DERMATOLOGY

Function, Structure of the skin and Approach to dermatology patient

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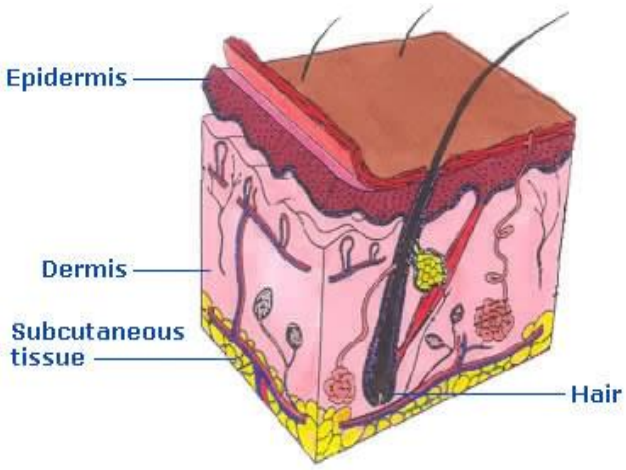
FROM SLIDES DOCTOR'S NOTES TEAM'S NOTES FROM BOOK IMPORTANT

Introduction to dermatology

- The skin is a complex (مكون من عدة اشياء), dynamic(مستمر التغير) organ.
- It is the largest organ of the body.
- It consist of many cell types and Specialized structures like "the Basement Membrane"
- It serves multiple functions that are crucial to health and survival.
- The skin consists of:
  - Epidermis (has 4 lyres)
    Basement membrane (between epidermis and dermis) thin 4 lyres
  - Dermis (2 lyres)
  - Subcutaneous tissue
  - Skin appendages



Function:

- Barrier to harmful exogenous substance & pathogens
- Prevents loss of water & proteins
- Sensory organ protects against physical injury
- Regulates body temperature
- Important component of immune system
- Vit .D production by absorbing UVB
- Has psychological and cosmetic importance such as hair, nails

Epidermis

Consist of several zones

1- Basal cell layer : (stratum basale)

keratinocytes :

Columnar dividing cells.

Rest on the basement membrane and divides continuously and move upwards. (the major cells, constituting 95% of the epidermis)

Melanocytes :dendritic cells lying between basal cells in a ratio of 1:10 and they synthesize melanin stored in melanosomes.

Melanosomes are transferred to adjacent cells by means of dendrites thus forming the "Epidermal Melanin Unit"

The size of melaosomes and packaging differentiate white from dark skin.
"The number of melanocytes are equal in white and dark skin"

2- Spinous cell layer : (stratum spinosum)

Keratinocyte adhere to each other by desmosomes (complex modification of the cell membrane) which appear like spines

Langerhans cells are antigen presenting cells

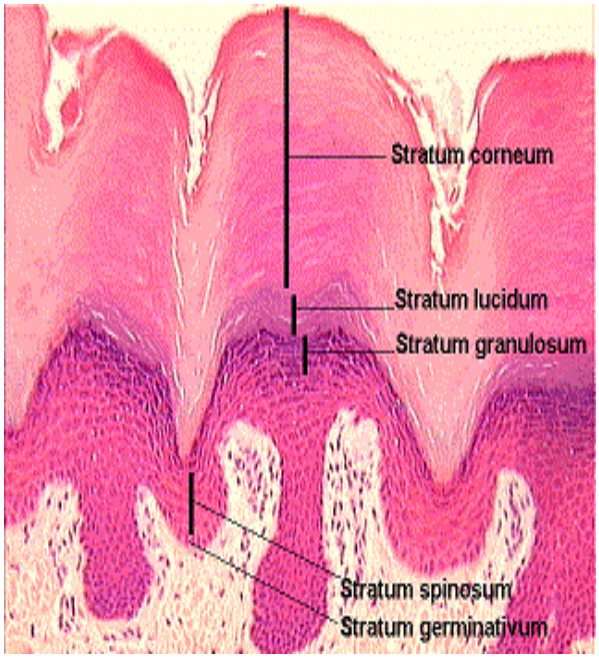
3- Granular cell layer (stratum granulosum)

Diamond shaped cells.

Cytoplasm is filled with keratohyaline granules.

Thickness of this layer is proportional to the thickness of the stratum cornium

"In thin skin it is 1 -3- cell layers and 10 cell layers in thick skin like palms and soles"



4- Cornified layer (Stratum corneum)

The cells in this layer have no nucleus . It is 25 cell layer .

Cells have thick envelope that resist chemicals.

provides protection against chemical and pathogens

- ✓ Stratum lucidum is found in thick skin below Stratum cornium.

Basement membrane

It is a pink undulated homogenous area between the epidermis and dermis .

It consist of number of proteins.

