

Structured Notes According to DERMATOLOGY

Revision friendly Fully Colored Book/Structured Notes

For Best results, watch the video lectures along with reading notes



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(Author)**

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1. BASICS OF DERMATOLOGY



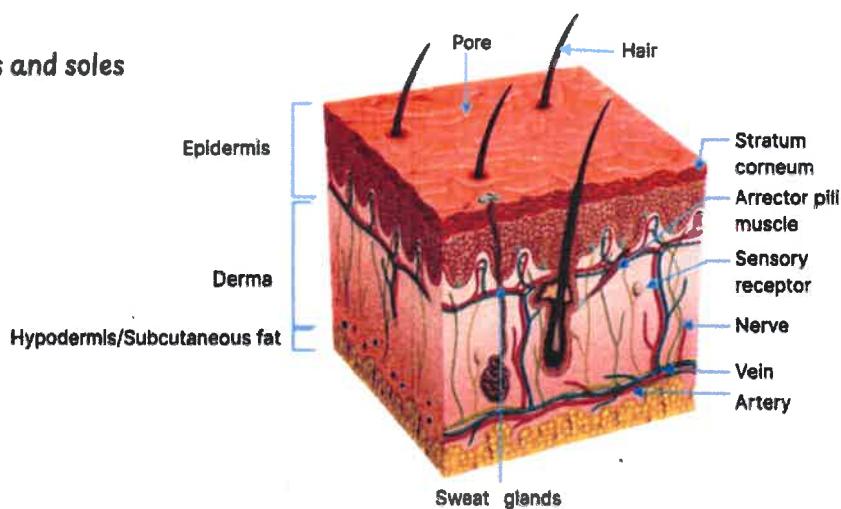
SKIN AND ITS APPENDAGES

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- Skin and its appendages (hair, nails, glands) → Integumentary System
- Skin - Largest organ human body
- Weight : 6-9 kgs
- **Glabrous skin:** Non-hairy skin in palms and soles

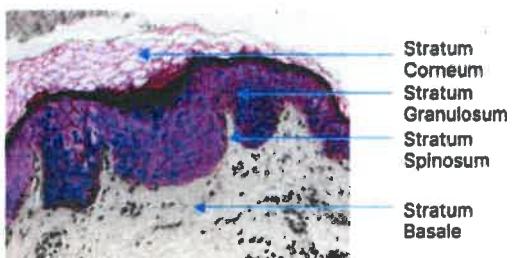
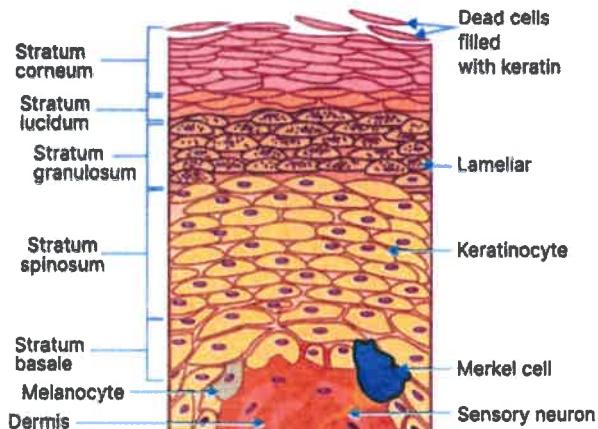
LAYERS OF SKIN

- Epidermis
- Dermis
- Hypodermis/Subcutaneous fat

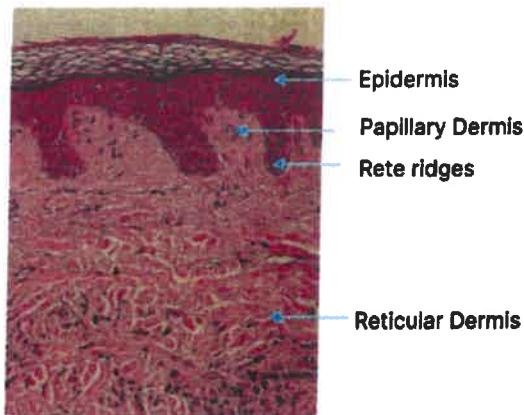


EPIDERMIS

INTRODUCTION

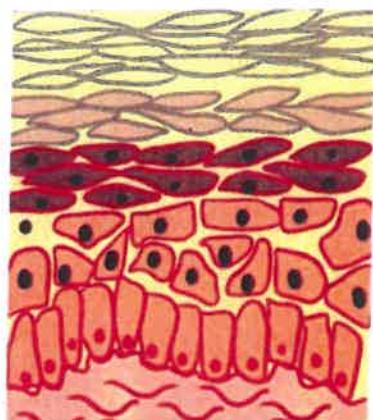


- Topmost layer
- Thickness : **100-300 micrometers**
- Thinnest : Eyelids
- Thickest : Palms and soles
- Main function : Barrier
- Layers of the Epidermis (Mnemonic - COME LET'S GET SUNBURNT)
 - Stratum corneum (Topmost)
 - Stratum lucidum : Only present in palms and soles (Thickest)
 - Stratum granulosum
 - Stratum spinosum
 - Stratum basale (Bottom most): Single cell layer



