



## Derma Team 436

# Introduction to Dermatology Part 1&2 (Skin Structure & Dermatological Language)

### Course Objectives:

- To learn and understand the normal structure of the skin
- To be able to take proper history from a dermatology patient
- To be able to describe lesions by using proper dermatological terminology
- To be able to formulate a list of differential diagnosis
- To be able to diagnose and treat common skin disorders
- To be familiar with dermatologic emergencies

### Introduction to Dermatology

- Functions & Structures of the Skin
- How to Approach a Dermatology Patient
- Descriptive Terms Used in Dermatology
- Morphology of Skin Lesions
- Reaction Patterns
- Treatments used in Dermatology

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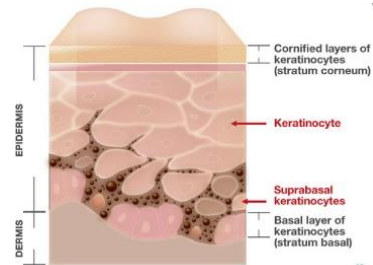
**Before you start..** [CHECK THE EDITING FILE](#)

**Sources:** doctor's slides and notes + 436 group B team

[ Color index: **Important** | **doctor notes** | Extra]

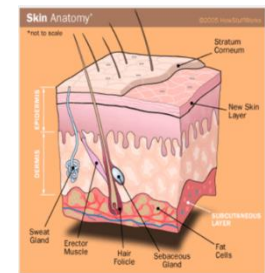
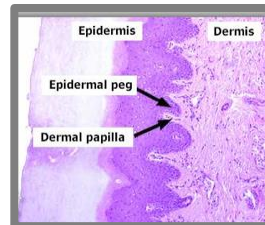
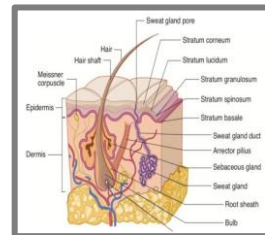
## The Skin:

- **The largest and heaviest** organ in the body. It has a body surface area of 1.5 – 2 m<sup>2</sup> and it contributes to 1/6 to 1/7 of body weight.
- It consists of many cell types called “**Keratinocytes**”
- Specialized structures like the Basement Membrane
- It serves multiple functions that are crucial to health and survival



## Skin function:

- **Immune function:** Barrier to harmful exogenous substance & pathogens, Langerhans cells in the skin are part of the adaptive immune system
- **Metabolic & endocrine function:** Prevents loss of water & proteins, Vit.D production by absorbing UVB.
- **Sensory organ:** Contains a **variety** of nerve endings that respond to heat, cold, touch, pressure, vibration and pain. Hence, protects against physical injury.
- **Thermoregulation:** Through eccrine glands and dermal blood vessels Important component of immune system **autonomic nervous system** what does the skin do? (Through the sweat glands, constriction or dilation of blood vessels)
- **Cosmetic importance** such as hair, nails.



## Skin structure:

The skin consists of:

1. Epidermis
2. Basement membrane
3. Dermis
4. Subcutaneous tissue
5. Skin appendage: (hair, nail, sweat & sebaceous glands)

### 1) The epidermis:

Is the **outermost** layer of the skin. **The main cell types which make up the epidermis are:**

- 1-Keratinocytes **90% of epidermis + produce keratin** the main cell type in the skin as we go up the cells become less nucleated
- 2-Melanocytes produce melanin responsible for skin color and protection against UV light.
- 3- Merkel cells serve a neurological function They are essential for light touch.
- 4-Langerhans cells are antigen presenting cells (immune system).

#### 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
- It involves the formation of keratin polypeptides.
- Abnormalities in this process lead to roughness and scaling of the skin like PSORIASIS (In psoriasis it takes 3 days which will result in a lot of scales)

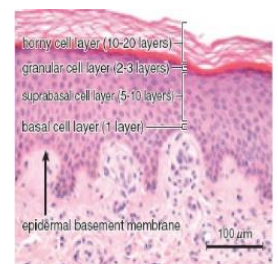
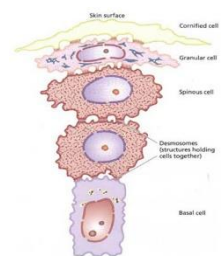


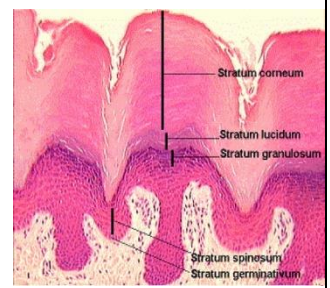
Fig. 1.4 The four layers of the epidermis



Composed of four layers:

**1) Stratum corneum (cornified layer horny cell layer):**

- Is the outermost layer of the epidermis.
- Composed of elongated and flattened dead cells with **no nuclei or organelles** called 'corneocytes' (**dead cells**).
- **Its 25-cell layer**. The cells have a thick envelope that resist external chemicals. In psoriasis you see a nucleus in the stratum corneum, this is NOT normal! (**Parakeratosis**)
- In diseases like psoriasis the keratinocytes divide rapidly the cells go all the way up because they are very fast, and they contain a nucleus. Its not normal to see a nucleated cell up here.

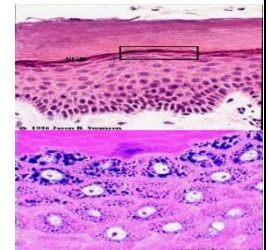


**2). Stratum lucidum**

- Is found in thick skin of the palms and soles below the startum cornium

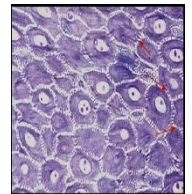
**3) Stratum granulosum (granular cell layer) (flat cells containing keratohyalin granules):**

- If you go back it looks like it has granules, from afar it looks like it is purple or violet
- Diamond shaped cells
- Cytoplasm is filled with keratohyalin granules **hence why its more dense in color** (the protein Keratohyalin forms dense cytoplasmic granules that promote dehydration of the cellswell as aggregation and cross-linking of the keratinfibers. The nucleiand other organelles then disintegrate, and the cells die)
- The thickness of this layer is proportional to that of the stratum corneum thicker in palms and soles than in the face because the stratum corneum is thicker there.
- In thin skin it is 1-3 cell layers and 10 cell layers in thick skin like palms and soles.



