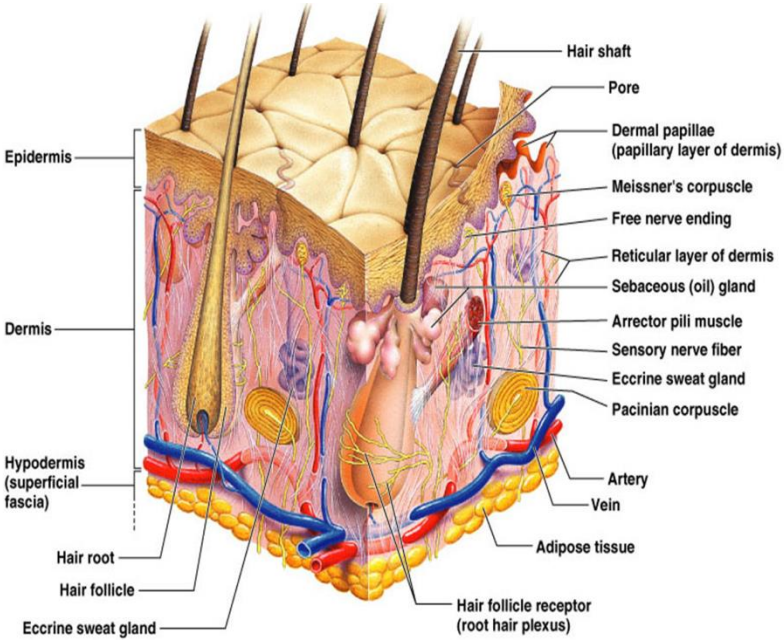
Skin, Hair and Nails

Dr. Gary Mumaugh – Western Physical Assessment

Anatomy and Physiology

- Heaviest and largest single organ in body
  - 16% of body weight
- Major function of skin is to keep the body in homeostasis
  - Protects boundaries for body fluid
  - Protects deeper tissues from microorganisms, harmful substances and radiation
  - Modulates body temperature via evaporation and radiation
  - Provides sensory perception
  - Synthesizes vitamin D
- Three layers
  - Epidermis
  - Dermis
  - Subcutaneous

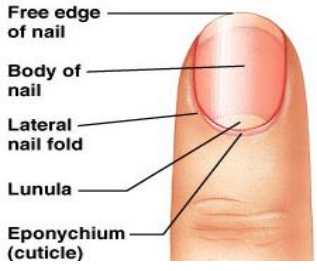


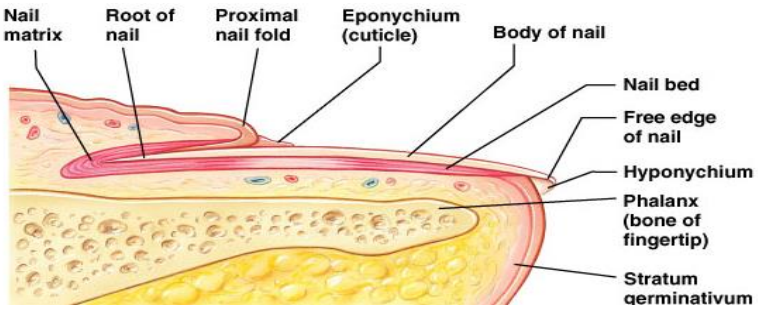
Hair, nails and sebaceous and sweat glands are the appendages of the skin

- Hair
  - Vellus hair – short, fine, less pigmentation
  - Terminal hair – coarser, pigmented (scalp and eyebrows)
- Nails
  - Protects distal ends of fingers and toes
- Sebaceous glands
  - Present on all surfaces
  - except palms/soles
  - Produces a fatty substance
  - secreted onto skin surface
  - through hair follicles

