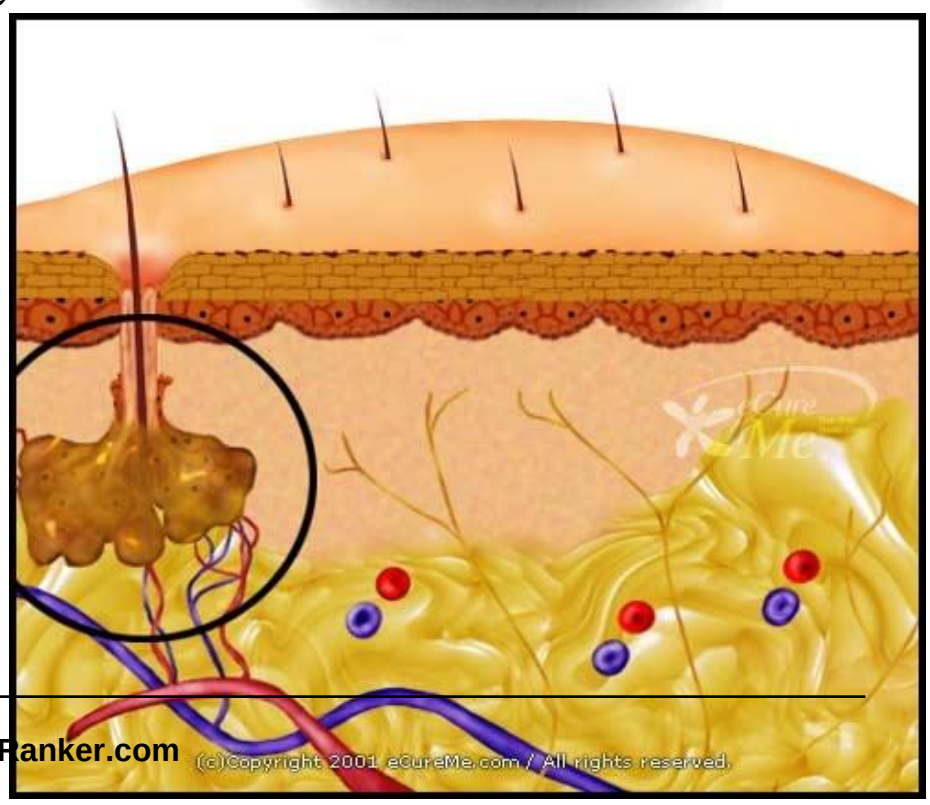
Sebaceous cyst

It occurs because of the obstruction (blocking) of the sebaceous duct.





Cyst
(fluid or semisolid filled sac)



