

Dermatology

Edition 8.5

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Contents

Dermatology

Basics of Dermatology : Part 1	1
Skin • Epidermis • Dermis • Hypodermis • Dermopathology	
Basics in Dermatology : Part 2	9
Morphology • Configuration/pattern • Distribution • Lines in dermatology • Dermatological diagnosis and investigations • Dermatological therapy	
Papulosquamous Diseases : Part 1	19
Psoriasis • Etiopathogenesis of psoriasis • Clinical types and features of psoriasis • Histopathology • Treatment • Systemic association	
Papulosquamous Diseases : Part 2	27
Lichen planus • Pityriasis rosea • Pityriasis rubra pilaris	
Appendages and Disorders : Part 1	33
Structure of hair • Type of hair • Hair cycle • Alopecia • Hidradenitis suppurativa	
Appendages and Disorders : Part 2	41
Sweat glands • Disorders of sweat glands • Sebaceous gland • Acne vulgaris • Rosacea • Basics of nail • Pathologies of nail	
Bullous Disorders : Part I	51
Basics of Bullous Disorders • Pemphigus group	
Bullous Disorders : Part 2	57
Pemphigoid group • Dermatitis herpetiformis/duhring's disease • Epidermolysis bullosa • Inherited acantholytic disorders	
Bacterial Infections of The Skin	65
Pyoderma(PD) • Staphylococcal scalded skin syndrome (SSSS) • Acute paronychia • Botryomycosis • Erysipeloid • Cutaneous corynebacterial infections • Pseudomonas infections • Cutaneous anthrax • Meningococemia • Scrub typhus • Cutaneous malakoplakia	
Mycobacterial Infections of Skin	73
Secondary cutaneous TB • Tuberculids • Atypical mycobacterial skin infections	
Viral Infections of Skin	78
Herpes virus 1 • Varicella zoster virus • Epstein barr virus • HHV infections • Molluscum contagiosum (MC) • Parapox virus • Human papilloma virus • Enterovirus • Parvovirus B19 • Approach to white plaques in oral cavity	
Fungal Infections of Skin	88
Superficial mycoses • Pityriasis versicolor • Tinea nigra & piedra • Mucocutaneous candidiasis • Dermatophytosis • Subcutaneous mycoses/implantation mycoses	

Parasitic Infections of The Skin	99
Ectoparasitic infections • Migratory infective skin lesions • Trypanosomiasis • Leishmaniasis	
Sexually Transmitted Infections : Part 1	108
Anogenital warts/condyloma acuminata • Genital discharge disease • Bacterial vaginosis • Syndromic management of STIs	
Sexually Transmitted Infections : Part 2	115
Syphilis • Congenital syphilis • Acquired syphilis • Serological tests in syphilis • Treatment • Chancroid • Herpes genitalis • Lymphogranuloma venerum • Donovanosis • Approach to genital ulcer disease	
Hansen's Disease : Part 1	127
Course of hansen's disease (HD) • Clinical features and types of leprosy • Deformities in HD	
Hansen's Disease : Part 2	133
Lepra reaction • Cardinal features for diagnosis of hansen's disease • Investigations in hansen's disease • Treatment of HD • Tropic ulcer/Neuropathic ulcer • National leprosy eradication program • Prophylaxis in leprosy	
Pigmentary Diseases	140
Melanocyte • Disorders of hyperpigmentation • Disorders of hypo/depigmentation • Nevus depigmentosa vs. vitiligo	
Eczema	147
Morphological classification • Etiological classification • Atopic dermatitis (AD)	
Genodermatoses	153
Neurofibromatosis • Tuberous sclerosis complex (TSC) • Sturge weber syndrome • Ichthyosis • Incontinentia pigmenti • Xeroderma pigmentosum (XP)	
Histamine Related Disorders	160
Histamine mediated emergencies • Urticaria • Hereditary angioedema • Cutaneous mastocytosis	
Cutaneous Drug Reactions	165
Fixed drug eruption • Erythema multiforme (EM) • Stevens johnson syndrome (SJS)/toxic epidermal necrolysis (TEN) • Cutaneous manifestations of chemotherapy	
Skin in Rheumatology and Immunology	170
Skin in connective tissue disorders • Skin manifestations in vasculitic conditions • Skin in rheumatological conditions	
Skin and Systems	178
Acanthosis nigricans • Diabetes & skin • Chronic granulomatous disease • Pretibial myxedema • Xanthelasma palpebrarum • Lyme disease • Nutritional dermatoses • Internal malignancies	
Short Topics in Dermatology	184
Panniculitis • Neutrophilic dermatoses • Lichen nitidus • Cutis marmorata • Langerhans cell histiocytosis • Mycosis fungoides/cutaneous T-cell lymphoma (CTCL) • Basal cell carcinoma • Dermatotherapeutics • Prokeratosis • Lichen sclerosis (LC)	

BASICS OF DERMATOLOGY : PART 1

----- Active space -----

Skin

00:00:34

Weight : 4-5 Kg.

