

Sault Area Schools Athletics

In partnership with
Sault Health Adolescent Care Center
(SHACC) and MyMichigan Rehab
Concussion/Traumatic Brain Injury



Concussion

What is it?

A concussion is a type of traumatic brain injury—or TBI—caused by a bump, blow, or jolt to the head or by a hit to the body that causes the head and brain to move rapidly back and forth. This sudden movement can cause the brain to bounce around or twist in the skull, creating chemical changes in the brain and sometimes stretching and damaging brain cells.



Concussion Symptoms

Physical

Headache
Nausea
Vomiting
Balance Problems
Dizziness
Visual Problems
Fatigue
Sensitivity to Light
Sensitivity to Noise
Numbness/tingling

Cognitive (Mental)

Feeling Mentally Foggy
Feeling Slowed Down
Difficulty Concentrating
Difficulty Remembering

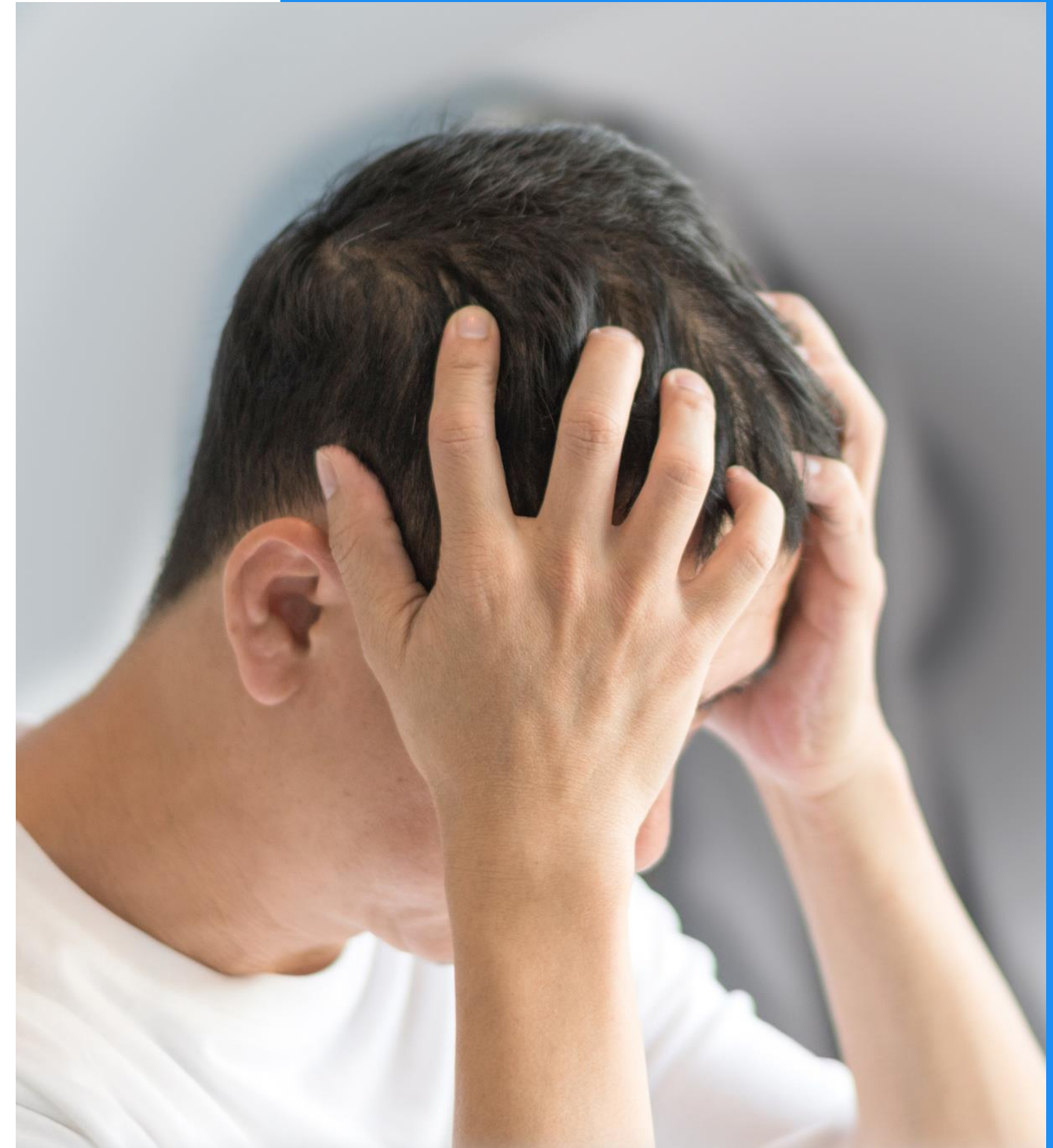


Sleep

Drowsiness
Sleeping Less than Usual
Sleeping More than Usual
Trouble Falling Asleep

Emotional

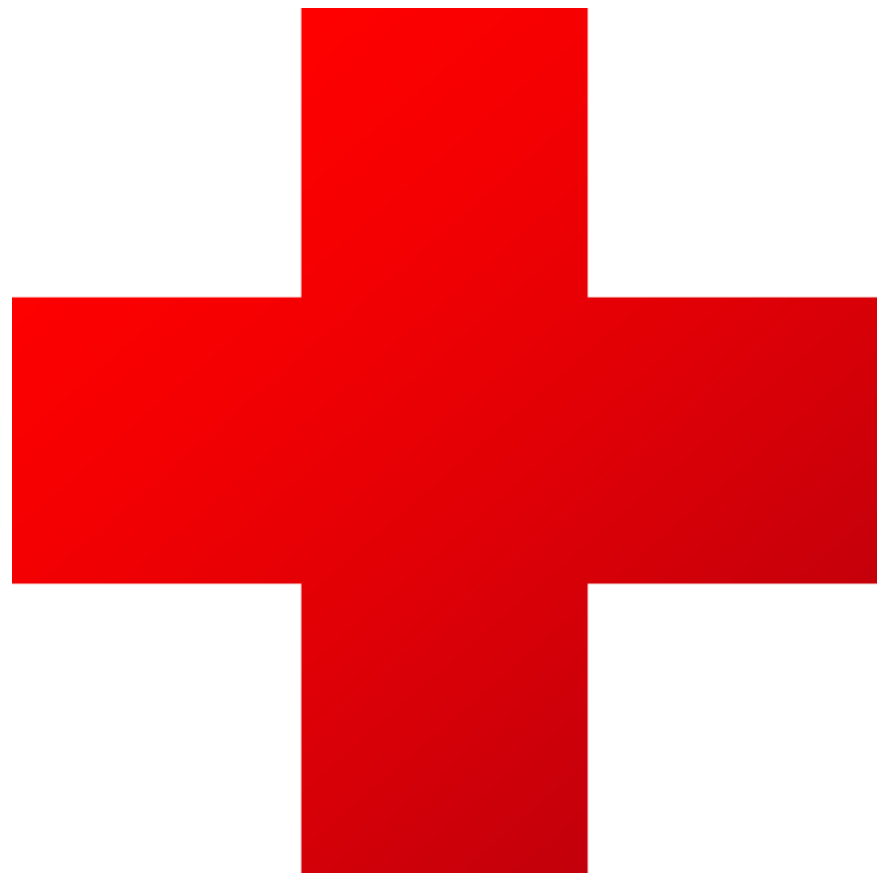
Irritability or Moodiness
Sadness
Decreased Interest in Hobbies
Nervousness



