Nervous system

•Body's control center and _____ network, shares maintenance of homeostasis with endocrine

Organs and divisions of nervous system

•_____ Nervous system (CNS)
–Brain, Spinal cord
•_____ nervous system (PNS)
–Somatic (body) – Afferent (sensory), efferent skeletal muscles
•Autonomic nervous system (ANS)
–Sympathetic -stimulate,
–Parasympathetic -restores

Coverings

•Skull, spine, meninges CSF
•3 membranes called the meninges:
–_____ *mater* – tough outer layer, "tough mother"
–_____ – webby middle, spider layer
–_____ – delicate inner layer on brain

Covering con't

•Serous fluid– Dura, Arachnoid
•_____ fluid (CSF) – arachnoid, pia
•Enclosed within meninges, Acts as shock absorber, 150 cc in adult
•_____ – abnormal accumulation of CSF

Cells of the N.S.

•_____ – nerve cell, transmits electrochemical changes
•Cell body – regular cell functions
•_____ – receptive nerve fibers which carry impulses to the cell body, short, branched and many
•_____ – carry impulses away from cell body, long, one

Cells of N.S con't

•_____ sheath – fatty substances surrounding axon
•_____ cell – produce myelin, neurilemma
•Node of _____ – Gap / indentations along myelin sheath
•Neurilemma – outer covering around axon
•_____ - Greek means nerve – glue, Gives support to nerve tissue

•_____ – star shaped, blood – brain barrier, prevent toxic substances
•_____ – phagocytosis of unwanted substances
-_____ – provide support, forming sheath in brain and spinal cord
•_____ – lining of cavities in brain and spinal cord

Structural Classification:

•_____ – Several dendrites and one axon (brain, spinal cord)
•_____ – one dendrite and one axon (retina, inner ear, nose)
•_____ – one process that splits into axon with dendrite endings (sensory)

Functional Characteristics:

•_____ – nerve endings that respond to stimuli
•Sensory (_____) – unipolar, bring impulses from receptors to CNS
•via periphery
•_____ (association) – connect motor to sensory neurons –lie within CNS
•Motor (_____) – multipolar, carry impulses from CNS to muscle and glands for reaction

_____ arc

•Route a nerve impulse takes (simplest pathway) involuntary
•5 STEPS: Receptors – sensory – interneurons – motor – action
•_____ – space separating two neurons of a reflex arc

Nerve Impulse Transmission

•At rest, the inner surface of a neuron is more negatively charged than the outside. When charges are separated there is a potential for work. (_____ *potential*)
•When a neuron receives a stimulus Na + ions are pumped into the cell, making that point more positive on inside this is called _____

Nerve Impulse Transmission con't

_____ *potential* – potential across the membrane of an active neuron, moves in one direction down the fiber.
•_____ – returning of a neuron to its resting potential, sodium pumped back outside. A neuron can not carry another impulse until it returns to its resting potential

Speed of impulse

- Greater diameter neuron – faster impulse
- Axons with myelin are faster than those without

_____

- Chemical which transmit impulses across synapse
- Synapse – axon of one, near the dendrite of another, the gap
- _____ – at myoneural junction
- Norepinephrine, dopamine, serotonin, _____ (adrenaline)
- _____ – released CNS – morphine like, block the conduction of pain impulses.

Grouping of neural tissue:

- _____ – bundles of parallel axons
- _____ matter – nervous tissue made up of myelinated fibers (axons)
- _____ matter – cells bodies, dendrites, unmyelinated axons in brain
- (cortex)
- _____ – Nerve cell bodies, outside CNS in groups

Grouping of neural tissue con't:

- _____ – Bundle of fibers inside the CNS,
- while *Ascending* tracts move up, senses,
- *Descending* tracts – move down, motor
- Nucleus – mass of nerve cell bodies, gray
- _____ – area of gray matter

Spinal Cord

- Tube – like mass of nerves (1/2 "diameter)
- Runs from foramen magnum to 2nd lumbar vertebra (16 – 18 inches), 3 meninges
- X section - H or _____ pattern (cell bodies and dendrites)

Spinal Cord

•Ascending tracts – neurons carrying impulses to brain
•Descending tracts – from brain
•Controls reflexes of body below neck
•Injury may lead to: _____ – loss of sensation, _____ – loss of ability to move

Peripheral N.S.