It is the site of attack injury in blistering diseases.

Formed by:

- Plasma membrane of basal cells and hemidesmosomes
- Thin clear amorphous space (lamina lucida)
- An electron dense area (lamina densa)
- Anchoring fibrils that anchors the epidermis to dermis .

Dermis

Dermis is divided into :

- Papillary dermis
- Reticular dermis

Consists of :

1.Collagen fibers >> Provides strength
Thin fibers in papillary dermis but thick and coarse in the reticular dermis .

2. Elastic Fibers. >> Provides elasticity
Protection against shearing forces.

3. Ground substance
Binds water and maintains the skin turgor.

4. . Blood vessels and nerve to nourish the overlying epidermis also.
"Fibroblasts Produce the above elements"

Function of dermis:

It provides nourishment to the epidermis and interact with it during wound repair.
It gives the skin its strength ,elasticity, and softness.

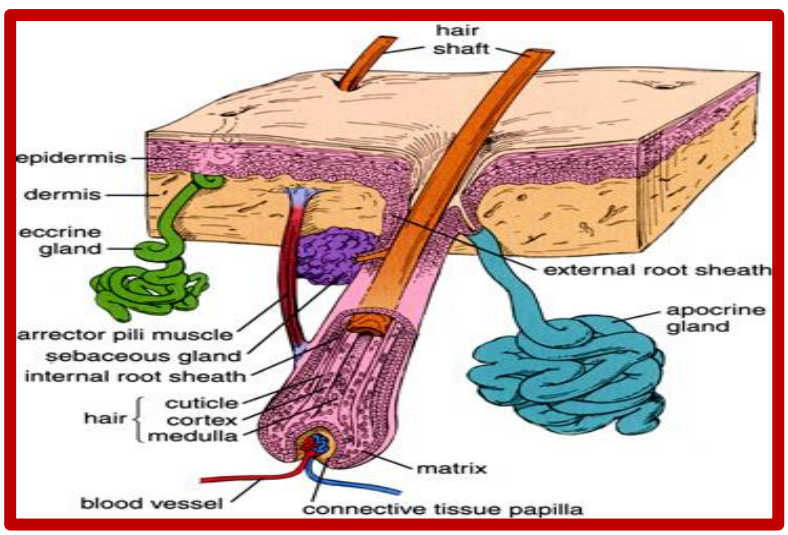
Subcutaneous Fat

Composed of lipocytes

Skin Appendages

Include:

- Eccrine/ apocrine sweat glands.
- Sebaceous glands.
- Hair Follicles.
- Nails



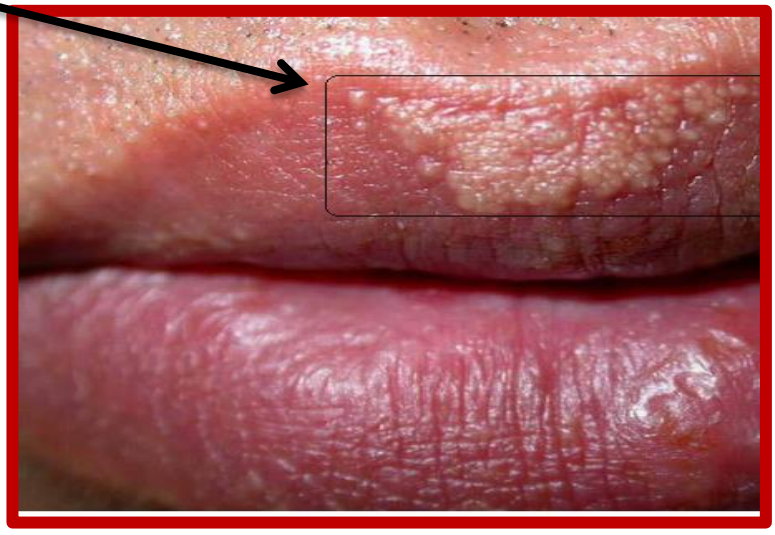
A. Sweat glands :

Eccrine	Apocrine
Open freely on the SKIN " not attached to hair follicles " Under the influence of CHOLINERGIC STIMULI Present everywhere EXCEPT : - The vermilion border - Nail beds - Labia minora - Glans **Abundant in "palms & soles"**	Attached to hair follicles Under ADRENERGIC STIMULI Present ONLY in : - The axillae - Anogenital area - Modified glands in the external ear canal - The eye lids and areolae. **Secrete viscous material that give musty odor when acted upon by bacteria**.