Structure of a Nail

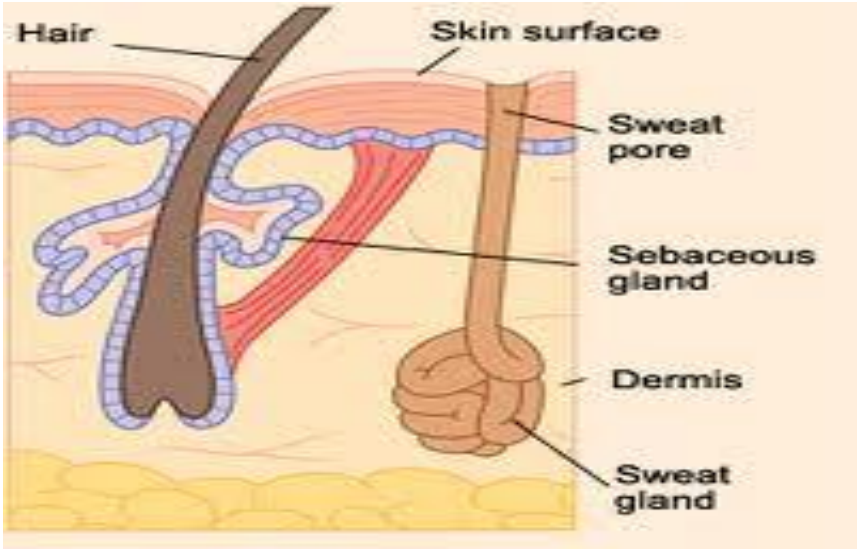
- Scalelike modification of the epidermis on the distal, dorsal surface of fingers and toes





Sweat glands – two types

- Eccrine glands
    - Widely distributed and open directly onto skin surface
    - Controls body temperature via sweat production
- Aprocrine glands
    - Found in axilla and groin
    - Open into hair follicles
    - Stimulated by emotional stress
    - Bacterial decomposition responsible for adult body odor



Infants vs. Adolescents

- Infants
    - Subcutaneous fat poorly developed
    - Skin smoother, less oily than adults
    - Eccrine glands function after 1 month
    - Apocrine glands do not function
- Adolescents
    - Apocrine glands activated
    - Increased sebum production
    - Grow pubic and axillary hair
    - Facial hair in boys

Pregnant Women

- Increased blood flow to skin
- Increased sweat from sebaceous gland activity
- Fat deposits
- Stretch marks
- Vascular spiders
- Increased pigmentation

Skin Color

- Normal skin color depends primarily on four pigments
- Melanin
    - Brown pigment
    - Genetically determined
    - Increased with sunlight
- Carotene
    - Golden yellow pigment in subcutaneous fat
    - Abundant in keratinized areas – palms & soles
- Oxyhemoglobin
    - Bright red hemoglobin pigment
    - Reddish color of skin
    - Carries oxygen
    - Found in capillaries and arterioles
- Deoxyhemoglobin
    - Gives the skin bluish color as in cyanosis
    - Less oxygenated hemoglobin
    - Becomes darker or bluish pigment

Skin Vocabulary

- Bulla – vesicle < 1cm.
- Macule – flat lesion with localized change in skin color
- Papule – solid elevated lesion < 0.5 cm.
- Vesicle – a clear filled elevation < 0.5 cm.
- Pustule – purulent fluid filled elevation of skin
- Petechiae – single or multiple hemorrhagic spots
- Purpura – larger visible collection of blood under the skin
- Echymosis – large collection of red cells
- Telengiectasis – visible permanently dilated capillaries

Health History

- Common or concerning symptoms
    - Hair loss
    - Rash
    - Moles
- Ask the patient
    - “Have you noticed any changes in your skin or hair color?”
    - “Have you noticed any moles that have changed in sized, shape, color or sensation?”
    - “Have you noticed any new moles?”

