

Chapter 8

Health Assessment

The Integument, Musculoskeletal, and Neurological Systems

Prepared and Presented by:
Ms. Sohad Noorsaheed, RN. MSN

Learning Outcomes

o **The Integument (skin, hair, and nails):**

1. Identify techniques used to assess the Integument.
2. Define most common terms when assessing the integument.
3. Explore the normal and abnormal findings of integumentary assessment.
4. Differentiate between primary and secondary skin lesions with examples.

o **Musculoskeletal System:**

1. Identify techniques used to assess the MS.
2. Define most common terms when assessing the MS.
3. Explore the normal and abnormal findings of MS assessment.

o **Neurological System:**

1. Identify techniques used to assess the neurological system.
2. Define most common terms when assessing the neurological system.
3. Explore the normal and abnormal findings of neurological assessment.

The Integument (skin, hair, and nails)

- The integument includes the skin, hair, and nails. The assessment begins with a generalized inspection using a good source of lighting, preferably indirect natural daylight.
- **Skin:** Assessment of the skin involves inspection and palpation. The entire skin surface may be assessed at one time or as each aspect of the body is assessed.

The Integument (skin, hair, and nails)

1-Inspecting Skin Color:

- Pallor (decrease in skin color) is the result of *inadequate circulating blood or hemoglobin*. Pallor in all people is usually most evident in the *conjunctiva, oral mucous membranes, nail beds, palms of the hand, and soles of the feet*.
- Cyanosis (a bluish tinge) is most evident in the *nail beds, lips, and buccal mucosa*.



- Jaundice (a yellowish tinge) may first be evident in the *sclera* of the eyes and *then in the mucous membranes* and the *skin*. If jaundice is suspected, the posterior part of the hard palate should also be inspected for a yellowish color tone.



- Erythema is a redness associated with a variety of rashes. Other localized color changes may indicate a problem such as edema or a localized infection.



- Edema is the presence of excess interstitial fluid. An area of edema appears swollen, shiny, and taut and tends to blanch the skin color or, if accompanied by inflammation, may redden the skin.



skin lesions

- A skin lesion is an alteration in a client's normal skin appearance.
- Nurses are responsible for describing skin lesions accurately in terms of *location* (e.g., face), *distribution* (i.e., body regions involved), and *configuration* (the arrangement or position of several lesions) as well as *color*, *shape*, *size*, *firmness*, *texture*, and *characteristics* of individual lesions.
- Some clients may have cauterization scars made by traditional healers on the client's skin. The nurse should ask the client.

Types of skin lesions

Primary

See figure 8-7 page 150 (name, describe, one example)

- appear initially in response to some change in the external or internal environment of the skin.

Secondary

See table 8-4 page 151 (name, all examples)

- not appear initially but result from modifications such as chronicity, trauma, or infection of the primary lesion. For example, a vesicle or blister (primary lesion) may rupture and cause erosion (secondary lesion).

Primary skin lesions

- Macule Patch: Flat, un-elevated change in color.

1 mm to 1 cm; examples: freckles, measles, petechiae, flat moles. Patches are larger than 1 cm and may have an irregular shape; examples: port wine birthmark, vitiligo (white patches), rubella.



- Papule :Circumscribed, solid elevation of skin.

Examples: warts, acne, pimples, elevated moles.



Primary skin lesions

- Plaque: Plaques are larger than 1 cm. Examples: psoriasis, rubeola.



- Nodule: Tumor Elevated, solid, hard mass that extends deeper into the dermis than a papule. circumscribed border 0.5 to 2 cm. Examples: squamous cell carcinoma, fibroma. Tumors are larger than 2 cm and may have an irregular border. Examples: malignant melanoma, hemangioma.

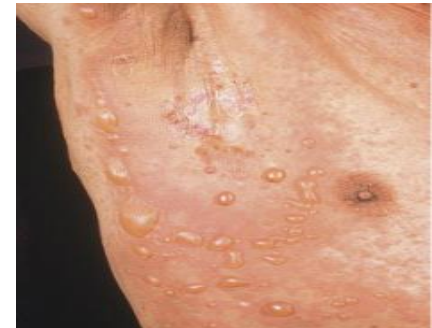


Primary skin lesions

- Pustule: Vesicle or bulla filled with pus. Examples: acne vulgaris, impetigo.