B. Sebaceous glands :

Attached to hair follicles or open freely.
Present in the scalp, forehead, face upper chest EXCEPT palms and soles.
Under the control of androgens

Called " **Montgomery tubercles** " **in** AREOLA
Called "**Meibomian glands**. " **in** EYE LIDS
Called "**fordyce spots** " when present in the mucous membrane as Ectopic glands



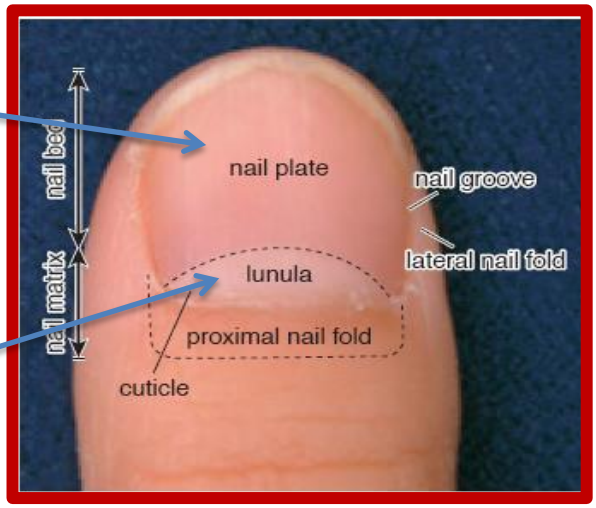
C. **Hair follicles :**

The hair follicle with it's attached sebaceous gland Form the Pilosebaceous Unit.

D. **Nails.**

The nail plate is formed of hard keratin

Proximal nail fold :
morphology can be altered in connective tissue disease



THE LUNULA is the visible part of the matrix
The matrix covers the mid-portion of the distal Phalanx

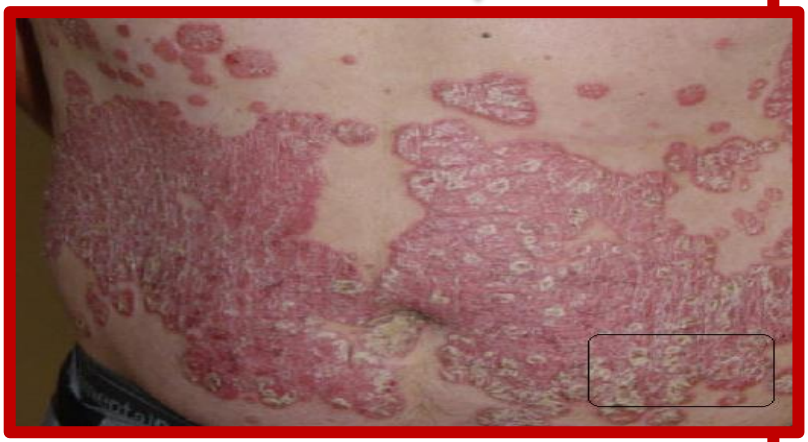
Fingernails grow 3mm/month
Toenails grow 1mm/month

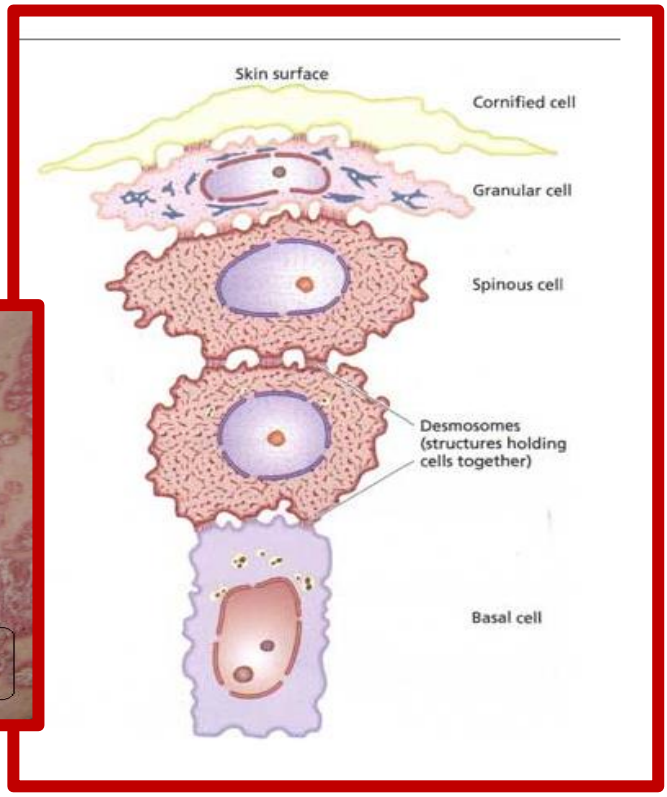
Cornification (keratinization)

It is the cytoplasmic events that occur in the cytoplasm of epidermal keratinocytes during their terminal differentiation into dead horny cell (corneocyte)

The total process takes approximately 2 months

Abnormalities in this process leads to roughness and scaling of the skin like PSORIASIS





Approach to dermatology patient

Step 1: Start with basics :

- Age
- Race
- Sex
- Occupation

Step 2 : Present complaints

History of skin lesion

Onset - when?
Where? site of onset.
Extension of lesions.
Evolution.
Itchy/ painful
Provocative factors (sun , cold, friction).
Treatment

Past medical history.
Family history.
Drug history.
Recreational and social history.

Examination :

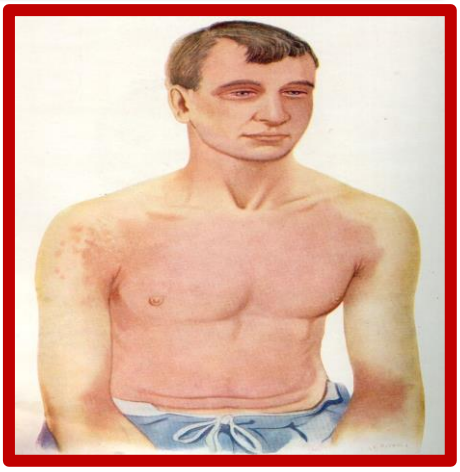
- Use good light when examining a patient.
- Examine nails & mucous membrane.

Describe the general appearance of patient.
Describe distribution of lesions
Describe arrangement of lesions
Describe the type of the lesion
Describe the shape.
Describe the color.
Describe size.

Doctor's example : ABCDE

- A= primary lesion
- B= border
- C= color
- D = distribution
- E = Configuration "The relation of lesions to each other. "

Distribution



Generalized :

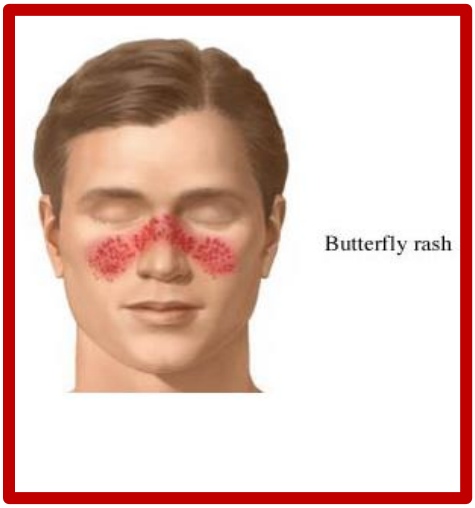
1. Symmetrical
2. Asymmetrical

Focal :

1.Unilateral
2.Bilateral

Localized to:

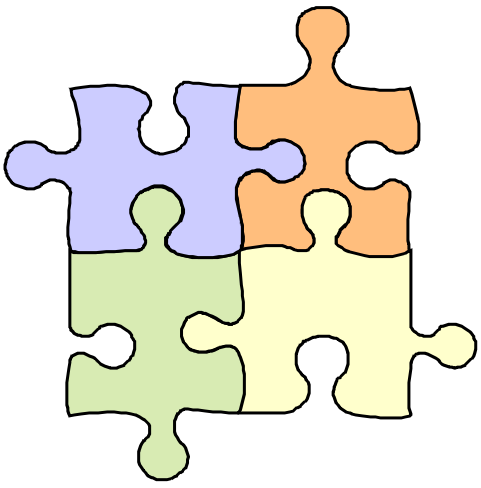
- Acral (peripheral parts, limbs, fingers, ears,)
-Sun exposed.
-Trauma sites.
-Flexures.
-Specific part



Configuration

The relation of lesions to each other.

- Linear.
-Grouped.
-Annular
-Reticular
-Circinate (circular)
-Arciform (arc like)
-Dermatomal



Linear: **Forms a line .**

Dermatomal.

Annular(Ring like)

Grouped

Reticular (Net like)

MCQs

1. **The number of layer in epidermis:**
   a) 2.
   b) 3.
   c) 4.
   d) 6.
   e) 8.

2. **Which of the epidermal cell layers provides protection against chemical and pathogens?**

   a) Stratum corneum.
   b) Stratum granulosum.
   c) Stratum spinosum.
   d) Stratum basale

3. **The main cell type in the epidermis is**:
   a. Keratinocytes
   b. Melanocytes
   c. Langerhans cells
   d. A and B

4. **Thick skin differ from thin skin in:**
   a) No different .
   b) Thick spinous layer.
   c) Thick basal layer .
   d) Thick stratum cornium

5. **During your clinical attachment in dermatology clinic the dermatologist explained the real difference between normal white and black skin. Which of the following explain the cause of this difference?**

   a. Difference in number of melanocytes
   b. Melanocytes are deeper in dark skin
   c. Melanocytes number is equal but the activity is different
   d.Keratinocytes are different in number

ANS :

1 – C
2 – A
3 – A
4 – D
5 – C