Health Promotion & Counseling

- Clinicians play an important role in educating patients
    - Early detection of suspicious moles
    - Protective measure for skin care
    - Hazards of excessive sun exposure
- Skin cancers most common cancer in USA
    - Most prevalent on hands, neck and head
- Disease can be primary to skin or manifestation of problems elsewhere

History

- Skin
    - Changes
        - Timing, Associated symptoms, Location, Alleviating/aggravating, Treatment(s), Exposures
- Hair
    - Changes
        - Timing, Associated symptoms, Nutrition, Alleviating/aggravating, Treatment(s), Exposures
- Nails
    - Changes
        - Associated symptoms, Nutrition, Alleviating/aggravating, Treatment, Exposures

History

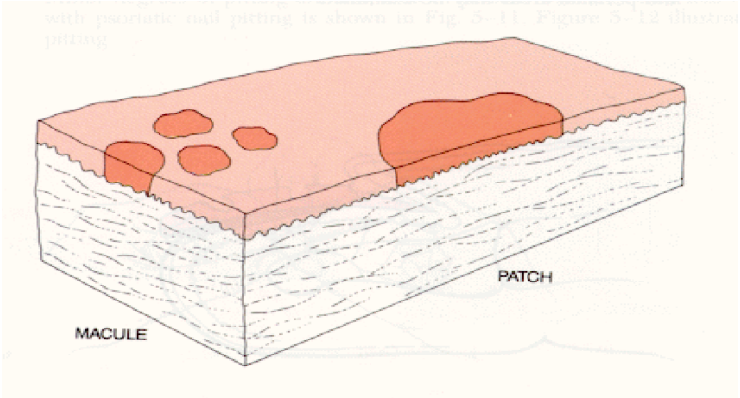
- Past Medical History
    - previous problems
    - systemic disease
- Family History
    - skin CA, psoriasis, allergy, infestations and infections
- Psychosocial
    - personal habits
    - exposures

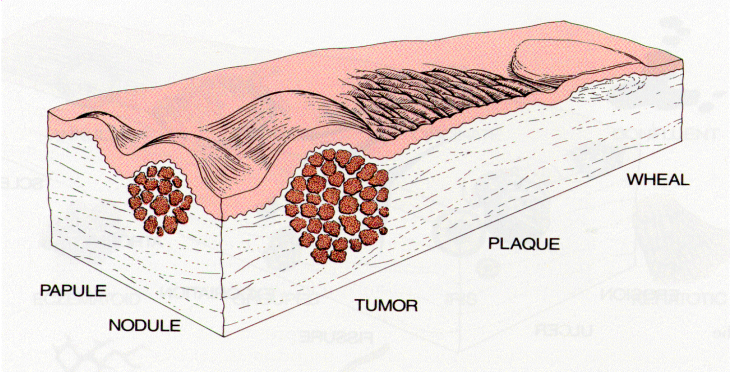
Examination

- Ruler
- Lighting
- Penlight
- Gloves
- Magnifying glass
- Woods lamp

Examination

- Inspection
  - Color
  - Uniformity
  - Thickness
  - Hygiene
  - Lesions
- Palpation
  - Moisture
  - Temperature
  - Texture
  - Turgor
  - Mobility
- Sequence
  - Regional
  - System



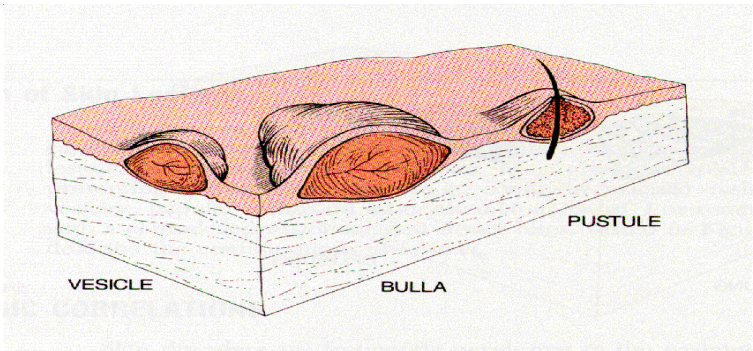


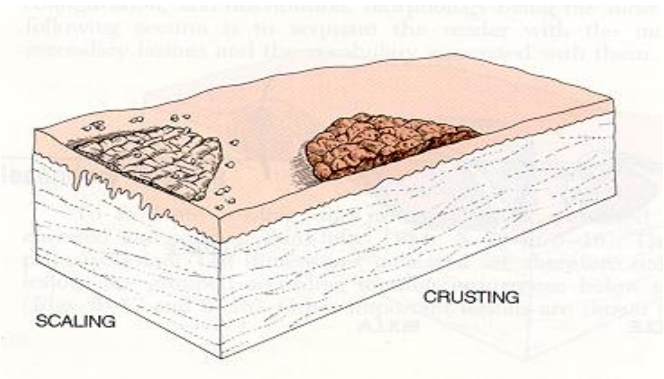
Normal and Benign Variants

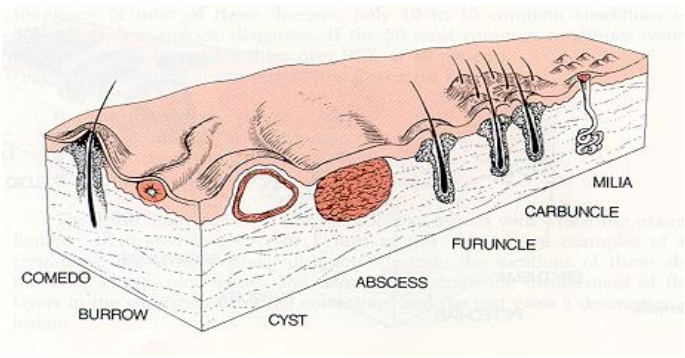
- Birthmarks, freckles, bruising, color variations
- Nevi, hemangiomas, corns and calluses, skin tags, keloids, warts, acne, etc

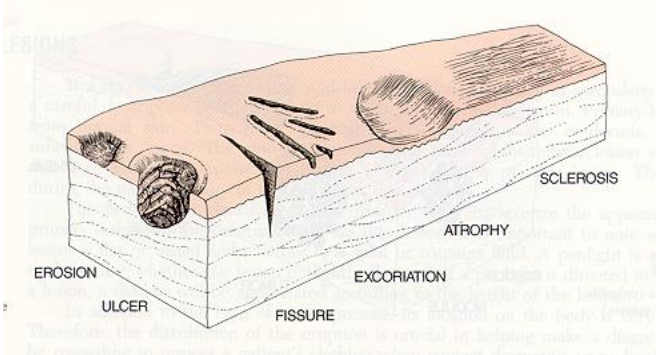
Lesion Description

- Size, Shape, Color
- Edges
- Texture
- Elevated or depressed
- Exudates
- Configuration
- Location & Distribution

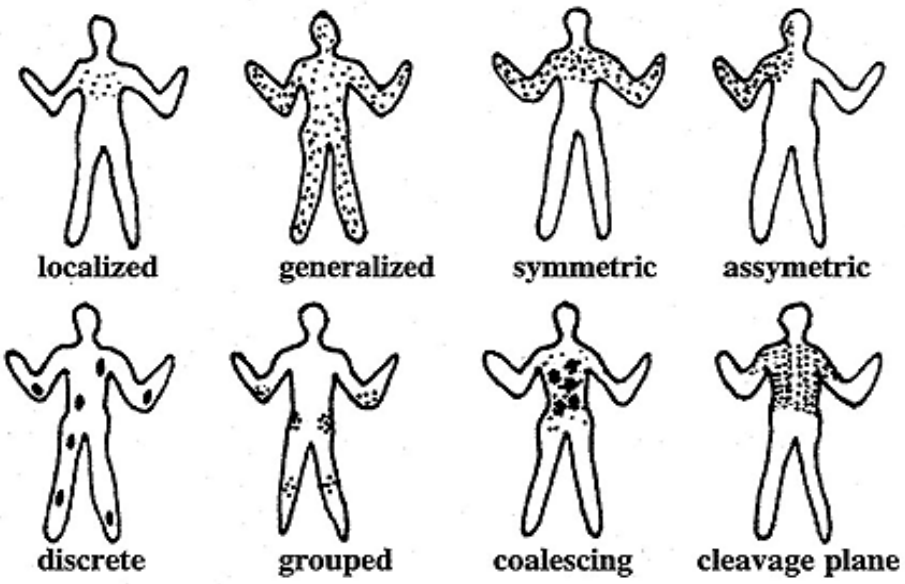








Distribution



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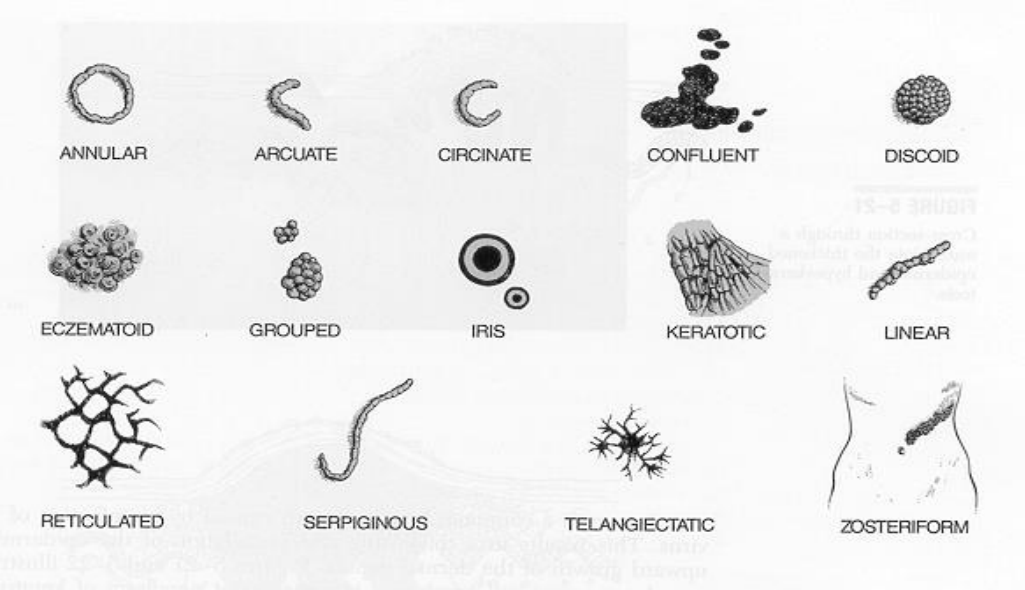


Skin Cancer

- Skin cancer – induced by the ultraviolet rays of the sun
    - most often on the head and neck
    - most common in fair-skinned people and the elderly
    - one of the most common cancers
    - one of the easiest to treat
    - has one of the highest survival rates if detected and treated early
    - three types of skin cancer named for the epidermal cells in which they originate

Basal Cell Carcinoma
- Most common type
- Least dangerous because it seldom metastasizes
- Forms from cells in stratum basale
- Lesion is small shiny bump with central depression and beaded edges
- Most common skin cancer – ¾ of non-melanoma cases

Squamous Cell Carcinoma
- Arise from keratinocytes from stratum spinosum
- Lesions usually appear on scalp, ears, lower lip, or back of the hand
- Have raised, reddened, scaly appearance later forming a concave ulcer
- Chance of recovery good with early detection and surgical removal
- Tends to metastasize to lymph nodes and may become lethal
- ¼ of non-melanoma cases

Malignant Melanoma
- Skin cancer that arises from melanocytes
- Often in a preexisting mole
- Less than 5% of skin cancers, but most deadly form
- Treated surgically if caught early
- Metastasizes rapidly - unresponsive to chemotherapy - usually fatal
- Person with metastatic melanoma lives only 6 months from diagnosis
- 5% - 14% survive 5 years
- Greatest risk factor – familial history of malignant melanoma
- High incidence in men, redheads, people who experience severe sunburn in childhood