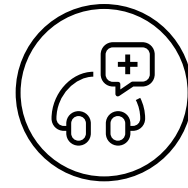
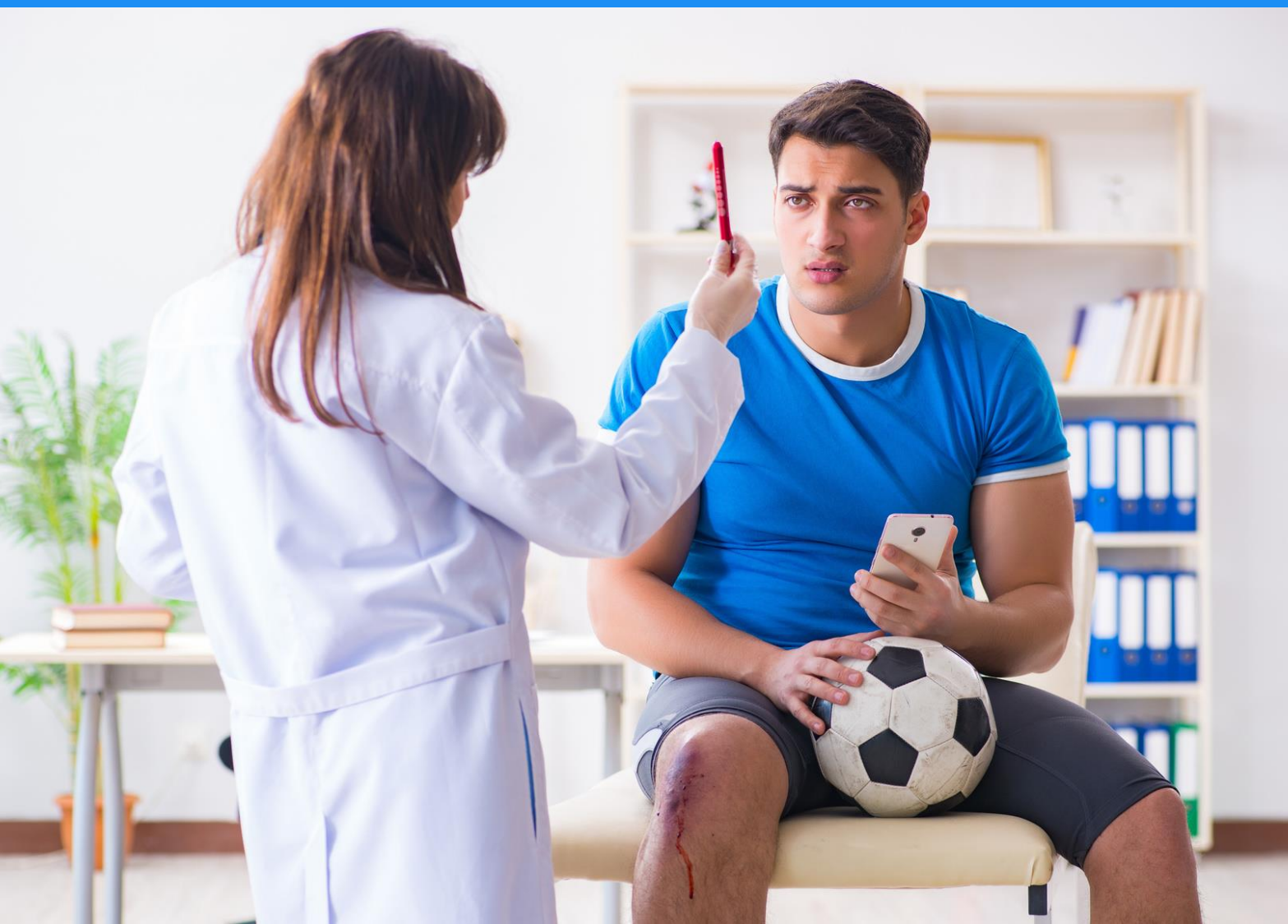
Red Flags

When to go to the ER

- Loss of consciousness for more than 1 minute
- Increasing confusion or inability to stay awake
- Repetitive vomiting
- Severe or increasing headache
- Severe neck pain
- Weakness, tingling, or burning in arms or legs
- Persistent double vision or loss of vision
- Increasingly restless, agitated or combative

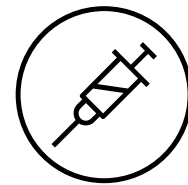


Sault Area High School Concussion Protocol



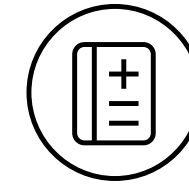
Pre-Season

Every student athlete is required to have ImPACT baseline testing prior to starting the season (this includes try-outs and practice).



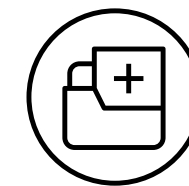
Suspected Concussion

Athlete is evaluated on the side lines by the athletic trainer. If an athletic trainer is not present the athlete should be pulled from participation/practice until they can be evaluated.



