MEDICINE 1: Skin, Hair and Nails

Types of Lesions

- Primary Lesion
- Secondary Lesion

Primary and Secondary Lesions

- Primary: original lesion, previously unaltered skin, trauma or pathologic process
- Secondary: Changes in the primary lesion.
  - Later evolution of a primary lesion
  - Changes induced by external trauma to the primary lesion

<table>
<thead>
<tr>
<th>Primary Skin Lesions</th>
<th>Secondary Skin Lesions</th>
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</thead>
<tbody>
<tr>
<td>Macule</td>
<td>Debris on skin surface</td>
</tr>
<tr>
<td>Patches</td>
<td>o Crusts</td>
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<tr>
<td>Papule</td>
<td>o Scales</td>
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<tr>
<td>Plaque</td>
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<tr>
<td>Nodule</td>
<td>Loss of Skin Surface</td>
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<tr>
<td>Tumor</td>
<td>o Erosion</td>
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<tr>
<td>Wheal</td>
<td>o Excoriation</td>
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<tr>
<td>Vesicle</td>
<td>o Ulcer</td>
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<tr>
<td>Bullae</td>
<td>o Fissure</td>
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<tr>
<td>Pustule</td>
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<td></td>
<td>Healed Tissue</td>
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<td></td>
<td>o Scars (Hypertrophic,</td>
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<td></td>
<td>Keloid or Atrophic Scar)</td>
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<tr>
<td></td>
<td>o Lichenification</td>
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</tbody>
</table>
# PRIMARY SKIN LESIONS

## MACULE
- Flat, circumscribed area that differs from the surrounding skin based on its color
  - Non-palpable
  - Circular, oval or irregular
  - <1 cm in diameter

**Ephilid (Freckles), flat moles (nevi), petechiae, measles, scarlet fever**

## PATCHES
- A large macule – flat, circumscribed
  - >1 cm in diameter

**Vetiligo, port-wine stains, Mongolian spots, Café Au Lait patches, Tinea Versicolor**

**Patch vs. Macule (Size)**

## PAPULE
- Circumscribed, solid elevations
  - With no visible fluid
  - <1 cm in diameter
  - Elevation due to inc. thickness of the epidermis or deposits within the dermis
  - May appear white, red, black, flesh colored
  - Accuminate, rounded, conical, flat topped umbilicated
  - May have surface changes – scales and crusts

*need to distinguish from pustules and vesicles*

**Wart (verruca), elevated moles, lichen, planus, Acne vulgaris**

## PLAQUES
- An elevated lesion that is > 1 cm in diameter
  - A broad papule
  - Confluence of papules
  - Generally flat topped surface
  - May have secondary changes (scale, crusts)

**Psoriasis, seborrheic and actinic keratoses**

**Plaque vs. Papule (size)**
### NODULES
- Elevated, firm, circumscribed, often round, solid lesion
- Deeper in the dermis than a papule
- Larger volume than a papule, >2 cm in diameter
- Involves the dermis and may extend to the subcutis
- Frequently centered in the dermis or subcutaneous fat
- Greatest mass may be beneath the skin surface

![Erythema nodosum, lipomas](image)

### WHEALS
- Evanescent, edematous, plateau-like elevations of various sizes
- Pink to red
- Oval or arcuate contours
- Discrete or may coalesce
- Lasts for a few hours - transient

![Insect bites, Urticaria, Allergic Reaction](image)

### VESICLES
- Circumscribed fluid containing epidermal elevations
- < 1 cm in diameter
- Pale or yellow from serous exudates
- Discrete, irregularly scattered, grouped, linear

![Varicella (chickenpox), herpes zoster (shingles), Herpes simplex, Bullous pemphigoid](image)

### BULLAE
- Differ from vesicles only on size
- >1 cm in diameter
- Clear, non-cystic blister
- Rounded or irregularly shaped blisters containing serous or seropurulent fluid

![Blister, pemphigus vulgaris](image)

### PUSTULES
- Small elevations of the skin
- Filled with purulent fluid
- Usually <1 cm
- Usually white or yellow centrally

![Impetigo, Acne](image)
### Additional Primary Skin Lesions (not included in the lecture)

