

## Clinical Neurology Sample Items

1. A 39-year-old man is admitted to the hospital by his brother for evaluation of increasing forgetfulness and confusion during the past month. His brother reports that the patient has been drinking heavily and eating very little, and has been slightly nauseated and tremulous. He wanders at night because he cannot sleep. On admission to the hospital, intravenous administration of 5% dextrose in water is initiated. Two hours later, the patient has ophthalmoplegia and is completely confused. Which of the following is the most appropriate next step in management?
  - (A) Administration of an anticoagulant
  - (B) Administration of diazepam
  - (C) Administration of large doses of vitamin B<sub>1</sub> (thiamine), intravenously
  - (D) Administration of large doses of vitamin C,
  - (E) Continued administration of intravenous fluids with magnesium
2. A 47-year-old man comes to the physician because of a 2-year history of fatigue. He has had progressive difficulty with daytime sleepiness and has intermittently fallen asleep at work. He has no difficulty falling asleep or staying asleep at night but awakens in the morning not feeling well rested. His vital signs are within normal limits. Examination of the throat shows no abnormalities except for hypertrophied tonsils. His hemoglobin concentration is 17.9 g/dL, leukocyte count is 8700/mm<sup>3</sup>, and platelet count is 170,000/mm<sup>3</sup>. Which of the following is the most likely cause of this patient's symptoms?
  - (A) Chronic Epstein-Barr virus infection
  - (B) Chronic fatigue syndrome
  - (C) Erythroleukemia
  - (D) Polycythemia vera
  - (E) Sleep apnea
3. A 45-year-old man has had a 1-week history of increasing neck pain when he turns his head to the right. He also has had a pins-and-needles sensation starting in the neck and radiating down the right arm into the thumb. His symptoms began 3 months ago when he developed severe pain in the neck and right shoulder. Neurologic examination shows limitation of motion on turning the neck to the right. There is 4+/5 weakness of the right biceps and decreased pinprick over the right thumb. Deep tendon reflexes are 1+ in the right biceps and brachioradialis; all others are 2+. Which of the following is the most likely diagnosis?
  - (A) Carpal tunnel syndrome
  - (B) Cervical root compression
  - (C) Multiple sclerosis
  - (D) Thoracic outlet syndrome
  - (E) Ulnar nerve compression
4. A 29-year-old man is brought to the emergency department because he has a severe bilateral headache and irritability. His pulse is 120/min, respirations are 30/min, and blood pressure is 200/120 mm Hg. Ophthalmoscopic examination shows blurring of the optic discs. Deep tendon reflexes are 3+ and symmetric. Which of the following is the most likely diagnosis?
  - (A) Alcohol intoxication
  - (B) Heavy metal poisoning
  - (C) Hypertensive encephalopathy
  - (D) Hyperthyroidism
  - (E) Panic disorder

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- (A) Alcohol-induced amnestic episode (blackout)
- (B) Alcohol withdrawal
- (C) Apathetic hyperthyroidism
- (D) Bipolar disorder, depressed
- (E) Delirium because of medical condition
- (F) Dementia, alcohol-related
- (G) Dementia, Alzheimer type
- (H) Generalized anxiety disorder
- (I) Masked depression
- (J) Medication toxicity
- (K) Normal age-associated memory decline
- (L) Normal-pressure hydrocephalus
- (M) Parkinson disease
- (N) Pick disease
- (O) Pseudodementia
- (P) Residual schizophrenia
- (Q) Vascular dementia

For each patient with a memory problem, select the most likely diagnosis.

5. A 29-year-old woman with an 11-year history of bipolar disorder comes to the physician because she is concerned about memory loss during the past 2 weeks. She has had difficulty remembering appointments that she has made, and on one occasion, she got lost going to the health club where she has been a member for years. She has taken lithium carbonate for 8 years, and she has been taking a friend's diuretic for perimenstrual weight gain during the past 3 months. Physical examination shows a resting tremor of both hands and mild ataxia. On mental status examination, she is oriented to person, place, and time, but she recalls only one of three objects after 5 minutes.
6. A 63-year-old man is brought to the physician by his daughter because she is concerned about his memory loss during the past year. Yesterday he could not remember his 18-month-old granddaughter's name. Although he denies that there is any problem, she says he has been forgetful and becomes easily confused. There is no history of alcohol abuse. His temperature is 37°C (98.6°F), pulse is 77/min, respirations are 12/min, and blood pressure is 118/84 mm Hg. On mental status examination, his mood is normal. He is oriented to person and place but initially gives the wrong month, which he is able to correct. He recalls memories from his youth in great detail but only recalls one of three words after 5 minutes. He has difficulty recalling the names of common objects and does not remember the name of the current US president. Physical examination, laboratory studies, and thyroid function tests show no abnormalities.

