

## NEUROLOGICAL HISTORY AND EXAMINATION

(Chapter 1. Barbara Scherokman's Clinical Syndromes in Neurology, 2002 Edition,  
Carl H. Gunderson MD ed.)

### I. History

#### A. Source

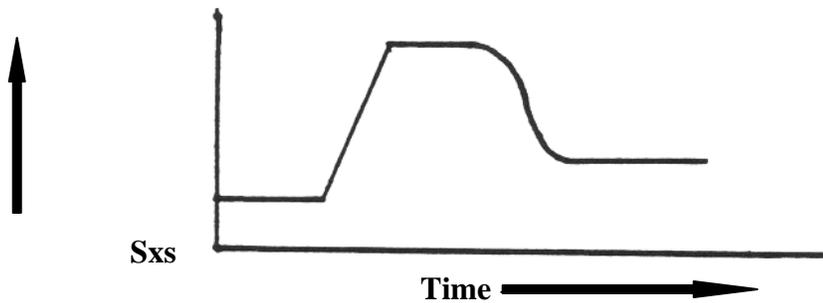
1. At the onset, decide on the patient's reliability.
2. In disorders where the patient has lost consciousness, try to obtain additional history from an observer.
3. Especially in dealing with sensory complaints, including headache, get as complete a description of the symptom complex as you can.

#### B. Anatomy:

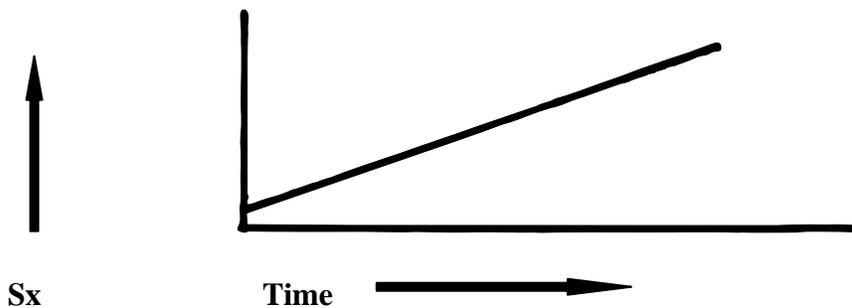
1. The first step in diagnosis is to determine which part of the nervous system is affected.
2. While taking the history, form hypothesis about the location of the disorder, which you can later test during the physical examination.
3. Observe the patient's behavior while taking the history. Look for:
  - (1) Areas of evident physical weakness
  - (2) Akinesia, involuntary movements and pain behaviors
  - (3) Problems in language, memory, or mental process.
4. If the complaint is one of pain, sensory loss, or abnormal sensation, ask the patient to show you where it is rather than relying solely on description.

#### C. Once the anatomy is defined, the temporal profile will narrow down the diagnostic possibilities

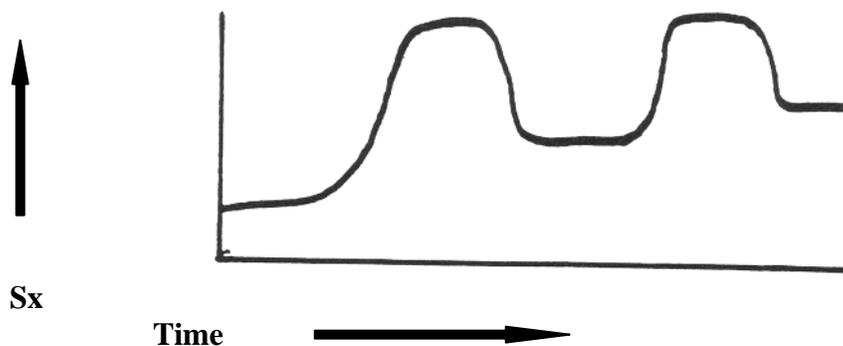
1. Vascular: Sudden onset with slow improvement.



2. Tumor and Degenerative: Gradual onset and gradual progression.



3. Demyelinating: Exacerbations and remissions.



- D. Neurologic Diseases: The pneumonic in the table below is very useful in remembering the range of diseases that affect the nervous system. However, different portions of the nervous system are prone to different disease processes. The combination of disease site, disease time course, and a rudimentary understanding of incidence and prevalence rates provide an excellent beginning to differential diagnosis.