Area : 1.7 m².

Layers of skin :

Outermost to innermost :

- Epidermis : Above dermis.
- Dermis.
- Hypodermis : Below dermis.

Embryology of Skin :

Ectoderm

↓
Epidermis.

Mesoderm

↓
Dermis :

↓
Hypodermis.

Exception : Face & frontal scalp from neural crest.

Epidermis

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Layers :

From outer to inner.

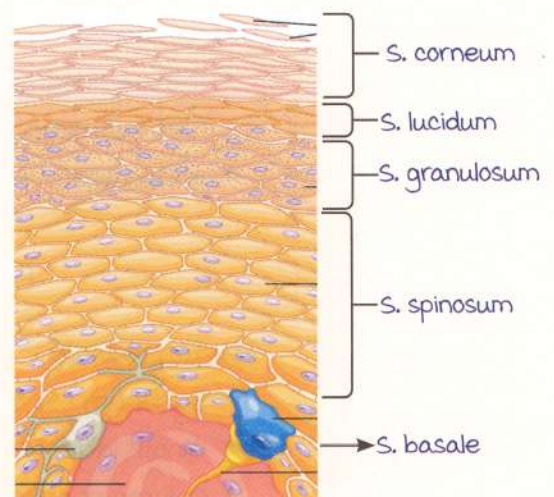
Histology : Stratified squamous epithelium.

Stratum Corneum :

- "Stratum" : Layer; "Corneum" : Keratin.
- Shape : Flat.
- Composition : Fully keratinised.
- Nucleus : Absent (Dead protein).
- Function : Barrier function
 - Prevents entry of microbes, allergens, irritants.
 - Prevents exit of dermal fluid (Trans epidermal water loss).

Stratum Lucidum :

- "Lucidum" : Clear.
- Location : Palms & soles.



----- Active space -----

Stratum Granulosum :

- "Granulosum" : Granule (Prominent).

Types of granules

Keratohyaline

Lamellar granules

(Odland bodies, cementosomes)

Components : Profilaggrin (Inactive) :**Filaggrin (Active)**

(Filament aggregating protein)

- Function : Aggregation of keratin intermediate filaments
- Disease : D/t mutation of filaggrin
 - Ichthyosis vulgaris (vulgaris is m/c). (Fish like scales)
 - Atopic dermatitis.

Lipid

Barrier function
of skin

Note : "vulgaris" indicates most common.

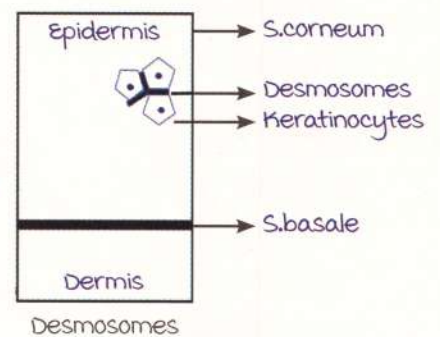
Stratum Spinosum :

- Spines are **most prominent** in s.spinosum.
- Spines correspond to protein : **Desmosomes**.

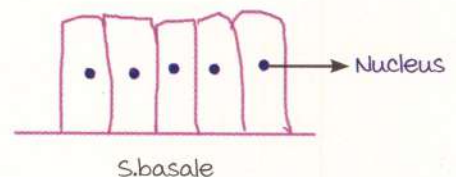
Desmosomes :

- Intra epidermal intercellular connections.
- Lies between keratinocytes (Cells of epidermis).
- Importance : Autoantibodies to desmosomes

Pemphigus group of disorders

**Stratum Basale :**

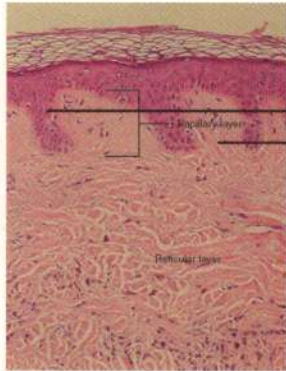
- Synonym : S. germinativum.
- Single layer.
- Columnar cells.
- Central nucleus.



Note : malpighian layer : S. spinosum + S. basale.

