Concussion Management Guidelines
July 1, 2015

1. UT Martin will require student-athletes to sign a statement in which student-athletes accept the responsibility for reporting their injuries and illnesses to the sports medicine staff, including signs and symptoms of concussions (attachment A). Student athletes will be emailed a link to view watch a NCAA video on concussions and be provided with educational material on concussions (https://youtu.be/T3FLRDSbLXg).

2. UT Martin will have on file and annually update an emergency action plan for each athletics venue to respond to student-athlete catastrophic injuries and illnesses, including but not limited to concussions, heat illness, spine injury, cardiac arrest, respiratory distress (e.g., asthma), and sickle cell trait collapses.

3. UT Martin sports medicine staff members shall be empowered to determine management and return-to-play of any ill or injured student-athlete, as he or she deems appropriate. Conflicts or concerns will be forwarded to Bart Belew (director of sports medicine) and Brad Wright, MD (head team physician) for remediation.

4. UT Martin shall have on file a written team physician–directed concussion management plan that specifically outlines the roles of athletics healthcare staff (e.g., physician, certified athletic trainer, nurse practitioner, physician assistant). In addition, the following components have been specifically identified for the collegiate environment:
   a. UT Martin coaches will receive a copy of the concussion management plan, a fact sheet on concussions in sport, and will be emailed a video on concussions annually. The UT Martin compliance office will be copied on all emails to coaches. UT Martin sports medicine staff members and other athletics healthcare providers will practice within the standards as established for their professional practice (e.g., team physician, certified athletic trainer, physical therapist, nurse practitioner, physician assistant, neurologist, neuropsychologist).
   b. UT Martin shall record a baseline assessment for each student-athlete in the sports of baseball, basketball, cheerleading, equestrian, football, rodeo, soccer, and softball, at a minimum. In addition, a baseline assessment will be recorded for student-athletes with a known history of concussion. The same baseline assessment tools should be used post-injury at appropriate time intervals. The baseline assessment should consist of the use of: 1) symptoms checklist, 2) neuropsychological testing (computerized IMPACT test).
   c. When a student-athlete shows any signs, symptoms or behaviors consistent with a concussion, the athlete will be removed from practice or competition, by either a member of the coaching staff or sports medicine staff. If removed by a coaching staff member, the coach will refer the student-athlete for evaluation by a member of the sports medicine staff. During competitions, on the field of play injuries will be under the purview of the official and playing rules of the sport. UT Martin staff will follow such rules and attend to medical situations as they arise. Visiting sport team members evaluated by UT Martin sports medicine staff will be managed in the same manner as UT Martin student-athletes.
   d. A student-athlete diagnosed with a concussion will be withheld from the competition or practice and not return to activity for the remainder of that day. Student-athletes that sustain a concussion outside of their sport will be managed in the same manner as those sustained during sport activity.
   e. The student-athlete will receive serial monitoring for deterioration. Athletes will be provided with written home instruction upon discharge; preferably with a roommate, guardian, or someone that can follow the instructions.
   f. The student-athlete will be monitored for recurrence of symptoms both from physical exertion and also mental exertion, such as reading, phone texting, computer games, watching film, athletic meetings, working on a computer, classroom work, or taking a test. Academic advisors and professors will be notified of student-athlete’s concussion, with permission for release of information from the student-athlete.
   g. The student-athlete will be evaluated by a team physician as outlined within the concussion management plan. Once asymptomatic and post-exertion assessments are within normal baseline limits, return to play shall follow a medically supervised stepwise process.
   h. Final authority for Return-to-Play shall reside with the team physician or the physician’s designee as noted in the concussion management flowchart.

5. UT Martin will document the incident, evaluation, continued management, and clearance of the student-athlete with a concussion. Aggregate concussion numbers per sport will be reported to the Director of Athletics annually.

6. Athletics staff, student-athletes and officials will continue to emphasize that purposeful or flagrant head or neck contact in any sport should not be permitted.

7. The certified athletic trainer responsible for the team in which the student-athlete participates, will be the primary contact for the student-athlete and the liaison between the Assistant AD for Academics and the student-athlete in regards to returning to classroom activities.
Reference Documents

1. NCAA and CDC Educational Material on Concussion in Sport. Available online at [www.ncaa.org/health-safety](http://www.ncaa.org/health-safety)


UT Martin Concussion Management Plan

**Obtain Baseline Testing:** Symptom checklist and IMPACT testing data obtained for athletes in high-risk sports for concussion (baseball, basketball, cheerleading, equestrian, football, rodeo, soccer and softball) or with pertinent medical history of concussion