**4) Stratum spinosum (spinous cell layer, polyhedral cells attached by desmosomes):**

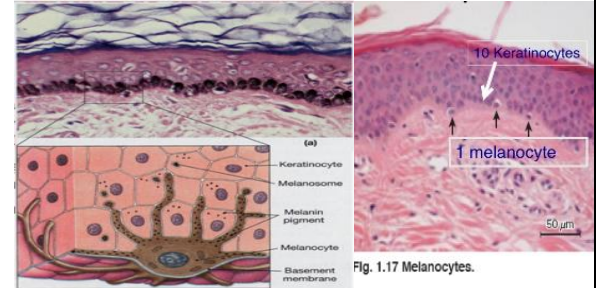
- Keratinocytes in this layer adhere to each other by Desmosomes (complex modification of the cell membrane). Desmosomes appear like spines.
- So called because of desmosomes and keratin filaments that gives the cells a spiny appearance
- Desmosome is a complex modification of the cell membrane. When there is a problem with desmosomes, the patient develops "blistering diseases" > the connection between keratinocytes is no longer there due to autoimmune antibodies or other causes.
- Bone marrow derived Langerhan cells are antigen presenting cells (MHC II) **present in abundance in this layer**. (skin immune function/adaptive immunity) and they can be identified through birbeck granules. Abnormal proliferation of these cells is seen in Langerhans cell histiocytosis
- Other autoimmune **bullous disease that targets desmosomes which looses attachment from one keratinocyte to the other which leads to flaccid blisters**



**5) Stratum basalis (basal cell layer) (columnar or cuboidal dividing cells): stem cells**

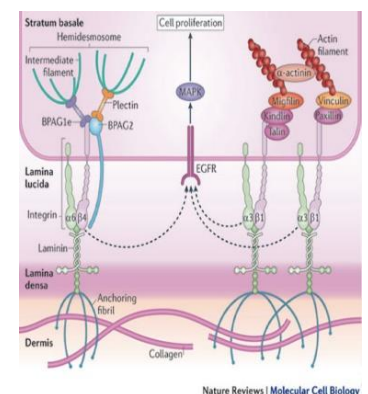
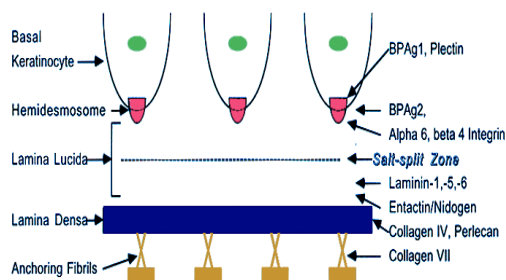
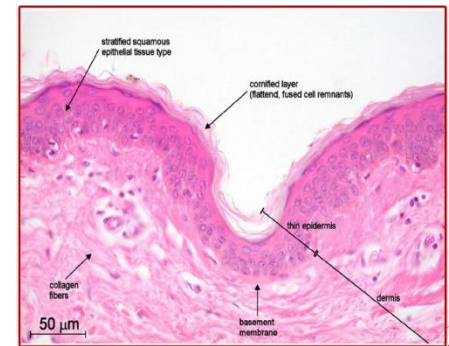
- This layer Rests on (above)the basement membrane
- Divides continuously and moves upwards.
- It takes 28 days to transmit cells from this layer to stratum corneum

- In this layer there is also cells called Melanocytes which are dendritic cells lying between basal cells in a ratio of **1:10** for every 10 keratinocytes, there is ONE melanocyte. Melanocytes are scattered among the keratinocytes.
- Melanocytes synthesize melanin stored in melanosomes (pigment granules). melanosomes are transferred to adjacent cells (keratinocytes) by means of dendrites thus forming **the epidermal melanin unit** (the melanin melanosomes unit) . Melanosomes serve as the packaging of melanin pigment.
- The size of melanosomes and packaging differentiate white from dark skin, the number of melanocytes is equal in white and dark skin **what differs is the SIZE of the melanosomes**. Melanocytes are cells responsible for skin pigment and provide protection from UV light. They are mainly seen in this layer. Melanocytes can also be found in the hair bulb, eye and brain.



## 2) Basement Membrane:

- It is a pink undulated homogenous area between the epidermis and dermis
- It consists of number of proteins.
- **It is the site of attack injury in blistering diseases.**
- Autoimmune bullous diseases attack the basement membrane which leads to separation between epidermis and dermis and blistering
- Thickened in certain skin diseases like discoid lupus erythematosus
- Suggestive vs consistent with: consistent with is more sure while suggestive is ايجاء
- One of the features of CT diseases on skin biopsy is thickening of basement membrane.
- **Formed by:**
- Plasma membrane of basal cells and hemidesmosomes (proteins that anchor the basal cells to basement membrane).
- Thin clear amorphous space (lamina lucida). **Seen on EM only**
- An electron dense area (lamina densa).
- Anchoring fibrils that anchors the epidermis to dermis.
- There are certain autoimmune diseases where these anchoring fibrils are not there called ... babies are born and when you hold them their skin comes off. They are genetic diseases. Eventually they get strictures. (beyond your level)



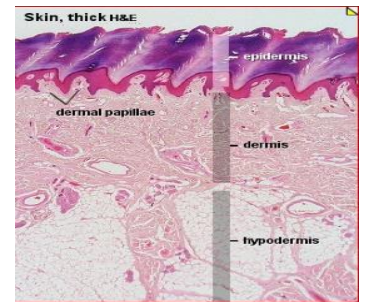
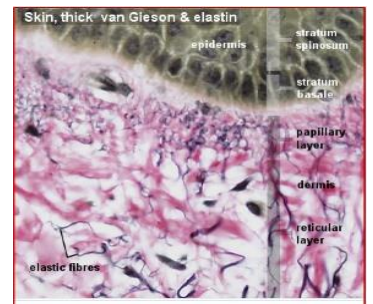
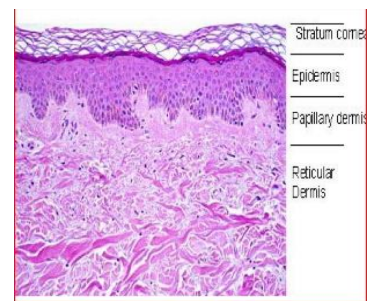
## 2) Dermis:

## Divided into:

1. papillary dermis (Upper layer)
2. reticular dermis (lower layer) "Bigger part"