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7. A 65-year-old man has had increasingly severe headaches and diffuse muscle aches during the past 3 months. He also has a 1-month history of jaw pain when chewing food and decreasing visual acuity in his left eye. His temperature is 38°C (100.4°F). Visual acuity in his left eye is 20/100, and the left optic disc is slightly atrophic. His muscle strength is normal. Which of the following tests should be obtained next?
- (A) Measurement of erythrocyte sedimentation rate
  - (B) Antinuclear antibody assay
  - (C) Examination of cerebrospinal fluid
  - (D) CT scan of the head
  - (E) Electroencephalography
8. A 19-year-old woman comes to the physician because of a 3-month history of intermittent drooping of her left eyelid each evening and occasional difficulty chewing and swallowing. She also has had two episodes of double vision that occurred in the evening and resolved by the following morning. Examination shows no abnormalities except for slight ptosis on the right. Which of the following is the most likely diagnosis?
- (A) Acute intermittent porphyria
  - (B) Brain stem glioma
  - (C) Complex partial seizures
  - (D) Guillain-Barré syndrome
  - (E) Myasthenia gravis
9. A 72-year-old man is brought to the physician by his daughter because of a 2-day history of confusion, disorientation, and lethargy. He has had no weakness. He had a cerebral infarction 1 year ago and has been treated with daily aspirin since then. He is awake but lethargic. His temperature is 38.9°C (102°F), pulse is 82/min, respirations are 16/min, and blood pressure is 144/88 mm Hg. Physical examination shows no other abnormalities. He is disoriented to place and time but recognizes his daughter. Laboratory studies show:

Hemoglobin	11.1 g/dL
Leukocyte count	12,200/mm <sup>3</sup>
Segmented neutrophils	60%
Eosinophils	2%
Lymphocytes	30%
Monocytes	8%
Serum	
Na <sup>+</sup>	130 mEq/L
Cl <sup>-</sup>	92 mEq/L
K <sup>+</sup>	4.1 mEq/L
HCO <sub>3</sub> <sup>-</sup>	21 mEq/L
Urea nitrogen	29 mg/dL
Creatinine	1 mg/dL
Urine	
pH	7
Specific gravity	1.020
WBC	10/hpf
RBC	6/hpf
Bacteria	positive
Nitrates	positive

Which of the following is the most likely diagnosis?

- (A) Delirium
- (B) Dementia, Alzheimer type
- (C) Major depressive disorder
- (D) Parkinson disease
- (E) Vascular dementia

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10. A 21-year-old college student comes to student health services requesting medication to help her sleep. Four days ago, she returned from a 1-year trip to India where she studied comparative religions. Since her return, she has been unable to fall asleep until 4 or 5 AM and has difficulty awakening before noon. She constantly feels tired, has difficulty concentrating, and does not feel ready to begin classes. Her appetite has not decreased, but she has an aversion to eating meat since following a vegetarian diet in India. She has no history of medical or psychiatric illness. She takes no medications and does not drink alcohol. She appears sleepy. She is 173 cm (5 ft 8 in) tall and weighs 54 kg (120 lb); BMI is 18 kg/m<sup>2</sup>. Her pulse is 60/min, and blood pressure is 115/70 mm Hg. She is alert and oriented to person, place, and time. When asked to subtract serial sevens from 100, she begins accurately but then repeatedly loses track of the sequence. Which of the following is the most likely diagnosis?

- (A) Adjustment disorder with depressed mood
- (B) Bipolar disorder
- (C) Circadian rhythm sleep disorder
- (D) Major depressive disorder
- (E) Malingering
- (F) Primary insomnia

11. A 67-year-old woman comes to the physician for a follow-up examination. She had a pulmonary embolism and required treatment in the hospital for 3 weeks. She had a retroperitoneal hemorrhage; anticoagulant therapy was temporarily discontinued, and she underwent placement of an inferior vena cava (IVC) filter. She had a hematoma that was resolving on discharge from the hospital 2 weeks ago. Today, she says she has had a persistent sensation of tingling and numbness of her left thigh that she did not report in the hospital because she thought it would go away; the sensation has improved somewhat during the past week. Her only medication is warfarin. Vital signs are within normal limits. Examination of the skin shows no abnormalities. Muscle strength is normal. Sensation to light touch is decreased over a 5 × 5-cm area on the lateral aspect of the left anterior thigh. Which of the following is the most likely cause of this patient's decreased sensation?