Rete Ridges vs Dermal Papilla :

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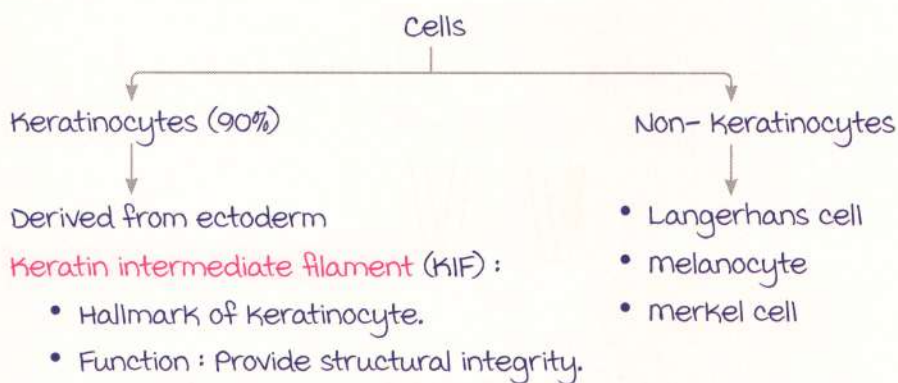


Rete ridges : Projection of epidermis into dermis

Dermal papilla : Extension of dermis into epidermis

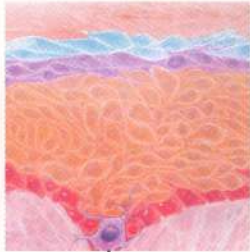
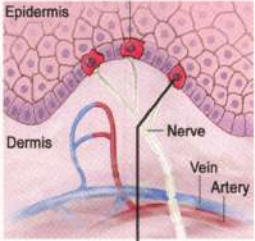
Epidermal Transit Time :

- Cells move from S. basale $\xrightarrow[\text{4 weeks}]{\text{Time taken}}$ S. corneum.
- Psoriasis : $\downarrow$ epidermal transit time.

Cells :Non Keratinocytes :

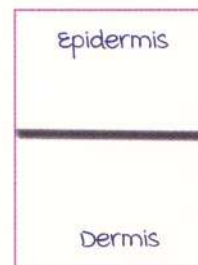
	Langerhans cell	melanocyte	merkel cell
Location	S. spinosum	s. basale	s. basale
Embryology	mesoderm (Bone marrow)	Neural crest	Ectoderm
Content	Birbeck granules	melanosomes	Neuro secretory granules
Function	Antigen presenting cells (APC) : Dendritic langerhan cells present antigens to T cells in lymph node.	Tyrosine (Aminoacid) melanin (Protection from uv light)	Fine touch mechano receptors (Slow adapting, low threshold)
markers for diagnosis	• S100, CD1a, CD 207 (Langerin) : most specific. • Dx of LCH.	• S100, HMB 45, melan A. • Dx of melanoma.	• Cytokeratin 20. • Dx of merkel cell carcinoma.

----- Active space -----

	Langerhans cell	melanocyte	merkel cell
Additional points	Dendritic cell	Dendritic cell	
Image	 Tennis racket appearance Birbeck granules (Electron microscope)	 melanocyte	 merkel cell

Dermo Epidermal Junction (DEJ) :

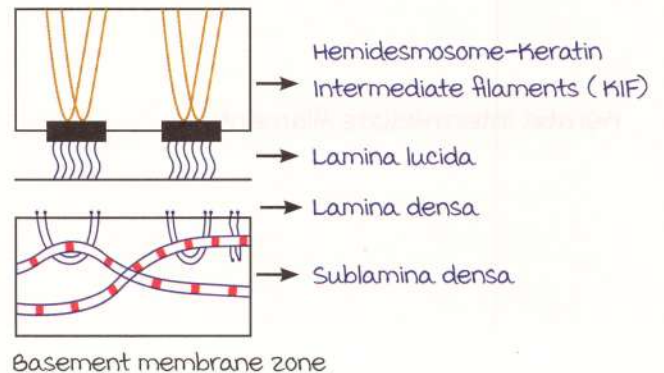
- Synonym : basement membrane zone (BMZ).



BMZ/DEJ : Connects epidermis to dermis.

Layers :

1. Hemidesmosome - KIF complex.
2. Lamina lucida.
3. Lamina densa.
4. Sublamina densa.

Dermis

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Types :

Dermis

Features

Papillary dermis (10%)

Reticular dermis (90%)