## Consists of:

1. **Collagen fibers** (provides strength):  
-70-80%  
-Thin fibers in papillary dermis but thick and coarse in the reticular dermis.
2. **Elastic fibers** (provides elasticity).  
-1-3 %  
-Protects against shearing forces collagen and elastin are reduced with age, this is why we give collagen for age related wrinkles.
3. **Ground substance** (softness)  
- Are proteoglycans  
-binds water and maintains skin turgor.
4. **Fibroblasts**  
-produce the above elements (collagen)
5. **Blood vessels**  
- It provides nourishment to the overlying epidermis and interact with it during wound repair, nerves, lymphatics and muscles. **No blood vessels in the epidermis**



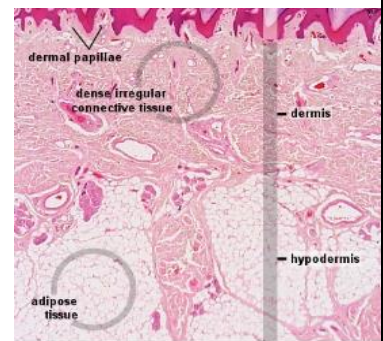
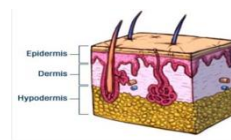
## Functions of the dermis:

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

**The cells in the dermis include:** macrophages, fibroblasts, dermal dendritic cells and mast cells (immune functions).

## 3) Subcutaneous fat:

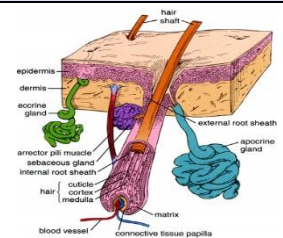
- Composed of **Lipocytes**.
- What is the fundamental unit of Subcutaneous fat? lipocytes.
- Attach the skin to underlying bone and muscle as well as supplying it with blood vessels and nerves.
- The main cell types are fibroblasts, macrophages and adipocytes



## 5) Skin appendage:

are skin-associated structures that serve a particular function It includes:

- 1-Eccrine/apocrine sweat glands.
- 2-Hair follicles.
- 3-Sebaceous glands.
- 4-Nail.

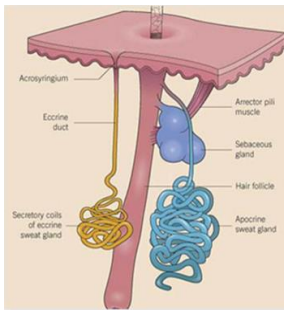


## Pilosebaceous unit

Formed by the hair follicles with it's attached sebaceous gland (you have to know that)

**Ecrrine sweat glands (IMP):**

- Tubular structures open **freely on the skin, not attached to hair follicles.** While apocrine is attached to hair follicles.
- Under **cholinergic stimuli.** parasympathetic
- **Present everywhere except:**
  - The vermilion border of lip.
  - Nail beds (under nail plate)
  - glans penis.
  - Labia minora.
- **Abundant** in palms and soles.

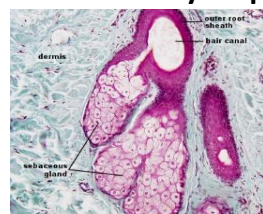
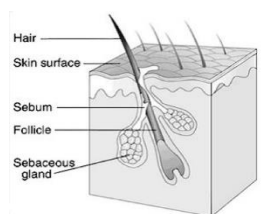


**Apocrine sweat glands:**

- Are modified sweat glands that present in the axillae, anogenital, external ear canal, the eye lids (**moll's glands**) and the areolae.
- Secrete viscous material that gives musky odor when acted upon by Bacteria.
- Under **adrenergic stimuli.**

**Sebaceous glands:**

- Attached to hair follicles or open freely. If attached, it's called pilosebaceous unit.
- Present in the scalp, forehead, face and upper chest **except palms and soles.** My hands are **sweaty not oily**
- Secrete sebum to moisturize the skin.
- Sebaceous glands are under the control of **androgens**
- Sebaceous glands in the areola are called **Montgomery tubercles**, in the eyelid they are called **meibomian glands.**
- Ectopic Sebaceous glands in the mucous membrane are called **Fordyce spots (after fillers)**



**Hair follicles:**

- Hair follicle has the hair shaft, hair bulb and the bulge.
- **Pilosebaceous unit include: hair follicle + sebaceous gland+ arrector pili muscle.**



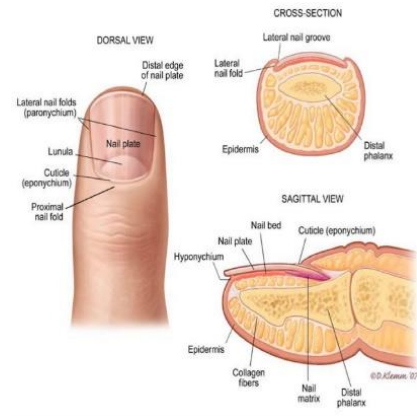
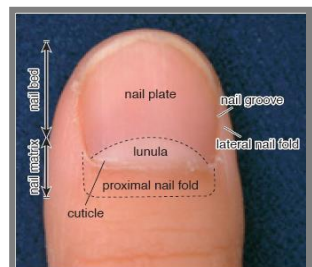
**Nails:**

- The nail plate is formed of hard keratin.
- Fingernails grow 3mm/month. Toenails grow 1mm/month.
- 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.
- Nails can be affected in systemic and skin diseases.

**NAIL DISORDERS**

1- ABSENT PART: Anonychia congenita	4	3	2	1
2- NAIL PITTING: Psoriasis	8	7	6	5
3- CUTICLE INVASION: Lichen planus	12	11	10	9
4- PIGMENTATION & RIDGING: Monilia	16	15	14	13
5- DISTAL ONYCHOLYSIS: Tinea	18	17		

11- YELLOW: Bronchiectasis, Lymphoma & Edema  
 12- HALF & HALF: Hepatic Necrosis  
 13- RIDGING: Rheumatoid arthritis  
 14- LONGITUDINAL BROWN LINES: Addisons's, Breast cancer & Melanoma  
 15- WHITE NAILS: Anemia  
 16- RED NAILS: SLE, Polycythemia  
 17- HORIZONTAL WHITE & PINK BANDS: Nephrotic Syndrome  
 18- BRITTLE NAILS: Hypothyroidism

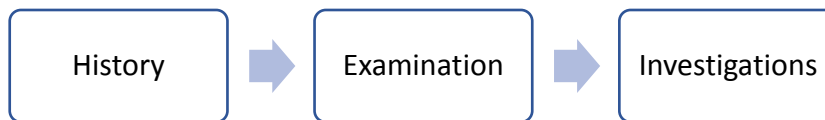


# Part 2 (Dermatological Language)

## Why Do Dermatologists Use Words That Are Rarely Used by Other Medical Specialties?

- ✓ The language of dermatology is different, and the use of correct dermatologic terms is important to accurately describe skin lesions.
- ✓ A good description of a skin lesion enables the listener to formulate a series of differential diagnosis.
  - Vesicular > herpes
  - Bullae > autoimmune bullous diseases
  - I had a patient once, she came because she had pigmentation. It was the only thing that bothered her. Turns out she had lupus, she was highly positive (1:2600). When I took history, turns out she has joint pain and photosensitivity.
  - For example when a resident is oncall and he is calling me. What I do is trying to imagine what he is saying. If he gave me a good description I can help him to get Ddx without seeing the patient.
  - Another example there was a girl she came with pigmentation she only concerned because the pigmentation and she had it for a year and half. OK what looks like that? It turned out that she's having lupus and she didn't know. When I dug in her hx I found that she has joint pain and photosensitivity and all what she was complaining of is pigmentation so that's why description in our specialty is very important.