<b>V</b>	Vascular
<b>I</b>	Infectious
<b>T</b>	Trauma
<b>A</b>	Autoimmune/inflammatory
<b>M</b>	Metabolic/toxic
<b>I</b>	Iactrogenic
<b>N</b>	Neoplastic
<b>C</b>	Congenital/familial
<b>D</b>	Degenerative
<b>E</b>	Epileptic
<b>F</b>	Functional

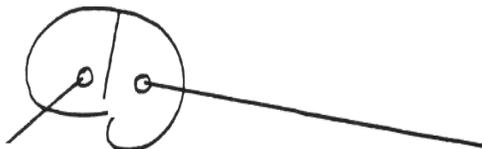
II. Exam:

- A. Quick neurological exam on a patient without neurological symptoms and no observable defects.

1. Pupils, Extra-ocular movements, and Fundi
2. Arm drift, strength at elbows, wrists, and ankles
3. Vibration and pinprick on both sides of face hands and feet
4. Reflexes
5. Finger to nose
6. Gait

B. Alert patient with neurological symptoms.

1. Mental Status
  - a. General features
    - 1) Mood and Affect (Depression)
    - 2) Level of consciousness
    - 3) Language disorders
    - 4) Insight
    - 5) Attention
      - a) Perseveration
      - b) Impersistence
      - c) Inattention
  - b. Mini-Mental Status: (Point values are given in parenthesis).
    - 1) Orientation
      - a) Year, season, date, day, month (5)
      - b) State, county, town, hospital, floor (5)
    - 2) Three objects (3)
    - 3) Serial "7"s or world backwards (5)
    - 4) Recall (3)
    - 5) Language (9)
      - a) Name a pencil and a watch (2)
      - b) Repeat "no ifs, ands, or buts"(1)
      - c) "Take a paper in your hand, fold it in half, put it on the floor (3)
      - d) Read and obey (3)
        - i. Close your eyes
        - ii. Write a sentence
        - iii. Copy design
  - c. Normal is 27 or better
  - d. A diagnosis of dementia requires:
    - 1) Memory loss
    - 2) One other domain
2. Speech: Observe and record fluencies, repetition, and comprehension



Nonfluent

Fluent Aphasia

<b>Broca</b>	<b>Wernicke's</b>	<b>Conductive</b>	<b>Anomic</b>
<u>Motor Aphasia</u>	<u>Sensory Aphasia</u>	<u>Repeating Deficit</u>	<u>Naming Problem</u>
produce few words	many words	many words	many words
frustrated	effortlessly - paraphasias	effortlessly	effortlessly
can comprehend	can't comprehend	can comprehend	can comprehend
poor repeat	can't repeat	can't repeat, especially "no ifs, ands, or buts"	can repeat
poor naming	can't name	can name	can't name
lesion in frontal lobe	lesion in post temporal region	lesion in angular gyrus	lesion in arcuate fasciculus

Note: Although this table characterizes the four most common forms of aphasia, many patients have mixed features of more than one. Furthermore, aphasias vary in severity. A patient with mild Broca's aphasia may be able to repeat very well, while a patient with severe Broca's aphasia may be unable to repeat more than one word or none at all.

### 3. Cranial Nerves

I: Olfactory: Usually not tested. Soap and coffee can be used at the bedside.

II: Optic:

- 1) Visual acuity
- 2) Visual fields
- 3) Inspect discs.

III, IV, VI: Oculomotor, Trochlear, Abducens

- 1) Test full range of motion with saccades and tracking
- 2) Check pupils for symmetry, reaction to light and near vision
- 3) Swinging light test

V: Trigeminal

- 1) Motor: Palpate masseters. Test Pteragoid strength
- 2) Sensory: Pinprick and touch on all three divisions
- 3) Reflexes: Jaw jerk, corneal, stenoauditory.

VII: Facial

- 1) Voluntary and emotional smile
- 2) Bury eyelids
- 3) Wrinkle forehead
- 4) Whistle

VIII. Auditory

- 1) Hearing: Rinne, Weber, hear whisper
- 2) Vestibular: Nystagmous, past pointing

IX. Glossopharyngeal: Gag reflex

X. Vagus: Palate elevation, voluntary and gag

XI. Spinal Accessory: Trapezius and sterno-cleido-mastoid strength

- XII. Hypoglossal: Tongue protrusion
4. Motor
- a. Drift of upper and lower extremities
  - b. Power:
    - 1) Sites to be tested
      - a) Shoulder: Abduction first 15 degrees, abduction at 90 degrees, internal and external rotation.
      - b) Elbow: Flexion and extension
      - c) Wrist: Flexion and extension
      - d) Thumb: Adduction abduction and opposition
      - e) Second and fourth digits: Abduction
      - f) Hip: Flexion, adduction, and abduction
      - g) Knee: Flexion and extension.
      - h) Ankle: Flexion and extension, eversion and inversion
      - g) First toe: Extension.
    - 2) Rating scale
 

