

Case Study #1

Learning Objectives

1. Understand the structure of the individual neuron
2. Understand the ionic relationship of both the resting and action potential
3. Understand how neurons communicate with each other (pre- and post-synaptically)
4. Be able to identify structures and functions of the Telencephalon, Diencephalon, Mesencephalon, Metencephalon, and Myelencephalon.
5. Be able to recognize the Sympathetic versus the Parasympathetic divisions of the Autonomic Nervous System.

Scenarios:

- a. Recently, Texas put a criminal to death by lethal injection by the name of Karla Fay Tucker. When lying on the injection table, she was injected with a dose of Potassium Chloride, which ultimately stopped her heart.
- b. Wade Davis writes an account of the following: "Ten minutes after eating the fish (puffer fish which contains tetrodotoxin, a toxin that binds to and BLOCKS the Sodium Receptor) the patient could not raise himself without the greatest exertion...the pulse quick, small and intermittent...breathing became difficult, and consciousness failed...appeared paralytic...finally his heart and respiration ceased some 17 minutes after eating the fish."
- c. Kyle Wilson was rushed to the hospital after suffering a momentary seizure for the first time. After a mandatory CAT scan of Kyle's head, a large mass was found spanning the Central Sulcus of his right hemisphere. His health quickly deteriorated, losing both sensation and movement on his left side. After removing the mass, and physical therapy, Kyle has regained almost 80% of movement and sensation.

In order to understand these scenarios, you must read chapters 2 and 3.

Questions:

Answer all eight for full credit

1. Name the ions that are involved in the action potential.

2. Why did Potassium Chloride stop Ms. Tucker's heart?

