

Neuro Test

1. A 63-year-old man complains of trouble swallowing and hoarseness. On physical exam, he is noted to have ptosis and a constricted pupil on the left, and a diminished gag reflex. Neurological examination shows decreased pain and temperature sensation on the left side of his face and on the right side of his body. Which of the following vessels is most likely occluded?

- A. Anterior inferior cerebellar artery (AICA)
- B. Anterior spinal artery
- C. Middle cerebral artery (MCA)
- D. Posterior cerebral artery (PCA)
- E. Posterior inferior cerebellar artery (PICA)

2. A 3-year-old child is brought to the emergency room by her concerned parents. They state the girl has been complaining of a severe headache and has had two episodes of vomiting. On physical examination, there is bilateral papilledema and an impaired level of consciousness. Emergency contrast CT scan demonstrates displacement of the ventricular system by a multilobular "mass" with well-defined white high-attenuation rings around black low-attenuation centers. The lesion involves the cerebellum. To which of the following conditions is this lesion most likely related?

- A. Bacteremia following tooth extraction
- B. Bacterial meningitis
- C. Lung abscess
- D. Otitis media
- E. Sinusitis

3. An 80-year-old woman dies after a long history of progressive memory loss, apraxia, and recurrent episodes of confusion. In the last months of life she was bedridden and unable to recognize familiar faces and objects. The pathologist identifies numerous flame-shaped intracytoplasmic inclusions in neurons of the neocortex and hippocampus. These consist of paired helical filaments (PHFs) on electron microscopy. Which of the following biochemical changes most likely accounts for the development of PHFs in this condition?

- A. Abnormal degradation of amyloid precursor protein (APP)
- B. Abnormal phosphorylation of tau
- C. Accumulation of advanced glycosylation end (AGE) products
- D. Increased expression of APP
- E. Precipitation of insoluble α -tubuli

4. A 54-year-old white male presents with gradual onset of mild dementia, ataxic gait, and startle myoclonus. An MRI scan is normal, and an examination of his cerebrospinal fluid reveals no abnormalities, but the patient's EEG is remarkable for recurrent bursts of high-voltage slow waves. Over the next 6 months, the patient's dementia rapidly worsens, accompanied by general hypertonicity and profound dysarthria. The patient dies shortly thereafter. Which of the following is the mostly likely neuropathological finding on autopsy?

- A. Cerebellar hyperplasia
- B. Diffuse spongiform change
- C. Multiple lacunar infarcts
- D. Negri bodies
- E. Neurofibrillary tangles

5. In which of the following neurodegenerative conditions would you expect to observe the phenomenon known as anticipation?

- A. Familial Alzheimer disease (FAD)
- B. Familial amyotrophic lateral sclerosis (ALS)
- C. Huntington disease
- D. Pick disease
- E. Progressive supranuclear palsy

6. A 37-year-old woman is in a serious automobile accident and sustains a closed head injury. She does not immediately seek medical attention, but is brought to the emergency room two hours later by her brother. On physical examination, there is mydriasis and loss of the pupillary light reflex. Several hours later, she is unable to follow a flashlight with her eyes. Which of the following types of herniation is most likely occurring in this patient?

- A. Cerebellar tonsils into the foramen magnum
- B. Cerebellum upward past the tentorium
- C. Cingulate gyrus under the falx
- D. Medulla into the foramen magnum
- E. Temporal lobe under the tentorium

7. A 10-year-old boy with history of epilepsy and mental retardation is brought to a specialty clinic for evaluation. Physical examination is remarkable for several ovoid hypopigmented areas on the trunk and large numbers of red and yellow papules on the face, particularly near the mouth. Biopsy of the papules demonstrates angiofibromata. This patient is most likely to have which of the following central nervous system pathologies?

- A. Acoustic neuromas
- B. Capillary hemangioblastomas
- C. Herniation of cerebellar tonsils into foramen magnum
- D. Large cortical hamartomas
- E. Leptomeningeal angiomas

8. A 25-year-old man presents with bilateral hearing loss. MRI reveals bilateral tumors within the cerebellopontine angles. Surgery is performed, and the tumors are removed. Both are found to be neurilemmomas ("schwannoma"). Which of the following is the most likely diagnosis?

