Worcester Polytechnic Institute: Sports Medicine Department
Concussion Policy and Protocol

Introduction:

Research has shown that student athletes are most vulnerable to concussions, post-concussion syndrome, and complex concussion symptoms within 7-14 days of an initial concussion. The WPI Sports Medicine Departments focus is to provide proper care in collaboration with Team Physicians and annual recommendations from the NCAA Sports Science Institute to minimize the short and long-term risks of concussions.

Definition of Concussion:

According to the NCAA Sports Science Institute, a concussion is:

- A change in brain function,
- following a force to the head, which
- may be accompanied by temporary loss of consciousness, but is
- identified in awake individuals, with
- measures of neurologic and cognitive dysfunction.

Signs/Symptoms of a Concussion:

Be aware that concussion signs/symptoms are often individualistic. Signs/symptoms can appear immediately following an injury or have delayed-onset. Those individuals with prior concussions, history of migraines/headache disorders, learning disabilities, and mood disorders may have a longer return to play. These signs/symptoms may include, but not limited to:

- Headache or head pressure
- Nausea or vomiting
- Balance problems or dizziness
- Double or blurry vision
- Sensitivity to light or noise
- Feeling sluggish, hazy, or foggy
- Confusion, concentration or memory problems
- Ringing in the ears
- Excessive sleeping or not sleeping enough
- Mood swings, changes in personality

Signs and symptoms that you may notice in someone with a concussion:

- Unconsciousness or fainting
- Convulsions or seizure
- Person appears dazed or stunned
- Person forgets instructions
- Person is confused with assignment or position
- Person is unsure of game, score or opponent
- Person appears less coordinated
- Person answers questions slowly
- Mood swings, changes in personality
Second Impact Syndrome:

This may occur in individuals who had a concussion from which they are still experiencing symptoms, and they sustain a second injury to the head. There is an increase in pressure in the head. The person become unresponsive with dilated pupils, had respiratory failure, and result in death.

Annual Education:

Student athletes, coaches, and additional administrators will be educated annually about current NCAA Sports Science Institute concussion guidelines and updates.

**Coaches and Director of Physical Education, Recreation, and Athletics (PERA):**

All head, assistant, and volunteer coaches, in addition to the Director of PERA, will be required to complete annual concussion education prior to the start of the first official practice:

1. The completion of the *Heads Up* training module through the Center of Disease Control and Prevention ([https://www.cdc.gov/heads-up/youthsports/training/](https://www.cdc.gov/heads-up/youthsports/training/)) and provide a copy of the certificate to the WPI Athletic Training staff.
3. A signed *Concussion Statement* document, which states that coaches undergo annual concussion education. Return the form to the WPI Athletic Training staff.

**WPI Team Physicians:**

1. The team physician has reviewed and approved the policy/protocol.
2. A copy of the policy/protocol provided annually to team physicians, prior to first doctor clinic hours.

**WPI Varsity Student Athletes:**

All student athletes are required to complete the following forms and tasks prior to clearance to participate in varsity athletics.

1. Medical History Form: Provides an up to date history of past brain injury and concussions, which is completed annually.
2. Student athletes are required to view the Concussion Education Video located on the WPI Sports Medicine website ([http://athletics.wpi.edu/navbar_red/sports_medicine/index](http://athletics.wpi.edu/navbar_red/sports_medicine/index)), electronically complete and sign *Concussion Statement Form*, and *Athletic Training Video Quiz*.
3. Annually there will be a concussion education power point presentation, and the NCAA Concussion: A Fact Sheet for Student-Athletes provided during Preseason Meeting. Prior to the start of the first official practice.
4. Documents about concussion education are available on the WPI Sports Medicine Website.
5. All first year/transfer student athletes are required to complete a baseline concussion computerized test (symptom evaluation and cognitive assessment) and balance testing prior to first official team practice.
   a. Impact Test for symptom and cognitive baseline.
6. Student athletes with a history multiple concussions or complicated concussions evaluated further by WPI team physicians for final clearance.

Baseline Concussion Testing:

1. All first year and transfer student athletes must complete a baseline concussion computerized and balance test. This must be completed prior to the first official team practice.

*If a student athlete does not complete their baseline test they will not be cleared to participate.

Recognition and Diagnosis of Concussion:

A certified athletic trainer (ATC) will be on the sideline at all home contests, away contests (football, wrestling, and post-season competition), and a team physician will be present at all football games. During practices, an ATC will be available via radio/cell phone; the exception is football practice where an ATC will be onsite.

