


POM II Student Guide

Mental Status the Neurological Exam with Cranial Nerves

- **Readings:**
 - **Bates 13th edition:**
 - **Chapter 24 Nervous system:** Anatomy and Physiology "Central Nervous system" pages 841-844, "Peripheral Nervous System" pages 844-847 "Motor Pathways" pages 847-848, "Sensory Pathways" 849-850 and "Spinal Reflexes: Muscle Stretch Responses" page 850 and Health History General Approach 851-858, and Physical Exam: General Approach: 859-862 Cranial Nerves 862-876 "Motor system" pages 867-880, "Sensory System" pages 880-885 and "Muscle Stretch Reflexes" pages 885-891 and Recording Your Findings page 902 and pages 924-926 Tables 24-9 "Nystagmus" and 24-10 "Types of Facial Paralysis"
 - **Chapter 9 Cognition, Behavior and Mental Status** pages 241- 277
 - Chen, J. "Finding a common chord" *Pulse* 09/11/2020:
<https://pulsevoices.org/index.php/stories/finding-a-common-chord>
 - Tracer H, Caton Gilstrap L. Screening for Cognitive Impairment in Older Adults. *Am Fam Physician*. 2020 Jun 15;101(12):753-754. PMID: 32538603.
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 - [Physical Exam Standards PPSI/II](#)
 - [Neurologic Exam - PPSII \(youtube.com\)](#)
 - [Mental Status and Cranial Nerve Exam PPSII \(youtube.com\)](#)
(<https://www.youtube.com/watch?v=Ht1iQg3Kv3Q&list=PLB0msUc7n7ONWp2Wtkn12VCBiXz9qYD8&index=2&t=214s>)
- **Clinical Skills Assessment in BNS- CSA 6A&6B (5 mins) (5/21-5/23)**
 - CSA after BNS will be **two cases** instead of the single case they are accustomed to.
 - CSA 6A & 6B will be the last Clinical Skills Assessment for POM II
 - There will be a **Neuro case with a PEN** and a **HEENT case with a VPP**.
 - Go to the SIM lab at the assigned date and time and will need to be prepared to do this two station CSA. Perform a History and Physical Exam on two separate SPs and after one of them they will be prompted to do a VPP and after the other one they will be prompted to write a PEN.
 - We will take some time at the next LGI to answer questions and give overview of the last CSA to students.
- **2:15 Prep Check Question Review (5mins)**
 - Review Prep check questions with students
- **2:20 Discuss the reading, "Finding a Common Chord," by Jimmy Chen (10 min)**
- **2:30 Practice history taking (20 min)**
 - Discuss review of system questions and definitions of unfamiliar terms: (5 minutes):
 - Highlight: if related to HPI, goes there. If something patient states or answers in reply to a general question eg "I feel sad a lot" then report in ROS. If something observed eg flat affect or response to orientation or other mental status assessment question then goes in (physical) exam section.
 - **Review of Systems ROS : Take a few minutes to talk about how you use ROS in the clinical setting.**
 - You probably target the ROS questions to clinical issues you may be concerned about for this patient or that may affect your differential diagnosis.
 - Its not included just for billing purposes now, we use this to identify issues that may not be related to chief complaint, but are important to address and follow up on.
 - Also want to stress that some ROS findings if positive will end up leading to follow up questions to determine the severity, context and importance of addressing this issue at the moment.

PPS I.II Review of Systems (ROS) Examples Box 3-18 from Bates 13 th Edition Textbook.	Other Medical Terminology used to describe Neurologic Symptoms
Changes in mood, attention or speech	Diplopia •double vision
Changes in Orientation, memory, insight or judgment	Dysarthria •Difficult forming words
Headache	Ataxia •difficulty with gait or balance
Dizziness • Light-headed, feeling faint	Paresthesias •peculiar sensations without an obvious stimulus
Vertigo • Perception of room spinning or rotating	Dysesthesias •distorted sensation in response to a stimulus
Fainting (Syncope) or Blackouts • Sudden but temporary loss of consciousness • Or Presyncope (symptoms of feeling faint, light-headed, or weak, but without actual loss of consciousness)	Analgesia •absence of pain sensation
Weakness	Hypoesthesia •decreased touch sensation
Paralysis	Hyperesthesia •increased touch sensation
Numbness or loss of sensation	
Tingling or "pins and needles",	
Tremors (or other involuntary movements) • trembling, shakiness, or body movements that the patient seems unable to control	
Clonus • series of alternating contractions and partial relaxations of a muscle	
Seizures	