- **Rete ridges** : Invaginations of Epidermis into Dermis
- **Dermis**
 - **Papillary dermis** : Invaginations of Dermis into Epidermis
 - **Reticular dermis** : Made of fibrils

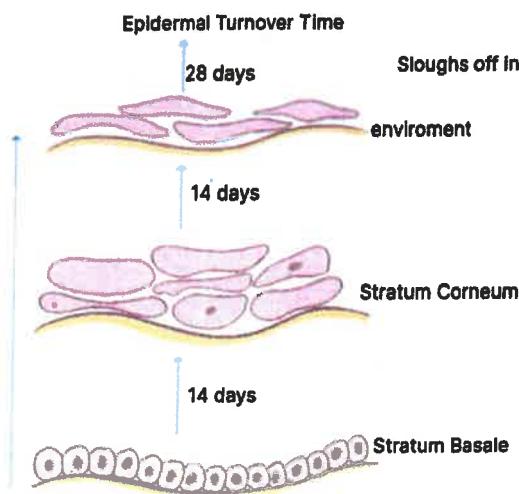
CELL DIFFERENTIATION



Preterm baby

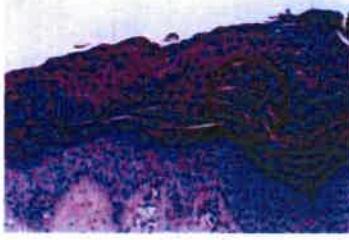
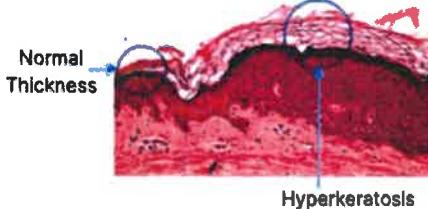
- Bottom to top : **Stratum Basale layer** (First to form) → **Stratum Corneum layer**
- Certain changes : SB → SC
 - Flat cells
 - ↑ Surface area
 - Cells lose nuclei → No mitosis (SB- Most mitotic activity)
 - Dehydrated cells
- In preterm baby, **Stratum Corneum** is absent

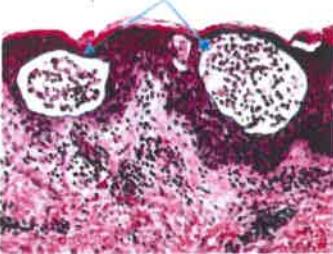
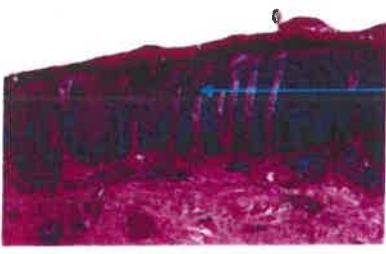
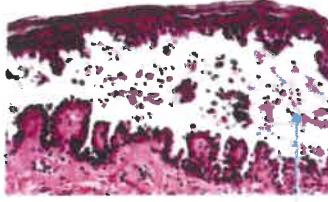
CELL KINETICS



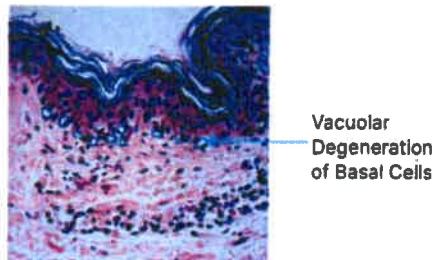
- Cell cycle of Keratinocytes - 300 hours
- Epidermal Turnover time
 - Continuous process of formation of skin - 56 - 75 days.
 - Cells migrate from SB → SC
 - ↓
 - 14 days to reach SC
 - ↓
 - Stay there for another 14 days
 - ↓
 - Slough off - 28 days
- In Psoriasis
 - Cell kinetics - 36 hours and Epidermal Turnover time : 4 days
 - Thus skin multiplies rapidly causing scaling

LAYERS OF EPIDERMIS

LAYERS	HISTOPATHOLOGICAL FINDINGS	CONDITIONS ASSOCIATED
STRATUM CORNEUM	<p>Parakeratosis Retention of Nuclei in Stratum Corneum</p>  <p>Site : Mouth and vagina</p>	<ul style="list-style-type: none"> • Psoriasis • Eczema • Actinic Keratosis • Seborrheic Dermatitis • Squamous Cell Carcinoma
	<p>Hyperkeratosis ↑ Thickness of Stratum Corneum</p> 	<ul style="list-style-type: none"> • Psoriasis • Lichen Planus
STRATUM LUCIDUM	<ul style="list-style-type: none"> • Found in Palms and Soles only • Clear cell layer → Presence of 	
STRATUM GRANULOSUM	<p>KERATOHYALIN GRANULES (PROFILAGGRIN)</p> <ul style="list-style-type: none"> • Keratinisation occurs here • Made up of granules • 2 important granules <ol style="list-style-type: none"> 1. Keratohyalin Granules (Forming Filaggrin) 2. Odland bodies/ Lipid Coating Granules/ Membrane coated granules 	<p>ODLAND BODIES/ LIPID COATING GRANULES/ MEMBRANE COATED GRANULES</p> <ul style="list-style-type: none"> • Function : Lubricates skin. • Defect cause dryness of skin → Asteatotic eczema (No fat rash)
	<p>Hypergranulosis ↑ thickness of Stratum granulosum</p> 	<ul style="list-style-type: none"> • Lichen planus

