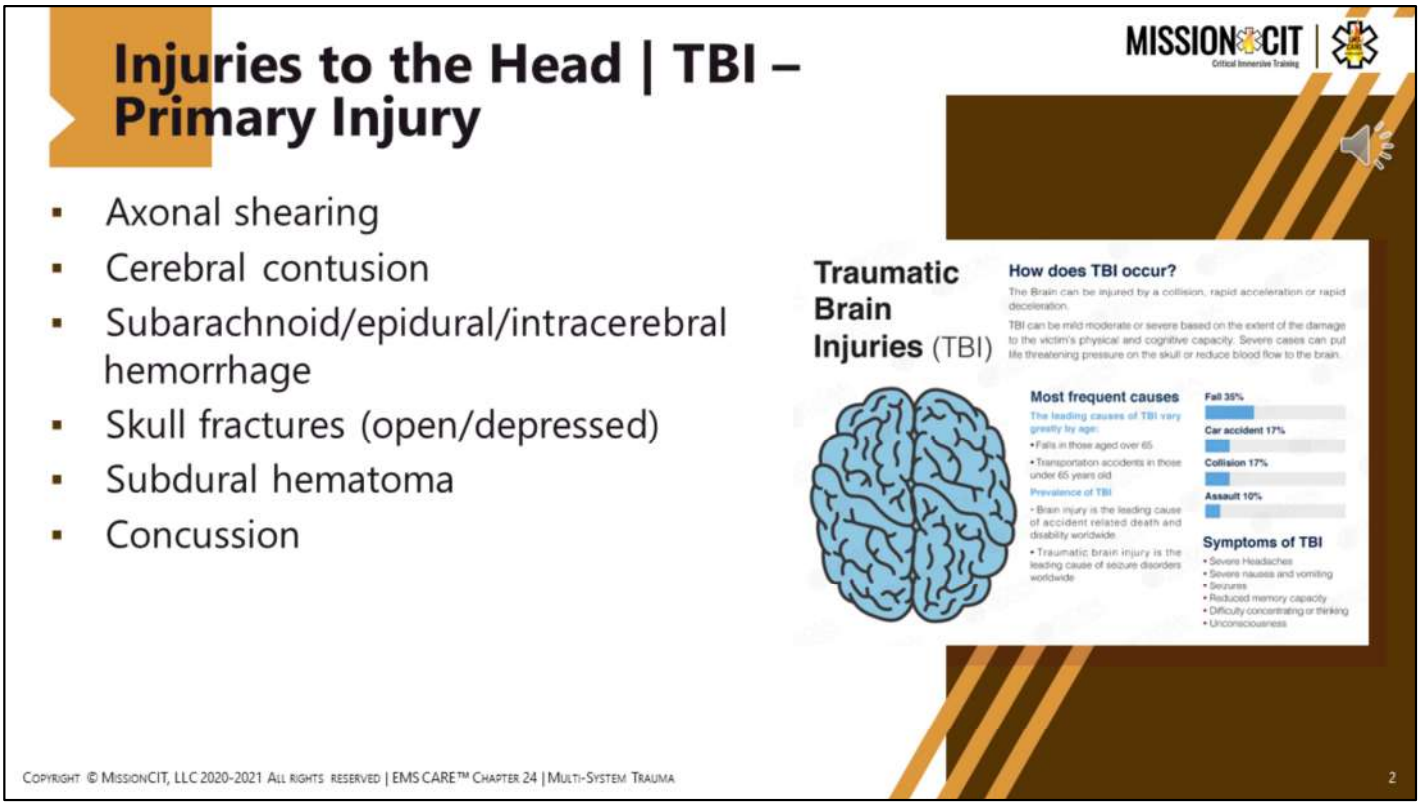