HARMM Risk Factors for Melanoma
- **H**istory of previous melanoma
- **A**ge over 50
- **R**egular dermatologist absent
- **M**ole changing
- **M**ale gender

Additional Risk Factors for Melanoma
- > 50 common moles
- > 1-4 atypical or unusual moles
- Red or light hair
- Actinic lentigines, macular brown or tan spots
- Heavy sun exposure – especially severe childhood sunburns
- Light eyes or skin color – especially freckles or burns easily
- Family history of melanoma

ABCDE

- **A**symmetry
- **B**orders – irregular, ragged, notched or blurred
- **C**olor variations – especially black or blue
- **D**iameter > 5 cm or different from other moles, especially changing, itching, bleeding
- **E**levation or **E**nlargement

Techniques of Examination

- Examination of the skin, hair and nails begins with the general survey of the patient
- Make sure patient wears a gown
    - Drape appropriately to facilitate close inspection of hair, anterior and posterior body surfaces, palms and soles and web spaces
- Inspect entire skin in good light
    - Preferable in natural light or artificial light that resembles natural
    - Artificial light often distorts colors
- Inspect and palpate skin
- Note characteristics of
    - Color
    - Moisture
    - Temperature
    - Texture
    - Mobility and turgor
    - Lesions
- Color
    - Patients often notice change in color first
    - Look for increased pigmentation, loss of pigmentation
    - Look for redness, pallor, cyanosis and yellow
        - Red color of oxyhemoglobin best assessed at fingertips, lips and mucous membranes
        - In dark skinned, look at palms and soles
        - For central cyanosis, look at lips, tongue and oral mucosa
        - Jaundice look at sclera
- Moisture
    - Dryness, sweating, and oiliness
- Temperature
    - Use back of fingertips
    - Identify warmth or coolness of skin
- Texture
    - Roughness or smoothness
- Mobility and turgor
    - Lift fold of skin
    - Note ease with which it lifts up (mobility)
    - Note speed which it returns to place (turgor)

Assessing Skin Turgor

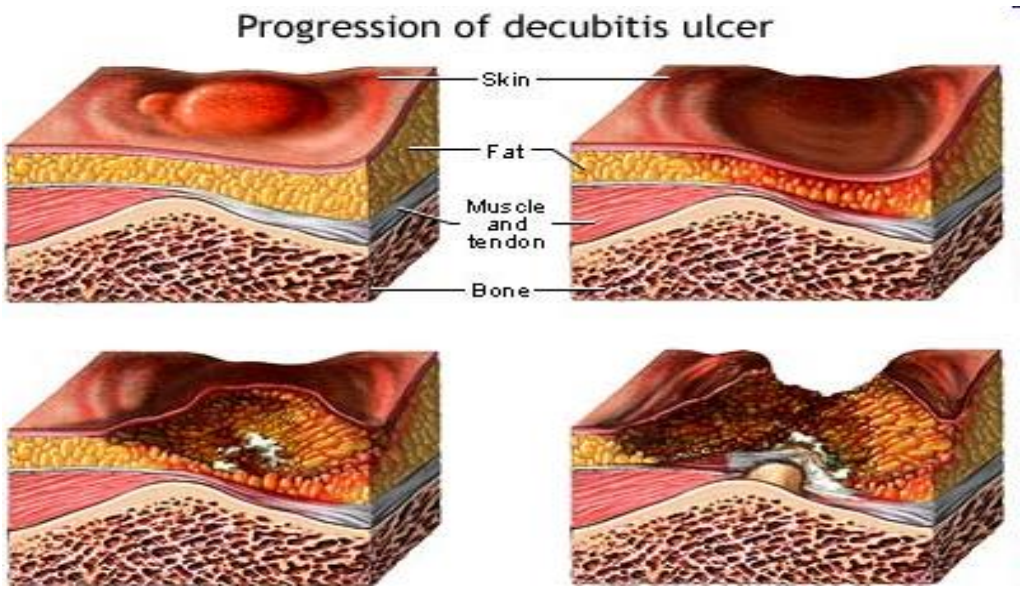
- To determine turgor, pinch a fold of skin under the clavicle or on the forearm so the top skin separates from the underlying structure. Assess as follows:
- Normal: rises easily and returns to place immediately
- Abnormal: skin does not return to place immediately but exhibits “tenting”
- Because poor skin turgor is more common and more prominent in the elderly patient due to loss of elasticity, check for skin turgor at the sternum.
- Abnormal turgor is exhibited in dehydration, edema, scleroderma, connective tissue disorders

