Two main types of cells in nervous system biology essay

There are two main types of cells in the nervous system. These two types are neurons and neuroglia. A neuron is a nerve cell that transmits impulses of the nervous system. Three main parts make up a neuron: cell body, axon, and dendrite. The cell body of a neuron contains the nucleus and cytoplasm. The axon conducts impulses away from the cell body and is away from the cell body a single slender projection from the cell body. A dendrite sticks out off the cell body. It is shaped somewhat like a tree branch.

Neuroglia is a type of connective tissue that supports the neurons. Neuroglia protects the nervous system instead of conducting impulses. Neuroglia use a process called phagocytosis to get rid of any unwanted substances. Neuroglia come in three types; astrocytes, microglia, and oligodendrocytes. Astrocytes are cells that possess many processes for attachment.

Astrocytes are more plentiful than any other neuroglia, and are only present in the central nervous system. Astrocytes combined with the walls of a blood capillary, prevent harmful substances from passing from the blood to the brain.

Microglia have branch like processes protruding from their bodies. The purpose of microglia is to remove debris, waste products, and pathogens from nervous tissue. Microglia increase in number when there is an injury or infection of the tissue. Oligodendrocytes have processes that protrude from their body and coil around axons. Oligodendrocytes main purpose is to be an electrical insulator and help speed the conduction of nerve impulses.

#2

The peripheral nervous system contains twelve pairs of cranial nerves and thirty-one pairs of spinal nerves. The peripheral nervous system transmits sensory and motor impulses to and from the central nervous system and other parts of the body.

The peripheral nervous system (PNS) is made of nerves. According to Comprehensive medical Terminology 3rd Edition by Betty Davis Jones, “ A nerve is a cord like bundle of nerve fibers that transmits impulses to and from the brain and spinal cords to other parts of the body. A nerve is macroscopic (i. e., able to be seen without the aid of a microscope). A ganglion is a knot like mass of nerve cell bodies located outside the CNS.”

The peripheral nervous system also has afferent and efferent nerves. Afferent nerves are sensory nerves that carry impulses from the body to the central nervous system. Efferent nerves are motor nerves that carry impulses from the central nervous system to the muscles and glands. Efferent nerves make the organs respond to a command by completing an action. There are two smaller nervous systems within the PNS called the somatic nervous system and the autonomic nervous system. The main difference between the somatic and autonomic nervous system is that the somatic nervous system is under voluntary control of the skeletal muscle contractions and the autonomic nervous system operates under involuntary control of the smooth and cardiac muscle as well as glandular activities and secretions.

#3

The two main components of the central nervous system are the spinal cord and the brain. There is a protective membrane that surrounds the contents of the central nervous system. The membrane is made up of connective tissue called meninges as well as cerebrospinal fluid. The meninges are made up of three layers of membranes. The first layer is the dura mater. The dura mater is a tough white connective tissue. The second layer of the meninges is the arachnoid membrane. The arachnoid membrane is a thin layer of strands that connect to the innermost layer of meninges. The third layer is the pia meter. The pia meter is bound tightly to the surface of the CNS contents.

#4

The brain, one of the organs found in the central nervous system can be divided into four sections. The first section is the cerebrum. The cerebrum controls consciousness, memory, sensations, emotions, and voluntary movements. The second section is the cerebellum. The cerebellum maintains muscle tone and coordinates normal movement as balance. The third section of the brain is the diencephalon which contains the thalamus, and the hypothalamus. The thalamus receives sensory stimuli and relays them to the cerebral cortex. The hypothalamus activates, controls, and integrates the peripheral autonomic nervous system, processes, and some sensory functions like body temperature, sleep, and appetite. The fourth and final section of the brain is the brain stem.

“ The brain stem serves as a pathway for conduction of impulses between the brain and spinal cord. It controls such vital functions as respiration, blood pressure, and hear rate. (Davis Jones, 2008)”

#5

There are many pathological conditions that one may come across. Following will be a list of the just a few along with a description and treatment options for each.

Anencephaly is where a child is born without a brain and spinal cord. It is a congenital disorder. A child born with this disorder cannot live. Anencephaly can be detected during pregnancy by the use of amniocentesis or ultrasonography.

Carpal Tunnel Syndrome is pain caused by pinching or compressing of the median nerve. Inflammation and swelling of the tendons is what causes the pinching or compression. The pain of Carpal Tunnel Syndrome is the worst during the night. The inflammation associated with Carpal Tunnel Syndrome is caused by repetitious overuse of the fingers, hands, or wrists. There is a treatment for Carpal Tunnel Syndrome which includes taking anti-inflammatory medication, applying splints, attending physical therapy, and stopping the overuse. If these actions do not fix the problem, surgery may be necessary to relieve the pressure.

A cerebral contusion is a “ bruise” of the brain tissue that appears when the brain strikes the inner skull. Cerebral contusions cause swelling of the brain. Symptoms consistent with a cerebral contusion are combativeness,

increased intracranial pressure, and altered levels of consciousness. Treatments for cerebral contusions are close observation, hospitalization, maintain cerebral perfusion, and administer corticosteroids, and osmotic diuretics.

A headache or cephalagia is another pathological condition. Cephalagia is chronic to acute pain in the cranial cavity. A headache may be the result of a disease or other condition, but may also be benign. Treatment for headaches includes taking a mild analgesic.

Petit mal seizures are a type of seizure where there is a sudden short time of unconsciousness. Unconsciousness associated with petit mal seizures last only a few seconds. Signs of a petit mal seizure are blank facial expression or repeated blinking for a short time. Most people suffering from petit mal seizures are small children prior to puberty.

Peripheral neuritis is inflammation of one or more peripheral nerves. Other disorders are associated with peripheral neuritis such as trigeminal neuritis, Bell’s palsy, and carpal tunnel syndrome. Each disorder produces unique symptoms and has different treatments.

Neuroblastoma is a malignant tumor in the sympathetic nervous system. Neuroblastoma occurs in the adrenal medulla and usually spreads to the liver, lungs, lymph nodes, and bone.

Parkinson’s disease is a slow deterioration of the nerves in the brain stem’s motor system. Signs and symptoms associated with Parkinson’s disease are stooped posture, bowed head, shuffling gait, expressionless face, muffled

speech, and difficulty swallowing. Treatment for Parkinson’s disease is drug therapy, controlling the symptoms, and physical therapy. A surgical technique called a pallidotomy is sometimes used, but is not always successful.

Shingles is a viral infection in adults who have had chicken pox. Shingles causes inflammation of the spinal or cranial nerve pathway. Symptoms commonly associated with shingles are server pain, fever, itching, GI disturbances, headache, general tiredness, and increased skin sensitivity. Treatment for shingles includes antiviral medications, analgesics, and corticosteroids.

Spinal bifida cystic is a disorder in which the back part of one or more vertebrae is not normally closed. In this opening, cysts come through the fifth lumbar.

There are tons of other pathological conditions a person may develop all of which have different symptoms, effects, and treatments.