

## Dermpath and Musculoskeletal Pathology Section

### Assignment page, skin and musculoskeletal pathology.

Robbins: Chapter 25, Skin Pathology  
Chapter 26, Skeletal and Soft Tissue Tumors

Clinical lab Source:

Arthritis Panel,  
Rheumatoid factor,  
Rhabdomyolysis panel,  
Aldolase,  
CPK,  
LDH,  
AST,  
Myoglobin, urine and serum,

Wheater: Chapters 21 and 22

Slide assignment:

Refer to the skin and musculoskeletal sections of the lab manual..

Pay special attention to the following skin slides: 31, 52, 87, 93, 116, 151, 154, 157, 190

And the following musculoskeletal slides: 7, 23, 134, 156

**Online cases**, there are **two**, one for derm and one for musculoskeletal. These are due by the time of our 4<sup>th</sup> unit exam.

Case 15 (CD case 15): Mr. Phillips' lymph nodes.

Case 14 (CD case16): Mrs. Robinson's morning stiffness

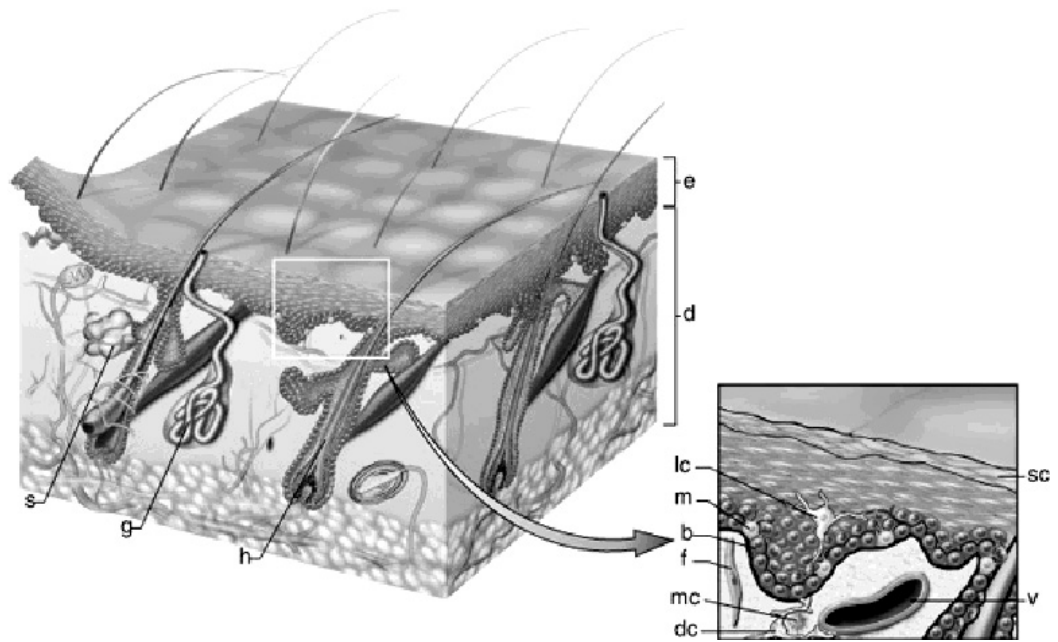
**Paper cases:**

There are several paper cases for this unit, they are found at the end of the muscle and skeletal unit.

## Disorders of Skin

### I) Some functions

- Immune system processing - Langerhans cells
- Water regulation
- “holds us together”
- vitamin D

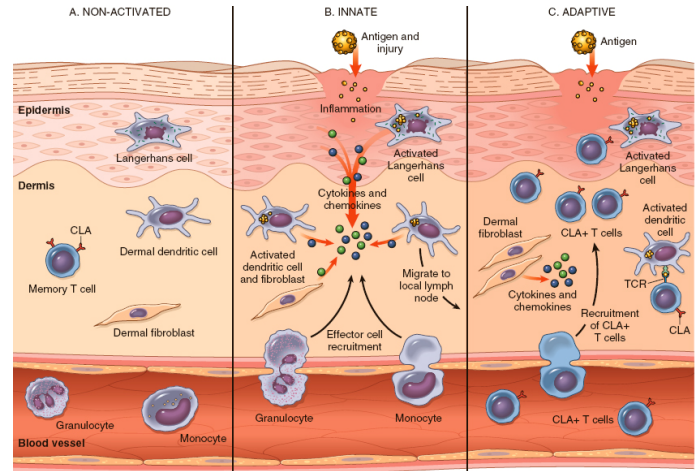


Ref: Robbins, Pathologic Basis of Dis

### II) Composition

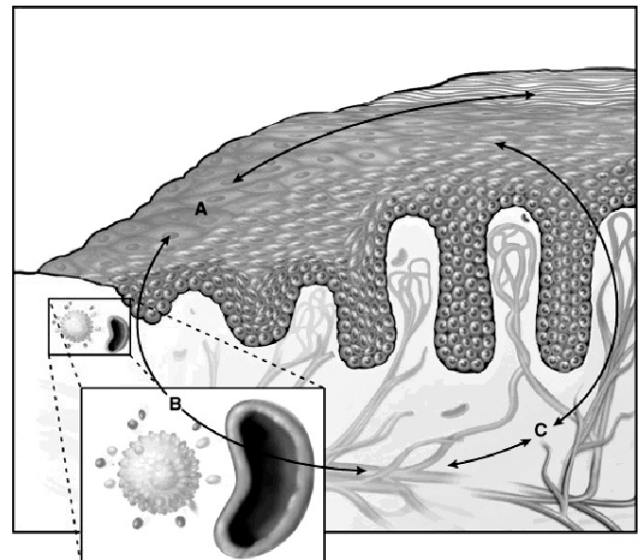
- corneum; granulosa; spinosum; basal layer; membrane; dermis
- connective tissue; vessels; immune; pigmentation cells; hormonally active

## Immune processing



Dermal/epidermal interaction:

- cytokines for keratinization
- endothelial cell regulation
- constant interplay and “tuning”



III) Basic patterns indicating injury; you can see the changes; pigmented or not etc.