Histology

Contains dermal papilla

mesh-like network

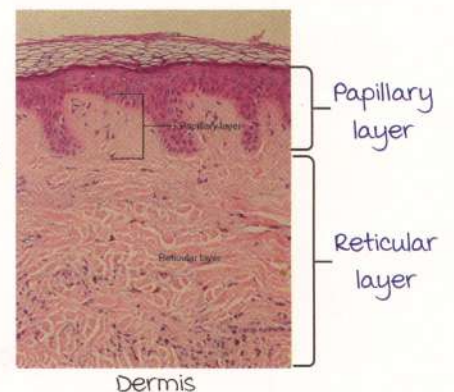
of collagen

Loosely arranged

Dense, irregular

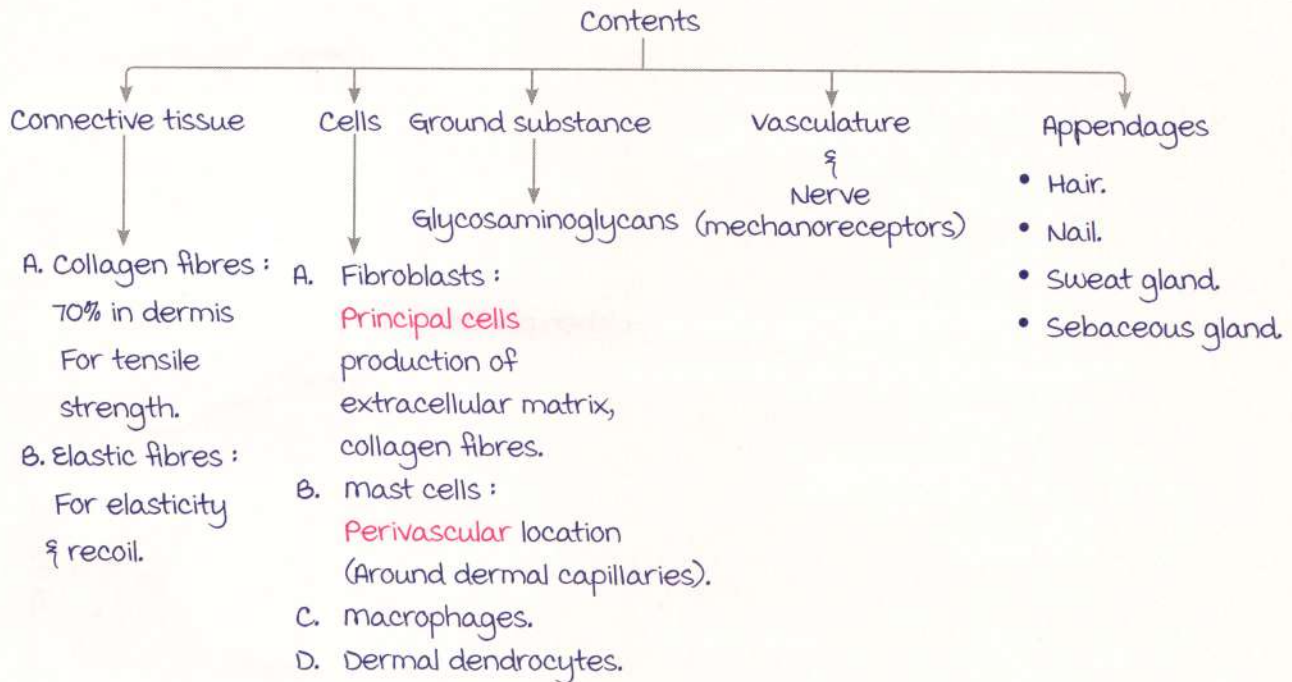
Thin fibres

Thick fibres



Content :

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Collagen :

- m/c type of collagen : **Type 1 > Type 3.**
- Type of collagen in cartilage : **Type 2.**

Hypodermis

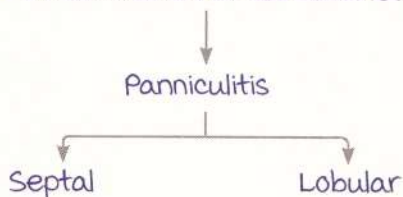
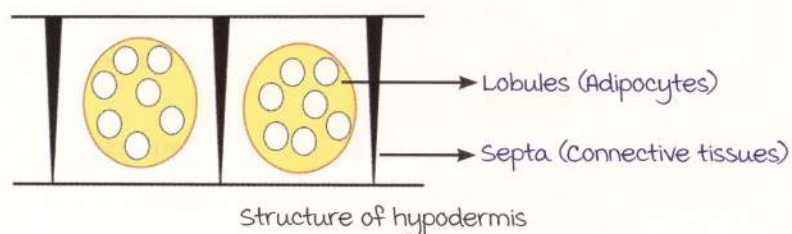
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Overview :

- AKA subcutaneous tissue.
- Function : Insulation, Thermal regulation (D/t presence of subcutaneous fat).

Panniculus :

- "Panniculus" : Fat.
- Inflammation of subcutaneous fat.