**Concussion Identified and Assessed:** Physical examination and assessment of concussion symptoms by medical staff (athletic trainer, physician assistant and/or physician: if physician not immediately available. If emergent, athlete should be transported to closest emergency department); athlete held from all physical activity; given concussion information home instruction sheet; notify parent/guardian of concussion; Athlete repeats baseline testing with Symptoms checklist, and IMPACT (within 48 hours of injury if possible)

**Concussion Management:** Athlete held from all physical activity; re-assess athlete daily by medical staff; administer symptom checklist daily until completely asymptomatic; notify academic advisor (consideration of academic modifications/restrictions)

**Athlete Asymptomatic:** Athlete repeats baseline testing with Symptoms checklist and IMPACT (unless directed otherwise by physician and/or neuropsychologist)

**Test Results Return to Baseline:**
Perform exertional testing; re-evaluation by physician for return to play decision

**Test Results NOT Returned to Baseline:**
When medically cleared by physician, repeat test battery.

When medically cleared by physician, repeat exertional testing; re-evaluation by physician for return to play decision
Exertional Testing Protocol Following Concussion

Symptom checklist and IMPACT testing WNL

Exertional Testing Protocol
1. 10 min on stationary bike; exercise intensity <70% maximum predicted heart rate
2. 10 min continuous jogging on treadmill; exercise intensity <70% maximum predicted heart rate
3. Strength training: (i.e. push-ups, sit-ups, squats thrusts)
4. Advanced cardiovascular training: sprint activities
5. Advanced strength training: weight lifting exercises
6. Sport specific agility drills (no risk of contact)

If no change or increase in symptoms, move to next step.

Non-contact practice following completion of exertional protocol

If no change or increase in symptoms, move to next step.

Limited to full contact practice

If no change or increase in symptoms, final return to play decision made by medical staff.
Symptom Checklist: *Circle “YES” if you have experienced the symptom within the last 24 hours or “NO” if you have not experienced the symptom over the last 24 hours.*

1. Have you had a **headache** in the last 24 hours?  YES / NO
2. Have you experienced **nausea** in the last 24 hours?  YES / NO
3. Have you had any **difficulty balancing** in the last 24 hours?  YES / NO
4. Have you experienced **fatigue** in the last 24 hours?  YES / NO
5. Have you experienced **drowsiness** in the last 24 hours?  YES / NO
6. Have you experienced **sleep disturbances** in the last 24 hours?  YES / NO
7. Have you had **difficulty concentrating** in the last 24 hours?  YES / NO
8. In the last 24 hours have you felt like you are **“in a fog”**?  YES / NO
9. In the last 24 hours have you felt **“slowed down”**?  YES / NO
10. Have your eyes been **sensitive to light** in the last 24 hours?  YES / NO
11. Have you felt **sadness** in the last 24 hours?  YES / NO
12. Have you experienced **vomiting** in the last 24 hours?  YES / NO
13. Have your ears been **sensitive to noise** in the last 24 hours?  YES / NO
14. Have you experienced **nervousness** in the last 24 hours?  YES / NO
15. Have you had **difficulty remembering** things in the last 24 hours?  YES / NO
16. Have you experienced **numbness** in the last 24 hours?  YES / NO
17. Have you experienced any **tingling** sensations in the last 24 hours?  YES / NO
18. Have you experienced **dizziness** in the last 24 hours?  YES / NO
19. Have you experienced any **neck pain** in the last 24 hours?  YES / NO
20. Have you been **irritable** in the last 24 hours?  YES / NO
21. Have you experienced feelings of **depression** in the last 24 hours?  YES / NO
22. Have you experienced **blurred vision** in the last 24 hours?  YES / NO
<table>
<thead>
<tr>
<th></th>
<th>DURATION</th>
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<td>6) Sleep Disturbances</td>
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<td>9) Feeling “slowed down”</td>
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<td>12) Vomiting</td>
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<td>15) Difficulty Remembering</td>
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<td>17) Tingling</td>
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<td>19) Neck Pain</td>
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<td>20) Irritable</td>
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<td>21) Depression</td>
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<td>22) Blurred Vision</td>
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Concussion Information: Home Instruction Sheet

Name ___________________________  Date ___________________________

You have had a head injury or concussion and need to be watched closely for the next 24-48 hours.

