Short Clinical Guidelines:  
Traumatic Brain Injury/Concussion Management

Most Common Causes for Head Trauma
- Blast or explosion
- Head striking or being struck by object or fall
- Acceleration/deceleration movement e.g. motor vehicle accident
- Sports related events

Diagnostic Criteria
- Loss of or decreased level of consciousness for less than 30 minutes
- Loss of memory for events immediately up to or one day after injury
- Alteration of consciousness/mental state for 0-24 hours after injury
- Normal structural imaging
- Glasgow Coma Score of 13-15 (best within first 24 hours)

Indicators for Emergent Care/Immediate Referral
1. Current altered consciousness
2. Difficult to arouse
3. Progressively declining neurological exam
4. Pupillary asymmetry
5. Seizures
6. Repeated vomiting
7. Double vision
8. Worsening headache
9. Cannot recognize people
10. Disoriented to place
11. Slurred speech
12. Unsteady gait
13. Weakness or numbness in arms/legs
14. Unusual, confused or irritable behavior

Post-Concussion/TBI Related Symptoms
1. Physical
   - Headache
   - Dizziness/balance problems
   - Nausea/vomiting
   - Fatigue
   - Blurred vision
   - Sleep disturbance
   - Sensitivity to light/noise
   - Numbness/tingling
   - Dazed or stunned
2. Cognitive
   - Feeling “foggy”
   - Feeling slowed down
   - Difficulty concentrating
Short Clinical Guidelines:  
Traumatic Brain Injury/Concussion Management

- Difficulty remembering  
- Concentration problems  
- Forgetful of recent information or conversations  
- Decreased judgment/executive control

3. Behavioral/Emotional
- Sadness/depression  
- Irritability  
- Anxiety  
- Agitation  
- Impulsivity  
- Aggression  
- Sleep disturbances

4. Symptom Attributes
- Duration  
- Triggers  
- Location  
- Patient perception of symptom  
- Intensity and impact  
- Previous episode(s)  
- Previous treatment and response

Management of Concussion/TBI
1. Initiate Acute Concussion Evaluation (ACE) (see attachment)
2. Symptom reduction should occur over 3 to 5 days
   a. Consider referral to specialist if symptoms do not show significant improvement after 5 days
3. Early intervention
   a. Provide information and education on symptoms and recovery  
   b. Use of non-narcotic pain relievers, NSAIDs  
   c. Educate about prevention of further injuries  
   d. No sport activities until symptom free for  
   e. Reassure on positive recovery expectation  
   f. Recommend limiting use of caffeine, tobacco, alcohol  
   g. Provide sleep hygiene education  
   h. Teach relaxation techniques  
   i. Review graded exercise with close monitoring  
   j. Encourage monitored progressive return to normal work/school/sport activities  
   k. Review ACE Care Plan (see attachment)

Adapted from the following resources by Riverside Physician Network Medical Practice Committee:  
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Heads Up Facts for Physicians

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4. Persistent symptoms beyond 4 weeks not responding to initial treatment
   a. Assess for possible alternative causes
      i. Infection
      ii. Migraine history
      iii. Sleep disorder
      iv. Eye injury
      v. Occult orthopedic/neuro injury
   b. Psychosocial evaluation
      i. Support system
      ii. Mental health history
      iii. Co-occurring conditions
         1. Chronic pain
         2. Mood disorders
         3. Stress disorders
         4. Personality disorders
      iv. Substance abuse
      v. Unemployment or change in job status
      vi. Secondary gains
   c. Treatment considerations
      i. Short term SSRI therapy for persistent cognitive/behavioral symptoms
      ii. Case management referral
      iii. Behavioral health referral
      iv. Physical/occupational therapy evaluation
Short Clinical Guidelines:
Traumatic Brain Injury/Concussion Management

ACUTE CONCUSSION EVALUATION (ACE)

<table>
<thead>
<tr>
<th>PHYSICIAN/CLINICIAN OFFICE VERSION</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gerard Gloc, PhD &amp; Micky Collins, PhD*</td>
</tr>
<tr>
<td>Children's National Medical Center</td>
</tr>
<tr>
<td>University of Pittsburgh Medical Center</td>
</tr>
</tbody>
</table>