- All student athletes with a suspected/diagnosed concussion must be removed from play to be evaluated immediately by an ATC and/or covering physician (if present) and triaged appropriately (monitoring the student athlete, sending to ER, activating EMS, etc.).
- Any student athlete with a suspected/diagnosed concussion is done from participation for the calendar day (i.e. no more bell ringing episodes and sending the athlete back if they are clear of symptoms within 15 minutes). It is too risky to return a student athlete to activity that same calendar day with a brain injury/suspected concussion.
- The student athlete will be evaluated in these core areas, but additional areas may be required:
  - Assessment for cervical, skull, and intracranial bleeding.
  - General symptoms assessment (verbal or Graded Symptom Scale Checklist⁷ if available)
  - Physical (neck injury, strength testing) and neurological exam (Pupils, Cranial Nerves, ocular movement)
  - Cognitive assessment (SCAT⁴ or SAC⁹)
  - Balance (modified BESS, SCAT or SAC)
- Any student athlete with progressive neurologic symptoms, focal/unilateral neurologic deficits, confusion, agitation, or at the discretion of the ATC and/or covering physician (if present) should be transferred via EMS to the nearest appropriate hospital or medical facility. This might be either when evaluated on the field/site of injury or later in the day/evening if symptoms worsen. Some of the signs and symptoms that will require emergency medical attention are:
  - Prolonged loss of consciousness
  - Seizure
  - Rapid increase of symptoms (increased headache, persistent vomiting, in and out of consciousness, etc.)
  - Glasgow Coma score less than 13
  - Focal neurological deficit (pupils unequal, loss of normal motor function, slurred speech, etc.)
  - Repetitive emesis
  - Persistently diminished/worsening mental status
  - Potential Spine or Skull Injury
• Non-emergency concussions will be continued to be monitored by ATC and/or covering physician for the remainder of the game/athletic event or practice.
• All student athletes with a suspected/diagnosed concussion and stable neurologic exam will be released to a responsible adult (roommate, coach, or parent/guardian). The student athlete and responsible adult will be provided a concussion management packet\(^0\) regarding the warning signs/symptoms to monitor and treatment for the next 24-48 hours after sustaining a concussion. ATC will also provide their cell phone number.
  o Visiting team student athletes with a suspected concussion are provided the *WPI Visiting Team Concussion Management Factsheet\(^1\)*. The athletic trainer on duty will notify the visiting team student athlete’s athletic trainer via email/phone.
• The on call ATC will notify “The Care Team” via the link: [https://www.wpi.edu/offices/dean-students/concerned-about-student](https://www.wpi.edu/offices/dean-students/concerned-about-student). The Director of PERA notified via email at the time of the injury.
• All WPI student athletes with a suspected/diagnosed concussion will be seen within 24-48 hours of the injury by a WPI approved team physician or health services. The ATC and student athlete will work together to make an appointment as soon as possible. The athletic training staff will continue to monitor symptoms.
• The WPI Team Physician, Disability Services, Academic Advising, and Health Services will provide the student athlete with academic support and Return to Learn protocols. The student athlete may begin the *Return to Play Protocol\(^2\)* once they are asymptomatic for 24-48 hours, has re-taken the computerized concussion test and is similar to baseline score, and completed the Return to Learn Protocol.
• All student athletes with a suspected/diagnosed concussion needs to be evaluated and cleared prior to full return to play by WPI approved team physicians in collaboration and coordination with the WPI Athletic Training Staff. Appropriate serial monitoring, balance testing, neuro-cognitive testing, clinical exam, and symptom scores will assist in this process. If computer based neuropsychological testing is utilized post-concussion, it should not be performed until the student athlete’s symptom checklist score is zero (i.e. has no symptoms) and they have a normal clinical exam.
• Cases of complex concussions (atypical symptoms, prolonged recovery, etc.) may require triage to neurology on a case by case basis. Cases of complex concussions, history of prior concussions, or repeat concussions within the same athletic season will often require a longer return to play progression and may necessitate the termination of the athletic season at the discretion of the WPI athletic training staff and appropriate consultants. **Complex concussions will be considered as concussions with symptoms lasting two weeks or longer.**
  o Complex concussions can be referred to the UMass Medical Center: Sports Medicine Clinic.
  o Office phone number: (508) 334-6606
• Team physicians in coordination with the athletic training staff, the student athlete, and student athlete’s family (if a minor) have the final decision on return to play at WPI. Outside or home physician evaluations sought by the student athlete or student athlete’s family will be reviewed and put in context of the injury, but non WPI associated physicians will not determine return to
play for WPI student athletes.
- No student athlete with continued clinical symptoms will be allowed to return to play at any time.
- All non-athletic related concussions will be referred to the emergency room or health services. All student athletes that sustain a concussion must complete the Return to Play (RTP) protocol prior to returning to full activity.

**Return to Learn:**

The WPI Sports Medicine Department works with a team of departments to assist with the Return to Learn process:
- Team Physician
- Health Services
- Office of Disability Services (DSO)
- Academic Advising (AA)
- Student Development and Counseling Center (SDCC)
- The Care Team

When a student athlete sustains a concussion, the athletic trainer on duty notifies “The Care Team”. The following are the steps taken to return the athlete back to the classroom:
- Academic Advising alerts the student athlete’s professors that they will be on cognitive rest.
- Athlete does not attend class if he/she is symptomatic that calendar day/following day until seen by the team physician.
- Team physician designates student athlete’s academic load and progress. Follow up weekly.
- If signs/symptoms persist for 72 hours, the WPI Athletic Trainer will alert DSO to set up a meeting, and accommodations in the classroom.
- Once symptom free student athlete begins to gradually progress back to normal academic load under the guidance of the team physician.
- Once asymptomatic and cleared by team physician to return to the classroom fully, student athlete may begin Return to Play Protocol.

**Recommendations for Return to Learn from NCAA Sports Science Institute:**

- If the student athlete has a suspected/diagnosed concussion, it is recommended they avoid the classroom for that calendar day at least.
- The student athlete avoids cognitive activity if they cannot tolerate light.
- Return to the classroom once they can tolerated cognitive activity.
- If the student athlete becomes symptomatic after returning to cognitive activity, the team physician notified for reassessment of the student athlete.

