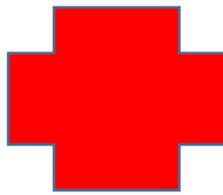


TRAUMA ALERT



**Welcome to the Trauma Alert Education Newsletter brought to you by
Beacon Trauma Services.**

Edition 10 (2021)

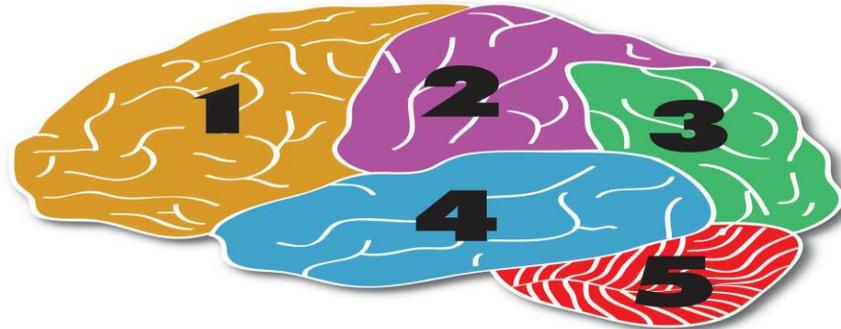
Head Trauma



Source: <https://tinyurl.com/y9vc7ubw>

- Head injuries and traumatic brain injuries (TBI) are among the most common types of trauma that present to emergency departments and trauma centers.
 - Nearly 90% of prehospital trauma related deaths involve brain injuries.
 - 75% of brain injuries can be categorized as having mild injuries, 15% as moderate, and 10% as severe.
 - Every year there are an estimated 80,000 people in the United States that experience long term disabilities as a result of a brain injury.
- When evaluating the patient for a TBI and resulting deficits it is important to know what area of the brain is responsible for what functions. This knowledge can give you clues as to what problems may occur immediately in the patient presentation and what symptoms might develop later in the course of treatment.

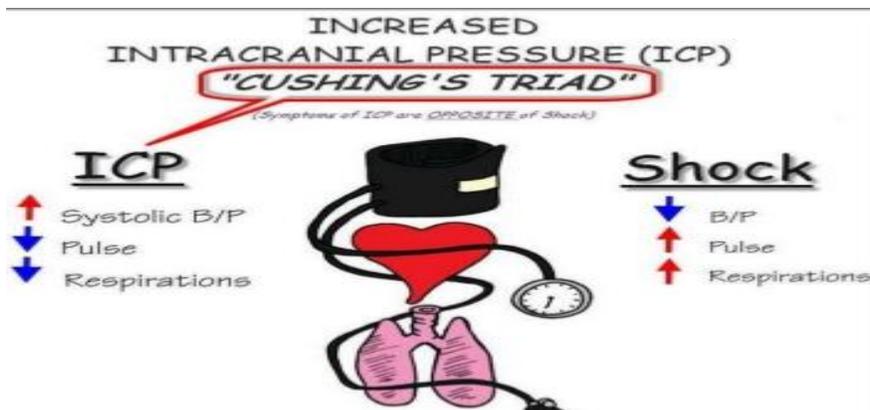
PARTS OF THE BRAIN AND WHAT THEY CONTROL



- 1 FRONTAL LOBE - REASONING, MOTOR SKILLS. HIGH LEVEL COGNITION, EXPRESSIVE LANGUAGE**
- 2 PARIETAL LOBE - SENSATIONS (PRESSURE, TOUCH, PAIN)**
- 3 OCCIPITAL LOBE - SIGHT/VISUAL CORTEX**
- 4 TEMPORAL LOBE - HEARING/AUDITORY/SOUND**
- 5 CEREBELLUM - FINE MOTOR MOVEMENTS, BALANCE**

Source: <https://tinyurl.com/yalapaz6>

- The primary goal of treatment of TBI patients is to prevent secondary brain injury.
- The Monro-Kellie Doctrine states that the total volume of intracranial contents must remain constant, because the cranium is a rigid container and incapable of expanding.
 - When the volume is exceeded the ICP will increase and the body will start to herniate contents out of the cranium to make room for the added volume.
 - The first content that is herniated is cerebral spinal fluid (CSF) which accounts for 10% of the content. The second content that is herniated is blood which accounts for 10% of the content. The brain is the last that is herniated and it is about 80% of the cranium content.



Source: <https://tinyurl.com/52mgbp4a>

- Pre - hospital TBI considerations
 - ABC's first.
 - Protect cervical spine, keep head midline, and elevate the head of the bed thirty degrees.
 - Record and report to the emergency department staff the time of the injury and the initial Glasgow Coma score.
 - Manage the airway and prevent aspiration.
 - Avoid the three H's:
 - Hypoxemia – maintain SaO₂ ≥ 98%.
 - Hypotension – maintain systolic B/P ≥ 100 or at a level to perfuse the brain.
 - Hyperventilation – maintain EtCO₂ 35 – 45.
 - Monitor for signs for increased ICP and be prepared with medications as directed for seizures, perfusion, and sedation.
 - Stop the bleeding to the head.
 - Don't get distracted by what might look like brain matter. It might be subcutaneous tissue from the wound.
- Emergency Department nursing care of the TBI patient
 - It is vital to prevent further brain injury and to recognize complications.
 - All the principles as outlined for the EMS should continue to be followed in the emergency department.
 - Frequent neuro assessments.
 - Limit stimulation that can be induced by: frequent procedures, frequent suctioning, coughing, gagging, vomiting, too tight cervical collar or dressings, loud noises, fever, shivering, and frequent visitors.
 - Report the initial EMS GCS, the last ER GCS, last neuro exam results, and time of injury to Neurosurgery.
 - For example, a patient with a field GCS of 13 that deteriorates to 6 in the ER may have a better prognosis than a patient that starts with a field GCS of 3.
 - Monitor for signs of increased intracranial pressure.
 - Early signs include: nausea, vomiting, altered level of consciousness, dizziness, headache, and mood changes.
 - Late signs include: loss of consciousness, pupil changes, posturing, and seizures.
 - Monitor for drainage from ears and/or nose that could be cerebral spinal fluid (CSF).
 - There are a couple of ways to test the fluid to see if it is positive for CSF.
 - If CSF is suspected to be leaking from the nose and/or ear do NOT pack the area, let it freely drain. Packing will increase the ICP.

- Dip a Dextrostix or test-tape into the fluid. It will test positive for glucose if it is CSF. However, the drainage must be further tested because glucose is also found in blood.
- Another method is to perform a halo test where the leaking fluid is dripped onto a 4x4 gauze or towel. Positive results are indicated by blood coalescing into the center, leaving an outer ring of cerebrospinal fluid.

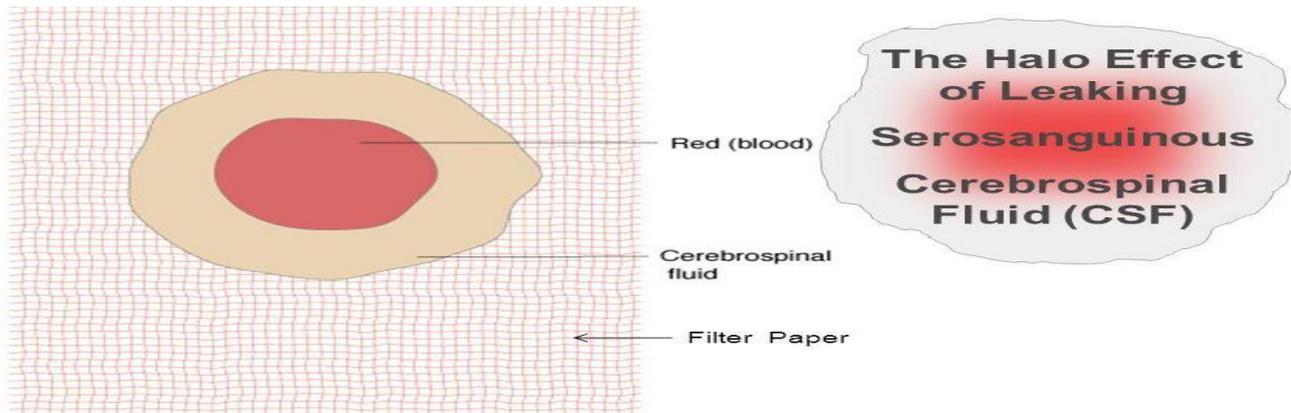


Figure 41-5 Halo sign. Clear drainage that separates from bloody drainage suggests the presence of cerebrospinal fluid.

Source: <https://tinyurl.com/ycogytwz>

- ICU care of the TBI patient
 - In addition to the principles outlined above in the emergency department care of the TBI patient the following should also be implemented:
 - Monitor and maintain all drains and monitors.
 - Monitor patient temperature and keep patient normothermic.
 - Balance sedation with ICP levels and waking patient to follow commands.
 - Maintain as close to normal ICP as possible.
 - The normal ICP is 10 mm Hg.
 - Pressures greater than 22 mm Hg are associated with poor outcomes
 - If patient is unable to communicate, a meeting with the family and healthcare team to discuss the wishes of the patient should be coordinated.
 - In addition to monitoring the SaO₂, EtCO₂, B/P, ICP, and temperature the ICU staff should also closely monitor:
 - CPP (cerebral perfusion pressure) - ≥ 60 .
 - Glucose – 80-120 mg/dl.
 - Sodium – 135 – 145.
- Nursing unit care of the TBI patient
 - Monitor for delayed neuro decline.
 - Monitor the elderly for worsening of a subdural head bleed.
 - Monitor patients for post traumatic seizures and hydrocephalus.

- Monitor Sodium levels closely as they can drop overnight and this can be one of the first signs of a change in the ICP.
 - For example, an admission sodium of 148 that decreases to 136 overnight is a significant drop, even though it is within normal range. This needs to be reported to the neurosurgeon and a complete neurologic exam should be performed.
 - This change in sodium is common in those TBI patients with known ETOH abuse and with frontal head contusions.



Source: <https://tinyurl.com/yag4y9gk>

1. Which of the following is true regarding the management of a TBI patient?
 - a. Keep the oxygen saturations < 95% to maintain brain perfusion.
 - b. Keep the B/P > 150 systolic to keep more blood flowing to the brain.
 - c. Keep the ICP >20 to promote a better outcome.
 - d. None are true.
2. Which of the following are important nursing interventions for the TBI patient?
 - a. Keep the bed elevated at least 30 degrees and keep the head and neck midline.
 - b. Limit stimulation from procedures, noises, and visitors.
 - c. Monitor for signs of increased ICP.
 - d. All are true.
3. Which of the following are early signs of increased ICP?
 - a. Headache and altered level of consciousness.
 - b. Nausea, vomiting and dizziness.
 - c. Unequal or blown pupils.
 - d. A and B are true.

Answers at the end

Recognition/Thank You

- Brain injury awareness month.
- National doctor's day- March 30.
- Social workers month.
- Certified nurse's day-March 19.
- St. Patrick's day- March 17.
- 20th annual trauma symposium- March 19.

Teamwork



Source: <https://tinyurl.com/y9qv28c6>

Test your knowledge Answers-

1. D 2. D 3. D

References-

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