	<p>Agranulosis Absent granular layer/Stratum granulosum</p> <p>Dyskeratosis Disordered Keratinization (keratinization in other layers instead of SG)</p>	<ul style="list-style-type: none"> • Psoriasis • Benign : Hailey hailey disease, Darier's disease • Malignant : Basal cell carcinoma, Squamous cell carcinoma, Paget's disease
<p>STRATUM SPINOSUM</p> <ul style="list-style-type: none"> • Prickle cell layer • Desmosomes : Intercellular bridges connecting Keratinocytes <ul style="list-style-type: none"> ◦ Seen clearly in HPE • Thickest layer • Malpighian layer - Viable layer/ Most mitotically active layer <ul style="list-style-type: none"> ◦ Stratum Basale + Stratum Spinosum 	<p>Spongiosis Intercellular Edema</p>  <p>Ballooning</p>  <p>Acanthosis</p> 	<ul style="list-style-type: none"> • Acute eczema • Acute eczema • Chronic eczema
<p>STRATUM BASALE</p> <ul style="list-style-type: none"> • Lowest most/Basal layer • Most Mitotically Active layer • Single layer thickness 	<p>Acantholysis Separation of keratinocytes (acanthocytes)</p>  <p>Separation of Keratinocytes within the epidermis</p>	<ul style="list-style-type: none"> • Pemphigus group of disorders

Basal cell Degeneration
Degeneration of cells of basal layer



- Lichen planus.
- Lichenoid dermatitis

MICROABSCESS

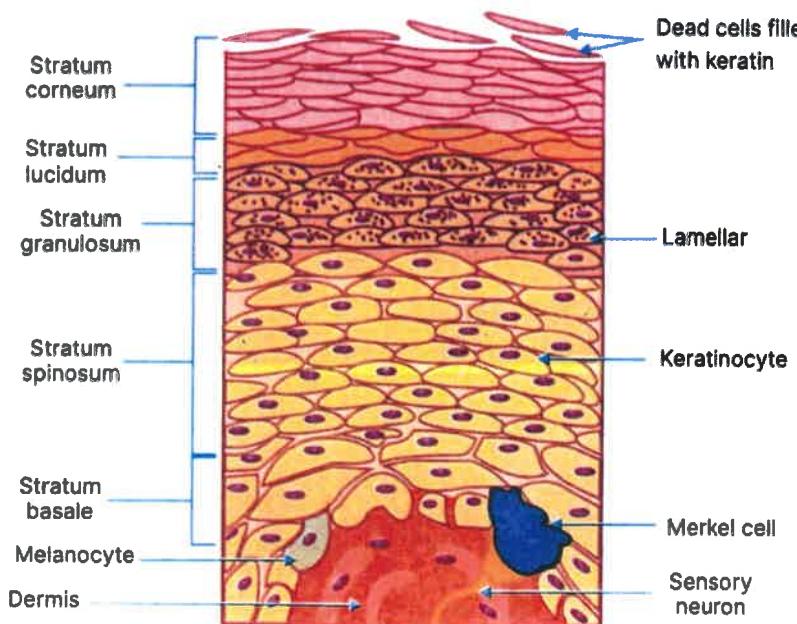
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- Collection of inflammatory cells in different cell layers

TYPES	INFLAMMATORY INFILTRATE	SITE	SEEN IN
Munro's	Neutrophils	Stratum corneum	Psoriasis
Kogoj's Spongiform Pustules	Neutrophils	Stratum spinosum	Psoriasis
Papillary	Neutrophils	Papillary dermis	Dermatitis Herpetiformis
Eosinophilic	Eosinophils	Basement membrane zone, Upper dermis	Bullous pemphigus
Pautrier's	Lymphocytes	Epidermis	Mycosis fungoides

CELLS IN EPIDERMIS

00:40:35



KERATINOCYTES



Intercellular Desmosomes

- Site: All cell layers (predominant cells)
- > 90% of Epidermis
- Derived from [redacted]
- Bound by filament aggregating proteins: Desmosomes (intercellular bridges)
- Function : Barrier maintenance

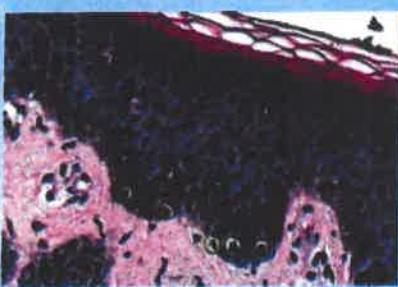
LANGERHANS CELLS



IHC Stained Langerhans cells

- Site : Stratum Spinosum.
- Type of dendritic cells
- Derived from Mesenchyme
- Antigen Presenting cells
- Contain Birbeck Granules : Racquet Shaped
- Stains : CD1A, CD207, S100