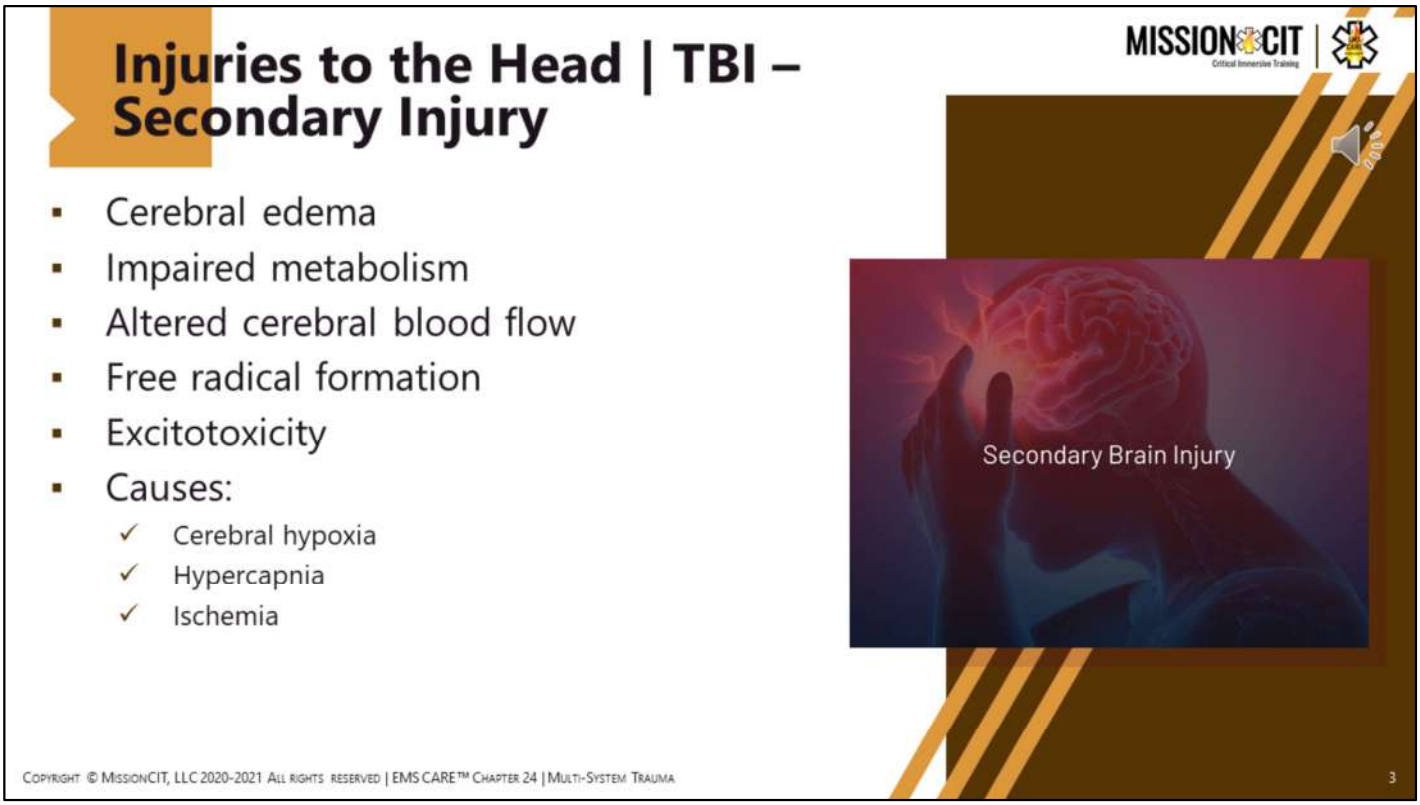