<table>
<thead>
<tr>
<th>It is OK to:</th>
<th>There is no need to:</th>
<th>DO NOT:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Use Tylenol (acetaminophen)</td>
<td>Check eyes with a light</td>
<td>Drink Alcohol</td>
</tr>
<tr>
<td>Use an ice pack to head/neck for</td>
<td>Wake up every hour</td>
<td>Eat spicy foods</td>
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<td>comfort</td>
<td>Stay in bed</td>
<td>Drive a car</td>
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<tr>
<td>Eat a light meal</td>
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<td>Use aspirin, Aleve, Advil or other NSAID products</td>
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<td>Go to sleep</td>
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Special Recommendations: ____________________________________________________________
__________________________________________________________________________________

**WATCH FOR ANY OF THE FOLLOWING PROBLEMS:**

- Worsening headache
- Vomiting
- Decreased level of Consciousness
- Dilated Pupils
- Increased Confusion
- Stumbling/loss of balance
- Weakness in one arm/leg
- Blurred Vision
- Increased irritability

If any of these problems develop, call your athletic trainer or physician immediately.

Athletic Trainer ___________________________  Phone ___________________________

Physician ___________________________  Phone ___________________________

You need to be seen for a follow-up examination at ________ AM/PM at: ____________________.

Recommendations provided to _________________________________________________________

Recommendation provided by _________________________________________________________
Concussion Awareness Letter

The University of Tennessee at Martin Sports Medicine Department would like to inform you that _____________ sustained a concussion during ________ on __/__/__. He/she was evaluated by_______________, ATC, LAT (staff athletic trainer). ________ will undergo additional concussion testing today. A concussion or mild traumatic brain injury can cause a variety of physical, cognitive, and emotional symptoms. Concussions range in significance from minor to major, but they all share one common factor — they temporarily interfere with the way your brain works. We would like to inform you that during the next few weeks this athlete may experience one or more of these signs and symptoms.

<table>
<thead>
<tr>
<th>Headache</th>
<th>Nausea</th>
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<tbody>
<tr>
<td>Balance Problems</td>
<td>Dizziness</td>
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<tr>
<td>Diplopia - Double Vision</td>
<td>Confusion</td>
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<tr>
<td>Photophobia – Light Sensitivity</td>
<td>Difficulty Sleeping</td>
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<tr>
<td>Misophonia – Noise Sensitivity</td>
<td>Blurred Vision</td>
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<tr>
<td>Feeling Sluggish or Groggy</td>
<td>Memory Problems</td>
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<tr>
<td>Difficulty Concentrating</td>
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</tbody>
</table>

As a department, we wanted to make you aware of this injury and the related symptoms that the student athlete may experience. Although the student is attending class, please be aware that the side effects of the concussion may adversely impact his/her academic performance. Any consideration you may provide academically during this time would be greatly appreciated. We will continue to monitor the progress of this athlete and anticipate a full recovery. Should you have any questions or require further information, please do not hesitate to contact us.

Bart Belew, MS, ATC, LAT
Assistant AD for Athletic Training Services
(731)881-7689
bbelew@utm.edu

Thank you in advance for your time and understanding with this circumstance.
University of Tennessee at Martin Sports Medicine personnel will evaluate mild traumatic brain injured / concussive student-athletes as follows-

**Baseline Testing**
- a) Neuropsychological Assessment – ImPACT

**Time of Injury**
- a) Mild Traumatic Brain Injury Initial Evaluation Form
- b) Post Concussion Symptom Scale
- c) Standardized Assessment of Concussion (SAC) Test
- d) Balance Error Scoring System (BESS) Test

**Recommendations**
- Any athlete showing symptoms of a concussion will be removed for practice or competition for the remainder of day.
- Monitor the athlete for deteriorating symptoms, complete symptoms checklist, and send home concussion home instruction sheet.

**Post- Concussion Follow-Up (24-48 hours post-injury)**
- a) Post Concussion Symptom Scale
- b) Balance Error Scoring System (BESS) Test
- c) Neuropsychological Assessment – ImPACT

**Note**
The Post Concussion Symptom Scale will be repeated every day until the student-athlete Self-Reports Asymptomatic (SRA), at which time the student-athlete will begin with Day 1 SRA Procedures.
Day 1 **Self-Report Asymptomatic (SRA)**

a) Post Concussion Symptom Scale  
b) Neuropsychological Assessment – ImPACT  
c) Cardiovascular exercise in controlled setting-  
   - Mode, duration and intensity dependant upon sport  
   - Monitor symptomology  
      - If student-athlete becomes symptomatic, return the student-athlete to the concussed state / procedures until they Self-Report Asymptomatic (SRA)

d) Weight Training (under the direction of a certified athletic trainer)-  
   - Mode, duration and intensity dependant upon sport  
   - If Day 2 does not fall within the student-athlete’s scheduled weight lifting schedule, the student-athlete should still perform weight training exercises under the direction of a certified athletic trainer.  
   - Monitor symptomology  
      - If student-athlete becomes symptomatic, return the student-athlete to the concussed state / procedures until they Self-Report Asymptomatic (SRA)