Athlete Evaluation

Athletic trainer contacts nurse practitioner about a suspected concussion and an urgent appointment is made for student. Parents and student athletes can also make an appointment for evaluation.



Return to Play

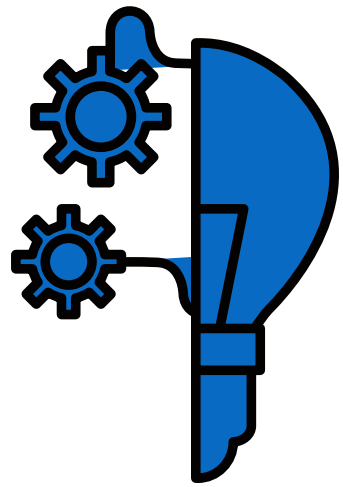
Student athlete is evaluated by the nurse practitioner and once cleared can begin the BRAIN protocol with the athletic trainer. After completion of BRAIN protocol the student returns to NP for final clearance to return to play.

ImPACT Test

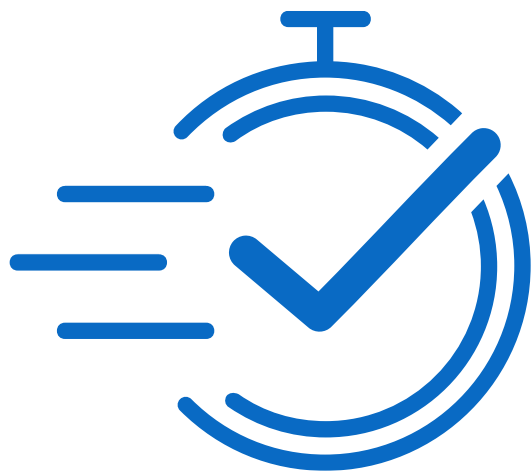
- ImPACT stands for-Immediate Post-Concussion Assessment and Cognitive Testing
 - It is an online test given in a controlled environment.
 - There are two parts to the test:
 - Baseline testing (everyone gets this)
 - Post-injury testing (if you have a head injury)
- Baseline testing is done every 2 years
- Post-injury testing along with clinical judgement is used to decide when a student can safely return to play
- Repeat testing is generally needed after a head injury to ensure at least an improvement to 80% of the baseline test.



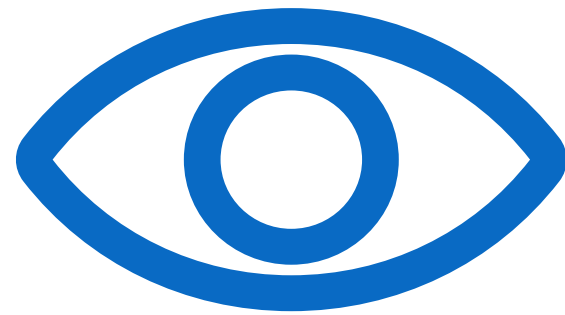
Parts to the ImPACT Test



Memory



Reaction Time



Visual Motor Speed



Impulse Control




Symptoms


Sample ImPACT Question

You have completed 1 of 6 modules.


Next, a number of designs will be presented one at a time. Try to remember each of these designs EXACTLY as it is shown as you will be asked about them later. For example:

 This is a sample design

Was this one of the designs?

 Answer: **Yes**

Was this one of the designs?

 Answer: **No**

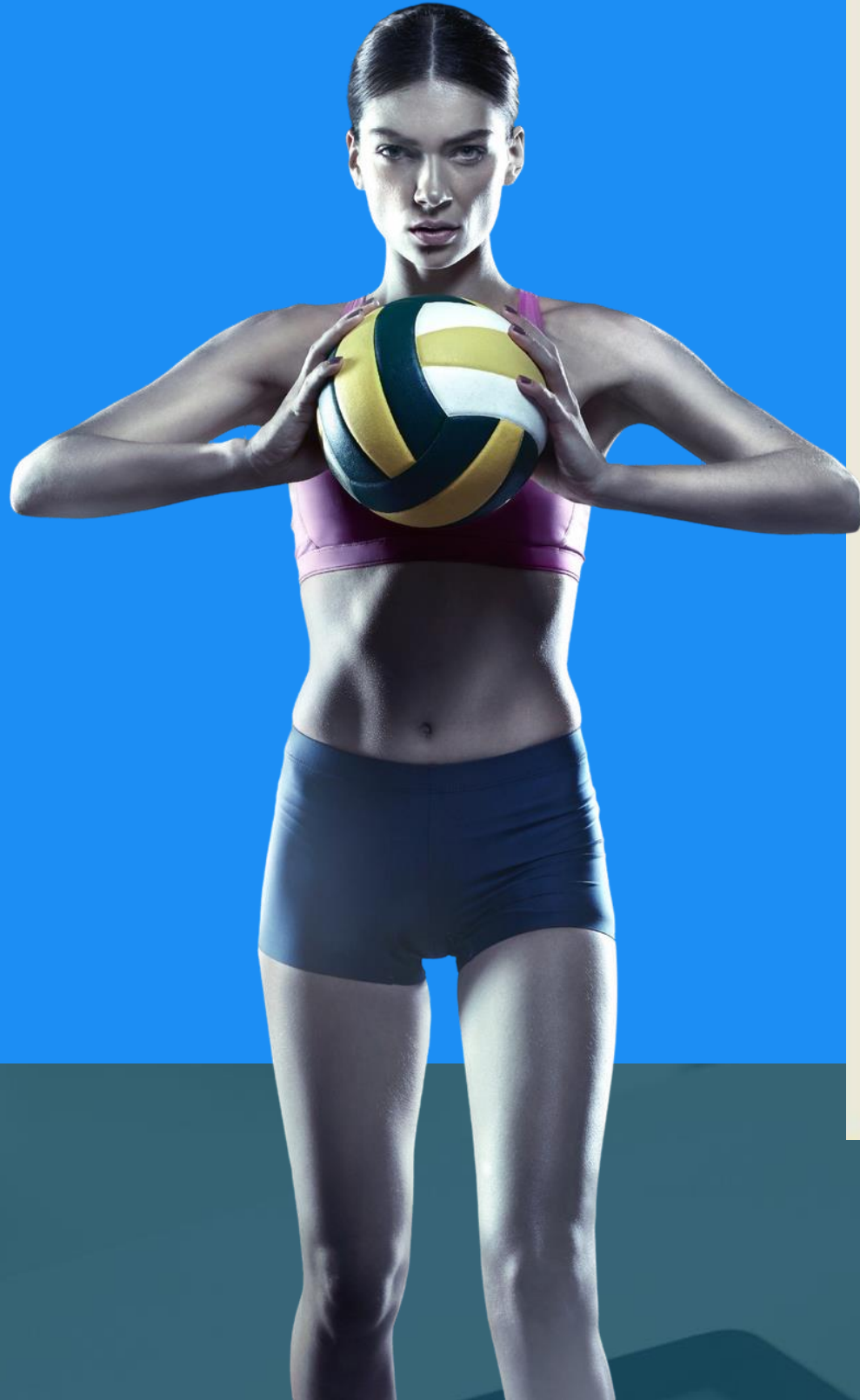
We will start with a sample of the test to familiarize you with the process.