Welcome back. In this lesson we will delve into the topic of specific injuries you may encounter in a multi-system trauma scene.



Traumatic brain injury (TBI) occurs during initial insult and results from initial displacement of physical brain structures.

- Axonal shearing is when the axons of neuron stretched and torn
- Cerebral contusion
- Subarachnoid/epidural/intracerebral hemorrhage
- Skull fractures (open/depressed)
- Subdural hematoma
- Concussion is the most common

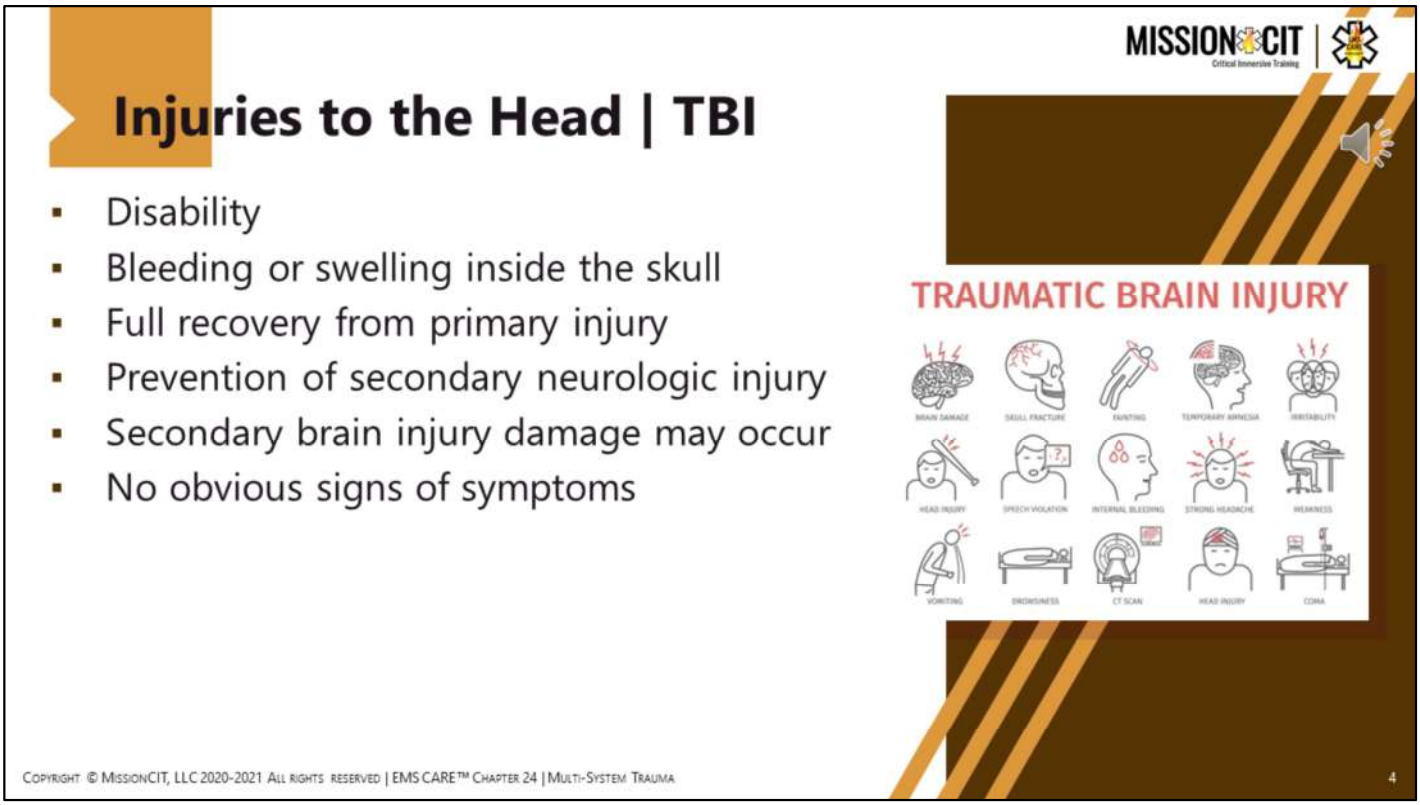


Indirect results from the complications of the injury are:

- Cerebral edema
- Impaired metabolism
- Altered cerebral blood flow
- Free radical formation
- Excitotoxicity

Causes:

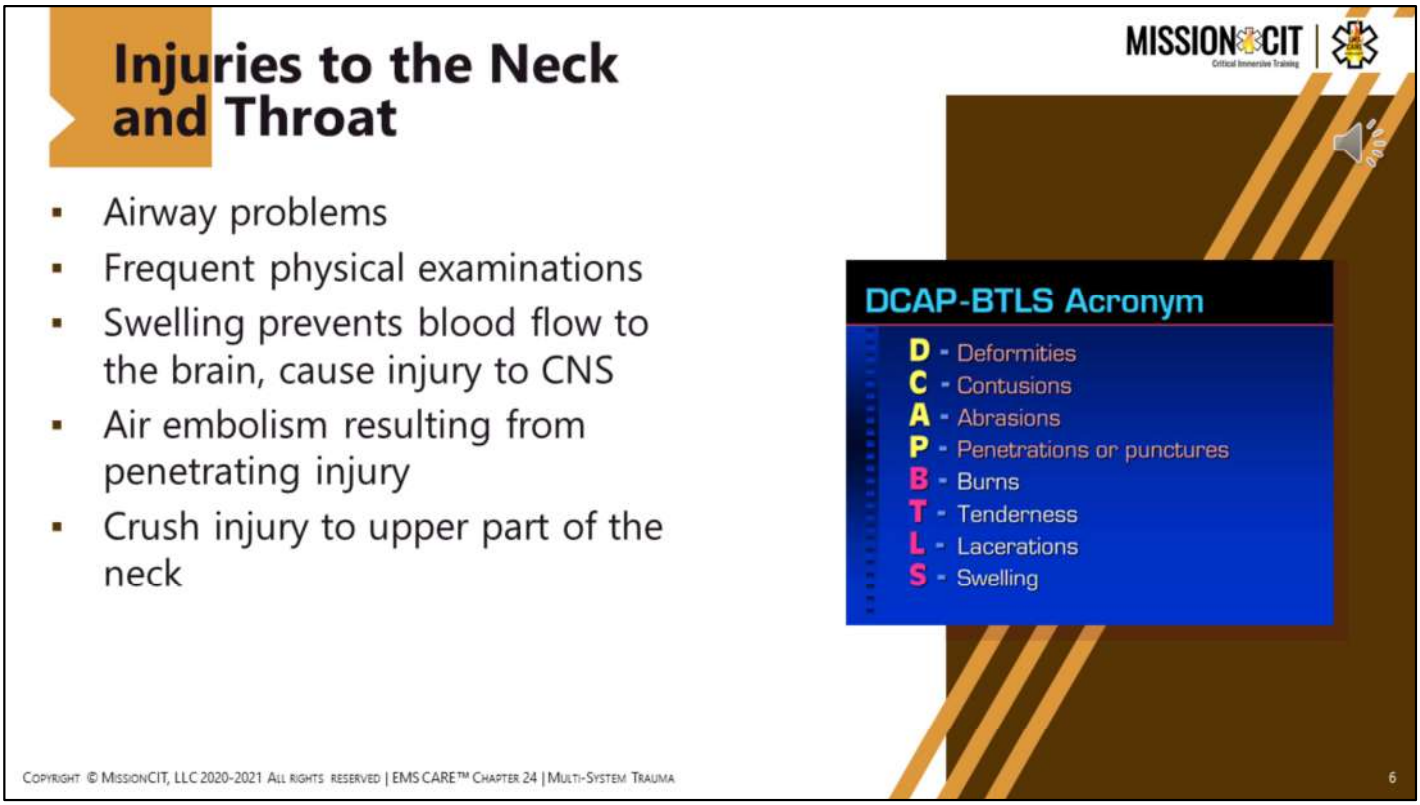
- Cerebral hypoxia
- Hypercapnia
- Ischemia – insufficient blood flow to the brain