- A. Metastatic disease
- B. Multiple sclerosis
- C. Neurofibromatosis type 1
- D. Neurofibromatosis type 2
- E. Tuberous sclerosis

9. Which of the following is the most frequent primary malignant tumor of the CNS?

- A. Glioblastoma multiforme
- B. Medulloblastoma
- C. Meningioma
- D. Oligodendroglioma
- E. Pituitary adenoma

10. A child develops a tumor of the cerebellum. Biopsy reveals evidence of both neuronal and glial differentiation. Which of the following is the most likely diagnosis?

- A. Astrocytoma
- B. Glioblastoma multiforme
- C. Medulloblastoma
- D. Meningioma
- E. Oligodendroglioma

11. Which of the following nuclei undergo transsynaptic degeneration as a consequence of primary degeneration affecting dorsal root ganglia in Friedreich ataxia?

- A. Cerebellar dentate nucleus
- B. Contralateral gracile and cuneate nuclei
- C. Ipsilateral gracile and cuneate nuclei
- D. Pontine nuclei
- E. Vestibular nuclei

12. An adult patient presents with persistent headaches. A CT scan of the head demonstrates a 2-cm spherical mass at the junction of the white and gray matter of the lateral aspect of the cerebral hemisphere. Which of the following would most likely produce this lesion?

- A. Astrocytoma
- B. Ependymoma

- C. Glioblastoma multiforme
- E. Metastatic carcinoma

D. Meningioma

13. Which of the following regarding dementia is true:

- A. To make the accurate diagnosis of dementia memory impairment is not enough, impairment in every day activities is also required.
- B. Patients with Alzheimer's disease often have problems with balance and abnormal gait.
- C. Neuronal loss is not observed in Alzheimer disease
- D. Finding Lewy bodies is often diagnostic postmortem for Alzheimer's disease
- E. Progressive Supranuclear palsy is often associated with symptoms of visual hallucinations

14. A 34-year-old man with AIDS suddenly falls to the floor and has a tonic-clonic seizure. His concerned friends call paramedics, who take him to the hospital. On arrival at the hospital he is conscious, but confused. Physical examination is remarkable for cachexia and oral thrush. Neurological examination reveals isolated weakness of lateral gaze on the right. MRI reveals multicentric mass lesions in the brain and meninges. One of the masses is biopsied and appropriate immunohistochemical stains are performed. From which of the following cell types did the masses most likely derive?

- A. Astrocyte
- B. B lymphocyte
- C. Ependymal cell
- D. Melanocyte
- E. Oligodendrocyte

15. Which of the following nuclei play a central role in auditory reflexes and descending efferent pathways?

- A. Superior Olivary Nucleus
- B. Inferior Olivary Nucleus
- C. Cochlear Nucleus
- D. Inferior Colliculus

16. A 63-year-old man has taken an antidepressant for the past 3 months. He is on no other medications and is generally in good health. After attending a graduation party for his son at which he consumes wine, bread, and cheese, he is rushed to the emergency room with tachycardia, headache, and a blood pressure of 200/100 mm Hg. Which antidepressant is he most likely taking?

- A. Fluoxetine
- B. Imipramine
- C. Phenelzine
- D. Trazodone
- E. Venlafaxine

17. Which of the following statements regarding the nasal anatomy is false?

- A. Obstruction of the ostiomeatal complex results in congestion of the Anterior ethmoid, frontal and maxillary sinuses.
- B. The most common site of bleeding is from Kesselbach's plexus
- C. The primary form of treating allergic rhinitis is Avoidance
- D. Triad asthma (which includes the symptoms of aspirin sensitivity, asthma, and polyps) should lead to a suspicion of cystic fibrosis.
- E. All of the above statements are true.

18. Wegener's disease is associated with which of the following nasal conditions?

- A. Saddle Nose Deformity
- B. Septal perforation
- C. Allergic Rhinitis
- D. Cystic Fibrosis
- E. A and B

- F. A and D
- G. B and D
- H. B and C

19. A 52-year-old female complains of sudden visual abnormalities. Her history reveals a 30 pack-year history of smoking, hypertension, and hypercholesterolemia. A head CT shows a lesion in the right occipital lobe and an angiogram reveals an embolic stroke of the right posterior cerebral artery. What type of visual deficit is she most likely experiencing?

- A. Bitemporal hemianopia
- B. Central scotoma
- C. Left homonymous hemianopia
- D. Left superior quadrantanopia
- E. Right homonymous hemianopia
- F. Right superior quadrantanopia
- G. Total left eye blindness
- H. Total right eye blindness

20. A 38-year-old woman with multiple sclerosis (MS) has stable neurologic deficits resulting from old demyelinated plaques. Which of the following histopathologic features would be prominent in this patient's old plaques?

- A. Complete loss of axons
- B. Gliosis
- C. Histiocytic infiltration
- D. Lymphocytic infiltration
- E. Myelin breakdown

21. A patient with long term severe hypertension develops progressive dementia. CT scan of the head demonstrates a diffuse loss of deep hemispheric white matter. Which of the following terms best describes the pathological process that is occurring?

- A. Anemic infarcts
- B. Hemorrhagic infarcts
- C. Hypertensive encephalopathy
- D. Lacunae
- E. Subcortical leukoencephalopathy

22. A 40-year-old man with adult polycystic kidney disease is brought to the emergency room in a coma. CT scan of the head demonstrates a subarachnoid hemorrhage without parenchymal hemorrhage. Which of the following is the most likely source of the bleeding?

- | | |
|------------------------------|----------------------------|
| A. AV malformation | D. Circle of Willis |
| B. Bridging veins | E. Middle meningeal artery |
| C. Charcot-Bouchard aneurysm | |

23. During a boxing match, a contestant is "knocked out" by a blow to the lateral skull. He recovers after a few minutes, and is asymptomatic for the next 12 hours. He then develops a severe headache, changes in mental status, nausea, and vomiting. Which of the following is the most likely diagnosis?

- | | |
|-----------------------------|----------------------------|
| A. Basilar skull fracture | D. Subarachnoid hemorrhage |
| B. Epidural hemorrhage | E. Subdural hematoma |
| C. Intracerebral hemorrhage | |

24. A 60-year-old man presents to a physician because of difficulty in reading and coming down stairs, which he attributes to an inability to "look down." Physical examination reveals that the patient looks around by moving his head rather than his eyes and also shows a distinctive axial rigidity of neck, trunk, and proximal limb muscles. He shows poverty of movement and dysarthric speech. Mentally, the patient responds very slowly but has better memory and intellect than are initially apparent. Which of the following pathologic findings of the brain would most likely be present?

- A. Depigmentation of the substantia nigra and locus ceruleus
- B. Diffuse cortical atrophy with relative sparing of primary motor and sensory areas
- C. Selective frontal and temporal lobe atrophy
- D. Striking degeneration of the caudate nucleus
- E. Widespread neuronal loss and gliosis in subcortical sites

25. A neurological examination of a 47-year-old woman reveals a normal corneal reflex in her right eye, but no consensual corneal reflex in her left eye. Which of the following additional findings might be expected?
- Absence of pupillary light reflex of the left eye
 - Hyperacusis of the left ear
 - Inability to abduct the right eye
 - Loss of pain and temperature of the left face
 - Loss of taste from the anterior two-thirds of the right tongue
 - Ptosis of the left eye
26. A 64-year-old man begins to show behavioral changes and irritability, and is found wandering in the park near his home. On neurological examination, there is evidence of mild aphasia and cognitive dysfunction, but motor function is preserved. CT scan of the head demonstrates selective atrophy of the cortex of the frontal lobes. Which of the following is the most likely diagnosis?
- Alzheimer's disease
 - Friedreich's ataxia
 - Huntington's disease
 - Parkinson's disease
 - Pick's disease
27. Careful testing of the visual fields in a patient complaining of difficulty reading demonstrates a central scotoma involving one visual field. This defect is most likely due to a lesion involving which of the following structures?
- Macula
 - Optic chiasm
 - Optic radiations in the parietal lobe
 - Optic radiations in the temporal lobe
 - Optic tract
28. In the evaluation of a 73 year old man who complains of frequent confusion and disorientation. His neighbor has noticed that he no longer is keep up his garden and is concerned about his frequent wandering in the neighborhood. She also noticed that he often looks disheveled, which is particularly abnormal for him. All of the following lab exams would be relevant in the assessment for dementia except:
- Blood sample for CBC, glucose, electrolytes and LFT's.
 - Imaging studies such as CT and MRI
 - Urinanalysis
 - Presenilin (sequencing)
 - All are appropriate
29. A 76-year-old female presents with complaints of difficulty reading. Ophthalmologic examination is remarkable for bilateral, white opacifications in her eyes, consistent with cataract formation. In which of the following structures are the opacifications located?
- | | |
|------------------|----------------|
| A. Aqueous humor | D. Optic nerve |
| B. Cornea | E. Retina |
| C. Lens | |
30. A middle-aged woman comes to her physician's office with complaints of visual difficulties. A review of systems and physical examination are unremarkable except for her eye exam. When a light is shined in her right eye, there is no pupillary response in either eye. However, upon shining a light in her left eye, both ipsilateral and contralateral pupillary responses are apparent. Her extraocular movements are intact. What is the most likely location of her lesion?
- Oculomotor nerve, left side
 - Oculomotor nerve, right side
 - Optic nerve, left side
 - Optic nerve, right side
 - Trochlear nerve, left side
 - Trochlear nerve, right side