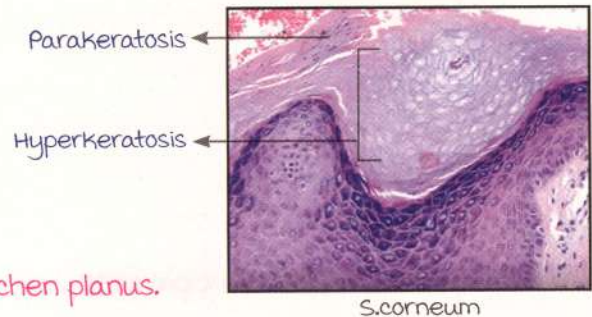
Structure :

Dermopathology

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S. Corneum :

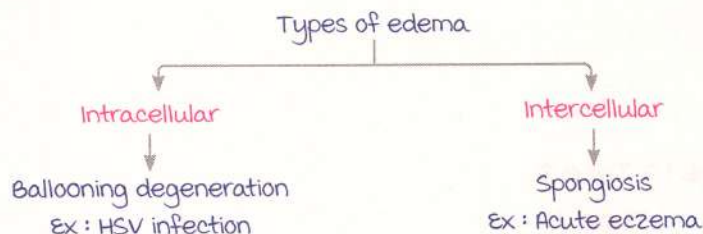
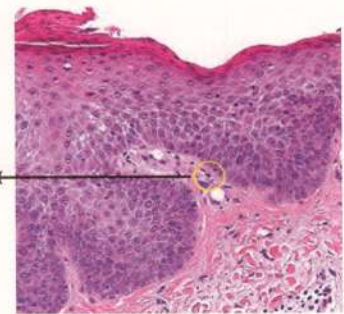
- Thickening : Hyperkeratosis.
- Presence/retention of nucleus : Parakeratosis.

**S. Granulosum :**

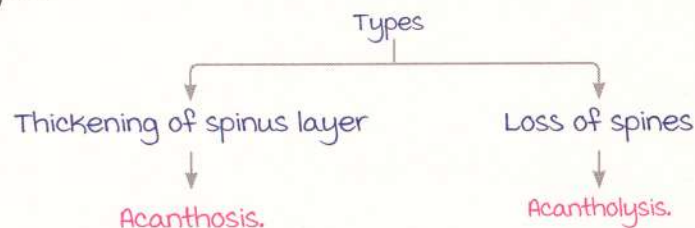
- Wedge shaped hypergranulosis : **Lichen planus**.
- Absent / decreased granular layer :
 - a. Psoriasis.
 - b. Ichthyosis vulgaris.

S. Spinosum :

Edema :

Gap between
Keratinocytes

Layers :



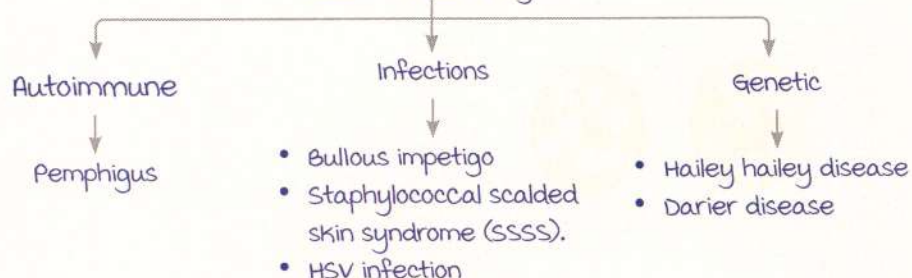
Acantholysis :

- Pathology : Loss of attachment b/w Keratinocytes.

Polyhedral Keratinocytes Loss of desmosomes → Circular Keratinocytes.

- Circular Keratinocytes have prominent nucleus.
- Called as tzanck cells/acantholytic cells.