Click the button below when you are ready to begin the sample.

[Continue](#)



Sample ImPACT Question



PAY CLOSE ATTENTION AND REMEMBER WHICH NUMBER GOES WITH EACH SHAPE

								
1	2	3	4	5	6	7	8	9

Click on the number that corresponds to the following





Sample ImPACT Question

Click each of these buttons in **BACKWARD ORDER**.

Start with 25 and count down to 1

AS FAST AS YOU CAN

15	8	22	24	2
16	18	10	21	17
19	4	9	1	3
11	13	12	20	23
14	25	6	5	7

If you make a mistake, use the 'Go Back' button to clear the buttons you have already clicked, one at a time.

<< Go back

Sample ImPACT Question



You have completed 4 of 6 modules.

This is a test of SPEED OR REACTION TIME.

On the next screen, you will see the words RED, GREEN and BLUE presented one at a time. Click the word inside the box when it is shown in the same color in which it is written. Do not click the word when it is shown in a different color.

For example:

Click as fast as you can when you see one of these:



Do not click when you see these:



We will start with a sample of the test to familiarize you with the process.



Click the button below when you are ready to begin the sample.



Continue






Sample ImPACT Question

In this window, do the following for each shape displayed:

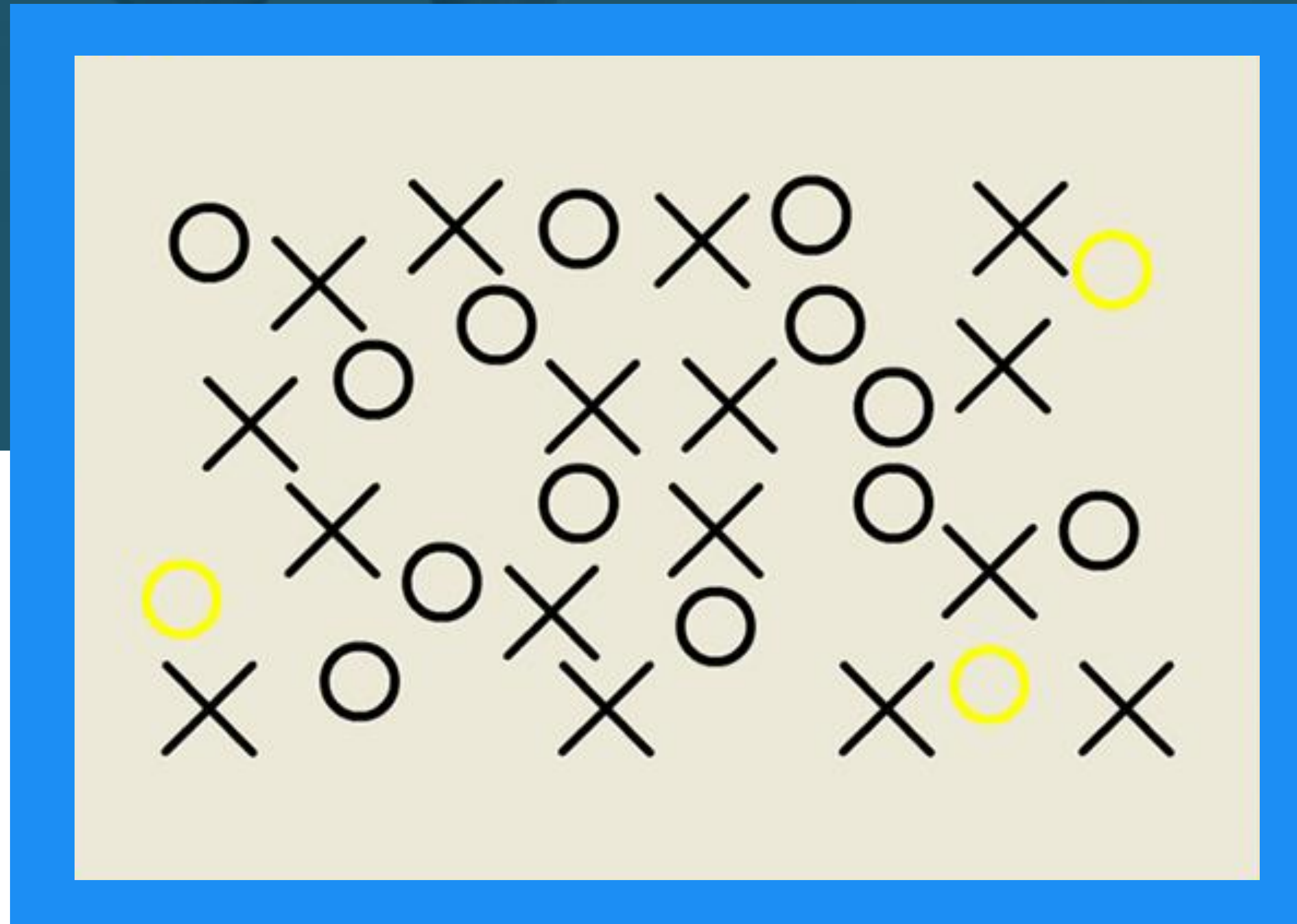
 Press this key on your keyboard as quickly as you can when you see: 

 Press this key on your keyboard as quickly as you can when you see: 

PLEASE RESPOND AS FAST AS YOU CAN!