### DEFINITIONS OF MACROSCOPIC TERMS

<b>Excoriation</b>	Traumatic lesion breaking the epidermis and causing a raw linear area (i.e., deep scratch); often self-induced
<b>Lichenification</b>	Thickened and rough skin characterized by prominent skin markings (as lichen on a tree trunk); usually the result of repeated rubbing
<b>Macule</b>	Circumscribed lesion, 5 mm or smaller in diameter, characterized by flatness and distinguished by coloration ( <b>patch</b> is greater than 5 mm)
<b>Onycholysis</b>	Separation of nail plate from nail bed
<b>Papule</b>	Elevated dome-shaped or flat-topped lesion 5 mm or less across ( <b>nodule</b> is greater than 5 mm)
<b>Plaque</b>	Elevated flat-topped lesion, usually greater than 5 mm across (may be caused by coalescent papules)
<b>Pustule</b>	Discrete, pus-filled, raised lesion
<b>Scale</b>	Dry, horny, platelike excrescence; usually the result of imperfect cornification
<b>Vesicle</b>	Fluid-filled raised lesion 5 mm or less across ( <b>Bulla</b> is greater than 5 mm. <b>Blister</b> is the common term for either.)
<b>Wheal</b>	Itchy, transient, elevated lesion with variable blanching and erythema formed as the result of dermal edema

### DEFINITIONS OF MICROSCOPIC TERMS

<b>Acantholysis</b>	Loss of intercellular cohesion between keratinocytes
<b>Acanthosis</b>	Diffuse epidermal hyperplasia
<b>Dyskeratosis</b>	Abnormal, premature keratinization within cells below the stratum granulosum
<b>Erosion</b>	Discontinuity of the skin showing incomplete loss of the epidermis
<b>Exocytosis</b>	Infiltration of the epidermis by inflammatory cells
<b>Hydropic swelling (ballooning)</b>	Intracellular edema of keratinocytes, often seen in viral infections
<b>Hypergranulosis</b>	Hyperplasia of the stratum granulosum, often due to intense rubbing
<b>Hyperkeratosis</b>	Thickening of the stratum corneum, often associated with a qualitative abnormality of the keratin
<b>Lentiginous</b>	A linear pattern of melanocyte proliferation within the epidermal basal cell layer
<b>Papillomatosis</b>	Surface elevation caused by hyperplasia and enlargement of contiguous dermal papillae
<b>Parakeratosis</b>	Keratinization with retained nuclei in the stratum corneum. On mucous membranes, parakeratosis is normal.
<b>Spongiosis</b>	Intercellular edema of the epidermis
<b>Ulceration</b>	Discontinuity of the skin showing complete loss of the epidermis revealing dermis or subcutis
<b>Vacuolization</b>	Formation of vacuoles within or adjacent to cells; often refers to basal cell–basement membrane zone area

#### IV) Lesions resulting in changes in pigmentation

- vitiligo

- autoimmune

- humeral self destruction

of melanocytes

- depigmentation



- freckle - localized incr pigmentation

- melasma - estrogens; facial pigmentation of pregnancy

- lentigo - LINEAR proliferation of melanocytes at basal layer; hyper pigmentation

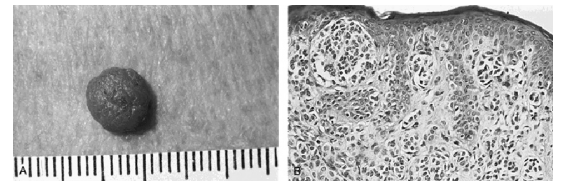
- nevus - “mole” - benign proliferation of young melanocytes; present at birth

Table 27-1. VARIANT FORMS OF NEVOCELLULAR NEVI			
Nevus Variant	Diagnostic Architectural Features	Diagnostic Cytologic Features	Clinical Significance
Congenital nevus	Deep dermal and sometimes subcutaneous growth around adnexa, neurovascular bundles, and blood vessel walls	Identical to ordinary acquired nevi	Present at birth; large variants have increased melanoma risk
Blue nevus	Nonnested dermal infiltration, often with associated fibrosis	Highly dendritic, heavily pigmented nevus cells	Black-blue nodule; often confused with melanoma clinically
Spindle and epithelioid cell nevus (Spitz nevus)	Fascicular growth	Large, plump cells with pink-blue cytoplasm; fusiform cells	Common in children; red-pink nodule; often confused with hemangioma clinically
Halo nevus	Lymphocytic infiltration surrounding nevus cells	Identical to ordinary acquired nevi	Host immune response against nevus cells and surrounding normal melanocytes
Dysplastic nevus	Large, coalescent intraepidermal nests	Cytologic atypia	Potential precursor of malignant melanoma

- junctional

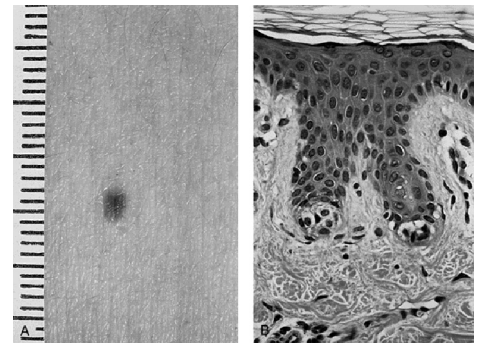
- dermal

- compound



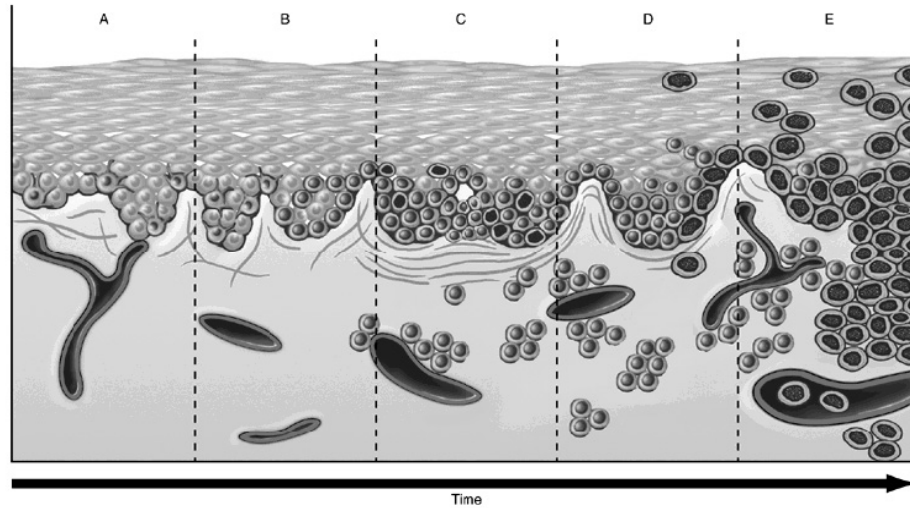
- “Spitz”