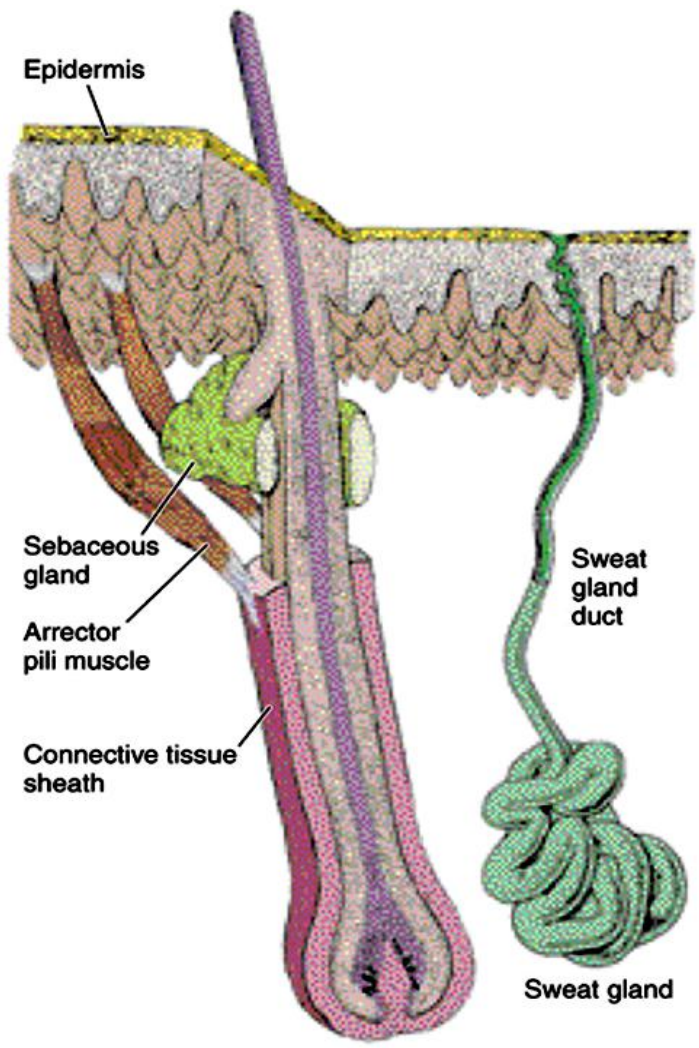
Sweat glands

tubular

lips nail beds glans

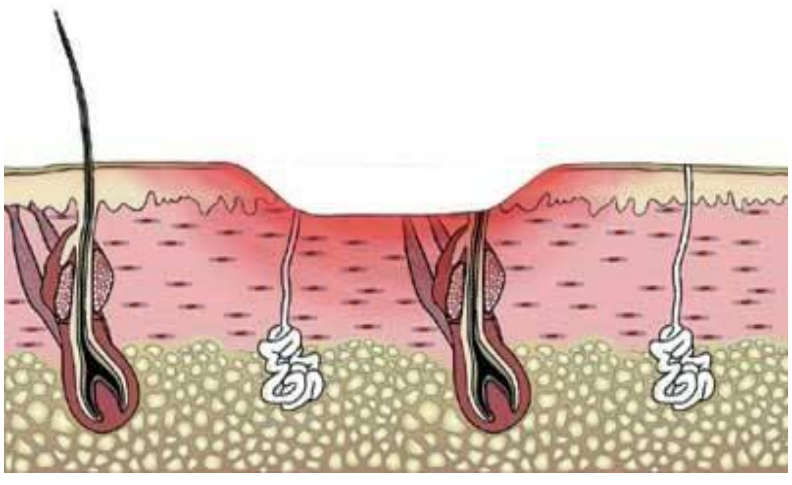
penis clitoris

deeply



Skin burns

Superficial

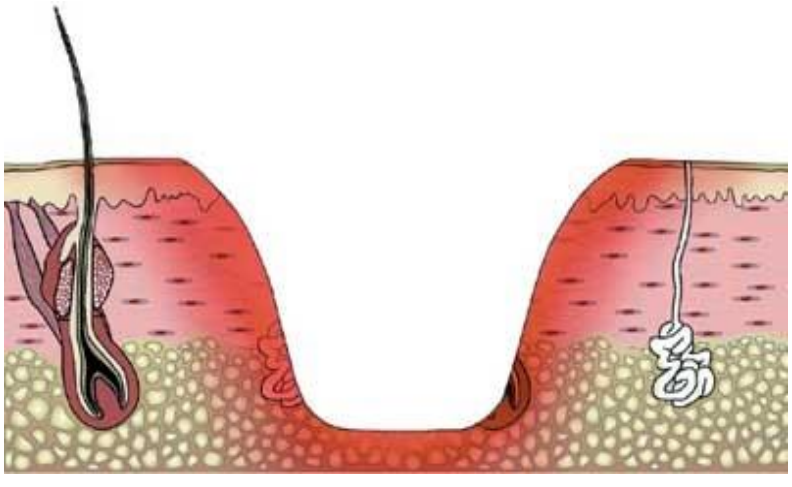


Heals rapidly from the edges,.

Heals quickly.