LEFT   RIGHT 


Sample ImPACT Question



Sample ImPACT Clinical Report

A history of headaches, past head injuries/concussions, learning disabilities, depression, anxiety, ADD/ADHD can affect the length of time it takes the brain to heal



 ImPACT™ Clinical Report			
Organization:	University of the Incarnate Word		
Date of Birth:	11/07/1989	Age:	20
Gender:	Male	Height:	76 inches
Handedness:	Right	Weight:	210 lbs
Native Country:	United States	Second Language:	
Native Language:	English	Years Speaking:	
Years of education completed:	14	Repeated one or more years of school:	No
Received speech therapy:	No	Diagnosed learning disability:	No
Attended special education classes:	No	Problems with ADD/hyperactivity:	No
Current sport:	Football	Current level of participation:	Collegiate
Primary position:	Sophomore	Years experience at this level:	1
Number of times diagnosed with a concussion (excluding current injury):	2		
Concussions that resulted in loss of consciousness:	0		
Concussions that resulted in confusion:	2		
Concussions that resulted in difficulty remembering events that occurred immediately after injury:	2		
Concussions that resulted in difficulty remembering events that occurred:	0		
Total games missed as a result of all concussions combined:	0		
Concussion history:	September/2006 September/2010		
Treatment for headaches:	No	History of meningitis:	No
Treatment for migraine:	No	Treatment for substance/alcohol abuse:	No
Treatment for epilepsy/seizures:	No	Treatment for psychiatric condition (depression, anxiety):	No
Treatment brain surgery:	No		
Diagnosed with ADD/ADHD:		Diagnosed with Autism:	
Diagnosed with Dyslexia:		Strenuous exercise in the last 3 hours:	

Sample ImPACT Clinical Report

Red numbers show deficits in visual motor speed due to head injury.



ImPACT™ Clinical Report

Exam Type	Baseline	Post-Injury 1	Post-Injury 2		
Date Tested	08/7/2010	09/20/2010	09/22/2010		
Last Concussion	09/07/2006	09/18/2010	09/18/2010		
Exam Language	English	English	English		
Test Version	2.0	2.0	2.0		

Composite Scores	Percentile scores if available are listed in small type.				
Memory composite (verbal)	100	99	99		
Memory composite (visual)	71	70	70		
Visual motor speed composite	46.83	41.5	46.9		
Reaction time composite	0.56	0.1	0.56		
Impulse control composite	2	7	2		
Total Symptom Score	0	1	0		

Cognitive Efficiency Index: 0.48 0.52 0.54

The Cognitive efficiency Index measures the interaction between accuracy (percentage correct) and speed (reaction time) in seconds on the Symbol Match test. This score was not developed to make return to play decisions but can be helpful in determining the extent to which the athlete tried to work very fast on symbol match (decreasing accuracy) or attempted to improve their accuracy by taking a more deliberate and slow approach (jeopardizing speed). The range of scores is from approximately zero to approximately .70 with a mean of .34. A higher score indicates that the athlete did well in both the speed and memory domains on the symbol match test. A low score (below .20) means that they performed poorly on both the speed and accuracy component. If this score

Scores in **bold RED** type exceed the Reliable Change Index (RCI) when compared to the baseline score. However, scores that do not exceed to RCI index may still be clinically significant. Percentile scores if available are listed in small type.

Hours slept last night	7	7.5	7		
Medication					

The information provided by this report should be viewed as only one source of information regarding an individual's level of [neurocognitive] functioning. Even though impact is based on demonstrated scientific principles and research, external factors such as improper test administration or improper test taking environment may result in inaccurate test results. These factors and others must be considered in making return-to-play decision. The information provided by this report is of a general nature and does not represent medical advice, a diagnosis, or prescription for treatment. Additionally, diagnostic or return to play decisions should not be based solely on the data generated by this report, but on an in-person evaluation made by a professional trained in concussion management in accordance with usual and standard medical practice. An individual suspected of suffering traumatic brain injury or concussion should immediately seek the advice of qualified and trained personnel for interpretation of test results and should be monitored closely for the emergence of symptoms. Impact is not responsible for any decisions based on information contained in the report. A test-taker's qualified and trained personnel has the sole responsibility for establishing diagnosis and suggesting appropriate treatment.

Sample ImPACT Clinical Report

Sample report shows gradual improvement in memory, visual motor speed, reaction time, and symptoms



Exam Type	Baseline	Post-Injury 1	Post-Injury 2	Post-Injury 4	
Date Tested	09/12/2013	09/27/2013	09/30/2013	11/20/2013	
Last Concussion	06/14/2008	09/25/2013	09/25/2013	09/18/2013	
Exam Language	English	English	English	English	
Test Version	2.1	2.1	2.1	2.1	
Composite Scores	Percentile scores if available are listed in small type.				
Memory composite (verbal)	78 22%	55 <1%	68 4%	81 32%	
Memory composite (visual)	91 93%	47 4%	53 12%	63 21%	
Visual motor speed composite	36.23 31%	29.73 2%	30.88 7%	41.13 55%	
Reaction time composite	0.48 92%	0.72 5%	0.65 12%	0.51 80%	
Impulse control composite	13	23	13	13	
Total Symptom Score	1	49	52	0	

BESS-Balance Error Scoring System

A diagnostic tool to detect balance impairments secondary to a TBI.



