

Indiana University Athletics
Concussion Management Protocol

The Indiana University Department of Intercollegiate Athletics Concussion Management Protocol follows the direction and guidance of the NCAA's Concussion Safety Protocol Committee and is compliant with a concussion management plan recommended by the Committee. It is a dynamic protocol that will be reviewed and edited as necessary to remain consistent with the most recent best practices of concussion management as set forth by the Committee.

Introduction:

Concussion management is challenging because concussion risk is highly individualized. A blow to the head with the exact same forces will yield different symptoms of differing severity depending on the individual concussed. Additionally, the brain is dynamic, especially in the developmental years of youth and adolescence, and is influenced by a multitude of other factors (i.e. sleep deprivation, dehydration, fatigue, depression, ADD/ADHD, headache disorders, drugs and supplements etc.).

International experts have convened at conferences on five occasions, most recently in Germany in 2016, in attempts to form consensus statements on the management of sports-related concussion. What has resulted is that concussions are no longer "graded" or "labeled" based on signs, symptoms, and severity. This supports the realization that sports concussion diagnosis and management needs to be individualized, and does not lend itself to a "cookbook" approach. Noting this premise, some fundamental principles apply to concussion management.

Definition:

Concussion is a complex pathophysiological process affecting brain function and induced by traumatic biomechanical forces. Concussion may or may not result in a loss of consciousness. It is most commonly characterized by the rapid onset of a constellation of physical, cognitive, emotional and sleep-related symptoms. Symptoms may last from several minutes to days, weeks, months or even longer in some cases. A working diagnosis of concussion includes two criteria: 1. A mechanism of injury to the head or an "event" which can involve direct or indirect forces and 2. That event results in one or more of the common symptoms associated with concussion and/or any sign of a concussion.

Pre -Season Education:

Education of the student-athletes, coaches, team physicians, athletic trainers, Director of Athletics and other administrators and academic personnel about concussion and the potential for chronic or permanent injury is essential to their understanding and cooperation with treatment. Time will be allotted in a preseason team meeting for education of the coaches and student-athletes about concussive injuries and the procedural guidelines for treatment of concussion are received by each player and coach. Each student-athlete and coach have the responsibility to report events or behaviors that might indicate that a concussion has occurred. Student-athletes will sign a statement in which they accept the responsibility for reporting all their injuries and illnesses to the medical staff, including signs and symptoms of concussions (Table 1). All Indiana University student-athletes, coaches, team physicians, athletic trainers and the Director of Athletics will annually be provided NCAA concussion fact sheets (or other applicable material) and will annually sign a statement to acknowledge they understand those factsheets (and/or other concussion material provided), the concussion management policy, their role within the policy and that they have received education about concussions and have had an opportunity to ask questions. Each student-athlete and coach will receive a copy of the sequence of events that will occur at practice or on game day if a concussion is suspected or diagnosed (Appendix A).

Pre-Participation Assessment:

Every new student-athlete will go through a SCAT6 pre-participation baseline concussion assessment that addresses brain injury and concussion history, symptom evaluation, cognitive assessment and balance evaluation. The team physician will determine pre-participation clearance and/or the need for additional consultation or testing. In any student-athlete with a documented concussion, especially those with complicated or multiple concussion history. Additionally, any history of migraine/headache disorders, ADD/ADHD or other learning disabilities, psychiatric or sleep disorder and drug or alcohol abuse will be recorded and considered in the assessment. The baseline concussion assessment will be stored electronically and will be accessible at practices and competitions. Returning student-athletes will fill out and sign the Annual Concussion Review form (Appendix G).

Recognition and Diagnosis of Concussion:

The immediate evaluation of the head-injured athlete will include an assessment of airway, breathing and circulation (ABC's), cervical spine, skull fracture as well as any signs of a more serious head injury to determine if a controlled, stabilized removal from the field and transportation to the nearest hospital is necessary. Conditions that would require transport to a designated hospital for further medical care are for any of the following: Glasgow Coma Scale score of <13, a prolonged loss of consciousness, focal neurological deficit suggesting intracranial trauma, repetitive vomiting, persistently diminishing/worsening mental status or other neurological signs/symptoms or a spine injury.

Medical personnel with training in the diagnosis, treatment and initial management of acute concussion are present at all NCAA competitions in the following contact/collision sports: basketball; field hockey; football; pole vault; soccer and wrestling. Such trained medical personnel are present on site at the campus or arena of the competition. Medical personnel may be from either team, or may be independently contracted for the event. Also, medical personnel with training in the diagnosis, treatment and initial management of acute concussion are available at all NCAA practices in the following contact/collision sports: basketball; field hockey; football; pole vault; soccer; and wrestling. To be available means that, at a minimum, medical personnel can be contacted at any time during the practice via telephone, messaging, email, beeper or other immediate communication means. Further, the case can be discussed through such communication and immediate arrangements can be made for the athlete to be evaluated.

If a student-athlete is diagnosed with or suspected of having experienced a concussion based on signs/symptoms/behaviors consistent with a concussion, they will be immediately removed from the activity (i.e. practice, competition and/or conditioning) and not allowed to return to activity that day if a concussion is confirmed. They will be evaluated by the Certified Athletic Trainer (ATC) and/or Team Physician with concussion experience. If the injury occurs in the sport of football, the student athlete is taken to the athletic training room for evaluation. If the injury occurs at a venue without an official designated athletic training room, the evaluation will be made in the most appropriate setting as determined by the medical staff. As part of the evaluation, a history will be taken from the patient about their injury. A standardized "sideline" evaluation for concussion (SCAT6) and vestibular ocular motor screening (VOMS) will be performed. This evaluation will be part of an initial suspected concussion evaluation management plan which will also include a symptom assessment, physical and neurological exam, cognitive assessment, balance exam and clinical assessment of cervical spine trauma, skull fracture and intracranial bleed. Additionally, observation of the injury event by the medical staff, coaching staff and game officials can also provide valuable information in determining if a concussion injury has occurred. If it is determined that a concussion has occurred, the student athlete will be monitored by a designated staff member and will remain in the athletic training room (in football and in other sports if possible) or locker room and not return to practice, competition or conditioning.

In the sport of football, a trained, unaffiliated certified athletic trainer with previous sideline experience will be

stationed in the replay booth as an “eye in the sky” to observe players that might have sustained a concussive injury not witnessed by on-field personnel. This person will have the capability of communicating with (a) the field referee who can stop play for the potentially injured student-athlete and (b) the sideline medical staff of each team to alert them of a potentially injured player. This person also has access to video replay to further evaluate the play where the player might have been concussed. Additionally, IU Athletics will have a neurospecialist on the IU sideline at each home and away football game to assist in the diagnosis and evaluation of potential concussed players.

Post-Concussion Management:

Medical personnel will observe/monitor the concussed student-athlete for any deterioration in their neurological status which might require further evaluation at a designated hospital. Prior to leaving the practice or competition venue, the athlete will be re-examined and if medically stable, will be discharged with a responsible adult (typically a roommate, friend or family member) and both are given oral and written care instructions to follow until they are seen for a follow-up medical appointment (Appendix C). The student-athlete is treated with both physical and cognitive rest at the direction of the team physician. As part of the treatment process, the team physician will evaluate a student-athlete with a prolonged recovery to consider best management options and additional diagnosis, such as post-concussion syndrome, sleep dysfunction, migraine or other headache disorders, mood disorders such as anxiety and depression, and ocular or vestibular dysfunction. Research has shown that determining the functional integrity of the concussed athlete’s brain also requires neurocognitive testing and this modality is being used as part of the standard of care for the diagnosis and treatment of concussion. Physical rest precludes exertional activity including sport specific drills, practices, games, weightlifting and conditioning.

Return-to-Play:

The final determination of return-to-play of a concussed student-athlete is from the team physician or medically qualified physician designee. In a concussed student-athlete with a complicated or prolonged course the team physician will make the final return-to-play decision after consultation with a concussion management team which may include one or more of the following: a neurosurgeon or other neurospecialist, a neuropsychologist, a vestibular/ocular motor therapist. The duration it takes to return to activity is completely individualized to each individual student-athlete and is not based on an arbitrary timeframe. Any student-athlete with a concussion must undergo a supervised stepwise progression management plan by a health care provider with expertise in concussions that specifies that the concussed student-athlete will have limited physical and cognitive activity while they return to baseline, and then progresses with each of the following steps without worsening or new symptoms:

1. Rest and recovery (routine daily activities as tolerated).
2. Progression starts with light aerobic exercise without resistance training (such as biking or jogging for 15-20 minutes), with gradual and steady increases in exertion if the athlete remains without symptoms.
3. Sport-specific exercise and activities are then introduced without contact or head impact.
4. Non-contact practice with progressive resistance training.
5. Unrestricted training.
6. Full, unrestricted return-to-competition.

This progression can take anywhere from days to weeks and the speed with which the athlete moves through this progression and returns-to-play is dependent on multiple factors and is guided by the medical team. Some of these factors include the clinical signs and symptoms, prior concussion history (number, remoteness, and severity), history of ADD/ADHD, learning disability, psychiatric history, sleep disorder, history of migraine headaches, age, sport, position, and the athlete’s lack of hesitancy to return.

It is essential that the athlete is completely asymptomatic before any final clearance to return- to-play.

Return-to-Learn:

In addition to physical symptoms, concussed student-athletes often experience cognitive symptoms and have difficulty performing at their normal academic level. Cognitive rest may necessitate not being able to attend classes and having to observe academic accommodations which reduce the workload on the brain. The timeframe and nature of the classes and assignments missed will be determined by the team physician. The team academic advisor will serve as the point person within IU Athletics to navigate return-to-learn with the student-athlete. Student-athletes may fall behind in their studies and may not be able to take tests until their brain recovers. Formal guidelines in the form of Academic Accommodations (Appendix D) and Return-to-Learn Guidelines (Appendix E) are expressly a part of this concussion management policy. The student-athlete's concussion symptoms should guide the academic workload and weaning and eventual discontinuance of accommodations and restrictions. When the symptoms have resolved with activities of daily living including cognitive activities, the athlete must undergo a sport-specific activity progression program without recurrence of symptoms as outlined in the Return-to-Learn Guidelines.

Potential Complications or Sequelae of Concussions:

Symptoms and signs of concussion in a small percentage of cases may be prolonged and a diagnosis of Post-Concussion Syndrome may be made requiring specialty consultation with a neuropsychologist or psychiatrist. Other symptoms or signs which include sleep dysfunction, migraine or other headache disorders, mood disorders such as anxiety and depression and ocular motor/vestibular dysfunction may be persistent and must be individually addressed by a specialist or specific therapy. Those specialists have been identified and are part of the medical team.

Role of Imaging:

The role of imaging (CT scans and MRI) is very limited in the management of concussion and for most cases, not necessary. For most concussions, these studies are usually normal. These imaging studies do, however, have a role in evaluating the concussed athlete when a concern exists for associated injuries, such as skull or orbital fractures, intracranial bleeds and seizures, or if the athlete's symptoms persist or neurological status deteriorates.

Reducing Exposure to Head Trauma:

The recognition and management of concussion will continue to evolve as the knowledge base of concussive brain injury is advanced. Emphasis must continue to be placed on ways to prevent this injury. Prevention is potentially the highest-yield opportunity in the lexicon of concussion risk reduction. Changes in the rules of collision sports will be a significant key to the prevention of concussions. Launching one's body and using one's helmet as a weapon must be eliminated. Rule changes and enforcement are beginning to reflect these priorities. Sources for safety procedures are found on the websites or organizations committed to athlete safety such as USA Football and the CDC. Coaches and athletes must also favor an atmosphere of competitive, but non-combative, competition. Collegiate players, their teams and their institutions set the example for young people who are beginning to play athletics and brain immaturity puts them at greater risk to sustain injuries. Safe play in all sports should become the example.

Consistent with the foregoing, a reducing head trauma exposure management plan has been established. This plan includes the following: adherence to Inter-Association Consensus: Year-Round Football Practice Contact Guidelines; adherence to Inter-Association Consensus: Independent Medical Care Guidelines; reducing gratuitous contact during practice; taking a "safety first" approach to sport; taking the head out of contact; and coaching/student-athlete education regarding safe play and proper technique.

Table 1: Signs and Symptoms of Concussion

SIGNS	SYMPTOMS
Amnesia – prior to or after injury	Headache
Loss of consciousness (LOC)	Nausea and/or vomiting
Slurred/incoherent speech	Excessive drowsiness
Disoriented to time, place, person	Unable to focus, concentrate
Delayed verbal & motor responses	Feeling hazy, foggy, groggy
Vacant stare	Dizziness
Light sensitivity	Blurry/double vision
Loss of balance, feeling unsteady	Sensitivity to light/noise
Crying unexpectedly or inappropriate behavior	Confusion
Behavior or personality change	Not “feeling right”
Slow to get up	Feeling slowed down
Rubbing, squinting or blinking one’s eyes	
Grabbing or shaking the head	
Asking for ammonia capsule	
Atypical response to initial questioning	

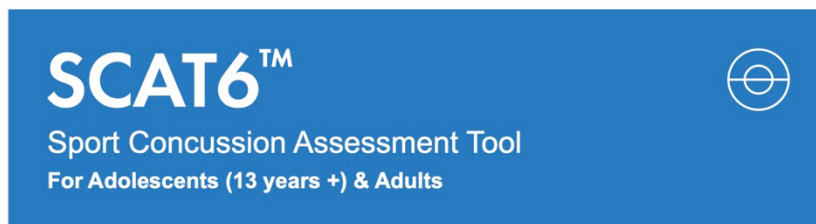
Appendix A

Guidelines for Suspected or Diagnosed Concussion During Practice or Game

1. The student-athlete will be immediately removed from the practice or game.
2. An initial brief assessment for concussion will be made.
3. If a concussion is suspected the student-athlete will be taken to the athletic training room (in football and other sports if possible) and the SCAT6 and VOMS will be repeated and may be compared to the baseline.
4. If a concussion is diagnosed the student-athlete will remain in the athletic training room (if possible) and not return to the field.
5. The concussed student-athlete will be monitored by one of the medical personnel for any deterioration of his neurological exam. If necessary the student-athlete will be taken to the emergency department for further diagnosis and treatment.
6. Before returning to their residence, the student-athlete will receive detailed instructions for him and his roommate or family to recognize if the situation is deteriorating.
7. Return to play is determined when all symptoms have resolved at rest, the neurologic examination is normal, and the student-athlete has successfully passed a graded activity progression program without recurrence of concussion symptoms.
8. Documentation from the team doctor in consultation with other neurological specialists when applicable must be obtained.

Appendix B – SCAT6

Sport Concussion Assessment Tool – 6 (SCAT6)



What is the SCAT6?

The SCAT6 is a standardised tool for evaluating concussions designed for use by Health Care Professionals (HCPs). The SCAT6 cannot be performed correctly in less than 10-15 minutes. Except for the symptoms scale, the SCAT6 is intended to be used in the acute phase, ideally within 72 hours (3 days), and up to 7 days, following injury. If greater than 7 days post-injury, consider using the SCAT6/Child SCAT6.

The SCAT6 is used for evaluating athletes aged 13 years and older. For children aged 12 years or younger, please use the Child SCAT6.

If you are not an HCP, please use the Concussion Recognition Tool 6 (CRT6).

Preseason baseline testing with the SCAT6 can be helpful for interpreting post-injury test scores but is not required for that purpose. Detailed instructions for use of the SCAT6 are provided as a supplement. Please read through these instructions carefully before testing the athlete. Brief verbal instructions for each test are given in *blue italics*. The only equipment required for the examiner is athletic tape and a watch or timer.

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Recognise and Remove

A head impact by either a direct blow or indirect transmission of force to the head can be associated with serious and potentially fatal consequences. If there are significant concerns, which may include any of the Red Flags listed in Box 1, the athlete requires urgent medical attention, and if a qualified medical practitioner is not available for immediate assessment, then activation of emergency procedures and urgent transport to the nearest hospital or medical facility should be arranged.

Completion Guide

Orange: Optional part of assessment

Key Points

- Any athlete with suspected concussion should be REMOVED FROM PLAY, medically assessed, and monitored for injury-related signs and symptoms, including deterioration of their clinical condition.
- No athlete diagnosed with concussion should return to play on the day of injury.
- If an athlete is suspected of having a concussion and medical personnel are not immediately available, the athlete should be referred (or transported if needed) to a medical facility for assessment.
- Athletes with suspected or diagnosed concussion should not take medications such as aspirin or other anti-inflammatories, sedatives or opiates, drink alcohol or use recreational drugs and should not drive a motor vehicle until cleared to do so by a medical professional.
- Concussion signs and symptoms may evolve over time; it is important to monitor the athlete for ongoing, worsening, or the development of additional concussion-related symptoms.
- The diagnosis of concussion is a clinical determination made by an HCP.
- The SCAT6 should NOT be used by itself to make, or exclude, the diagnosis of concussion. It is important to note that an athlete may have a concussion even if their SCAT6 assessment is within normal limits.

Remember

- The basic principles of first aid should be followed: assess danger at the scene, athlete responsiveness, airway, breathing, and circulation.
- Do not attempt to move an unconscious/unresponsive athlete (other than what is required for airway management) unless trained to do so.
- Assessment for a spinal and/or spinal cord injury is a critical part of the initial on-field evaluation. Do not attempt to assess the spine unless trained to do so.
- Do not remove a helmet or any other equipment unless trained to do so safely.





SCAT6™

Sport Concussion Assessment Tool For Adolescents (13 years +) & Adults



Athlete Name:				ID Number:	
Date of Birth:		Date of Examination:		Date of Injury:	
Time of Injury:		Sex:	Male <input type="checkbox"/> Female <input type="checkbox"/> Prefer Not To Say <input type="checkbox"/> Other <input type="checkbox"/>		
Dominant Hand:	Left <input type="checkbox"/> Right <input type="checkbox"/> Ambidextrous <input type="checkbox"/>	Sport/Team/School:			
Current Year in School (if applicable):		Years of Education Completed (Total):			
First Language:		Preferred Language:			
Examiner:					

Concussion History

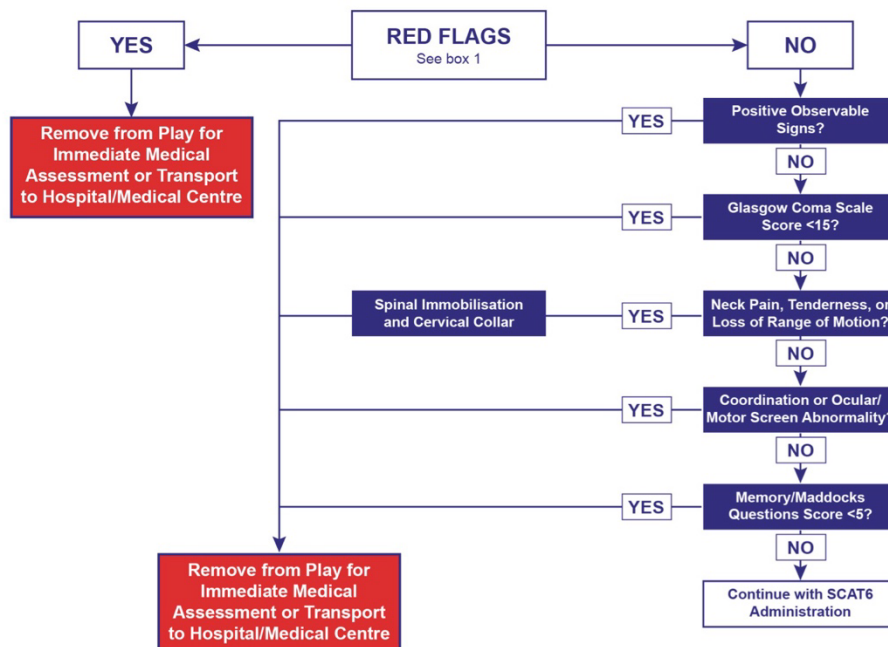
How many diagnosed concussions has the athlete had in the past?:	
When was the most recent concussion?:	
Primary Symptoms:	
How long was the recovery (time to being cleared to play) from the most recent concussion?:	(Days)

Immediate Assessment/Neuro Screen (Not Required at Baseline)

The following elements should be used in the evaluation of all athletes who are suspected of having a concussion prior to proceeding to the cognitive assessment, and ideally should be completed "on-field" after the first aid/emergency care priorities are completed.

If any of the observable signs of concussion are noted after a direct or indirect blow to the head, the athlete should be immediately and safely removed from participation and evaluated by an HCP.

The Glasgow Coma Scale is important as a standard measure for all patients and can be repeated over time to monitor deterioration of consciousness. The Maddocks questions and cervical spine exam are also critical steps of the immediate assessment.



For use by Health Care Professionals only

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Step 1: Observable Signs

Witnessed ☐ Observed on Video ☐

Lying motionless on playing surface	Y	N
Falling unprotected to the surface	Y	N
Balance/gait difficulties, motor incoordination, ataxia: stumbling, slow/laboured movements	Y	N
Disorientation or confusion, staring or limited responsiveness, or an inability to respond appropriately to questions	Y	N
Blank or vacant look	Y	N
Facial injury after head trauma	Y	N
Impact seizure	Y	N
High-risk mechanism of injury (sport-dependent)	Y	N

Step 2: Glasgow Coma Scale

Typically, GCS is assessed once. Additional scoring columns are provided for monitoring over time, if needed.

Time of Assessment:

Date of Assessment:

Best Eye Response (E)			
No eye opening	1	1	1
Eye opening to pain	2	2	2
Eye opening to speech	3	3	3
Eyes opening spontaneously	4	4	4

Best Verbal Response (V)			
No verbal response	1	1	1
Incomprehensible sounds	2	2	2
Inappropriate words	3	3	3
Confused	4	4	4
Oriented	5	5	5

Best Motor Response (V)			
No motor response	1	1	1
Extension to pain	2	2	2
Abnormal flexion to pain	3	3	3
Flexion/withdrawal to pain	4	4	4
Localized to pain	5	5	5
Obeys commands	6	6	6

Glasgow Coma Score (E + V + M)			
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Box 1: Red Flags

- Neck pain or tenderness
- Seizure or convulsion
- Double vision
- Loss of consciousness
- Weakness or tingling/burning in more than 1 arm or in the legs
- Deteriorating conscious state
- Vomiting
- Severe or increasing headache
- Increasingly restless, agitated or combative
- GCS <15
- Visible deformity of the skull

Step 3: Cervical Spine Assessment

In a patient who is not lucid or fully conscious, a cervical spine injury should be assumed and spinal precautions taken.

Does the athlete report neck pain at rest?	Y	N
Is there tenderness to palpation?	Y	N
If NO neck pain and NO tenderness, does the athlete have a full range of ACTIVE pain free movement?	Y	N
Are limb strength and sensation normal?	Y	N

Step 4: Coordination & Ocular/Motor Screen

Coordination: Is finger-to-nose normal for both hands with eyes open and closed?	Y	N
Ocular/Motor: Without moving their head or neck, can the patient look side-to-side and up-and-down without double vision?	Y	N
Are observed extraocular eye movements normal? If not, describe:	Y	N

Step 5: Memory Assessment Maddocks Questions¹

Say "I am going to ask you a few questions, please listen carefully and give your best effort. First, tell me what happened?"

Modified Maddocks questions (Modified appropriately for each sport; 1 point for each correct answer)

What venue are we at today?	0	1
Which half is it now?	0	1
Who scored last in this match?	0	1
What team did you play last week/game?	0	1
Did your team win the last game?	0	1
Maddocks Score	/5	

Note: Appropriate sport-specific questions may be substituted



Off-Field Assessment

Please note that the cognitive assessment should be done in a distraction-free environment with the athlete in a resting state **after** completion of the Immediate Assessment/Neuro Screen.

Step 1: Athlete Background

Has the athlete ever been:

Hospitalised for head injury? (If yes, describe below)	Y	N
Diagnosed/treated for headache disorder or migraine?	Y	N
Diagnosed with a learning disability/dyslexia?	Y	N

Diagnosed with attention deficit hyperactivity disorder (ADHD)?	Y	N
Diagnosed with depression, anxiety, or other psychological disorder?	Y	N

Notes:

Current medications? If yes, please list:

Step 2: Symptom Evaluation

Baseline: ☐ Suspected/Post-injury: ☐ Time elapsed since suspected injury: mins/hours/days

The athlete will complete the symptom scale (below) after you provide instructions. Please note that the instructions are different for baseline versus suspected/post-injury evaluations.

Baseline: Say *"Please rate your symptoms below based on how you typically feel with "1" representing a very mild symptom and "6" representing a severe symptom."*

Suspected/Post-injury: Say *"Please rate your symptoms below based on how you feel now with "1" representing a very mild symptom and "6" representing a severe symptom."*

PLEASE HAND THE FORM TO THE ATHLETE

Symptom	Rating
Headaches	0 1 2 3 4 5 6
Pressure in head	0 1 2 3 4 5 6
Neck pain	0 1 2 3 4 5 6
Nausea or vomiting	0 1 2 3 4 5 6
Dizziness	0 1 2 3 4 5 6
Blurred vision	0 1 2 3 4 5 6
Balance problems	0 1 2 3 4 5 6
Sensitivity to light	0 1 2 3 4 5 6
Sensitivity to noise	0 1 2 3 4 5 6
Feeling slowed down	0 1 2 3 4 5 6
Feeling like "in a fog"	0 1 2 3 4 5 6
"Don't feel right"	0 1 2 3 4 5 6
Difficulty concentrating	0 1 2 3 4 5 6
Difficulty remembering	0 1 2 3 4 5 6
Fatigue or low energy	0 1 2 3 4 5 6
Confusion	0 1 2 3 4 5 6
Drowsiness	0 1 2 3 4 5 6
More emotional	0 1 2 3 4 5 6
Irritability	0 1 2 3 4 5 6
Sadness	0 1 2 3 4 5 6
Nervous or anxious	0 1 2 3 4 5 6
Trouble falling asleep (if applicable)	0 1 2 3 4 5 6

Do your symptoms get worse with physical activity?	Y	N
Do your symptoms get worse with mental activity?	Y	N

If 100% is feeling perfectly normal, what percent of normal do you feel?

If not 100%, why?

PLEASE HAND THE FORM BACK TO THE EXAMINER

Once the athlete has completed answering all symptom items, it may be useful for the clinician to revisit items that were endorsed positively to gather more detail about each symptom.

Total number of symptoms: of 22

Symptom severity score: of 132



Step 3: Cognitive Screening (Based on Standardized Assessment of Concussion; SAC)²

Orientation

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

All 3 trials must be administered irrespective of the number correct on Trial 1. Administer at the rate of one word per second.

Trial 1: Say "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 and 3: Say "I am going to repeat the same list. Repeat back as many words as you can remember in any order, even if you said the word before in a previous trial."

Word list used: A ☐ B ☐ C ☐

				Alternate Lists	
List A	Trial 1	Trial 2	Trial 3	List B	List C
Jacket	0 1	0 1	0 1	Finger	Baby
Arrow	0 1	0 1	0 1	Penny	Monkey
Pepper	0 1	0 1	0 1	Blanket	Perfume
Cotton	0 1	0 1	0 1	Lemon	Sunset
Movie	0 1	0 1	0 1	Insect	Iron
Dollar	0 1	0 1	0 1	Candle	Elbow
Honey	0 1	0 1	0 1	Paper	Apple
Mirror	0 1	0 1	0 1	Sugar	Carpet
Saddle	0 1	0 1	0 1	Sandwich	Saddle
Anchor	0 1	0 1	0 1	Wagon	Bubble
Trial Total					

Immediate Memory Score of 30 Time Last Trial Completed:



Step 3: Cognitive Screening (Continued)

Concentration

Digits Backward:

Administer at the rate of one digit per second reading DOWN the selected column. If a string is completed correctly, move on to the string with next higher number of digits; if the string is completed incorrectly, use the alternate string with the same number of digits; if this is failed again, end the test.

Say *"I'm going to read a string of numbers and when I am done, you repeat them back to me in reverse order of how I read them to you. For example, if I say 7-1-9, you would say 9-1-7. So, if I said 9-6-8 you would say? (8-6-9)"*

Digit list used: A ☐ B ☐ C ☐

List A	List B	List C			
4-9-3	5-2-6	1-4-2	Y	N	0 1
6-2-9	4-1-5	6-5-8	Y	N	
3-8-1-4	1-7-9-5	6-8-3-1	Y	N	0 1
3-2-7-9	4-9-6-8	3-4-8-1	Y	N	
6-2-9-7-1	4-8-5-2-7	4-9-1-5-3	Y	N	0 1
1-5-2-8-6	6-1-8-4-3	6-8-2-5-1	Y	N	
7-1-8-4-6-2	8-3-1-9-6-4	3-7-6-5-1-9	Y	N	0 1
5-3-9-1-4-8	7-2-4-8-5-6	9-2-6-5-1-4	Y	N	
			Digits Score		of 4

Months in Reverse Order:

Say *"Now tell me the months of the year in reverse order as QUICKLY and as accurately as possible. Start with the last month and go backward. So, you'll say December, November... go ahead"*

Start stopwatch and CIRCLE each correct response:

December November October September August July June May April March February January

Time Taken to Complete (secs):

Number of Errors:

1 point if no errors and completion under 30 seconds

Months Score: of 1

Concentration Score (Digits + Months) of 5

Step 4: Coordination and Balance Examination

Modified Balance Error Scoring System (mBESS)³ testing

(see detailed administration instructions)

Foot Tested: Left ☐ Right ☐ (i.e. test the non-dominant foot)

Testing Surface (hard floor, field, etc.):

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

OPTIONAL (depending on clinical presentation and setting resources): For further assessment, the same 3 stances can be performed on a surface of medium density foam (e.g., approximately 50cm x 40cm x 6cm) with the same instructions and scoring.

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Step 4: Coordination and Balance Examination (Continued)

Modified BESS

(20 seconds each)

Double Leg Stance: of 10

Tandem Stance: of 10

Single Leg Stance: of 10

Total Errors: of 30

On Foam (Optional)

Double Leg Stance: of 10

Tandem Stance: of 10

Single Leg Stance: of 10

Total Errors: of 30

Note: If the mBESS yields normal findings then proceed to the **Tandem Gait/Dual Task Tandem Gait**.

If the mBESS reveals abnormal findings or clinically significant difficulties, **Tandem Gait** is not necessary at this time.

Both the **Tandem Gait** and optional **Dual Task** component may be administered later in the office setting as needed (see SCAT6).

Timed Tandem Gait

Place a 3-metre-long line on the floor/firm surface with athletic tape. The task should be timed. Please complete all 3 trials.

Say *"Please walk heel-to-toe quickly to the end of the tape, turn around and come back as fast as you can without separating your feet or stepping off the line."*

Single Task:

Time to Complete Tandem Gait Walking (seconds)				
Trial 1	Trial 2	Trial 3	Average 3 Trials	Fastest Trial
<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>

Dual Task Gait (Optional. Timed Tandem Gait must be completed first)

Place a 3-metre-long line on the floor/firm surface with athletic tape. The task should be timed.

Say *"Now, while you are walking heel-to-toe, I will ask you to count backwards out loud by 7s. For example, if we started at 100, you would say 100, 93, 86, 79. Let's practise counting. Starting with 93, count backward by sevens until I say 'stop'."* Note that this practice only involves counting backwards.

Dual Task Practice: Circle correct responses; record number of subtraction counting errors.

Task									Errors	Time
Practice	93	86	79	72	65	58	51	44	<input type="text"/>	<input type="text"/>

Say *"Good. Now I will ask you to walk heel-to-toe and count backwards out loud at the same time. Are you ready? The number to start with is 88. Go!"*

Dual Task Cognitive Performance: Circle correct responses; record number of subtraction counting errors.

Task													Errors	Time (circle fastest)
Trial 1	88	81	74	67	60	53	46	39	32	25	18	11	4	<input type="text"/>
Trial 2	90	83	76	69	62	55	48	41	34	27	20	13	6	<input type="text"/>
Trial 3	98	91	84	77	70	63	56	49	42	35	28	21	14	<input type="text"/>

Alternate double number starting integers may be used and recorded below.

<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
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Starting Integer: Errors: Time:



Step 4: Coordination and Balance Examination (Continued)

Were any single- or dual-task, timed tandem gait trials not completed due to walking errors or other reasons?

Yes ☐ No ☐

If yes, please explain why:

Step 5: Delayed Recall

The Delayed Recall should be performed after **at least 5 minutes** have elapsed since the end of the Immediate Memory section:
Score 1 point for each correct response.

Say *"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."*

Time started:

Word list used: A ☐ B ☐ C ☐

Alternate Lists

List A	Score	List B	List C
Jacket	0 1	Finger	Baby
Arrow	0 1	Penny	Monkey
Pepper	0 1	Blanket	Perfume
Cotton	0 1	Lemon	Sunset
Movie	0 1	Insect	Iron
Dollar	0 1	Candle	Elbow
Honey	0 1	Paper	Apple
Mirror	0 1	Sugar	Carpet
Saddle	0 1	Sandwich	Saddle
Anchor	0 1	Wagon	Bubble
Delayed Recall Score	of 10		

Total Cognitive Score

Orientation: of 5

Immediate Memory: of 30

Concentration: of 5

Delayed Recall: of 10

Total: of 50

If the athlete was known to you prior to their injury, are they different from their usual self?

Yes ☐ No ☐ Not applicable ☐ (If different, describe why in the [clinical notes](#) section)

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Step 6: Decision

Domain	Date:	Date:	Date:
Neurological Exam (Acute Injury evaluation only)	Normal/Abnormal	Normal/Abnormal	Normal/Abnormal
Symptom number (of 22)			
Symptom Severity (of 132)			
Orientation (of 5)			
Immediate Memory (of 30)			
Concentration (of 5)			
Delayed Recall (of 10)			
Cognitive Total Score (of 50)			
mBESS Total Errors (of 30)			
Tandem Gait fastest time			
Dual Task fastest time			

Disposition

Concussion diagnosed?

Yes ☐ No ☐ Deferred ☐

Health Care Professional Attestation

I am an HCP and I have personally administered or supervised the administration of this SCAT6.

Name:

Signature: Title/Speciality:

Registration/License number (if applicable): Date:

Additional Clinical Notes

Note: Scoring on the SCAT6 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 sport after concussion. Remember: An athlete can score within normal limits on the SCAT6 and still have a concussion.

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Appendix C



Athlete: _____ Date of injury: _____ Time: _____
Athletic Trainer/Physician: _____ Parent/Roommate: _____

Concussion Information for Home

You have been diagnosed with a concussion. Observation in the first 24 hours is critical to determine if your injury is more than a concussion with the possibility of causing more or worsening symptoms or signs. This is a guide for your roommates or family to follow over the first 24 hours post injury. If any of the following conditions occur, call the team athletic trainer immediately.

Change in Level of Consciousness

A change in the level of consciousness is an early sign of worsening. The injured athlete should be awakened every 3 hours in the first 24-hour period and any change in the following symptoms must be reported.

Disorientation (Confusion)	Increased Dizziness	Slurred or Incoherent Speech
Progressive Memory Loss	Lack of Coordination	Inability to Arouse or Awaken
Inability to Function	Vacant Stare	Worsening Ability to Concentrate
Fainting	Lack of Awareness	

Personality Changes (Increase in any of following symptoms)

Irritability, Anxiety or Depression, Confusion, Excessive Emotion

Headache

Significant Increase in Severity

New Onset Headache

Nausea and Vomiting

Increase in Severity Should be Reported

Weakness of Limbs or Loss of Coordination

Convulsions / Seizures (Fits)

May use Acetaminophen (Tylenol) for pain but do not use aspirin or aspirin substitutes, no NSAIDS (ibuprofen, naproxen, Aleve, Advil) in first 48 hrs. post-injury. Do not use alcoholic beverages or illegal drugs. Do not drive.

If you have any doubt, seek medical attention IMMEDIATELY.

Athletic Trainer Office: _____ Physician Phone: _____
Athletic Trainer's Cell: _____

Appendix D

Academic Accommodations Following Concussion

Indiana University Department of Athletics – Sports Medicine

Date: _____

Patient Name: _____

Sport: _____

Students recovering from concussions often exhibit cognitive symptoms that make attending school and learning difficult. They may not be able to attend classes or only partial classes. They often have light and nose sensitivity, headache, trouble focusing, concentrating and remembering. The accommodations listed below often help to lessen the symptoms and allow full participation sooner. Compliance with these accommodations allows the brain to recover more quickly. These students often do not appear ill, but they are.

The student is currently experiencing symptoms of concussion. Current Symptoms list:

- | | | | |
|------------------------------------|---|---|---|
| <input type="checkbox"/> Headache | <input type="checkbox"/> Visual problems | <input type="checkbox"/> Sensitivity to noise | <input type="checkbox"/> Memory problems |
| <input type="checkbox"/> Nausea | <input type="checkbox"/> Balance problems | <input type="checkbox"/> Difficulty concentrating | <input type="checkbox"/> Sensitivity to light |
| <input type="checkbox"/> Dizziness | <input type="checkbox"/> Feeling foggy | <input type="checkbox"/> Irritability | <input type="checkbox"/> Fatigue |

Class Attendance:

- ☐ Full attendance, no restrictions
- ☐ Attendance if symptoms allow and may leave early or take short breaks

Visual Stimulus:

- ☐ Allow student to wear sunglasses
- ☐ Limited computer, TV, bright screen use
- ☐ Provide pre-printed class notes before class
- ☐ Change classroom seating as necessary

Testing:

- ☐ Additional time to complete test/quiz
- ☐ No more than one test per day
- ☐ Allow for scribe, oral response and oral delivery of questions
- ☐ Postpone exams/quizzes

Workload/Multi-tasking:

- ☐ Reduce homework as possible
- ☐ Provide more time to complete assignments
- ☐ No note taking – listening only
- ☐ Allow student to record lectures

Additional Comments/concerns: _____

We will continue to update you on the patient's progress and recovery. We appreciate your support and assistance in helping this patient recover from their concussion. If you have any question, please feel free to contact us.

*****Indiana University Department of Sports Medicine (812)855-4509*****

Physician name: _____

Contact number: _____

Physician signature: _____

Appendix E

Guidelines for Return-to-Learn

1. Academic accommodations guidelines are given to the concussed student-athlete and a copy is given to their athletic department team academic advisor. No classroom activity will occur on the same day of the concussion.
2. The team academic advisor will serve as the point person to navigate academic adjustments/accommodations and return-to-learn aspects of the student-athlete.
3. Letter from head team physician documenting the injury and the recommendation of academic accommodations will be provided to course professors and instructors when necessary.
4. An individualized initial plan will be based on the student-athlete's tolerance of cognitive activity and will include: remaining at home/dorm if student-athlete cannot tolerate light cognitive activity and a gradual return to classroom/studying as tolerated, modification of schedule/academic accommodations for up to two weeks, as indicated, with help from the identified point person, re-evaluation by team physician and member of the multi-disciplinary team, as appropriate, for student-athletes with symptoms greater than two weeks, engaging campus resources for cases that cannot be managed through schedule modification/academic accommodations. Such campus resources must be consistent with ADAAA, and include at least one of the following: learning specialists, office of disability services or ADAAA office.
5. Continued medical follow up until complete recovery, including a re-evaluation by the team physician if concussion symptoms worsen with academic challenges.
6. Involvement of a multi-disciplinary team when necessary for more complex or prolonged cases. The multi-disciplinary team may include, but is not limited to:
 - a. Team physician
 - b. Athletic trainer
 - c. Psychologist/counselor
 - d. Neuropsychologist and/or other mental health professionals
 - e. Faculty athletic representative, appropriate campus administrators
 - f. Academic course professors, counselors and instructors
 - g. College administrators
 - h. Disability Services for Students (in Office of Student Affairs) representative
 - i. Coaches
7. Compliance with the ADAAA.
 - a. Engagement of ADAAA compliant campus resources when typical academic accommodations do not suffice.
8. Notification of the team academic advisor when accommodations are weaned or discontinued.

Appendix F

Concussion Acknowledgement Form

I, _____ acknowledge that as a member of the Indiana University Department of Intercollegiate Athletics, I accept responsibility for supporting our Sports Medicine Department's policy on concussion management.

I understand that student-athletes may have a risk of head injury and/or concussion. I also understand the importance of reporting any such symptoms of a head injury/concussion to the sports medicine staff (i.e. team physician, athletic trainer). I also accept responsibility for reporting to the sports medicine staff any signs or symptoms that I may witness.

By signing below, I acknowledge that my institution has provided me with educational materials on concussion and given me an opportunity to ask questions about areas and issues that are not clear to me on this issue.

I have read the above and agree that the statements are accurate.

Signature _____



Indiana University Sports Medicine
Annual Concussion Review

Student-Athlete Name: _____ **Sport:** _____

1. Have you experienced a concussion since last being at IU (sport related or any other concussion)?
 _____ YES* _____ NO **If YES, please see you team's athletic trainer to discuss episode of injury*
2. Do you need to see a physician regarding any previous concussion?
 _____ YES _____ NO

Symptom evaluation (please circle the number corresponding your typical rating for each symptom listed):

Symptom	None	Mild		Moderate		Severe	
<i>Headache</i>	0	1	2	3	4	5	6
<i>"Pressure in head"</i>	0	1	2	3	4	5	6
<i>Neck Pain</i>	0	1	2	3	4	5	6
<i>Nausea or vomiting</i>	0	1	2	3	4	5	6
<i>Dizziness</i>	0	1	2	3	4	5	6
<i>Blurred vision</i>	0	1	2	3	4	5	6
<i>Balance problems</i>	0	1	2	3	4	5	6
<i>Sensitivity to light</i>	0	1	2	3	4	5	6
<i>Sensitivity to noise</i>	0	1	2	3	4	5	6
<i>Feeling slowed down</i>	0	1	2	3	4	5	6
<i>Feeling like "in a fog"</i>	0	1	2	3	4	5	6
<i>"Don't feel right"</i>	0	1	2	3	4	5	6
<i>Difficulty concentrating</i>	0	1	2	3	4	5	6
<i>Difficulty remembering</i>	0	1	2	3	4	5	6
<i>Fatigue or low energy</i>	0	1	2	3	4	5	6
<i>Confusion</i>	0	1	2	3	4	5	6
<i>Drowsiness</i>	0	1	2	3	4	5	6
<i>More emotional</i>	0	1	2	3	4	5	6
<i>Irritability</i>	0	1	2	3	4	5	6
<i>Sadness</i>	0	1	2	3	4	5	6
<i>Nervousness or Anxious</i>	0	1	2	3	4	5	6
<i>Trouble falling asleep</i>	0	1	2	3	4	5	6

Total number of symptoms: _____/22

Symptom severity score: _____/132

Student-Athlete signature: _____ **Date:** _____