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- Have students pair up and practice taking a history (HPI and cranial nerves review of systems) of chief complaint of numbness of left side of face. (10 min)
- Have 1 or 2 students present the history they obtained. (5 min)

2:50 Hands-On Practice (60 mins)

- Demonstration of skill set (10 minutes)
- Mental status
 - Assess level of alertness and ask patient all four of the following to assess orientation:
 - person (partial or full name),
 - place (current location),
 - time (date including year), and
 - event (purpose of visit, recent current event, or life event)
 - Tips: Report patient's general mental status (e.g., alert, stuporous, confused). Student can ask orientation questions in any order as long as all four are asked. Ask the questions clearly and provide sufficient time for a response.
 - *Pediatric patient: Assesses alertness, responsiveness to exam, fussiness, and how consolable they are*
 - **Mini-Cog (Bates Table 9-7)**
 - **We are doing this on patients who we are concerned about cognitive function or memory loss**
 - *Ask patients to remember 3 unrelated words (eg pen, ball, coffee)*
 - *Ask the patient to draw the face of a clock including the numbers. After clock face drawn, ask patient to draw the hands of the clock set to a specific time.*
 - *After clock drawing exercise complete, ask patient to remember the 3 words.*
 - *Scoring:*

- *All 3 words recalled accurately –no dementia*
- *No words recalled accurately – possible dementia*
- *1 or 2 words recalled accurately and clock normal – no dementia*
- *1 or 2 words recalled accurately and clock abnormal – possible dementia*

- **Cranial Nerve Examination: Name each nerve as you are testing it.**

- **CN I**

- *Ask patient about loss of smell or use fragrant object (e.g. coffee beans) to evaluate sense of smell*

- **CN II**

- **Checks pupils**

- Pupillary response to light – dims lights in room then shines light in each eye, observing for constriction of pupils
- Swinging flashlight test – in dim light, moves a light back and forth between the eyes every 2-3 seconds, checking for an afferent pupillary defect

- **Assess visual fields**

- Peripheral vision – ask the patient to look at your nose and maintain gaze. Then, put up varying number of fingers in the patient's peripheral vision and ask the patient to state the number of fingers. Ensure that peripheral vision is tested 4 quadrants bilaterally.
- Face the patient "nose to nose" separated by about 2-3 feet, and ask the patient to close one eye and look at your nose.
- Close your opposite eye and show a number of fingers on each hand midway between you and the patient and in opposite visual fields (e.g., upper right and lower left). Ask the patient to say how many fingers they see.
- Then move your hands to the other visual fields (e.g., lower right and upper left, then bilaterally at eye level) and ask the same thing again.
- Repeat testing for other eye.
- Alternative method: You may wiggle a finger on one hand and ask the patient to point to the finger which is moving instead of showing a number of fingers. This should be performed in all four quadrants as well.

- **Assess visual acuity**

- *Hold a Snellen pocket vision card about 14 inches from the patient in good light and ask them to read the lowest line they are able to read with one eye and then with the other. You may ask the patient to close one eye, cover one eye, or may cover the patient's eye yourself.*
- *If a line other than the lowest line is read, ask the patient to read the next line down. Record the lowest line with at least half correctly read.*
- *This should be done before any other eye exam with the ophthalmoscope. You should not ask the patient to remove their corrective lenses. Note presence or absence of correction when documenting findings.*

- **CN III, IV, and VI**

- **Assess extraocular movements**

- Ask patient to hold head steady and have the patient follow your fingers as they move in an "H" or star pattern 8-12 inches from the patient's eyes. Next, bring finger towards patient's nasal bridge. Move finger slowly and not so far in any direction that it becomes blurry or hard to see. Done Incorrectly - If done too quickly, making the patient dizzy, or finger does not cross midline.