MELANOCYTES



- Site: Stratum Basale
- Derived from NCC
- Pigment forming cells
- Dendritic cell
- Ratio is 1:10 i.e., 1 melanocyte for 10 Keratinocytes.
- Each melanocyte transfers melanin through melanosomes to 36 keratinocytes surrounding it → [redacted]
 - Ratio- 1:36
 - Responsible for uniform skin color

MERKEL CELLS

- Site : Stratum Basale
- Derived from : Ectoderm > Neural Crest
- Slow adapting touch receptors

Important Information

- Change in skin color is due to:
 - Melanosomes
 - Light skin : Distributed as membrane-bound clusters
 - Dark skin : larger and distributed individually
 - Type of melanin
 - Eumelanin (Darker)
 - Pheomelanin (Lighter)

NERVE AND INNERVATION

- Rich network of nerves with 2 types of sensory endings.
 - Mechano-receptors : The corpuscles
 - Nociceptors : Free nerve endings

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MECHANO-RECEPTORS

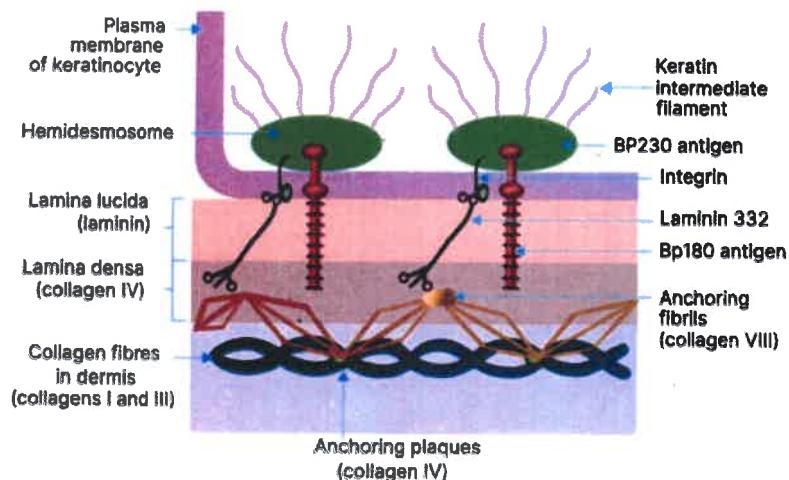
- **Light touch** : Merkel cells of the epidermis, Meissner's corpuscles in dermal papillae
- **Pressure** : Pacinian corpuscles in deep dermis or subcutaneous tissue

NOCICEPTORS

- **Pain and itch** : Transmitted through naked fine free nerve endings
 - In basal layer of the epidermis close to dermo epidermal junction
- **Temperature** : Kruse bulbs (detect cold), Ruffini end organs (detect heat)
 - Heat, cold and proprioception: Located in superficial dermis

DERMO EPIDERMAL JUNCTION

00:56:42



- Structure connecting epidermis to dermis
- Basement membrane zone
- Predominantly formed by **type IV collagen**
- Main function : **Adhesion and Signaling**
- Weakest part of BMZ : **Lamina Lucida**

PARTS OF BMZ

- **Hemidesmosomes**
 - Connects Keratin intermediate filament and Dermis
 - Formed by **BP 180, BP 230 antigens**
- **Lamina lucida**
 - Formed by Laminin
- **Lamina densa**
 - Anchoring fibrils connecting to Anchoring plaques
 - Made of Collagen IV
- **Anchoring fibrils**
 - Made of Collagen VIII
- **Anchoring plaques**
 - Made of Collagen IV



