Neurology Clerkship Pocket Syllabus

Neurology Clerkship

Identifying Data

Name: _____

Dates of clerkship: _____/_____/_____ to _____/_____/_____

Location: _____

_____

_____

Clerkship Website: https://courses.washington.edu/neural

Goals and Objectives

1. Learn and demonstrate an organized approach to interviewing, physical exam, and clinical decision-making in neurology.
2. Encourage self-directed learning.
3. Deliver clear and concise oral presentations.
4. Prepare a clear and concise written document
5. Perform a neurologic exam and distinguish normal from abnormal findings. (Appendices 1 & 2)
6. Localize the likely site in the nervous system that could produce the patients' symptoms and signs.
7. Formulate a differential diagnosis.
8. Know when to order and how to interpret common tests used in diagnosing neurologic disease.
9. Understand the management principles for common neurologic diseases.
10. (Ideally) Perform a lumbar puncture.

Learning Objectives

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.

This syllabus is to aid in your study of neurology. It is not intended to be all-inclusive, but rather is a minimal understanding expected for graduating medical students. Feel free to dive deeper into an interesting subject, especially if you are trying to work-up or manage a patient. The final exam may contain questions from any of these areas.

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

Names and Numbers

Attending _____ #_____

Attending _____ #_____

Chief resident _____ #_____

Junior resident _____ #_____

Resident _____ #_____

Intern _____ #_____

Intern _____ #_____

Student _____ #_____

Other 1._____ #_____ 6._____ #_____

2._____ #_____ 7._____ #_____

3._____ #_____ 8._____ #_____

4._____ #_____ 9._____ #_____

5._____ #_____ 10._____ #_____

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	Function
Brain	Motor and sensory Language Visual acuity Memory Behavior Consciousness Often unilateral
Brain stem	Motor and sensory Cranial nerves: diplopia, vertigo, hearing, tongue, swallow Consciousness Cerebellar Often unilateral
Spinal cord	Motor and sensory Bilateral symptoms common Bowel and bladder
Motor neuron	Motor only Proximal and distal Slowly progressive Asymmetric bilateral Fasciculations
Peripheral nerve	Motor and/or sensory 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

Symptom approach

Patients present to clinic and emergency room with symptoms more often than with a disease. A differential diagnosis is based on symptoms and then pared down as testing makes things more or less likely.

1. Weakness
2. Numbness or paresthesias
3. Gait disturbance
4. Dizziness
5. Vision loss
6. Diplopia
7. Headache
8. Involuntary movements
9. Acute mental status change
10. Dementia
11. Aphasia
12. Sleep disorder
13. Episodic focal symptoms
14. Urinary incontinence
15. Developmental disorders

Procedures and specific diseases

Procedures

- ☐ Lumbar puncture (observed by)
  1. _____ 3. _____
  2. _____ 4. _____
- ☐ 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 (Fabulous eye model)

Neuromuscular disease

http://www.mdausa.org/disease/index.html
http://www.neuro.wustl.edu/neuromuscular/

- ☐ Motor neuron disease/ALS
  http://www.neuro.wustl.edu/neuromuscular/spinal/als.htm
- ☐ Peripheral nerve: Guillain-Barre syndrome, Carpal tunnel syndrome, Bell's palsy, Length dependent neuropathy
- ☐ Myasthenia gravis
- ☐ Myopathy: Polymyositis, Muscular dystrophy

Dizziness

- ☐ Vertigo - http://www.wfubmc.edu/neurology/lectures/slctalks/slcvertigo/index.htm
- ☐ 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 - http://www.upstate.edu/neurology/haas/index.html
- ☐ Migraine
- ☐ Tension
- ☐ Cluster
- ☐ Subarachnoid hemorrhage
- ☐ Giant cell arteritis - http://www.medinfo.ufl.edu/cme/grounds/bhatti/index.html

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 - http://www.nhlbi.nih.gov/about/ncsdr/
- ☐ Sleep apnea
- ☐ Restless leg syndrome
- ☐ Narcolepsy

Child neurology
- ☐ Childhood specific epilepsy
- ☐ Enlarging head circumference
- ☐ Cerebral palsy

Psychiatry - http://www.emedicine.com/med/PSYCHIATRY.htm
- ☐ Depression
- ☐ Bipolar disorder
- ☐ Conversion disorder

Anatomy web sites

http://medstat.med.utah.edu/kw/sol/sss/
http://www9.biostr.washington.edu/da.html

Physical exam web sites

http://courses.temple.edu/neuroanatomy/lab/index.htm (Video of entire exam)

Quiz yourself

http://umed.med.utah.edu/neuronet/ (Reasonable quiz questions)
http://www.bcm.tmc.edu/neurol/ (Cases of the month are challenging)

Patient Log

You will be recording each patient encounter by logging in their disease or symptom (inpatient or clinic, your evaluation or just observing). You will submit your patient data online each day. This form is for you to write notes on-site. The online log and instructions on how to record information are at: http://catalyst.washington.edu/webtools/webq/survey.cgi?user=neural&survey=17.

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. Mini-mental status examination (MMSE) 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 a 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:

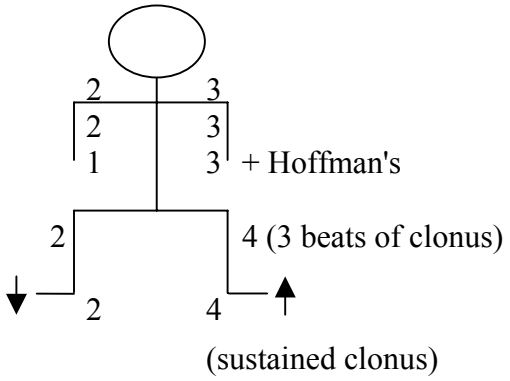
	delt	bic	tric	w flex	w ext	grip	interosseous
R	**5**	**5**	**5**	**5**	**5**	**5**	**5**
L	**3**	**4+**	**4**	**4**	**3**	**3**	**1**

	h flex	h ext	quad	ham	f dorsiflex	f plantarflex
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. Cerebellar function, 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.

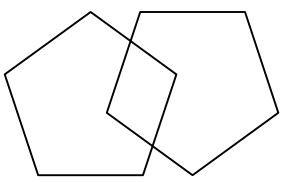
G. Abnormal movements
   1. Tremor (note predominant component)
      a. Rest (Parkinsonian)
      b. Postural
      c. Kinetic (action)
   2. Involuntary movements (dystonia, chorea, tic)
   3. Bradykinesia

H. Meningeal and mechanical signs
   1. Neck stiffness
   2. Brudzinski's sign
   3. Kernig's sign
   4. Straight leg raising
   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: Mini-mental status examination (MMSE)

Maximum Score	Score	
		Orientation
5	( )	What is the (year) (date) (day) (month) (season)?
5	( )	Where are we: (state) (county) (city) (hospital) (floor)?
		Registration
3	( )	Name 3 common objects (e.g. apple, table, penny) Take 1 second to say each. Then ask the patient to say all 3. Give 1 point for each correct answer. Repeat exercise until they have learned all 3 words.
		Attention and Calculation
5	( )	Spell "world" backwards. The score is the number of letters in correct order: D____ L____ R____ O____ W____
		Recall
3	( )	Ask for the 3 objects repeated above. Give 1 point for each correct answer.
		Language
2	( )	Name 2 objects (e.g. pencil, watch)
1	( )	Repeat the following "No ifs, ands, or buts."
3	( )	Follow a three stage command: (e.g. "Hold up your right thumb, put out your left leg, and stick out your tongue.")
1	( )	Read and obey the following: CLOSE YOUR EYES
1	( )	Write a sentence.
1	( )	Copy the following design.



Total score _____ Normal 25-30
Abnormal <25