31. In attempting to introduce a catheter into the right internal jugular vein, a resident inadvertently damages the cervical sympathetic trunk in a patient. Which of the following findings is most likely to be seen in this patient as a result of the injury?
- Constriction of the right pupil
 - Dilation of the right pupil
 - Inability to abduct the right eye
 - Inability to close the right eye
 - Paralysis of the platysma muscle on the right side
32. During a follow-up visit to her psychiatrist, a 17-year-old female admits that she is contemplating suicide. She has been morbidly depressed for the past 2 months; she denies drug abuse or excessive drinking. After a complete evaluation, her physician prescribes imipramine. This drug acts by
- increasing dopamine release
 - inhibiting monoamine oxidase
 - inhibiting the reuptake of serotonin and norepinephrine
 - potentiating GABA
 - selectively inhibiting the reuptake of serotonin
33. If an Acoustic Reflex Test was being performed on the right ear of a normal man with a loud sound we would expect a tympanogram from the right ear to have a:
- Higher than normal compliance peak
 - Lower than normal compliance peak
 - A shift in the compliance peak to the left
 - A shift in the compliance peak to the right
 - no change
34. Which of the following statements are true regarding hearing aids:
- Amplified sound does not have the same fidelity
 - completely in the canal hearing aids are reserved only for patients with severe hearing problems
 - Bond conduction aids are useful for people with conductive hearing loss
 - All of the above are true
 - None of the above are true
35. You have a patient who was diagnosed with a large pituitary tumor. Which of the following visual fields most likely would be affected?
- Right nasal field and left temporal field
 - Left nasal field and right temporal field
 - Right nasal field and left nasal field
 - Right temporal field and left temporal field
 - Right nasal and right temporal field
36. An elderly patient dies with chronic dementia. At autopsy, the brain shows diffuse cortical atrophy with relative sparing of primary motor and sensory areas. Which of the following would most likely be a prominent feature on microscopic examination of her brain tissue?
- Central chromatolysis
 - Lewy bodies
 - Gliosis of the caudate nucleus
 - Loss of pigmented neurons
 - Neurofibrillary tangles
37. In the patient above (Q. 36) which types of cells are most likely affected?
- GABAnergic neurons
 - Cholinergic neurons
 - Dopaminergic neurons
 - Glutamatergic neurons
 - Glial cells

38. A 6-year-old girl manifests acute vomiting and nuchal rigidity. MRI reveals a tumor in the posterior fossa consisting of a large cyst with a nodular mass attached to its wall (cyst with "mural nodule"). Histologic examination shows elongated astrocytes with long bipolar processes and numerous Rosenthal fibers. Which of the following is the most likely diagnosis?