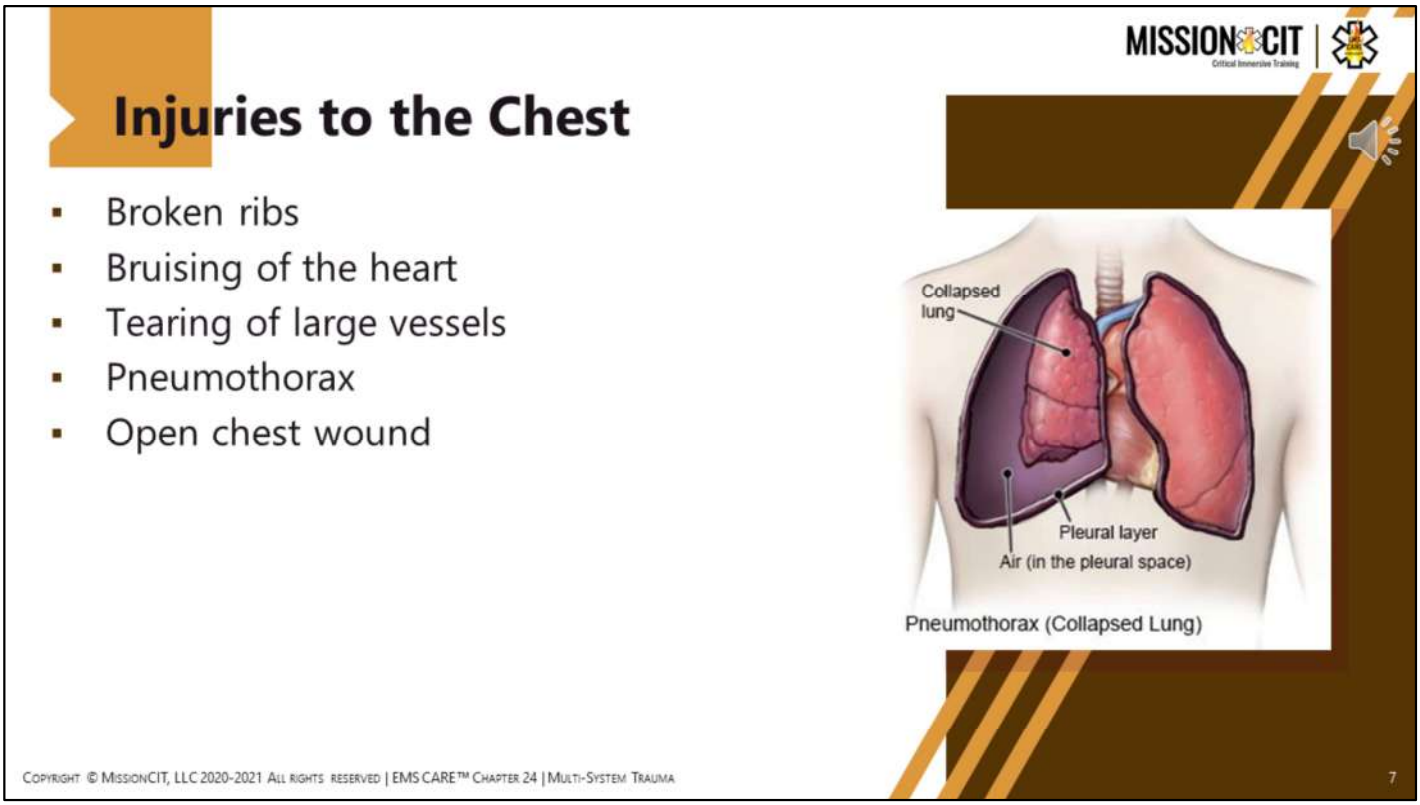
- Survivors of severe and moderately severe head injuries are likely to be left with some degree of disability
- Bleeding or swelling inside the skull is often life-threatening
- Include frequent neurologic examinations in your assessment. The goal of treatment is not only full recovery from the primary injury but the prevention of secondary neurologic injury
- Secondary brain injury is damage that occurs as a result of the body's response to the initial brain injury
- Some patients will not have obvious signs or symptoms until minutes or hours after the injury has occurred