## ◆ How do you approach a patient with skin lesions?



### 1) History

- **Personal Data:** Age, gender, race, Occupation and marital status
- **Chief Complaint:** Onset, duration (Acute, subacute, chronic), progression (constant or increasing in size), associated symptoms (itching, pain), triggering and relieving factor (sun, heat, cold ...Etc.)
- **Where** did the problem first appeared? (does it change sites?)
- **Treatment** history.
- **Drug Hx and allergy Hx** VERY IMPORTANT in dermatology
- **Past medical** history (general relevant medical history). (chronic diseases)
- **Occupational** and recreational history. (Jobs like painting)
- **Travel** and **Family** and **household** contact history (pets)
- **Social History**
- **Systematic review**


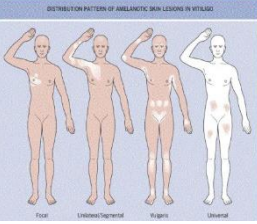
### 1) Examination Don't forget the patient vital signs

- Full skin examination should be carried out to determine the full extent of the problem and possible unrelated conditions.
- The examination should be done in a good light, better natural sunlight. Crucial in examination in dermatology and in current days we use something called Dermatoscope (small instrument with a lens and it has light. We put it and we look at the lesions in magnified manner).
- **Skin, nails, hair, mucous membranes should all be examined.** Easily forgotten but they are very very important parts of the skin.
- **Describe the General appearance of the patient.**




- Describe skin lesion as follow:
  - Distribution\*
  - Configuration
  - Size
  - Border and shape
  - Color
  - Morphology (Primary lesion and Secondary changes) Primary lesion something appeared and we didn't scratch it and it didn't get abraded. Primary lesion looks what it looked like when it appeared. Secondary lesion means that there were secondary changes that happened to it and there are a certain lesions that cannot happen as primary lesions. They happen as primary lesion and they will progress into secondary lesions. For example in Eczema starts as an eczematous lesion with chronic changes from chronic itching Lichenification (will be discussed later) will occur on top of it (secondary changes).
- Palpate for consistency mobility depth and tenderness.
- Lymph node exams in selected diseases like mycosis fungoides and skin cancers.
- Some dermatologists argue that first thing we have to do is examination and then we do history because describing and looking at things first is important and then we go like "ummmm... this pattern looks like something I've seen before let me ask the right history".

### ◆ Distribution:

- Distribution refers to how the skin lesions are scattered or spread out
- Skin lesions may be isolated (solitary/ single) or multiple
- The localization of multiple lesions in certain regions aids in making a diagnosis, as skin diseases tend to have characteristic distribution
- Aids in understanding the extent of the eruption and its pattern

Distribution	Description	Picture
<b>Acral</b>	<ul style="list-style-type: none"> <li>• Affects distal portions of limbs (hand, foot) and head (ears, nose)</li> <li>• peripheral body parts e.g. vitiligo</li> </ul>	--
<b>Dermatomal</b>	Corresponding with nerve root distribution following the dermatomes, e.g. Shingle (الحزام الناري)	
<b>Extensor</b>	<ul style="list-style-type: none"> <li>• Involving extensor surfaces of limbs</li> <li>• Contrast with flexor surfaces</li> </ul> <p>For example there are certain diseases like certain types of vasculitis that happen in young kids called Henoch–Schönlein purpura they only happen on extensor surfaces.</p>	--
<b>Flexural</b>	<ul style="list-style-type: none"> <li>• Involving skin flexures (body folds); also known as intertriginous</li> <li>• Inter-mammary</li> </ul>	--
<b>Generalized/ Universal</b>	<ul style="list-style-type: none"> <li>• Universal distribution; may be scattered or diffuse</li> </ul>	






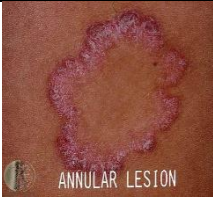

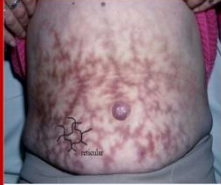
<b>Koebnerised</b>	<ul style="list-style-type: none"> <li>• Arising in a wound or scar</li> <li>• The Koebner phenomenon refers to the tendency of several skin conditions to affect areas subjected to injury</li> <li>• Examples: Psoriasis, Lichen planus, Vitiligo, Lichen nitidus.</li> </ul> <p>There are certain diseases in dermatology like psoriasis, vitiligo or lichen planus. What happens is when someone is injured the injury may heal with lesion of the same disease.</p>	
<b>Photosensitive</b>	<ul style="list-style-type: none"> <li>• Favoring sun exposed areas.</li> <li>• Face, upper back, upper chest, hands</li> </ul>	
<b>Seborrhoeic</b>	<ul style="list-style-type: none"> <li>• The areas generally affected by seborrhoeic dermatitis, with a tendency to oily skin (seborrhoea)</li> <li>• Scalp, behind ears, eyebrows, nasolabial folds, sternum and interscapular</li> </ul>	--
<b>Symmetrical</b>	<ul style="list-style-type: none"> <li>• In the same regions, the left side is affected in a similar way to the right side.</li> </ul>	
<b>Unilateral</b>	<ul style="list-style-type: none"> <li>• Wholly or predominantly on one side of the affected region.</li> </ul>	--
<b>Malar</b>	<ul style="list-style-type: none"> <li>• malar bone (cheeks).</li> </ul>	--

### ◆ Configuration:

- Refers to the shape or outline of the skin lesions
- Skin lesions are often grouped together
- Certain lesions do not fit the pattern like unexplained bruising or linear lesions > you suspect child abuse.
- Sometimes patient comes and you can tell that this not a skin lesion because you see that they are very linear and this can not happen except with scratch. Or if you see bruising in different areas of the skin and it doesn't have an explanation which could raise drug abuse. So there are certain patterns that don't follow a role that raises suspicion of either self injection or that something is going on.



Configuration	Description	Picture
<b>Nummular/Discoid lesion</b>	Round (coin-shaped) lesions, also known as "Discoid"	
<b>Linear lesion</b>	A linear shape to a lesion often occurs for some external reason such as scratching	
<b>Target (Targetoid) lesion</b>	Concentric rings also known as iris lesion E.g. erythema multiforme More red area in the middle, more faintly area around it and more red area around them. It looks like a target.	




<b>Annular</b>	<p>Lesions grouped in a ring like pattern</p> <p>Some diseases they start like a papule and as the lesion gets bigger, it becomes empty on the side and follows an annular pattern</p> <p>What is the difference between Annular and Numular lesions?</p> <p>Annular: like a half circle (empty inside).</p> <p>Numular: like a coin.</p>	
<b>Grouped/Herpetiform</b>	<p>as in herpes simplex lesion</p> <p>child with eczema and grouped vesicles, I think herpes. When they tell me grouped vesicles it equals herpes in my mind.</p>	
<b>Reticular</b>	net like pattern	
<b>Verrucous, warty, papillomatous:</b>	Surface consisting of finger like projections (in papilloma).	
<b>Guttate</b>	Drop-like, "en gouttes" E.g. guttate psoriasis.	
<b>Umbilication</b>	Round depression in the center (molluscum contagiosum).	





### ◆ Morphology:

Skin lesions are divided into:

- Primary- Basic lesion
- Secondary- Develop during evolution of skin disease by scratching or infection





#### 1) **Primary skin lesions:** how it looked like when it appeared

Primary lesion	Description	Picture
<b>Macule</b>	<ul style="list-style-type: none"> <li>• Flat circumscribed discoloration that lacks surface elevation or depression (not palpable)</li> <li>• &lt; than 0.5 cm in diameter</li> <li>• E.g. freckle, vitiligo</li> <li>• Change in color only, no elevation or depression</li> </ul>	
<b>Patch</b>	<ul style="list-style-type: none"> <li>• Flat circumscribed skin discoloration</li> <li>• "A large macule" &gt; 0.5 cm in diameter</li> <li>• E.g. Vitiligo, melasma.</li> <li>• Macule and patch are the only colored primary lesions of the skin. If there is anything in the surface of the skin (elevation, depression or scales) it's no longer a macule or patch.</li> </ul>	
<b>Papule</b>	<ul style="list-style-type: none"> <li>• Elevated, superficial, solid lesion &lt; 0.5cm in diameter</li> <li>• Examine for color and surface changes</li> </ul>	

	<ul style="list-style-type: none"> <li>• E.g. Umblicated<sup>1</sup>, Keratotic, Papillomatous, Flat topped<sup>2</sup></li> <li>• As they grow and come together it becomes a plaque</li> <li>• Umblicated papule: dimple in the middle of the papule I immediately think Molluscum Contagiosum. Viral infection that creates big pimples on the face in children, especially in the summer when they go to public pools. Self limiting in 1-2 years but could be removed.</li> <li>• Papillomatous like warts</li> <li>• Flat topped like in lachun planus (flat surface but raised)</li> </ul>	
<b>Plaque</b>	<p>Elevated, palpable, solid confluence or expansion of papules, &gt; 0.5cm in diameter. Confluence (group) of papules leads to the development of larger, usually flat topped, circumscribed, plateau-like elevations known as Plaques</p> <ul style="list-style-type: none"> <li>• Lacks a deep component</li> <li>• If it has a deep component it becomes a nodule or a tumor</li> <li>• E.g. Plaque psoriasis</li> <li>• Once there are secondary changes its no longer a macule or patch</li> </ul>	 <p>It is colored because it has Scales (secondary changes)</p>
<b>Nodule</b>	<ul style="list-style-type: none"> <li>• Elevated, circumscribed, solid lesion, &gt; 0.5cm in diameter whose greater part lies beneath the skin surface</li> <li>• With deep component (<b>elevation+depth</b>)</li> </ul>	
<b>Cyst</b>	<ul style="list-style-type: none"> <li>• Nodule that contains fluid or semisolid material</li> <li>• It is usually soft and has depth</li> <li>• If I look at it and it looks like a nodule but when I feel it its fluctuating or its soft then it's a cyst</li> </ul>	
<b>Vesicle</b>	<ul style="list-style-type: none"> <li>• Elevation that contains clear fluid &lt; 0.5cm in diameter</li> <li>• Vesicle is a smaller bulla</li> <li>• E.g. Dermatitis Herpetiformis.</li> <li>• Blisters</li> <li>• Due to separation of basement membrane</li> </ul>	
<b>Bulla</b>	<ul style="list-style-type: none"> <li>• Localized fluid collection &gt; 0.5 cm in diameter "bulla is a large vesicle"</li> <li>• Can be tense or flaccid</li> <li>• Tense you can see the bulla but flaccid you see the scar</li> <li>• E.g. Bullous Pemphigoid.</li> <li>• In tense you can actually see the blister (bulla or vesicle), while in flaccid you can see only an erosion and you can rarely see the actual bulla or vesicle.</li> </ul>	 <p>These are tense blister: blister that happen from separation of the basement membrane</p>

<sup>1</sup> Sometimes there's a papule but in the papule there could be changes on the surface of the papule so for example you could find like a dimple in the middle of the papule so we call it an umblicated papules (like an umbilicus at the middle of the papule). When someone called you and say there is an umblicated papule immediately I will think of Molluscum Contagiosum (it's a viral infection that happens to kids especially in summer when they go to public pools) so umblicated papule could be specific to certain diseases.

<sup>2</sup> Like in lichen planus

<b>Burrow</b>	<ul style="list-style-type: none"> <li>Linear tunnel in the epidermis induced by scabies mite</li> <li>I only see burrows with scabies</li> <li>Formed by entry and movement of the organism under the skin</li> </ul>	
<b>Pustule</b>	<ul style="list-style-type: none"> <li>Elevation that contains purulent material</li> <li>A pustule is a purulent vesicle</li> <li>It is filled with neutrophils, and may be white, or yellow</li> <li>Not all pustules are infected</li> <li>Looks like a papule but has pus</li> </ul>	
<b>Wheal (Hive)</b>	<ul style="list-style-type: none"> <li>Firm, edematous, slightly raised plaque that is evanescent (short lived) and pruritic.</li> <li>characteristically with a pale center and a pink margin</li> <li>Commonly seen in urticaria</li> </ul>	
<b>Purpura</b>	<ul style="list-style-type: none"> <li>Extravasation of red blood cells giving non-blanchable erythema</li> <li>Small spots called petechiae while large ones called ecchymosis</li> </ul>	
<b>Telangiectasia</b> “not in the slides”.	<ul style="list-style-type: none"> <li>Dilated capillaries visible on the skin surface. e.g. Rosacea.</li> </ul>	
<b>Tumor</b> “not in the slides”.	<ul style="list-style-type: none"> <li>Solid elevation of the skin more than 2 cm in diameter and has depth. Like large nodule.</li> </ul>	



A. Burrow.

B. Comedone.

C. Macule.



E. Papule.

F. Petechiae and purpura.

G. Plaque.



I. Scale.

J. Telangiectasia.

K. Vesicle.

2) Secondary skin lesions: result of scratching or infection

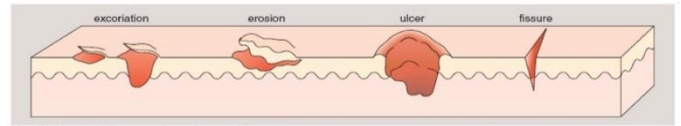







Fig. 4.24 Excoriation, erosion, ulcer and fissure.

Primary lesion	Description	Picture
Excoriation	<ul style="list-style-type: none"> <li>Linear erosion induced by <b>scratching</b></li> <li>Always linear</li> </ul>	
Erosion	<ul style="list-style-type: none"> <li>A partial and superficial focal loss of epidermis that <b>heals without scarring (V important)</b> Because only the most superficial layer of the skin is removed.</li> <li>You can develop a blister on your foot because of you shoes and without knowing you hurt yourself the blister bursts open, the wound left is called an erosion.</li> </ul>	
Fissure	<ul style="list-style-type: none"> <li>Vertical loss of epidermis and Dermis with sharply defined walls; "cracks in skin"</li> </ul>	
Ulcer	<ul style="list-style-type: none"> <li>A full thickness focal loss of epidermis and dermis</li> <li><b>Heals with scarring</b></li> </ul>	
Crust	<ul style="list-style-type: none"> <li>A collection of cellular debris, dried serum and blood.</li> <li>Antecedent primary lesion usually a vesicle, bulla, or pustule <b>when they dry they form a crust.</b></li> </ul>	
Scale	<ul style="list-style-type: none"> <li>Thickened stratum corneum</li> <li>Psoriasis (like in the picture)</li> <li>Scales could be thick or thin.</li> </ul>	<p>This is psoriasis patient and he has a thick scale</p>
Scar	<ul style="list-style-type: none"> <li>A collection of new connective tissue</li> <li>May be hypertrophic or atrophic</li> <li>Implies dermoepidermal damage</li> <li>Sometimes scars are depressed</li> <li>You can't have a scar without having a Primary lesion.</li> </ul>	

<b>Lichenification</b>	<ul style="list-style-type: none"> <li>Increased skin markings secondary to chronic scratching</li> <li>Impossible to develop as primary lesion</li> </ul>	
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◆ **Important Signs in dermatology:**

<b>Nikolsky Sign</b>	<ul style="list-style-type: none"> <li>Rubbing of apparently normal skin induces blistering of the skin.</li> <li>Seen only in pemphigus vulgaris<sup>3</sup> and toxic epidermal necrolysis (TEN)<sup>4</sup>.</li> <li>Certain autoimmune diseases effect desmosomes or side effect of medication like Steven-Johnson Syndrome or toxic epidermal necrolysis. When I touch the skin it comes off, that's a positive Nikolsky sign.</li> </ul>	<p>Figure 2. A positive Nikolsky's sign in toxic epidermal necrolysis.</p>  <p><small>Reproduced with permission from Mohr T, ed. Clinical Dermatology: A Color Guide to Diagnosis and Therapy, 3rd ed. St Louis: Mosby, 1996.</small></p>
<b>AUSPITZ SIGN</b>	<ul style="list-style-type: none"> <li>forceful removal of scale on top of a red papule produces bleeding points (pinpoint bleeding)</li> <li>Seen in psoriasis. <a href="#">Video</a></li> </ul>	
<b>Koebner's phenomenon</b>	<ul style="list-style-type: none"> <li>The tendency for certain skin diseases (psoriasis, vitiligo, lichen planus, warts) to develop at sites of trauma. <a href="#">Video</a></li> </ul>	
<b>Dermatographism</b>	<ul style="list-style-type: none"> <li>Firm stroking of the skin produces erythema and wheal.</li> <li>Seen in physical urticaria.</li> <li>In patient with atopy, stroking produces white dermatographism rather than red.</li> <li>They come in urticaria and its hard to see urticaria, unless they have angioedema in the ER. So you get a tongue depressor and draw a line. If it wheels that's dermatographism</li> </ul>	

<sup>3</sup> Autoimmune blistering disease it happens in epidermis.

<sup>4</sup> could be a side effect of medication.








## ◆ Investigations:

<p><b>1-Wood's lamp:</b> We do it in the clinic</p>	<p>Produces long wave UVL (360 nm). Useful in:</p> <ul style="list-style-type: none"> <li>• Tinea Versicolor<sup>5</sup> - yellowish green fluorescence.</li> <li>• Superficial fungal infection on the abdomen, gets worse in the summer with sweating and better in winter.</li> <li>• Tinea Capitis<sup>6</sup> yellow green fluorescence in M. canis, M. andouini.</li> <li>• Fungal infection on the scalp</li> <li>• Vitiligo - <b>milky white</b>. Wood's lamp is always important to diagnose Vitiligo. If it's white chalk it is Vitiligo and if it's hypopigmented it is not.</li> <li>• Erythrasma<sup>7</sup> - coral <b>red fluorescence</b></li> <li>• infection over axillary area caused by <i>Corynebacterium minutissimum</i> bacteria</li> <li>• Melasma becomes more intensified</li> </ul>	 <p>The image shows a handheld Wood's lamp on the left. To its right are two photographs: the top one shows a person's face with blue light reflecting off their skin, and the bottom one shows a close-up of skin with a bright, milky white fluorescence, characteristic of vitiligo.</p>
<p><b>2-KOH preparation</b> scaly lesions</p>	<ul style="list-style-type: none"> <li>• Cleanse skin with alcohol Swab to avoid contamination (avoid false results).</li> <li>• Scrape skin with edge of microscope slide onto a second microscope slide. So we take a few scales</li> <li>• Put on a drop of 10% KOH.</li> <li>• Apply a cover slip and warm gently.</li> <li>• Examine with microscope objective lens</li> <li>• Sometimes you see hyphae</li> </ul>	 <p>The image consists of two parts. On the left is a microscopic view of a KOH preparation showing broad, thin-walled, septate hyphae with irregular branching. On the right is a photograph of a person's skin being scraped with a microscope slide to collect scales.</p> <p><small>Figure 2: 10x KOH preparation showing broad thin walled septate hyphae with irregular branching (SOO)</small></p>

<sup>5</sup> Superficial fungal infection on the abdomen.

