

Neurological System

LA County College of Nursing & Allied Health
School of Nursing

N113 Medical/Surgical Nursing

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Neurological System

Central nervous system

Brain

Spinal cord

Peripheral nervous system

Peripheral nerve

ADAM

Neurological System

Nursing Assessment Objectives

- Identify appropriate nursing assessment questions
- Discuss methods utilized to assess clients
- Describe various associated characteristics
- Identify cultural variations
- Discuss older adult variations
- Identify appropriate health promotions and client/family teaching

Student Activities

➤ Required Readings



- Berman
- Chapter 30
- Pp. 580-589

Remember to read content in the boxes

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Pre-Procedure

Verify
MD order

Introduce
self

Identify
client

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Implementation of Neurological Nursing Assessment

Explain

What you
are going
to do

Why you
are going
to do it

Perform
Hand
Hygiene

Use appropriate
infection control
procedures

Provide
privacy

Door, drape, chaperone

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Neurological Nursing Assessment

Begins from
across the
room

Routine
screening
first by RN

Complete,
thorough,
detailed
exam by MD
or NP

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Neurological Nursing Assessment

3 major client considerations for extent of exam

- Chief complaint
- Physical condition
- Willingness to participate/cooperate

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Clinical Alert!!

All questions in
an exam must
be
appropriately
related to the
client's:

- Age
- Language
- Education level
- Culture

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Nursing Assessment Questions

Nursing history
focus

- Orientation
 - Person, place, time, (and event)
- Presence of pain
 - Head, back, or extremities
- Speech disorder (slurred)

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Nursing Assessment Questions (cont.)

Nursing History
focus:

- Loss of consciousness
- Fainting, convulsions
 - Management of active seizure
- Trauma
 - Head or spinal cord injuries
- Tingling or numbness
- Tremors
- Limping or paralysis
- Uncontrolled muscle movements
- Memory loss or mood swings
- Problems with any of 5 senses

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Neurological Nursing Assessment

Examination
includes:

- Mental status
- Level of consciousness
- Cranial nerve function
- Reflexes
- Motor function
- Sensory function

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Neurological Nursing Assessment: Mental Status

Mental status

- Reveals general cerebral function
- Cognitive
- Affective

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Neurological Mental Status Nursing Assessment

4 areas of assessment

- Language
- Orientation
- Memory
- Attention span and calculation

**** Abnormalities require a more extensive exam by MD or NP****

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Neurological Mental Status Language Assessment

Language

Unable to comprehend or express oneself

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Mental Status Language Assessment: Aphasia

Aphasia

- Defects or loss of power to express or comprehend r/t disease or injury of cerebral cortex

Sensory or **receptive** aphasia (comprehension)

Motor or **expressive** aphasia (function)

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Mental Status Language Assessment: Receptive Aphasia

Sensory or receptive
aphasia
(COMPREHENSION)

Auditory aphasia—
unable to comprehend
symbolic content
associated with **sound**

Visual aphasia—
unable to
comprehend/understand
printed or written
figures.

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Mental Status Language Assessment: Expressive Aphasia

Motor or expressive aphasia

- Unable to **OUTWARDLY EXPRESS** oneself through
 - writing
 - making signs
 - speaking

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Mental Status Assessment: Language, Modified

When client has difficulty speaking, assess client's abilities:

- Identify objects
- Read and match words & pictures
- Obey simple commands
 - Written
 - Verbal

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MATCHING GAME

- Language
- Orientation
- Memory
- Attention Span/Calculation
- Obeys simple commands
- Knows Location
- Ability to focus
- Expressive aphasia

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Mental Status Assessment: Orientation

| Oriented x | Awareness of |
|------------------|------------------|
| 1. Person | (Who: Others) |
| 2. Place | (Where/Location) |
| 3. Time | (When) |
| 4. Event/purpose | (Why/what) |
| {Self | (Themselves)} |

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Mental Status Assessment: Memory

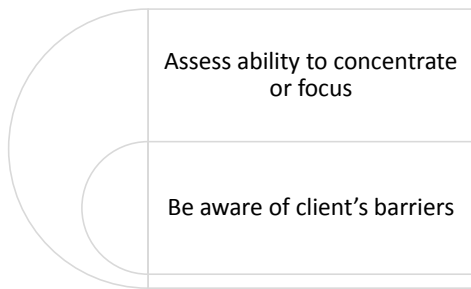
Listen for lapses in memory

3 categories of memory

- Immediate recall
- Recent memory
- Remote memory

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Mental Status Assessment: Attention Span & Calculation



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Neurological Assessment: Level of Consciousness (LOC)

- Very early and highly sensitive
indicator of neurological status change.
- **Clearly** describe client's response to stimuli
 - Alert, lethargic, stuporous, comatose
 - Glasgow Coma Scale (GCS)
 - Most commonly used to assess LOC

