Anatomy1

Your Name

Academic Year 2025-2026

Contents

Lecture 2: Exam3Review **Tue 02 Dec**

0.1 Chapter 11: Introduction to the Nervous System and Nervous Tissue

What structures are in the CNS versus the PNS?

My Answer: The brain and the spinal cord vs the peripheral nerves and neurons **Ideal Answer:**

Where I Went Wrong:

Name the neuroglial cells present in the CNS and the PNS and describe their functions.

My Answer: Forgot

Ideal Answer:
Astrocytes: These cells anchor neurons and blood vessels, regulate the extracellular environment, facilitate the formation of the blood-brain barrier, and repair damaged tissue.
Oligodendrocytes: They myelinate certain axons in the CNS, which helps speed up the conduction of action potentials.
Microglial cells: These act as phagocytes, ingesting and breaking down waste products and pathogens.
Ependymal cells: They line cavities in the brain and spinal cord, with cilia that circulate cerebrospinal fluid, and some also secrete this fluid.

Where I Went Wrong: AMOE nmueumonic

Draw a neuron and label the parts.

My Answer:
Also dendrites but whatevs

Ideal Answer:

Where I Went Wrong:

Where do you find the different organelles of a neuron?

My Answer: Axon body

Ideal Answer: cell body

Where I Went Wrong: cell not axon body

Be able to distinguish between multipolar, bipolar, and pseudounipolar neurons and describe the location of each.

My Answer:
Multipolar – axons going in multiple directions in the brain
Psuedounipolar - axons coming out in different direction but all going 1 direction in the pns
Bipolar - going in 2 directions forgot **Ideal Answer:** Multi: one axon with many dendrites, motor and interneurons
Bipolar: one axon and one dendrite, sensory (olfaction and retina)
Psuedounipolar: 2 axons, sensory pns

Where I Went Wrong:

describe sensory neurons, interneurons, and motor neurons.

My Answer:
sensory –¿ bring signals to the CNS interneuron –¿ process signal in the brain, multipolar motor –¿ control some bodily function

Ideal Answer:

Where I Went Wrong:

What is myelin and why are some axons myelinated?

My Answer:
myelin is fat and it is wrapped around the axon to make action potentials go faster

Ideal Answer: also insulation and efficiency

Where I Went Wrong:

Describe the different types of ion channels present at different locations in the neuron.

My Answer:
Na+ outside and K+ plus insude
Also Ca

Ideal Answer: Ligand gated, Voltage Gated Na K, Voltage gated Ca, Leak

Where I Went Wrong:

What is the typical resting membrane potential for a neuron?

My Answer:
-70mV

Ideal Answer:
duh

Where I Went Wrong:

Describe the similarities and differences between local potentials versus action potentials.

My Answer:
local potentials do not travel all the way down an axon
but both change in the resting potential

Ideal Answer:
got the jist

Where I Went Wrong:

Draw an action potential, label the phases, and describe which channels are responsible for each phase.

My Answer:
depolarization polarization hyperpolarization refactory period

Ideal Answer: depolarization: Na open repolarization: Na close, K open hyperpolarization: K still open

Where I Went Wrong:

Where does the action potential begin, and what triggers the action potential?

My Answer:
axon hillock
opening of Na+ channel

Ideal Answer:

Where I Went Wrong:

Which ion is typically responsible for local potentials (small depolarizations in a small area)?

My Answer:
Na+

Ideal Answer:

Where I Went Wrong:

Why is the refractory period important?

My Answer:
determines how frequently a potential can fire

Ideal Answer:
prevents overlapping signals allows unidirectional flow

Where I Went Wrong:

What is saltatory conduction, and why do only some neurons exhibit saltatory conduction?

My Answer:
Forgot

Ideal Answer:
leap from one myelin sheath gap to another

Where I Went Wrong:

Draw a typical synapse. Label the pre-synaptic membrane, the post-synaptic membrane, and the synaptic cleft. Where do you find vesicles containing neurotransmitters?