Day 2 **Self-Report Asymptomatic (SRA) – w/ no increase in symptomology**

a) Exertional Functional Activity w/o contact  
   - Mode, duration and intensity dependant upon sport  
   - Monitor symptomology  
      - If student-athlete becomes symptomatic, return the student-athlete to the concussed state / procedures until they Self-Report Asymptomatic (SRA)

b) Post Concussion Symptom Scale

**Ifs-**

- If the student-athlete is symptomatic during and/or after any of the tests, return him/her to the concussed state / procedures until SRA and consult with the Team Physician for further evaluation.  
- If the student-athlete is asymptomatic with all activity, consult with the Team Physician for return to play clearance

Day 3 **Self-Report Asymptomatic (SRA) - w/ no increase in symptomology**

a) sports specific drills w/o contact.  
   - Mode, duration and intensity dependant upon sport.  
   - Monitor Symptomology  
      - If student-athlete becomes symptomatic, return the student-athlete to the concussed state/procedures until they Self-Report Asymptomatic (SRA).

Day 4 **Self-Report Asymptomatic (SRA) - w/ no increase in symptomology**

a) sports specific drills with contact.  
   - Mode, duration and intensity dependant upon sport.  
   - Monitor Symptomology  
      - If student-athlete becomes symptomatic, return the student-athlete to the concussed state/procedures until they Self-Report Asymptomatic (SRA).
Standardized Assessment of Concussion (SAC) Test-

**Baseline Average**-
- College athletes = 27
- High School athletes = 26

**Post-Injury Average** = within two (2) standard deviations of baseline score

Balance Error Scoring System (BESS) Procedures-

**Athlete Position**-
- Shoes off
- Roll pant legs above ankles
- Feet narrowly together
- Hands on the iliac crests
- Eyes closed

**Test Procedures / Patient Instructions**-
- Test begins when the patient closes his/her eyes
- Patient is instructed to make any necessary adjustments in the event that they lost their balance and to return to the testing position as quickly as possible
  - Test #1 - Double Leg Stance (feet together)
  - Test #2 - Single Leg Stance (non-dominant foot; free leg should be bent to 90 degrees)
  - Test #3 - Tandem Stance (non-dominant foot in the rear; weight evenly distributed)
- 20 seconds per test
- Each test is performed on a firm surface (grass, turf, court, etc.) and a 10-cm-thick foam / unstable surface

**Balance Errors**-
- Hands lifted off of iliac crests
- Opening eyes
- Step, stumble, or fall
- Moving hip into more than 30 degrees of flexion or abduction
- Lifting forefoot or heel
- Remaining out of testing position for more than five (5) seconds

**BESS Scoring**-
- The number of balance errors (1 point per error) on each of the six (6) tests are added together for a total BESS Score

Team Physician Signature: ________________________________    Date: _____________________

Head Athletic Trainer: ____________________________________    Date: _____________________
UNIVERSITY OF TENNESSEE AT MARTIN
Department of Athletics

Concussion Policy Acknowledgement

I confirm that I have been informed by The University of Tennessee at Martin Department of Athletics that by participating in intercollegiate athletics, that I may experience any of the following symptoms by suffering from a concussion:

- Headaches
- Dizziness
- Nausea
- Blurred Vision
- Amnesia
- Possible Loss of Consciousness
- Ringing in the ears (Tinnitus)
- Confusion
- Disorientation
- Slurred or Incoherent Speech
- Delayed Verbal or Motor Response
- Light Sensitivity

I, the undersigned, do hereby affirm that it is my responsibility to notify the UT Martin Sports Medicine Staff should I experience any of these symptoms at any time. I further attest that should I suffer a concussion that I agree to abide by the UT Martin Concussion Policy before being allowed to return to play in my sport.

____________________________________________                                  ___________________
Student Athlete Signature (If under 18, include parent/guardian signature)                  Date
What is the SCAT3?1

The SCAT3 is a standardized tool for evaluating injured athletes for concussion and can be used in athletes aged from 13 years and older. It supersedes the original SCAT and the SCAT2 published in 2005 and 2009, respectively. For younger persons, ages 12 and under, please use the Child SCAT3. The SCAT3 is designed for use by medical professionals. If you are not qualified, please use the Sport Concussion Recognition Tool. Preseason baseline testing with the SCAT3 can be helpful for interpreting post-injury test scores.

Specific instructions for use of the SCAT3 are provided on page 3. If you are not familiar with the SCAT3, please read through these instructions carefully. This tool may be freely copied in its current form for distribution to individuals, teams, groups and organizations. Any revision or any reproduction in a digital form requires approval by the Concussion in Sport Group.