- Vesicle, Bulla: A circumscribed, round or oval, thin translucent mass filled with serous fluid or blood. Vesicles are less than 0.5 cm. Examples: herpes simplex, early chicken pox, small burn blister. Bullae are larger than 0.5 cm. Examples: large blister, second degree burn, herpes simplex.



Primary skin lesions

- Cyst: A 1-cm or larger, elevated, encapsulated, fluid-filled or semisolid mass arising from the subcutaneous tissue or dermis. Examples: sebaceous and epidermoid cysts, chalazion of the eyelid.



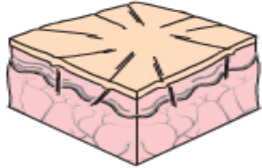
- Wheal: A reddened, localized collection of edema fluid; irregular in shape. Size varies. Examples: hives, mosquito bites.



Secondary skin lesions

TABLE 8-4 Secondary Skin Lesions

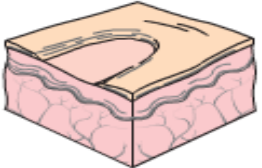
Atrophy



A translucent, dry, paperlike, sometimes wrinkled skin surface resulting from thinning or wasting of the skin due to loss of collagen and elastin.

Examples Striae, aged skin.

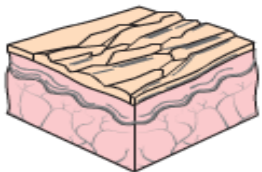
Erosion



Wearing away of the superficial epidermis causing a moist, shallow depression. Because erosions do not extend into the dermis, they heal without scarring.

Examples Scratch marks, ruptured vesicles.

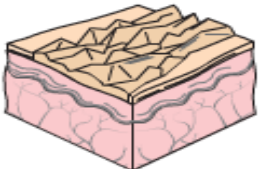
Lichenification



Rough, thickened, hardened area of epidermis resulting from chronic irritation such as scratching or rubbing.

Example Chronic dermatitis.

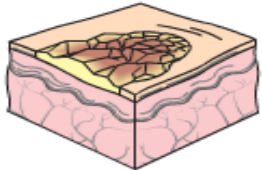
Scales



Shedding flakes of greasy, keratinized skin tissue. Color may vary from white, gray, or silver. Texture may vary from fine to thick.

Examples Dry skin, dandruff, psoriasis, and eczema.

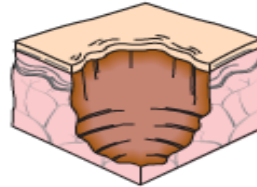
Crust



Dry blood, serum, or pus left on the skin surface when vesicles or pustules burst. Can be red-brown, orange, or yellow. Large crusts that adhere to the skin surface are called scabs.

Examples Eczema, impetigo, herpes, or scabs following abrasion.

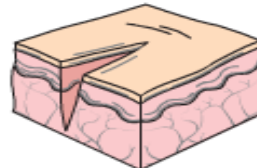
Ulcer



Deep, irregularly shaped area of skin loss extending into the dermis or subcutaneous tissue. May bleed. May leave scar.

Examples Decubitus ulcers (pressure sores), stasis ulcers, chancres.

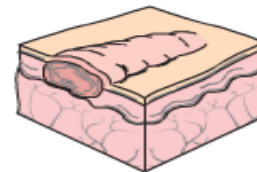
Fissure



Linear crack with sharp edges, extending into the dermis.

Examples Cracks at the corners of the mouth or in the hands, athlete's foot.

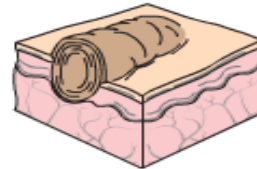
Scar



Flat, irregular area of connective tissue left after a lesion or wound has healed. New scars may be red or purple; older scars may be silvery or white.