- **CN V**

- **Assess muscles of mastication**

- Place hands on the masseter or temporalis muscles and ask the patient to bite down or clench teeth while feeling muscles. Use both hands (one on each side) and feel the difference between relaxed and clenched muscles. Try to open the patient's closed jaw by placing your hands on their chin and forehead or chin and upper lip/cheeks.

- **Assess facial sensation**

- Touch patient's face with fingers (lightly; no scraping or swiping) or cotton/gauze on forehead, cheeks, and jaw, alternating sides. Ask the patient if the sensation on each pair of the three levels is the same. You must test corresponding sides at a time (example: right forehead then left forehead).
- **CN VII**
 - **Assess facial expressions**
 - Ask patient to close their eyes and mouth tightly and attempt to open them with your fingers. *[Alternative: Asks patient to smile broadly].* Must test both eyes and mouth.
- **CN VIII**
 - **Assess hearing**
 - Completes one of the following two tests.
 - Ask patient to close their eyes, put hand next to ear, and make sound with fingers (by rubbing tips of fingers together). Confirm that the patient can hear the sound. Then, move hand away from the ear while asking the patient to state when they no longer hear the sound. Perform bilaterally and confirm the patient hears the sounds the same on both sides.
 - Ask patient to close their eyes, put hand a small distance (6-8 inches) from ear, and make sound with fingers (by rubbing tips of fingers together). Ask patient if they hear anything, and if so, from which side it is coming. Perform bilaterally.
- **CN IX and X**
 - **Assess for uvula deviation**
 - Ask the patient to open mouth widely and say "ah" to visually examine the uvula. Use a light as necessary to have better exposure. Note if midline, unmoving or deviated toward either side.
- **CN XI**
 - **Assess trapezius and sternocleidomastoid**
 - Ask patient to shrug shoulders then push down on the trapezius muscles above the shoulders one at a time. Next, ask patient to turn head to the side and then resist while you try to turn head back to midline. Perform bilaterally.
- **CN XII**
 - **Assess tongue movement/strength**
 - Ask patient to stick out tongue. Note if tongue midline, unmoving or deviated toward either side. Then ask patient to put tongue back in mouth and push against the side of their cheek while pressing against the tongue from the outside. Perform bilaterally.

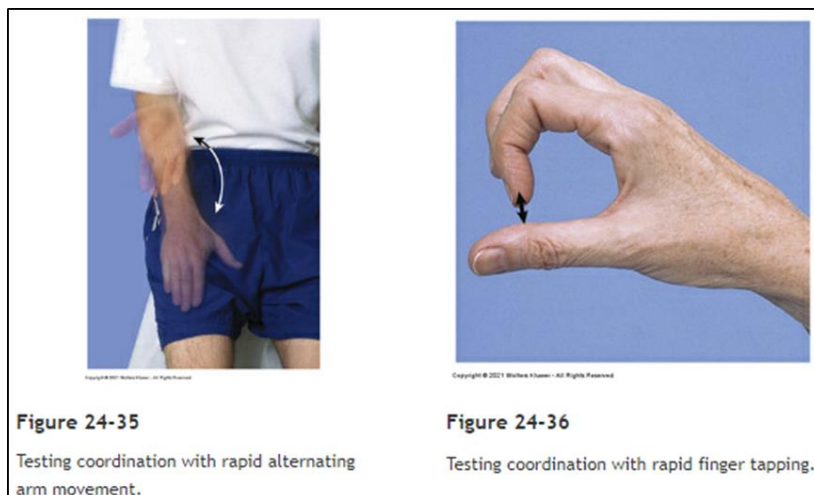
Skills in italics should be reviewed and practiced but will not appear on the POM II CSAs

Proprioception, cerebellar function, and gait

- Wash hands!

Assess rapid alternating movements

- Performs one of the two following exams:
 - Asks patient to alternate striking right thigh with palm and back of right hand, repeating as quickly as possible. Performs bilaterally.
 - Asks patient to tap index finger to distal joint of their thumb as rapidly as possible. Performs bilaterally.