- halo



- blue - very dendritic

- Dysplasticnevus - BK moles



- Melanoma - “flag sign”

- NODULAR (VERTICAL) growth; important (compared with radial)

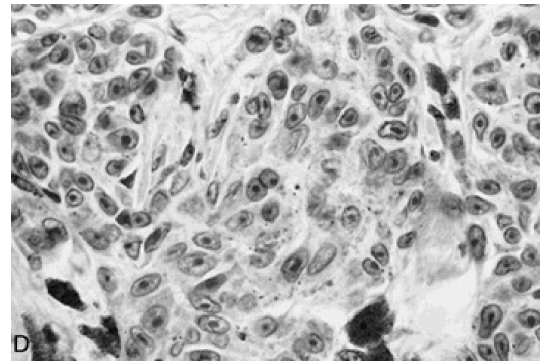
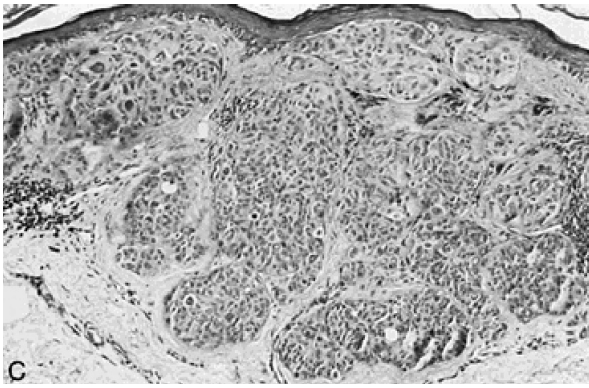
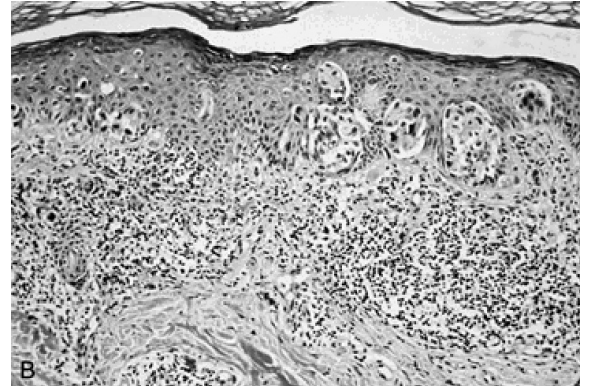
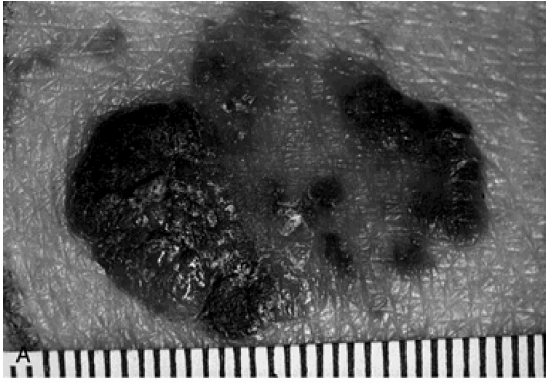
- Clark’s level – I through IV

- Today we measure the depth

<0.76, good; 0.76-1.5 moderate risk; >1.5mm high risk.

- skin - meninges - retina - conjunctiva - iris - anus - nail beds

- can be widely metastatic - site of origin



Ref: Robbins, Pathologic Basis of Dis

Ref: Robbins, Pathologic Basis of Di

## V) Epithelial lesions

- basic patterns

- pigmentation, +/-

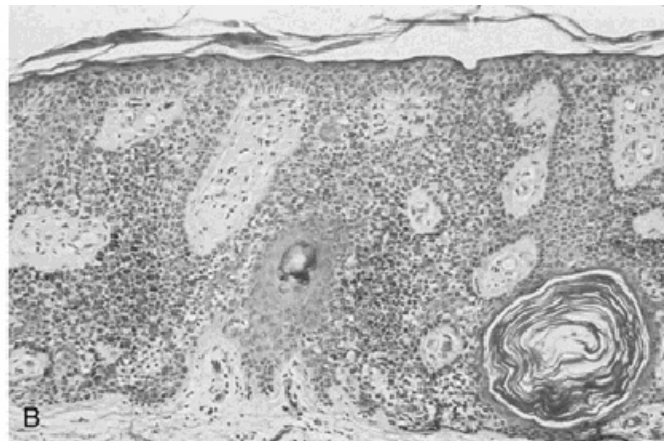
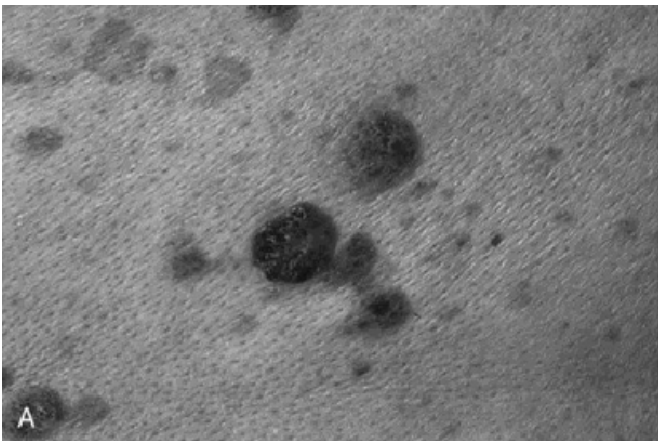