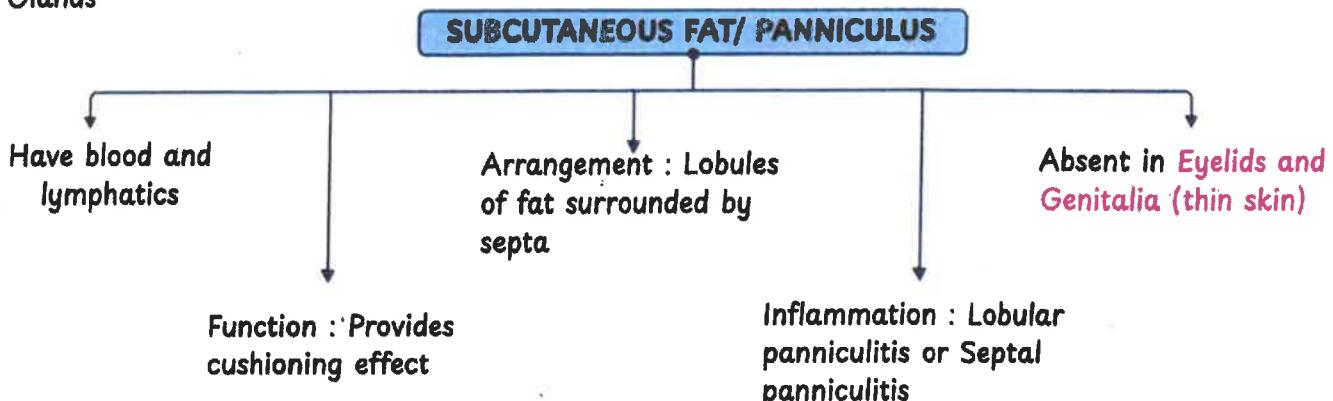
COMPONENTS OF THE DERMIS

CELLS	FIBER	GROUND SUBSTANCE
<ul style="list-style-type: none"> • Fibroblast (Predominant cell) • Langerhans Cell • Mast cell • Lymphocytes • Phagocyte 	<ul style="list-style-type: none"> • Collagen (most abundant) • Elastin 	<ul style="list-style-type: none"> • Hyaluronic Acid • Heparan Sulphate

- Other Components include : blood vessels, nerves, hair follicles, glands

SKIN APPENDAGES

- Hair
- Nails
- Glands



FUNCTIONS OF SKIN

- Most important function: Formation of Vitamin D
 -
- Other functions are
 - Barrier function
 - Thermoregulation
 - Cosmetic purpose
 - Nail bed: Cosmesis
 - Metabolism

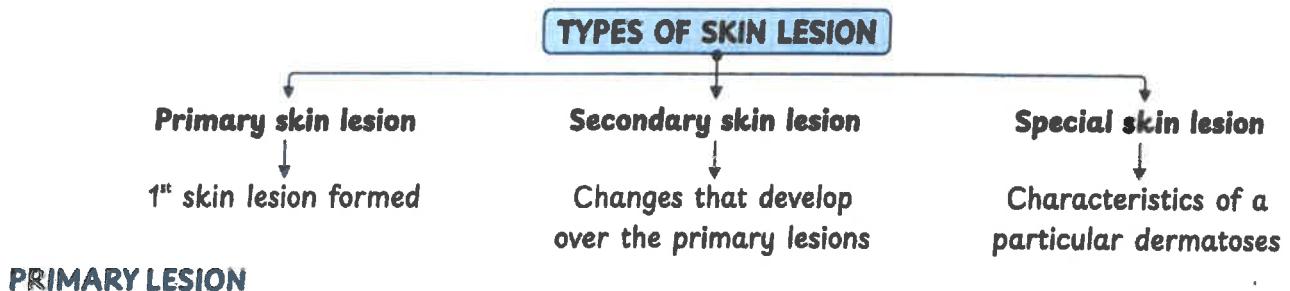
MCQ's

Q. Which layer of skin is characterized by the presence of refractile granules of Eleidin?

- a. Stratum Corneum
- b. Stratum Granulosum
- c. Stratum Spinosum
- d. Stratum Lucidum

Ans. (d)

2. SKIN LESIONS IN DERMATOLOGY



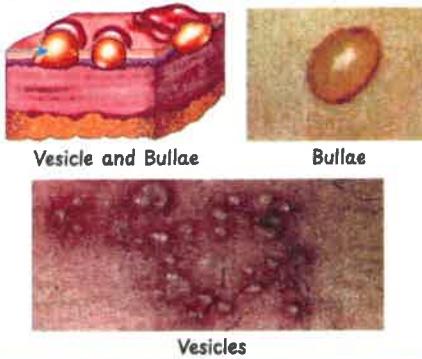
PRIMARY LESION

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PRIMARY LESION	IMAGE	CHARACTERISTIC LESIONS
Macule and Patch	<p>Hyperpigmented lesions Depigmented lesions</p>	<ul style="list-style-type: none"> Change in skin color Can only be seen, not felt Neither raised nor depressed <ul style="list-style-type: none"> If lesion < 0.5 cm = Macule If lesion > 0.5 cm = Patch Change in skin color <ul style="list-style-type: none"> : Freckles, Cafe au lait spots/macules Depigmented (Milky white) : Vitiligo : Leprosy, Pityriasis versicolor
Papule	<p>Papule Plaque Nodule</p> <p>Papule Nodule</p> <p>Multiple Papules Plaque</p>	<ul style="list-style-type: none"> Circumscribed solid raised lesion Three types <ul style="list-style-type: none"> < 0.5 cm = papule > 0.5 cm = plaque (Change in Skin texture) > 0.5 cm & more depth than height Nodule (better felt than seen)