BESS Score Card (# of errors)

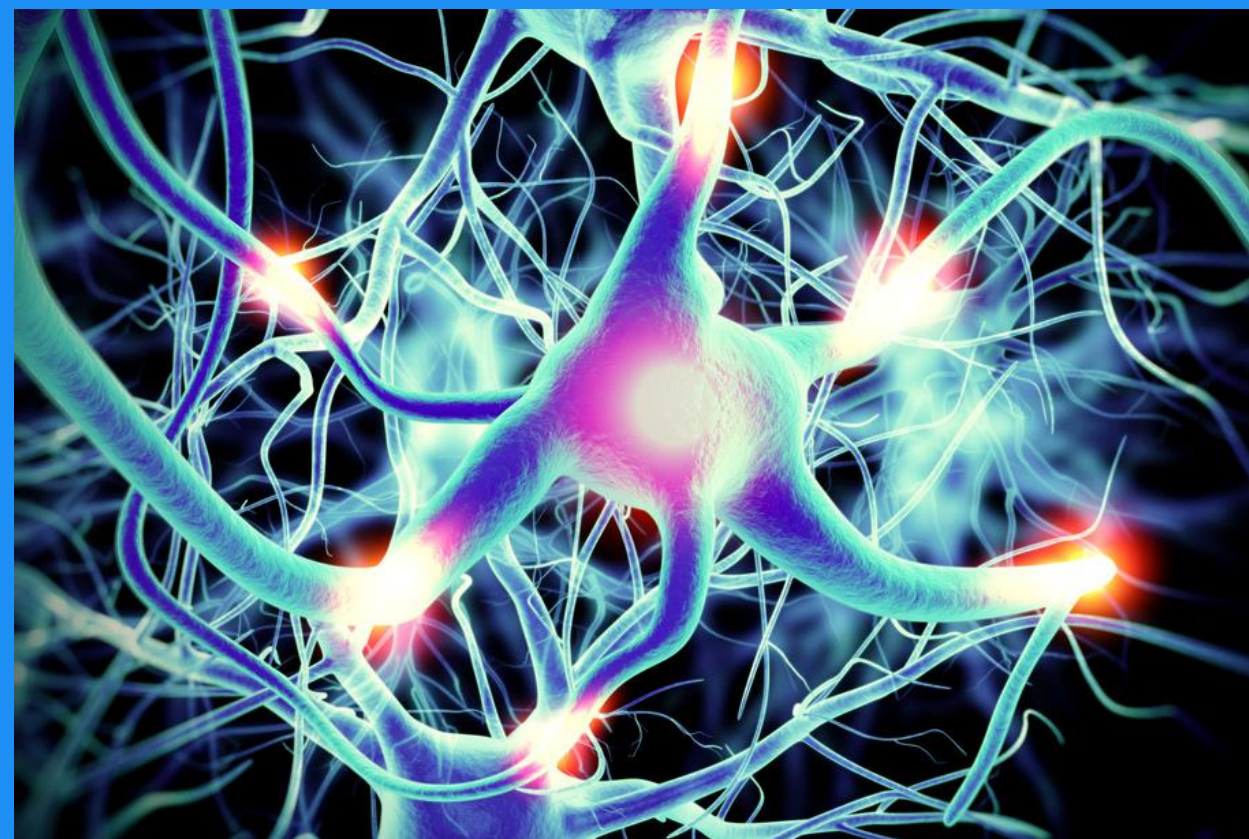
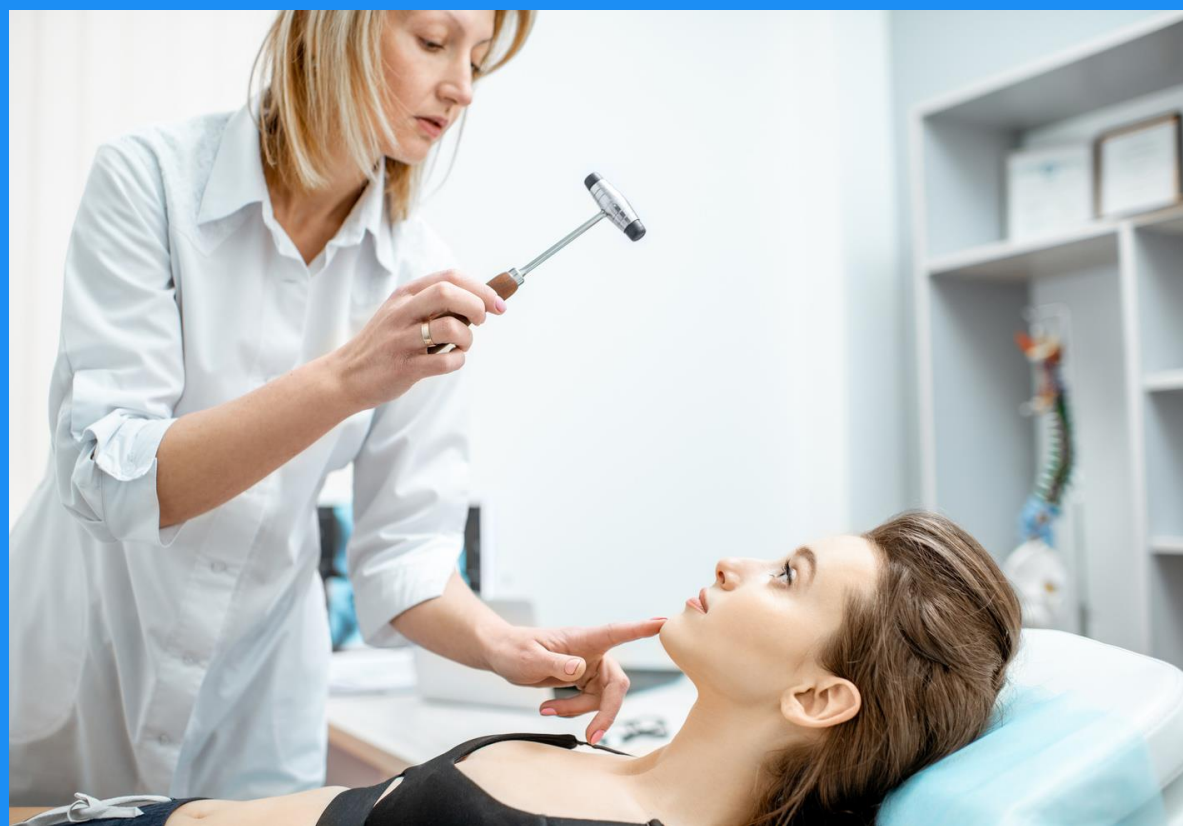
	Firm Surface	Foam Surface
Double Leg Stance		
Single Leg Stance		
Tandem Stance		
Total Scores		
BESS Total		

