

The Nervous System

Part 5 • Spinal Nerves, Reflexes, and Neurological Disorders

Name: _____ Date: _____ Block: _____

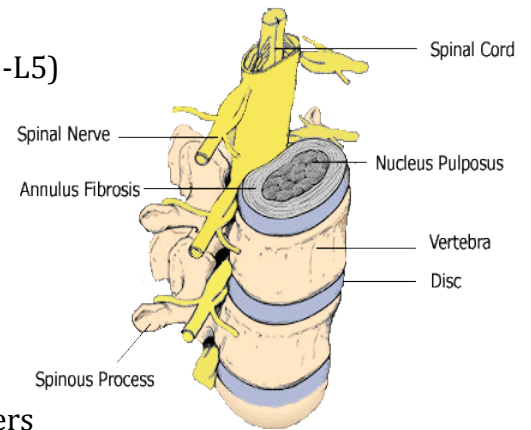


Spinal Nerves

- Humans have _____ of spinal nerves, each roughly corresponding to a segment of the vertebral column:

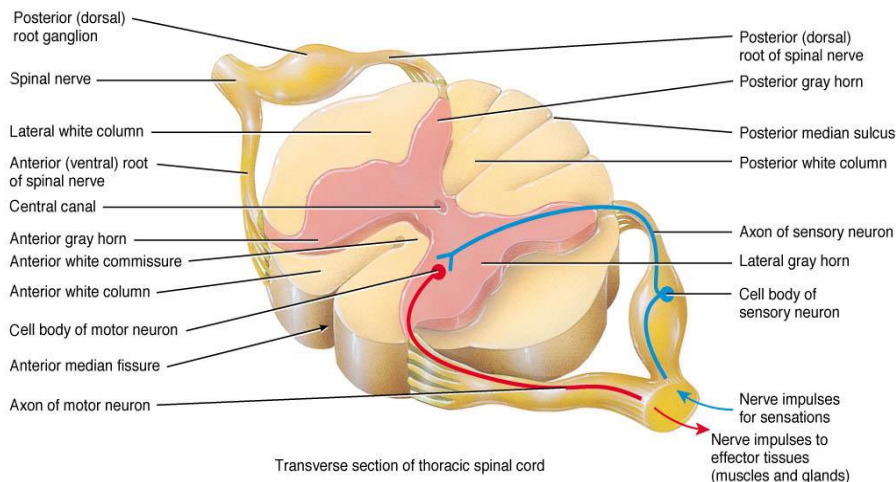
- _____ spinal nerve pairs (C1-C8)
- _____ pairs (T1-T12)
- _____ lumbar pairs (L1-L5)
- _____ pairs (S1-S5)
- _____ pair.

- The spinal nerves are part of the _____.



Spinal Nerve Composition

- Each spinal nerve is formed from the combination of nerve fibers
 - The _____ root is the _____ root and carries sensory information to the brain.
 - The _____ root is the _____ root and carries motor information from the brain.
- Outside the spinal column, the nerves _____
 - Approximately _____ of nerves throughout the human body!



Reflexes

- Rapid, predictable, _____ responses to _____
1. **Somatic Reflexes:** _____
 - Ex.) Pulling away hand from hot object
 2. **Autonomic Reflexes:** _____
 - Ex.) salivation, digestion, blood pressure, sweating

Reflex Arc

Five elements:

1. _____
2. _____
3. _____
4. _____
5. _____

Patellar Reflex

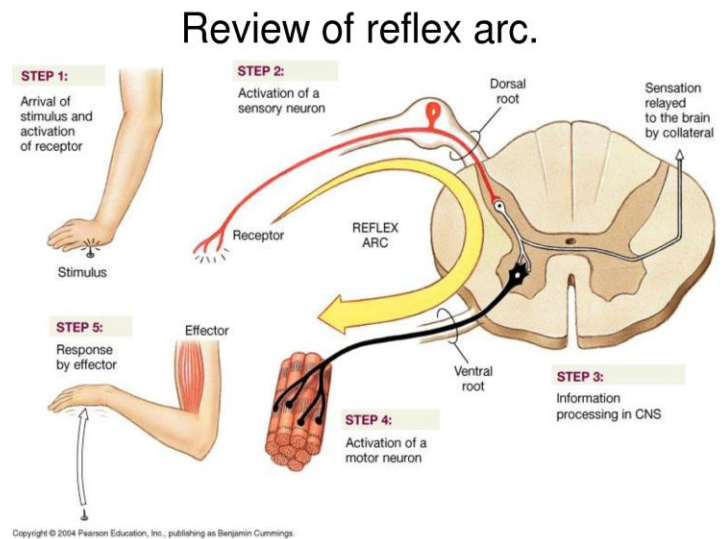
- Stretch reflex
- Tapping _____ causes _____ to contract → knee _____
- Exaggeration or absence of the reaction suggests that there may be damage to the _____

Pupillary Reflex

- Optic nerve → brain stem → _____
- Useful for checking _____

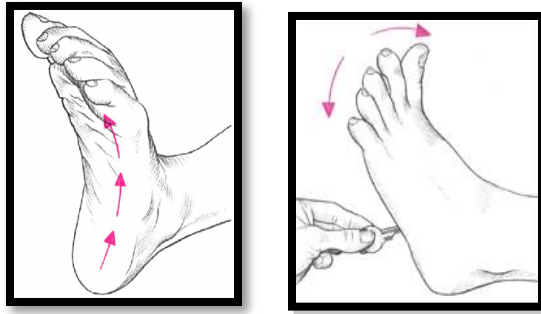
Achilles reflex

- Tap Achilles tendon → movement of _____
 - Positive result would be jerking of the foot towards its plantar surface



Plantar reflex

- Draw object down sole of foot → _____
 - **Babinski's sign:** check to see if _____



PTSD

- Develops after _____
- Evidence that susceptibility to PTSD is **hereditary**. Approximately 30% of the variance in PTSD is caused from genetics alone.
- 3 areas of the brain in which function may be altered in PTSD have been identified:
 - **Prefrontal cortex:** _____
 - **Amygdala:** _____
 - **Hippocampus:** _____
(elongated ridges on the floor of each lateral ventricle)

Alzheimer's Disease

- **Discovered in** _____, Dr. Alois Alzheimer noticed changes in the brain tissue of a woman who had died of an unusual mental illness.
- It is a chronic _____ disease; starts slow and gets worse over time
- Alzheimer's disease is currently ranked as the _____ leading cause of death in the United States
- Most common early symptom is _____
- As the disease advances, **symptoms** can include: _____

- The average life expectancy following diagnosis is _____
- The cause of Alzheimer's disease is **poorly understood**.
 - **About 70% of the risk is believed to be genetic with other risk factors including head injuries, depression, or hypertension.**

ACh and Alzheimer's

- Acetylcholine is found in cells called _____.
These neurons are involved in a variety of functions, including _____
- About 50 years ago, discovered that drugs that block acetylcholine release can block memory functions
 - Later shown that one of the enzymes needed to form acetylcholine → _____
_____ → drops to significantly lower levels in people with Alzheimer's disease
- A significant reduction in the number of cholinergic neurons in the forebrain of Alzheimer's sufferers was found in the 1980s
- Overall → lower production of ACh, lower number of cells that contain it and its receptor sites

Adrenoleukodystrophy

- _____ metabolic disorder, characterized by progressive neurologic deterioration due to _____
- Brain function declines as the _____
is gradually stripped from the brain's nerve cells.
 - Without that sheath, the neurons _____
 - This sequence of events appears to be related to an _____
_____ in the CNS, which sets off an abnormal immune response that leads to demyelination
- Affects approximately _____ people from all races
 - _____
- Three Categories:
 - **Childhood cerebral form:** _____
 - **Adrenomyelopathy:** _____
 - **Addison disease:** _____