ACUTE CONCUSSION EVALUATION (ACE)
Emergency Department (ED) Version v1.4
Gerard Gioia, PhD & Micky Collins, PhD
1 Children's National Medical Center
2 University of Pittsburgh Medical Center

Patient Name__________________________ Age: _______________________
DOB: ______________________ Date: __________________________ ID/MR# ______________

A. Injury Characteristics

1. Injury Description

Date/Time of Injury ____________________________ Reporter: __Patient __Parent __Spouse __Other _______

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  __Lft Temporal  __Rt Temporal  __Lft 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).

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

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

© Copyright G. Gioia & M. Collins, 2006
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 neurormetabolic 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 premorbidly/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. 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.

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.