

Neurology Clerkship Syllabus

Clerkship Website

<http://courses.washington.edu/neural/index.html>

Neurology Clerkship

Identifying data

Name: _____
Dates of clerkship: ____/____/____ to ____/____/____
Location: _____

Goals and Objectives

Please refer to the neurology clerkship website for details.

Core goals and objectives:

1. Learn the neurological exam.
2. Learn localization in neurology.
3. Understand a bioethical issue in neurology.
4. Have clinical exposure to several neurological diseases.
5. Receive mid-rotation feedback

Desired goals and objectives:

1. Formulate a differential diagnosis for patients with neurological symptoms.
2. Know when to order and how to interpret common tests used in diagnosing neurological disease.
3. Understand the management principles for common neurological diseases.
4. (Ideally) Perform a lumbar puncture.

Names and Numbers

Attending	_____	#	_____
Attending	_____	#	_____
Chief resident	_____	#	_____
Junior resident	_____	#	_____
Resident	_____	#	_____
Intern	_____	#	_____
Intern	_____	#	_____
Student	_____	#	_____
Other	1. _____	#	6. _____ #
	2. _____	#	7. _____ #
	3. _____	#	8. _____ #
	4. _____	#	9. _____ #
	5. _____	#	10. _____ #

Learning Neurology

Neurology can be taught by emphasizing localization, symptoms, or specific diseases. Each has its pros and cons and so this course will try to combine all three approaches.

Resources include general medical and neurology textbooks, the recommended text for this course, didactic lectures, attendings/residents/students, and web based information (referenced).

Localization of signs and symptoms

Try and think about neurological problems from an anatomical point-of-view. Split the nervous system up into parts and ask yourself, "Could the patient's symptoms be produced by this part of the nervous system"? You will usually find that this approach can easily eliminate a long differential list. Keep in mind that there are exceptions to every rule in neurology.

Anatomy

Brain

Function

Motor and sensory

Language

Visual acuity

Memory

Behavior

Consciousness

Seizures

Movement disorders

Often unilateral

Brain stem

Motor and sensory

Cranial nerves: diplopia, vertigo, hearing, tongue, swallow

Consciousness

Cerebellar

Movement disorders

Often unilateral

Spinal cord

Motor and sensory

Bilateral symptoms common

Bowel, bladder and erectile function

Motor neuron

Motor only

Proximal and distal

Slowly progressive

Asymmetric bilateral

Fasciculations

Peripheral nerve

Motor and/or sensory (predominates)

Cranial nerves: peripheral course

Usually distal in stocking/glove distribution

Neuromuscular junction

Motor only

Proximal and distal

Fatigable weakness and eye involvement in MG

Muscle

Motor only

Usually proximal and symmetric

Procedures and specific diseases

Procedures

- Lumbar puncture <http://www.nejm.org/doi/full/10.1056/NEJMvcm054952>
- EEG/evoked potentials
- EMG/NCV
- MRI
 - <http://spinwarp.ucsd.edu/NeuroWeb/Text/br-phys.html>
- CT

General web sites to find everything below. Other sites listed under specific disease.

<http://www.emedicine.com/neuro/> (**Almost any topic is available. Excellent site**)

<http://www.uptodate.com/>

<http://www.mayoclinic.com/index.cfm>

Movement disorders

- Tremor
- Parkinson's disease

Epilepsy/seizure

- Partial onset
- Generalized onset
- Status epilepticus

Disorders of vision

- Patterns of visual loss
- Afferent pupillary defect and Horner's syndrome
 - <http://cim.ucdavis.edu/EyeRelease/Interface/TopFrame.htm> (Mozilla only)

Neuromuscular disease

<http://neuromuscular.wustl.edu/>

- Motor neuron disease/ALS

- Peripheral nerve

Guillain-Barre syndrome, Carpal tunnel syndrome, Bell's palsy, Length dependent neuropathy

- Myasthenia gravis

- Myopathy

Polymyositis, Muscular dystrophy

Dizziness

- Vertigo
- Presyncope
- Dysequilibrium

Cerebrovascular disease

- Stroke

Embolic, Lacunar, Transient ischemic attack, Hemorrhagic

Multiple sclerosis

- Relapsing-remitting
- Primary progressive

Head trauma

- Concussion and post-concussive syndrome
- Subdural and epidural hematoma

Altered consciousness

- Delirium
- Coma
- Brain death

Dementia

- Alzheimer's

Aphasia

- Fluent (Wernicke's)
- Non-fluent (Broca's)

