

PRACTICE EXAM QUESTIONS

1. A patient presents with muscle weakness. To assess his condition, you test his knee-jerk reflex by tapping his patella tendon with your hammer. Next you examine the jaw-jerk reflex by tapping his lower jaw with your finger. The pathways that mediate these two reflexes are similar in that **both** involve:
 - A. dorsal root ganglia
 - B. a 2-neuron, sensory to motor pathway
 - C. pathways to the cortex through ventral posterior lateral nuclei
 - D. cell bodies of sensory neurons in peripheral ganglia
 - E. nuclei in the brainstem
2. While I was cooking a few days ago, I reached into the oven and the top of my hand touched the heating element. My hand immediately withdrew, but the contact caused a burn on the top of my finger. The next day my finger was red and swollen and when I washed my hands in slightly warm water (30°C), the area around my burned finger became painful. Which of the following molecules contributed to the redness, swelling, and pain?
 - A. glutamate
 - B. substance P
 - C. enkephalin
 - D. norepinephrine
 - E. acetylcholine
3. A 45 year old man with an 8 year history of HIV sees his physician because he has had difficulty at his job as an accountant. He tells his physician that he was always good with math, but now he finds calculation difficult, he has trouble reasoning and he gets confused easily if there is more than one event occurring. His physician should schedule:
 - A. an MRI
 - B. a CT
 - C. an X ray
 - D. a lumbar puncture
 - E.
4. A 14 year-old girl with recent onset of headaches, nausea, and cognitive difficulties is diagnosed with communicating hydrocephalus. The most likely location to cause this condition is:
 - A. interventricular foramina
 - B. cerebral aqueduct
 - C. foramen of Magendie
 - D. foramina of Luschka
 - E. arachnoid granulations

5. An infant was born with a severe defect in which the top of its skull had not formed and its brain had largely failed to develop. This defect most likely began during which of the following periods:
- A. week 1 of development
 - B. 3-4 weeks of development
 - C. 6-8 weeks of development
 - D. 3-4 months of development
 - E. 6 months of development
6. A 29 year-old obese woman sees her physician because of a recent increase in headaches. On questioning she indicates that she has no history of headaches. An exam indicates papilledema, but a CT and MRI show no abnormalities. A likely reason for this woman's symptoms is:
- A. subdural hemorrhage
 - B. meningitis
 - C. subarachnoid hemorrhage
 - D. idiopathic intracranial hypertension
 - E. hydrocephalus
7. A 23 year-old woman is found comatose in her hotel room with an empty syringe next to her. Her respiration is slow and shallow and her pupils are meiotic. Which of the following drugs could she **NOT** have taken:
- A. morphine
 - B. fentanyl
 - C. meperidine
 - D. methadone
 - E. buprenorphine
8. Which of the following choices characterizes the ionic changes in an axon that produce the action potential:
- A. influx of sodium and outflux of potassium
 - B. influx of calcium and outflux of sodium
 - C. influx of potassium and outflux of sodium
 - D. influx of calcium and outflux of sodium
 - E. influx of both sodium and potassium
9. In an experiment in lab, you stimulate an axon once and then measure the size of the postsynaptic potential. You repeat the experiment, but this time you stimulate the axon at high frequency. When you measure the postsynaptic potential again, you find it is significantly larger in amplitude for many hours. The increased amplitude of the postsynaptic potential is due to
- A. an increased number of NMDA receptors
 - B. an increased number of AMPA receptors
 - C. a decreased number of NMDA receptors
 - D. a decrease in sodium channel inactivation
 - E. a decrease in potassium channel activation