Cause of acantholysis



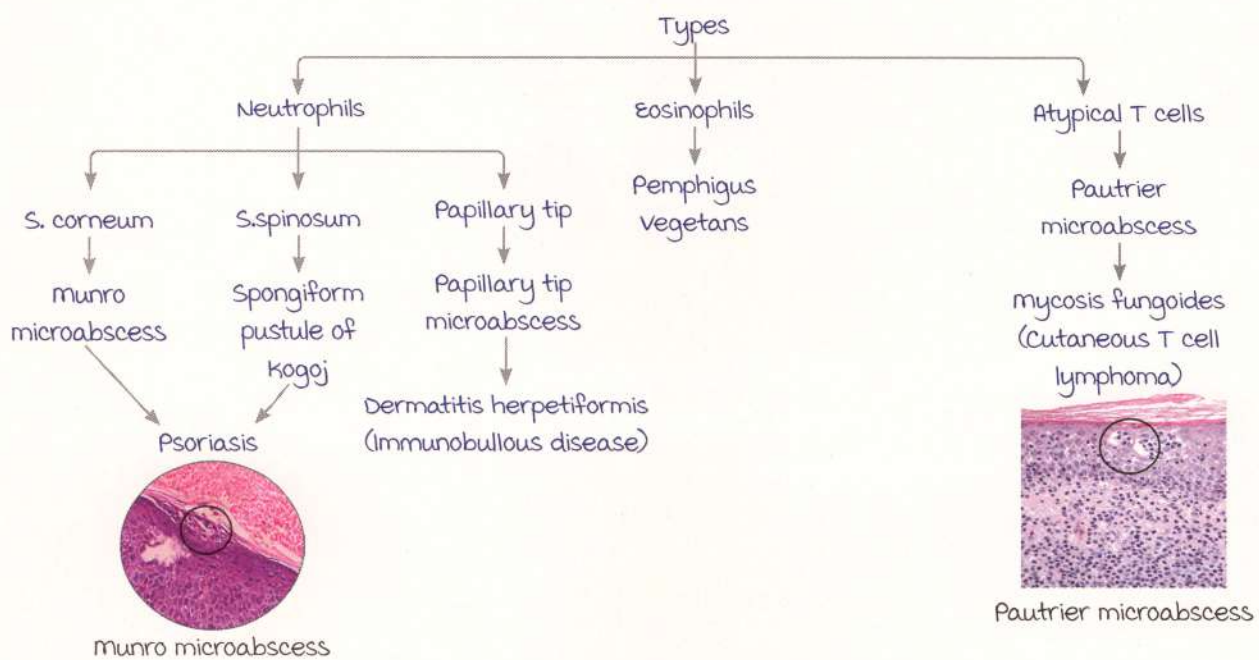
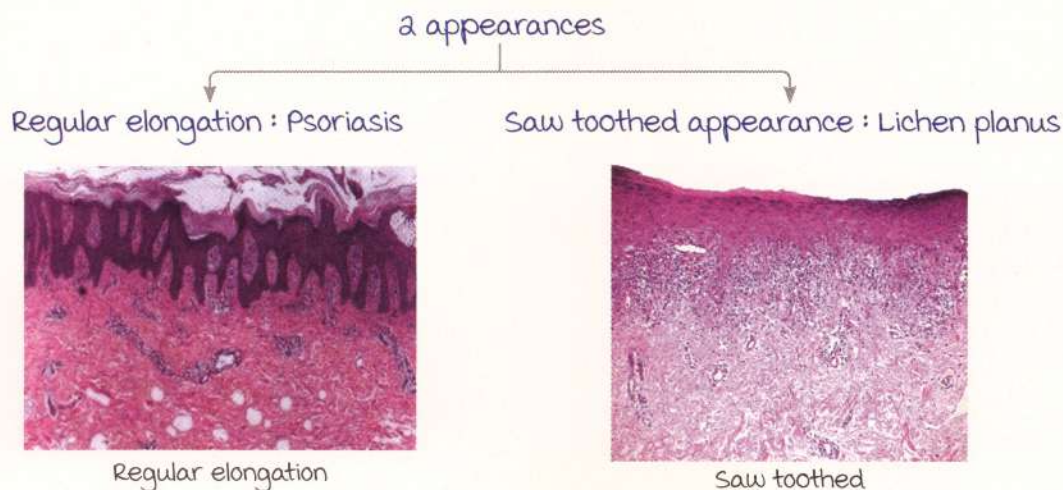
Dyskeratosis :

- Abnormal, premature, keratinisation of individual keratinocytes.
- Ex :
 - **Bowens disease** (Carcinoma in situ).
 - **Darier disease.**
 - Squamous cell carcinoma.

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microabscess :

- microscopic collection of cells.

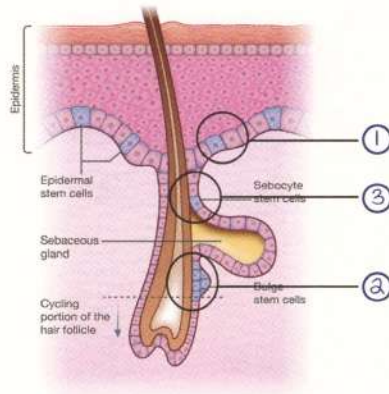
Rete Ridges :Stem Cells :Definition :

undifferentiated, **self-renewing**, **multipotent** cells located in specific areas of skin.

----- Active space -----

Function :

- maintain skin homeostasis : Replacement of old cells.
- Regenerate skin appendages
 - Hair.
 - Sebaceous glands.
- Self healing.



Location :

3. Stratum basale : Interfollicular epidermis.
4. Hair follicle : Bulge area (Corresponds to erector pili muscle).
5. Base of sebaceous gland.