*Adapted from Mosby’s Guide to Physical Examination 6th Edition*

<table>
<thead>
<tr>
<th>TUMOR</th>
<th>CYST</th>
<th>TELANGIECTASIA</th>
</tr>
</thead>
<tbody>
<tr>
<td>Elevated and solid lesion, may or may not be clearly demarcated, deeper in dermis, greater than 2 cm in diameter</td>
<td>Elevated circumscribed encapsulated lesion, in dermis or subcutaneous layer, filled with liquid or semi-solid material</td>
<td>Fine, irregular, red lines produced by capillary dilation</td>
</tr>
</tbody>
</table>

| Neoplasms, benign tumor, lipoma | Sebaceous cyst, cystic acne | Telangiectasia in rosacea |

### TUMOR
- Elevated and solid lesion, may or may not be clearly demarcated, deeper in dermis, greater than 2 cm in diameter

### CYST
- Elevated circumscribed encapsulated lesion, in dermis or subcutaneous layer, filled with liquid or semi-solid material

### TELANGIECTASIA
- Fine, irregular, red lines produced by capillary dilation
### SECONDARY SKIN LESIONS

#### DEBRIS ON SKIN SURFACE

**SCALES**
- Dry or greasy laminated masses of keratin
- Heaped-up
- Accumulation of stratum corneum due to increased proliferation and/or delayed desquamation
- Vary in size – fine, delicate, coarse or in large sheets
- Vary in color – white, gray to yellow or brown

Flaking of skin with seborrheic dermatitis following scarlet fever, or flaking of skin following drug reaction, dry skin

**CRUSTS**
- Dried serum, pus or blood on the surface
- May include bacteria (usually Staphylococcus)
- Vary in size, thickness, shape and color

Scab on abrasion, eczema, *Impetigo contagiosa*

#### LOSS OF SKIN SURFACE

**EXCORIATIONS**
- Exogenous injury to all or part of the epidermis
- A punctuate or linear abrasion produced by mechanical means
- Involving only the epidermis
- Caused by scratching with the fingernails
- Secondary feature of pruritic conditions, including arthropod bites and atopic dermatitis

Abrasions, scabies, *Scratch marks*

**FISSURES**
- Cracks, clefts
- Linear cleft through the epidermis or into the dermis
- Single or multiple
- Vary in length
- Dry or moist

Athlete’s foot, cracks at the corner of the mouth
### Erosions
- Loss of all or a portion of the epidermis
- Follows rupture of a vesicle
- Moist, glistening
- It heals without a scar
Diff. bet. Fissure, erosion and ulcer

### Ulcers
- Rounded or irregularly shaped excavations that result from complete loss of the epidermis and a portion of the dermis
- Vary in diameter
- May be shallow or deep
- Heal with scarring

### Varicella, variola after rupture
- Staphylococcal scalded skin syndrome

### Decubiti, Stasis ulcer

### Healed tissue
- **Scars**
  - Composed of new connective tissue that replaced lost substance in the dermis or deeper parts as a result of injury or disease
  - *Thin to thick fibrous tissue that replaces normal skin following injury or laceration to the dermis*

### Keloid
- *Irregular-shaped, elevated, progressively enlarging scar; grows beyond the boundaries of the wound, caused by excessive collagen formation during healing*
*from Mosby’s (scar and keloid are not the same)*

### Atrophy
- A depression in the skin resulting from thinning of the epidermis or dermis
- E.g. aging, lupus, striae

### Lichenification
- Rough, thickened epidermis secondary to persistent rubbing
- Thickening of the epidermis and accentuation of natural skin lines

### Hypertrophic scar VS Keloid
*review Patho: In keloid, scar tissue grows beyond boundaries of original wound due to accumulation of excessive amounts of collagen*

### Atrophy
- Chronic dermatitis, Lichen simplex chronicus, Allergic contact dermatitis
# PHYSICAL EXAMINATION OF THE SKIN

**Four Cardinal Features**

1. Type of lesion
2. Shape
3. Arrangement
4. Distribution

<table>
<thead>
<tr>
<th>Shape and Arrangement</th>
<th>Distribution</th>
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<tbody>
<tr>
<td><strong>Grouped:</strong> Herpes Zoster</td>
<td>Extent of Involvement</td>
</tr>
<tr>
<td>Serpiginous: Cutaneous larvae migrans</td>
<td>localized</td>
</tr>
<tr>
<td>Gyrae – connecting arcs</td>
<td>generalized</td>
</tr>
<tr>
<td>Nunnular eczema</td>
<td>symmetric</td>
</tr>
<tr>
<td>Annular – Tinea corporis</td>
<td>assymetric</td>
</tr>
</tbody>
</table>