Vesicle and Bullae

Fluid-filled lesions



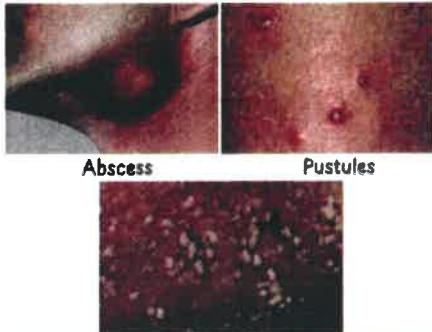
- Fluid-filled lesions

 - Lesion < 0.5 cm = **Vesicle**
 - Lesion > 0.5 cm = **Bullae**

- Vesicle : Herpes and pemphigus group of disorders

- Bullae : Pemphigus group of disorders and Bullous impetigo

Pustule



- Pus-filled lesions

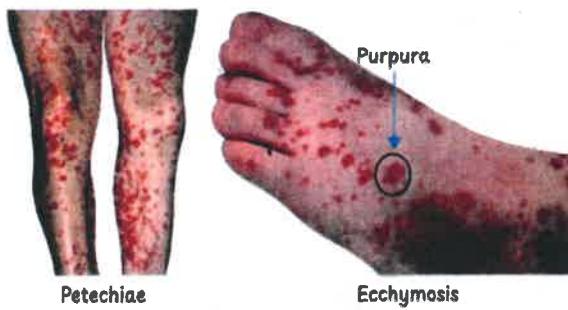
- Collection of pus in a cavity : **Abscess**

 - Neutrophil collection : Sterile
 - Microbes collection : Infected

- Can be

 - Primary Pustules (Pustular psoriasis - Sterile)
 - Secondary Pustules (Infections)

Petechiae, Purpura and Ecchymosis



- Non-Blanchable.

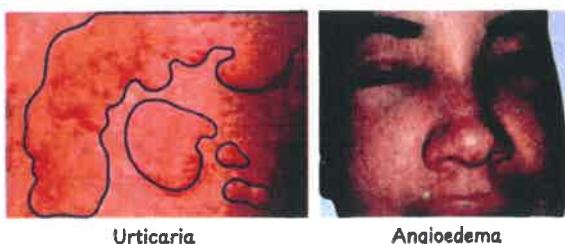
- Extravasation of RBCs in skin

 - Lesions 1-2 mm = **Petechiae**
 - Lesions > 3 mm = **Purpura**
 - Palpable purpura (Vasculitis)
 - Non-palpable purpura (Thrombocytopenia, Clotting disorders)
 - Lesions 1-2 cm = **Ecchymosis**

- Erythema**

 - Occurs because of vasodilation
 - Blanching of lesion

Urticaria And Angioedema



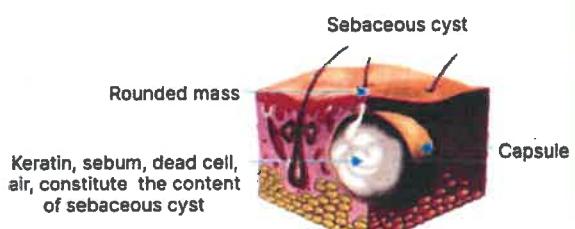
- Urticaria** - Development of wheals

- Wheal is erythematous, edematous &

 - Temporary, Raised papules and plaques

- Angioedema** - Evanescent swelling of mucous membranes

Cyst



Rounded mass
Keratin, sebum, dead cell, air, constitute the content of sebaceous cyst

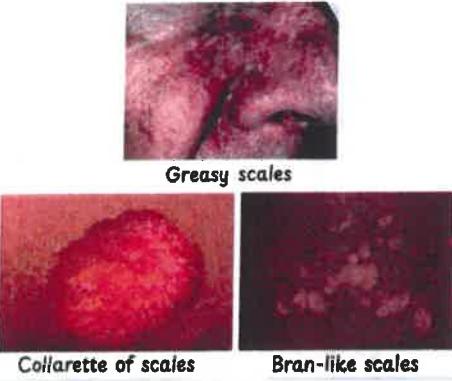
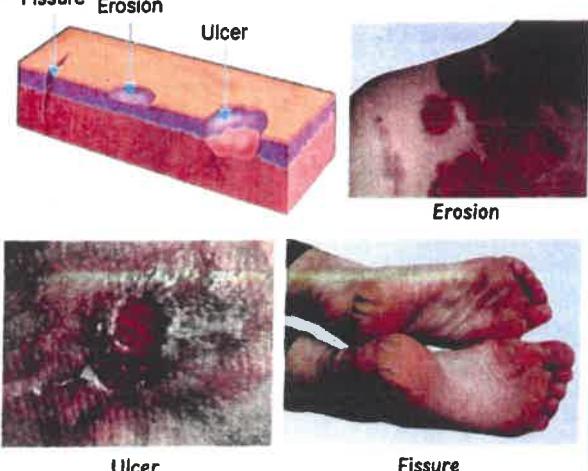
- Enclosed cavity with a lining filled with fluid or semisolid material