~~Doesn't need a skin graft.~~

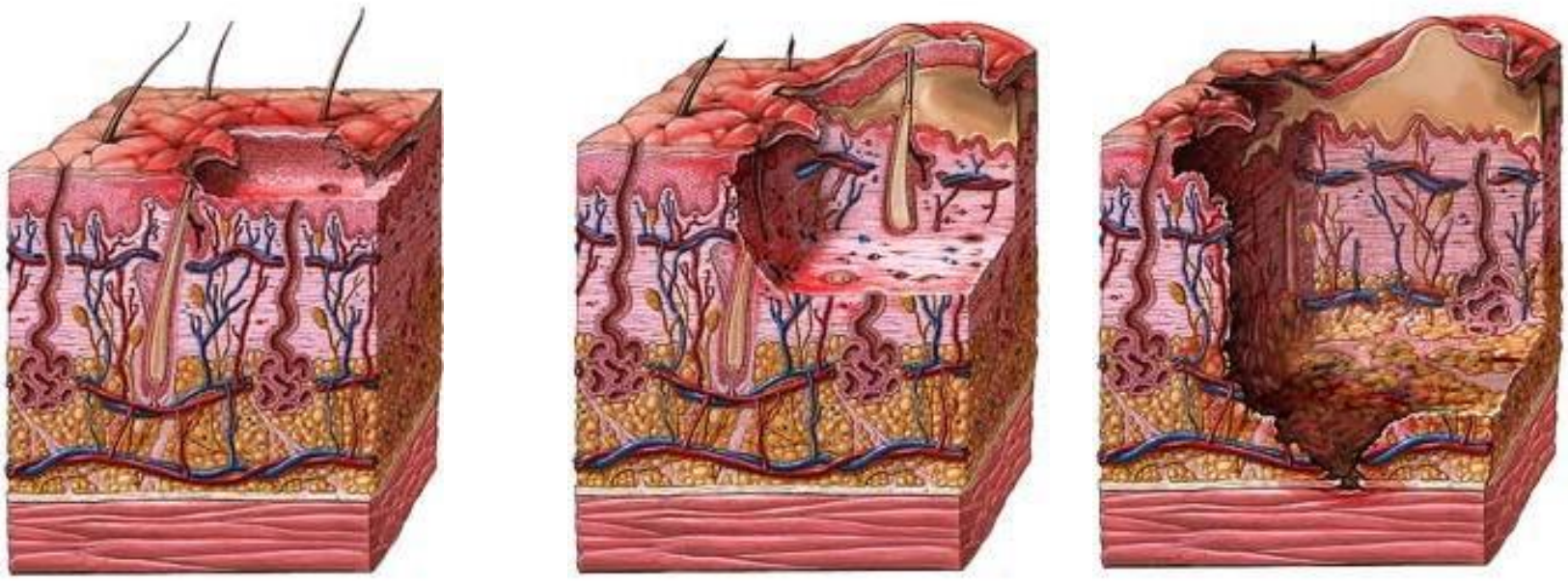
Deep



Heals slowly from the edges.

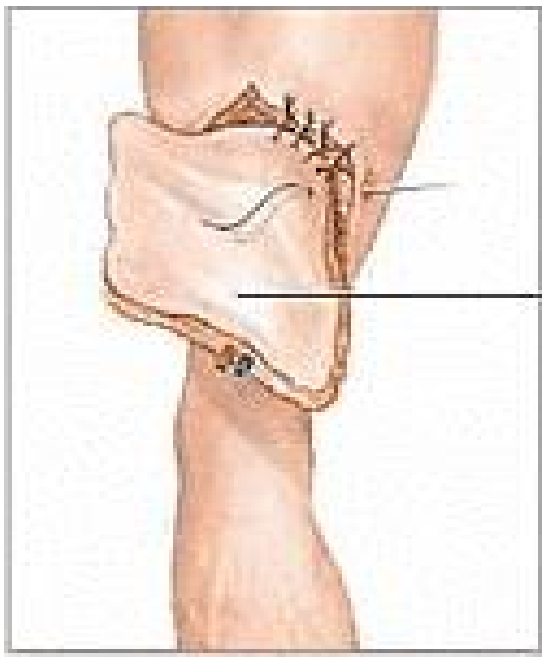
Usually needs skin grafting.