My Answer:
in the pre-synaptic cleft

Ideal Answer:

Where I Went Wrong:

What is the difference between an EPSP and an IPSP? Predict whether activation of a given neurotransmitter receptor will generate an EPSP or an IPSP.

My Answer:
what

Ideal Answer:
excitatory postsynaptic potential) and an IPSP (inhibitory postsynaptic potential) excitatory –¿ moves close to action potential typically caused by the opening of ligand-gated sodium or calcium ion channels
inhibitory –¿ moves away from action potential usually the result of opening ligand-gated potassium or chloride ion channels.

Where I Went Wrong:

why do we need temporal and spatial summation?

My Answer:
different ways to create/start an action potention

Ideal Answer:

yep pretty much

Where I Went Wrong:

What neurotransmitter is present at the neuromuscular junction?

My Answer:
acetylcholine

Ideal Answer:
yep

Where I Went Wrong:

Name two excitatory and two inhibitory neurotransmitters.

My Answer:
forgot

Ideal Answer: excite: glutamate, acetylcholine inhibit: GABA, glyecin

Where I Went Wrong:

How do we terminate the action of neurotransmitters? (Name three things that can happen to the neurotransmitter.)

My Answer:
bind to g-protein diffuse in the cells forgot

Ideal Answer:
diffusion, absorption, degredation, reuptake in pre-synaptic cleft

Where I Went Wrong:

Describe how interneurons are organized into neuronal pools. Contrast diverging circuits versus converging circuits.

My Answer:
diverging circuit on neuron to many converging circuit is many neuron to less

Ideal Answer: yep

Where I Went Wrong:

0.2 Chapter 12: The Central Nervous System

Draw the shape of the brain, label the regions, and list them in order from the medulla oblongata to the cerebral cortex.

My Answer:
medulla oblongata pons midbrain thalamus cingulate gyrus cerebral cortex **Ideal Answer:** Medulla

Oblongata: Located at the base of the brainstem, it regulates autonomic functions. Pons: Above the medulla, it regulates breathing and the sleep/wake cycle. Midbrain: The top part of the brainstem, it processes visual and auditory stimuli. Cerebellum: Posterior to the brainstem, it coordinates voluntary movements. Diencephalon: Contains the thalamus and hypothalamus, involved in sensory and autonomic functions. Cerebral Cortex: The outermost layer of the cerebrum, responsible for higher brain functions like thought and action.

Where I Went Wrong:

Describe the placement of gray and white matter in the brain and its functional significance. Describe how neurons are organized within gray and white matter.

My Answer:
gray is at the outside, bodies white is inner, axons **Ideal Answer:**

Where I Went Wrong:

Name the three types of white matter tracts in the brain and describe their function.

My Answer:
idk

Ideal Answer:
commissural: connect the right and left hemispheres, corpus callosum projection: connect axons in same hemisphere, and CNS with lower CNS association: same hemisphere

Where I Went Wrong:

Name the lobes of the cerebrum and describe the functional areas of each.

My Answer:
frontal: complex thought parietal: motor, sensory temporal: hearing insula: tastes occipital: vision

Ideal Answer:

Where I Went Wrong:

What is an association area?

My Answer:
area of the brain connected to a particular function

Ideal Answer: integrate various types of information. They are crucial for cognitive functions such as processing complex stimuli,
Parietal Association Cortex: Handles spatial awareness and attention, enabling recognition of object positions and movements.
Temporal Association Cortex: Specializes in recognizing complex stimuli, such as faces, and is involved in identifying stimuli.
Prefrontal Cortex: Involved in behavior modulation, personality, learning, and memory.

Where I Went Wrong:

What is the general function of the basal nuclei?

My Answer:
to stop signals from erronously being carried

Ideal Answer:
this but mainly for movement

Where I Went Wrong:

What are the structures of the limbic system? What are the functions of the limbic system?

