

Name _____KEY_____

Lab Section _____

**Nsci 2100: Human Neuroanatomy
2017 Examination 3**

On this page, write your name and lab section.

On your bubble answer sheet, enter your name (last name, space, first name), internet ID (X.500 name) and student number. Please do it now!!!

Lecture 23 motor system

1. A motor unit is ...
 - A. all the motor neurons that synapse with a muscle.
 - B. all the motor neurons that synapse with a myofiber.
 - C. all the myofibers in a muscle.
 - D. all the myofibers with which one motor neuron synapses.
 - E. all the muscles with which one motor neuron synapses.

2. Neurons in which of the following do NOT typically synapse with a motor neuron?
 - A. dorsal root ganglion
 - B. frontal cortex
 - C. superior colliculus
 - D. deep cerebellar nuclei
 - E. None of the above are correct. Neurons in all synapse with motor neurons.

3. The majority of axons from primary motor cortex that synapse with spinal motor neurons run in which tract within the spinal cord?
 - A. lateral corticospinal tract
 - B. ventral corticospinal tract
 - C. dorsal corticospinal tract
 - D. medial corticospinal tract
 - E. None of the above is the correct name for this tract.

4. 80-90% of the corticospinal axons cross the midline in the ...
 - A. diencephalon.
 - B. midbrain.
 - C. spinal cord.
 - D. pons.
 - E. medulla.

Lecture 24 basal ganglia

5. Which of the following is NOT considered part of the basal ganglia?
 - A. substantia nigra
 - B. subthalamic nucleus
 - C. globus pallidus
 - D. nucleus accumbens
 - E. None of the above are correct. All are parts of the basal ganglia.

6. Which of the following axon tracts run through the striatum?
- A. internal capsule
 - B. dorsal columns
 - C. spinocerebellar tract
 - D. medial lemniscus
 - E. More than one of the above are correct.
7. Which of the following nuclei borders the lateral wall of the lateral ventricles?
- A. globus pallidus
 - B. putamen
 - C. caudate nucleus
 - D. subthalamic nucleus
 - E. lateral posterior nucleus
8. A major input to the striatum that uses glutamate as the neurotransmitter is from the ...
- A. substantia nigra.
 - B. subthalamic nucleus.
 - C. red nucleus.
 - D. cerebral cortex.
 - E. anterior nucleus of the thalamus.
9. Degeneration of neurons in which of the following results in Parkinson's disease?
- A. substantia nigra.
 - B. subthalamic nucleus.
 - C. red nucleus.
 - D. cerebral cortex.
 - E. anterior nucleus of the thalamus.

Lecture 25 cerebellum

10. Which of the following statements is true regarding inputs to the cerebellum?
- A. Axons from motor cortex synapse in the medial region of the cerebellar cortex.
 - B. Axons from motor cortex synapse in the lateral region of the cerebellar cortex.
 - C. Axons from motor cortex synapse in the pontine nuclei, and neurons in the pontine nuclei synapse in the cerebellar cortex.
 - D. Axons from motor cortex synapse in the red nucleus, and neurons in the red nucleus synapse in the cerebellar cortex.
 - E. More than one of the above are correct.
11. The major output from the cerebellum is from neurons in the ...
- A. granular cell layer.
 - B. purkinje cell layer.
 - C. molecular cell layer.
 - D. deep cerebellar nuclei.
 - E. inferior olivary nucleus.
12. What is the major input to the flocculonodular lobe of the cerebellum?
- A. vestibular nuclei
 - B. pontine nuclei
 - C. spinal cord
 - D. motor cortex
 - E. thalamus

13. A stroke in which of the following is most likely to directly result in a significant movement problem on the right side of the body?
- A. right primary motor cortex
 - B. right ventral anterior nucleus of the thalamus
 - C. right cerebral peduncle
 - D. right cerebellar hemisphere
 - E. More than one of the above is correct.

Lecture 26 eye movements (from Dr. L. McLoon)

14. All of the following are conjugate eye movements except:
- A. vergence
 - B. vestibulo-ocular reflex
 - C. saccades
 - D. smooth pursuit
 - E. all of the above are conjugate eye movements
15. Which of the following is NOT true about the vestibulo-ocular reflex?
- A. It is a 3-neuron pathway.
 - B. It is activated by angular acceleration of the head.
 - C. It does not require vision.
 - D. It allows the world to look stationary when the head is moving.
 - E. All of the above are true.
16. Which is true about childhood onset strabismus?
- A. If it is not corrected by the end of the critical period for development of binocular vision, reduced visual acuity can occur in the eye that is not straight in primary gaze.
 - B. It never results in reduced visual acuity.
 - C. It is an uncommon condition in children.
 - D. It is characterized by uncontrolled oscillatory movements of the eyes.
 - E. None of the above are correct.
17. Which of the following cranial nerves directly innervates the lateral rectus muscle?
- A. oculomotor (CNIII)
 - B. trochlear (CNIV)
 - C. abducens (CNVI)
 - D. vestibular (CNVIII)
 - E. None of the above directly innervates the lateral rectus muscle.