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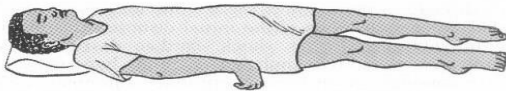
Glasgow Coma Scale

- Originally, predictor of head injury recovery
 - **Most commonly used to assess LOC**
 - Efficient and quick
- 3 major areas assessed
 - Eye Opening
 - Verbal Response
 - Motor Response
- Score totals 3-15

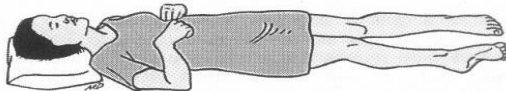
Table 30-10 Berman, pg . 581

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Posturing



A. Extension posturing (decerebrate rigidity)



B. Abnormal flexion (decorticate rigidity)

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Reflexes

- Automatic response to a stimulus
- Responses graded 0,+1,+2,+3,or +4
- Evaluation of reflexes
 - Testing
 - Deep tendon reflexes (DTR)
 - Superficial reflexes
 - Observation of primitive reflexes

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Superficial Tendon Reflexes

- Stimulate skin or mucous membranes
 - Light touch sensation
- Babinski (plantar) reflex
 - Nml (negative):
 - all toes bend down
 - Abnormal (positive):
 - big toe moves up
 - toes flare out



<https://www.youtube.com/watch?v=ZFu7bdbnZx8>

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Assessment of Motor Function

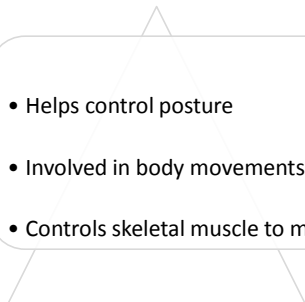
Evaluates

- Cerebellar function
- Proprioception

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Neurological Nursing Assessment: Motor Function—Cerebellar Function

- Helps control posture
- Involved in body movements and coordination
- Controls skeletal muscle to maintain equilibrium



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Neurological Nursing Assessment: Motor Function--Proprioception

- Movement and position sensation
- Sensory nerve terminals, chiefly in muscles, tendons, joints, and internal ear

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Motor Function Assessment

Evaluation
includes:

- Gross motor function
- Fine motor function

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Gross Motor & Balance Assessment

Generally, use **Romberg + 1** other gross motor test

Romberg Test +

Walking Gait

Standing on One Foot w/eyes Closed

Heel-Toe Walking

Toe or Heel Walking

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Gross Motor Function Assessment: Romberg Test



Romberg Test

- Feet together
- Arms resting at sides
- First with eyes open,
- Then with eyes closed

(Google.com, 2013)

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Gross Motor Function: Romberg Test Findings

Normal findings (Negative Romberg):

- Client may sway slightly
- Upright posture maintained
- Foot stance maintained

Abnormal findings (+Romberg):

- Cannot maintain foot stance
- Moves feet apart to maintain stance

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Gross Motor Function Assessment: Walking Gait

Assess gait while client walks
across the room and back

Normal

- Ambulates with **strong, steady** gait with **upright** posture.

Abnormal

- Ambulates with **unsteady, irregular, staggering** gait with **poor posture** and **wide stance**.

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Gross Motor Function: Standing on One Foot w/Eyes Closed

Client closes eyes; stands on one foot.

Normal

- Maintains stance x5 sec minimum

Abnormal

- CANNOT maintain stance x5 sec

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Gross Motor Function: Heel-Toe Walking

Client walks straight line,
heel directly in front of toes

Normal

- Maintains heel-toe walking along straight line

Abnormal

- Assumes wider foot gait to stay upright

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Gross Motor Function: Toe or Heel Walking

Client walks several steps on toes
and then on heels

Normal

- Client walks several steps on toes or heels

Abnormal

- Cannot maintain balance on toes and/or heels

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Neurological Nursing Assessment: LEAP Program

- Bureau of Primary Health Care of US Gov., 1992
- LEAP: Lower Extremity Amputation Prevention Program
 - Goal: identify high risk clients
 - 5 step program
 - Standard practice for at risk clients
 - Foot screening at least 4 X per year

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Fine Motor Function Assessment: Upper Extremities (UE)

- ☐ Finger to nose test
- ☐ Alternating supination & pronation hands on knees
- ☐ Finger to nose to nurse's finger
- ☐ Fingers to fingers
- ☐ Fingers to thumb (same hand)

Berman, pgs. 585-587

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Fine Motor Function Upper Extremities Finger-To-Nose Test

Client abducts and extends arms at shoulder and rapidly touches nose alternating index fingers. Repeat with eyes closed.