Techniques of Examination

- Lesions
    - Note characteristics
        - Anatomic location and distribution
        - Patterns and shapes
        - Types of lesion (macules, papules, nevi, vesicles)
        - Color
- Putting skin lesions in context
    - Whenever you see a skin lesion, look it up in a well-illustrated dermatology textbook or use my notes or research the net
    - To arrive at a dermatologic diagnosis, consider the type of lesions, location, and distribution, along with the patient’s history and physical
- Hair
    - Inspect and palpate
    - Note quantity, distribution and texture
- Nails
    - Inspect and palpate fingernails and toenails
    - Note color and shape
    - Note lesions
        - Longitudinal bands of pigment may be a normal finding in darker skinned people

Evaluating the Bedbound Patient

- People confined to bed are particularly susceptible to skin damage and ulceration
- Pressure sores result when sustained compression obliterates arteriolar and capillary blow flow to the skin
- Assess these patients by carefully inspecting the skin that overlies the sacrum, buttocks, greater trochanters, knees and heels
- Role patient onto one side to see sacrum and buttocks (pressure areas)

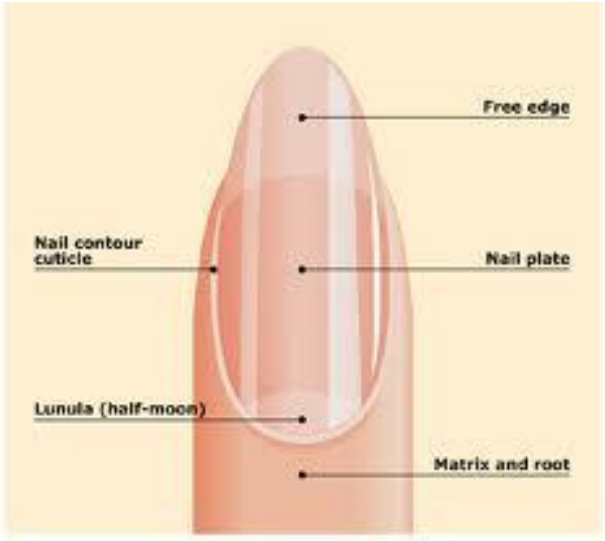


Recording the Physical Examination

- "Color good. Skin warm and moist. Nails without clubbing or cyanosis. No suspicious nevi. No rash, petechiae or ecchymosis."
- "Marked face pallor, with circumoral cyanosis. Palms cold and moist. Cyanosis in beds of fingers and toes. One raised blue-black nevus, 1X2 cm, with irregular border on right forearm. No rash"

Nails

- Accessory skin appendages
- Changes indicative of both systemic and local diseases



General Considerations - Nails

- Beau's lines are depressions across the nails
  - Seen in injury, malnutrition, after illness
- Brittle nails are often a normal result of aging
- Koilonychia is an abnormal shape
  - Iron deficiency anemia
- Leukonychia is white streaks or spots

General Considerations - Nails

- Pitting is the presence of small depressions on nail surface
    - Sometimes the nail crumbles, becomes loose and falls off
- Ridges are tiny raised lines