Lecture 27 autonomics

18. Which of the following levels of the spinal cord have preganglionic sympathetic neuron cell bodies?
- A. fourth cervical (C4)
 - B. fourth lumbar (L4)
 - C. fourth thoracic (T4)
 - D. fourth sacral (S4)
 - E. All of the above have preganglionic sympathetic neuron cell bodies.

19. Pain radiating down the left arm could indicate ...
- A. a bladder infection.
 - B. acid reflux from the stomach into the esophagus.
 - C. a sinus infection.
 - D. a heart attack.
 - E. kidney stones.
20. Axons carrying visceral sensory information in the vagus nerve synapse in ...
- A. the vagus sensory ganglion.
 - B. the vagus parasympathetic ganglion.
 - C. the solitary nucleus in the medulla.
 - D. the ventral posterior nucleus in the thalamus.
 - E. the insular cortex,
21. Where are axons from autonomic neurons in the intermediolateral cell column of the thoracic spinal cord likely to synapse?
- A. nuclei in the brainstem
 - B. dorsal root ganglia
 - C. sympathetic ganglia
 - D. parasympathetic ganglia
 - E. blood vessels

Lecture 28 reticular formation & sleep (from Dr. Riedl)

22. Which of the following functions is NOT associated with the brainstem reticular formation?
- A. control of autonomic functions like respiration, heart rate, and vomiting
 - B. sensory attention
 - C. storage of long-term memory
 - D. control of posture, balance and muscle tone
 - E. sleep and wakefulness
23. Which statement best describes the EEG pattern as one progresses through stages I-IV of the sleep cycle?
- A. There is decreasing frequency and increasing amplitude of cortical activity.
 - B. There is increasing frequency and decreasing amplitude of cortical activity.
 - C. There is increasing frequency and increasing amplitude of cortical activity.
 - D. There is decreasing frequency and decreasing amplitude of cortical activity.
24. Which of the following statements about REM sleep is NOT true?
- A. Breathing and blood pressure increases.
 - B. Dreaming occurs during this stage of sleep.
 - C. Movement of limb (arm and leg) muscles is inhibited.
 - D. There is low cortical activity.
 - E. Eye movements are increased.
25. Which of the following is a characteristic of narcolepsy?
- A. inability to fall asleep
 - B. involuntary sleep during the day
 - C. inability to enter REM sleep
 - D. increased movement of legs during sleep
 - E. instances of sleepwalking

26. Which of the following neurotransmitters is NOT important in maintaining wakefulness?
- A. Enkephalin
 - B. Orexin
 - C. Norepinephrine
 - D. Serotonin
 - E. Dopamine

Lecture 29 hypothalamus (from Dr. Wessendorf)

27. Major fiber tracts of the hypothalamus include all of the following EXCEPT:
- A. medial forebrain bundle
 - B. mammillothalamic tract
 - C. fornix
 - D. medial lemniscus
28. Which of the following helps regulate water balance by DECREASING urination?
- A. oxytocin
 - B. thyrotropin-releasing hormone
 - C. thyroid hormone
 - D. vasopressin
 - E. follicle-stimulating hormone
29. Imagine that McDonald's asked you to develop a chemical that they could add to their food to make customers who eat their food want to order more. What properties should your chemical have to be most attractive to McDonald's?
- A. It should have properties similar to leptin.
 - B. It should block the actions of orexin.
 - C. It should mimic the actions of ghrelin.
 - D. It should block the actions of thyrotropin-releasing hormone.
 - E. More than one of the above are correct.
30. Stimulation of the dorsomedial nucleus of the hypothalamus would be expected to ...
- A. increase urination.
 - B. decrease urination.
 - C. increase eating.
 - D. increase blood pressure.
 - E. decrease body temperature.
31. With no outside input your circadian clock normally runs slowly, averaging slightly over 25 hours per cycle. What sets your circadian clock to the correct time?
- A. input from the mammillary nuclei
 - B. light-sensitive neurons of the retina
 - C. regular daily activities such as eating, using the bathroom, sleeping, etc.
 - D. temperature-sensitive neurons of the preoptic nuclei.
 - E. osmolarity-sensitive neurons of the vascular organ of the lamina terminalis