NOTE: The diagnosis of a concussion is a clinical judgment, ideally made by a medical professional. The SCAT3 should not be used solely to make, or exclude, the diagnosis of concussion in the absence of clinical judgement. An athlete may have a concussion even if their SCAT3 is “normal”.

What is a concussion?

A concussion is a disturbance in brain function caused by a direct or indirect force to the head. It results in a variety of non-specific signs and/or symptoms (some examples listed below) and most often does not involve loss of consciousness. Concussion should be suspected in the presence of any one or more of the following:

- Symptoms (e.g., headache), or
- Physical signs (e.g., unsteadiness), or
- Impaired brain function (e.g. confusion) or
- Abnormal behaviour (e.g., change in personality).

SIDELINE ASSESSMENT

Indications for Emergency Management

NOTE: A hit to the head can sometimes be associated with a more serious brain injury. Any of the following warrants consideration of activating emergency procedures and urgent transportation to the nearest hospital:

- Glasgow Coma score less than 15
- Deteriorating mental status
- Potential spinal injury
- Progressive, worsening symptoms or new neurologic signs

Potential signs of concussion?

If any of the following signs are observed after a direct or indirect blow to the head, the athlete should stop participation, be evaluated by a medical professional and should not be permitted to return to sport the same day if a concussion is suspected.

Any loss of consciousness?

“If so, how long?”

Balance or motor incoordination (stumbles, slow/laboured movements, etc.)?

Disorientation or confusion (inability to respond appropriately to questions)?

Loss of memory:

“If so, how long?”

“Before or after the injury?”

Blank or vacant look:

Visible facial injury in combination with any of the above:

Glasgow coma scale (GCS)

Best eye response (E)

No eye opening

Eye opening in response to pain

Eye opening to speech

Eye opening spontaneously

Best verbal response (V)

No verbal response

Incomprehensible sounds

Inappropriate words

Confused

Oriented

Best motor response (M)

No motor response

Extension to pain

Abnormal flexion to pain

Flexion/Withdrawal to pain

Localizes to pain

Obeys commands

Glasgow Coma score (E + V + M)

GCS should be recorded for all athletes in case of subsequent deterioration.

Maddocks Score3

“I am going to ask you a few questions, please listen carefully and give your best effort.”

Modified Maddocks questions (1 point for each correct answer)

What venue are we at today?

Which half is it now?

Who scored last in this match?

What team did you play last week/game?

Did your team win the last game?

Maddocks score

Maddocks score is validated for sideline diagnosis of concussion only and is not used for serial testing.

Notes: Mechanism of Injury (“tell me what happened”):

Any athlete with a suspected concussion should be REMOVED FROM PLAY, medically assessed, monitored for deterioration (i.e., should not be left alone) and should not drive a motor vehicle until cleared to do so by a medical professional. No athlete diagnosed with concussion should be returned to sports participation on the day of Injury.
### Background

Name: ___________________________ Date: ___________________________

Examiner: ________________________ Sport/team/school: ________________________

Date/time of injury: ________________________ Age: ________________________

Years of education completed: ________________________ Gender: M F

Dominant hand: right left neither How many concussions do you think you have had in the past? ________________________

When was the most recent concussion? ________________________

How long was your recovery from the most recent concussion? ________________________

Have you ever been hospitalized or had medical imaging done for a head injury? Y N

Have you ever been diagnosed with headaches or migraines? Y N

Do you have a learning disability, dyslexia, ADD/ADHD? Y N

Have you ever been diagnosed with depression, anxiety or other psychiatric disorder? Y N

Has anyone in your family ever been diagnosed with any of these problems? Y N

Are you on any medications? If yes, please list: Y N

### Symptom Evaluation

**How do you feel?**

*You should score yourself on the following symptoms, based on how you feel now.*

<table>
<thead>
<tr>
<th>Symptom</th>
<th>none</th>
<th>mild</th>
<th>moderate</th>
<th>severe</th>
</tr>
</thead>
<tbody>
<tr>
<td>Headache</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td><em>Pressure in head</em></td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>Neck Pain</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>Nausea or vomiting</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>Dizziness</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>Blurred vision</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>Balance problems</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>Sensitivity to light</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>Sensitivity to noise</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>Feeling slowed down</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>Feeling like “in a fog”</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>“Don’t feel right”</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>Difficulty concentrating</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>Difficulty remembering</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>Fatigue or low energy</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>Confusion</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>Dizziness</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>Trouble falling asleep</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>More emotional</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>Irritability</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>Sadness</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>Nervous or Anxious</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
</tbody>
</table>

**Total number of symptoms (Maximum possible 22)**

**Symptom severity score (Maximum possible 132)**

- Do the symptoms get worse with physical activity? Y N
  - self rated
  - clinician interview

- Do the symptoms get worse with mental activity? Y N
  - self rated and clinician monitored
  - self rated with parent input

**Overall rating:** If you know the athlete well prior to the injury, how different is the athlete acting compared to his/her usual self?