- Example - **Epidermal Inclusion Cyst (EIC)**



SECONDARY SKIN LESIONS

00:18:56

SECONDARY SKIN LESION	IMAGE	CHARACTERISTIC LESIONS
Scale	 Silvery white scales Fish like scales  Greasy scales Bran-like scales	<ul style="list-style-type: none"> Visible exfoliation of stratum corneum Examples <ul style="list-style-type: none"> o Silvery white scale (Psoriasis) o Fish-like/Plate-like scale (Ichthyosis) o Greasy scales (Seborrheic dermatitis) o Collarette of scales (P. Rosea) o Fine bran-like scales (very thin) - P.vesicolor
Crust	 Honey-coloured crust is seen in Non-bullous impetigo	<ul style="list-style-type: none"> Dried-up exudate (pus, serum, blood) Honey-coloured crust is seen in Non-bullous impetigo Hemorrhagic crust : Seen in Herpes
Erosion, Ulcers, and Fissures	 Fissure Erosion Ulcer Erosion Ulcer Fissure	<ul style="list-style-type: none"> Erosions <ul style="list-style-type: none"> o Denudation of skin/break in continuity of skin limited to epidermis o Superficial → heals without a scar Ulcer: <ul style="list-style-type: none"> o Denudation + Involvement of dermis(beyond epidermis) o Can even extend up to subcutaneous tissue o Is deep, has a base and an edge Fissure : Linear cracks in the skin (Soles)

Excoriations



- Superficial excavations on the skin (stratum corneum)
- Cause : Scratching

Lichenification



- Chronic eczema
- Histopathology : Acanthosis (\uparrow Thickness of stratum spinosum)
- Features
 - Hyperpigmentation
 - \uparrow skin markings
 -

Sinus



- Blind tract that connects skin to a deeper cavity
- Eg:- Hidradenitis suppurativa

Scars



- Abnormal proliferation of fibrous tissue replacing normal tissue
- Two types
 - Hypertrophic : Increased/Raised scarring (Keloid)
 - Atrophic : Decreased/Depressed scarring (Acne)

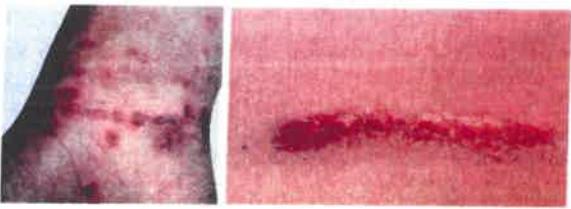
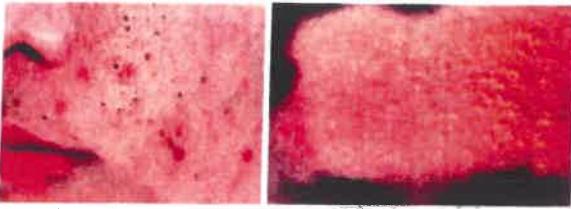
Atrophy



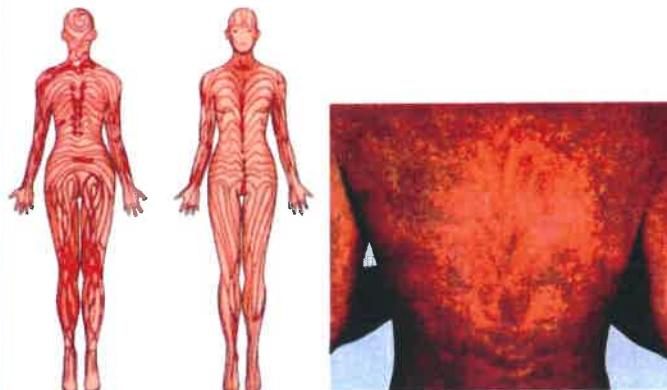
- Loss of portion of skin
- Epidermal atrophy : Wrinkled skin (Old age)
- Dermal atrophy : Lesion more depressed

SPECIAL SKIN LESIONS

00:29:28

Burrow		<ul style="list-style-type: none"> Linear tract in skin extending upto stratum corneum and stratum malpighii (laid by scabies mite) Seen in Scabies
Comedones	 <div style="display: flex; justify-content: space-around; width: 100%;"> Open comedones Closed comedones </div>	<ul style="list-style-type: none"> Seen in Acne Types <ul style="list-style-type: none"> Closed comedones are white Open comedones are black
Telangiectasia		<ul style="list-style-type: none"> Visible dilatation of dermal capillaries Seen in poikiloderma Poikiloderma has three components <ul style="list-style-type: none"> Atrophy Atrophy Skin pigmentation
Sclerosis		<ul style="list-style-type: none"> Binding down of skin (Loss of skin elasticity) Seen in Scleroderma
Milia		<ul style="list-style-type: none"> Keratinous cysts / Keratin-filled cysts Appear as white solid papules
Target lesion		<ul style="list-style-type: none"> Seen in Erythema multiforme Has 3 zones <ul style="list-style-type: none"> Central zone of necrosis Peripheral zone of edema Zone of erythema

BLASCHKO'S LINES



LANGER'S LINES



- Lines of **embryonic development**
- Has clear central demarcation
- Constant lines
 - Trunk - curved; Limb - linear ; Abdomen - S-shaped pattern
- Some Examples - **Verrucous epidermal nevus (VEN)**, **Incontinentia Pigmenti**

- Lines of the orientation of **collagen and muscle fibers**
- **Importance**
 - Incisions are preferably given along the Langer lines
 - Better healing and less damage to collagen and muscle fibers
- Also known as **Relaxed Skin Tension Lines (RSTL)**
- Lines are **not constant**
- No clear central demarcation