Finger to nose test

- At arm's length from the patient, asks patient to alternate touching their own nose then student's finger with one finger while moving finger left to right and making sure to cross midline. Performs bilaterally.

Heel to shin test

- Asks patient to slide heel of one foot up and down shin of other leg. Performs bilaterally.



Romberg test

- Asks patient to stand with feet together and then close eyes for 10-30 seconds. Observes ability to maintain upright position and positions themselves standing to the side of the patient with arms extended to support patient if they become unsteady.

Posture and stance

- Visually examines the patient's posture and stance while standing.*

Normal walking

- Asks the patient to walk normally and observes for several steps.

Heel walking

- Asks patient to walk on heels and observes for several steps.

Toe walking

- Asks patient to walk on toes and observes for several steps.

Tandem gait

- Asks patient to walk in tandem (heel to toe) and observes for several steps. Tips: one foot should be placed directly in front of the other, with heel touching the toes. You may need to demonstrate this for the patient.



Figure 24-38

Testing tandem gait (heel-to-toe).

Motor:

○ REVIEW MUSCLE STRENGTH GRADING SCALE

- 0 – No muscular contraction detected
- 1 – Barely detectable flicker of trace of contractions
- 2 – Active movement of body part with gravity eliminated
- 3 – Active movement against gravity
- 4 – Active movement against gravity and some resistance
- 5 – Active movement against full resistance without evident fatigue (normal)

Observe for hyperkinetic disorders: tics, tremors.

Tips: put muscle being tested into full contraction for testing and stabilize joint by supporting above joint being tested with opposite hand; patient should be moving further into contraction with resistance testing.

Shoulder

- Asks patient to abduct one shoulder 90 degrees and then places hands on patient's elbow and pushes down checking for resistance. Performs bilaterally, one side at a time.



Figure 24-23

Testing shoulder abduction (C5, C6–deltoid).



Figure 24-24

Testing elbow flexion (C5, C6–biceps, brachioradialis).



Figure 24-25

Testing elbow extension (C6, C7, C8–triceps).

Elbow

- Asks patient to bend elbow and tries to pull the elbow straight against the patient's resistance. Then asks the patient to straighten their elbow without locking the joint, and tries to push the arm in against the patient's resistance. Performs bilaterally, one side at a time.

Wrist

- Asks patient to bend wrist back (extension – like riding a bike) and tries to pull the hand down against the patient's resistance. Then asks patient to bend wrist forward (flexion – like putting up your dukes) and tries to push hand up against the patient's resistance. Performs bilaterally, one side at a time.



Figure 24-26

Testing wrist extension (C6, C7, C8, radial nerve—extensor carpi radialis longus and brevis, extensor carpi ulnaris).

Fingers

- Asks patient to straighten (extend) fingers without locking and tries to push fingers down against the patient's resistance. Then asks patient to curl fingers without locking and tries to uncurl fingers against the patient's resistance. Performs bilaterally, one side at a time.

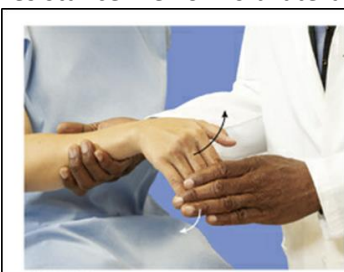


Figure 24-27

Testing finger extension (C7, C8, radial nerve—extensor digitorum).



Figure 24-28

Testing finger abduction (C8, T1, ulnar nerve—first dorsal interosseous and abductor digiti minimi).

Pronator drift

- Asks patient to extend arms out completely in front of them with palms upward. Then asks patient to close eyes for 10-30 seconds while observing for involuntary pronation of the hands.

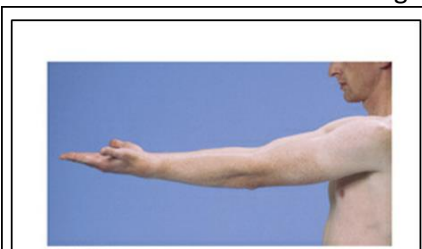


Figure 24-21

Testing for pronator drift.