Burns



1st degree burn 2nd degree burn 3rd degree burn

Clinical notes



transferring

Clinical notes

Skin Graft

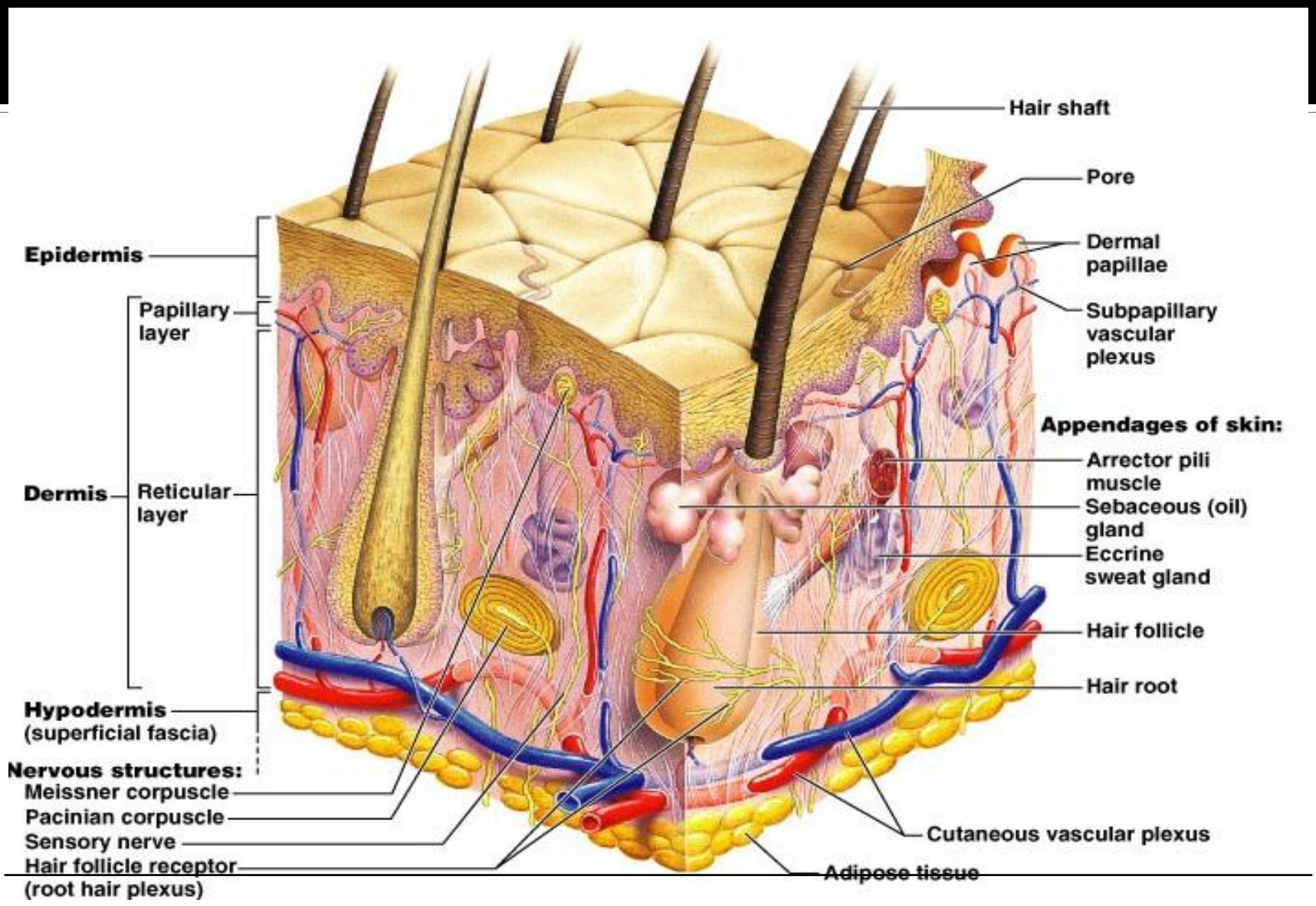
- Split thickness grafting
- Full thickness grafting