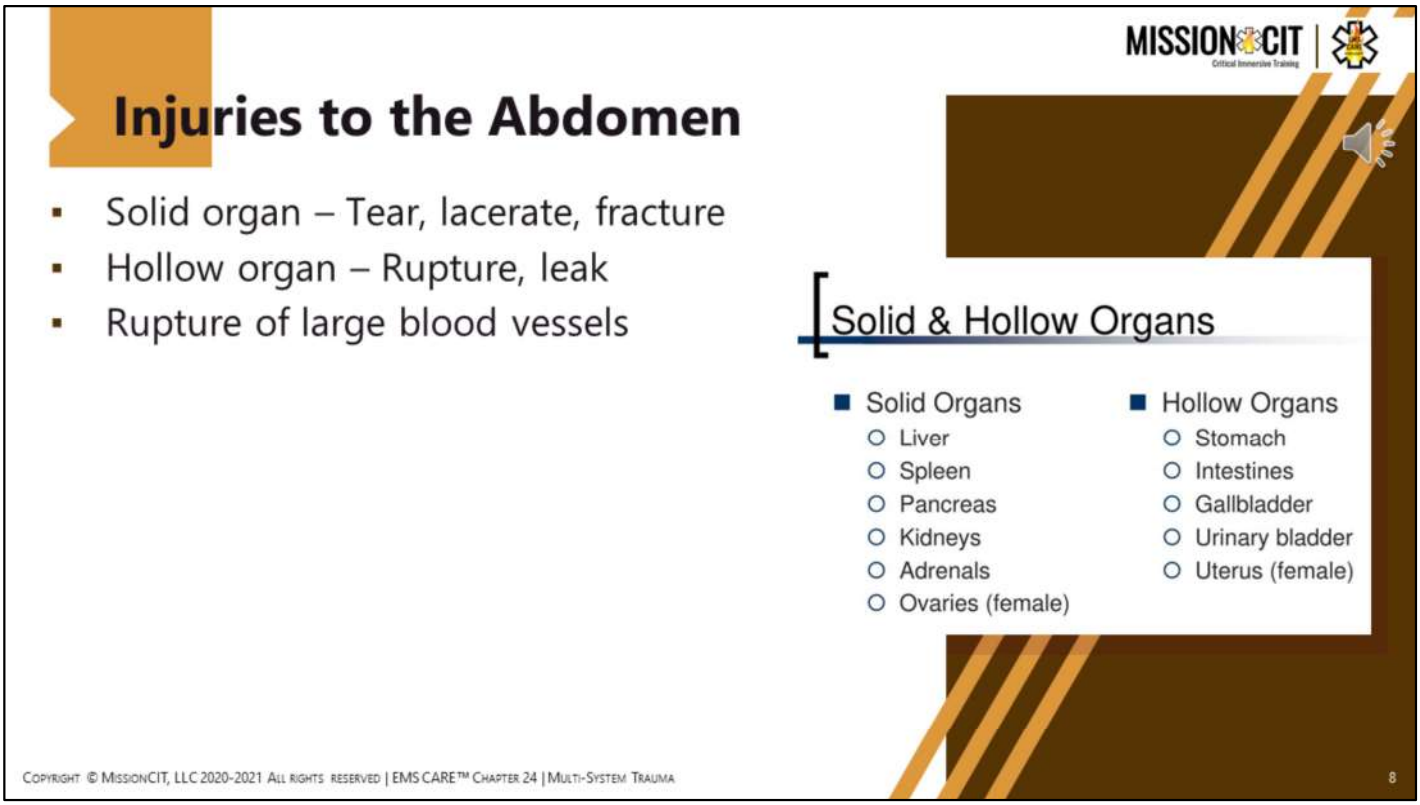
Did you know traumatic brain injury is a leading cause of death and disability in children and young adults in the United States? Drs. Rodgers and Koroshetz explain traumatic brain injuries and post-concussive symptoms.



- Airway problems may result that could quickly become a serious life threat
- Your assessment must include frequent physical examinations looking for DCAP-BTLS in the neck region
    - Assess for jugular vein distention and tracheal deviation
- Swelling may prevent blood flow to the brain and cause injury to the central nervous system
- A penetrating injury may result in an air embolism
- A crushing injury to the upper part of the neck may cause the cartilages of the upper airway and larynx to fracture

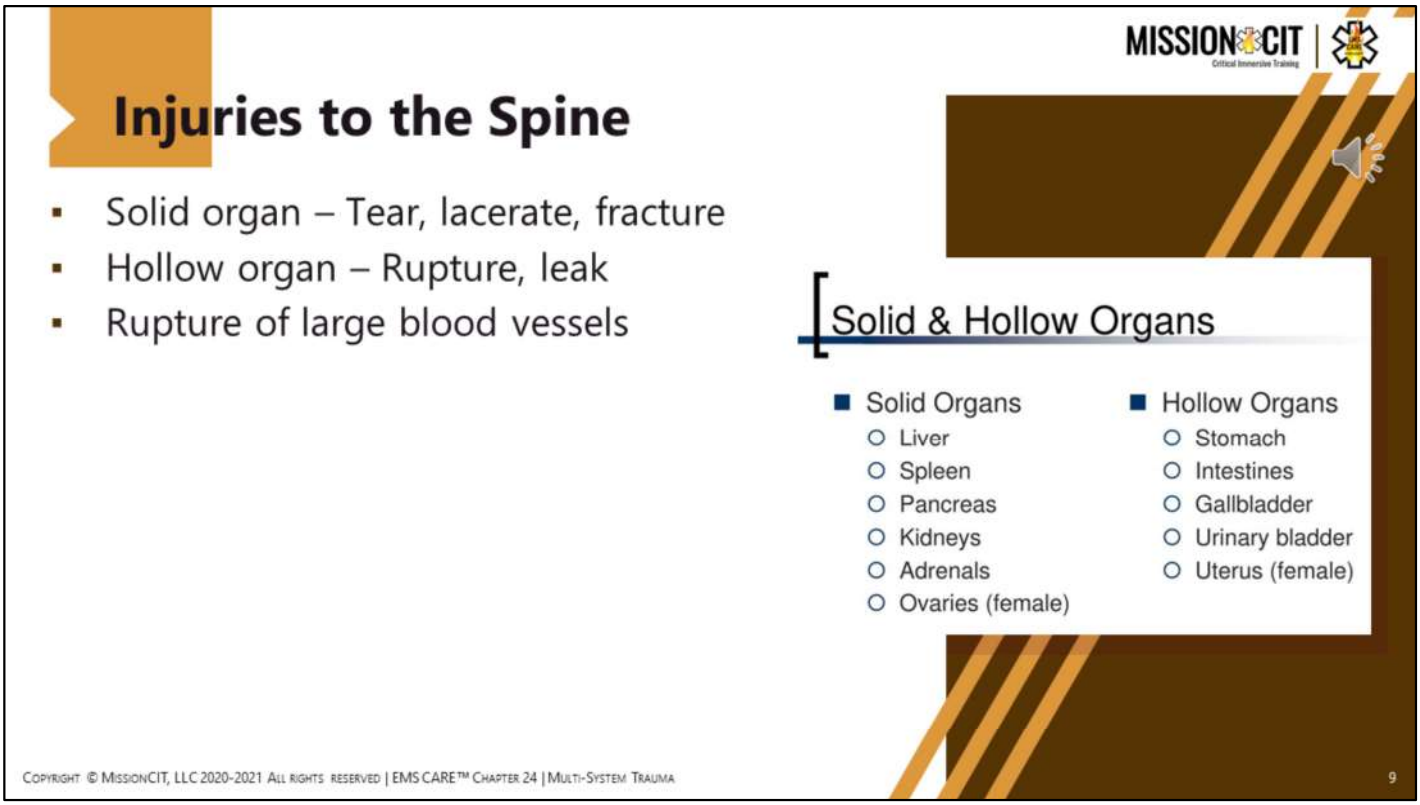


- The chest contains the heart, lungs, and large blood vessels
- Many life-threatening injuries may occur to the chest:
    - Broken ribs may hinder breathing
    - Bruising may occur to the heart and cause an irregular heartbeat
    - Large vessels of the heart may be torn inside the chest causing severe internal bleeding
    - Air may collect between the lung tissue and the chest wall, known as a pneumothorax
- A penetration or perforation of the integrity of the chest is called an open chest wound:
    - If left untreated, shock and/or death will result



The abdomen contains vital organs that require a very high amount of blood flow to perform the functions necessary for life. Here are some possible injuries to the abdomen:

- Solid organs may tear, lacerate, or fracture, which can cause serious bleeding into the abdomen
    - Solid organs include the liver, spleen, pancreas, and kidneys
- Hollow organs may rupture and leak toxic digestive chemicals causing the possibility of a life-threatening infection
    - Hollow organs include the stomach, large and small intestines, and urinary bladder
- The rupture of large blood vessels can cause serious unseen bleeding