- (A) Cerebral infarction during the hospitalization
- (B) Complication of the IVC filter placement
- (C) Compression of the lateral femoral cutaneous nerve
- (D) Hematoma of the left thigh
- (E) Spinal cord infarct
- (F) Vitamin B<sub>12</sub> (cobalamin) deficiency

12. A 77-year-old woman is admitted to the hospital because of difficulty walking. She has had progressive pain and paresthesia of both feet over the past 3 weeks. She has a history of mild hypertension treated with hydrochlorothiazide and hypothyroidism treated with thyroid replacement therapy. Her pulse is 80/min, respirations are 16/min, and blood pressure is 150/80 mm Hg. Neurologic examination shows decreased ankle jerk reflexes bilaterally and decreased vibratory sense and proprioception in the lower extremities. Laboratory studies show:

Hemoglobin	10 g/dL
Leukocyte count	11,000/mm <sup>3</sup> with a normal differential
Mean corpuscular volume	106 μm <sup>3</sup>
Serum	
K <sup>+</sup>	4.1 mEq/L
Urea nitrogen	8 mg/dL
Creatinine	1.1 mg/dL
Glucose	110 mg/dL

Which of the following is the most likely diagnosis?

- (A) Diabetic neuropathy
- (B) Hypothyroidism
- (C) Pulmonary osteoarthropathy
- (D) Spinal stenosis
- (E) Vitamin B<sub>12</sub> (cobalamin) deficiency

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13. An 82-year-old man is admitted to the hospital because nursing staff in his skilled nursing care facility report that he has appeared sad and depressed during the past 2 months. It is reported that he has a history of psychiatric illness, but details are not provided. He has been taking olanzapine, paroxetine, and haloperidol for 2 years. He does not appear to be in acute distress. He is 160 cm (5 ft 3 in) tall and weighs 48 kg (105 lb); BMI is 19 kg/m<sup>2</sup>. Physical examination shows 2+ cogwheel rigidity of the upper extremities. Neurologic examination shows psychomotor retardation. On mental status examination, he is alert and generally pleasant and cooperative. His affect has little intensity or range. He says he does not feel depressed or anxious. Laboratory findings are within the reference range. Which of the following is the most likely cause of this patient's current symptoms?
- (A) Adjustment disorder
  - (B) Akathisia
  - (C) Dementia, Alzheimer type
  - (D) Drug-induced parkinsonism
  - (E) Major depressive disorder
14. A 25-year-old butcher has had severe episodic pain in his right thumb and right second and third digits for 2 months. The pain frequently awakens him from sleep. He has decreased sensation over the palmar surface of the thumb and index and long fingers of the right hand and atrophy of the thenar muscle mass. Compression of which of the following nerves is the most likely cause?
- (A) Median
  - (B) Musculocutaneous
  - (C) Posterior interosseous
  - (D) Radial
  - (E) Ulnar
15. A 27-year-old woman comes to the physician because of a 3-week history of fatigue and blurred vision. She occasionally has had double vision during this period. For the past year, she has had 3- to 4-day episodes of numbness and tingling of her arms and legs. She has no personal or family history of serious illness. Her only medication is an oral contraceptive. She has smoked one pack of cigarettes daily for 5 years. Vital signs are within normal limits. Funduscopic examination shows no abnormalities. Visual acuity is decreased in the left eye. Sensation to light touch is decreased over the hands and feet; sensation to pinprick is increased over the fingers and toes bilaterally. An MRI of the brain shows several hyperintense oval plaques in the periventricular region on T2-weighted images. Which of the following is the most likely diagnosis?
- (A) Glioma
  - (B) Guillain-Barré syndrome
  - (C) Multiple sclerosis
  - (D) Systemic lupus erythematosus
  - (E) Toxoplasmosis
16. A 57-year-old woman comes to the physician because of a 2-year history of difficulty sleeping. After she gets into bed at night, her legs feel cold and crampy, and she cannot settle into a comfortable position. Walking around temporarily relieves her symptoms. She also has difficulty sitting for a prolonged period of time. She has a mild anxiety disorder but takes no medications. Vital signs are within normal limits. Examination shows no abnormalities. Which of the following is the most likely diagnosis?
- (A) Benign fasciculations
  - (B) Major depressive disorder
  - (C) Parkinson disease
  - (D) REM sleep behavior disorder
  - (E) Restless legs syndrome
  - (F) Stiff-person syndrome

