A&P 14 Brain & Cranial Nerves Essay

Author: OpenStax College

Published 2014

Disclaimer

All services and content of QuizOver.com are provided under QuizOver.com terms of use on an "as is" basis, without warranty of any kind, either expressed or implied, including, without limitation, warranties that the provided services and content are free of defects, merchantable, fit for a particular purpose or non-infringing.

The entire risk as to the quality and performance of the provided services and content is with you.

In no event shall QuizOver.com be liable for any damages whatsoever arising out of or in connection with the use or performance of the services.

Should any provided services and content prove defective in any respect, you (not the initial developer, author or any other contributor) assume the cost of any necessary servicing, repair or correction.

This disclaimer of warranty constitutes an essential part of these "terms of use".

No use of any services and content of QuizOver.com is authorized hereunder except under this disclaimer.

The detailed and up to date "terms of use" of QuizOver.com can be found under:

http://www.QuizOver.com/public/termsOfUse.xhtml

eBook Content License

OpenStax College. Anatomy & Physiology, OpenStax-CNX Web site. http://cnx.org/content/col11496/1.6/, Jun 11, 2014

4. Chapter: A&P 14 Brain & Cranial Nerves Essay

1. A&P 14 Brain & Cranial Nerves Essay Questions

4.1.1. Watch this video (http://openstaxcollege.org/l/DanielleReed) to lea...

Author: OpenStax College

Watch this video (http://openstaxcollege.org/l/DanielleReed) to learn about Dr. Danielle Reed of the Monell Chemical Senses Center in Philadelphia, PA, who became interested in science at an early age because of her sensory experiences.

She recognized that her sense of taste was unique compared with other people she knew.

Now, she studies the genetic differences between people and their sensitivities to taste stimuli.

In the video, there is a brief image of a person sticking out their tongue, which has been covered with a colored dye.

This is how Dr. Reed is able to visualize and count papillae on the surface of the tongue.

People fall into two large groups known as "tasters" and "non-tasters" on the basis of the density of papillae on their tongue, which also indicates the number of taste buds.

Non-tasters can taste food, but they are not as sensitive to certain tastes, such as bitterness.

Dr. Reed discovered that she is a non-taster, which explains why she perceived bitterness differently than other people she knew.

Are you very sensitive to tastes? Can you see any similarities among the members of your family?

- Answers will vary, but a typical answer might be: I can eat most anything (except mushrooms!), so I don't think that I'm that sensitive to tastes. My whole family likes eating a variety of foods, so it seems that we all have the same level of sensitivity.

Check the answer of this question online at QuizOver.com:
Question: Watch this video http://openstaxcollege OpenStax College Anatomy

4.1.2. Figure 14.9 The basilar membrane is the thin membrane that extends ...

Author: OpenStax College

Figure 14.9 The basilar membrane is the thin membrane that extends from the central core of the cochlea to the edge.

What is anchored to this membrane so that they can be activated by movement of the fluids within the cochlea?

- Figure 14.9 The hair cells are located in the organ of Corti, which is located on the basilar membrane. The stereocilia of those cells would normally be attached to the tectorial membrane (though they are detached in the micrograph because of processing of the tissue).

Check the answer of this question online at QuizOver.com:
Question: Figure 14.9 The basilar membrane is the OpenStax College Anatomy

4.1.3. Watch this video (http://openstaxcollege.org/l/ear1) to learn more ...

Author: OpenStax College

Watch this video (http://openstaxcollege.org/l/ear1) to learn more about how the structures of the ear convert sound waves into a neural signal by moving the "hairs," or stereocilia, of the cochlear duct.

Specific locations along the length of the duct encode specific frequencies, or pitches.

The brain interprets the meaning of the sounds we hear as music, speech, noise, etc.

Which ear structures are responsible for the amplification and transfer of sound from the external ear to the inner ear?

- The small bones in the middle ear, the ossicles, amplify and transfer sound between the tympanic membrane of the external ear and the oval window of the inner ear.

Check the answer of this question online at QuizOver.com:
Question: Watch this video http://openstaxcollege OpenStax College Anatomy

4.1.4. Watch this animation (http://openstaxcollege.org/l/ear2) to learn m...

Author: OpenStax College

Watch this animation (http://openstaxcollege.org/l/ear2) to learn more about the inner ear and to see the cochlea unroll, with the base at the back of the image and the apex at the front. Specific wavelengths of sound cause specific regions of the basilar membrane to vibrate, much like the keys of a piano produce sound at different frequencies.

Based on the animation, where do frequencies-from high to low pitches-cause activity in the hair cells within the cochlear duct?

- High frequencies activate hair cells toward the base of the cochlea, and low frequencies activate hair cells toward the apex of the cochlea.