My Answer:
amygdala, thalamus

Ideal Answer: hippocampus and amygdala involved in memory, learning, emotion, and behavior

Where I Went Wrong:

Describe how Broca's area and Wernicke's area are involved in speech and language.

My Answer:
broca: is speech processing wernicke: is motor language

Ideal Answer:
broca: language production wernicke: language comprehension

Where I Went Wrong:

Describe the locations of the thalamus and hypothalamus. Describe the functions of the thalamus and hypothalamus.

My Answer:
in the middle of the brain thalamus, the multiplexor of the brain hypothalamus: same thing but mainly for endocrine system

Ideal Answer:

Where I Went Wrong:

Where is the cerebellum located? How do axons travel to or from the cerebellum? What is the function of the cerebellum?

My Answer:
back of the brain, have to detour, refine motor control

Ideal Answer:

Where I Went Wrong:

What three structures form the brainstem? Where do you find the reticular formation? What is the function of the reticular formation?

My Answer:
medulla oblongata, pons, midbrain reticular formation is the center of all of them idk what the function is

Ideal Answer: sleep/arousal autonomic function homeostasis

Where I Went Wrong:

What two structures of the central nervous system are key for maintaining homeostasis?

My Answer:
brainstem and Diencephalon

Ideal Answer: sure, and ANS

Where I Went Wrong:

How do we measure brain activity?

My Answer:
voltage

Ideal Answer:
MRI EEG PET

Where I Went Wrong:

Name the 3 layers of the meninges in order.

My Answer:
dura mater arachnoid mater pia mater

Ideal Answer: yep

Where I Went Wrong:

Describe the production of CSF.

My Answer:
idk

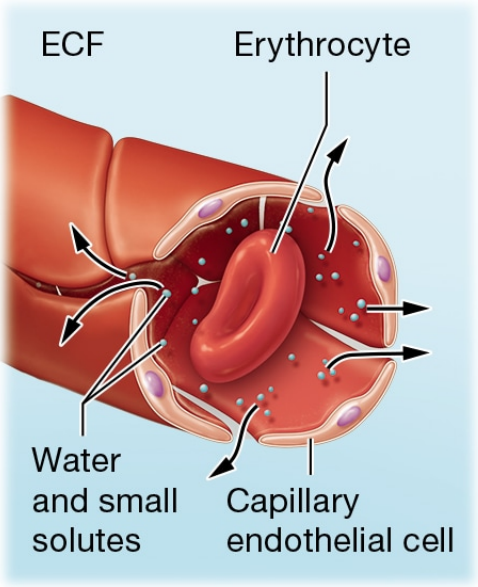
Ideal Answer: t is produced in the brain's ventricles by the choroid plexus, a cluster of capillaries and ependymal cells

Where I Went Wrong:

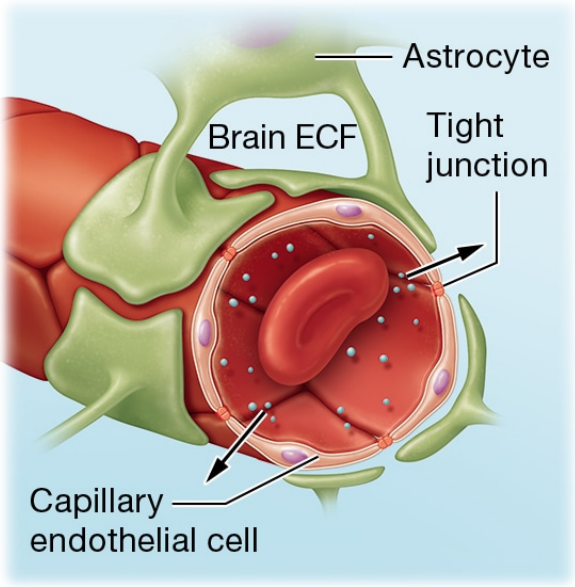
Describe the blood brain barrier.

My Answer:
layer around the brain where gases can pass but not blood

Ideal Answer:
Endothelial cells and Astrocytes



A typical capillary allows water and small solutes to move from the blood to the ECF.