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17. A 77-year-old man comes to the emergency department 1 hour after a 15-minute episode of right arm weakness and an inability to speak in sentences; the symptoms have now resolved. He has a 30-year history of hypertension treated with hydrochlorothiazide. He does not have diabetes mellitus or coronary artery disease. During the past 8 weeks, he has walked 3 miles daily without symptoms. His pulse is 80/min, respirations are 14/min, and blood pressure is 144/88 mm Hg. Examination, including cardiopulmonary and neurologic examinations, shows no other abnormalities. A carotid bruit is heard on the left. An ECG shows a normal sinus rhythm with a ventricular rate of 76/min. Echocardiography shows no abnormalities. Carotid duplex ultrasonography and follow-up MR angiography show an 80% left internal carotid stenosis. Which of the following is the most appropriate next step to prevent cerebral infarction in this patient?
- (A) Prophylactic atorvastatin
  - (B) Prophylactic naproxen
  - (C) Prophylactic warfarin
  - (D) Carotid endarterectomy
  - (E) Extracranial-intracranial bypass surgery
  - (F) Percutaneous coronary intervention
18. A 62-year-old man with alcoholism is admitted to the hospital because of somnolence and hepatic failure. On admission, his serum sodium concentration is 109 mEq/L. Hypertonic saline is administered, and the next day his serum sodium concentration is 138 mEq/L. Three days after admission, he has severe weakness; neurologic examination shows flaccid paresis of both the upper and lower extremities. Which of the following is the most likely cause of this patient's acute neurologic symptoms?
- (A) Alcohol withdrawal
  - (B) Central pontine myelinolysis
  - (C) Hepatic encephalopathy
  - (D) Hepatorenal syndrome
  - (E) Vitamin B<sub>1</sub> (thiamine) deficiency
19. A 32-year-old woman comes to the emergency department 3 hours after the sudden onset of a severe headache. The pain is associated with nausea and vomiting. Medical history is noncontributory. She is drowsy but easy to arouse. Her temperature is 37.1°C (98.8°F), pulse is 92/min, respirations are 10/min, and blood pressure is 130/70 mm Hg. Examination of the head shows no abnormalities. Flexion of the neck produces pain. The optic fundi are normal. Motor and sensory examinations show no abnormalities. Cranial nerves are intact. Deep tendon reflexes are symmetric. Babinski sign is present bilaterally. Which of the following is most likely to confirm the diagnosis?
- (A) X-rays of the sinuses
  - (B) Carotid duplex ultrasonography
  - (C) EEG
  - (D) CT scan of the head
  - (E) Biopsy of the temporal artery

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20. A previously healthy 4-year-old boy is brought to the emergency department 8 hours after the onset of fever and a diffuse, constant headache. He had been well until 2 days ago when he developed malaise. Yesterday, he slept more than usual and had temperatures to 39.2°C (102.5°F). Immunizations are up-to-date. He is lethargic and irritable when aroused. He holds his head extended and cries when his neck is flexed. Muscle strength is normal, and deep tendon reflexes are symmetrically increased. A lumbar puncture yields turbid cerebrospinal fluid. Laboratory studies show:

Serum glucose	120 mg/dL
Cerebrospinal fluid	
Opening pressure	250 mm H <sub>2</sub> O
Glucose	10 mg/dL
Protein	85 mg/dL
Leukocyte count	750/mm <sup>3</sup>
Segmented neutrophils	95%
Lymphocytes	5%
Erythrocyte count	0/mm <sup>3</sup>

A Gram stain of cerebrospinal fluid shows gram-negative diplococci. A CT scan of the head shows no abnormalities. Which of the following is the most likely causal organism?

- (A) Cytomegalovirus
- (B) *Haemophilus influenzae*
- (C) *Neisseria meningitidis*
- (D) *Streptococcus agalactiae* (group B)
- (E) Varicella-zoster virus

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### Answer Form for Clinical Neurology Sample Questions

#### (Questions 1–20)

- |           |           |
|-----------|-----------|
| 1. _____  | 11. _____ |
| 2. _____  | 12. _____ |
| 3. _____  | 13. _____ |
| 4. _____  | 14. _____ |
| 5. _____  | 15. _____ |
| 6. _____  | 16. _____ |
| 7. _____  | 17. _____ |
| 8. _____  | 18. _____ |
| 9. _____  | 19. _____ |
| 10. _____ | 20. _____ |



## **Clinical Neurology Sample Items**

### **Answer Key for Clinical Neurology Sample Questions (Questions 1–20)**

- |     |   |     |   |
|-----|---|-----|---|
| 1.  | C | 11. | C |
| 2.  | E | 12. | E |
| 3.  | B | 13. | D |
| 4.  | C | 14. | A |
| 5.  | J | 15. | C |
| 6.  | G | 16. | E |
| 7.  | A | 17. | D |
| 8.  | E | 18. | B |
| 9.  | A | 19. | D |
| 10. | C | 20. | C |