CROSSSECTIONAL ANATOMY OF THE BRAIN pdf

1: Cross-Sectional Anatomy: The Brain (Part A) - ProProfs Quiz

Anatomy of the brain: how to visualize anatomic labels. This module is a comprehensive and affordable learning tool for medical students and residents and especially for neuro-radiologists and radiation oncologists.

In this lesson you will learn CT cross sectional brain anatomy. This lesson is divided into four sections. The first section discusses CT brain imaging. The second section offers introductory brain anatomy. The third section offers actual CT brain images at different levels of the scan with labeled anatomy for learning, figures depicting where the level of the scan is in relationship to the body, and labeling activities for some of the learning sections to test the anatomy presented at each specific level. Continue on to the next page to start Section 1. There are four parts to this section. Continue on to the next page to begin. First, are the regions of the brain. These regions include the frontal lobe, parietal lobe, occipital lobe, temporal lobe, brain stem, cerebellum, and spinal cord. The cerebrum is the largest part of the brain and is composed of the different lobes. The cerebrum controls perception, imagination, thought judgment, and decisions. Locate these parts of the brain on the image below. Second, on this page and the next, are brain images illustrating the lateral ventricles located within the cerebrum. CSF is the cushiony fluid that protects the brain and spine from trauma and is produced by a cluster of blood vessels that line the ventricles. These clusters of blood vessels are known as the choroid plexus. Together, the ventricles of the brain hold about a glassful of CSF. The CSF flowing through the ventricles has several functions including: In other words, the CSF acts to cushion a blow to the head and lessen the impact. Therefore, pressure at the base of the brain is reduced. Excretion of waste products: Endocrine medium for the brain: Hormones released into the CSF can be carried to remote sites of the brain where they may act. The lateral ventricles are the largest of the ventricles and have an irregular shape. Parts of the lateral ventricles include: Its roof and anterior border are formed by the corpus collosum, its vertical medial wall by the septum pellucidum. The floor is formed by the head of the caudate nucleus. Its roof is formed by fibers of the corpus collosum. Its roof is formed by the white substance of the cerebral hemisphere. Along the medial border is the stria terminalis and the tail of the caudate nucleus. The amygdaloid nucleus bulges into the terminal part of the inferior horn. The floor and the medial wall are formed by the fimbria, the hippocampus and the collateral eminence. Third, is an image depicting all of the ventricles. The ventricular system consists of four ventricles. These are the right and left lateral ventricles, the third ventricle, and the fourth ventricle. The lateral ventricles both communicate via the interventricular foramina with the third ventricle, found centrally within the diencephalon. The lateral ventricles consist of two curved openings that conform to the shape of each half of the brain. Their shape is often likened to a horseshoe. There is one lateral ventricle on each side of the brain that pass though all four lobes, providing a pathway for the CSF. The third ventricle communicates via the cerebral aqueduct, located within the midbrain, with the fourth ventricle, found within the hindbrain. The three foramina to the subarachnoid space are found here, permitting CSF produced in the ventricles to surround the brainstem, cerebellum, and cerebral cortex. The fourth ventricle is also continuous with the central canal, allowing CSF to bathe the inside surface of the spinal cord as well. Locate the following on the image below: The Circle of Willis also called the cerebral arterial circle, arterial circle of Willis, or Willis Polygon is a circle of arteries that supply blood to the brain. It is named after Thomas Willis â€” , an English physician. The Circle of Willis is made up of the following major components: Open the slide show below and click through the slide images to begin learning about the Circle of Willis. Now that you have learned the components of the Circle of Willis, try doing the labeling activity below.

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2: Neuroanatomy Coronal Brain Sections

This MRI brain cross sectional anatomy tool is absolutely free to use. Use the mouse scroll wheel to move the images up and down alternatively use the tiny arrows (>>) on both side of the image to move the images.

Sequencing and organization Language In general, the left hemisphere of the brain is responsible for language and speech and is called the "dominant" hemisphere. The right hemisphere plays a large part in interpreting visual information and spatial processing. In about one third of people who are left-handed, speech function may be located on the right side of the brain. Left-handed people may need special testing to determine if their speech center is on the left or right side prior to any surgery in that area. Aphasia is a disturbance of language affecting speech production, comprehension, reading or writing, due to brain injury â€" most commonly from stroke or trauma. The type of aphasia depends on the brain area damaged. If this area is damaged, one may have difficulty moving the tongue or facial muscles to produce the sounds of speech. The person can still read and understand spoken language but has difficulty in speaking and writing i. The individual may speak in long sentences that have no meaning, add unnecessary words, and even create new words. They can make speech sounds, however they have difficulty understanding speech and are therefore unaware of their mistakes. Cortex The surface of the cerebrum is called the cortex. It has a folded appearance with hills and valleys. The nerve cell bodies color the cortex grey-brown giving it its name â€" gray matter Fig. Beneath the cortex are long nerve fibers axons that connect brain areas to each other â€" called white matter. The cortex contains neurons grey matter , which are interconnected to other brain areas by axons white matter. The cortex has a folded appearance. A fold is called a gyrus and the valley between is a sulcus. Each fold is called a gyrus, and each groove between folds is called a sulcus. There are names for the folds and grooves that help define specific brain regions. Deep structures Pathways called white matter tracts connect areas of the cortex to each other. Messages can travel from one gyrus to another, from one lobe to another, from one side of the brain to the other, and to structures deep in the brain Fig. Coronal cross-section showing the basal ganglia. It plays a role in controlling behaviors such as hunger, thirst, sleep, and sexual response. It also regulates body temperature, blood pressure, emotions, and secretion of hormones. The pituitary gland is connected to the hypothalamus of the brain by the pituitary stalk. It secretes hormones that control sexual development, promote bone and muscle growth, and respond to stress. It has some role in sexual development. It plays a role in pain sensation, attention, alertness and memory. These nuclei work with the cerebellum to coordinate fine motions, such as fingertip movements. Included in this system are the cingulate gyri, hypothalamus, amygdala emotional reactions and hippocampus memory. Memory Memory is a complex process that includes three phases: Different areas of the brain are involved in different types of memory Fig. Your brain has to pay attention and rehearse in order for an event to move from short-term to long-term memory â€" called encoding. Structures of the limbic system involved in memory formation. The prefrontal cortex holds recent events briefly in short-term memory. The hippocampus is responsible for encoding long-term memory. Short-term memory, also called working memory, occurs in the prefrontal cortex. It stores information for about one minute and its capacity is limited to about 7 items. For example, it enables you to dial a phone number someone just told you. It also intervenes during reading, to memorize the sentence you have just read, so that the next one makes sense. Long-term memory is processed in the hippocampus of the temporal lobe and is activated when you want to memorize something for a longer time. This memory has unlimited content and duration capacity. It contains personal memories as well as facts and figures. Skill memory is processed in the cerebellum, which relays information to the basal ganglia. It stores automatic learned memories like tying a shoe, playing an instrument, or riding a bike. Ventricles and cerebrospinal fluid The brain has hollow fluid-filled cavities called ventricles Fig. Inside the ventricles is a ribbon-like structure called the choroid plexus that makes clear colorless cerebrospinal fluid CSF. CSF flows within and around the brain and spinal cord to help cushion it from injury. This circulating fluid is constantly being absorbed and replenished. CSF is produced inside the ventricles deep within the brain. CSF fluid circulates inside the brain and spinal cord and then outside to the subarachnoid space. Common sites of obstruction: There are two ventricles deep within the

cerebral hemispheres called the lateral ventricles. They both connect with the third ventricle through a separate opening called the foramen of Monro. The third ventricle connects with the fourth ventricle through a long narrow tube called the aqueduct of Sylvius. From the fourth ventricle, CSF flows into the subarachnoid space where it bathes and cushions the brain. CSF is recycled or absorbed by special structures in the superior sagittal sinus called arachnoid villi. A balance is maintained between the amount of CSF that is absorbed and the amount that is produced. A disruption or blockage in the system can cause a build up of CSF, which can cause enlargement of the ventricles hydrocephalus or cause a collection of fluid in the spinal cord syringomyelia. Skull The purpose of the bony skull is to protect the brain from injury. The skull is formed from 8 bones that fuse together along suture lines. These bones include the frontal, parietal 2 , temporal 2 , sphenoid, occipital and ethmoid Fig. The face is formed from 14 paired bones including the maxilla, zygoma, nasal, palatine, lacrimal, inferior nasal conchae, mandible, and vomer. The brain is protected inside the skull. The skull is formed from eight bones. Inside the skull are three distinct areas: A view of the cranial nerves at the base of the skull with the brain removed. Cranial nerves originate from the brainstem, exit the skull through holes called foramina, and travel to the parts of the body they innervate. The brainstem exits the skull through the foramen magnum. The base of the skull is divided into 3 regions: Similar to cables coming out the back of a computer, all the arteries, veins and nerves exit the base of the skull through holes, called foramina. The big hole in the middle foramen magnum is where the spinal cord exits. Cranial nerves The brain communicates with the body through the spinal cord and twelve pairs of cranial nerves Fig. Ten of the twelve pairs of cranial nerves that control hearing, eye movement, facial sensations, taste, swallowing and movement of the face, neck, shoulder and tongue muscles originate in the brainstem. The cranial nerves for smell and vision originate in the cerebrum. The Roman numeral, name, and main function of the twelve cranial nerves:

3: Brain Anatomy, Anatomy of the Human Brain

The cross-sectional anatomy of the normal adrenal gland is identical on CT and MRI. The right adrenal gland lies more cranially in the abdomen than the left adrenal. It is superior to the upper pole of the right kidney, whereas the left adrenal gland is anteromedial to the upper pole of the left kidney.

4: MRI anatomy | free MRI axial brain anatomy

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Out of the three membranes surrounding the brain, the innermost one is called the.

8: Anatomy of the brain -

CROSSSECTIONAL ANATOMY OF THE BRAIN pdf

Cross Sectional Anatomy - Overview Brain Anatomy: Mid-Sagittal Axial CT Image Hintâ€•the Corpus callosum is the only white matter structure to cross midline.

9: The Radiology Assistant : Brain Anatomy

coronal brain sections These coronal sections were made, photographed and labeled by Dr. Bruce Crawford and Kurt McBurney at the University of Victoria. â†' Click on the image of a brain section and a larger version will pop up in a separate window.

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