- Please circle one response: no different very different unsure N/A

### Cognitive & Physical Evaluation

**SCAT3 to be done in resting state. Best done 10 or more minutes post exercise.**

### Cognitive Assessment

**Standardized Assessment of Concussion (SAC)**

**Orientation** (1 point for each correct answer)

- What month is it? 0 1
- What is the date today? 0 1
- What is the day of the week? 0 1
- What year is it? 0 1
- What time is it right now? (within 1 hour) 0 1

**Orientation score** of 5

**Immediate memory**

<table>
<thead>
<tr>
<th>List</th>
<th>Trial 1</th>
<th>Trial 2</th>
<th>Trial 3</th>
<th>Alternative word list</th>
</tr>
</thead>
<tbody>
<tr>
<td>elbow</td>
<td>0 1 0 1 0 1</td>
<td>candle</td>
<td>baby</td>
<td>finger</td>
</tr>
<tr>
<td>apple</td>
<td>0 1 0 1 0 1</td>
<td>paper</td>
<td>monkey</td>
<td>penny</td>
</tr>
<tr>
<td>carpet</td>
<td>0 1 0 1 0 1</td>
<td>sugar</td>
<td>perfume</td>
<td>blanket</td>
</tr>
<tr>
<td>saddle</td>
<td>0 1 0 1 0 1</td>
<td>sandwich</td>
<td>sunset</td>
<td>lemon</td>
</tr>
<tr>
<td>bubble</td>
<td>0 1 0 1 0 1</td>
<td>wagon</td>
<td>iron</td>
<td>insect</td>
</tr>
</tbody>
</table>

**Immediate memory score total** of 15

**Concentration:** Digits Backward

<table>
<thead>
<tr>
<th>List</th>
<th>Trial 1</th>
<th>Alternative digit list</th>
</tr>
</thead>
<tbody>
<tr>
<td>4-9-3</td>
<td>0 1</td>
<td>6-2-9</td>
</tr>
<tr>
<td>3-8-1-4</td>
<td>0 1</td>
<td>3-2-7-9</td>
</tr>
<tr>
<td>6-2-9-7-1</td>
<td>0 1</td>
<td>1-5-2-8-6</td>
</tr>
<tr>
<td>5-7-1-8-4-6-2</td>
<td>0 1</td>
<td>5-3-9-1-4-8</td>
</tr>
</tbody>
</table>

**Concentration score** of 5

**Concentration:** Month in Reverse Order (1 pt. for entire sequence correct)

Dec-Nov-Sep-Oct-Aug-Jul-Jun-May-Apr-Mar-Feb-Jan

**Concentration score** of 5

### Neck Examination

**Range of motion** Tenderness Upper and lower limb sensation & strength

**Findings:**

### Balance Examination

Do one or both of the following tests.

Footwear (shoes, barefoot, braces, tape, etc.)

**Modified Balance Error Scoring System (BESS) testing**

- Which foot was tested (i.e. which is the non-dominant foot) Left Right
- Testing surface (hard floor, field, etc.)

**Condition**

- Double leg stance: Errors
- Single leg stance (non-dominant foot): Errors
- Tandem stance (non-dominant foot at back): Errors

**And / Or**

**Tandem gait**

Time (best of 4 trials): _______ seconds

### Coordination Examination

**Upper limb coordination**

- Which arm was tested: Left Right

**Coordination score** of 1

### SAC Delayed Recall

**Delayed recall score** of 5

---

Scoring on the SCAT3 should not be used as a stand-alone method to diagnose concussion, measure recovery or make decisions about an athlete’s readiness to return to competition after concussion. Since signs and symptoms may evolve over time, it is important to consider repeat evaluation in the acute assessment of concussion.
INSTRUCTIONS
Words in italics throughout the SCAT3 are the instructions given to the athlete by the tester.

Symptom Scale
“You should score yourself on the following symptoms, based on how you feel now”. To be completed by the athlete. In situations where the symptom scale is being completed after exercise, it should still be done in a resting state, at least 10 minutes post exercise.

For total number of symptoms, maximum possible is 22. For Symptom severity score, add all scores in table, maximum possible is 22 x 6 = 132.

SAC4
Immediate Memory
“I am going to test your memory. I will read you a list of words and when I am done, repeat back as many words as you can remember, in any order.”