Normal

- Repeated/rhythmic touching nose

Abnormal

- Misses nose or gives slow response

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Fine Motor Function Upper Extremities Alternating Supination & Pronation Hands on Knees

Client pats both knees w/palms of both hands and then backs of hands @ increasing rate

Normal

- Rapid alternation of supination and pronation on knees

Abnormal

- Slow, clumsy movements
- Irregular timing
- Difficulty alternating supination & pronation

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Fine Motor Function Upper Extremities Finger to Nose and to Nurse's Finger

Client touches nose, then nurse's index finger @ 45cm (18in.) @ a rapid increasing rate

Normal

- Coordinated, rapid performance

Abnormal

- Misses finger
- Moves slowly

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Fine Motor Function Upper Extremities Fingers to Fingers

Client spreads arms broadly, shoulder height and brings fingers midline, slowly then rapidly, eyes open, then w/eyes closed

Normal

- Accurate, rapid performance

Abnormal

- Slow, inconsistent movement and finger touch

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Fine Motor Function Upper Extremities Fingers to Thumb, Same Hand

Client touches each finger of one hand to thumb of same hand, rapidly

Normal

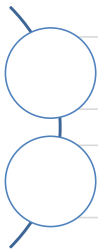
- Rapidly touches finger to thumb of each hand

Abnormal

- Uncoordinated movement of one or both hands

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Fine Motor Function Assessment: Lower Extremities (LE)



Heel down opposite shin

Toe or ball of foot to nurse's finger

Berman, pgs. 585-587

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Fine Motor Lower Extremities Heel Down Opposite Shin

Client places heel of one foot below opposite knee and runs heel down shin to foot

Normal

- Demonstrates bilateral equal coordination

Abnormal

- Tremors
- Awkward movement
- Heel moves off shin

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Fine Motor Function Lower Extremities Toe or Ball of Foot to Nurse's Finger

Client touches your finger w/large toe of each foot

Normal

- Smooth, coordinated movements

Abnormal

- Misses finger;
- Cannot coordinate movement

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Neurological Nursing Assessment: Sensory Function

Include:

- Light-Touch
- Pain
- Temperature
- Position
- Tactile discrimination

Abnormal sensory responses

- Loss of sensation or abnormal sensation
- Anesthesia/ paresthesia
- Hyperesthesia/hypoesthesia

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Detailed Neurological Assessment of Sensory Function

Client's eyes closed for all sensory tests

Light touch

Pain

Temperature

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Sensory Function Light-Touch

Compare light-touch sensation of symmetric areas of body with wisp of cotton.

Normal

- Light tickling or touching sensation felt

Abnormal

- Anesthesia;
- Hyper/hypoesthesia;
- Paresthesia

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Sensory Function Pain Sensation

Client identifies sharp or dull or unknown when random areas of body are touched with dull & sharp ends of safety pin

Normal

- Discriminates sharp and dull sensations

Abnormal

- Reduced, heightened, or absent sensation

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Sensory Function Temperature Sensation

Client identifies warm or cold when random areas of body are touched with warm or cold object.

Normal

- Identifies warm or cold sensation with touch with warm or cold object to body

Abnormal

- unable to identify warmth or cold when body touched with warm or cold object

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Detailed Neurological Sensory Function Nursing Assessment

Client's eyes closed for all sensory tests

Position sense

Tactile discrimination

- One & two point discrimination
- Stereognosis
- Extinction

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Detailed Sensory Function Position Sensation

Client identifies position of digit as middle finger or big toe are moved up, down, or straight out.

Normal

- Readily determines position of fingers and toes

Abnormal

- Unable to determine position of one or more fingers or toes

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Tactile Discrimination: One & Two Point

For all tests the client's eyes need to be closed

One and two point discrimination

Stimulate skin with 2 pins contralateral,

Ask if client feels 1 or 2 pins

Sharp vs. dull sensation

and then with 1 pin

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Tactile Discrimination Stereognosis

Stereognosis

- Recognition of objects by touch or manipulation of objects

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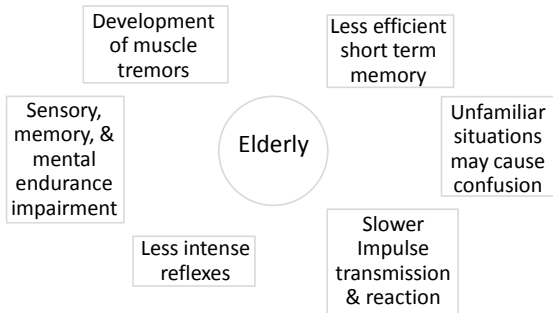
Tactile Discrimination Extinction

Extinction

- Failure to perceive touch on one side of body when two symmetrical sides are touch simultaneously

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Lifespan Considerations



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Health Maintenance & Promotion

Annual health exams

Healthy diet & exercise

Maintain a stimulating/safe environment

- Clocks/ calendar/ pictures/light, etc.