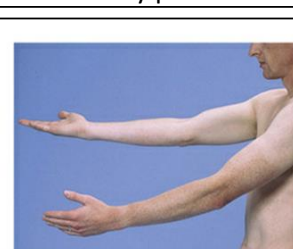


Figure 24-22

Positive test for pronator drift of left side.

Hip

- With patient sitting, asks patient to raise thigh up off the chair or exam table with knee bent. Places hand on the patient's thigh and pushes down. Performs bilaterally, one side at a time.

Knee

- With patient sitting, ask the patient to let legs dangle at the end of the table or seat. Then asks the patient to straighten the leg without locking the knee. Pushes down on the ankle while supporting knee against the patient's resistance. Performs bilaterally, one side at a time.

Ankle

- With patient sitting, asks patient to:
 - Bend foot upwards (dorsiflexion) and pushes foot down against patient's resistance.
 - Bend foot downward (plantar flexion) and pushes foot up against patient's resistance.
 - Performs bilaterally, one side at a time.

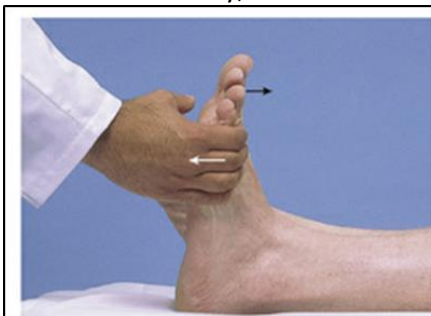


Figure 24-33

Testing foot dorsiflexion (L4, L5—tibialis anterior).



Figure 24-34

Testing plantar flexion (S1—gastrocnemius, soleus).

Sensation

Assess light touch

- Ask patient to close eyes respond whenever a touch is felt and to compare one area with the other. With a cotton tip or fingertip (no scraping or swiping), lightly touches **shoulders, forearms, front of patient's thighs, and shins**, alternating from left to right. Then asks patient if left felt similar to right **AND** upper felt similar to lower.

Assess painful sensation (pinprick)

- Asks patient to close eyes and respond whenever a touch is felt and to compare one area with the other. With the broken end of a wooden cotton applicator (or other appropriate sharp-ended stimulus), **touches shoulders, forearms, front of patient's thighs, and shins**, alternating from left to right. Then asks patient if left felt similar to right **AND** upper felt similar to lower.

Test distal position sense

- Grasps patient's big toe (or finger) by the sides, pulling it away from the other digits, and, with the patient's eyes closed, asks the patient whether the digit is positioned "up" or "down" while manipulating the digit's position. Repeats several times on each side. Performs bilaterally, one side at a time.



Figure 24-39

Testing vibration sense.



Figure 24-40

Testing joint position sense (proprioception).

Test vibratory sense

- Asks patient to close eyes and places a vibrating tuning fork over the distal interphalangeal (DIP) joint of patient's finger and whether the patient feels vibration. Repeats for DIP of big toe.

Stereognosis

- Asks patient to close eyes and places an object in the patient's hand and asks them to identify it without looking.

Two-point discrimination

- Using the two ends of an open paperclip or other comparable stimulus, touch a finger pad in two places simultaneously. Asks the patient whether they feel one or two points. Finds the minimal distance at which the patient can discriminate one from two points (usually < 5 mm on finger pads).

Graphesthesia

- Asks patient to close eyes and draws a letter or number on the hand and asks patient to identify it

Reflexes

REFLEX GRADING SCALE

4+ Very brisk, hyperactive, with clonus
 3+ Brisker than average; possible indicative of disease, possible normal variant
 2+ Average; normal
 1+ Somewhat diminished; low normal
 0 No response

Biceps

- Ask patient to relax arm. At the inner elbow, places thumb firmly on biceps tendon and taps with a reflex hammer. Performs bilaterally.

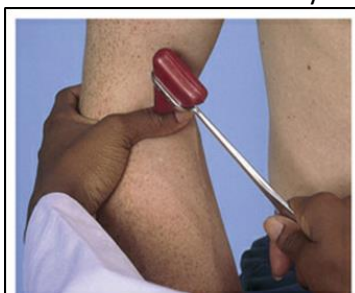


Figure 24-48
Biceps reflex (C5, C6)—patient sitting.