Fascia

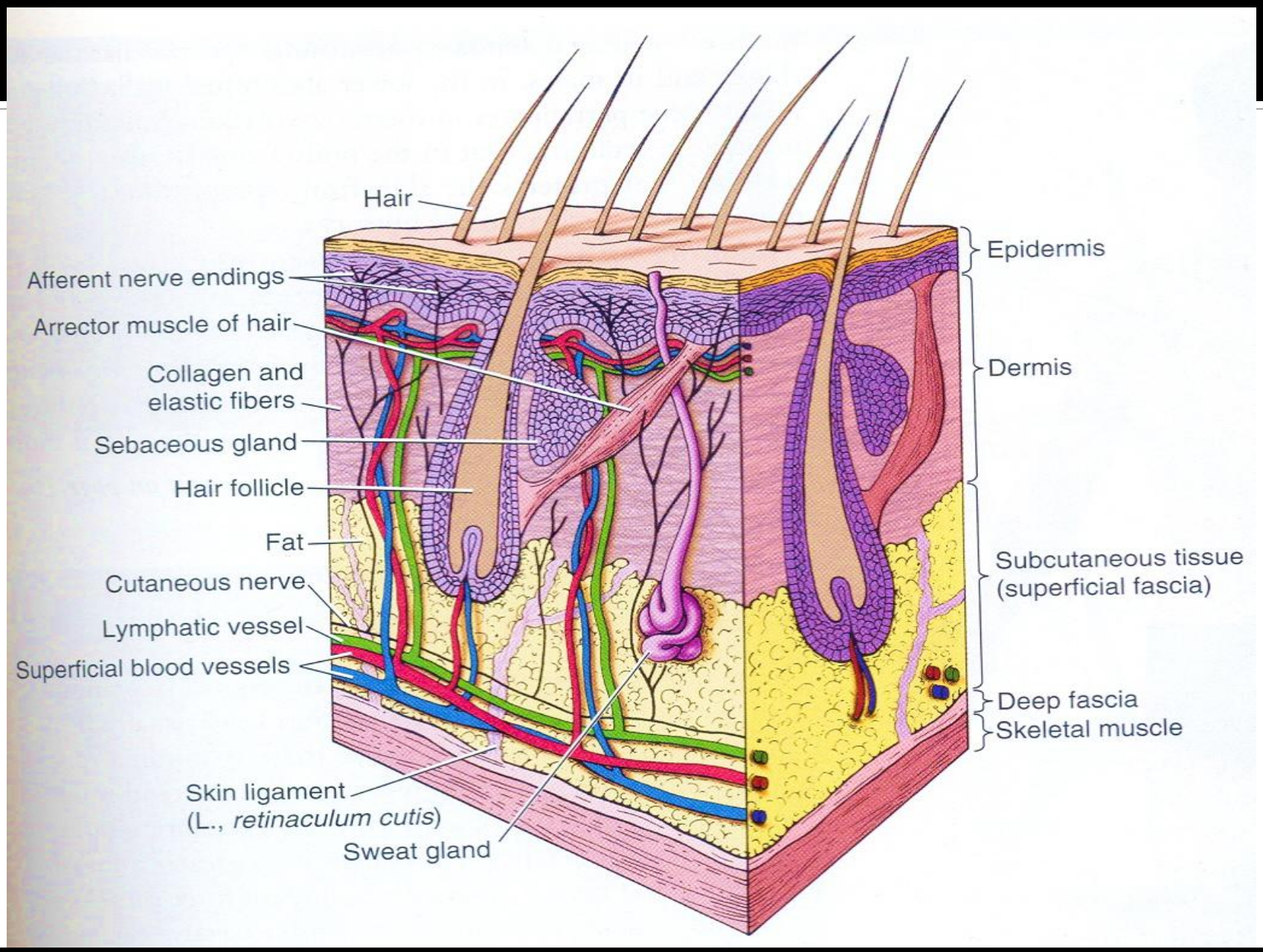
Fascia

- Superficial fascia
- Deep fascia

Superficial fascia



Deep Fascia



Superficial fascia

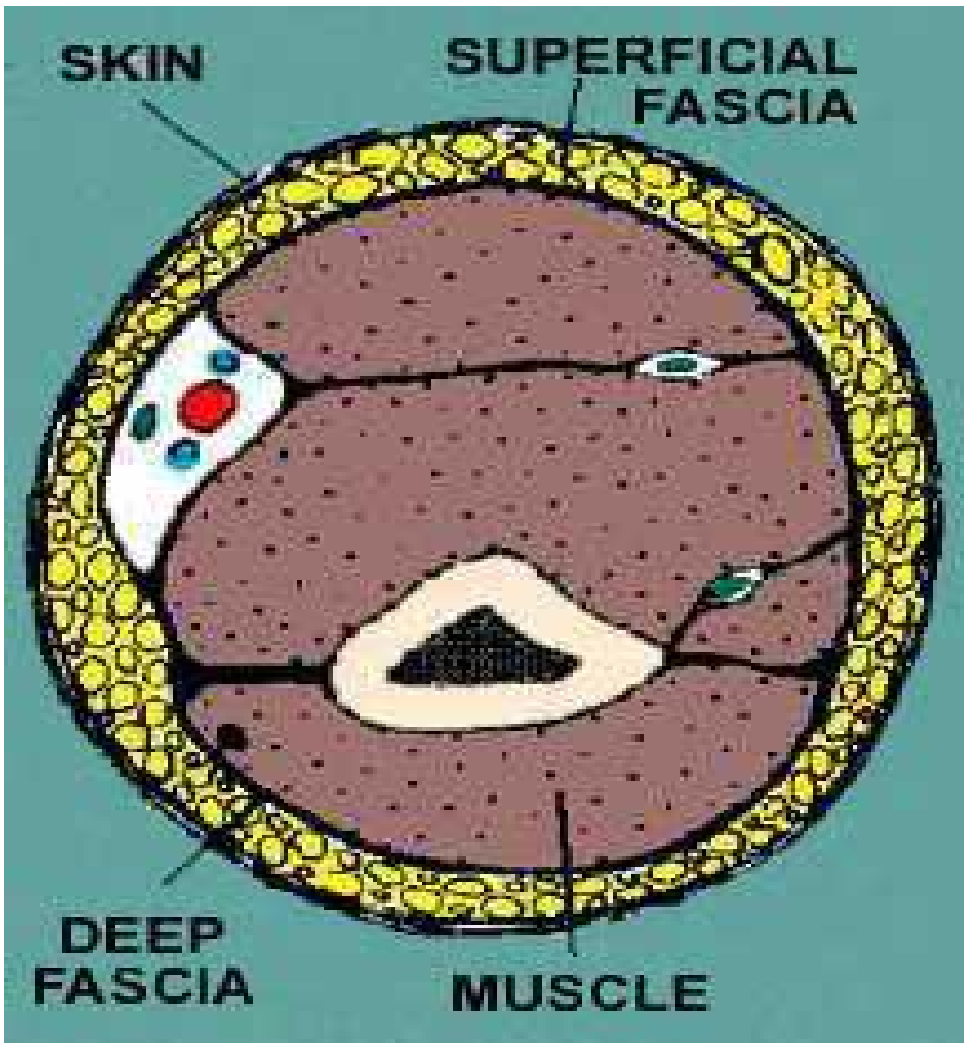
Superficial fascia:

- **Loose, mixture of adipose and loose areolar tissues.**
- **It unites the skin to the underlying structures.**
- **It is dense in some places as scalp, palm of hand and sole of foot and contains collagen bundles**
- **It is thin in the eyelids, auricle, scrotum (devoid of adipose tissue).**

Functions:

- **Facilitates movement of skin over underlying structures.**
- **Passage for cutaneous vessels, nerves.**
- **Protects the body against heat loss.**

