**Chapter 21 Study Guide - Spine, Brain, and Nervous System Injuries**

**LEARNING OBJECTIVES**

* Understand anatomy of brain (neurons/axons, lobes, layers of meninges), nervous system (central and peripheral), spine (5 sections)
* Understand skeletal injuries to head, neck, and back and neurologic injuries related to brain and nervous system
* Understand signs and symptoms of skeletal injuries to head, neck, and back and neurologic injuries related to brain and nervous system
* Be able to assess patient with suspected TBI, spinal injury
* Be able to care for patient with suspected TBI, spinal injury
* Demonstrate how to manually align and stabilize head, neck, and spine (including jams/pretzels)
* Demonstrate how to stabilize patient with c-collar, backboard, and vacuum splint

**KEY POINTS**

* All brain and spinal cord injuries can be life altering and/or life threatening
* If a patient has a serious head or brain injury, automatically consider a spinal injury as well
* Spinal motion restriction can be determined based on MOI and the exam conducted on the patient
* “C3, C4, C5 keep the diaphragm alive”… injuries at/above C3, C4, C5 vertebrae (neck) can cause breathing to cease
* Main goals when working with neurologic injuries are maintaining ABCDs and stabilizing spine
* All patients with significant MOI or positive indication of head, neck and back injuries should have spinal motion restriction on backboard or vacuum splint

**KEY TERMS**

Antegrade amnesia: Loss of memory of events that occurred *after* a traumatic event to the brain.

Axon: Long, slender projection of a neuron that conducts electrical impulses away from the neuron’s cell body.

Cerebral contusion: A bruise to the brain.

Concussion: Temporary unconsciousness or confusion caused by a blow to the head.

Coup-contrecoup brain injury: Dual-impacting of the brain (front and back) into the skull; coup injury occurs on impact (brain slamming forward) and contrecoup occurs at the opposite side of impact (brain rebounding).

Cranium: Skull.

Epidural hematoma: Traumatic brain injury in which buildup of arterial blood occurs between the dura mater and the skull; onset of signs/symptoms is rapid.

Intracerebral hematoma: A hematoma inside the brain from bleeding in brain tissue.

Intracranial pressure: Pressure within the skull; can be exerted on brain tissue and cerebrospinal fluid.

Jams/pretzels: A phrase that refers to the process by which someone who is injured and in an awkward position is returned to normal supine anatomic position while maintaining spinal motion restriction.

Lucid interval: A state in which the patient is relatively alert and becomes increasingly less responsive until they become completely unresponsive.

Retrograde amnesia: Loss of memory of events that occurred *before* a traumatic event to the brain.

Stabilized extrication: Keeping a patient’s spine anatomically aligned/stabilized during removal from an accident, preventing any further damage to spine, brain, or nervous system.

Subdural hematoma: An accumulation of venous blood between the dura mater and the surface of the brain; onset of signs/symptoms is slow.

Traumatic brain injury (TBI): Physical trauma to the brain.

Information gathered from the chapter 21 (p. 509-540) of the 6th edition of *Outdoor Emergency Care: A Patroller’s Guide to Medical Care*.