Presentation		
	Superficial bulla → hypopyon Rupture → Golden colored crust	Crusted erosions → Honey colored M/c in face and children
Target cell/protein	DSG1 (Desmoglein 1) • Causes subcorneal bulla → Hypopyon)	—
Age group	Newborns	Preschoolers/toddlers
Organism	Staphylococcus aureus	Streptococcus > Staphylococcus • Staph - developed nation • Strep - developing nation
Complication	Staphylococcal scalded skin syndrome (SSSS)	

DIAGNOSIS

- Gram stain : Gram positive cocci in clusters
 - Grape like clusters**

Gram +ve cocci in grape like clusters



ECTHYMA

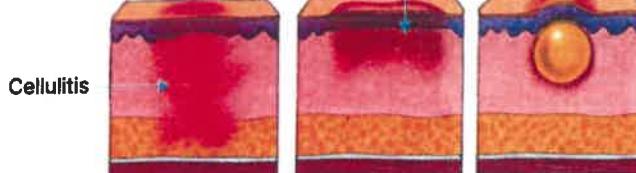
- Non-follicular deep infection- localized
- Streptococcus > Staphylococcus
- On 
- Erythematous plaques → Ulcers
 - covered with necrotic plaques

Ulcers with thick necrotic crusts



ERYSIPelas AND CELLULITIS

- Widespread and non-follicular
- Soft tissue infection
- Lower limb > upper limb > Face
- Warm tender plaques, fever and constitutional symptoms

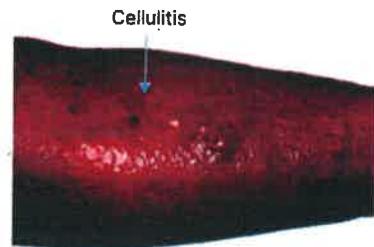
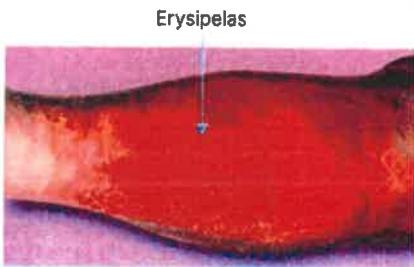


ERYSIPelas

- Superficial
- Affects superficial dermis and lymphatics
- Well demarcated margins**
- M/C Causative agent : Streptococcus

CELLULITIS

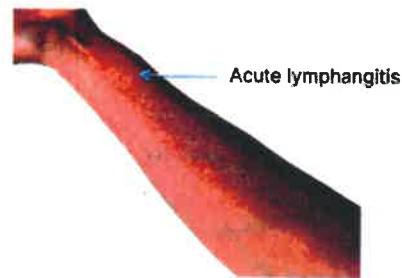
- Deeper
- Involve the whole of the dermis and the subcutaneous tissue
- Ill-defined margins (diffused)**
- M/C Causative agent : Staphylococcus



ACUTE LYMPHANGITIS

- Tender erythematous linear streak of varying width
 - Extending from the local lesion
- From portal of entry of organism towards regional lymph nodes
- Causative agent : **Streptococcus**
- Affects the lymphatic vessels of subcutaneous tissues
- Lymph node : Tender and enlarged

00:15:00



FOLLICULAR INFECTIONS- PYODERMA

TYPES

00:16:30

FOLLICULITIS	FURUNCLE	CARBUNCLE
<ul style="list-style-type: none"> • Types <ul style="list-style-type: none"> ◦ Superficial folliculitis ◦ Deep folliculitis 	<ul style="list-style-type: none"> • Severe infection • Follicle + Peri follicular area 	<ul style="list-style-type: none"> • Multiple contiguous hair follicles infection



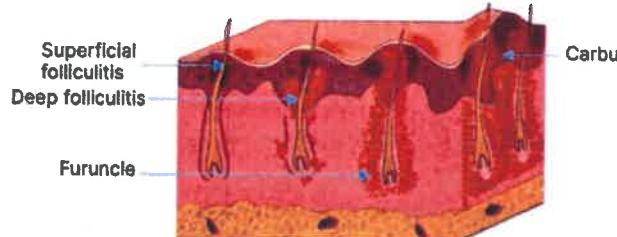
Folliculitis



Furuncle



Carbuncle



Carbuncle

FOLLICULITIS

BOCKHART'S IMPETIGO/ SUPERFICIAL FOLLICULITIS

- Caused by : **Staphylococcus**
- Children - M/c
- Pustules in crops
- Scalp, hair margin, extremities
- Heal in a week
- **Chemical folliculitis:** Irritation from chemicals
- **Pseudofolliculitis:** Improper waxing → leading to ingrown hair, causing irritation to hair follicles

DEEP FOLLICULITIS

- Beard : **Sycosis barbae**
 - Misnomer → bacterial infection not fungal infection
 - Deep painful pustules
 - **Fig tree appearance**
 - Around nose and perioral area
 - Differential diagnosis : **Tinea barbae**
 - Itchy
 - KOH positivity
- Hair : **Folliculitis decalvans / Dissecting cellulitis**
- Face : **Lupoid sycosis**
 - Severely deep folliculitis
 - Lupoid/lupus-like scarring