Check the answer of this question online at QuizOver.com:
Question: Watch this animation http://openstaxcollege OpenStax College Anatomy

4.1.5. Watch this video (http://openstaxcollege.org/l/occipital) to learn ...

Author: OpenStax College

Watch this video (http://openstaxcollege.org/l/occipital) to learn more about a transverse section through the brain that depicts the visual pathway from the eye to the occipital cortex.

The first half of the pathway is the projection from the RGCs through the optic nerve to the lateral geniculate nucleus in the thalamus on either side.

This first fiber in the pathway synapses on a thalamic cell that then projects to the visual cortex in the occipital lobe where "seeing," or visual perception, takes place.

This video gives an abbreviated overview of the visual system by concentrating on the pathway from the eyes to the occipital lobe.

The video makes the statement (at 0:45) that "specialized cells in the retina called ganglion cells convert the light rays into electrical signals."

What aspect of retinal processing is simplified by that statement? Explain your answer.

- Photoreceptors convert light energy, or photons, into an electrochemical signal.
  The retina contains bipolar cells and the RGCs that finally convert it into action potentials that are sent from the retina to the CNS.
  It is important to recognize when popular media and online sources oversimplify complex physiological processes so that misunderstandings are not generated.
  This video was created by a medical device manufacturer who might be trying to highlight other aspects of the visual system than retinal processing.
  The statement they make is not incorrect, it just bundles together several steps, which makes it sound like RGCs are the transducers, rather than photoreceptors.

Check the answer of this question online at QuizOver.com:
Question: Watch this video http://openstaxcollege OpenStax College Anatomy

4.1.6. Watch this video (http://openstaxcollege.org/l/l_3-D1) to learn mor...

Author: OpenStax College

Watch this video (http://openstaxcollege.org/l/l_3-D1) to learn more about how the brain perceives 3-D motion.

Similar to how retinal disparity offers 3-D moviegoers a way to extract 3-D information from the two-dimensional visual field projected onto the retina, the brain can extract information about movement in space by comparing what the two eyes see.

If movement of a visual stimulus is leftward in one eye and rightward in the opposite eye, the brain interprets this as movement toward (or away) from the face along the midline.

If both eyes see an object moving in the same direction, but at different rates, what would that mean for spatial movement?

- Whereas the video shows opposite movement information in each eye for an object moving toward the face on the midline, movement past one side of the head will result in movement in the same direction on both retinae, but it will be slower in the eye on the side nearer to the object.

Check the answer of this question online at QuizOver.com:
Question: Watch this video http://openstaxcollege OpenStax College Anatomy

4.1.7. The inability to recognize people by their faces is a troublesome p...

Author: OpenStax College

The inability to recognize people by their faces is a troublesome problem.

It can be caused by trauma, or it may be inborn.

Watch this video (http://openstaxcollege.org/l/faces) to learn more about a person who lost the ability to recognize faces as the result of an injury.

She cannot recognize the faces of close family members or herself.

What other information can a person suffering from prosopagnosia use to figure out whom they are seeing?

- Even if a person cannot recognize a person's face, other cues such as clothing, hairstyle, or a particular feature such as a prominent nose or facial hair, can help make an identification.

Check the answer of this question online at QuizOver.com:
Question: The inability to recognize people by their OpenStax College Anatomy

4.1.8. Watch this video (http://openstaxcollege.org/l/motorpathway) to lea...

Author: OpenStax College

Watch this video (http://openstaxcollege.org/l/motorpathway) to learn more about the descending motor pathway for the somatic nervous system.

The autonomic connections are mentioned, which are covered in another chapter.

From this brief video, only some of the descending motor pathway of the somatic nervous system is described.

Which division of the pathway is described and which division is left out?

- The video only describes the lateral division of the corticospinal tract. The anterior division is omitted.

Check the answer of this question online at QuizOver.com:
Question: Watch this video http://openstaxcollege OpenStax College Anatomy

4.1.9. Visit this site (http://openstaxcollege.org/l/NYTmotor) to read abo...

Author: OpenStax College

Visit this site (http://openstaxcollege.org/l/NYTmotor) to read about an elderly woman who starts to lose the ability to control fine movements, such as speech and the movement of limbs.

Many of the usual causes were ruled out.

It was not a stroke, Parkinson's disease, diabetes, or thyroid dysfunction.

The next most obvious cause was medication, so her pharmacist had to be consulted.

The side effect of a drug meant to help her sleep had resulted in changes in motor control.

What regions of the nervous system are likely to be the focus of haloperidol side effects?

- The movement disorders were similar to those seen in movement disorders of the extrapyramidal system, which would mean the basal nuclei are the most likely source of haloperidol side effects.
  In fact, haloperidol affects dopamine activity, which is a prominent part of the chemistry of the basal nuclei.

Check the answer of this question online at QuizOver.com:
Question: Visit this site http://openstaxcollege OpenStax College Anatomy Quest

4.1.10. Watch this video (http://openstaxcollege.org/l/reflexarc) to learn ...

Author: OpenStax College

Watch this video (http://openstaxcollege.org/l/reflexarc) to learn more about the reflex arc of the corneal reflex.

When the right cornea senses a tactile stimulus, what happens to the left eye? Explain your answer.

- The left eye also blinks.
  The sensory input from one eye activates the motor response of both eyes so that they both blink.

Check the answer of this question online at QuizOver.com:
Question: Watch this video http://openstaxcollege OpenStax College Anatomy

4.1.11. Watch this video (http://openstaxcollege.org/l/newreflex) to learn ...

Author: OpenStax College

Watch this video (http://openstaxcollege.org/l/newreflex) to learn more about newborn reflexes.

Newborns have a set of reflexes that are expected to have been crucial to survival before the modern age.

These reflexes disappear as the baby grows, as some of them may be unnecessary as they age.

The video demonstrates a reflex called the Babinski reflex, in which the foot flexes dorsally and the toes splay out when the sole of the foot is lightly scratched.

This is normal for newborns, but it is a sign of reduced myelination of the spinal tract in adults.

Why would this reflex be a problem for an adult?

- While walking, the sole of the foot may be scraped or scratched by many things.
  If the foot still reacted as in the Babinski reflex, an adult might lose their balance while walking.

4.1.12. The sweetener known as stevia can replace glucose in food.
What doe...

Author: OpenStax College

The sweetener known as stevia can replace glucose in food.

What does the molecular similarity of stevia to glucose mean for the gustatory sense?

- The stevia molecule is similar to glucose such that it will bind to the glucose receptor in sweet-sensitive taste buds.
  However, it is not a substrate for the ATP-generating metabolism within cells.

Check the answer of this question online at QuizOver.com:
Question: The sweetener known as stevia can replace OpenStax College Anatomy

4.1.13. Why does the blind spot from the optic disc in either eye not resul...

Author: OpenStax College

Why does the blind spot from the optic disc in either eye not result in a blind spot in the visual field?

- The visual field for each eye is projected onto the retina as light is focused by the lens.
  The visual information from the right visual field falls on the left side of the retina and vice versa.
  The optic disc in the right eye is on the medial side of the fovea, which would be the left side of the retina.
  However, the optic disc in the left eye would be on the right side of that fovea, so the right visual field falls on the side of the retina in the left field where there is no blind spot.

4.1.14. Following a motorcycle accident, the victim loses the ability to mo...

Author: OpenStax College

Following a motorcycle accident, the victim loses the ability to move the right leg but has normal control over the left one, suggesting a hemisection somewhere in the thoracic region of the spinal cord.

What sensory deficits would be expected in terms of touch versus pain? Explain your answer.

- The right leg would feel painful stimuli, but not touch, because the spinothalamic tract decussates at the level of entry, which would be below the injury, whereas the dorsal column system does not decussate until reaching the brain stem, which would be above the injury and thus those fibers would be damaged.

4.1.15. A pituitary tumor can cause perceptual losses in the lateral visual...

Author: OpenStax College

A pituitary tumor can cause perceptual losses in the lateral visual field.

The pituitary gland is located directly inferior to the hypothalamus.

Why would this happen?

- As the tumor enlarges, it would press against the optic chiasm, and fibers from the medial retina would be disrupted.
  These fibers carry information about the lateral visual field because the visual scene is reversed as the light passes through the pupil and lens.

Check the answer of this question online at QuizOver.com:
Question: A pituitary tumor can cause perceptual OpenStax College Anatomy Quest

4.1.16. The prefrontal lobotomy is a drastic-and largely outof-practice-pro...

Author: OpenStax College

The prefrontal lobotomy is a drastic-and largely outof-practice-procedure used to disconnect that portion of the cerebral cortex from the rest of the frontal lobe and the diencephalon as a psychiatric therapy.

Why would this have been thought necessary for someone with a potentially uncontrollable behavior?

- The prefrontal cortex is involved in decision-making functions that lead to motor responses through connections to the more posterior motor regions.
  These early aspects of behavior are often associated with a person's personality, so disrupting those connections will lead to severe changes in behavior.

4.1.17. If a reflex is a limited circuit within the somatic system, why do ...

Author: OpenStax College

If a reflex is a limited circuit within the somatic system, why do physical and neurological exams include them to test the health of an individual?

- Though reflexes are simple circuits within the nervous system, they are representative of the more involved circuits of the somatic nervous system and can be used to quickly assess the state of neurological function for a person.

Check the answer of this question online at QuizOver.com:
Question: If a reflex is a limited circuit within OpenStax College Anatomy