Superficial fascia



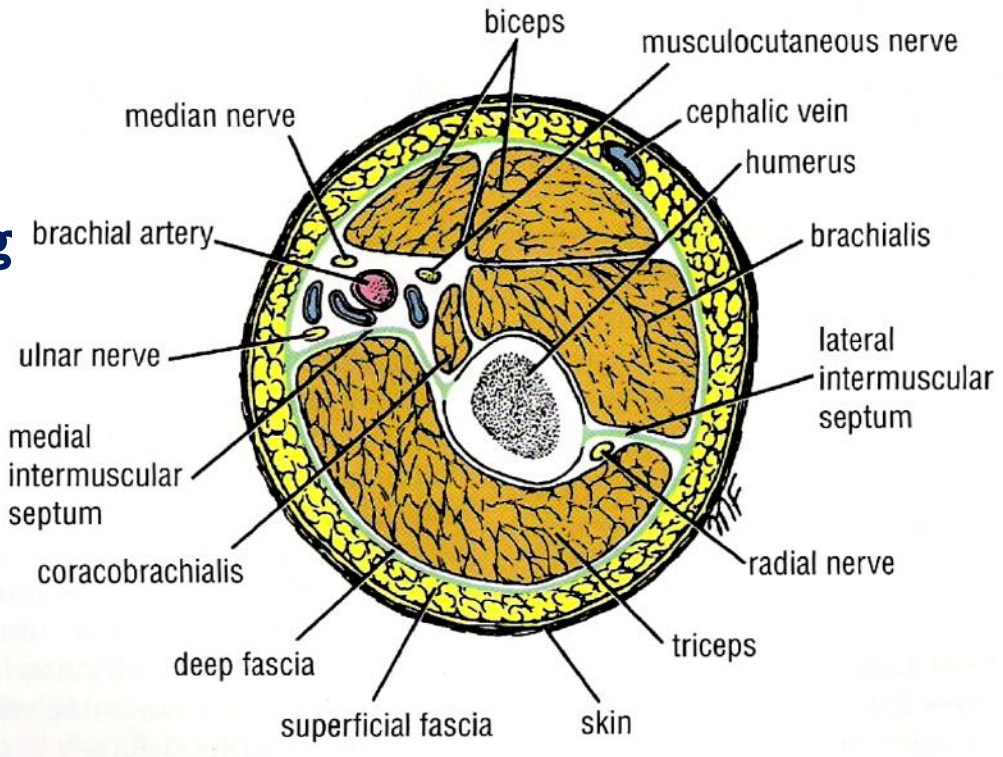
Deep fascia

- It is more dense than superficial fascia
- Collagenous bundles are more compact and more regularly arranged
- It is usually present in the form of membranes