Astrocytes and tight junctions in brain capillaries limit the solutes that enter the brain ECF.

Where I Went Wrong:

What are the functions of the spinal cord?

My Answer:
Control ANS and connect CNS with PNS

Ideal Answer:

Where I Went Wrong:

What substance do you find in the epidural space? What substance do you find in the subarachnoid space?

My Answer:
csf

Ideal Answer:
epidural: fat, veins subarachnoid: CSF

Where I Went Wrong:

Describe the anatomy of the spinal cord itself (superior to inferior segments and layers).

My Answer:
idk

Ideal Answer:
The spinal cord begins as an extension of the brainstem at the foramen magnum and ends at the conus medullaris, located between the first and second lumbar vertebrae. It features two enlargements: the cervical enlargement and the lumbar enlargement, which accommodate the nerves serving the upper and lower limbs, respectively.
dura, arachnoid, pia,

Where I Went Wrong:

Describe the organization of white matter and gray matter within the spinal cord.

My Answer:
grey is middle white is outer

Ideal Answer:

Where I Went Wrong:

What senses are classified as general somatic senses?

My Answer:
touch

Ideal Answer:
touch pain temprature stretch proprioception

Where I Went Wrong:

Describe the pathways travelled by the posterior columns pathway and the spinothalamic tract pathway.

My Answer:

Ideal Answer: Posterior: sensory first order enter posterior horn, travel through the fasciculus gracilis, synapse in the medulla, cross over in the medulla, ascend to pons and midbrain, synapse in the thalamus, third order to the cortex
spinothalamic: first-order pain temp and nondisc touch, synapse in post horn, decussation in spinal cord, ascend, synapse in thalamus,

Where I Went Wrong:

Which sensory pathways go through the thalamus?

My Answer:
all except olfaction

Ideal Answer:
yep

Where I Went Wrong:

Describe the corticospinal pathway, naming the neurons involved.

My Answer:

Ideal Answer:
voluntary movement: upper motor, go through midbrain, decussate, spinal cord, synapse with interneuron and the synapse with and lower motor neuron

Where I Went Wrong:

What is a "motor program"?

My Answer:
lots of signals together to make a movement

Ideal Answer:

Where I Went Wrong:

How does the cerebellum reduce motor error?

My Answer:

Ideal Answer:
receives sensory info and compares to intended movement and finds discrepency learns and adapts

Where I Went Wrong:

0.3 Chapter 13: The Peripheral Nervous System

Define the following terms within the context of the peripheral nervous system: sensory / motor; somatic / visceral; afferent / efferent.

My Answer:
know this

Ideal Answer:

Where I Went Wrong:

Describe the type of information carried in each division of the peripheral nervous system.

My Answer:
skip

Ideal Answer:

Where I Went Wrong:

Describe the structure of a nerve (the layers and coverings).

My Answer:
skip

Ideal Answer:

Where I Went Wrong:

Name the 12 pairs of cranial nerves. Explain the physiological significance of each pair. Which cranial nerves carry parasympathetic innervation?

My Answer:
1. Olfactory
2. Ocular
3. Oculomotor
4. Trigeminal
5. Facial
6.
7.
8. Vestibulocochlear
9. Glossopharyngeal
10. Vagus
11.
12. Accesory

Ideal Answer:
1. Olfactory - smell
2. Optic - vision

3. Oculomotor - eye movement
4. Trochlear - eye movement
5. Trigeminal - facial sensation and chewing
6. Abducens - lateral eye movement
7. Facial - taste, facial expression, salivary glands
8. Vestibulocochlear - hearing and balance
9. Glossopharyngeal - swallow, taste
10. Vagus - parasympathetic, internal organs
11. Accesory - shoulder and neck muscles
12. Hypoglossal - tongue movement

Where I Went Wrong:

What is the difference between an anterior root and a posterior root?