Trials 2 & 3:
“I am going to repeat the same list again. Repeat back as many words as you can remember in any order, even if you said the word before.”
Complete all 3 trials regardless of score on trial 1 & 2. Read the words at a rate of one per second. Score 1 pt. for each correct response. Total score equals sum across all 3 trials. Do not inform the athlete that delayed recall will be tested.

Concentration
Digits backward
“I am going to read you a string of numbers and when I am done, repeat them back to me backwards, in reverse order of how I read them to you. For example, if I say 7-1-5, you would say 9-1-7.”
If correct, go to next string length. If incorrect, read trial 2. One point possible for each string length. Stop after incorrect on both trials. The digits should be read at the rate of one per second.

Months in reverse order
“Now tell me the months of the year in reverse order. Start with the last month and go backward. So you’ll say December, November … Go ahead”.
1 pt. for entire sequence correct

Delayed Recall
The delayed recall should be performed after completion of the Balance and Coordination Examination.

“Do you remember that list of words I read a few times earlier? Tell me as many words from the list as you can remember in any order.”
Score 1 pt. for each correct response

Balance Examination
Modified Balance Error Scoring System (BESS) testing5
This balance testing is based on a modified version of the Balance Error Scoring System (BESS)6. A stopwatch or watch with a second hand is required for this testing.

“I am now going to test your balance. Please take your shoes off, roll up your pant legs above ankle (if applicable), and remove any ankle taping (if applicable). This test will consist of three twenty-second tests with different stances."

(a) Double leg stance:
“The first stance is standing with your feet together with your hands on your hips and with your eyes closed. You should try to maintain stability in that position for 20 seconds. I will be counting the number of times you move out of this position. If you stumble out of this position, open your eyes and return to the start position and continue balancing. I will start timing when you are set and have closed your eyes.”

(b) Single leg stance:
“If you were to kick a ball, which foot would you use? (This will be the dominant foot). Now stand on your non-dominant foot. The dominant leg should be held in approximately 30 degrees of hip flexion and 45 degrees of knee flexion. Again, you should try to maintain stability for 20 seconds with your hands on your hips and your eyes closed. I will be counting the number of times you move out of this position. If you stumble out of this position, open your eyes and return to the start position and continue balancing. I will start timing when you are set and have closed your eyes.”

(c) Tandem stance:
“Now stand heel-to-toe with your non-dominant foot in back. Your weight should be evenly distributed across both feet. Again, you should try to maintain stability for 20 seconds with your hands on your hips and your eyes closed. I will be counting the number of times you move out of this position. If you stumble out of this position, open your eyes and return to the start position and continue balancing. I will start timing when you are set and have closed your eyes.”

Balance testing – types of errors
1. Hands lifted off iliac crest
2. Opening eyes
3. Step, stumble, or fall
4. Moving hip into > 30 degrees abduction
5. Lifting forehead or heel
6. Remaining out of test position > 5 sec

Each of the 20-second trials is scored by counting the errors, or deviations from the proper stance, accumulated by the athlete. The examiner will begin counting errors only after the individual has assumed the proper start position. The modified BESS is calculated by adding one error point for each error during the three 20-second tests. The maximum total number of errors for any single condition is 10. If a athlete commits multiple errors simultaneously, only one error is recorded but the athlete should quickly return to the testing position, and counting should resume once subject is set. Subjects that are unable to maintain the testing procedure for a minimum of five seconds at the start are assigned the highest possible score, ten, for that testing condition.

OPTION: For further assessment, the same 3 stances can be performed on a surface of medium density foam (e.g., approximately 50 cm x 40 cm x 6 cm).

Tandem Gait5,7,8
Participants are instructed to stand with their feet together behind a starting line (the test is best done with footwear removed). Then, they walk in a forward direction as quickly and as accurately as possible along a 38mm wide (sports tape), 3 meter line with an alternate foot heel-to-toe gait ensuring that they approximate their heel and toe on each step. Once they cross the end of the 3mm line, they turn 180 degrees and return to the starting point using the same gait. A total of 4 trials are done and the best time is retained. Athletes should complete the test in 14 seconds. Athletes fail the test if they step off the line, have a separation between their heel and toe, or if they touch or grab the examiner or an object. In this case, the time is not recorded and the trial repeated, if appropriate.

Coordination Examination
Upper limb coordination
Finger-to-nose (FTN) task:
“I am going to test your coordination now. Please sit comfortably on the chair with your eyes open and your arm (either right or left) outstretched (shoulder flexed to 90 degrees and elbow and fingers extended), pointing in front of you. When I give a start signal, I would like you to perform five successive finger to nose repetitions using your index finger to touch the tip of the nose, and then return to the starting position, as quickly and as accurately as possible.”