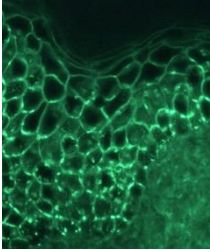
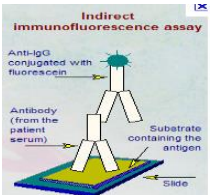
<sup>6</sup> Fungal infection on the scalp.

<sup>7</sup> Infection over axillary area caused by *mycobacterium minutissimum* and pt. come with itching.

<p><b>3- Tzanck smear:</b> vesicular lesions</p>	<p><b>Important in diagnosing:</b></p> <ul style="list-style-type: none"> <li>• Herpes simplex or VZV (multinucleated giant cells)</li> <li>• Pemphigus Vulgaris (acantholytic cells<sup>8</sup>).</li> </ul> <p><b>Method</b></p> <ul style="list-style-type: none"> <li>• Select a fresh vesicle</li> <li>• De-roof and scrape base of the vesicle</li> <li>• Smear onto a slide</li> <li>• Fix with 95% alcohol</li> <li>• Stain with Giemsa stain</li> <li>• Examine under microscope</li> </ul>	 <p>Multinucleated giant cells that are present in Herpes simplex virus infection</p> 																																																																
<p><b>4-Prick test:</b></p>	<ul style="list-style-type: none"> <li>• Detects <b>immediate-type IgE mediated</b> reaction (type 1 hypersensitivity reaction) in most allergic diseases.</li> <li>• Put a drop of allergen containing solution.</li> <li>• A non bleeding prick is made through the drop</li> <li>• After 15-20 min the antigen is washed and the reaction is recorded</li> <li>• A positive test shows urticarial reaction at site of prick. (wheeling in the area)</li> <li>• <b>Immediate allergic reaction (type 1)</b> <ul style="list-style-type: none"> <li>• Emergency therapeutic measures should be available in case of anaphylaxis.</li> </ul> </li> </ul>	 																																																																
<p><b>5- Patch skin test</b></p>	<ul style="list-style-type: none"> <li>• Important in contact dermatitis. <b>Contact dermatitis: is delayed immune reaction (type 4 immune reaction).</b></li> <li>• Select the most probable substances causing dermatitis.</li> <li>• Apply the test material over the back.</li> <li>• Read after 48 &amp; 72 hr, look for (erythema, edema, vesiculation).</li> <li>• Positive patch test showing erythema and edema.</li> <li>• In severe positive reaction vesicles may be seen.</li> </ul>	 <table border="1" data-bbox="1318 976 1523 1228"> <thead> <tr> <th colspan="2">Panel 1</th> <th colspan="2">Panel 2</th> </tr> <tr> <th>Test Allergy</th> <th>Concn</th> <th>Test Allergy</th> <th>Concn</th> </tr> </thead> <tbody> <tr><td>1. Nickel sulfate</td><td>20</td><td>12. Penicillium</td><td>10</td></tr> <tr><td>2. Nickel sulfate</td><td>100</td><td>13. Penicillium</td><td>100</td></tr> <tr><td>3. Nickel sulfate</td><td>1000</td><td>14. Penicillium</td><td>1000</td></tr> <tr><td>4. Nickel sulfate</td><td>10000</td><td>15. Calcium</td><td>20</td></tr> <tr><td>5. Calcium</td><td>20</td><td>16. Nickel sulfate</td><td>10</td></tr> <tr><td>6. Calcium</td><td>100</td><td>17. Calcium</td><td>100</td></tr> <tr><td>7. Calcium</td><td>1000</td><td>18. Calcium</td><td>1000</td></tr> <tr><td>8. Calcium</td><td>10000</td><td>19. Calcium</td><td>10000</td></tr> <tr><td>9. Calcium</td><td>100000</td><td>20. Calcium</td><td>100000</td></tr> <tr><td>10. Calcium</td><td>1000000</td><td>21. Calcium</td><td>1000000</td></tr> <tr><td>11. Calcium</td><td>10000000</td><td>22. Calcium</td><td>10000000</td></tr> <tr><td>12. Calcium</td><td>100000000</td><td>23. Calcium</td><td>100000000</td></tr> <tr><td>13. Calcium</td><td>1000000000</td><td>24. Calcium</td><td>1000000000</td></tr> <tr><td>14. Calcium</td><td>10000000000</td><td>25. Calcium</td><td>10000000000</td></tr> </tbody> </table>	Panel 1		Panel 2		Test Allergy	Concn	Test Allergy	Concn	1. Nickel sulfate	20	12. Penicillium	10	2. Nickel sulfate	100	13. Penicillium	100	3. Nickel sulfate	1000	14. Penicillium	1000	4. Nickel sulfate	10000	15. Calcium	20	5. Calcium	20	16. Nickel sulfate	10	6. Calcium	100	17. Calcium	100	7. Calcium	1000	18. Calcium	1000	8. Calcium	10000	19. Calcium	10000	9. Calcium	100000	20. Calcium	100000	10. Calcium	1000000	21. Calcium	1000000	11. Calcium	10000000	22. Calcium	10000000	12. Calcium	100000000	23. Calcium	100000000	13. Calcium	1000000000	24. Calcium	1000000000	14. Calcium	10000000000	25. Calcium	10000000000
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<p><b>6-Skin punch biopsy</b></p>	<ul style="list-style-type: none"> <li>• Clean skin with alcohol.</li> <li>• Infiltrate with 1-2% xylocaine with adrenaline.</li> <li>• Rotate 2-6 mm diameter punch into the lesions.</li> <li>• Lift specimen and cut at base of lesion.</li> <li>• Fix in 10% <b>formalin</b></li> <li>• <b>For Immunoflourescence put in normal saline.</b></li> <li>• In autoimmune blistering or connective tissue disease we need to do direct immunofluorescence to look for complements or antigens at the basement membrane. We put them in normal saline (very important).</li> <li>• Suture if 5 mm punch is used.</li> </ul>	 																																																																

<sup>8</sup> Acantholytic cells: cells death or broken that have lost attachment.