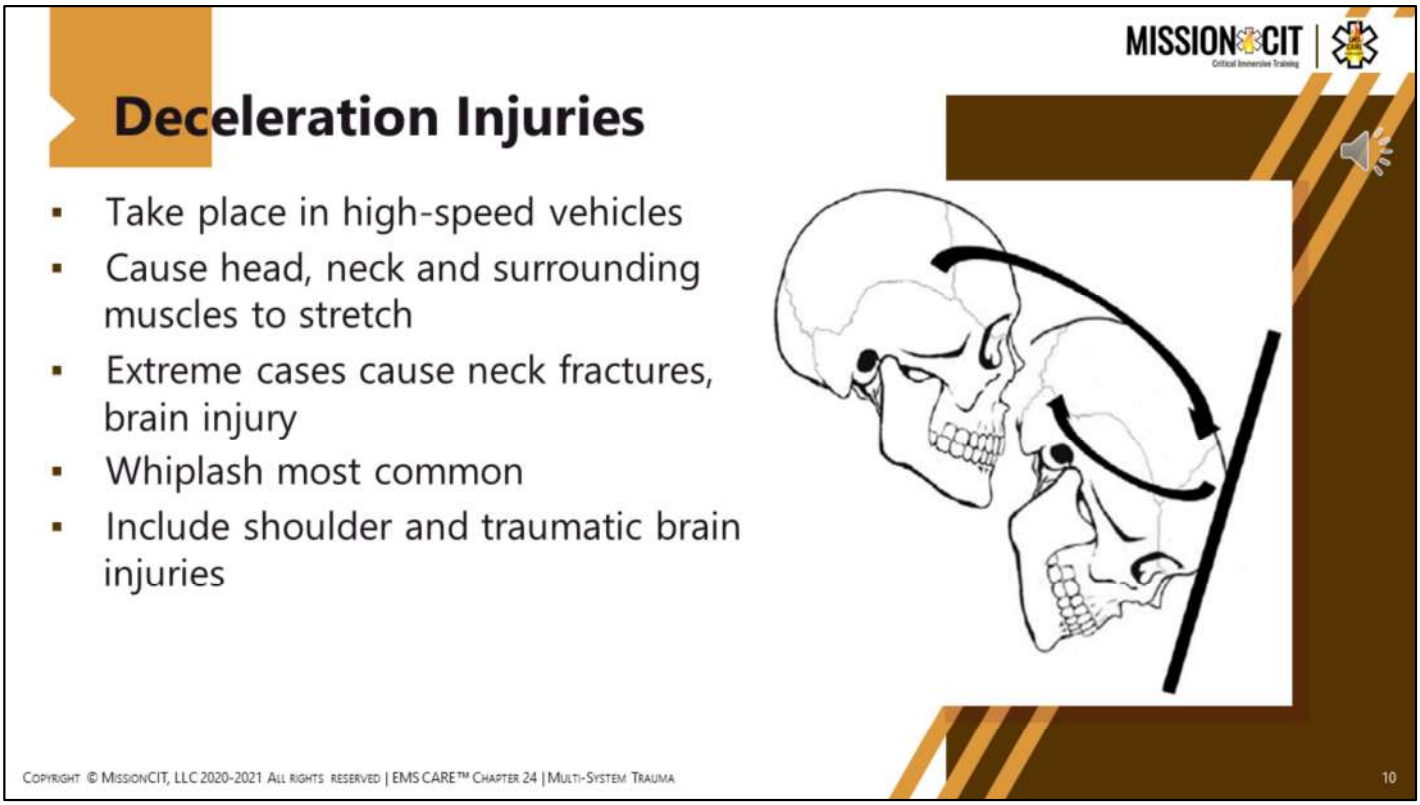


A traumatic spinal cord injury can stem from a sudden, traumatic blow to the spine that fractures, dislocates, crushes or compresses one or more of the vertebrae. It can also result from a gunshot or knife wound that penetrates and cuts your spinal cord.

Additional damage usually occurs over days or weeks because of bleeding, swelling, inflammation and fluid accumulation in and around the spinal cord.

Some common causes of spinal cord injuries are:

- Motor vehicle accidents
- Falls
- Acts of violence usually from gunshot wounds. Knife wounds also are common
- Sports and recreation injuries, and
- Diseases



Deceleration injury can be defined as an impact injury to a body within or upon a rapidly moving object caused by the forces exerted when the object comes to a complete stop. Deceleration injury generally takes place in high-speed vehicles when they abruptly stop or when the vehicles slow down, or when the occupants are propelled from the vehicle while it is moving. These types of injuries are very common and typically cause the head, neck, and surrounding muscles to stretch beyond their normal range of motion.

The most extreme cases of whiplash can cause neck fractures, brain injury, and intense pain and are associated with long recovery times. Whiplash is considered an acceleration-deceleration injury, which can also include shoulder injuries and traumatic brain injuries.

With these words, we come to the end of this lesson.