10. A 28 year-old man was shot in the back outside a bar during an argument. He was rushed to the ED where an exam revealed that he had no pin prick sensation in his left lower extremity. Vibratory sensation was intact on his body and limbs. The most likely location of a lesion causing these symptoms is:
- T6
 - T8
 - T12
 - L2
 - L4
11. A 34 year-old woman gives birth to a baby boy whose head is noticeably enlarged. An MRI indicates incomplete formation of the foramina of Magendie and Luschka. An early developmental defect that might have resulted in malformation of these structures would have involved the:
- diencephalon
 - mesencephalon
 - telencephalon
 - rhombencephalon
 - prosencephalon
12. A 30 year old woman who has been taking pain medication on the same prescription for several months complains to her doctor that her pain seems worse than it has been in the past. After examining the woman, her physician finds no change in the woman's physical condition. The woman's increased pain is an example of drug:
- adverse effects
 - withdrawal
 - tolerance
 - dependence
 - interaction
13. A patient comes to you because she has difficulty seeing. You suspect a problem with her visual system. You would like to perform a noninvasive procedure to test its function, so you schedule her for an electroretinogram. This tests relies on which of the following properties:
- probability of Na^+ channel activation
 - synchronized activity of many neurons
 - efficiency of K^+ channel activation
 - conduction velocity
 - action potential amplitude
14. The condition shown in the figure (myelin stain) involves similar sensory deficits to which of the syndromes below?
- tabes dorsalis
 - syringomyelia
 - Brown-Sequard
 - thalamic pain syndrome
 - Horner's syndrome



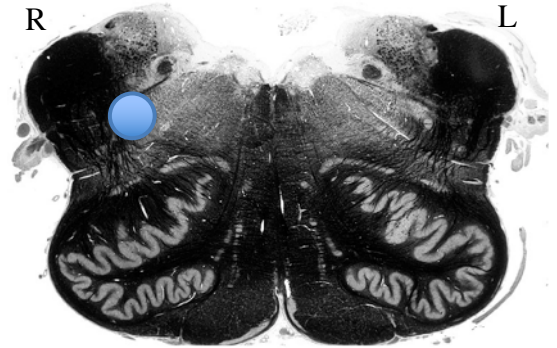
15. A small infarct in a 65 year-old woman destroyed the ventral posterior thalamic nucleus on the right side. Which of the following would describe all of her deficits:
- A. loss of tactile and pain sense on the LT side of the face
 - B. loss of tactile and pain sensation on the LT side of the body
 - C. loss of tactile sensation on the body and face on the LT
 - D. loss of tactile and pain sensation on the body and face on the LT
 - E. loss of tactile and pain sensation on the body on the LT and face on the RT
16. A 39 year-old woman with a predominantly occipital headache and neck stiffness was brought to the ED by her friend. She was worked up for possible meningitis, which was negative. Two days after she returned home, she called her physician to complain of a persistent headache, which worsened when she stood up, but subsided when she reclined. The most likely reason for the headache is:
- A. migraine
 - B. idiopathic intracranial hypertension
 - C. leakage of CSF
 - D. subarachnoid hemorrhage
 - E. subdural hemorrhage
17. A 60 year-old woman experiences sharp, shooting pain in her left oral cavity. The attacks are precipitated by brushing her teeth and cold fluids in her mouth. Between attacks she has no symptoms. The most likely treatment for this condition would be:
- A. Tylenol with codeine
 - B. carbamazepine
 - C. triptans
 - D. oxycodone
 - E. SSRI
18. A 70 year-old woman admitted to the ED is sent for imaging and her scan is shown in the figure. Based on the image, this woman has:
- A. right sided edema
 - B. communicating hydrocephalus
 - C. uncal herniation
 - D. epidural hemorrhage
 - E. hydrocephalus ex vacuo



19. A 14-year old boy suffered a blow to the temporal region that unknowingly fractured his skull while he was riding his skateboard. He arrived at home, but shortly thereafter became unconscious and died while he was being transported to the ED. The death most likely would have resulted from:
- A. communicating hydrocephalus
 - B. epidural hematoma
 - C. subdural hematoma
 - D. subarachnoid hemorrhage
 - E. non-communicating hydrocephalus
20. A wife was brought to the ED by her husband after she complained about numbness on her face. A neurological exam showed loss of pain and temperature sensation on the RIGHT face and the LEFT body. A lesion causing these symptoms would be located in:
- A. right postcentral gyrus
 - B. medial part of the rostral medulla on the right
 - C. lateral part of the rostral medulla on the right
 - D. right trigeminothalamic tract
 - E. lateral part of the rostral pons on the left
21. A man fell off a ladder while working on his house and was rushed to the ED. An MRI showed damage at the level of T12 on the LEFT side in the anterolateral quadrant of his spinal cord. This injury would result in a loss of some sensation:
- A. from the entire leg on the right side
 - B. from the entire leg on the left side
 - C. from the knee down on the right side
 - D. from the umbilicus down on the right side
 - E. from the umbilicus down on the left side
22. A radiologist discussed a case with you in which a patient had a stroke involving the brainstem. The imaging showed a lesion area including the ventral trigeminothalamic tract at the level of the midbrain on one side. What symptoms would this patient show?
- A. loss of only pain and temperature sensation on the ipsilateral face
 - B. loss of pain, temperature, and touch sensation on the ipsilateral face
 - C. loss of pain, temperature, and touch sensation on the contralateral face
 - D. paralysis of jaw muscles on the contralateral side
 - E. loss of only touch sensation on the contralateral face
23. A patient displayed loss of pain, temperature and tactile sensation all on the left side of the body. These symptoms could be caused by a unilateral lesion in all of the following locations **EXCEPT**:
- A. spinal cord
 - B. medulla
 - C. pons
 - D. midbrain
 - E. internal capsule

24. A patient who has loss of pin prick sensation starting at the level of the nipple and downward on the right side would have a lesion in the spinal cord at which level:
- A. C7-C8
 - B. T2-T3
 - C. T4-T5
 - D. T6-T7
 - E. T9-T10

25. Damage to the area indicated in the figure, would result in :
- A. loss of pain and temperature sensation on the ipsilateral face
 - B. loss of pain and temperature sensation on the contralateral face
 - C. loss of pain, temperature, and touch sensation on the contralateral face
 - D. loss of only touch sensation on the ipsilateral face
 - E. loss of pain sensation on the contralateral body



26. A patient displays a symmetrical loss of pain and temperature on the shoulder area on both sides of the body with no loss of tactile sensation. Pain and temperature and tactile sensation are normal over the rest of the body. This condition would be due mostly likely to:
- A. syringomyelia
 - B. Brown-Sequard syndrome
 - C. vitamin B12 deficiency
 - D. Arnold Chiari syndrome
 - E. tabes dorsalis

27. A patient shows a loss of tactile sensation on the right starting at the lateral aspect of the thigh and continuing over the rest of the lower right limb. There is also a loss of pain and temperature on the left from the medial aspect of the leg and below on the left. This would be caused by a lesion of the spinal cord:
- A. on the left at T12
 - B. on the left at L2
 - C. on the right at T12
 - D. on the right at L2
 - E. on the right at L4

28. As you examine a patient in the ED, you find she has loss of pain, temperature, and touch sensation on the right side of the face. Sensation on the rest of the body and face are normal. These symptoms could be caused by a lesion of the:
- A. left spinal trigeminal nucleus
 - B. right spinal trigeminal nucleus
 - C. right chief sensory nucleus of V
 - D. ventral trigeminothalamic tract on the right
 - E. ventral trigeminothalamic tract on the left

29. In a patient you are evaluating, you find an early-stage tumor growing near the anterolateral surface of the cervical spinal cord. The tumor is irritating nerve fibers adjacent to it and stimulating them. Considering the pathway affected by this tumor and its somatotopic distribution, which symptom would the patient experience:
- A. tingling sensation on one side of the body
 - B. pain in the shoulders on one side
 - C. loss of position sense in the leg on one side
 - D. pain in the back of the leg on one side
 - E. suspended, bilateral loss of pain sensation in the lower body
30. A patient has been diagnosed with a brainstem tumor involving cranial nerve VII on the right side. Which response would you expect when the right cornea is touched with a cotton applicator:
- A. no eyes blink
 - B. right eye blinks
 - C. left eye blinks
 - D. both eyes blink
31. A patient was referred to you by another physician who was unable to diagnosis the patient's disorder. When you test the patient in your office, you find that the patient cannot localize the source of a pin prick stimulus, but he can still feel the pin prick and reports it as feeling dull. This patient most likely has a lesion in:
- A. ALS
 - B. substantia gelatinosa
 - C. cingulate gyrus
 - D. medial lemniscus
 - E. postcentral gyrus
32. A patient who has lost pain and temperature sensation from the level of the right little finger and the rest of the body below on the right side would most likely be caused by a lesion of the:
- A. left ALS at C6
 - B. left ALS at T2
 - C. right ALS at C6
 - D. right ALS at C8
 - E. anterior white commissure at C8
33. A patient shows loss of tactile sensation on the right side of the face, but pin prick sensation for the face and body are normal as well as tactile sensation for the body. This patient most likely has a lesion in the:
- A. spinal cord at C1
 - B. medulla
 - C. pons
 - D. midbrain
 - E. cortex

34. A man was shot in a hunting accident. In the ED it was determined that the bullet hit the ALS at the level of T2 on the right side. This lesion would cause:
- A. loss of pain and temp at the level of C8 on the left
 - B. loss of pain and temp at the level of T4 on the left
 - C. loss of pain and temp at the level of C8 on the right
 - D. loss of tactile sensation at the level of T2 on the right
 - E. loss of tactile sensation at the level of T2 on the left
35. You are involved in testing a new environmental pollutant found to be a neurotoxin. After injecting the agent into the brain, you discover that the levels of tyrosine hydroxylase decrease dramatically. Which of the following neurons would be impaired by this neurotoxin?
- A. dopaminergic and noradrenergic
 - B. GABAminergic and glutaminergic
 - C. serotonergic and dopaminergic
 - D. serotonergic and glutaminergic
 - E. serotonergic and GABAminergic
36. A 50 year-old man who comes to your office tends to slap his feet down on the floor as he walks toward you. On examination you find that he cannot tell the position of his legs when you move them passively and that there is decreased tactile and vibratory sensation in both lower limbs. Sensation to pin prick is normal. The most likely reason for these symptoms is:
- A. Syringomyelia
 - B. Brown-Sequard Syndrome
 - C. Tic Douloureux
 - D. Tabes Dorsalis
 - E. Myasthenia Gravis
37. Which of the following patients most likely has cluster headaches?
- A. 24 year old female with a 10 year history of unilateral throbbing headaches with associated nausea and vomiting. The patient has headaches every month right before her menstrual period
 - B. 47 year old female with bilateral non-throbbing headaches that begin around noon every day and peak in the late afternoon
 - C. 60 year old male who gets flurries of brief "electric shock" pains in his right lower face triggered by chewing
 - D. 30 year old female with headaches lasting 2-4 days after receiving epidural anesthesia for the delivery of each of her four children
 - E. 25 year old male with a two month history of severe non-throbbing left fronto-orbital headaches which last 30-40 minutes and awaken him from sleep in the early morning on a nearly daily basis. He had similar headaches for 10 weeks, 3 years ago.

38. A 45 year old female gives a history of intermittent unilateral throbbing headaches with associated nausea and photophobia since age 20. She is currently having headaches 2-3 times a week lasting 4-8 hours. She has a history of hypertension. The most appropriate medication for treatment of her acute symptoms when they occur is:

- A. beta blocker
- B. anticonvulsant
- C. NSAID
- D. tricyclic antidepressant
- E. ACE inhibitor

1. B	10. C	19. B	28. E	37. E
	11. D		29. D	38. C
2. B	12. C	20. C	30. C	
3. A	13. B	21. A	31. E	
4. E	14. A	22. C	32. A	
5. B	15. D	23. A	33. C	
6. D	16. C	24. B		
7. E	17. B	25. A	34. B	
8. A	18. A	26. A	35. A	
9. B		27. D	36. D	