VOMS-Vestibular/Ocular-Motor Screening

Vestibular/Ocular Motor Test:	Not Tested	Headache 0-10	Dizziness 0-10	Nausea 0-10	Fogginess 0-10	Comments
BASELINE SYMPTOMS:	N/A					
Smooth Pursuits						
Saccades – Horizontal						
Saccades – Vertical						
Convergence (Near Point)						(Near Point in cm): Measure 1: _____ Measure 2: _____ Measure 3: _____
VOR – Horizontal						
VOR – Vertical						
Visual Motion Sensitivity Test						

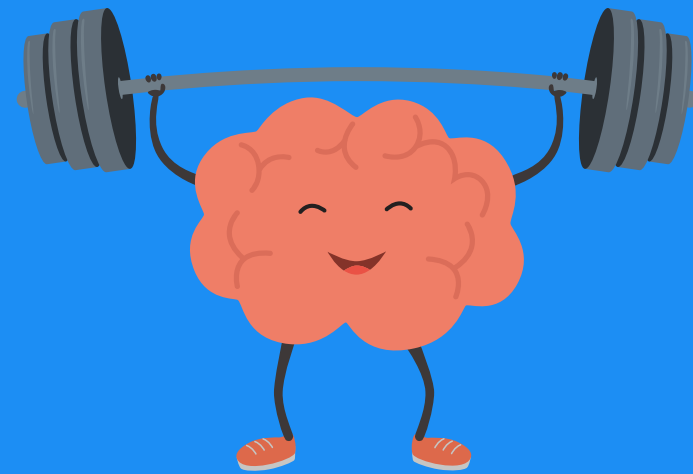


Full Neurological Exam



BRAIN Protocol

Completed by the athletic trainers at MyMichigan Rehab Center.



BIKE-Increase heart rate with sustained effort while keeping the head as still as possible

RUN-Adds simple, repetitive movement

AGILITY-Adds more explosive movement and asks the brain to do more complex function.

IN RED-Adds usual drills and workout while avoiding all physical contact

NO RESTRICTIONS- A provider must clear the athlete before this step

BRAIN PROTOCOL

A step-by-step gradual process for return to play

No RESTRICTIONS

BIKE

Increase heart rate with sustained effort while keeping the head as still as possible.

RUN

Adds simple, repetitive movement.

AGILITY

Adds more explosive movement and asks the brain to do more complex function.

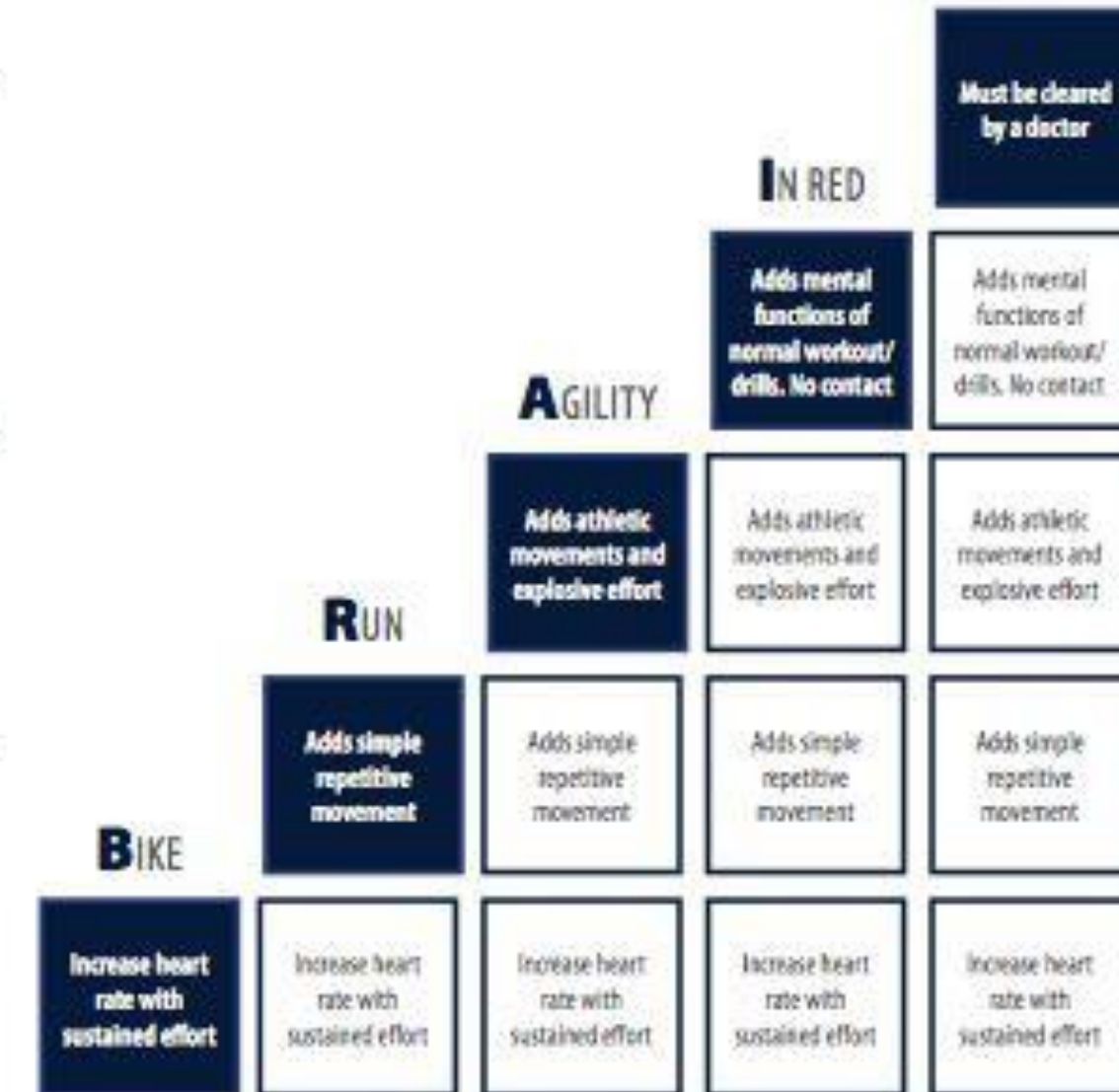
IN RED

Adds usual drills and workout while avoiding all physical contact.

("In Red" refers to the red jersey players wear to signify that they are NOT to be hit.)