BASICS IN DERMATOLOGY : PART 2

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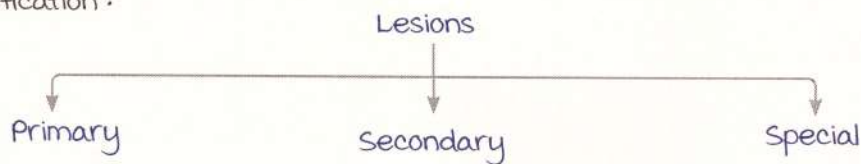
Principles of clinical diagnosis :

- morphology.
- Configuration.
- Distribution.

Morphology

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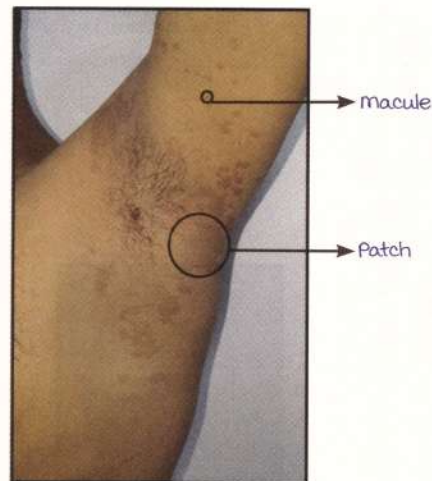
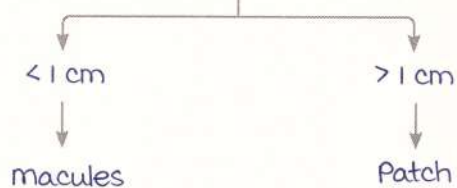
Classification :



Primary Skin Lesions :

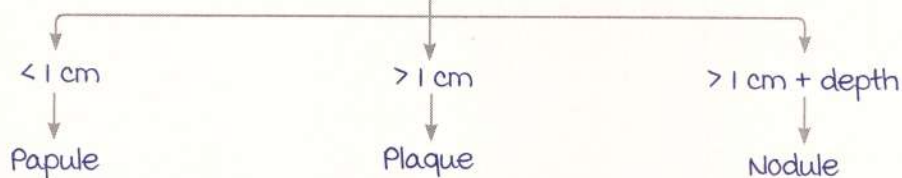
- Initial skin lesions.
- Non-modified lesions.

A. Flat non-palpable



Flat non-palpable lesions

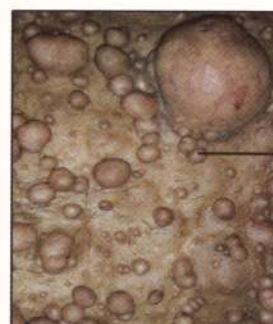
B. Circumscribed, solid, raised lesions



Papule



Plaque



Nodule

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C. Clear fluid filled lesions

< 1 cm

Vesicle



Vesicle

> 1 cm

Bulla



Bulla

Vesicular rash :

1. Herpes labialis/zoster.
2. Varicella.
3. Hand foot mouth disease.

D. Pus filled lesions

Pin point

Pustule



Pustule

Large

Abscess



Abscess

E. RBC extravasation into skin/mucous membrane

1-2 mm

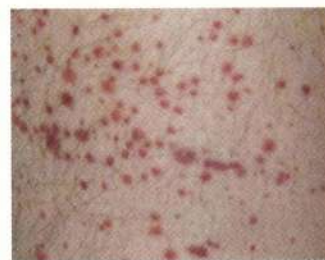
Petechiae

 ≥ 3 mm

Purpura

> 1 cm

Ecchymoses



Purpura

F. Wheals :

- Plaques which are :
 - a. Pruritic.
 - b. Erythematous.
 - c. Edematous.
 - d. **Transient.**
- Seen in urticaria



Wheals

Secondary Skin Lesions :

----- Active space -----

- Skin lesions modified $\xrightarrow{D/t}$ Itching/treatment.

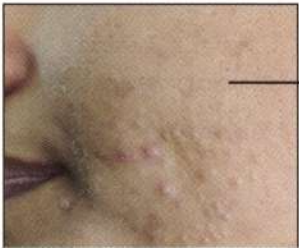
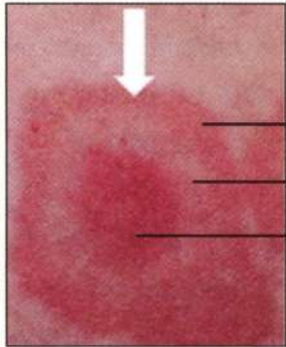
	Features	Images
A. Scale	• Visible exfoliation of stratum corneum. • Scalp scaling : <i>Seborrhoeic dermatitis, psoriasis.</i>	
B. Crust	• Hard exudate. • D/t drying of serum, pus, blood. • Golden brown (honey color crust) : <i>Non-bullous impetigo.</i>	
C. Erosion	• Focal/total loss of epidermis. • Eg : <i>pemphigus vulgaris.</i>	
D. Ulcer	Loss of epidermis leads to Partial/total loss of dermis which in turn leads to molecular death	
E. Fissure	• Linear deep cleft in skin. • Eczema.	
F. Excoriation	• Punctate/linear abrasions resulting due to Scratching • Scratch marks	
G. Lichenification	• Thickening of skin. • Hyperpigmentation. • Exaggerated skin markings. • D/t chronic scratching.	