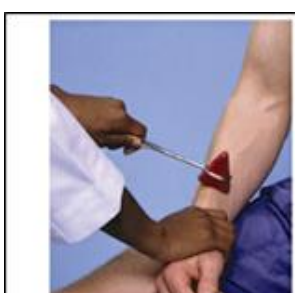


Figure 24-53
Brachioradialis reflex (C5, C6).

Brachioradialis

- Asks patient to relax arm then taps on the thumb side of the forearm about halfway to 2/3 between the elbow and wrist with a reflex hammer. Performs bilaterally.

Triceps

- Ask patient to relax one arm with it bent at 90 degrees and rest it on their lap.
- Alternative: Supports the arm in the air while bent at 90 degrees.
- Taps the triceps tendon 1-2 inches above the outer elbow with a reflex hammer. Performs bilaterally.



Figure 24-50
Triceps reflex (C6, C7)—patient sitting.

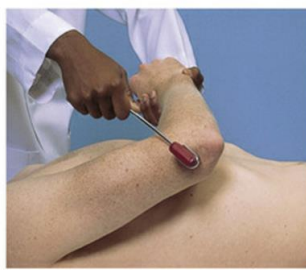


Figure 24-51
Triceps reflex (C6, C7)—patient supine.



Figure 24-52
Triceps reflex (C6, C7)—patient sitting, and elbow supported.

Patellar

- Asks patient to sit with legs dangling freely. Taps the patellar tendon with a reflex hammer. Performs bilaterally.



Achilles

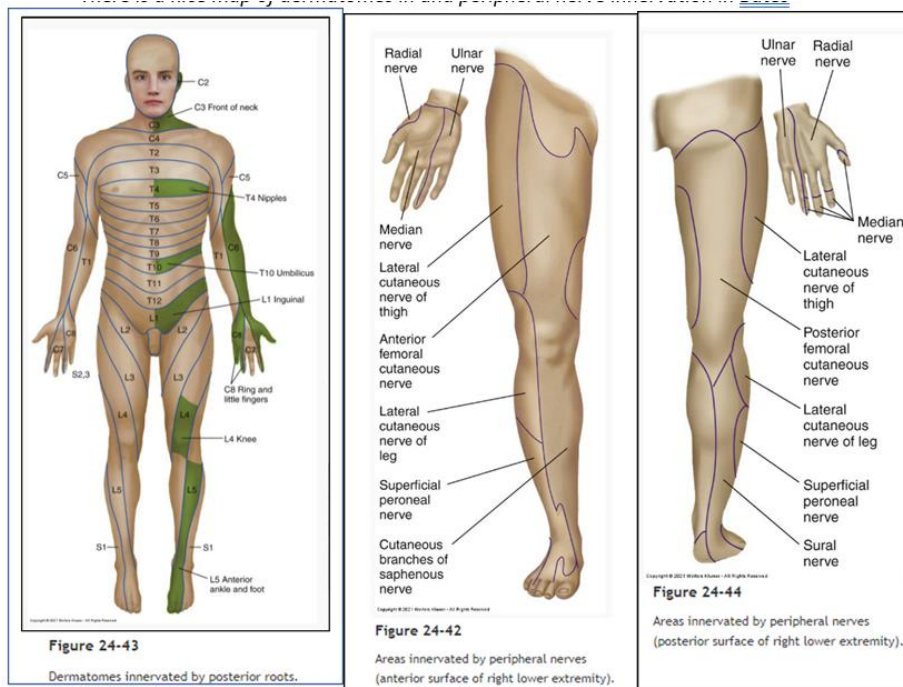
- With legs dangling freely, bends ankle slightly upward and taps Achilles tendon just above the heel with a reflex hammer. Performs bilaterally.



- 3:10 Have students practice the neuro exam with partners, giving directly observed feedback (50 minutes)

Note:

- *Map of dermatomes in and peripheral nerve innervation in Bates*



- You may also demonstrate each section of the full exam (ie motor, sensation, reflexes and coordination) then have students pair off and practice that section, allowing roughly 15 minutes for each.