- acanthosis

- perkeritosis

- hyperkeratosis

- seborrheic keratosis



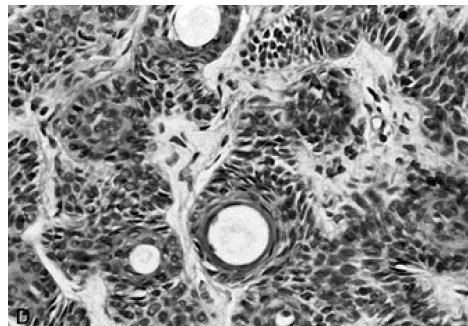
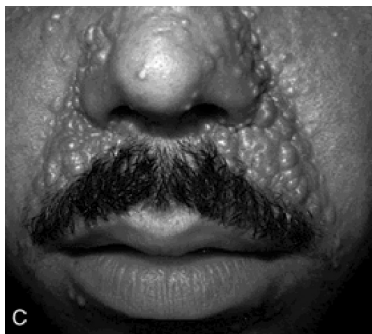
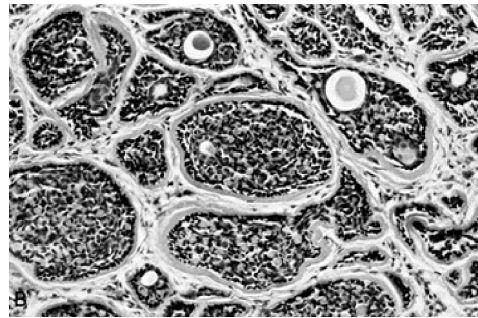
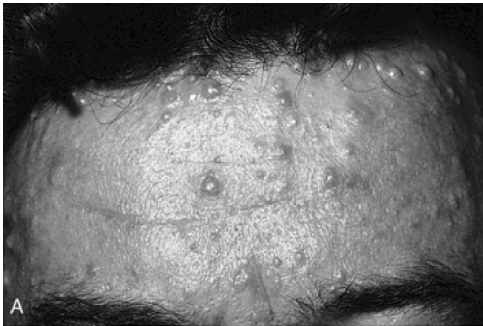
- Acanthosis nigricans - hyper pigmentation on flexor surfaces; internal malignancy

20% of adults have an occult adenocarcinoma somewhere.

- polyps and papillomas

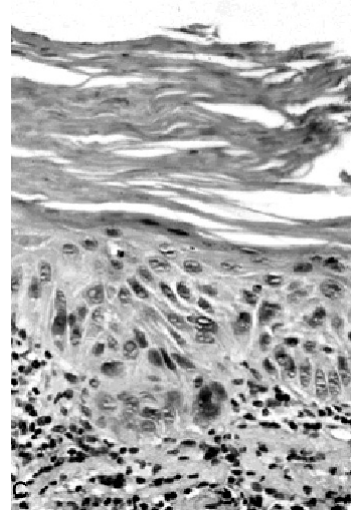
- cysts (wen from the Old English meaning welt)

Tumors of adenexal origin (basal cells that give rise hair shafts, sweat glands etc.)

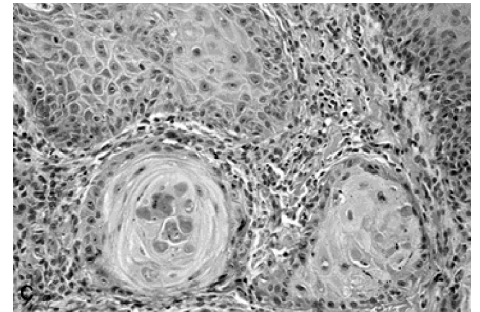


Atypical, premalignant and malignant

- actinic keratosis (solar)

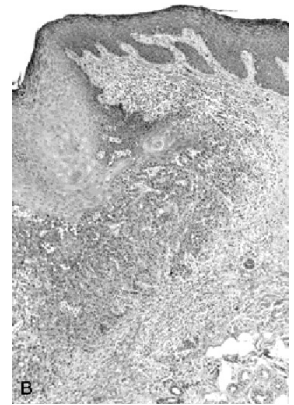
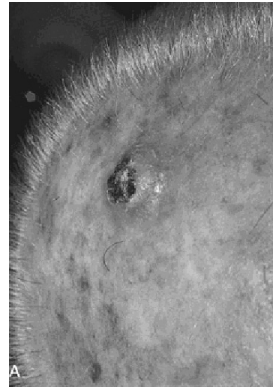
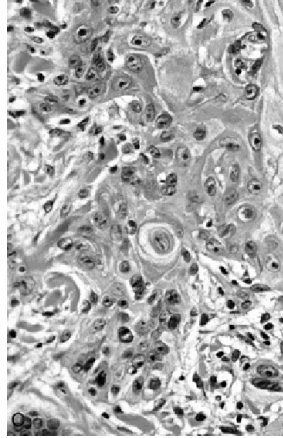


- keratoacanthoma; now classed as squamous cell ca

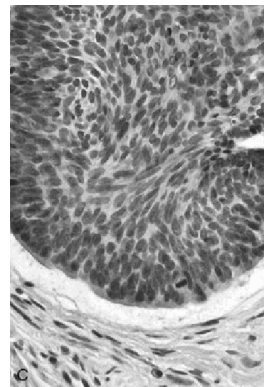
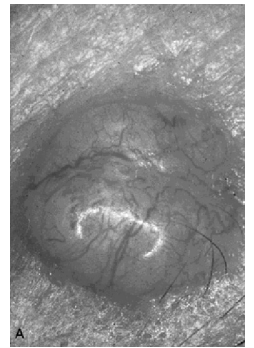
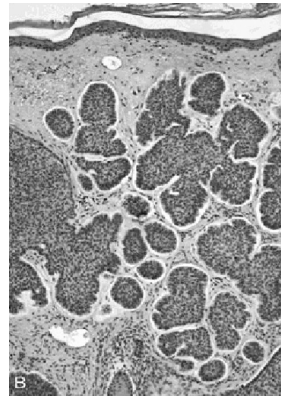


Ref: Robbins, Pathologic Basis of Dis.

- squamous cell carcinoma



- basal cell carcinoma



## VI) Dermal tumors

### Fibrous lesions

- fibromas
- scars
- xanthomas
  
- Dermatofibroma



Ref: Robbins, Pathologic Basis of

### Dis

- DFSP (dermatofibrosarcoma protuberans)