NO RESTRICTIONS

A doctor must clear the athlete before this step.



- An athlete **cannot start** the protocol until there are no remaining symptoms.
- Athletes 18 years old or younger **must wait at least 24 hours between each step**, without symptoms.
- If the **symptoms return, the protocol MUST stop**. Once ALL symptoms are gone again, the process restarts by repeating the last step completed before symptoms returned.

**RETURN TO ACTIVITY &
POST-CONCUSSION CONSENT FORM**

This form is to be used after an athlete is removed from and not returned to activity after exhibiting concussion symptoms. MHSAA rules require 1) Unconditional written authorization from a physician (MD/DO/Physician's Assistant/Nurse Practitioner), and 2) Consent from the student and parent/guardian. Both Sections 1 & 2 of this form must be completed prior to a return to activity. This form must be kept on file at the school and emailed to Concussion@MHSAA.com or faxed to 517-332-4071.

Student: _____ School: _____
Event/Sport: _____ Date of Injury: _____

1. Action of M.D., D.O., Physician's Assistant or Nurse Practitioner

- **The clearance must be in writing and must be unconditional.** It is not sufficient that the M.D., D.O., Physician's Assistant or Nurse Practitioner has approved the student to begin a return-to-activity progression. The medical examiner must approve the student's return to unrestricted activity.
- Individual schools, districts and leagues may have more stringent requirements and protocols including but not limited to mandatory periods of inactivity, screening and post-concussion testing prior to or after the written clearance for return to activity.
- A school or health care facility may use a locally created form for this portion of the return to activity protocol, provided it complies with MHSAA regulations. (See MHSAA Protocol.)

I have examined the above named student-athlete following this episode and determined the following: _____

Permission is granted for the athlete to return to activity (may not return to practice or competition on the same day as the injury).

SIGNATURE (must be MD or DO or PA or NP – circle one) DATE: _____

Examiner's Name (Printed): _____

2. Post-Concussion Consent from Student and Parent/Guardian.

- I am fully informed concerning, and knowingly and voluntarily consent to, my/my child's immediate return to participation in athletic activities; I understand, appreciate, acknowledge, and assume the risks associated with such return to activity, including but not limited to concussions, and agree to comply with all relevant protocols established by my/my child's school and/or the MHSAA; and I/my child has been evaluated by, and has received written clearance to return to activity from an M.D., D.O., Physician's Assistant or Nurse Practitioner.
- In consideration of my/my child's continued participation in MHSAA-sponsored athletics, I/we do hereby waive any and all claims, suits, losses, actions, or causes of action against the MHSAA, its members, officers, representatives, committee members, employees, agents, attorneys, insurers, volunteers, and affiliates based on any injury to me, my child, or any person, whether because of inherent risk, accident, negligence, or otherwise, during or arising in any way from my/my child's participation in an MHSAA-sponsored sport.
- I/we consent to the disclosure to appropriate persons, consistent with HIPAA and FERPA, of the treating medical examiner's written statement.

Student's Signature (Required): _____ Date: _____

*Parent/Guardian's Name _____ *Parent/Guardian's Signature: _____

*Required if student is less than 18 years of age.

SEE REVERSE FOR OTHER CONCUSSION RELATED INFORMATION INCLUDING INSURANCE
THIS FORM SHOULD BE KEPT ON FILE AT THE SCHOOL FOR SEVEN YEARS FOLLOWING THE
STUDENT'S HIGH SCHOOL GRADUATION. Print Year of HS Graduation: _____

Return to Play

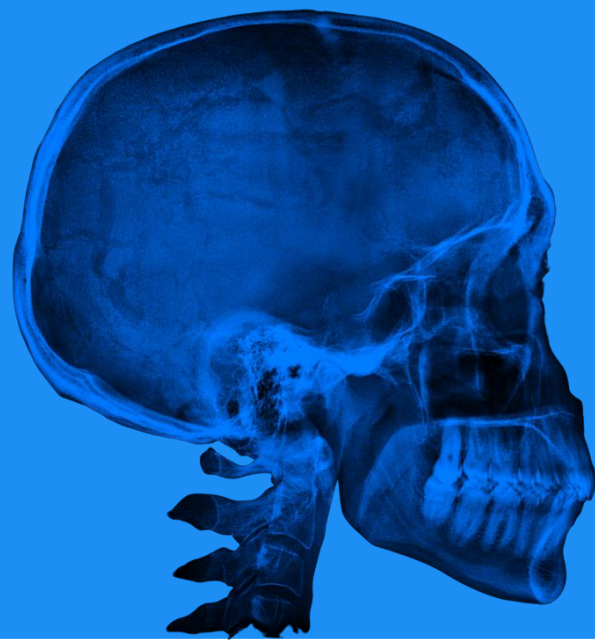
Form must be signed by:

- Provider (M.D., D.O., NP or PA)
- 2. Student
- 3. Parent
- 4. Form is then presented to the athletic department



Second Impact Syndrome

- Occurs when a second concussion happens before the first has healed.
- Causes the brain to “lose its ability to [self-regulate](#) pressure and blood volume flowing” and causes rapid and severe brain swelling.
- While rare, second impact syndrome is often [fatal](#). The mortality rate in confirmed SIS cases is [just over 50%](#), while the probability of permanent disability nears 100%
- The [vast majority of cases of SIS](#) occur in high school athletes who play high impact sports. By [some estimates, 95%](#) of the those who suffer SIS are children under the age of 18.



Concussion Statistics

- 10% of all contact sport athletes sustain concussions yearly.
- Brain injuries cause more death than any other sports injury. In football, brain injuries account for 65% to 95% of all fatalities.
- An athlete who sustains concussion is 4-6 times more likely to sustain a second concussion.
- 1/2 of all concussions go unreported
- For males, the leading cause of high school sports concussion is football; for females the leading cause of high school sports concussion is soccer.



Questions



References

Concussion care training: Impact applications inc.. ImPACT Applications Inc. Training. (2023, July 31). <https://concussioncaretraining.com/>

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Concussion statistics and facts: UPMC: Pittsburgh. UPMC. (n.d.). <https://www.upmc.com/services/sports-medicine/services/concussion/about/facts-statistics>

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