----- Active space -----

	Features	Images
H. Atrophy	- Decreased/absent structural component of skin. - Clinically : Wrinkling + - Eg : in topical steroid abuse.	

Special Lesions :

Specific to a particular disease.

	Features	Images
A. Burrow	- Wavy, grayish white tunnel. - Level : S. corneum. - Seen in scabies.	
B. Comedones	- Folliculo-centric lesion plugged by sebum + keratin. - Seen in acne vulgaris. - Types : a. Open comedones : Black in color due to oxidation of sebum b. Closed comedones : white color	 Open comedone  Closed comedone
C. Target lesion	3 zones : - Centre : Dusky red hue. - Intermediate : Pale edema. - Periphery : Erythema. - Seen in erythema multiforme.	 Periphery Intermediate Centre

Configuration/Pattern

00:13:05

----- Active space -----

- Refers to arrangement of skin lesion.

	Features	Images
A. Grouped	- Clustered. - Seen in herpes labialis.	
B. Dermatomal	- Along area supplied by single nerve. - Seen in herpes zoster, shingles.	
C. Linear	Line like pattern.	
D. Blaschkoid	Wavy/whorled.	
E. Annular	- Shape : Ringlike - Centre : Clear. - Periphery : Active. - Seen in : - Pityriasis rosea, - mid borderline leprosy (BB), - Tinea corporis.	

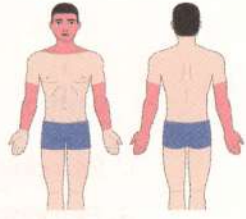
----- Active space -----

	Features	Images
F. Discoid/ Nummular	• Shape : Coin. • Centre : Active. • Periphery : Active. • Seen in : - Discoid lupus erythematosus - Discoid eczema.	
G. Discrete	• Individual/separately present	
H. Confluent	• multiple lesions merge together.	

Distribution

00:16:48

	Distribution	Images
A. Acral	• Extremities	
B. Flexor	• Flexor aspect.	
C. Extensor	• Extensor aspect (Elbows, knees).	

	Distribution	Images
D. Photodistributed	Sun exposed areas.	

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Lines In Dermatology

00:17:35

Langer's Lines :

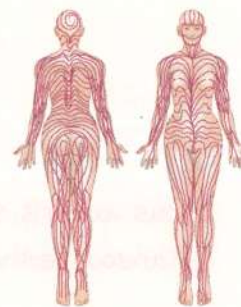
- Represent : Skin tension lines.
- Along the orientation of collagen fibres in dermis.
- Importance :
 - Surgical incisions are made along these lines.
 - Incisions across these lines → Hypertrophic scars.



Langers lines

Blaschko's Lines :

- Represent : Epidermal cell migration during embryologic development.
- Patterns :
 - Upper spine : V shaped.
 - Abdomen : S shaped.
 - Lower extremities : Perpendicular down.
 - Scalp : Spiralled.
- Importance : **Incontinentia pigmenti** (X-linked dominant disease) → Follows these lines.



Blaschko lines

Dermatological Diagnosis and Investigations

00:20:38

Dermatological Signs :

Nikolsky Sign :

Tangential pressure applied over skin

↓
upper layer separates from lower layer.



Nikolsky sign

----- Active space -----

Types of Nikolsky sign

• Nikolsky sign :	True	Pseudo
• mechanism :	Acantholysis	Necrosis of keratinocytes
• Ex :	1. Pemphigus foliaceus 2. Pemphigus vulgaris 3. Staphylococcal scalded skin syndrome (SSSS)	1. Toxic epidermal necrolysis (TEN)

Diascopy/Vitropression test :

Glass slide pressed over an erythematous lesion

Blanching response
(vasodilation)

Ex : Erythema

Non-blanching response
(Extravasation of RBC →
results in degeneration
→ Staining of vessel wall)

Purpura

Non-blanching
response (purpura)

Diascopy test

Apple jelly nodules :

- Yellowish-brown color on diascopy.
- Suggests granulomatous diseases.

Ex : Lupus vulgaris, Sarcoidosis,
Cutaneous leishmaniasis.

Apple jelly nodules

Dermatological Investigations :

Wood's lamp :

- Outpatient/office procedure.
- Wavelength : 364 nm.
- Filter : 9% Nickel oxide,
Barium silicate.



Wood's lamp