0:	No contraction
1:	Flicker
2:	Movement with gravity
3:	Movement against gravity only
4:	Movement against some resistance
5:	Normal
  - c. Atrophy: Look and feel for atrophy
  - d. Tone: Arms and legs:
    - 1) Increased: Spasticity or rigidity
    - 2) Decreased: Hypotonia
5. Gait
- a. Normal, Look for broad base, circumduction, scissoring, or slapping
  - b. Stressed gait and station
    - 1) Toes and heels
    - 2) Tandem
    - 3) Romberg
6. Coordination:
- a. Finger to nose and heel to shin
  - b. Rapid alternating movements
  - c. Arm rolling
7. Sensory:
- a. Test pinprick and touch on arms, feet and face on both sides.
  - b. Vibration on bony prominences of hands and feet.
  - c. Proprioception on fingers and toes.

- d. If the patient has an area of sensory symptoms, map it carefully moving from the center out to the edge.
- e. If a spinal cord lesion is suspected, run a sensory level up the patient's back if possible
8. Reflexes
- a. Deep tendon reflexes routinely tested.
- 1) Biceps and triceps
  - 2) Knee jerk and ankle jerk (latter may show one beat of clonus)
- b. Superficial reflexes:
- 1) Abdominal and cremasteric
  - 2) Will disappear in both upper motor neuron and motor unit disease.
- c. Abnormal (expressed infantile) reflexes
- 1) Wartenberg, Hoffman and related finger reflexes
  - 2) Babinski, Chaddock, and related toe signs
- d. Grading

0	Unobtainable
1+	Barely obtainable
2+	Average
3+	Brisk
4+	Clonus

- e. Evaluating
- 1) 4+ reflexes are abnormal
  - 2) Reflexes are often asymmetric and the physician must decide which is abnormal.
    - i. The symptomatic or weak side is usually the abnormal one.
    - ii. If there are no motor complaints, the more active side is more likely to be abnormal.

B. Evaluation of the comatose patient:

1. Glasgow Coma Scale: Total of three elements may be used to assess the depth of coma. This scale has generally replaced the older terms severity of semicoma (patient responds to stimulation with at least avoidance behavior) and coma (reflexes only)

a. Verbal responses

5	Oriented
4	Confused
3	Inappropriate words
2	Incomprehensible
1	None

b. Eye Opening

4	Spontaneous
3	To Speech
2	To pain

1	None
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c. Motor

6	Obeys commands
5	Localizes pain
4	Withdraws
3	Abnormal flexion
2	Abnormal extension
1	None

2. Plum and Poser criteria for deeper levels of coma. Although reporting in these anatomic terms is no longer commonly used, the concept is useful

	Respiratory Pattern	Calorics	Pupils	Posture
<b>Bilateral Cerebral</b>	 Cheyne-Stokes	Intact: Conjugate Deviation Toward Cold Water	Normal Size & Reactive	Flaccid or Decorticate 
<b>Mid-Brain</b>	 Central Neurogenic Hyperventilation	Dysconjugate or Absent	Mid-Position & Fixed	Flaccid or Decerebrate 
<b>P O N S</b>	 Apneustic	Dysconjugate or Absent	Pinpoint & Reactive	Flaccid or Decerebrate
<b>M E D U L L A</b>	Ataxic  Absent 	Dysconjugate or Absent	Fixed & Dilated	Flaccid

3. Cranial nerves

a. Optic and oculomotor systems

- 1) Pupillary response to light
- 2) Doll's Eyes and resting eye position
- 3) Cold calorics
- 4) Eyes may deviate away from a hemiparesis in a hemisphere lesion and toward a hemiparesis in a brainstem lesion.

b. Trigeminal

- 1) Corneal and jaw jerk reflexes
- 2) Sensory limb of facial grimacing

c. Facial nerve

- 1) Grimacing to pain (pressure over glabellum)
    - 2) Cheeks blowing out with expiration.
  - d. Auditory
    - 1) Cold calorics
    - 2) Shouting in each ear
  - e. Glossopharyngeal and vagus: Gag reflex
4. Spinal levels
  - a. Watch spontaneous movements. Test strength with resistance.
  - b. Painful withdrawal from each extremity and sternal pressure
  - c. Comparison of deep tendon and pathologic reflexes.
  - d. Look for external rotation of a leg suggesting a hemiparesis.