- sarcomas

### Fibroblastic

- vascular

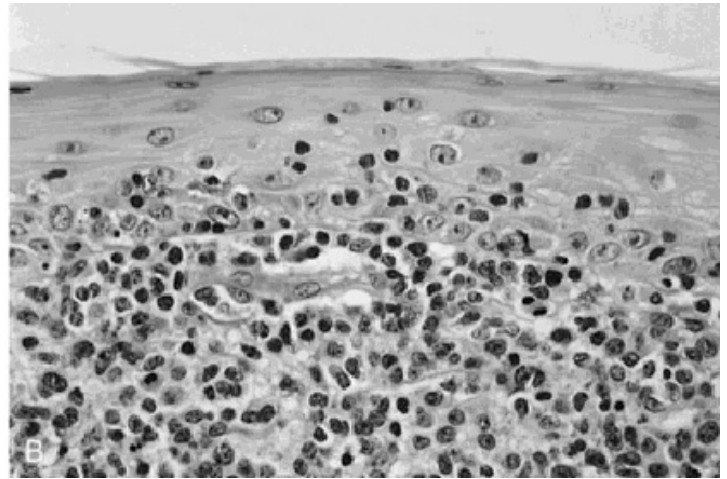
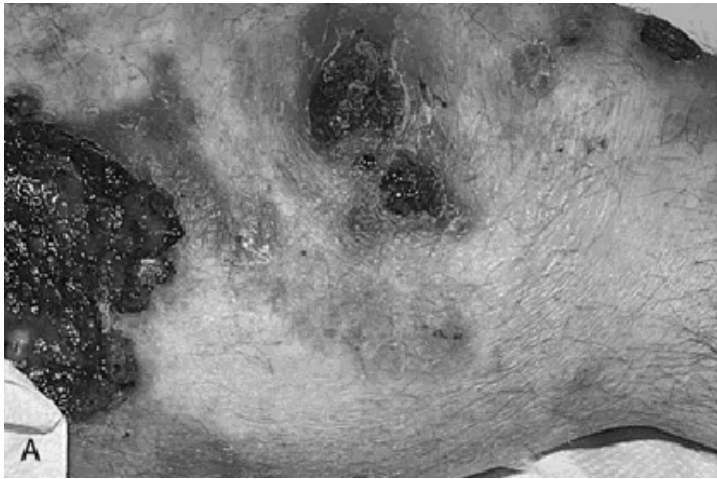
- Kaposi's

- benign hemangioma

- leiomyoma vascular wall or arrector pilla

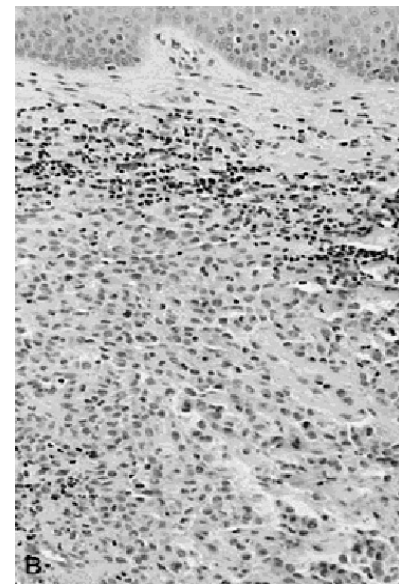
- primary lymphoid proliferations - reactive - malignant (primary and metastatic)

- MF with Sz cells in peripheral blood - T cell lymphoma - helper variety



Ref: Robbins, Pathologic Basis of Dis

- Histiocytosis X



Ref: Robbins, Pathologic Basis of Dis

- specialized or neuroendocrine - Merkel cell carcinoma

- metastatic cancer in dermis or epithelial covering

- melanoma
- lymphoma
- breast
- renal cell
- lung

#### VII) Inflammatory dermatosis - epithelium and or dermis

- Acute - many types - immunologic response generally

- urticaria - hives - localized mast cell degranulation - incr vascular perm.

- “wheal” reaction (not spelled wheel)

- IgE

- reaction to be sting or drug

- can be generalized



Eczematous dermatosis - “to boil over”

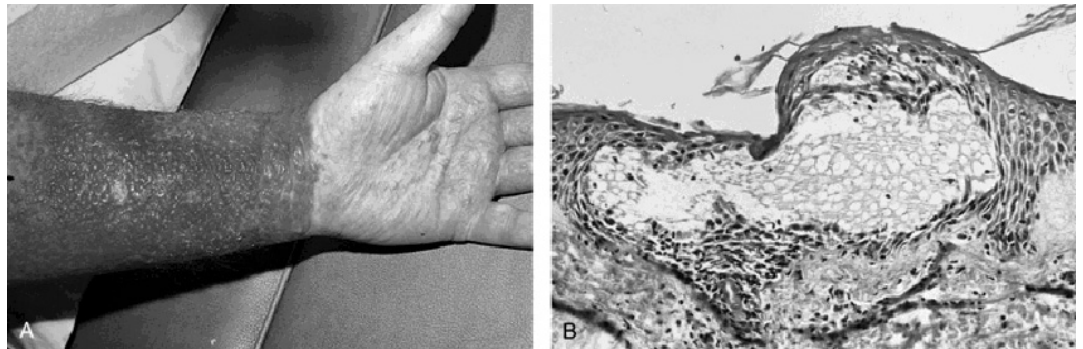
**Table 27-3. CLASSIFICATION OF ECZEMATOUS DERMATITIS**

Type	Cause or Pathogenesis	Histology*	Clinical Features
Contact dermatitis	Topically applied antigens Pathogenesis: delayed hypersensitivity	Spongiotic dermatitis	Marked itching or burning or both; requires antecedent exposure
Atopic dermatitis	Unknown, may be heritable	Spongiotic dermatitis	Erythematous plaques in flexural areas; family history of eczema, hay fever, or asthma
Drug-related eczematous dermatitis	Systemically administered antigens or haptens (e.g., penicillin)	Spongiotic dermatitis; eosinophils often present in infiltrate; deeper infiltrate	Eruption occurs with administration of drug; remits when drug is discontinued
Photoeczematous eruption	Ultraviolet light	Spongiotic dermatitis; deeper infiltrate	Occurs on sun-exposed skin; phototesting may help in diagnosis
Primary irritant dermatitis	Repeated trauma (rubbing)	Spongiotic dermatitis in early stages; epidermal hyperplasia in late stages	Localized to site of trauma

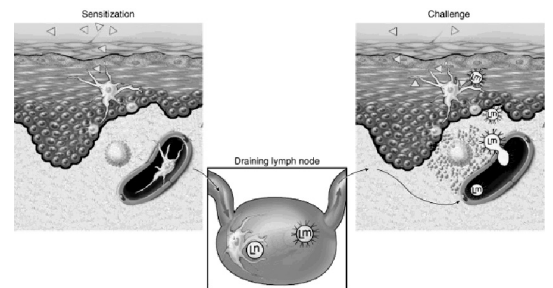
\*All types, with time, may develop chronic changes.