**Return to Play Protocol:**

This protocol is a seven day (usually 8-10 days for football) progression that has been approved by the WPI team physician. In order to begin the RTP Protocol the student athlete must be cleared by the WPI Team Physician, asymptomatic (24-48 hours), and completed the Return to Learn process, returned to the classroom full time (unless otherwise designated differently by team physician), and returned to baseline (re-take computerized cognitive test). This is a general progression and each concussion case is
individualistic.

- The student athlete must be asymptomatic after each stage to progress to the next step.
- If symptoms occur during the RTP Protocol activity stops and the student athlete must wait until they are asymptomatic 24-48 hour before restarting at the same progression stage.
- If symptoms continue, activity will be stopped and the student athlete will be referred back to the team physician for reassessment.

1. Light aerobic exercise such as walking, swimming or riding a stationary bike. No resistance training. If asymptomatic with light exercise, then;
2. Mode, duration, and intensity-dependent exercise based upon sport. If asymptomatic with such exertion, then;
3. Sport-specific activity with no head impact. If asymptomatic with sport-specific activity, then;
4. Non-contact sport drills and resumption of progressive resistance training. If asymptomatic with non-contact drills and resistance training, then;
5. Full-contact practice. If asymptomatic with full-contact practice, then;
6. Return-to-play. Medical clearance will be determined by the team physician/physician designee, or athletic trainer in consultation with a team physician.
7. Game Day

Reducing Exposure to Head Trauma Management Plan:

- Annual concussion education to student athletes, coaches, and Director of PERA prior to the start of first official practice.
- Educational Series throughout the year with updated information and resources for head injury/concussion and safety regulations.
- Adhere to Interassociation Consensus: Year-Round Football Practice Contact Recommendations.
  - Football coaches view the Seattle Seahawks Tackling Video to decrease risk of injury.
  - Mobile tackling dummies were purchased for student athletes to practice proper tackling techniques, and for players to tackle each other less at practice.
- Concussion injuries entered for data collection into the NCAA Injury Surveillance Program.
- In order to see areas of higher occurrence of concussions. Document Concussions with the following data:
  - What sport or nonathletic
  - Practice or Game
  - Time it takes to recover from symptoms
  - Time it takes to return to class
  - Time it takes of Return to Play
- When available WPI Athletic Training Staff will attend/view Board of Certification continuing education units (CEUs), seminars, and symposiums on head, spine, and concussion injuries.
- WPI Athletic Training Staff will review updated research and NCAA Sport Science Institute recommendations annually, applying changes to the concussion protocol as needed.
What is a concussion?
A concussion is a type of traumatic brain injury. It follows a force to the head or body and leads to a change in brain function. It is not typically accompanied by loss of consciousness.

How can I tell if an athlete has a concussion?
You may notice the athlete ...
- Appears dazed or stunned
- Forgets an instruction
- Is confused about an assignment or position
- Is unsure of the game, score or opponent
- Appears less coordinated
- Answers questions slowly
- Loses consciousness

More than two concussions are the same. All possible concussions must be evaluated by an athletic trainer or team physician.

The athlete may tell you he or she is experiencing ...
- A headache
- Head pressure or that he or she doesn't feel right following a blow to the head
- Nausea
- Balance problems or dizziness
- Double or blurry vision
- Sensitivity to light or noise
- Feeling sluggish, hazy or foggy
- Confusion, concentration or memory problems

What can I do to keep student-athletes safe?

<table>
<thead>
<tr>
<th>Preseason</th>
<th>In-Season</th>
<th>Time of Injury</th>
<th>Recovery</th>
</tr>
</thead>
<tbody>
<tr>
<td>Create a culture in which concussion reporting is encouraged and promoted.</td>
<td>Know the signs and symptoms of concussions.</td>
<td>Remove athletes from play immediately if you think they have a concussion and refer them to the team physician or athletic trainer.</td>
<td>Follow the recovery and return-to-play protocol established by team physicians and athletic trainers.</td>
</tr>
</tbody>
</table>

What can I do?

| Why does it matter?                                                                 |
|---------------------------------------------------------------------------|----------------------------------------------------------------------------|
| Athletes who don’t immediately seek care for a suspected concussion take longer to recover. |                                                                                   |
| The more people who know what to look for in a concussion, the more likely it will be identified. |
| Early removal from play can mean a quicker recovery and help avoid serious consequences. |
| Team physicians and athletic trainers have the training to follow best practices related to the concussion recovery process. |
| Tell athletes that decisions related to their return to play and health are entirely in the hands of the team physician and athletic trainer. |

Tips and strategies

<table>
<thead>
<tr>
<th>Preseason</th>
<th>In-Season</th>
<th>Time of Injury</th>
<th>Recovery</th>
</tr>
</thead>
<tbody>
<tr>
<td>Create a culture in which concussion reporting is encouraged and promoted.</td>
<td>Know the signs and symptoms of concussions.</td>
<td>Remove athletes from play immediately if you think they have a concussion and refer them to the team physician or athletic trainer.</td>
<td>Follow the recovery and return-to-play protocol established by team physicians and athletic trainers.</td>
</tr>
</tbody>
</table>

You play a powerful role in setting the tone for concussion safety on your team. Let your team know that you take concussion seriously and reporting the symptoms of a suspected concussion is an important part of your team’s values.
What happens if an athlete gets a concussion and keeps practicing or competing?

- Due to brain vulnerability after a concussion, an athlete may be more likely to suffer another concussion while symptomatic from the first one.
- In rare cases, repeat head trauma can result in brain swelling, permanent brain damage or even death.
- Continuing to play after a concussion increases the chance of sustaining other injuries too, not just concussion.
- Athletes with a concussion have reduced concentration and slowed reaction time. This means they won't be performing at their best.
- Athletes who delay reporting concussion may take longer to recover fully.

What are the long-term effects of a concussion?

- We don't fully understand the long-term effects of a concussion, but ongoing studies raise concerns.
- Athletes who have had multiple concussions may have an increased risk of degenerative brain disease, and cognitive and emotional difficulties later in life.

What do I need to know about repetitive head impacts?

- Repetitive head impacts mean that an individual has been exposed to repeated impact forces to the head. These forces may or may not meet the threshold of a concussion.
- Research is ongoing but emerging data suggest that repetitive head impact also may be harmful and place a student-athlete at an increased risk of neurological complications later in life.

Did you know?

- Most contact or collision teams have at least one student-athlete diagnosed with a concussion every season.
- Your school has a concussion management plan, and team physicians and athletic trainers are expected to follow that plan during a student-athlete's recovery.
- NCAA rules require that team physicians and athletic trainers have the unchallengeable authority to make all medical management and return-to-play decisions for student-athletes.
- We're learning more about concussion every day. To find out more about the largest concussion study ever conducted, which is being led by the NCAA and U.S. Department of Defense, visit ncaa.org/concussion.

For more information, visit ncaa.org/concussion.

NCAA is a trademark of the National Collegiate Athletic Association.
Concussion Statement

☐ I understand that it is my responsibility to report all injuries and illnesses to the athletic trainers and/or team physician.

☐ I have read and understand the NCAA Concussion Fact Sheet: For Coaches

After reading the NCAA Concussion fact sheet, I am aware of the following information:

Participation in intercollegiate athletics may result in a head injury or a concussion. A concussion is a potentially serious head injury that can result in brain injury or death, which I am responsible for reporting to the athletic trainer or team physician.

Helmets, face shields, mouth guards, and other protective equipment do not eliminate the risk of concussions.

A concussion can affect a student athlete's ability to perform everyday activities, and affect reaction time, balance, sleep, and classroom performance.

You cannot see a concussion, but you might notice some of the symptoms right away. Other symptoms can show up hours or days after the injury.

If I suspect a student athlete has a concussion, I am responsible for reporting the injury to the athletic trainer or team physician.

I will not allow a student athlete to return to a game or practice if they have received a blow to the head or body that results in concussion-related symptoms. A repeat concussion is more likely when an athlete returns to play before symptoms resolve.

Following a concussion the brain needs time to heal. Student athletes are much more likely to have a repeat concussion if they return to play before symptoms are resolved.

In rare cases, repeat concussions can cause permanent brain damage, and even death.

Purposeful head contact in any sport is prohibited.

WPI has the authority to permanently retire an athlete from athletics if it determines the risks of concussive injury present a serious threat to his or her safety and well-being.

__________________________  ____________________________
Signature of Coach/Administrator  Date

__________________________
Print Name
Student-Athlete Concussion Statement

☐ I understand that it is my responsibility to report all injuries and illnesses to my athletic trainer and/or team physician.
☐ I have read and understand the NCAA Concussion Fact Sheet.

After reading the NCAA Concussion fact sheet, I am aware of the following information:

Participation in intercollegiate athletics may result in a head injury or a concussion. A concussion is a potentially serious head injury that can result in brain injury or death, which I am responsible for reporting to my team physician or athletic trainer.

Helmets, face shields, mouth guards, and other protective equipment do not eliminate the risk of concussions.

A concussion can affect my ability to perform everyday activities, and affect reaction time, balance, sleep, and classroom performance.

You cannot see a concussion, but you might notice some of the symptoms right away. Other symptoms can show up hours or days after the injury.

If I suspect a teammate has a concussion, I am responsible for reporting the injury to my team physician or athletic trainer.

I will not return to play in a game or practice if I have received a blow to the head or body that results in concussion-related symptoms. A repeat concussion is more likely when an athlete returns to play before symptoms resolve.

Following concussion the brain needs time to heal. You are much more likely to have a repeat concussion if you return to play before your symptoms resolve.

In rare cases, repeat concussions can cause permanent brain damage, and even death.

Purposeful head contact in any sport is prohibited.

WPI has the authority to permanently retire an athlete from athletics if it determines the risks of concussive injury present a serious threat to his or her safety and well-being.

______________________________  __________________________
Signature of Participant                      Date

______________________________  __________________________
Parent or Guardian Signature (If Minor)          Date
WPI Athletic Training: Video Quiz

Name: ____________________  Sport(s): ____________  Graduation Year: ________

Once you have watched the Sickle-Cell, Concussion, and MRSA educational videos please complete the questions below.

1) Do you understand the information provided in the Sickle-Cell educational video? □YES  □NO
   ➢ You will also be required to complete the Sickle-Cell Trait Requirement Form.

2) Do you understand the information provided in the Concussion educational video? □YES  □NO
   ➢ Additional concussion information will be provided during your beginning of the year team meeting.
   ➢ Freshman and Transfer student-athletes will be required to take a baseline concussion test.

3) Do you understand the information provided in the MRSA educational video? □YES  □NO

**If you have answered “No” to any of the questions above please contact the WPI Athletic Training Staff. You will not be permitted to participate until you have an understanding about the conditions presented in these videos.**

I have all three pre-season videos regarding Concussion, MRSA, and Sickle-Cell Trait education in their entirety and understand the content.

Signature of Participant ___________________________  Date __________

Signature of Parent Guardian (If Minor) ___________________________  Date __________

WPI Athletic Training

Location: First floor (across from the pool) of the Sports and Recreation Center

E-mail: athletictrainers@wpi.edu

Phone: 508-831-5733
What is a concussion?
A concussion is a type of traumatic brain injury. It follows a force to the head or body and leads to a change in brain function. It is not typically accompanied by loss of consciousness.

How can I keep myself safe?

1. Know the symptoms.
   You may experience ...
   - Headache or head pressure
   - Nausea
   - Balance problems or dizziness
   - Dizziness or blurry vision
   - Sensitivity to light or noise
   - Feeling sluggish, hazy or foggy
   - Confusion, concentration or memory problems

2. Speak up.
   - If you think you have a concussion, stop playing and talk to your coach, athletic trainer or team physician immediately.

3. Take time to recover.
   - Follow your team physician and athletic trainer's directions during concussion recovery. If left unmanaged, there may be serious consequences.
   - Once you've recovered from a concussion, talk with your physician about the risks and benefits of continuing to participate in your sport.

How can I be a good teammate?

1. Know the symptoms.
   You may notice that a teammate ...
   - Appears dazed or stunned
   - Forgets an instruction
   - Is confused about an assignment or position
   - Is unsure of the game, score or opponent
   - Appears less coordinated
   - Answers questions slowly
   - Loses consciousness

2. Encourage teammates to be safe.
   - If you think one of your teammates has a concussion, tell your coach, athletic trainer or team physician immediately.
   - Help create a culture of safety by encouraging your teammates to report any concussion symptoms.

   - If one of your teammates has a concussion, let him or her know you and the team support playing it safe and following medical advice during recovery.
   - Being unable to practice or join team activities can be isolating. Make sure your teammates know they're not alone.

No two concussions are the same. New symptoms can appear hours or days after the initial impact. If you are unsure if you have a concussion, talk to your athletic trainer or team physician immediately.
What happens if I get a concussion and keep practicing or competing?

- Due to brain vulnerability after a concussion, an athlete may be more likely to suffer another concussion while symptomatic from the first one.
- In rare cases, repeat head trauma can result in brain swelling, permanent brain damage or even death.
- Continuing to play after a concussion increases the chance of sustaining other injuries too, not just concussion.
- Athletes with concussion have reduced concentration and slowed reaction time. This means that you won’t be performing at your best.
- Athletes who delay reporting concussion take longer to recover fully.

What are the long-term effects of a concussion?

- We don’t fully understand the long-term effects of a concussion, but ongoing studies raise concerns.
- Athletes who have had multiple concussions may have an increased risk of degenerative brain disease and cognitive and emotional difficulties later in life.

What do I need to know about repetitive head impacts?

- Repetitive head impacts mean that an individual has been exposed to repeated impact forces to the head. These forces may or may not meet the threshold of a concussion.
- Research is ongoing but emerging data suggest that repetitive head impact also may be harmful and place a student-athlete at an increased risk of neurological complications later in life.

Did you know?

- NCAA rules require that team physicians and athletic trainers manage your concussion and injury recovery independent of coaching staff, or other non-medical influence.
- We’re learning more about concussion every day. To find out more about the largest concussion study ever conducted, which is being led by the NCAA and U.S. Department of Defense, visit ncaa.org/concussion.

CONCUSSION TIMELINE

**Baseline Testing**
Balance, cognitive and neurological tests that help medical staff manage and diagnose a concussion.

**Concussion**
If you show signs of a concussion, NCAA rules require that you be removed from play and medically evaluated.

**Recovery**
Your school has a concussion management plan, and team physicians and athletic trainers are required to follow that plan during your recovery.

**Return to Learn**
Return to school should be done in a step-by-step progression in which adjustments are made as needed to manage your symptoms.

**Return to Play**
Return to play only happens after you have returned to your pre-concussion baseline and you’ve gone through a step-by-step progression of increasing activity.

For more information, visit ncaa.org/concussion.

NCAA is a trademark of the National Collegiate Athletic Association.
WPI
Athletic Training Balance Evaluation

Supplies:
- Stopwatch
- WPI Athletic Training Balance Evaluation

Instructions:
1. Fill out the Balance Error Score Evaluation Form
2. Instruct athlete that you will have them stand in a series of three stances. The athlete must stay balanced to the best of their ability.
3. The athlete will be timed 20 seconds for each stance.
4. Athletes should stand with hands on iliac crest and eyes closed for all stances.
   a. If the athlete cannot hold a stance for 5 seconds, they are given the max score of 10.
5. Types of errors:
   a. Hands lifted off iliac crest
   b. Opening eyes
   c. Step, stumble, or fall
   d. Moving of hip in > 30 degrees abduction
   e. Lifting forefoot or heel
   f. Remaining out of test stance > 5 seconds
6. Each error is worth 1 point. If the athletes commits more than one error at the same time (takes hands of iliac crest and opens eyes) it is still considered 1 point.
7. If there are no errors there is a score of 0.
8. There can only be a max of 10 points for each stance.

Name: ___________________________ Sport: _______________ Date: ___________________________

Examiner: ___________________________ Time of Examination: ___________________________

Type of Test: ◯ Baseline ◯ Sideline ◯ Post Injury Day: ________ ◯ Return to Play

Which foot was tested (should be their non-dominant)? ◯ Right ◯ Left

Testing surface (hard floor, field, etc.): ____________________________________________

<table>
<thead>
<tr>
<th>Balance Error Score Card:</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Stance</strong></td>
</tr>
<tr>
<td>---------------------------</td>
</tr>
<tr>
<td>Double Leg Stance</td>
</tr>
<tr>
<td>Single Leg Stance (non-dominant)</td>
</tr>
<tr>
<td>Tandem Stance</td>
</tr>
<tr>
<td>Total</td>
</tr>
</tbody>
</table>

*Modified from Balance Error Scoring System (BESS) and Sport Concussion Assessment Tool-3rd Edition*
# Graded Symptom Scale Checklist

*Modified from various published symptom checklists*

Evaluate all signs and symptoms, ranking each on a scale of 0-6. Establish baseline score prior to the start of the athletic season. After a concussive injury, re-assess the athlete for each symptom. Add columns and compare to baseline score. Only consider return to activity if scores are comparable to baseline score. Continue testing every 2-3 days if symptoms do not resolve. Use with SAC and/or BESS to determine appropriate time for return to play.

<table>
<thead>
<tr>
<th>Symptom</th>
<th>None</th>
<th>Moderate</th>
<th>Severe</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Score According to Severity</strong></td>
<td>0</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td><strong>Symptom</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Blurred Vision</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Dizziness</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Drowsiness</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sleeping More than Usual</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Easily Distracted</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Fatigue</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Feeling 'In a Fog'</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Feeling &quot;Slowed Down&quot;</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Headache</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Unusually Emotional</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Irritability</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Loss of Consciousness</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Loss of Orientation</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Memory Problems</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Nausea</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Nervousness</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Personality Changes</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Poor Balance/Coordination</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Ringing in the Ears</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sadness</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Seeing Stars</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sensitivity to Light</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sensitivity to Noise</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sleep Disturbances</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Vacant Stares/Glasse Eyes</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Vomiting</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**TOTAL SYMPTOM SCORE:**
SCAT3
Sport Concussion Assessment Tool – 3rd Edition

What is the SCAT3?

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

Specific instructions for use at the SCAT 3 are provided on page 3. If you are not familiar with the SCAT3, please read through these instructions carefully. This tool is highly sensitive and its current form is distributed 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 show some signs or symptoms 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 symptoms (some examples listed below) and most often does not involve loss of consciousness. Concussions should be suspected in the presence of any one or more of the following:

- Amnesia (e.g., head trauma)
- Physical signs (e.g., unsteadiness, dizziness)
- Impaired brain function (e.g., confusion or disorientation) or emotional behavior (e.g., change in personality).

SIDELINE ASSESSMENT

Indications for Emergency Management

NOTE: If not on the sidelines, or off-site, always make decisions in the presence of additional medical expertise. Any of the following warrants consideration of activating emergency procedures and urgent transportation to the nearest hospital:

- Glasgow Coma Scale less than 13
- Unconsciousness
- Seizure
- Prostration
- Unconscious or confusional symptoms or new neurologic signs

Potential signs of concussion:

Any of the following signs or symptoms during 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
- Loss of balance
- Limb weakness or motor incoordination (imbalance, stumbling, etc.)
- Loss of vision or confusion (difficulty to respond appropriately to questions)
- Lack of memory
- Slurred speech
- Change in behavior
- Headache
- Nausea

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.

Glasgow coma scale (GCS)

<table>
<thead>
<tr>
<th>Best eye response (E)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 No eye opening</td>
</tr>
<tr>
<td>2 Eye opening to speech</td>
</tr>
<tr>
<td>3 Eyes opening spontaneously</td>
</tr>
</tbody>
</table>

Best verbal response (V)

| 1 No verbal response |
| 2 Incomprehensible sounds |
| 3 Incomprehensible words |

Best motor response (M)

| 1 No motor response |
| 2 Abnormal sensitivity to pain |
| 3 Abnormal withdrawal to pain |

Glasgow Coma score (E + V + M)

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

Maddocks score

A scoring system to allow for accurate, precise, consistent and reliable post-play assessments.

What was your best score?

What were your worst?

What team did you play last week/game?

Did your team win the last game?

Notes: Mechanism of Injury ("tell me what happened")
COGNITIVE & PHYSICAL EVALUATION

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 (within 5 min)? 0 1

Orientation score

Immediate memory
- Finger-tapping recall (3 trials)
  - Right: 0 1 2
  - Left: 0 1 2

Immediate memory score total

Concentration: Digits Backward
- 4-9-3 0 1
- 3-9-4 0 1
- 1-5-9 0 1
- 2-5-9 0 1
- 7-1-6 0 1

Concentration score: 0 1 2 3 4

Neck Examination:
- Range of motion
- Tenderness
- Upper and lower limb sensation & strength

Balance examination
- Footwear (shoes, barefoot, braces, tape, etc.)

Modified Balance Error Scoring System (MBESS) testing
- Which foot was tested (i.e., the non-dominant foot) Left Right
- Testing surface (hard floor, field, etc.)

Condition
- Double leg stance: 
- Single leg stance (non-dominant foot):
- Lambshead stance (non-dominant foot at back)

And/or
- Tendem gain:

Coordination examination
- Upper limb coordination
- Which arm was tested: Left Right

Coordination score

SAC Delayed Recall
- Delayed recall score
INSTRUCTIONS

Nads or sobs throughout the SCAT 3 are the indications given to the athlete by the tester.

Symptom Scale

"I felt like I was having the following symptoms, I’d be interested in how you feel now:"

Not complained by the athlete. In situations where the symptom scale is being completed after an exercise, it should be done in a resting state, at least 10 minutes after the activity.

For each symptom, a maximum possible is 1.2.

1. Headache before and after exercise. Maximum possible is 12.46 - 17.2

SAC®

Interpretation of Results

1. If you are still feeling the same, progress to the next test, as you are not cleared to return to play.

Warm-up

Warming up the body for the test. Repeat tasks in every match as you are not cleared to return to play.

Warming up the muscles at a rate of 1 per second.

Single test for each correct response. Initial score equals a score of 1.2. Do not return to activity until the correct score is observed.

Neuromotor

Dizziness

Dizziness is a fall in the ability to maintain balance. If you lose your balance, take a few steps and then stop. If you lose your balance, take a few steps and then stop.

One point possible for each size:

2. One point possible for each size:

Balance Examination

Modified Balance Error Scoring System (MBESS)®

1. Balance testing is based on a modified version of the Balance Error Scoring System (MBESS)®. A "step test" or watch with a second hand is required for this testing.

2. The test is to be conducted in your normal environment. Your normal environment is where you are used to performing your tasks.

3. Double leg stance:

4. Single leg stance:

5. Tandem stance:

Balance testing - types of errors

1. Head loss of balance.
2. Opening eyes.
3. Step, stumble, or fall.
4. Missing hip into 30 degree abduction.
5. Lifting front foot or head.
6. Remaining out of test position > 3 sec.

Each of the 20-second trials is scored by counting the errors. An error occurs when the proper stance, accumulated by the athlete. The maximum will be determined 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 single error occurs, counting errors only after the individual has assumed the proper start position. The modified MBESS 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.

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

Tandem Gait*

Tandem gait is a functional task used to improve balance. The athlete must have the proper stance, accumulated by the athlete. The maximum will be determined by taking one error point for each error during the three 20-second tests. The maximum total number of errors for any single condition is 10.

Coordination Examination

Upper Limb Coordination

1. You may begin your coordination test with your hands over your head, with the palms facing upward and the index fingers pointing forward, opening your fingers. When your fingers are opened, without moving your hands, your fingers should reach the nose. Then, close your hands and fingers, opening your fingers again. Once your hands are opened, you should reach the nose.

2. You may begin your coordination test with your hands over your head, with the palms facing upward and the index fingers pointing forward, opening your fingers. When your fingers are opened, without moving your hands, your fingers should reach the nose. Then, close your hands and fingers, opening your fingers again.

Scoring: 5 correct repetitions in < 4 seconds = 1

Note for testers: Athletes fail the test if they do not have their nose, do not extend their elbow, or do not perform five repetitions. Failure should be scored as 0.

References & Footnotes

1. This test has been developed by a group of international experts at the 4th International Conference on Concussions in Sport held in Paris, Switzerland in November 2012. The full details of the conference outcomes and the authors of the test are published. The Braamfontein Inc. and the authors of the test are published in The British Journal of Sports Medicine. 2013 October;47(10) the outcome paper will also be submitted for publication in the Journal of Pediatrics and Adolescent Medicine. The outcome paper will also be submitted for publication in the Journal of Pediatrics and Adolescent Medicine. The outcome paper will also be submitted for publication in the Journal of Pediatrics and Adolescent Medicine. The outcome paper will also be submitted for publication in the Journal of Pediatrics and Adolescent Medicine.


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 should get a hospital if any of the following signs are observed:
  - Have a headache that gets worse
  - Are very dizzy or cannot be awakened
  - Can't recognize people or places
  - Have repeated vomiting
  - Behave unusually or seem confused; are very irritable
  - Have changes in color and leg jerk uncontrollably
  - Have weak, or numb arms or legs
  - Are unsteady on their feet; have slowed speech

Remember, it is better to be safe than sorry. 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:

1. **Pre-Activity Phase**
   - Characteristics: Cutting, throwing, stationary drills
   - Performance: Progressive endurance, balance, and reactive training

2. **Post-Activity Phase**
   - Characteristics: Running, tackling, stationary with heady
   - Performance: Progressive neuromuscular training

3. **Full-Activity Phase**
   - Characteristics: Full-contact drills, heady
   - Performance: Progressive cognitive and athletic training

4. **Game-Activity Phase**
   - Characteristics: Full-contact drills, heady
   - Performance: Progressive cognitive and athletic training

There should be at least 24 hours no 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 professional 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 suspected athlete

The patient has received an injury to the head. A careful medical examination has been carried out and no sign of any sensory complications has been found. Recovery will be 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 the telephone.

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

Other important points:

- No physical or mental activity, including training or playing sports
- Until symptoms resolve and you are medically cleared
- No alcohol
- No prescription or non-prescription drug, without medical supervision
- Speech therapy
- No driving vehicles
- Do not use inpatient, anti-depressant medication or sedating pain killers
- Do not drive until medically cleared
- Do not allow to play soccer until medically cleared

Clinic phone number

SCATT SPORT CONCUSSION ASSESSMENT TOOL | PAGE 4 © 2011 Concussion in Sport Group
STANDARDIZED ASSESSMENT OF CONCUSSION - SAC FORM C

NAME: ___________________________________________
TEAM: ___________________________________________
EXAMINER: _______________________________________
DATE OF EXAM: ________________________
TIME: _________________________________________
EXAM (Circle One): BLINE INJURY POST-GAME
FOLLOW-UP DAY: ________________________

INTRODUCTION:
I am going to ask you some questions. Please listen carefully and give your best effort.

ORIENTATION:
What Month is it? ________________________ 0 1
What's the Date today? ________________ 0 1
What's the Day of Week? ________________ 0 1
What Year is it? ________________________ 0 1
What Time is it right now? (within 1 hr.) ________________ 0 1

Award 1 point for each correct answer.

ORIENTATION TOTAL SCORE __________

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.

<table>
<thead>
<tr>
<th>LIST</th>
<th>TRIAL 1</th>
<th>TRIAL 2</th>
<th>TRIAL 3</th>
</tr>
</thead>
<tbody>
<tr>
<td>BABY</td>
<td>0 1</td>
<td>0 1</td>
<td>1 1</td>
</tr>
<tr>
<td>MONKEY</td>
<td>0 1</td>
<td>0 1</td>
<td>0 1</td>
</tr>
<tr>
<td>PERFUME</td>
<td>0 1</td>
<td>0 1</td>
<td>1 1</td>
</tr>
<tr>
<td>SUNSET</td>
<td>0 1</td>
<td>0 1</td>
<td>1 1</td>
</tr>
<tr>
<td>IRON</td>
<td>0 1</td>
<td>0 1</td>
<td>1 1</td>
</tr>
</tbody>
</table>

Total: 1

Trials 2 & 3: I am going to repeat that 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. 1 pt. for each correct response. Total score equals sum across all 3 trials.

Do not inform the subject that delayed recall will be tested.

IMMEDIATE MEMORY TOTAL SCORE __________

EXERCTIONAL MANEUVERS:
If subject is not displaying or reporting symptoms, conduct the following maneuvers to create conditions under which symptoms likely to be elicited and detected. These measures need not be conducted if a subject is already displaying or reporting any symptoms. If not conducted, allow 2 minutes to keep time delay constant before testing Delayed Recall. These methods should be administered for baseline testing of normal subjects.

EXERCTIONAL MANEUVERS
5 Jumping Jacks 5 Push-Ups 5 Sit-ups 5 Knee Bends

SEE REVERSE SIDE FOR IMPORTANT USER WARNINGS

CONCENTRATION

Digits Backward: I am going to read you a string of numbers and when I am done, you repeat them back to me backwards, in reverse order of how I read them to you. For example, if I say 7-1-9, you would say 9-1-7.

If correct, go to next string length. If incorrect, read trial 2. 1 pt. possible for each string length. Stop after incorrect on both trials.

Trial 1: 1-4-2 6-5-8 0 1
Trial 2: 6-8-3-1 3-4-8-1 0 1
Trial 3: 4-9-1-5-3 6-8-2-5-1 0 1
Trial 4: 3-7-6-5-1-9 9-2-6-5-1-4 0 1

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.

Doc-Nov-Oct-Sept-Aug-Jul-Jun-May-Apr-Mar-Feb-Jan 0 1

CONCENTRATION TOTAL SCORE __________

DELAYED RECALL

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. Circle each word correctly recalled. Total score equals number of words recalled.

BABY MONKEY PERFUME SUNSET IRON

DELAYED RECALL TOTAL SCORE __________

SAC SCORING SUMMARY

Exerctional Maneuvers & Neurologic Screening are important for examination, but not incorporated into SAC Total Score.

ORIENTATION / 5
IMMEDIATE MEMORY / 15
CONCENTRATION / 5
DELAYED RECALL / 5

SAC TOTAL SCORE / 30

Copyright ©2000 by McCrea, Kelly and Randolph. All rights reserved. May not be reproduced in whole or in part in any form or by any
Stepwise progression:

☐ Light aerobic exercise such as walking, swimming or riding a stationary bike. No resistance training. If asymptomatic with light aerobic exercise, then;

☐ Moderate intensity and intensity-dependent exercise based upon sport. If asymptomatic with such exercise, then;

☐ Sport-specific activity with no head impact. If asymptomatic with sport-specific activity, then;

☐ Non-contact sport drills and resumption of progressive resistance training. If asymptomatic with non-contact drills and resistance training, then;

☐ Full-contact practice. If asymptomatic with full-contact practice, then;

☐ Return-to-play. Medical clearance will be determined by the team physician/physician designee, or athletic trainer in consultation with a team physician.

☐ Game Day