Nail Conditions

- Visually inspect and palpate nails for color, shape and lesions
- Changes in nails shape and color may be due to
    - Systemic causes
        - Lungs, heart, liver, GI, or blood diseases
        - Vitamins or mineral deficiencies
    - Local Causes
        - Trauma, ingrown nails, fungal infections, inflammation, aging

Beau's Lines

- Beau's lines are indentations that run across the nails
    - These indentations can appear when growth at the area under the cuticle is interrupted by injury or sever illness
- Etiology
    - Uncontrolled diabetes
    - Peripheral vascular disease
    - Illnesses associated with a high fever, such as scarlet fever, measles, mumps and pneumonia
    - Zinc deficiency

Terry's Nails

- The tip of each nail has a dark band
- Sometimes attributed to aging
- In other cases, it can be a sign of a serious underlying condition, such as liver disease, CHF or diabetes

Dry Brittle Nails

- Often a normal result of aging
- May be also due to certain diseases and conditions
    - Zinc deficiency
    - Iron deficiency
    - Thyroid problems

Yellow Nail Syndrome

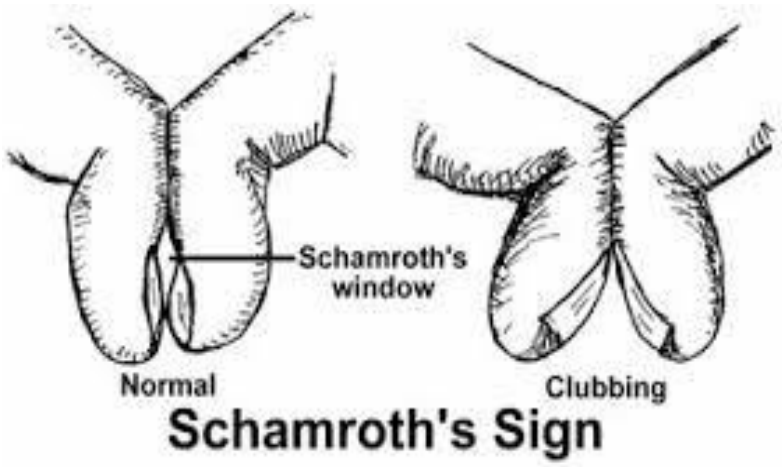
- Nails thicken and new growth slows
- Results in yellow discoloration of nails
- May lack a cuticle and detach from the bed
- Usually a sign of respiratory disease, such as chronic bronchitis
- Can be related to swelling of hands – lymphedema

Koilonychia – Spoon Nails

- Spoon nails are soft nails that look scoped out
- The depression usually is large enough to hold a drop of fluid
    - Iron deficiency anemia
    - Hemochromatosis (liver) in which the body absorbs to much iron from the food and deposits in liver cells
- Spoon nails can be associated with
    - Heart disease
    - Hypothroidism

Nail Clubbing

- The nail beds soften & seems to float instead of being firmly attached and the angle that the nail makes with its cuticle increases
    - The last part of the finger may be large or bulging
    - May be warm and red
    - The nail curves downward, similar to the shape of the round part of an upside down spoon
    - Visually inspect the shape and color
    - Palpate for sponginess
    - Look at angle
- May result from chronic low blood oxygen levels
    - Seen in cystic fibrosis, cyanotic heart disease and several other conditions
    - Lung cancer – most common cause
    - Interstitial lung disease
    - Infections
    - Heart diseases –endocarditis, congenital cyanotic defects
    - GI disease
        - Celiacs, dysentery, liver disease
    - Others
        - Graves's disease, overactive thyroid, Hodgkin's lymphoma



Nail Fungal Infections

Ingrown Toenail

Nail Separation

- Known as onycholysis, the fingernails can become loose and seperate from the bed
- Sometimes detached nails are associated with injury or infection
- Other causes
    - Drug reaction or reaction to consumer products such as nail hardeners or adhesions
    - Thyroid disease
    - Psoriasis