

# ACUTE CONCUSSION EVALUATION (ACE)

Emergency Department (ED) Version v1.4

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Patient Name \_\_\_\_\_  
 DOB: \_\_\_\_\_ Age: \_\_\_\_\_  
 Date: \_\_\_\_\_ ID/MR# \_\_\_\_\_

**A. Injury Characteristics** Date/Time of Injury \_\_\_\_\_ Reporter:    Patient    Parent    Spouse    Other \_\_\_\_\_

1. Injury Description \_\_\_\_\_

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1a. Is there evidence of a forcible blow to the head (direct or indirect)?    Yes    No    Unknown  
 1b. Is there evidence of intracranial injury or skull fracture?    Yes    No    Unknown  
 1c. Location of Impact:    Frontal    Lt Temporal    Rt Temporal    Lt Parietal    Rt Parietal    Occipital    Neck    Indirect Force  
 2. **Cause:**    MVC    Pedestrian-MVC    Fall    Assault    Sports (specify) \_\_\_\_\_ Other \_\_\_\_\_  
 3. **Amnesia Before (Retrograde)** Are there any events just BEFORE the injury that you/ person has no memory of (even brief)?    Yes    No Duration \_\_\_\_\_  
 4. **Amnesia After (Anterograde)** Are there any events just AFTER the injury that you/ person has no memory of (even brief)?    Yes    No Duration \_\_\_\_\_  
 5. **Loss of Consciousness:** Did you/ person lose consciousness?    Yes    No Duration \_\_\_\_\_  
 6. **EARLY SIGNS:**    Appears dazed or stunned    Is confused about events    Answers questions slowly    Repeats Questions    Forgetful (recent info)  
 7. **Seizures:** Were seizures observed? No    Yes    Detail \_\_\_\_\_

**B. Symptom Check List\*** Since the injury, has the person experienced    any of these symptoms any    more than usual today or in the past day?  
 Indicate presence of each symptom (0=No, 1=Yes). \*Lovell & Collins, 1998 JHTR

PHYSICAL (10)		COGNITIVE (4)		SLEEP (4)	
Headache	0 1	Feeling mentally foggy	0 1	Drowsiness	0 1
Nausea	0 1	Feeling slowed down	0 1	Sleeping less than usual	0 1 N/A
Vomiting	0 1	Difficulty concentrating	0 1	Sleeping more than usual	0 1 N/A
Balance problems	0 1	Difficulty remembering	0 1	Trouble falling asleep	0 1 N/A
Dizziness	0 1	<b>COGNITIVE Total (0-4)</b> _____		<b>SLEEP Total (0-4)</b> _____	
Visual problems	0 1	<b>EMOTIONAL (4)</b>			
Fatigue	0 1	Irritability	0 1		
Sensitivity to light	0 1	Sadness	0 1		
Sensitivity to noise	0 1	More emotional	0 1		
Numbness/Tingling	0 1	Nervousness	0 1		
<b>PHYSICAL Total (0-10)</b> _____		<b>EMOTIONAL Total (0-4)</b> _____			
(Add Physical, Cognitive, Emotion, Sleep totals)					
<b>Total Symptom Score (0-22)</b>					

Other Observations  
 \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_

**Patient Participation:** Full    Partial    None     
**Reason for Partial/None:** Young Age    Confused    Inattentive    Low arousal    Emotional Upset    In Pain    Other \_\_\_\_\_

**C. Concussion History:** Previous# 0 1 2 3 4 5 Date(s) \_\_\_\_\_  
**Headache History:** Prior treatment for headache N    Y    Details \_\_\_\_\_

**D. Diagnosis (ICD):**    Concussion w/o LOC 850.0    Concussion w/ LOC 850.1    Concussion (Unspecified) 850.9    Other (854) \_\_\_\_\_  
   No diagnosis

**E. Follow-Up Action Plan**     Referral to PCP for Office Monitoring MD Name \_\_\_\_\_  
   Neuropsychological Testing (recommended for Return to Sport decisions and academic/ behavioral management)  
   Physician: Neurosurgery    Neurology    Sports Medicine    Physiatry    Psychiatry     
   Other \_\_\_\_\_

ACE-ED Completed by: \_\_\_\_\_ MD RN NP DO

**A concussion** is an injury to the brain as a result of a force or jolt applied directly or indirectly to the head, which produces a range of possible symptoms, and may or may not involve a loss of consciousness. It is a complex pathophysiologic process affecting the brain, induced by traumatic biomechanical forces secondary to direct or indirect forces to the head. Disturbance of brain function is related to neurometabolic dysfunction, rather than structural injury, and is typically associated with normal structural neuroimaging findings (i.e., CT scan, MRI). Concussion may or may not involve a loss of consciousness (LOC). Concussion results in a constellation of cognitive, somatic, emotional and sleep-related symptoms. Duration of symptoms are variable and may last for as short as several minutes and last as long as several days, weeks, months or even longer in some cases.

## ACE ED Instructions

### **A. Injury Characteristics**

1. **Injury Description:** Ask for **description of events** resulting in the injury; how the injury occurred, type of force, location on head.
2. **Cause:** Indicate the cause of injury or write in Other cause.
- 3/4. **Amnesia:** Determine whether child was not registering memories (amnesia) – **before** (retrograde) and **after** (anterograde) injury. Estimate length of time for each (Retrograde amnesia “What is the **last thing** you remember before your injury?” Anterograde amnesia “What is the first thing you remember after your injury?”)
5. **Loss of consciousness (LOC)** - If occurs, determine length of LOC.
6. **Early signs observed by others.** Ask the individuals who know the patient (parent, spouse, friend, etc.) about signs of the concussion/ mTBI that they may have observed. Signs are typically observed early after the injury.
7. **Seizures:** Inquire whether **seizures** were observed or not.

### **B. Symptom Check List:**

- Ask patient (and/ or parent, if child) to report presence of the **4 categories** of symptoms since injury. It is important to assess all listed symptoms as different parts of the brain control different functions. One or all symptoms may be present depending upon mechanisms of injury. If the symptom is not present, circle “0” on the scale. Circle “1” if present.
- Note: Most sleep symptoms are only applicable after a night has passed since the injury. If not applicable, circle N/A. Drowsiness may be present on the day of injury.
- Since symptoms can be present pre-morbidly/ at baseline (e.g., inattention, headaches, sleep, sadness), it is important to **assess change** from its typical presentation. For **any symptom** - if Patient/ Parent indicates “I/ He usually has that problem/symptom” – Ask “Are you/ they experiencing this symptom **more than usual** or in a **different manner than usual?**” If “Yes” circle “1”.

**Scoring:** Sum total **number** of symptoms present per area, and sum all 4 areas into Total Symptom Score. (Note: Most sleep symptoms are only applicable after a night has passed since the injury. Drowsiness may be present on the day of injury.) If symptoms are new and present, there is no lower limit symptom score. Any score > 0 indicates **positive symptom** history.

- **General Impression:** Ask how different the person is acting than usual. Circle 0 (No difference) to 6 (Major) to rate degree.
- **Patient Participation:** Indicate the extent to which the patient is able to participate in the evaluation and, if less than fully, give reason for Partial or No participation.

**C. Concussion history:** Assess the number and date(s) of prior concussions.<sup>4-8</sup> History of prior concussions, especially recent (within past several weeks or months) would suggest the need for more conservative decision-making regarding Return to Play, and general post-injury management.

**Headache history:** Assess personal history of diagnosis/treatment for headaches. Recent research indicates headache (migraine in particular) can result in protracted recovery from concussion.<sup>8-11</sup>

**D. Diagnosis:** Assign the most appropriate diagnosis given the following:

**850.0 (Concussion, with no loss of consciousness)** – Positive Injury Description (A1), i.e., forcible direct/ indirect blow to the head; plus evidence of active symptoms (B) of any type and number related to the trauma; no evidence of LOC (A5), skull fracture, or other intracranial injury.

**850.1 (Concussion, with brief loss of consciousness < 1 hour)** - Positive Injury Description (A1), i.e., forcible direct/ indirect blow to the head; plus evidence of active symptoms (B) of any type and number related to the trauma; positive evidence of LOC (A5); no skull fracture, or other intracranial injury.

**850.9 (Concussion, unspecified)** - Positive Injury Description (A1), i.e., forcible direct/ indirect blow to the head; plus evidence of active symptoms (B) of any type and number related to the trauma; unclear/unknown injury details; unclear evidence of LOC (A5), no skull fracture, or other intracranial injury.

**NOTE: If there is evidence of skull fracture of structural intracranial injury to the brain, consider 854 (Intracranial injury of other and unspecified nature; 854.0 Without mention of open intracranial wound, 854.1 With open intracranial wound). Avoid using nonspecific Head injury NOS (959.01) whenever possible.**

**E. Follow-Up Action:** Determine a plan of action for follow-up of symptomatic patients. Serial evaluation of the concussion is critical as symptoms may resolve, worsen, or ebb and flow depending upon a variety of factors (e.g., cognitive/ physical exertion, comorbidities). Referral to a specialist can be particularly valuable to help manage certain aspects of the patient’s condition.

(a) Patient monitoring in the primary care physician office.

(b) Referral to a specialist: particularly valuable to help manage certain aspects of the patient’s condition.

- **Neuropsychological Testing** is particularly relevant for cognitive and/or behavioral dysfunction affecting school, home or work activities, for purpose of treatment planning. Testing is also recommended when a patient may be returning to sports or other at-risk activities.
- **Physician Evaluation** is particularly relevant for medical evaluation and management of concussion. Also, critical for evaluation and management of focal neurologic, sensory, vestibular, and motor concerns. May be useful for medication management (e.g., headaches, sleep disturbance, depression) if post-concussive problems persist.