Ref: Robbins, Pathologic Basis of Dis

contact dermatitis - poison ivy reaction



Ref: Robbins, Pathologic Basis of Dis



- atopic dermatitis - asthma



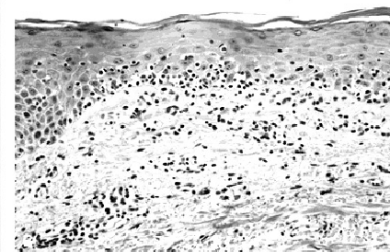
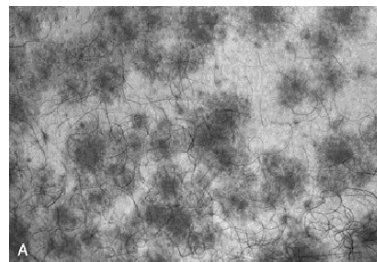
- drug related
- photo eruption
- primary irritants
- gross appearance - red - papular and vesicular - oozing - crusting
- micro
  - spongiosis - fluid in between cells of epidermis
  - perivascular lymphocytic and eosinophil infiltrate

- Erythema multiforme

- response to many things

- infection

- immune



- drugs

Ref: Robbins, Pathologic Basis of

Dis.

- target lesion is classic appearance - red macule or papule with darker center

Stevens-Johnson syndrome: children, hemolysis, crusting of lips

- immunologic in nature

- lymphocytic infiltrate of dermis with degeneration of basal layer of epi

- Erythema nodosum and enduratum

- inflammation of fat and sub-Q tissues

- infections - drugs Ag/Ab mediated I believe

- Pyoderma gangrenosum - UC

#### VIII) Chronic inflammatory dermatosis - both epi and dermis involved

- general aspects

- persistent acute in some cases

- epithelium reaction - thickening - scaling - roughening - incr turnover rate

- psoriasis - idiopathic ? Ab/Ag

- arthritis

- AIDS

- elbows

- knees

- scalp

- glans of penis

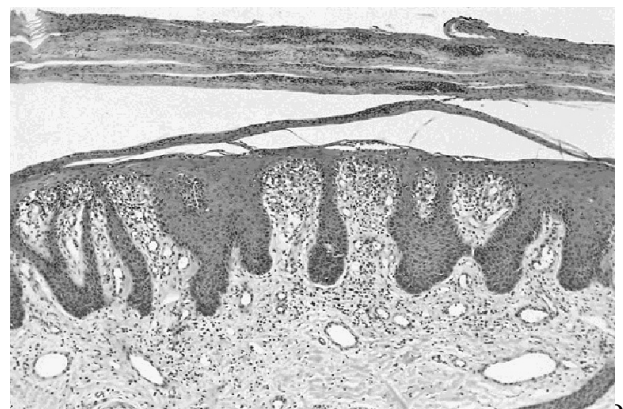
- “salmon” colored plaque covered with “scales”

- whole body in very bad cases

- micro

- acanthosis - elongation of the rete pegs

- “Munro’s” abscess - microscopic, seen in epidermis

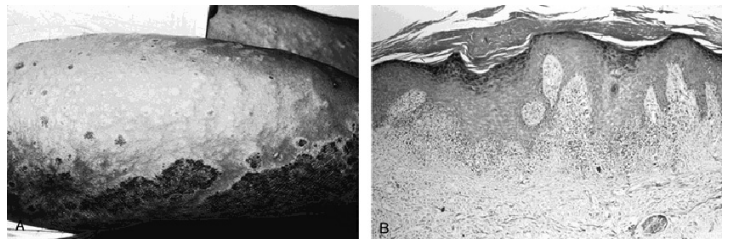


- Ag/Ab and C' at sites

- trauma ? Involved at sites of frequent injury

- Lichen planus

- skin and mucous membranes



- pruritic purple polygonal papules

- malignant potential ?

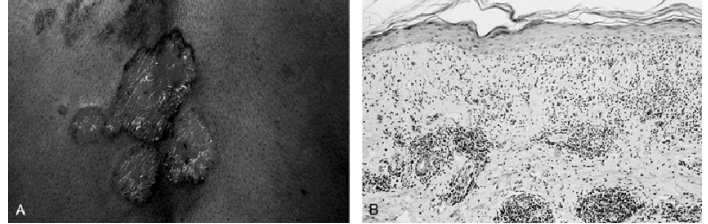
- band-like infiltrate in superficial dermis

- “saw-toothed” epi/derm junction

- sites of injury (Koebner phenomenon)

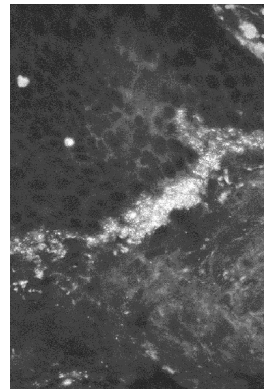
- Ag/Ab again

- SLE; there are two forms; LOCALIZED or DISCOID and the SYSTEMIC form



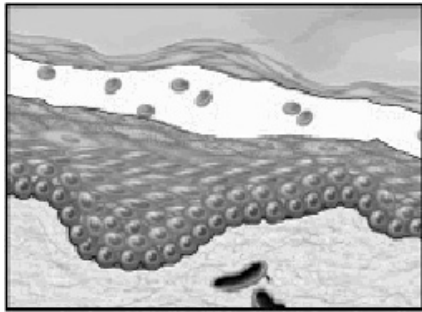
Ref: Robbins, Pathologic Basis of Dis.

- immunofluorescence at epi/derm junction
- actually, both Ab and cell mediated injury
- hair follicle involvement too

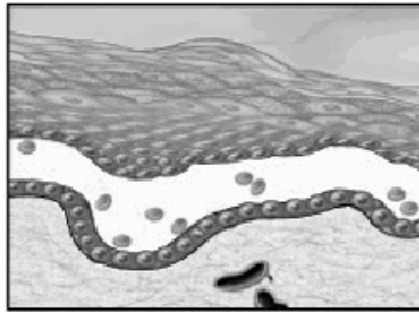


## IX) Blistering conditions

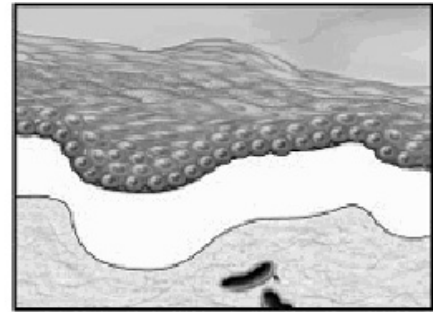
- vesicles and bullae - primary vs secondary causes
- Pemphigus vulgaris but several other forms
  - Ag directly against skin and BM
  - micro
    - SUPRABASALAR CLEFTS and ACANTHOLYSIS