- A. Astrocytoma, WHO grade II
- B. Ependymoma
- C. Glioblastoma multiforme
- D. Medulloblastoma
- E. Pilocytic astrocytoma

39. A 35-year-old man is referred to a psychiatrist because of erratic behavior. The man had been adopted in infancy, so his family history is not known. Over the next year, he develops uncontrollable erratic movements, such that attempts to pick up a cup or use a pencil produce sudden uncontrolled lurches. When he tries to walk, he staggers, thrusts, and abruptly changes direction. Eventually, with disease progression, he develops increasing rigidity and is unable to move, and finally dies ten years after the onset of symptoms. Which of the following changes would most likely be seen on examination of his brain at autopsy?

- A. Depigmentation of the substantia nigra and locus ceruleus
- B. Diffuse cortical atrophy with relative sparing of primary motor and sensory areas
- C. Selective frontal and temporal lobe atrophy
- D. Striking degeneration of the caudate nucleus
- E. Widespread neuronal loss and gliosis in subcortical sites

40. All of the following appear to play a role in depression except:

- A. Puberty
- B. Oral Contraception
- C. Pre menstrual
- D. Time Zone changes
- E. Menopause

41. Which of the following drug is most appropriate for treating a unipolar patient?

- A. Fluoxetine
- B. Lithium
- C. Oxazepam
- D. Clozapine
- E. Midazolam

42. Which of the following statements are true regarding the tensor tympani and stapedius muscles?

- A. They are similar in that they are both innervated by the facial nerve
- B. They are similar in that they are both innervated by the trigeminal nerve
- C. They are different in that the stapedius muscle is innervated by the CN. V and tensor tympani is innervated by CN. VII
- D. They are similar in that they both act to dampen sound. They both act in opposition of each other; the stapedius dampens sound and tensor tympani amplifies sound

43. A 48-year-old male is brought to the psychiatric emergency room after an attempted suicide. He claims to hear voices telling him to kill himself. The patient's family notes that he has been on several different kinds of antipsychotic medications, with no improvement of his symptoms. The attending psychiatrist places the patient on a new medication, and admits him. One week after therapy has begun, a routine blood test reveals profound depletion of polymorphonuclear leukocytes. Which of the following drugs is most likely responsible for these symptoms?

- A. Chlorpromazine
- B. Clozapine
- C. Fluoxetine
- D. Haloperidol
- E. Imipramine
- F. Phenelzine

Answers

1	e
2	d
3	b
4	b
5	c
6	e
7	d
8	d
9	a
10	c
11	c
12	e
13	a
14	b
15	a
16	c
17	e
18	e
19	c
20	b
21	e
22	d
23	e
24	e
25	b
26	e
27	a
28	d
29	c
30	d
31	a
32	c
33	b
34	a
35	d
36	e
37	b
38	e
39	d
40	e
41	a
42	d
43	b

7. The correct answer is D. The disease is tuberous sclerosis. The facial angiofibromata are also called adenoma sebaceum, and the hypopigmented patches on the trunk are called ash-leaf spots. This disease is one of the neurocutaneous disorders called phacomatoses. Tuberous sclerosis is inherited as an autosomal recessive trait, and epilepsy and mental retardation are commonly seen in this disorder. Large, firm, white hamartomatous nodules (tubers) are seen in the cortex and in subependymal sites. The tubers consist of aberrantly arranged neurons and/or glia. Patients may also have pancreatic cysts, renal angiomyolipomas, and cardiac rhabdomyomas. Rarely, an astrocytoma will arise in a tuber.

24. The correct answer is E. The disease is progressive supranuclear palsy, a degenerative disorder characterized by ophthalmoplegia, pseudobulbar palsy, axial dystonia, and bradykinesia. The presentation described in the question is typical. The pathologic changes consist of widespread neuronal loss and gliosis in subcortical sites with sparing of the cerebral and cerebellar cortices.

26. The correct answer is E. Pick's disease is a condition that is clinically similar to Alzheimer's disease. It differs from Alzheimer's disease in that the pronounced brain atrophy characteristically involves the frontal and temporal lobes, with sparing of the posterior aspects of the cortex. Microscopically, the affected cortex contains characteristic ballooned neurons (Pick cells) or cytoplasmic inclusions (Pick bodies). Clinically, there is a slowly progressive dementia with language disturbances and behavioral changes that may eventually lead to mutism. The progressive nature of the dementing process has been termed a "descent into a sea of mindlessness."