My Answer:
anterior, efferent, post is afferent

Ideal Answer:

Where I Went Wrong:

What is the difference between an anterior root and an anterior ramus?

My Answer:

Ideal Answer:
anterior root goes to the spinal cord whereas ramus goes to the peripheral

Where I Went Wrong:

What is a nerve plexus? Name the 4 nerve plexuses. Name the nerves from the (lab) tag list that come off each plexus and describe what they innervate.

My Answer:
network of nerves, cervical, lumbar, thoracic,

Ideal Answer: cervical, brachial, lumbar, sacral

Where I Went Wrong:

How do sensory neurons collect sensory input? What is a "receptor"? Describe the types of receptors involved in sensation and how those receptors are activated.

My Answer:

Ideal Answer:

Where I Went Wrong:

What is a receptive field and how do you measure the size of a receptive field?

My Answer:
how close a sensory is discriminatory

Ideal Answer:

Where I Went Wrong:

What is a dermatome?

My Answer:
where touch

Ideal Answer:
A dermatome is a segment of skin supplied by a specific spinal nerve

Where I Went Wrong:

Why do people sometimes experience referred pain?

My Answer:
idk

Ideal Answer:
one nerve can innvervate multiple things. ie: heart attack as skin pain

Where I Went Wrong:

Describe how neurons connect to form a reflex arc.

My Answer:
skip

Ideal Answer:

Where I Went Wrong:

What sensory input is collected by the muscle spindles and the Golgi tendon organ?

My Answer:
tension

Ideal Answer:

Where I Went Wrong:

Describe a simple stretch reflex; a flexion/withdrawal reflex; a crossed-extension reflex; a gag reflex; the corneal blink reflex.

My Answer:
skip

Ideal Answer:

Where I Went Wrong:

0.4 Chapter 14: The Autonomic Nervous System and Homeostasis

Name the divisions of the PNS and describe the type of information found in each.

My Answer:

Ideal Answer:

Where I Went Wrong:

Which division of the peripheral nervous system is also known as the autonomic nervous system?

My Answer:
visceral motor

Ideal Answer:

Where I Went Wrong:

In which regions do you find the outflow pathways for the sympathetic and parasympathetic nervous systems?

My Answer:

Ideal Answer: sympathetic out: thoracic and lumbar para: brainstem and sacral

Where I Went Wrong:

Describe the locations for the peripheral ganglia for the sympathetic and parasympathetic nervous systems.

My Answer: Ideal Answer:

symp chain ganglia para: near target organ

Where I Went Wrong:

Compare and contrast the function of the sympathetic versus parasympathetic nervous systems.

My Answer:
skip

Ideal Answer:

Where I Went Wrong:

Explain the concept of dual innervation.

My Answer:
1 thing/organ being innervated twice

Ideal Answer: innvervated by sympathetic and parasympathetic nerves

Where I Went Wrong:

Predict the effect of the sympathetic or a parasympathetic nervous system on the following structures: • Pupil • Heart • Lungs • Digestive organs • Urinary organs • Digestive and urinary sphincters

My Answer:
Skip

Ideal Answer:

Where I Went Wrong:

Describe the effect of the sympathetic nervous system on various different blood vessels.

My Answer: skip

Ideal Answer:

Where I Went Wrong:

What is the role of the adrenal medulla, and how is the adrenal medulla activated?

My Answer:
adrenalin, sympathetic nervous system

Ideal Answer:

Where I Went Wrong:

Which neurotransmitter is the key neurotransmitter for the: • Sympathetic and parasympathetic ganglia • Sympathetic post-ganglionic neurons • Parasympathetic post-ganglionic neurons

My Answer:
idk

Ideal Answer: both: acetylcholine, binds to nicotinic receptors sympathetic: norepinephrine, epinephrine para: AcH

Where I Went Wrong:

What types of receptors are activated by epinephrine and norepinephrine?

My Answer:
nicotinic

Ideal Answer:
Adrenergic Receptors: alpha and beta

Where I Went Wrong:

What types of receptors are activated by acetylcholine?