Examples Healed surgical wound or injury, healed acne.

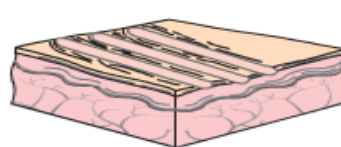
Keloid



Elevated, irregular, darkened area of excess scar tissue caused by excessive collagen formation during healing. Extends beyond the site of the original injury. Higher incidence in people of African descent.

Examples Keloid from ear piercing or surgery.

Excoriation



Linear erosion.

Examples Scratches, some chemical burns.

2-Palpating Skin:

- Moisture, temperature, and turgor. (fullness or elasticity) by lifting and pinching the skin.
- Skin returns back to previous position and shape; may be slower in elders.
- Skin stays pinched or tented or moves back slowly (e.g., in dehydration)

The Integument (skin, hair, and nails)

- **Hair:** Assessing a client's hair includes inspecting the hair, considering developmental changes and ethnic differences, and determining the individual's hair care practices. Much of the information about hair can be obtained by questioning the client.
- Normal hair is moist, flexible and evenly distributed.
- Some therapies cause alopecia (hair loss), and some disease conditions and medications affect the coarseness of hair.
- Alopecia vs. baldness.

The Integument (skin, hair, and nails)

- **Nails:** Nails are inspected for nail plate shape, angle between the nail and the nail bed (fingernails), nail texture, nail bed color, and the intactness of the tissues around the nails.
- The *nail plate* is normally colorless and has a convex curve.
- The *angle* between the fingernail and the nail bed is normally 160 degrees. One nail abnormality is the
- spoon shape, in which the nail curves upward from the nail bed.
- Clubbing is a condition in which the angle between the nail and the nail bed is 180 degrees or greater. Clubbing may be caused by a long term lack of

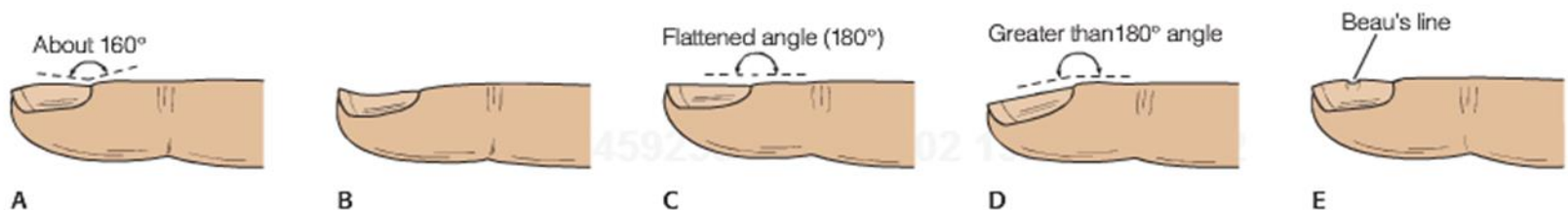


Figure 8-8 ■ A, A normal nail, showing the convex shape and the nail plate angle of about 160 degrees; B, a spoon-shaped nail, which may be seen in clients with iron-deficiency anemia; C, early clubbing; D, late clubbing (may be long-term oxygen lack); E, Beau's line on nail (may result from severe injury or illness).

- Nail *texture* is normally smooth. Excessively thick nails can appear in elders, in the presence of poor circulation, or in relation to a chronic fungal infection. *Beau's lines* are horizontal depressions in the nail that can result from injury or severe illness. The nail bed is highly vascular, a characteristic that accounts for its color. A bluish or purplish color to the nail bed may reflect cyanosis, and pallor may reflect poor arterial circulation. The tissue *surrounding* the nails is normally intact epidermis.
- Perform capillary refill test: Press two nails between your thumb and index finger; look for return of pink color to nail bed. Rapid return of pink or usual color (generally less than 3 seconds). Delayed return of pink or usual color (may indicate circulatory impairment)

Musculoskeletal System

- The musculoskeletal system encompasses the *muscles, bones, and joints*.
- Assessment of the MS involves inspection and palpation.
- The nurse usually assesses the musculoskeletal system for **muscle strength**, *tone, size, and symmetry of muscle development*, and for *tremors* (involuntary twitching of body parts, mostly the hands).
- **Bones** are assessed for *normal form*.
- **Joints** are assessed for *tenderness, swelling, thickening, crepitation* (the sound of bone grating on bone), *presence of nodules*, and *range of motion (ROM)*.
- **Body posture** is assessed for *normal standing and sitting positions*.

