

Pediatric Concussions in the Emergency and Primary Care Settings

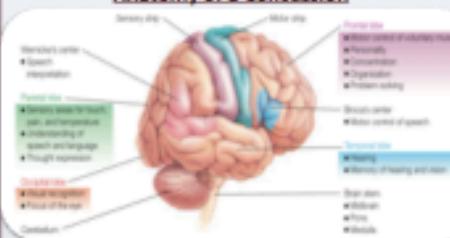
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Abstract

According to the Center for Disease Control and Prevention (CDC), almost half a million (472,947) children under fourteen years of age visit the emergency department due to a concussion yearly in the United States. Concussions are serious head injuries that can influence the ability of the brain to function at its normal capacity. A new study observing children's brains post-concussion found troubling evidence that they may experience long-term effects from a head injury, even after symptoms subside. This poster presents the typical presentation of concussions in children, signs and symptoms to monitor, concussion management and preventative measures. It is vital for all nurses to recognize concussions and understand current evidence-based recommendations for follow-up in the pediatric population.

Anatomy of a Concussion



Obtain a Detailed History

What is the mechanism of injury?

- Time
- Location
- Details

Did the child experience Loss of Consciousness?

- Duration of time

Is the child experiencing post-traumatic amnesia?

- Duration of time

Were seizures observed upon impact or since impact?

- Characteristics
- Duration of time

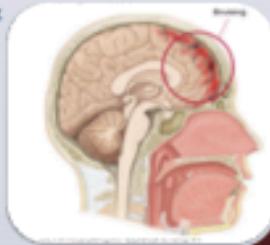
Has the child vomited since the incident?

- Time of onset
- Number of episodes
- Time of last episode

Is the child experiencing a headache?

- Intensity
- Location
- Time of onset
- Analgesia use

What part of the head was impacted?



Emergency Care

Acute Evaluation & Treatment

Step 1: Pediatric Assessment Triangle



Step 2: Pediatric Assessment Triage

1. Critical	2. Acute	3. Urgent	4. Urgent	5. Non-Urgent
Mental Status Changes: <ul style="list-style-type: none"> - GCS < 10 - Confusion - Hard to rouse - Incomprehensible language - Unconscious Other Neurological Symptoms: <ul style="list-style-type: none"> - Altered level of consciousness - Altered LOC - Post-traumatic seizures - Persistent vomiting (1-2 episodes) - Seizures, or any convulsions in the ED - Significant or severe headache - GCS < 11 - Irritable (change in behavior) - Persistent drooling - Requiring over manual - Fluid or blood from the ear 	Head Trauma with one of the following: <ul style="list-style-type: none"> - Age < 3 months - GCS < 10 - Loss of consciousness - External hemorrhage - Any loss of consciousness > 2 minutes - Non-focal hemorrhage 	Normal mental status: <ul style="list-style-type: none"> - Age < 1 month - GCS > 10 - No focal findings - No external hemorrhage 	Age > 1 month <ul style="list-style-type: none"> - 2 yrs with no focal findings - 3-5 yrs with mild, non-focal findings - 6-12 yrs with small hemorrhages or abrasions 	12 yrs with no focal findings <ul style="list-style-type: none"> - Trauma history > 12 hours (ED with normal PVS)

Step 3: Initial RN Rapid Assessment

- Assess Glasgow Coma Scale (GCS), mental status, vital signs, and pain score
- Assess need for cervical spine immobilization
- Notify the MD if concerned about the child's appearance
- Place child on cardiorespiratory (CR) monitor
- Make child NPO
- Assess need for: Analgesia, Anti-emetics, IV fluids
- Document VS, GCS and neuro checks in Epic every hour

Step 4: Is a head Cat Scan or Skull X-ray recommended?

Children <2 years: GCS = 14, other signs of altered mental status, palpable skull fracture, age < 3 months, occipital/parietal/temporal scalp hematomas, history of LOC > 5 seconds, severe mechanism of injury, not acting normally per parent, worsening symptoms during ED observation



Step 5: Is the CT positive for significant Intracranial Injury?

Yes ↓

- Consult Neurosurgery & Trauma Surgery
- Child remains NPO
- Consult to assess VS, GCS and neuro exams every hour. Report any changes.
- Observe child 2-4 hours from time of injury
- Allow child to begin PO challenging
- Continue to assess VS, GCS and neuro exams every hour. Report any changes.

Primary Care

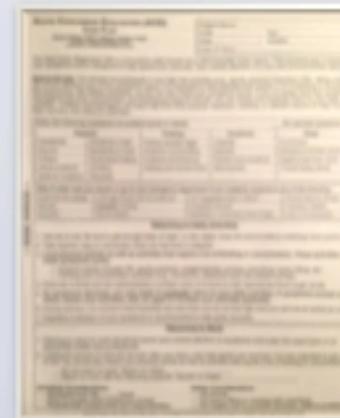
Evaluation and Treatment

- ✓ The child should be seen by Pediatrician for follow up evaluation within 24 hours.
- ✓ Parents should utilize ACE Care plan on a daily basis.
- ✓ Temporary leave from sports/physical activities.
- ✓ Decrease Cognitive function and Concentration
- ✓ Take naps/breaks when fatigued. Sleep.
- ✓ Decrease TV, screen and phone time.
- ✓ Increase fluids and carbohydrates.
- ✓ Evaluate Signs and Symptoms.
- ✓ Monitor emotions.
- ✓ ImPACT Test.
- ✓ Rest.



Acute Concussion Evaluation (ACE) Form

According to the CDC, a concussion is defined as a "complex pathophysiological process affecting the brain, induced by traumatic biomechanical forces secondary to direct or indirect forces to the head". Close evaluation and monitoring of a pediatric concussion patient are vital. The ACE Care Plan is a baseline tool containing: evaluation of Injury Characteristics, Symptom Checklist, Risk Factors for Protracted Recovery, Red Flags, Diagnosis, and Follow-Up Action Plan.



6 Step Return-to-Play Protocol

Table 1. Graduated Return-to-Play Protocol, with additional Step 6¹

Step	Graduated Return-to-Play Protocol	Rehabilitation Stage	Objective of Stage
1	No activity		Recovery
2	Light aerobic exercise		Increased heart rate
3	Sport-specific exercise		Adapt movement
4	Non-contact training drills		Exercise, coordination, cognitive load
5	Full-contact practice		Restore athletes confidence, coaching staff assess functional skills
6			Return to play

Immediate Post-Concussive Assessment & Cognitive Testing (ImPACT)

ImPACT Testing has become the standard computerized concussion evaluation tool across the United States for pediatric and professional sports alike. Athletes take a computerized cognitive evaluation test prior to the start of a sport. After a concussion, a post-game repeat test is given. Composite scores composed of Verbal Memory, Visual Memory, Visual Motor Speed, Reaction time and Impulse Control are assessed, forming a scalable Cognitive Efficiency Index. Diminished cognitive abilities are identified and addressed. As of 2015 all 50 states have mandated concussion safety laws.

Preventative Measures

Buckle your seat belt.

Wear appropriate shoes.

Follow pool safety rules.

Keep your home a safe environment.

Follow age appropriate Car Safety rules

Wear a helmet. Riding a bike, playing sports.

Delay child's early entrance into full-contact sports.

Wear protective gear during sports and physical activities.



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