Patient Name: ____________________________________________
DOB: __________ Age: __________
Date: __________ ID/MRI#: __________

A. Injury Characteristics

Data/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 fractures? __Yes __No __Unknown
   1c. Location of Impact: __Frontal __Lft Temporal __Rt Temporal __Lft Parietal __Rt Parietal __Occipital __Nek __Indirect Force
   1d. Amnesia Before (Retrograde) Are there any events just BEFORE the injury that your person has no memory of (even brief)? __Yes __No __Duration
   1e. Amnesia After (Antegrade) Are there any events just AFTER the injury that your person has no memory of (even brief)? __Yes __No __Duration
   1f. Loss of Consciousness: Did your person lose consciousness? __Yes __No __Duration
   1g. EASILY SIGNS: __Appearance dazed or stunned __Is confused about events __Answers questions slowly __Feels drowsy __Forgetful (recent info)
   1h. 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?

<table>
<thead>
<tr>
<th>PHYSICAL (10)</th>
<th>COGNITIVE (4)</th>
<th>SLEEP (4)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Headache</td>
<td>0 1</td>
<td></td>
</tr>
<tr>
<td>Nausea</td>
<td>0 1</td>
<td></td>
</tr>
<tr>
<td>Vomiting</td>
<td>0 1</td>
<td></td>
</tr>
<tr>
<td>Balance</td>
<td>0 1</td>
<td></td>
</tr>
<tr>
<td>Dizziness</td>
<td>0 1</td>
<td></td>
</tr>
<tr>
<td>Visual</td>
<td>0 1</td>
<td></td>
</tr>
<tr>
<td>Fatigue</td>
<td>0 1</td>
<td></td>
</tr>
<tr>
<td>Sensitivity</td>
<td>0 1</td>
<td></td>
</tr>
<tr>
<td>Sensitivity</td>
<td>0 1</td>
<td></td>
</tr>
<tr>
<td>Numbness/Tingling</td>
<td>0 1</td>
<td></td>
</tr>
<tr>
<td>PHYSICAL Total (10-16)</td>
<td>___</td>
<td></td>
</tr>
</tbody>
</table>

C. Risk Factors for Protracted Recovery

Concussion History? Y __ N

<table>
<thead>
<tr>
<th>Physical History</th>
<th>Y __ N</th>
</tr>
</thead>
<tbody>
<tr>
<td>Previous # 1 2 3 4 5 6+</td>
<td></td>
</tr>
<tr>
<td>Longest symptom duration</td>
<td></td>
</tr>
<tr>
<td>Days __ Weeks __ Months __ Years</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Headache History</th>
<th>Y __ N</th>
</tr>
</thead>
<tbody>
<tr>
<td>History of migraine headache</td>
<td></td>
</tr>
<tr>
<td>Personal __ Family</td>
<td></td>
</tr>
</tbody>
</table>

If multiple concussions, loss force caused rel injury? __Yes __No

List other comorbid medical disorders or medication usage (e.g., hypothyroid, seizures)

D. RED FLAGS for acute emergency management:

Refer to the emergency department with sudden onset of any of the following:

- Headache that worsens
- Seizure
- Nausea
- Vomiting
- Neck pain
- Difficulty concentrating
- Unusual emotional change
- Changes in alertness
- Difficulty sleeping

E. Diagnosis (ICD):

Concussion w/ 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

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

Referral: ____________

- Neurological Testing
- Physical Therapy
- Neurology __ Neurosurgery __ Sports Medicine __ Physiatrist __ Psychiatrist __ Other

Emergency Department

ACE Completed by: ____________________________

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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).
Short Clinical Guidelines: Traumatic Brain Injury/Concussion Management

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Traumatic Brain Injury/Concussion Management

ACUTE CONCUSSION EVALUATION (ACE) CARE PLAN
Gerard Gioia, PhD & Micky Collins, PhD
Children’s National Medical Center
University of Pittsburgh Medical Center

Patient Name: __________________________ Age: _________
DOB: __________________________ Date: __________ ID/MR#: __________________________
Date of Injury: __________________________

You have been diagnosed with a concussion (also known as a mild traumatic brain injury). This personal plan is based on your symptoms and is designed to help speed your recovery. Your careful attention to it can also prevent further injury.