Headaches

- Migraine
- Tension
- Cluster
- Subarachnoid hemorrhage
- Giant cell arteritis

Brain tumors

- Primary
- Metastatic

Spinal disorders

- Radiculopathy
- Cervical stenosis
- Lumbar stenosis
- Epidural abscess
- Cauda equina syndrome
- B12 subacute combined degeneration

Infections

- Encephalitis
- Meningitis
- HIV related

Alcohol related disorders

- Delirium tremens
- Wernicke's encephalopathy
- Korsakoff's dementia

Sleep Medicine

- Sleep apnea
- Restless leg syndrome
- Narcolepsy

Child neurology

- Childhood specific epilepsy
- Enlarging head circumference
- Cerebral palsy

Psychiatry

- Depression
- Bipolar disorder
- Conversion disorder

Anatomy web sites

<http://www.drawittoknowit.com/index.html> <http://www9.biostr.washington.edu/da.html>
<http://www.rad.washington.edu/atlas/> (Great peripheral nerve and muscle site)

Physical exam web sites

medlib.med.utah.edu/neurologicexam/html/home_exam.html (Video of entire exam)

Quiz yourself

<http://umed.med.utah.edu/neuronet/> (Reasonable quiz questions)

Radiology web site

<http://eradiology.bidmc.harvard.edu/>

Patient log

Please record each patient encounter according to the guidelines at <http://courses.washington.edu/neural/patientlog.html>

1. _____

10. _____

20. _____

30. _____

40. _____

50. _____

60. _____

70. _____

80. _____

90. _____

100. _____

Appendix 1: Neurological Examination

A. Mental and communication status

1. Education level
2. Level of consciousness
Alert Delirium Obtunded Stupor Coma



3. Mood and psychomotor activity
4. Orientation (time, place, person, body parts, left-right, awareness of illness)
5. Calculation, spelling
6. Speech function (fluency, comprehension, repetition, naming, reading, writing)
7. Memory (immediate, short term, long term)
8. Ability to follow complex commands
9. Mental status exam See appendix 2

B. Cranial nerve functions

1. Olfactory (aromatic smell)
2. Optic
 - a. Acuity (Snellen card, corrected?)
Example 1: acuity (near, corrected) 20/20 OU
Notation means normal vision in both eyes
Example 2: acuity (near, uncorrected) 20/100 OD, 20/50 -2 OS
In left eye, two of six numbers were missed on the 20/50 line
 - b. Fundi (vessels, disc border, cup/disc ratio)
 - c. Visual fields

3, 4, 6. Oculomotor, Trochlear, Abducens

- a. Pupillary reaction (light, accommodation, afferent pupillary defect)
Example 1: PERRLA = Pupils Equal Round Reactive to Light and Accommodation
Example 2: The right pupil is large with no response to direct or consensual light but will accommodate.
This example is consistent with a tonic (Adie's) pupil.
- b. Eye movements
Example 1: EOMI = ExtraOcular Movements Intact
Example 2: No abduction of the left eye with gaze left.
This example is consistent with left abducens palsy.

c. Nystagmus

Example: A right beating nystagmus is seen in all directions of gaze.
The direction of nystagmus is defined by its fast component.

5. Trigeminal
 - a. Muscles of mastication
 - b. Sensation of face (test all 3 divisions) and cornea
 - c. Sensation of mucous membranes and noxious smell
 - d. Jaw jerk
7. Facial
 - a. Muscles of facial expression, palpebral fissures
 - b. Taste anterior 2/3
8. Acoustic
 - a. Cochlear (finger rub, tuning fork)
 - b. Vestibular (nystagmus, past pointing)

- 9, 10. Glossopharyngeal, Vagus
 - a. Palate rise to phonation (say “ah”) and gag
 - b. Voice and articulation
 - c. Taste posterior 1/3
- 11. Spinal accessory
 - a. Sternocleidomastoid
 - b. Upper trapezius
- 12. Hypoglossal
 - a. Tongue movement
 - b. Bulk

C. Motor function

1. Strength

a. Direct testing

- Grades: 0 No muscle contraction
 1 Trace visual or palpable movement
 2 Movement with gravity eliminated
 3 Movement against gravity but not resistance
 4 Movement against resistance but can be overcome
 5 Normal

Example 1: strength 5/5 all muscles

Example 2:

	<u>delt</u>	<u>bic</u>	<u>tric</u>	<u>w flex</u>	<u>w ext</u>	<u>grip</u>	<u>interosseous</u>
R	5	5	5	5	5	5	5
L	3	4+	4	4	3	3	1

	<u>h flex</u>	<u>h ext</u>	<u>quad</u>	<u>ham</u>	<u>f dorsiflex</u>	<u>f plantarflex</u>
R	4+	5	5	5	5	5
L	2	4	4	4	2	4

b. Functional testing

- i. Walking on toes and heels
- ii. Deep knee bend
- iii. Hopping on one foot
- iv. Arm drift

2. Tone

- a. Spasticity
- b. Rigidity (lead-pipe, cogwheel)
- c. Hypotonic or flaccid

3. Bulk

D. Reflexes

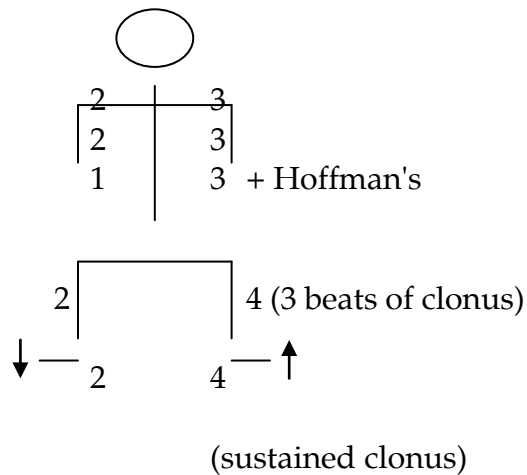
1. Deep tendon

- Grades: 0 No response
 Tr Reinforcement required
 1 Diminished
 2 Normal, average
 3 Brisker than normal
 4 Clonus

Use “+ or -” to indicate smaller differences

- 2. Abdominal
- 3. Babinski
- 4. Hoffman
- 5. Frontal lobe (glabellar, snout, palmomental)
- 6. Other (cremasteric, bulbocavernosis)

Example:



E. Sensory function (use sensory maps and draw pictures as needed)

1. Primary (thalamic) sensation
 - a. Light touch
 - b. Pain
 - c. Temperature
 - d. Vibration
 - e. Proprioception
2. Discriminative (cortical) sensation
 - a. Stereognosis
 - b. Graphesthesia
 - c. Two-point discrimination
 - d. Point localization
 - e. Extinction with double simultaneous stimulation (DSS)
3. Romberg - evaluation of balance with eyes closed and feet together reflects proprioceptive and touch function in the legs and feet

Example 1: Light touch, pinprick, and vibration are reduced distally in the hands and feet consistent with a stocking/glove distribution of sensory loss.

This example would be consistent with peripheral neuropathy.

Example 2: All left side primary sensory modalities are mildly reduced, and there is extinction on DSS.

This example would be consistent with right parietal lobe dysfunction.

F. Coordination, station, and gait

1. Balance on one foot with eyes open
2. Walking
 - a. Wide or narrow base
 - b. Normal or reduced arm swing
 - c. Tandem gait (heel-to-toe)
 - d. Ataxia
3. Rapid alternating movements (RAM)
4. Finger-nose-finger (FNF) and heel-knee-shin (HKS) tests

Example 1: The patient can't stand still with eyes open or closed, has markedly poor balance on one foot, a wide based ataxic gait, can't tandem walk, slow RAM, and dysmetria on FNF and HKS.

This example would be consistent with cerebellar dysfunction.

Example 2: The patient has a positive Romberg, mildly poor balance on one foot, slightly wide based non-ataxic gait, can take five steps in tandem, normal RAM, and no dysmetria on FNF and HKS.

This example would be consistent with peripheral neuropathy.

G. Abnormal movements

1. Tremor (note predominant component)
 - a. Rest (Parkinsonian)
 - b. Postural
 - c. Kinetic (action)
2. Involuntary movements (dystonia, chorea, tic)
3. Bradykinesia

H. Meningeal and mechanical signs

1. Neck stiffness
2. Brudzinski's sign
3. Kernig's sign
4. Straight leg raise
5. Pressure tenderness of bone, muscle, and nerves

I. Vascular status

1. Auscultation of head and neck
2. Auscultation of heart
3. Palpate extremity vessels

Appendix 2: Montreal Cognitive Assessment (MoCA)

Tests in multiple languages can be found at: <http://www.mocatest.org/>