**Pattern**

- Isolated, scattered, grouped, linear, herpetiform, zostireform

**Three Major Characteristics**

1. Color
2. Consistency and feel of lesion
   - Soft, doughy, firm, hard
   - Dry, moist, mobile, tender, warm
3. Anatomic components of the skin primarily affected
   - Epidermal, dermal, subcutaneous

**Color Depends on Four Pigments**

1. **Melanin** – amount genetically determined, brownish, increased by sunlight
2. **Carotene** – golden yellow, exits in subcutaneous fat and palms/soles
3. **Oxyhemoglobin** – bright red, exists mostly in arteries and capillaries
4. **Deoxyhemoglobin** – has lost some of its oxygen, darker and somewhat bluer, increase causes cyanosis (bluish cast)
**Diagnostic Details of Lesions**

1. **Distribution**
   - Extent of involvement, pattern, location
2. **Evolution**
   - Changes of the lesions over time
3. **Involution**
4. **Grouping**
   - arrangement
5. **Configuration**
6. **Color**
7. **Consistency**
   - Feel of the lesions

**Example: Typical Clinical Evolution of Impetigo contagiosa**

1. 2-4 mm erythematous macule or pustule
2. Becomes a vesicle or pustule
3. Vesicles easily rupture which form “honey-colored” crusts
4. Direct extension rapidly follows
5. Confluent crusted plaques

**Normal and Benign Variants**

- Birthmarks, freckles, bruising, color variations
- Nevi, hemangiomas, corns and calluses, skin tags, keloids, warts, acne, etc

**Skin Assessment**

- Be aware of other factors which may affect your examination of the skin
- Light Source (natural daylight preferred)
- Comfortable Temperature
- Awareness of External Variables which
  - Influence skin color
  - Ethnic and cultural variations
  - Cultural health practices

**History**

- Age
- Health
- Occupation
- Hobbies
- Living Conditions
- Other Illnesses
- Travel abroad
- Seasonal occurrences
- Sexual history
- Onset
- Duration
- Course of the disease
- Response to previous treatment
- Family history
- Complete drug history

**Examination**

- Ruler
- Lighting
- Penlight
- Gloves
- Magnifying glass
- Woods lamp
Clinical Pearls: Dermatologic Findings of Nails and Hair

PATIENT 1

History and Examination
- Excessive shedding
- Smaller ponytail
- Just married 3 mos ago
  - Diffuse decrease in hair density
  - Hair pull positive (In hair pull, the hair is divided into 6 different regions, and each region is scanned for falling hair strands)

Human Hair Cycle
1. Anagen – longest phase
2. Catagen – transition phase, 1-2 weeks
3. Telogen – resting phase, 5-6 weeks
4. Return to Anagen

Telogen Effluvium
- Triggered by emotionally or physiologically stressful events
- Shedding begins 2-4 mos after trigger
- > 25% of hairs in telogen phase
- Hair loss can approach 400-500/day
- Excessive and early entry of hairs into the telogen phase
- Causes

✓ Childbirth
✓ Severe infection
✓ Severe chronic illness
✓ Severe physiologic stress
✓ Major surgery
✓ Hypo or hyperthyroidism
✓ Crash diets inadequate protein
✓ Drugs

Clinical Pearl
- Acute onset, diffuse hair shedding occurring a few months after a major stressor

PATIENT 2

History and Examination
- Discoloration for years
- Itchy feet
- Healthy
- No skin disease
  - Similar findings on both feet

Onychomyosis
3 types
1. Distal/lateral subungual – most common
2. White superficial – direct invasion of superficial nail plate
3. Proximal subungual – immunocompromised hosts
**Alopecia Areata**

- Autoimmune disorder
- Acute onset
- Well circumscribed, round or oval patches
- Males = Females
- Excessive hair loss
- Can also affect eyebrows, eyelashes and beard
- Exclamation point hairs – short and tapered at the base