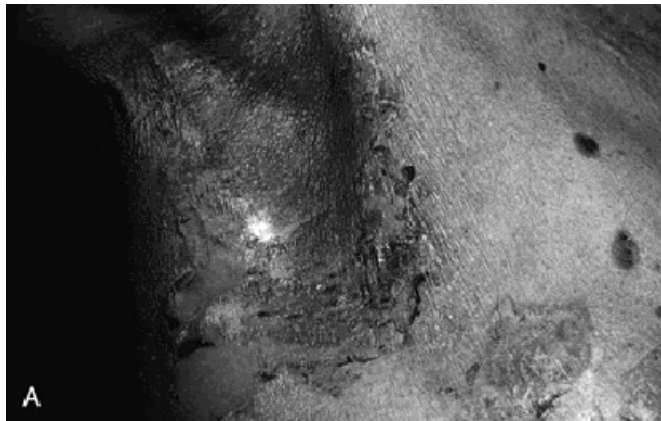
A Subcorneal



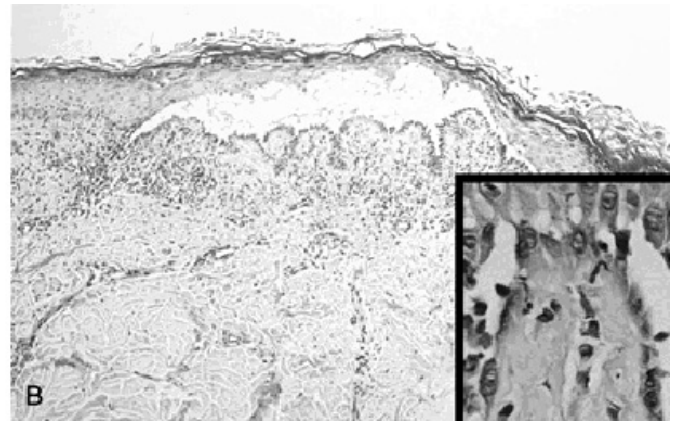
B Suprabasal



C Subepidermal

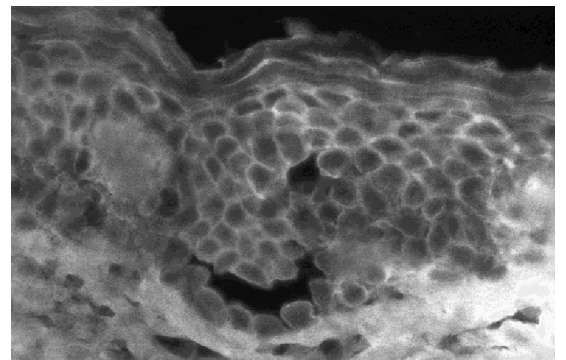


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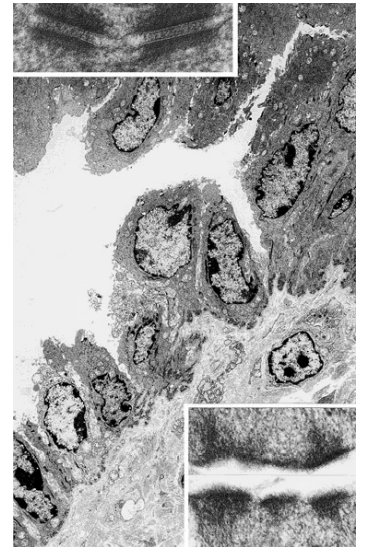


B

Ref: Robbins, Pathologic Basis of Dis

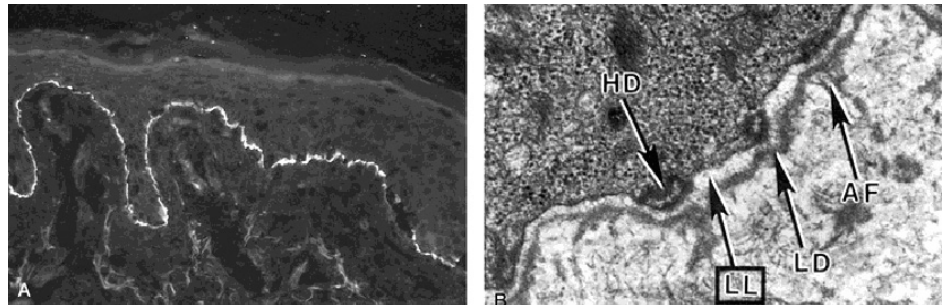


- can be life threatening
- Ab against desmosome component
- “pressure points”
- face - scalp - groin