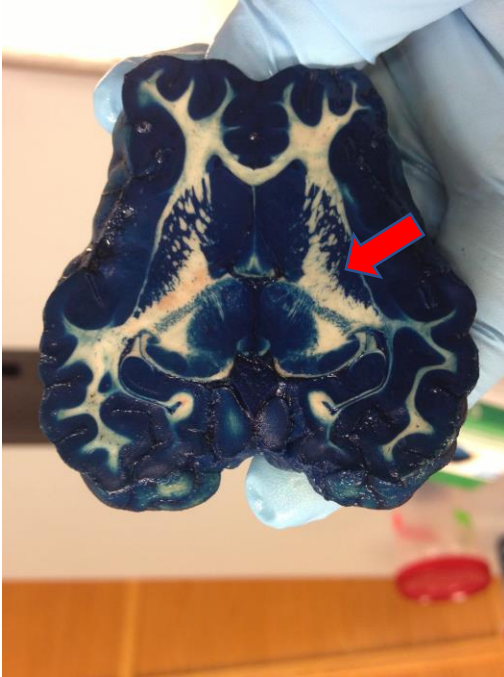
Lecture 30 limbic system (from Dr. Wessendorf)

32. Which of the following is NOT considered part of the limbic system?
- A. hippocampus
 - B. amygdala
 - C. anterior nucleus of the thalamus
 - D. cingulate gyrus
 - E. None of the above are correct. All are parts of the limbic system.
33. Phineas Gage became less responsible and showed less self-control after a lesion to which part of his brain?
- A. hypothalamus
 - B. amygdala
 - C. medial postcentral gyrus
 - D. prefrontal and anterior cingulate cortex
 - E. cerebellum and pons
34. Patient HM received surgery that bilaterally damaged his temporal lobes and left him with which combination of deficits:
- A. Able to learn new motor tasks but unable to form new declarative memories
 - B. Able to form new declarative memory but unable to recall events prior to his surgery
 - C. Able to form short-term memories but unable to learn new motor tasks
 - D. Unable to form new motor tasks and unable to form new declarative memories
 - E. None of the above are correct.
35. Bilateral lesions to the amygdala are associated with what?
- A. reduced sex drive
 - B. extreme caution and agoraphobia
 - C. inability to recognize happy faces
 - D. over-expression of acid-sensing ion channels
 - E. inability to recognize fearful faces

Laboratory #6-8 (from Dr. Riedl and Dr. Nakagawa)

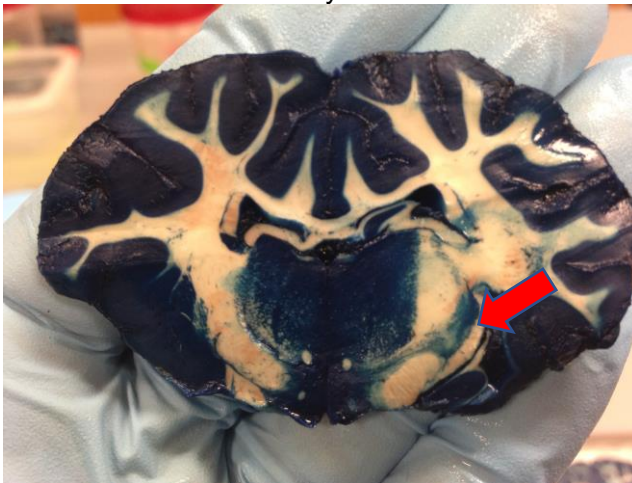
36. Given your data in the two-point discrimination test, which area of the body likely has the highest density of tactile receptors?
- A. fingertip
 - B. back of neck
 - C. back of arm
 - D. cheek

37. What structure is identified by the red arrow in this horizontal section of a sheep brain?



-
- A. putamen
 - B. caudate
 - C. hippocampus
 - D. lateral Ventricle
 - E. thalamus

38. What structure is identified by the red arrow in this coronal section of a sheep brain?



-
- A. corpus callosum
 - B. cerebral peduncle
 - C. optic tract
 - D. fornix
 - E. pyramids

39. What structure is the arrow pointing to?



- A. inferior colliculus
- B. superior colliculus
- C. medial geniculate
- D. lateral geniculate
- E. cerebral aqueduct

40. Which photoreceptors are most important for reading, and which area of the retina has the highest density of these receptors?

- A. rods, periphery
- B. cones, periphery
- C. rods, fovea
- D. cones, fovea

The End!

**Please turn in this exam and your bubble sheet in the box at the back of the room.
Double check that your name is on both.**