**Clinical Pearl: Alopecia Areata**

- Acute onset
- Well-defined
- Oval or round patches of alopecia

**PATIENT 4**

- 37 yo man
- 4 year history of gradual darkening and widening of pigmented band
- Brown/Black extension to proximal nail fold – Hutchinson’s sign

**Acral Lentiginous Melanoma**

- Palm, sole or nail bed
- Median age 65
- 50-70% of melanomas on African-American and Asians

**Nail matrix nevus**
Subungual hematoma

PATIENT 5

History
  - Gradual thinning on top since age 20s
  - Dad’s hair also thin
  - No known medical problems

Examination
  - ↓↓ density of frontal scalp with recession of frontal hair line
  - Many miniaturized hair

Androgenetic Alopecia – MEN
  - 50% by age 50 years
  - Androgen dependent progressive decline in anagen duration
  - Genetic predisposition

Female Pattern Hair Loss – WOMEN
  - With or without androgen excess
  - Early or late onset
  - Hairs of variable diameter
  - Top of scalp most significantly involved

Examination of Nails

- Normal nail – approx 160 degree angle between nail plate and nail
- Clubbing – change in angle bet nail and nail base (> 180 degree)
  - Causes: chronic lack of oxygen, heart or pulmonary disease (TB)
- Koilonychia (spoon nail) – concave curves
  - Causes: IDA, syphilis, use of string detergents
- Beau’s lines – transverse depressions in nails indicating temporary disturbance of nail growth (nail grows out over several months)
  - Causes: systematic illness such as severe infection, nail injury

Note: Please refer to the subsequent pages for additional notes (not included in the lecture)
(sources: Mosby’s and MareNotes[Section A 2015])

UST-FMS Department of Medicine (1) Lectures S.Y. 2014-2015
VASCULAR SKIN LESIONS

**Figure 8-7**
Characteristics and causes of vascular skin lesions.

- **Spider angiomata**: Red central body with radiating spiderlike legs that blanch with pressure to the central body. Cause: Liver disease, vitamin E deficiency, idiopathic.

- **Venous stasis**: Bluish spider-like lesion or irregularly shaped; does not blanch with pressure. Cause: Increased pressure in superficial veins.

- **Telangiectasia**: Fine, irregular red line. Cause: Dilatation of capillaries.

- **Capillary hemangioma (nevus flammeus)**: Red irregular macular patches. Cause: Dilatation of dermal capillaries.

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- **Petechiae**: Red-purple nonblanchable discoloration less than 0.5 cm diameter. Cause: Intravascular defects, infection.

- **Echymoses**: Red-purple nonblanchable discoloration of variable size. Cause: Vascular wall destruction, trauma, vasculitis.

- **Purpura**: Red-purple nonblanchable discoloration greater than 0.5 cm diameter. Cause: Intravascular defects, infection.
ANATOMIC STRUCTURE OF THE SKIN

ANATOMIC STRUCTURE OF THE NAIL
Basic Examination for Skin, Hair and Nails

SKIN
- Largest single organ in the body
- 16% of total body weight
- Functions
  - Protection
  - Temperature regulation
  - Vitamin D synthesis
  - Sensation
  - Sexual Attraction
- Epidermis
  - Stratum corneum
  - Stratum lucidum
  - Stratum granulosum
  - Stratum spinosum
  - Stratum basale

HAIR
- Terminal hair – coarser, thicker, usually pigmented (i.e. scalp hair and eyebrows)
- Vellus hair – short, fine relatively unpigmented

Assessment of Hair
- Inspect and Palpate Hair for:
  - Color
  - Texture
  - Distribution
  - Quantity
- Inspect Scalp for:
  - Hygiene
  - Dryness
  - Lesions or infestations
- Alopecia
  - Hair loss
    - Diffuse, patchy, male pattern/androgenic
  - Thinning
    - Sparse in hypothyroid – loss at hairline
    - Fine in hyperthyroid
  - Texture
    - Coarse in hypothyroid

NAILS
- Function is to protect distal ends of fingers and toes
- Attached to vascular nail bed and supplies nutrition and gives nail color
- Angle of nail base normally 160 degrees
- Fingernails grow about 0.1 mm

Assessment of Nails
- Inspect and palpate fingernails/toenails
- Note color and shape
- Index fingers together
  - Angle of base >180 degrees indicates clubbing

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