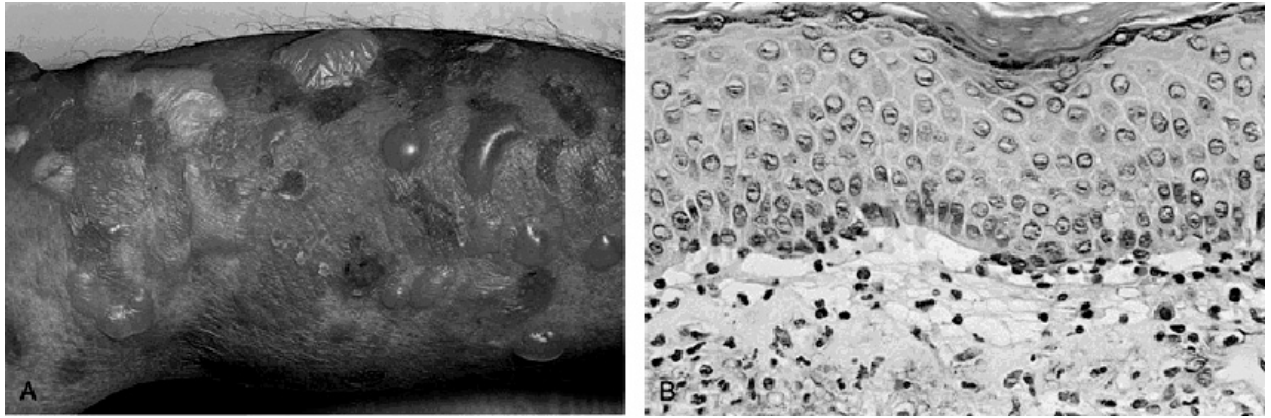
Ref: Robbins, Pathologic Basis of Dis

- Bullous pemphigoid



Ref: Robbins, Pathologic Basis of Dis

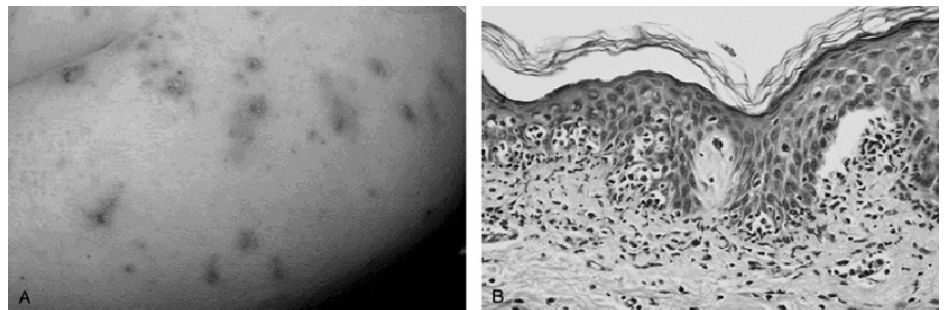
- autoimmune: hemidesmosome
- if not infected, the blisters will heal without scarring
- linear deposit of IgG and complement at dermal/epidermal junction.



Ref: Robbins, Pathologic Basis of Dis

- Dermatitis herpatiformis - NOT ACTUALLY HERPES

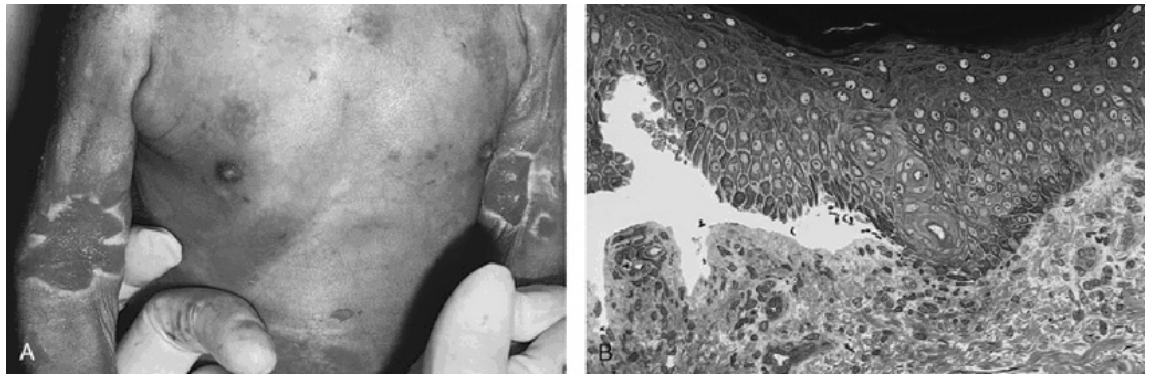
- this just means spreading or growing with serpiginous borders
- celiac disease
- gluten free diet helps
- micro
  - much like Pemphigus but only granular IgA deposits
  - MANY EOSINOPHILS





Noninflammatory blistering conditions

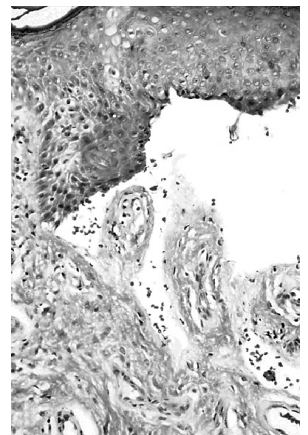
- Epidermolysis bullosa
- pressure sites



Ref: Robbins, Pathologic Basis of Dis. 6<sup>th</sup> Ed.

- porphyria

- light damage because of light absorbing compounds in skin resulting from inability to metabolize heme groups

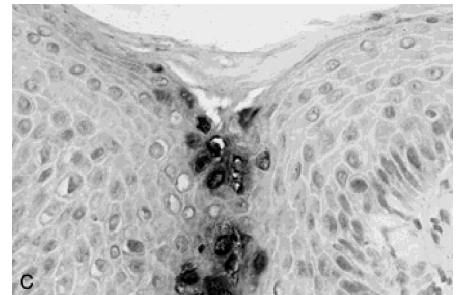
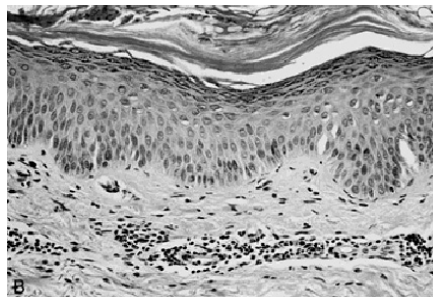
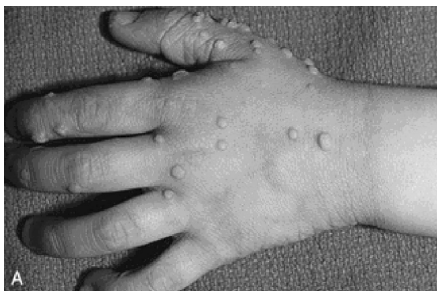


X Truly infectious:

- Acne kind of a special form of bacterial and irritant injury

- propionum bacteria
- keratin plugging of hair follicles
- bugs break down sebaceous oils,  
this stuff becomes very irritating

- abscesses
- bacterial
- protozoal
- worms
- viruses again primary vs secondary
- verrucae (warts)



Ref: Robbins, Pathologic Basis of Dis.

- molluscum



- condyloma

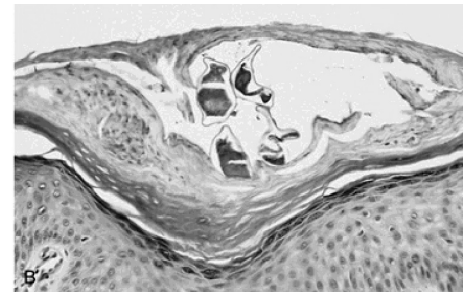
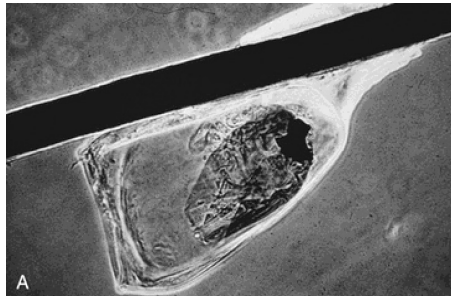
- fungi and parasites

- *Tinea, capitis, corpus barbae*



Ref: Robbins, Pathologic Basis of Dis

- Pediculosis (lice)



Ref: Robbins, Pathologic Basis of Dis