<b>7-Direct immunofluorescence:</b>	<ul style="list-style-type: none"> <li>• Used to diagnose autoimmune diseases e.g. Pemphigus Vulgaris, Bullous pemphigoid.</li> <li>• Detects immunoglobulin and complement deposits in skin.</li> <li>• The deposits will give a green fluorescence</li> <li>• Fluorescence will be noted if immunoglobulin deposits are found intercellular between the epidermal cells as in pemphigus vulgaris, while found the Basement membrane zone as in bullous pemphigoid.</li> </ul>	
<b>8- Indirect immunoFluorescence:</b>	<p>Detect auto antibodies in the serum. It is used:</p> <ul style="list-style-type: none"> <li>• To confirm a diagnosis.</li> <li>• To differentiate between bullous diseases.</li> <li>• To monitor disease activity</li> </ul>	

### ◆ Topical treatment:

A wide variety of topical agents are available. Delivers the drug to target site.

#### **(Golden rule):**

- IF the lesion is dry-wet it → How to wet it? Creams, ointments
- IF wet-dry it → How to dry it? Using compressors (cloth of water) will cause it to evaporate

#### **Topical drugs consist of:**

- 1-Active substance: → like steroids, antimicrobial agents.
- 2-Vehicle: → Is the base in which the active ingredient is dispersed.

#### Topical steroids side effects:

- 1) **Atrophy and striae.** Difficult to treat
- 2) Telangiectasia and purpura.
- 3) Masking the initial lesion.
- 4) Perioral dermatitis and rosacea or acne.
- 5) Systemic absorption.
- 6) Tachyphylaxis (sudden loss of response).

#### Guidelines regarding steroid use: **Doctor said read about it more**

- Avoid use for extended periods of time.
- Avoid high potency steroid on flexures and face
- Avoid high potency steroid in children.

#### Examples:

- Creams: are mixture of oils and water in which the active substance is dispersed. white in color useful in folds and are applied to wet lesions.
- Ointments are primarily grease, useful in dry lesions and they are translucent.

- Gels are mixtures of propylene glycol and water. Sometimes they contain Alcohol. They are translucent and are best used in wet disorders and hairy regions.

★ **Fingertip unit:** The amount of cream/ointment expressed from 5mm nozzle. It weighs 0.5g → It covers 2 hand units.

### Other therapeutic modalities:

1. Phototherapy machine/NBUVB.
2. Hand and feet narrow band UVB.
3. Liquid nitrogen gun (Cryotherapy) Used to treat warts.



\* 1 & 2 are used to treat: vitiligo, psoriasis, lichen planus and atopic dermatitis

## Questions:

### 1) What is a patch (D)

- A. Solid elevated less than 1 cm
- B. Solid elevated less more than
- C. Flat circumscribed less than 1 cm
- D. Flat circumscribed more than 1 cm

### 2) A reticular lesion is similar to which of the following? (D)

- A. coin like lesion
- B. drop like lesion
- C. line like lesion
- D. Net like lesion

### 3) Which one of following is a secondary lesion? (D)

- A. Plaque
- B. Papule
- C. Wheal
- D. Ulcer

### 4) A macule is: (D)

- A. Well circumscribed elevated lesion, more than 0.5 cm
- B. Well circumscribed elevated lesion, less than 0.5 cm
- C. Well circumscribed flat lesion, more than 1 cm
- D. Well circumscribed flat lesion, less than 1 cm

### 5) Which one of the following describes the Erythema multiforme configuration? (C)

- A. Annular.
- B. Discoid.
- C. Target.
- D. Reticular.

**6) which one of the following is a secondary lesion: (D)**

- A. patch
- B. macule
- C. papule
- D. ulcer

**7) Flat discoloration of the skin more than 0.5 cm: (A)**

- A. Patch
- B. Papule
- C. Plaque
- D. Macule

**8) Which one of the following whose greater part lies beneath the surface of the skin (A)**

- A- Nodule
- B- Papule
- C- Pustule
- D- Cyst

**9) What makes the difference between whites and dark skin? (C)**

- A- Number of melanocytes.
- B- Sizes of melanocytes.
- C- Size of melanosomes.
- D- Number of melanosomes.

**10) Prick test diagnose which type of hypersensitivity reaction? (A)**

- A- Type I.
- B- Type II.
- C- Type III.
- D- Type IV.

**11) Woods lamp is helpful in diagnosing which one of the following? (B)**

- A- Lichen planus.
- B- Tinea capitis.
- C- Atopic dermatitis.
- D- Psoriasis.

**12) Which one is true regarding melanocytes/ Keratinocytes Ratio: (A)**

- A- 1 Melanocyte to 10 Keratinocytes
- B- 1 Melanocyte to 40 Keratinocytes
- C- 10 Melanocytes to 10 Keratinocytes
- D- 1 Melanocyte to unlimited Keratinocytes

**13) Fingertip unit can cover: (C)**

- A- 1 hand unit
- B- 3 hands unit
- C- 2 hands unit
- D- 4 hands unit

**14) Partial focal loss of epidermis and heals without scarring is (B)**

- A- Excoriation
- B- Erosions
- C- Lichenification
- D- Fissure

**15) In bullous pemphigoid, the blisters are arise from? (B)**

- A- Intraepidermal
- B- Subepidermal
- C- Subcutaneous
- D- Sub-basal

**16) What is the type of reaction in patch test? (D)**

- A- Type I hypersensitivity reaction
- B- Type II hypersensitivity reaction
- C- Type III hypersensitivity reaction
- D- Type IV hypersensitivity reaction

**17) Which one of the following diseases has the pathognomic feature of burrows: (A)**

- A- Scabies
- B- Impetigo
- C- Herpes zoster
- D- Tinea corporis

**18) Which layer of the following composed of cells with No nuclei? (D)**

- A- Granular layer
- B- Basal layer
- C- Spinous layer
- D- Cornified layer

**19) Which one of the following has the least number of eccrine glands? (A)**

- A- Back
- B- Sole
- C- Palm
- D- Face

1	D
2	D
3	D
4	D
5	C
6	D
7	A
8	A
9	C
10	A
11	B
12	A
13	C
14	B
15	B
16	D
17	A
18	D
19	A