REST is the key. You should not participate in any high risk activities (e.g., sports, physical education (PE), riding a bike, etc.) if you still have any of the symptoms below. It is important to limit activities that require a lot of thinking or concentration (homework, job-related activities), as this can also make your symptoms worse. If you no longer have any symptoms and believe that your concentration and thinking are back to normal, you can slowly and carefully return to your daily activities. Children and teenagers will need help from their parents, teachers, coaches, or athletic trainers to help monitor their recovery and return to activities.

Today the following symptoms are present (circle or check). No reported symptoms

<table>
<thead>
<tr>
<th>Physical</th>
<th>Thinking</th>
<th>Emotional</th>
<th>Sleep</th>
</tr>
</thead>
<tbody>
<tr>
<td>Headaches</td>
<td>Sensitivity to light</td>
<td>Feeling mentally foggy</td>
<td>Irritability</td>
</tr>
<tr>
<td>Nausea</td>
<td>Sensitivity to noise</td>
<td>Problems concentrating</td>
<td>Sadness</td>
</tr>
<tr>
<td>Fatigue</td>
<td>Numbness/Tingling</td>
<td>Problems remembering</td>
<td>Feeling more emotional</td>
</tr>
<tr>
<td>Visual problems</td>
<td>Vomiting</td>
<td>Feeling more slowed down</td>
<td>Nervousness</td>
</tr>
<tr>
<td>Balance Problems</td>
<td>Dizziness</td>
<td></td>
<td>Trouble falling asleep</td>
</tr>
</tbody>
</table>

RED FLAGS: Call your doctor or go to your emergency department if you suddenly experience any of the following

- Headaches that worsen
- Look very drowsy, can’t be awakened
- Can’t recognize people or places
- Unusual behavior change
- Seizures
- Repeated vomiting
- Increasing confusion
- Increasing irritability
- Neck pain
- Slurred speech
- Weakness or numbness in arms or legs
- Loss of consciousness

Returning to Daily Activities
1. Get lots of rest. Be sure to get enough sleep at night- no late nights. Keep the same bedtime weekdays and weekends.
2. Take daytime naps or rest breaks when you feel tired or fatigued.
3. Limit physical activity as well as activities that require a lot of thinking or concentration. These activities can make symptoms worse.
   - Physical activity includes PE, sports practices, weight-training, running, exercising, heavy lifting, etc.
   - Thinking and concentration activities (e.g., homework, classroom load, job-related activity).
4. Drink lots of fluids and eat carbohydrate or protein to maintain appropriate blood sugar levels.
5. As symptoms decrease, you may begin to gradually return to your daily activities. If symptoms worsen or return, lessen your activities, then try again to increase your activities gradually.
6. During recovery, it is normal to feel frustrated and sad when you do not feel right and you can’t be as active as usual.
7. Repeated evaluation of your symptoms is recommended to help guide recovery.

Returning to Work
1. Planning to return to work should be based upon careful attention to symptoms and under the supervision of an appropriate health care professional.
2. Limiting the amount of work you do soon after your injury, may help speed your recovery. It is very important to get a lot of rest. You should also reduce your physical activity as well as activities that require a lot of thinking or concentration.
   - Do not return to work. Return on (date) ____________
   - Return to work with the following supports. Review on (date) ____________

Schedule Considerations
- Shortened work day ________ hours
- Allow for breaks when symptoms worsen
- Reduced task assignments and responsibilities

Safety Considerations
- No driving
- No heavy lifting or working with machinery
- No heights due to possible dizziness, balance problems

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Returning to Sports

1. **You should NEVER return to play if you still have ANY symptoms** – (Be sure that you do not have any symptoms at rest and while doing any physical activity and/or activities that require a lot of thinking or concentration.)
2. Be sure that the PE teacher, coach, and/or athletic trainer are aware of your injury and symptoms.
3. It is normal to feel frustrated, sad, and even angry because you cannot return to sports right away. With any injury, a full recovery will reduce the chances of getting hurt again. It is better to miss one or two games than the whole season.