- **Muscles:** inspect the muscles for size. Compare the muscles on one side of the body. Atrophy (a decrease in size) or hypertrophy (an increase in size).
- Inspect the muscles and tendons for contractures (shortening).
- Inspect the muscles for tremors.
- Palpate muscles at rest to determine muscle tonicity. Normally firm; Atonic (lacking tone).
- Palpate muscles for flaccidity (weakness or laxness) , spasticity (sudden involuntary muscle contraction) and smoothness of movement. Normally; Smooth coordinated movements.
- Test muscle strength.

Neurological System

- Examination of the neurologic system includes assessment of (a) *mental status* including *level of consciousness (LOC)*, (b) the *cranial nerves (CN)*, (c) *reflexes*, (d) *motor function*, and (e) *sensory function*.
- Assessment of mental status reveals the client's general cerebral function. These functions include intellectual (*cognitive*) as well as emotional (*affective*) functions.
- Major areas of mental status assessment include *language, orientation, memory, and attention span and calculation*.

1-Mental status

- **Language:** If the client displays difficulty speaking..
- Ask the client to point to common objects, and to name them.
- Ask the client to read some words and to match the printed and written words with pictures.
- Ask the client to respond to simple verbal and written commands, e.g., “raise your arm.”
- **Orientation:** Determine the client’s orientation to person, time, and place.
- Ask the client direct questions, e.g., “Where are you now?,” “What day is it today?,” “Who am I?”
- Ask the client to state his or her full name to assess the client’s ability to recognize self.

1-Mental status

- **Memory:** Assess the client's three categories of memory: *immediate recall*, *recent memory*, and *remote memory*.

To assess immediate recall:

- Ask the client to repeat a series of three digits, e.g., 7-4-3, spoken slowly.
- Gradually increase the number of digits until the client fails to repeat the series correctly.
- Start again with a series of three digits, but this time ask the client to repeat them backward. The average person can repeat a series of five to eight digits in sequence and four to six digits in reverse order.

To assess recent memory:

- Ask the client to recall the recent events of the day, such as how the client got to the clinic.
- Ask the client to recall information given early in the interview, e.g., the name of a doctor.
- Provide the client with three facts to recall, e.g., a color, an object, and an address; or a three-digit number, and ask the client to repeat all three. Later in the interview, ask the client to recall all three items.

To assess remote memory:

- ask the client to describe a previous illness or surgery, e.g., 5 years ago, or a birthday or anniversary.

1-Mental status

o **Attention Span and Calculation:**

- o Test the ability to concentrate or maintain attention span by asking the client to recite the alphabet or to count backward from 100.
- o Test the ability to calculate by asking the client to subtract 7 or 3 progressively from 100, i.e., 100, 93, 86, 79, or 100, 97, 94, 91. Normally, an adult can complete the serial sevens test in about 90 seconds with three or fewer errors.

1-Mental status

- o **Level of Consciousness:**

- o Assess the level of consciousness. Apply the **Glasgow Coma Scale**: *eye response, motor response, and verbal response*. An assessment totaling 15 points indicates the client is alert and completely oriented. A comatose client scores 7 or less (see Table 8-7, p. 190).

FACULTY MEASURED	RESPONSE	SCORE
Eye Opening	Spontaneous	4
	To verbal command	3
	To pain	2
	No response	1
Motor Response	To verbal command	6
	To localized pain	5
	Flexes and withdraws	4
	Flexes abnormally	3
	Extends abnormally	2
	No response	1
Verbal Response	Oriented, converses	5
	Disoriented, converses	4
	Uses inappropriate words	3
	Makes incomprehensible sounds	2
	No response	1

2-Cranial nerves (CN)

- | | | |
|---------------|---------------|----------------------|
| 1. Olfactory | 5. Trigeminal | 9. Glossopharyngeal |
| 2. Optic | 6. Abducens | 10. Vagus |
| 3. Oculomotor | 7. Facial | 11. Spinal Accessory |
| 4. Trochlear | 8. Acoustic | 12. Hypoglossal |

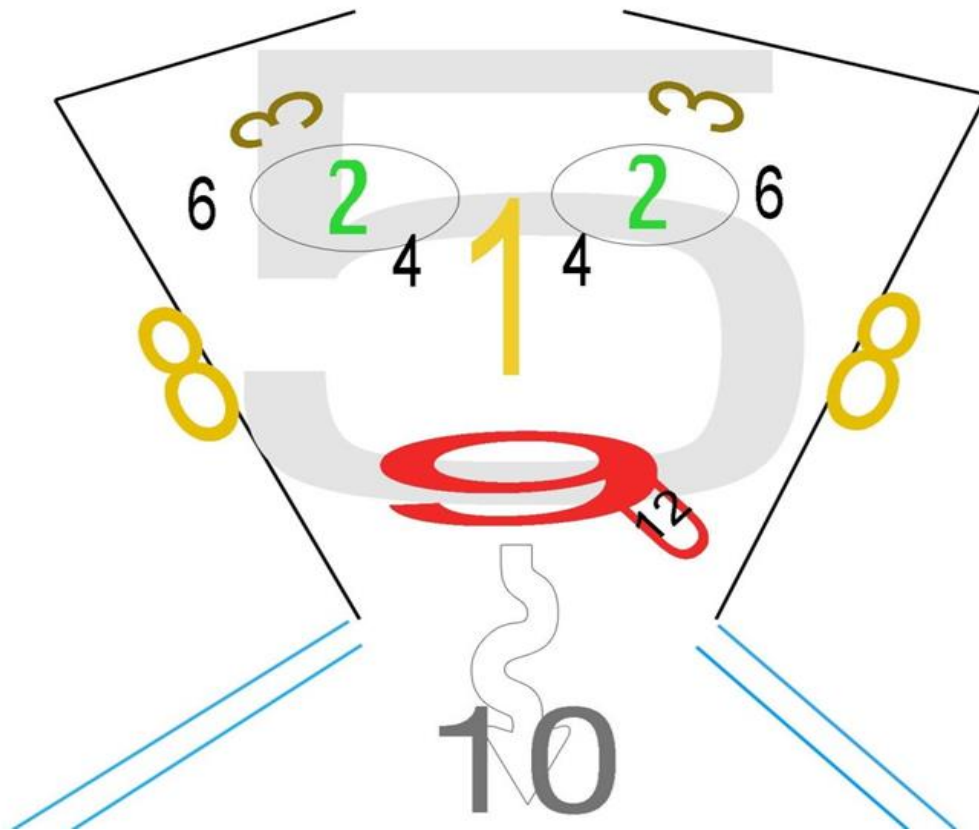


TABLE 8-8 Cranial Nerve Functions and Assessment Methods

CRANIAL NERVE	NAME	TYPE	FUNCTION	ASSESSMENT METHOD
I	Olfactory	Sensory	Smell	Ask client to close eyes and identify different odors, such as coffee, orange, chocolate.
II	Optic	Sensory	Vision and visual fields	Ask client to read Snellen-type chart (see Skill 8-4).
III	Oculomotor	Motor	Extraocular eye movement (EOM)	Assess six ocular movements and pupil reaction (see Skill 8-4).
IV	Trochlear	Motor	EOM; specifically, moves eyeball downward and laterally	Assess six ocular movements (see Skill 8-4).
V	Trigeminal	Sensory	Sensation of cornea, skin of face, and nasal mucosa	Test corneal reflex (see Skill 8-4).
	Ophthalmic branch			Assess light and deep sensation (see Skill 8-14)
	Maxillary branch	Sensory	Sensation of skin of face and anterior oral cavity (tongue and teeth)	Assess skin sensation as for ophthalmic branch above.
	Mandibular branch	Motor and sensory	Muscles of mastication; sensation of skin of face	Ask client to clench teeth.
VI	Abducens	Motor	EOM; moves eyeball laterally	Assess directions of gaze.
VII	Facial	Motor and sensory	Facial expression; taste (anterior two-thirds of tongue)	Ask client to smile, raise the eyebrows, frown, puff out cheeks, close eyes tightly. Ask client to identify various tastes placed on tip and sides of tongue: sweet, salt, sour, and bitter.
VIII	Auditory			
	Vestibular branch	Sensory	Equilibrium	Romberg Test (see Skill 8-15).
	Cochlear branch	Sensory	Hearing	Assess client's ability to hear spoken word and vibrations of tuning fork.
IX	Glossopharyngeal	Motor and sensory	Swallowing ability, tongue movement, taste (posterior tongue)	Apply tastes on posterior tongue for identification. Ask client to move tongue from side to side and up and down.
X	Vagus	Motor and sensory	Sensation of pharynx and larynx; swallowing; vocal cord movement	Assessed with cranial nerve IX; assess client's speech for hoarseness.
XI	Accessory	Motor	Head movement; shrugging of shoulders	Ask client to shrug shoulders against resistance from your hands and turn head to side against resistance from your hand (repeat for other side).
XII	Hypoglossal	Motor	Protrusion of tongue; moves tongue up and down and side to side	Ask client to protrude tongue at midline, then move it side to side.

3-Reflexes

- Test reflexes using a percussion hammer, comparing one side of the body with the other to evaluate the symmetry of response:

0 No reflex response

+1 Minimal activity (hypoactive)

+2 Normal response

+3 More active than normal

+4 Maximal activity (hyperactive)

3-Reflexes

Biceps Reflex: tests the spinal cord level C-5, C-6.

- Observe the normal slight flexion of the elbow, and feel the bicep's contraction through your thumb.



Triceps Reflex: tests the spinal cord level C-7, C-8.

- Observe the normal slight extension of the elbow.



3-Reflexes

Brachioradialis Reflex: tests the spinal cord level C-5, C-6.

- Observe the normal flexion and supination of the forearm.

The fingers of the hand may also extend slightly.



Patellar Reflex: tests the spinal cord level L-2, L-3, L-4.

- Observe the normal extension or kicking out of the leg as the quadriceps muscle contracts.



3-Reflexes

Achilles Reflex: tests the spinal cord level S-1, S-2.

- Observe and feel the normal plantar flexion (downward jerk) of the foot.



Plantar (Babinski) Reflex: it is superficial. It may be absent in adults without pathology or overridden by voluntary control.

- Observe the response. Normally, all five toes bend downward; this reaction is negative Babinski. In an abnormal (positive) Babinski response the toes spread outward and the big toe moves upward.



4-Motor function

- Ask the client to *walk* across the room and back. Normally, client Has upright posture and steady gait with opposing arm swing; walks unaided, maintaining balance.
- *Perform the Romberg Test*: Ask the client to stand with feet together and arms resting at the sides, first with eyes open, then closed. Stand close during this test to prevent the client from falling.
(-) test; may sway slightly but is able to maintain upright posture and foot stance>>>> normal.
(+) test; cannot maintain foot stance; moves the feet apart to maintain stance>>>> abnormal.

4-Motor function

- Ask the client to close the eyes and *stand on one foot*. Repeat on the other foot. Stand close to the client during this test. Should maintains stance for at least 5 seconds
- Ask the client to walk a straight line, placing the heel of one foot directly in front of the toes of the other foot (*Heel-toe walking test*).



4-Motor function

- *Perform Finger-to-Nose Test:*



- *Perform Fingers-to-nose and to the nurse's finger test:*



4-Motor function

- *Perform Fingers-to-thumb (same hand) test:*



- *Perform Heel down opposite shin test:*



5-Sensory function



5-Sensory function

