Appendix 1.1

Acute Concussion Evaluation (ACE): Physician/Clinician Office Version

Gerard Gioia, PhD & Micky Collins, PhD

*Children's National Medical Center
University of Pittsburgh Medical Center

A. Injury Characteristics
Date/Time of Injury ___________________________ Reporter: __Patient __Parent __Spouse __Other

1. Injury Description ___________________________ ___________________________ ___________________________

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 _Lt Parietal _Rt Parietal _Occipital _Neck _Indirect Force __Unknown

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).

PHYSICAL (10) COGNITIVE (4) SLEEP (4)

<table>
<thead>
<tr>
<th>Symptom</th>
<th>0</th>
<th>1</th>
</tr>
</thead>
<tbody>
<tr>
<td>Headache</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>Nausea</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>Vomiting</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>Balance problems</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>Dizziness</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>Fatigue</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>Sensitivity to light</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>Sensitivity to noise</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>Numbness/Tingling</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>Visual problems</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>Exertion: Do these symptoms worsen with:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Physical Activity</td>
<td>__Yes __No __N/A</td>
<td></td>
</tr>
<tr>
<td>Cognitive Activity</td>
<td>__Yes __No __N/A</td>
<td></td>
</tr>
</tbody>
</table>

Overall Rating: How different is the person acting compared to his/her usual self? (circle)
Normal 0 1 2 3 4 5 6 Very Different ___________________________

EMOTIONAL (4)

<table>
<thead>
<tr>
<th>Symptom</th>
<th>0</th>
<th>1</th>
</tr>
</thead>
<tbody>
<tr>
<td>Irritability</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>Sadness</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>Emotional</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>Nervousness</td>
<td>0</td>
<td>1</td>
</tr>
</tbody>
</table>

PHYSICAL Total (0-10) ___________ EMOTIONAL Total (0-4) ___________

(C) Risk Factors for Protracted Recovery (check all that apply)

Concussion History? Y _ N
Previous # 1 2 3 4 5 6+

Headache History? Y _ N

Longest symptom duration Days _ Weeks _ Months _ Years __

If multiple concussions, less force caused injury? Yes __ No

D. RED FLAGS for acute emergency management: Refer to the emergency department with sudden onset of any of the following:

* Headaches that worsen * Tinnitus * Seizures * Focal focal neurologic signs * Blurred speech * Weakness or numbness in arms/legs * Neck pain

* Can't recognize people or places * Increasing confusion or irritability * Unusual behavioral change

* Change in state of consciousness ___________________________

E. Diagnosis (ICD): __Concussion w/o LOC 850.0 __Concussion w/ LOC 850.1 __Concussion (Unspecified) 850.9 __Other (854) __No diagnosis ___________________________

F. Follow-Up Action Plan Complete ACE Care Plan and provide copy to patient/family.

No Follow-Up Needed

__ No Follow-Up Needed

Physician/Clinician Office Monitoring: Date of next follow-up ___________________________

Referal: ___________________________

Neuropsychological Testing __Physician: Neurosurgery __Neurology __Sports Medicine __Physiatrist __Psychiatrist __Other ___________________________

Emergency Department ___________________________

ACE Completed by: ___________________________

This form is part of the “Heads Up: Brain Injury in Your Practice” tool kit developed by the Centers for Disease Control and Prevention (CDC).

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Guidelines for Concussion/mTBI and Persistent Symptoms: 3rd Ed.
The ACE is intended to provide an evidence-based clinical protocol to conduct an initial evaluation and diagnosis of patients (both children and adults) with known or suspected MTBI. The research evidence documenting the importance of these components in the evaluation of an MTBI is provided in the reference list.

A. Injury Characteristics:
1. Obtain description of the injury – how injury occurred, type of force, location on the head or body (if force transmitted to head). Different biomechanics of injury may result in differential symptom patterns (e.g., occipital blow may result in visual changes, balance difficulties).
2. Indicate the cause of injury. Greater forces associated with the trauma are likely to result in more severe presentation of symptoms.
3. Amnesia: Amnesia is defined as the failure to form new memories. Determine whether amnesia has occurred and attempt to determine length of time of memory dysfunction – before (retrograde) and after (anterograde) injury. Even seconds to minutes of memory loss can be predictive of outcome. Recent research has indicated that amnesia may be up to 4-10 times more predictive of symptoms and cognitive deficits following concussion than is LOC (less than 1 minute).1
5. Loss of consciousness (LOC) – If occurs, determine length of LOC.

B. Symptom Checklist:2
1. Ask patient (and/or parent, if child) to report presence of the four 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.2 Record “1” for Yes or “0” for No for their presence or absence, respectively.
2. For all symptoms, indicate presence of symptoms as experienced within the past 24 hours. Since symptoms can be present premorbidly/at baseline (e.g., inattention, headaches, sleep, sadness), it is important to assess change from their usual presentation.
3. Scoring: Sum total number of symptoms present per area, and sum all four areas into Total Symptom Score (score range 0-22). (Note: most sleep symptoms are only applicable after the night. 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.
4. Exertion: Inquire whether any symptoms worsen with physical (e.g., running, climbing stairs, bike riding) and/or cognitive (e.g., academic studies, multi-tasking at work, reading or other tasks requiring focused concentration) exertion. Clinicians should be aware that symptoms will typically worsen or re-emerge with exertion, indicating incomplete recovery. Over-exertion may protract recovery.

E. Diagnosis: The following ICD diagnostic codes may be applicable.

850.0 (Concussion, with no loss of consciousness) – Positive injury description with evidence of forcible direct/indirect blow to the head (A1a); plus evidence of active symptoms (B) of any type and number related to the trauma (Total Symptom Score >0); no evidence of LOC (A5), skull fracture or intracranial injury (A1b).
850.1 (Concussion, with brief loss of consciousness < 1 hour) – Positive injury description with evidence of forcible direct/indirect blow to the head (A1a); plus evidence of active symptoms (B) of any type and number related to the trauma (Total Symptom Score >0); positive evidence of LOC (A5), skull fracture or intracranial injury (A1b).
850.9 (Concussion, unspecified) – Positive injury description with evidence of forcible direct/indirect blow to the head (A1a); plus evidence of active symptoms (B) of any type and number related to the trauma (Total Symptom Score >0); unclear/unknown injury details; unclear evidence of LOC (A5), no skull fracture or intracranial injury.

Other Diagnoses – If the patient presents with a positive injury description and associated symptoms, but additional evidence of intracranial injury (A 1b) such as from neuroimaging, a moderate TBI and the diagnostic category of 854 (Intracranial injury) should be considered.

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