The following are recommended at the present time:

___ Do not return to PE class at this time
___ Return to PE class
___ Do not return to sports practices/games at this time
___ **Gradual** return to sports practices under the supervision of an appropriate health care provider.
   - Return to play should occur in **gradual steps** beginning with aerobic exercise only to increase your heart rate (e.g., stationary cycle); moving to increasing your heart rate with movement (e.g., running); then adding controlled contact if appropriate; and finally return to sports competition.
   - Pay careful attention to your symptoms and your thinking and concentration skills at each stage of activity. Move to the next level of activity only if you do not experience any symptoms at the each level. If your symptoms return, stop these activities and let your health care professional know. Once you have not experienced symptoms for a minimum of 24 hours and you receive permission from your health care professional, you should start again at the previous step of the return to play plan.

Gradual Return to Play Plan

1. No physical activity
2. Low levels of physical activity (i.e., symptoms do not come back during or after the activity). This includes walking, light jogging, light stationary biking, light weightlifting (lower weight, higher reps, no bench, no squats).
3. Moderate levels of physical activity with body/head movement. This includes moderate jogging, brief running, moderate-intensity stationary biking, moderate-intensity weightlifting (reduced time and/or reduced weight from your typical routine).
4. Heavy non-contact physical activity. This includes sprinting/running, high-intensity stationary biking, regular weightlifting routine, non-contact sport-specific drills (in 3 planes of movement).
5. Full contact in controlled practice.
6. Full contact in game play.

*Neuropsychological testing can provide valuable information to assist physicians with treatment planning, such as return to play decisions.

This referral plan is based on today’s evaluation:

___ Return to this office. Date/Time
___ Refer to: Neurosurgery Neurology Sports Medicine Psychiatrist Psychiatrist Other
___ Refer for neuropsychological testing
___ Other

ACE Care Plan Completed by: __________________________ MD RN NP PhD ATC

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**Short Clinical Guidelines:**
**Traumatic Brain Injury/Concussion Management**

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### ACUTE CONCUSSION EVALUATION (ACE)

**CARE PLAN**

<table>
<thead>
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<th></th>
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<tbody>
<tr>
<td>DOB:</td>
<td>Age:</td>
<td>Date:</td>
<td>ID/MR#:</td>
<td>Date of Injury:</td>
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You have been diagnosed with a concussion (also known as a mild traumatic brain injury). This personal plan is based on your symptoms and is designed to help speed your recovery. Your careful attention to it can also prevent further injury.

You should not participate in any high risk activities (e.g., sports, physical education (PE), riding a bike, etc.) if you still have any of the symptoms below. It is important to limit activities that require a lot of thinking or concentration (homework, job-related activities), as this can also make your symptoms worse. If you no longer have any symptoms and believe that your concentration and thinking are back to normal, you can slowly and carefully return to your daily activities. Children and teenagers will need help from their parents, teachers, coaches, or athletic trainers to help monitor their recovery and return to activities.

#### Today the following symptoms are present (circle or check).

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<td>Feeling more slowed down</td>
</tr>
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<td>Sadness</td>
<td>Feeling more emotional</td>
<td>Nervousness</td>
</tr>
<tr>
<td>Drowsiness</td>
<td>Sleeping more than usual</td>
<td>Sleeping less than usual</td>
<td></td>
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#### RED FLAGS:

Call your doctor or go to your emergency department if you suddenly experience any of the following:

- Headaches that worsen
- Look very drowsy, can't be awakened
- Can't recognize people or places
- Unusual behavior change
- Seizures
- Repeated vomiting
- Increasing confusion
- Increasing irritability
- Neck pain
- Slurred speech
- Weakness or numbness in arms or legs
- Loss of consciousness

---

### Returning to Daily Activities

1. Get lots of rest. Be sure to get enough sleep at night—no late nights. Keep the same bedtime weekdays and weekends.
2. Take daytime naps or rest breaks when you feel tired or fatigued.
3. Limit physical activity as well as activities that require a lot of thinking or concentration. These activities can make symptoms worse.
   - Physical activity includes PE, sports practices, weight-training, running, exercising, heavy lifting, etc.
   - Thinking and concentration activities (e.g., homework, classroom work, job-related activity).
4. Drink lots of fluids and eat carbohydrates or protein to maintain appropriate blood sugar levels.
5. As symptoms decrease, you may begin to gradually return to your daily activities. If symptoms worsen or return, lessen your activities, then try again to increase your activities gradually.
6. During recovery, it is normal to feel frustrated and sad when you do not feel right and you can't be as active as usual.
7. Repeated evaluation of your symptoms is recommended to help guide recovery.