•Spinal Nerves
•31 pair named for vertebra (name and number) which they exit C 1-__, T 1-___, L 1-___ S 1-___ and___
•Ramus - branch of spinal neuron
•Plexus - group of spinal nerves
•_____ – collection of nerve cell bodies outside the CNS

Name & Number The Spinal Nerves II

Peripheral N.S.

•(Each pair of spinal nerves connects to a segment of the spinal cord by two points of attachment called roots.)
•Dorsal root – senses, Ventral root – motor
•_____ – area of skin supplied by individual sensory nerves

List The Principal Parts of The Brain

Brain stem (lowest part)

•_____ ***oblongata*** – All ascending and descending nerve tract, nerves "cross over", Control center for respiratory, vasomotor and cardiac activity
•_____ - breathing
•***Midbrain*** – eye / head to visual stimuli, head / trunk to loud noises

Diencephalon

•Between midbrain and cerebrum, optic chiasma, 2 major structure
•_____ -Links N.S. to endocrine system, Controls autonomic activities, mind over body, _____
•Helps regulate body temp, appetite and water balance
•Connected to pituitary gland
•_____ - Relays impulses to cerebrum from sense organs, Relates sensation with emotions

_____

•2nd largest, behind and below cerebrum
•Helps coordinate body movement (balance) and maintain posture
•Outer – gray, inner – white

Cerebrum

•Largest, outer portion, _____ – ridge, Sulcus – grove,)_____ – deep sulcus
•2 hemispheres divides by _____ fissure and connected by the corpus callosum
•Outer layer – gray matter, inner – white matter called cortex
_____ - Cavities within brain

Cerebrum

•Sensory – 5 senses plus variations ex. Pressure, Pain, Proprioception, Controls movement
•Integrative function – that which goes on between reception of impulse and a response
•_____ – state of awareness (coma, REM sleep, anesthesia, ASC), Memory (long term, short term)
•Language – usually controlled by the left hemisphere
•Emotions – limbic system – called the "emotional brain"

Consists of 5 lobes

•_____ – mood, motivation, voluntary muscles
•Temporal – hearing, smell
•_____ – control center for touch ect.
•Occiptial – hearing, smell
•Insula

List The Principal Parts of The Brain II

Cranial nerves

•12 pairs numbered I – XII in order from front to back
•Name relates to destination or function
•Olfactory – smell
•Optic – Sensory vision
•Oculomotor – eyeball movement, pupil reflex
•Trochlear – eye movement
•_____ – Chewing, touch to facial area

Cranial nerves

•Abducens – eye movement, abduction
•_____ – facial expressions, taste
•Acoustic (_____) – hearing, balance (equilibrium)
•Glossopharyngeal – swallowing, taste, saliva
•_____ - Esophagus, larynx
•_____ – movement of head, swallowing
•_____ –tongue movement, speech, swallowing

List The 12 Cranial Nerves & Their Functions (cont.)

_____ N.S.

•ANS part of NS regulates involuntary action, Controls glands, smooth muscles (Visceral effector) and cardiac muscle
•Preganglionic – from brain stem and sacral nerve
•Post ganglionic – short to muscle or gland
•Both use acetylcholine as neurotransmitter

Divisions

•_____ - Prepare emergencies, Heart rate, blood vessels –Flight or fight, Epinephrine, adrenaline
•_____ – Conserves body resources, slow body function, CNS control, Homeostasis, Restores after emergency

Conditions

_____ - Inflammation of the meninges
_____ - overactive brain, seizures
_____ - inflammation of brain tissue, mosquito bite
_____ - tremors of hand, shuffling walk