My Answer:
nicotinic

Ideal Answer: nicotinic, muscarinic

Where I Went Wrong:

Explain the basic mechanisms of action for Botox and Nicotine.

My Answer:

Ideal Answer: Botox binds to NMJ and blocks ACH release Nicotine: mimics ach

Where I Went Wrong:

How does the hypothalamus direct the autonomic nervous system?

My Answer:
skip

Ideal Answer:

Where I Went Wrong:

What is autonomic tone?

My Answer:
always on ans

Ideal Answer:

Where I Went Wrong:

Where are the autonomic centers that control the sympathetic and parasympathetic neurons?

My Answer:
hypothalamus, brainstep

Ideal Answer: brainstem

Where I Went Wrong:

0.5 Chapter 15: The Special Senses

Special senses: how are special senses the same and different from general senses? Give examples of each.

My Answer:
skip

Ideal Answer:

Where I Went Wrong:

Describe transduction.

My Answer:
turn something into signal

Ideal Answer:

Where I Went Wrong:

For each special sense, describe the following: • The sense organ that collects that stimulus information • The type of receptor that is activated • Which cranial nerve carries the sensation • Where the primary sensory cortex is located

My Answer:
skip

Ideal Answer:

Where I Went Wrong:

What smells can you sense? How and why? How do smells trigger memories?

My Answer:

Ideal Answer: odors, linked to limbic system

Where I Went Wrong:

What tastes can you sense? How are taste receptors activated?

My Answer:
skip

Ideal Answer:

Where I Went Wrong:

Describe the pathway that light takes as it enters your eye.

My Answer:

Ideal Answer: cornea, aqueous humor, pupil, lens, vitreous humor, retina, optic nerve

Where I Went Wrong:

Describe the three layers of the eyeball.

My Answer:
fibrous, vascular, nervous

Ideal Answer:

Where I Went Wrong:

Why do you have a blind spot?

My Answer:
spot without cones and rods

Ideal Answer:

Where I Went Wrong:

How do the cornea, the lens, and the ciliary body work together to focus the image on the retina?

My Answer:
nah

Ideal Answer:

Where I Went Wrong:

Why do some people need corrective lenses for clear vision?

My Answer:
focal point

Ideal Answer:

Where I Went Wrong:

How do extrinsic eye muscles orient the eyeball?

My Answer:
skip

Ideal Answer:

Where I Went Wrong:

How does the autonomic nervous system control pupil size?

My Answer:
light and such

Ideal Answer:

Where I Went Wrong:

Why do half of the optic nerve fibers cross at the optic chiasm?

My Answer:
to have division of left and right sight

Ideal Answer:

Where I Went Wrong:

Compare and contrast cone and rod photoreceptors.

My Answer:
cone color rod black and white, more

Ideal Answer:

Where I Went Wrong:

Describe the structures of the outer, middle, and inner ear.

My Answer:
skip

Ideal Answer:

Where I Went Wrong:

Which bone houses the structures of the inner ear?

My Answer:
temporal

Ideal Answer:

Where I Went Wrong:

Describe the structures that conduct auditory signals from the air to the hair cells of the cochlea.

My Answer:
skip

Ideal Answer:

Where I Went Wrong:

How are the vibrations of sound transduced into electrical signals?

My Answer:
skip

Ideal Answer:

Where I Went Wrong:

Describe how the utricle and saccule detect head tilt and linear acceleration.

My Answer:

Ideal Answer:

Where I Went Wrong:

Describe how the semicircular ducts detect rotational movements.

My Answer:

Ideal Answer:

Where I Went Wrong:

Which brain structures collect vestibular sensations in order to perform their functions?

My Answer:

Ideal Answer:
thalamus and parietal lobe

Where I Went Wrong:

What roles do the frontal lobes and the limbic system play in sensation?

My Answer:
process and interpret

Ideal Answer: higher level processing

Where I Went Wrong: