STEP 1: What neurological system(s) is involved?
- Mental status, cognitive, language
- Cranial nerves
- Motor (bulk, tone, strength)
- Muscle stretch reflexes
- Sensory (pin-prick, light touch, position sense)
- Cerebellar
- Romberg test
- Gait

STEP 2: Where is the problem (based on clinical findings or history)?
- Central nervous system (Cerebral cortex, cerebellum, brainstem or spinal cord)
- Peripheral nervous system (root, plexus, nerve, neuromuscular junction or muscle)

STEP 3: What is the etiology (make your best guess; if acute onset consider stroke, epilepsy or migraine)?
- Vascular
- Infectious
- Trauma
- Iatrogenic
- Metabolic
- Endocrine
- Neoplasia
- Degenerative

CASE 1. This is a 45 year-old right handed woman with a ten year history of the insidious development of extremity weakness, generalized seizures and more recently, because of shortness of breath, diagnosed with a cardiomyopathy. Her family history is significant for similar difficulties and age of onset in her mother, who eventually died from heart failure.

**What part(s) of the nervous system is(are) involved?**
**What does and where is the anatomical site of involvement that explains her facial weakness?**
**What are the implications for her mother’s illness, and significance of the associated symptoms of seizures and heart failure in relation to the pathophysiology of her syndrome of weakness?**

NOTES:

CASE 2. Three years ago, this 31-year-old, left handed man gradually (days) developed visual loss in his right eye that resolved over 3 weeks. Now he presents with a sensation of “dizziness” and double vision when looking to either side. When asked to look to either side you observe the following eye movements

**How would you document the movements of the abducting eye? Adducting eye?**
**Would the near reflex be expected to be normal?**
**Where would a deficit be located if neither eye moved on left gaze, but right gaze and the near reflex were normal?**

NOTES:
CASE 3. This 64 year-old right handed man, developed progressive weakness and sensory loss of his extremities and impaired ambulation, over a period of 20 years. He has no other relevant medical history.

Is his motor exam consistent with an upper or lower motor neuron problem?
What explanation (and descriptive name) is given for why his problems are worse in the lower extremities?
Would the presence of fasciculations change your anatomical localization for his exam findings?

NOTES:

CASE 4. This 64 year-old, right handed woman developed lower extremity pain, followed by weakness and sensory impairment over a matter of minutes. Later she was aware of urinary and bowel incontinence after being brought to the hospital.

What part(s) of the nervous system is(are) involved?
What is the explanation for the difference in sensory modalities involved?
Are the muscle stretch reflexes and plantar stimulation response consistent with your anatomical localization?

NOTES:

CASE 5. This 62 year-old man developed lower extremity weakness and clumsiness when walking, but no clear urinary incontinence over a period of 10 years. His ambulatory impairment resulted in his retirement from his job as a truck driver. Ten years earlier he underwent a stomach resection and vagotomy (ligation of the vagus nerve) for a gastric ulcer.

What part(s) of the nervous system is(are) involved?
What is the anatomical location that explains his lower extremity sensory exam findings?
Is his gastric surgery of any significance with regard to his current neurological deficit?

NOTES:

CASE 6. This is a 45 year-old right handed woman, who insidiously developed involuntary movements 15 years earlier, worse over the last 2 years and she is unable to suppress them (“like my brain gets stuck”).

How would you classify the movements you have witnessed?
What anatomical system is assumed to be involved?
If her father had a similar difficulty and her younger brother had depression, what diagnostic test may you consider for her?

NOTES:

CASE 7. This is a 72-year-old right handed woman whose difficulty began acutely 3 days earlier when she awoke with double vision when looking to her right side. There were no associated symptoms, and except for HTN and DM (controlled with medications), her health had been good. As her symptoms persisted, she sought evaluation.

What are the anatomical localizations for the results observed on examination?
What is the significance of the patient’s history with respect to an etiology (more likely or less likely)?

NOTES:
CASE 8. This is a 42 year-old right handed woman, whose difficulty began as a child when her childhood friends commented upon her abnormal movements and vocalizations. Her father thought she had St. Vitus’ dance, but there was no other relevant family history. While the movements lessened as she became older, they became more prominent recently and the reason for her seeking further evaluation.

How would you characterize her abnormal movements?
Could such a clinical presentation arise from degeneration of the substantia nigra or the striatum and why?
Is there any significance to the onset of these movements in childhood, with respect to her diagnosis?

NOTES:

CASE 9. This is a 68-year-old right handed woman who insidiously (years) developed gait impairment (mild), but later involuntary movements of her upper extremities which disrupted many activities. She was placed on Levodopa + Carbidopa (Sinemet™), but of no benefit. An intervention was performed and demonstrated within this video.

How would you classify her upper extremity movement disorder?
What portions of her exam speak against an essential tremor as the etiology for her upper extremity difficulty?
(In regards to her intervention, what structures do you think were targeted?)

NOTES:

CASE 10. This is a 75-year-old right handed man who, two days before admission, ate some of his own canned food (meat). One day later developed diarrhea, and on the day of admission double vision. Over one day his symptoms rapidly progressed, and he developed dysarthria, dysphagia and because of respiratory difficulties he was intubated. His symptoms of weakness progressed to include all extremities. This exam was performed 5 days after admission.

Involvement of what neurological sites could cause this pattern of weakness?
What is the significance of his intact reflexes? Of his sensory exam?
Is there evidence of cognitive impairment?

NOTES:

CASE 11. This is a 71-year-old right handed man who over a five-month period developed progressive motor and ambulatory difficulties, associated with jerky movements, but no clear sensory disturbance. Cognition appeared intact, speech was dysarthric and his sisters described him as becoming withdrawn. Family history and his medical history were non-contributory.

How would you classify the findings on exam (e.g. LMN, UMN, cerebellar, or basal ganglia in origin)
What are the quick sudden movements that are seen?
If his cognition was significantly impaired, then what diagnosis may you consider?

NOTES: