Chapter 1 : Nervous System and the Senses Trivia Questions & Answers | Page 3

General sense receptors for pressure, heat, cold, touch, and pain are located throughout the body in the skin and connective tissue. Messages from those receptors allow the human body to respond to its environment and help it react to conditions that can cause injury.

Visual perception Visual perception is the ability to interpret the surrounding environment using light in the visible spectrum reflected by the objects in the environment. The resulting perception is also known as visual perception, eyesight, sight, or vision adjectival form: The various physiological components involved in vision are referred to collectively as the visual system. The visual system in animals allows individuals to assimilate information from their surroundings. The act of seeing starts when the cornea and then the lens of the eye focuses light from its surroundings onto a light-sensitive membrane in the back of the eye, called the retina. The retina is actually part of the brain that is isolated to serve as a transducer for the conversion of light into neuronal signals. Based on feedback from the visual system, the lens of the eye adjusts its thickness to focus light on the photoreceptive cells of the retina, also known as the rods and cones, which detect the photons of light and respond by producing neural impulses. These signals are processed via complex feedforward and feedback processes by different parts of the brain, from the retina upstream to central ganglia in the brain. Note that up until now much of the above paragraph could apply to octopuses , mollusks , worms , insects and things more primitive; anything with a more concentrated nervous system and better eyes than say a jellyfish. However, the following applies to mammals generally and birds in modified form: The retina in these more complex animals sends fibers the optic nerve to the lateral geniculate nucleus , to the primary and secondary visual cortex of the brain. Signals from the retina can also travel directly from the retina to the superior colliculus. The perception of objects and the totality of the visual scene is accomplished by the visual association cortex. The visual association cortex combines all sensory information perceived by the striate cortex which contains thousands of modules that are part of modular neural networks. The neurons in the striate cortex send axons to the extrastriate cortex , a region in the visual association cortex that surrounds the striate cortex. Hearing Hearing, or auditory perception, is the ability to perceive sound by detecting vibrations , [4] changes in the pressure of the surrounding medium through time, through an organ such as the ear. Sound may be heard through solid , liquid , or gaseous matter. In humans and other vertebrates, hearing is performed primarily by the auditory system: Like touch , audition requires sensitivity to the movement of molecules in the world outside the organism. Both hearing and touch are types of mechanosensation. Olfaction Smell, or olfaction, is a chemoreception that forms the sense of smell. Olfaction has many purposes, such as the detection of hazards, pheromones , and food. It integrates with other senses to form the sense of flavor. The olfactory epithelium is made up of at least six morphologically and biochemically different cell types. This may occur by diffusion or by the binding of the odorant to odorant-binding proteins. The mucus overlying the epithelium contains mucopolysaccharides , salts, enzymes , and antibodies these are highly important, as the olfactory neurons provide a direct passage for infection to pass to the brain. This mucus acts as a solvent for odor molecules, flows constantly, and is replaced approximately every ten minutes. Taste Taste is the sensation produced when a substance in the mouth reacts chemically with taste receptor cells located on taste buds in the oral cavity , mostly on the tongue. Taste, along with smell olfaction and trigeminal nerve stimulation registering texture, pain, and temperature , determines flavors of food or other substances. Humans have taste receptors on taste buds gustatory calyculi and other areas including the upper surface of the tongue and the epiglottis. The tongue is covered with thousands of small bumps called papillae , which are visible to the naked eye. Within each papilla are hundreds of taste buds. There are between and [17] taste buds that are located on the back and front of the tongue. Others are located on the roof, sides and back of the mouth, and in the throat. Each taste bud contains 50 to taste receptor cells. The sensation of taste includes five established basic tastes: Sweet, umami, and bitter tastes are triggered by the binding of molecules to G protein-coupled receptors on the cell membranes of taste buds. Saltiness and sourness are perceived when alkali metal or hydrogen ions enter taste buds, respectively. As taste senses both harmful and beneficial things, all basic tastes

are classified as either aversive or appetitive, depending upon the effect the things they sense have on our bodies. Not all mammals share the same taste senses: Physiology of Behaviour 11th ed. Archived from the original on Flavour and Fragrance Journal. United States of America: Retrieved 22 March Retrieved 5 April

Chapter 2 : Sensory System â€¢ Anatomy, Structure, & Physiology

Your nervous system is made up of two main parts: the brain and the spinal cord, which combine to form the central nervous system; and the sensory and motor nerves, which form the peripheral nervous system.

Nociceptor Nociceptors respond to potentially damaging stimuli by sending signals to the spinal cord and brain. This process, called nociception , usually causes the perception of pain. Nociceptors detect different kinds of damaging stimuli or actual damage. Those that only respond when tissues are damaged are known as "sleeping" or "silent" nociceptors. Thermal nociceptors are activated by noxious heat or cold at various temperatures. Mechanical nociceptors respond to excess pressure or mechanical deformation. Chemical nociceptors respond to a wide variety of chemicals, some of which are signs of tissue damage. They are involved in the detection of some spices in food. Sensory cortex[edit] All stimuli received by the receptors listed above are transduced to an action potential , which is carried along one or more afferent neurons towards a specific area of the brain. While the term sensory cortex is often used informally to refer to the somatosensory cortex , the term more accurately refers to the multiple areas of the brain at which senses are received to be processed. For the five traditional senses in humans, this includes the primary and secondary cortexes of the different senses: This cortex is further divided into Brodmann areas 1, 2, and 3. Brodmann area 3 is considered the primary processing center of the somatosensory cortex as it receives significantly more input from the thalamus , has neurons highly responsive to somatosensory stimuli, and can evoke somatic sensations through electrical stimulation. Areas 1 and 2 receive most of their input from area 3. There are also pathways for proprioception via the cerebellum , and motor control via Brodmann area 4. S2 Secondary somatosensory cortex. The human eye is the first element of a sensory system: Visual cortex[edit] The visual cortex refers to the primary visual cortex, labeled V1 or Brodmann area 17 , as well as the extrastriate visual cortical areas V2-V5. The auditory cortex is composed of Brodmann areas 41 and 42, also known as the anterior transverse temporal area 41 and the posterior transverse temporal area 42 , respectively. Both areas act similarly and are integral in receiving and processing the signals transmitted from auditory receptors. Nose Primary olfactory cortex[edit] Located in the temporal lobe, the primary olfactory cortex is the primary receptive area for olfaction , or smell. Unique to the olfactory and gustatory systems, at least in mammals , is the implementation of both peripheral and central mechanisms of action. The peripheral mechanisms involve olfactory receptor neurons which transduce a chemical signal along the olfactory nerve , which terminates in the olfactory bulb. The chemo-receptors involved in olfactory nervous cascade involve using G-protein receptors to send their chemical signals down said cascade. The central mechanisms include the convergence of olfactory nerve axons into glomeruli in the olfactory bulb, where the signal is then transmitted to the anterior olfactory nucleus , the piriform cortex , the medial amygdala , and the entorhinal cortex , all of which make up the primary olfactory cortex. In contrast to vision and hearing, the olfactory bulbs are not cross-hemispheric; the right bulb connects to the right hemisphere and the left bulb connects to the left hemisphere. Gustatory cortex[edit] The gustatory cortex is the primary receptive area for taste. The word taste is used in a technical sense to refer specifically to sensations coming from taste buds on the tongue. The five qualities of taste detected by the tongue include sourness, bitterness, sweetness, saltiness, and the protein taste quality, called umami. In contrast, the term flavor refers to the experience generated through integration of taste with smell and tactile information. The gustatory cortex consists of two primary structures: Similarly to the olfactory cortex, the gustatory pathway operates through both peripheral and central mechanisms. Peripheral taste receptors , located on the tongue , soft palate , pharynx , and esophagus , transmit the received signal to primary sensory axons, where the signal is projected to the nucleus of the solitary tract in the medulla , or the gustatory nucleus of the solitary tract complex. The signal is then transmitted to the thalamus , which in turn projects the signal to several regions of the neocortex , including the gustatory cortex. Scent, in contrast, is not combined with taste to create flavor until higher cortical processing regions, such as the insula and orbitofrontal cortex.

Chapter 3 : Nervous and Special Senses - Anatomy & Physiology - WikiVet English

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Functions of Special Senses The functions of the five special senses include: Sight or vision is the capability of the eye s to focus and detect images of visible light on photoreceptors in the retina of each eye that generates electrical nerve impulses for varying colors, hues, and brightness. Hearing or audition is the sense of sound perception. Taste refers to the capability to detect the taste of substances such as food, certain minerals, and poisons, etc. Touch or somatosensory, also called tactition or mechanoreception, is a perception resulting from activation of neural receptors, generally in the skin including hair follicles, but also in the tongue, throat, and mucosa. External and Accessory Structures The accessory structures of the eye include the extrinsic eye muscles, eyelids, conjunctiva, and lacrimal apparatus. Anteriorly, the eyes are protected by the eyelids, which meet at the medial and lateral corners of the eye, the medial and lateral commissure canthus , respectively. Projecting from the border of each eyelid are the eyelashes. Modified sebaceous glands associated with the eyelid edges are the tarsal glands; these glands produce an oily secretion that lubricates the eye; ciliary glands, modified sweat glands, lie between the eyelashes. A delicate membrane, the conjunctiva, lines the eyelids and covers part of the outer surface of the eyeball; it ends at the edge of the cornea by fusing with the corneal epithelium. The lacrimal apparatus consists of the lacrimal gland and a number of ducts that drain the lacrimal secretions into the nasal cavity. The lacrimal glands are located above the lateral end of each eye; they continually release a salt solution tears onto the anterior surface of the eyeball through several small ducts. The tears flush across the eyeball into the lacrimal canaliculi medially, then into the lacrimal sac, and finally into the nasolacrimal duct, which empties into the nasal cavity. Lacrimal secretion also contains antibodies and lysozyme, an enzyme that destroys bacteria; thus, it cleanses and protects the eye surface as it moistens and lubricates it. Six extrinsic, or external, eye muscles are attached to the outer surface of the eye; these muscles produce gross eye movements and make it possible for the eyes to follow a moving object; these are the lateral rectus, medial rectus, superior rectus, inferior rectus, inferior oblique, and superior oblique. The Eyeball The eye itself, commonly called the eyeball, is a hollow sphere; its wall is composed of three layers, and its interior is filled with fluids called humors that help to maintain its shape. Layers Forming the Wall of the Eyeball Now that we have covered the general anatomy of the eyeball, we are ready to get specific. The outermost layer, called the fibrous layer, consists of the protective sclera and the transparent cornea. The middle eyeball of the layer, the vascular layer, has three distinguishable regions: Most posterior is the choroid, a blood -rich nutritive tunic that contains a dark pigment; the pigment prevents light from scattering inside the eye. Moving anteriorly, the choroid is modified to form two smooth muscle structures, the ciliary body, to which the lens is attached by a suspensory ligament called ciliary zonule, and then the iris. The pigmented iris has a rounded opening, the pupil, through which light passes. The innermost sensory layer of the eye is the delicate two-layered retina, which extends anteriorly only to the ciliary body. The outer pigmented layer of the retina is composed pigmented cells that, like those of the choroid, absorb light and prevent light from scattering inside the eye. The transparent inner neural layer of the retina contains millions of receptor cells, the rods and cones, which are called photoreceptors because they respond to light. Electrical signals pass from the photoreceptors via a two-neuron chain-bipolar cells and then ganglion cellsâ€” before leaving the retina via optic nerve as nerve impulses that are transmitted to the optic cortex; the result is vision. The photoreceptor cells are distributed over the entire retina, except where the optic nerve leaves the eyeball; this site is called the optic disc, or blind spot. Lateral to each blind spot is the fovea centralis, a tiny pit that contains only cones. Lens Light entering the eye is focused on the retina by the lens, a flexible biconvex, crystal-like structure. The lens divides the eye into two segments or chambers; the anterior aqueous segment, anterior to the lens, contains a clear, watery fluid called aqueous humor; the posterior vitreous segment posterior to the lens, is filled with a gel-like substance called either vitreous humor, or the vitreous body. Vitreous humor helps prevent the eyeball from collapsing inward by reinforcing it internally. Aqueous humor is similar to blood

plasma and is continually secreted by a special of the choroid; it helps maintain intraocular pressure, or the pressure inside the eye. Aqueous humor is reabsorbed into the venous blood through the scleral venous sinus, or canal of Schlemm, which is located at the junction of the sclera and cornea. Eye Reflexes Both the external and internal eye muscles are necessary for proper eye function. When the eyes are suddenly exposed to bright light, the pupils immediately constrict; this is the photopupillary reflex; this protective reflex prevents excessively bright light from damaging the delicate photoreceptors. The pupils also constrict reflexively when we view close objects; this accommodation pupillary reflex provides for more acute vision. Hearing and Balance At first glance, the machinery for hearing and balance appears very crude. Anatomy of the Ear Anatomically, the ear is divided into three major areas: External Outer Ear The external, or outer, ear is composed of the auricle and the external acoustic meatus. The external acoustic meatus is a short, narrow chamber carved into the temporal bone of the skull ; in its skin-lined walls are the ceruminous glands, which secrete waxy, yellow cerumen or earwax, which provides a sticky trap for foreign bodies and repels insects. Sound waves entering the auditory canal eventually hit the tympanic membrane, or eardrum, and cause it to vibrate; the canal ends at the ear drum, which separates the external from the middle ear. Middle Ear The middle ear, or tympanic cavity, is a small, air-filled, mucosa-lined cavity within the temporal bone. The tympanic cavity is flanked laterally by the eardrum and medially by a bony wall with two openings, the oval window and the inferior, membrane-covered round window. The pharyngotympanic tube runs obliquely downward to link the middle ear cavity with the throat, and the mucosae lining the two regions are continuous. The tympanic cavity is spanned by the three smallest bones in the body, the ossicles, which transmit the vibratory motion of the eardrum to the fluids of the inner ear; these bones, named for their shape, are the hammer, or malleus, the anvil, or incus, and the stirrup, or stapes. Internal Inner Ear The internal ear is a maze of bony chambers, called the bony, or osseous, labyrinth, located deep within the temporal bone behind the eye socket. The three subdivisions of the bony labyrinth are the spiraling, pea-sized cochlea, the vestibule, and the semicircular canals. The bony labyrinth is filled with a plasma-like fluid called perilymph. Suspended in the perilymph is a membranous labyrinth, a system of membrane sacs that more or less follows the shape of the bony labyrinth. The membranous labyrinth itself contains a thicker fluid called endolymph. Taste and Smell The receptors for taste and olfaction are classified as chemoreceptors because they respond to chemicals in solution. Olfactory Receptors and the Sense of Smell Even though our sense of smell is far less acute than that of many other animals, the human nose is still no slouch in picking up small differences in odors. The thousands of olfactory receptors, receptors for the sense of smell, occupy a postage stamp-sized area in the roof of each nasal cavity. The olfactory receptor cells are neurons equipped with olfactory hairs, long cilia that protrude from the nasal epithelium and are continuously bathed by a layer of mucus secreted by underlying glands. When the olfactory receptors located on the cilia are stimulated by chemicals dissolved in the mucus, they transmit impulses along the olfactory filaments, which are bundled axons of olfactory neurons that collectively make up the olfactory nerve. The olfactory nerve conducts the impulses to the olfactory cortex of the brain.

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Chapter 4 : Special Senses Anatomy and Physiology â€¢ Nurseslabs

Nervous System and Special Senses. -sympathetic nervous system A sensation of an acute burning pain along the path of a peripheral nerve sometime accompained.

Biological Aspects of Psychology click to play it. Question by author Vampjezzc. The Mystery of Synaesthesia click to play it. Question by author jungleeyes. Neurology and Psychiatry click to play it. Question by author vishal-nl. The cerebellum and the occipital lobe The cerebellum and the occipital lobe of the cerebrum are divided by the tentorium cerebelli. The left and right cerebral hemisphere are connected via the corpus callosum and divided by the fissura longitudinalis cerebri. The pons and the medulla are both structures within the brain stem. Roughly it can be said that the brain stem and the cerebellum are divided by the aquaeductus mesencephali, tectum mesencephalicum and canalis centralis. The Nervous System click to play it. Question by author mzbabymysty. Endoneurium Perineurium is the covering around a group of axons. Epineurium is the covering around the entire nerve. This condition is reffered to as? Question by author ivyfoo. There are two forms of ARMD: The "dry" form is marked by atrophy and degeneration of retinal cells. The "wet" form results from development of new and leaky blood vessels close to the macula. The macula is a small, oval, yellowish area to the side of the optic disc. It contains a central depression called the fovea centralis that is composed of cones and is the location of the sharpest vision in the eye. Question by author Lauren If pain is still felt after three to six months, it is classed as chronic. Human Neuroanatomy click to play it. Question by author chickenkev. Choroid plexus CSF is secreted from the choroid plexus in the lateral ventricles and reabsorbed at the arachnoid granulations.

Chapter 5 : Special senses - Wikipedia

Medical Anatomy and Physiology Unit Six- Nervous System / Special Senses Page 3 Draft Copy ANSWER KEY Prefixes, Suffixes, and Root Words af to, toward-al pertaining to.

Chapter 6 : Cranial Nerves & The Special Senses

Block 3 VIRGINIA CAMPUS Neurological System and Special Senses WEEK 3 1/18/18 T ime/Date Monday, February 12 Tuesday, February 13 Wednesday, February 14 Thursday, February 15 Friday, February

Chapter 7 : Disorders of special senses - Oxford Medicine

The nervous system is a complex collection of nerves and specialized cells known as neurons that transmit signals between different parts of the body. It is essentially the body's electrical.

Chapter 8 : Sensory nervous system - Wikipedia

This is the part of the nervous system that does not include the brain and the spinal cord. There are 2 types of nerves - sensory and motor nerves. Sensory Nerves carry information about the surroundings from the sense receptors in the skin, eyes, ears, nose and tongue, along the spinal cord to the brain to be interpreted.

Chapter 9 : Nervous System: Special Senses Lab by Makayla Wells on Prezi

The Peripheral Nervous System includes both cranial nerves and spinal nerves, and is commonly divided into the somatic nervous system and the autonomic nervous racedaydvl.com somatic nervous system co-ordinates body movements and also receives external stimuli.