Scoring: 5 correct repetitions in < 4 seconds = 1
Note for testers: Athletes fail the test if they do not touch their nose, do not fully extend their elbow or do not perform five repetitions. Failure should be scored as 0.

References & Footnotes
1. This tool has been developed by a group of international experts at the 4th International Consensus meeting on Concussion in Sport held in Zurich, Switzerland in November 2012. The full details of the conference outcomes and the authors of the tool are published in The BJSIM Injury Prevention and Health Protection, 2013, Volume 47, Issue 5. The outcome paper will also be simultaneously co-published in other leading biomedical journals with the copyright held by the Concussion in Sport Group, to allow unrestricted distribution, providing no alterations are made.

SCAT3 SPORT CONCUSSION ASSESSMENT TOOL 3 | PAGE 3 © 2013 Concussion in Sport Group
ATHLETE INFORMATION

Any athlete suspected of having a concussion should be removed from play, and then seek medical evaluation.

Signs to watch for
Problems could arise over the first 24–48 hours. The athlete should not be left alone and must go to a hospital at once if they:
- Have a headache that gets worse
- Are very drowsy or can't be awakened
- Can't recognize people or places
- Have repeated vomiting
- Behave unusually or seem confused; are very irritable
- Have seizures (arms and legs jerk uncontrollably)
- Have weak or numb arms or legs
- Are unsteady on their feet; have slurred speech

Remember, it is better to be safe.
Consult your doctor after a suspected concussion.

Return to play
Athletes should not be returned to play the same day of injury. When returning athletes to play, they should be medically cleared and then follow a stepwise supervised program, with stages of progression.

For example:

<table>
<thead>
<tr>
<th>Rehabilitation stage</th>
<th>Functional exercise at each stage of rehabilitation</th>
<th>Objective of each stage</th>
</tr>
</thead>
<tbody>
<tr>
<td>No activity</td>
<td>Physical and cognitive rest</td>
<td>Recovery</td>
</tr>
<tr>
<td>Light aerobic exercise</td>
<td>Walking, swimming or stationary cycling</td>
<td>Increase heart rate</td>
</tr>
<tr>
<td>Sport-specific exercise</td>
<td>Skating drills in ice hockey, running drills in soccer</td>
<td>Add movement</td>
</tr>
<tr>
<td>Non-contact training drills</td>
<td>Progression to more complex training drills, eg passing drills in football and ice hockey</td>
<td>Exercise, coordination, and cognitive load</td>
</tr>
<tr>
<td>Full contact practice</td>
<td>Following medical clearance participate in normal training activities</td>
<td>Restore confidence and assess functional skills by coaching staff</td>
</tr>
<tr>
<td>Return to play</td>
<td>Normal game play</td>
<td></td>
</tr>
</tbody>
</table>

There should be at least 24 hours (or longer) for each stage and if symptoms recur the athlete should rest until they resolve once again and then resume the program at the previous asymptomatic stage. Resistance training should only be added in the later stages.

If the athlete is symptomatic for more than 10 days, then consultation by a medical practitioner who is expert in the management of concussion, is recommended.

Medical clearance should be given before return to play.

CONCUSSION INJURY ADVICE
(To be given to the person monitoring the concussed athlete)

This patient has received an injury to the head. A careful medical examination has been carried out and no sign of any serious complications has been found. Recovery time is variable across individuals and the patient will need monitoring for a further period by a responsible adult. Your treating physician will provide guidance as to this timeframe.

If you notice any change in behaviour, vomiting, dizziness, worsening headache, double vision or excessive drowsiness, please contact your doctor or the nearest hospital emergency department immediately.

Other important points:
- Rest (physically and mentally), including training or playing sports until symptoms resolve and you are medically cleared
- No alcohol
- No prescription or non-prescription drugs without medical supervision.
  Specifically:
  - No sleeping tablets
  - Do not use aspirin, anti-inflammatory medication or sedating pain killers
  - Do not drive until medically cleared
  - Do not train or play sport until medically cleared

Clinic phone number

<table>
<thead>
<tr>
<th>Test Domain</th>
<th>Score</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of Symptoms of 22</td>
<td></td>
</tr>
<tr>
<td>Symptom Severity Score of 132</td>
<td></td>
</tr>
<tr>
<td>Orientation of 5</td>
<td></td>
</tr>
<tr>
<td>Immediate Memory of 15</td>
<td></td>
</tr>
<tr>
<td>Concentration of 5</td>
<td></td>
</tr>
<tr>
<td>Delayed Recall of 5</td>
<td></td>
</tr>
<tr>
<td>SAC Total</td>
<td></td>
</tr>
</tbody>
</table>

Notes:

Patient’s name
Date/time of injury
Date/time of medical review
Treating physician

Contact details or stamp

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