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Cranial Nerves

- **The nurse needs to be aware of specific nerve functions and assessment methods for each cranial nerve to detect abnormalities**

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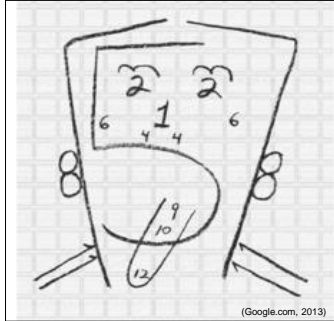
12 (XII) Cranial Nerves Mnemonics

- Name
 - On Old Olympus' Towering Top, A Finn And German Viewed A Hop
- Sensory/ Motor/ or Both
 - Some Say Marry Money, But My Brother Says Bad Business Marry Money

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12 Cranial Nerves

- I. Olfactory (S)
- II. Optic (S)
- III. Oculomotor (M)
- IV. Trochlear (M)
- V. Trigeminal (B)
- VI. Abducens (M)
- VII. Facial (B)
- VIII. Auditory (S)
- IX. Glossopharyngeal (B)
- X. Vagus (B)
- XI. Accessory (M)
- XII. Hypoglossal (M)



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I – Olfactory [Sensory, (On)]

Function:

- Smell

Assessment Method:

- Have client close eyes and identify different aromas
- Examples:
 - Coffee, vanilla, orange or lemon

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II - Optic Nerve [Sensory,(Old)]

Function

- Vision and Visual Fields

Assessment Method

- Snellen Chart
- Check visual fields by confrontation
- Conduct ophthalmoscope exam
 - (Berman, boxed skill 30-6)

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III – Oculomotor [Motor,(Olympus’)]

Function:

- Extraocular eye movement (EOM)
- Controls movement of ciliary muscles of lens

Assessment Method

- Six ocular movements and pupil reaction
 - (Berman, boxed skill 30-6)

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IV – Trochlear [Motor, (Towering)]

Function:

- Extraocular eye movement (EOM)
 - Specifically, moves eyeball downward and laterally

Assessment method

- Six ocular movements

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V – Trigeminal [Both, (Top)]

Function:

- Sensation of:
 - Cornea, skin of face, nasal mucosa
- Motor: muscles of mastication

Assessment Method:

- Test light touch, face, cotton ball (maxillary branch)
- Corneal reflex, blink reflex (ophthalmic branch)
- Ask client to clench teeth (mandibular branch)

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VI – Abducens [Motor, (A)]

Function:

- Extraocular movement (EOM)
- Moves eyeballs laterally

Assessment Method:

- Assess directions of gaze

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VII – Facial [Both, (Finn)]

Function:

- Facial expression
- Taste (anterior two thirds of tongue)

Assessment Method:

- Ask client to:
 - Smile, raise eyebrows, frown, puff out cheeks, or close eyes tightly
- Identify various tastes (tip of tongue)
 - Sugar, lemon juice (sweet or sour)

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VIII – Auditory [Sensory, (And)]

Function:

- Equilibrium
- Hearing

Assessment Method:

- Cerebellar functions: gait/coordination
- Assess hearing
- Auditory and tuning fork

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IX – Glossopharyngeal [Both,(German)]

Function:

- Swallowing ability, tongue movement, taste (posterior tongue)

Assessment Method:

- Ask client to move tongue from side to side and up and down
- Apply taste on posterior tongue

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X – Vagus [Both, Viewed]]

Function:

- Sensation of pharynx and larynx
- Swallowing
- Vocal cord movement

Assessment Method:

- Assessed with cranial nerve IX
- Assess speech for hoarseness

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XI – Accessory [Motor, (A)]

Function:

- Head movements; shrugging of shoulders

Assessment Method:

- Ask client to:
 - Shrug shoulders against your resistance
 - Turn head against your resistance

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XII – Hypoglossal [Motor, (Hop)]

Function:

- Protrusion of tongue;
- Moves tongue up and down & side to side

Assessment Method:

- Ask client to protrude tongue at midline and then move it side to side

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Conclusion

- Identified appropriate nursing assessment questions
- Discussed methods utilized to assess clients
- Described various associated characteristics
- Identified cultural variations
- Discussed older adult variations
- Identified appropriate health promotions and client/family teaching

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References

- Berman, A., & Snyder, S. (2016). *Fundamentals of Nursing: Concepts, Process, and Practice*. Upper Saddle River, N.J.: Pearson.
- Kluwer, W. (2008). *Assessment made Incredibly Easy!* Ambler, P.A.: Lippincott, Williams, & Wilkins.
- <http://www.hrsa.gov/hansensdisease/leap/>
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- Questions????

- Practice, practice, practice!

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