Examples of deep fascia

A. Intermuscular septa

lie between muscles dividing the limb into compartments



Examples of deep fascia

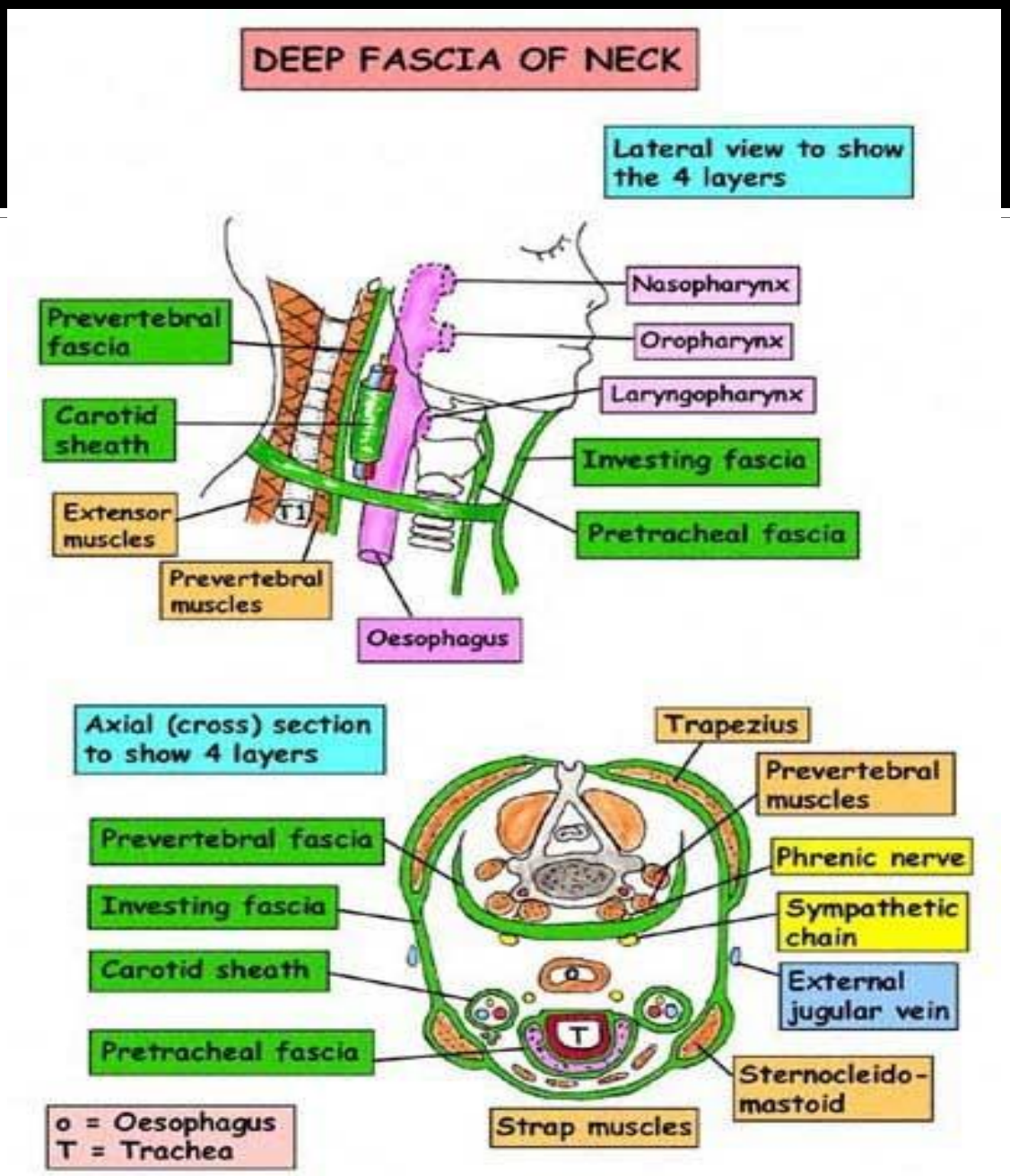
B. Investing fascia

Covers the surfaces of muscles

In the neck: it forms well-defined layers, bounds fascial spaces so limits spread of infection or determine the path of infection

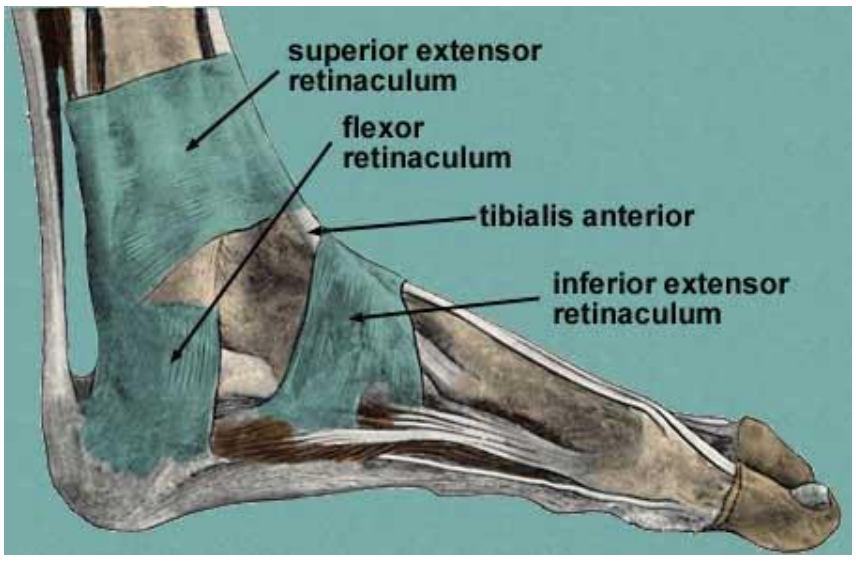
In the abdomen: it is thin

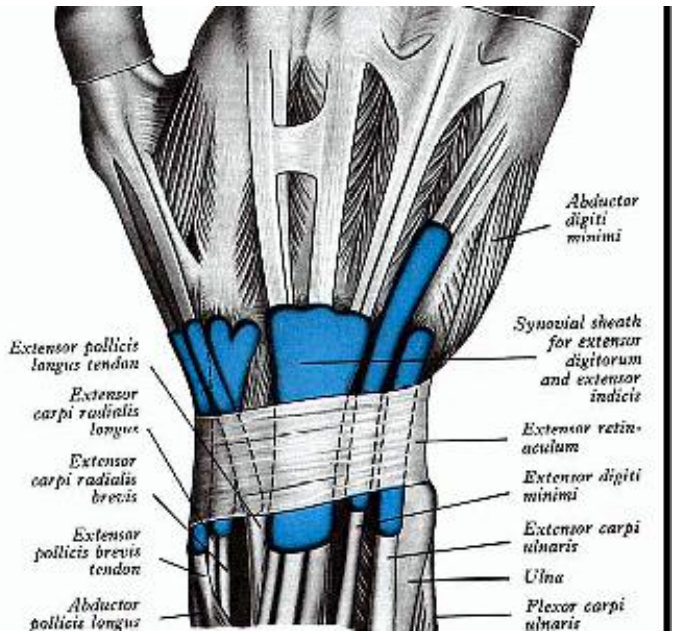
In the limbs: forms a definite sheath around the muscles



Examples of deep fascia

C. Retinacula





Localized thickening of deep fascia around joints, hold the tendons in place, prevent bowstringing of tendons