---

### Returning to School

1. If you (or your child) are still having symptoms of concussion you may need extra help to perform school-related activities. As your (or your child's) symptoms decrease during recovery, the extra help or supports can be removed gradually.
2. Inform the teacher(s), school nurse, school psychologist or counselor, and administrator(s) about your (or your child's) injury and symptoms. School personnel should be instructed to watch for:
   - Increased problems paying attention or concentrating
   - Increased problems remembering or learning new information
   - Longer time needed to complete tasks or assignments
   - Greater irritability, loss able to cope with stress
   - Symptoms worsen (e.g., headache, tiredness) when doing schoolwork

---

This form is part of the Heads Up Brain Injury In Your Practice and is developed by the Centers for Disease Control and Prevention (CDC).

---

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Effective date: August, 2012
Short Clinical Guidelines: Traumatic Brain Injury/Concussion Management

Returning to School (Continued)

Until you (or your child) have fully recovered, the following supports are recommended: (check all that apply)

- No return to school. Return on (date)______________
- Return to school with following supports. Review on (date)________________________
- Shortened day. Recommend ___ hours per day until (date)__________________________
- Shortened classes (i.e., rest breaks during classes). Maximum class length: ______ minutes.
- Allow extra time to complete coursework/assignments and tests.
- Lessen homework load by _______% . Maximum length of nightly homework: ______ minutes.
- No significant classroom or standardized testing at this time.
- Check for the return of symptoms (use symptom table on front page of this form) when doing activities that require a lot of attention or concentration.
- Take rest breaks during the day as needed.
- Request meeting of 504 or School Management Team to discuss this plan and needed supports.

Returning to Sports

1. You should NEVER return to play if you still have ANY symptoms – (Be sure that you do not have any symptoms at rest and while doing any physical activity and/or activities that require a lot of thinking or concentration.)
2. Be sure that the PE teacher, coach, and/or athletic trainer are aware of your injury and symptoms.
3. It is normal to feel frustrated, sad and even angry because you cannot return to sports right away. With any injury, a full recovery will reduce the chances of getting hurt again. It is better to miss one or two games than the whole season.

The following are recommended at the present time:

- Do not return to PE class at this time
- Do not return to sports practices/games at this time
- Gradual return to sports practices under the supervision of an appropriate health care provider.
  - Return to play should occur in gradual steps beginning with aerobic exercise only to increase your heart rate (e.g., stationary cycle); moving to increasing your heart rate with movement (e.g., running); then adding controlled contact if appropriate; and finally return to sports competition.
  - Pay careful attention to your symptoms and your thinking and concentration skills at each stage of activity. Move to the next level of activity only if you do not experience any symptoms at the each level. If your symptoms return, stop these activities and let your health care professional know. Once you have not experienced symptoms for a minimum of 24 hours and you receive permission from your health care professional, you should start again at the previous step of the return to play plan.

Gradual Return to Play Plan

1. No physical activity
2. Low levels of physical activity (i.e., ). This includes walking, light jogging, light stationary biking, light weightlifting (lower weight, higher rope, no bench, no squat).
3. Moderate levels of physical activity with body/head movement. This includes moderate jogging, brief running, moderate-intensity stationary biking, moderate-intensity weightlifting (reduced time and/or reduced weight from your typical routine).
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*Neuropsychological testing can provide valuable information to assist physicians with treatment planning, such as return to play decisions.

This referral plan is based on today’s evaluation:

- Return to this office. Date/Time____________
- Refer to: Neurosurgery ______ Neurology ______ Sports Medicine ______ Psychiatrist ______ Psychiatrist ______ Other ______
- Refer for neuropsychological testing
  - Other ______

ACE Care Plan Completed by: ___________________________ MD RN NP PhD ATC

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