Concussions: What you need to know

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Concussion Knowledge

- Prior to 2011
  - Graded scale
  - Return to sports same day
  - “Ding” was a household term
  - Knowledge and education low
- 2011-2013
  - Sports Concussion Specialist
  - State law came into effect
  - Physician clearance needed to RTP
  - Concussion Policy required for schools
  - Management entailed complete cognitive and physical rest
  - Education and research begins to boom
- Present
  - Homebound is rare
  - Management is more proactive
  - Therapies to speed recovery
  - Spectrum changed to prevention
  - Very much a hot topic

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True and False

1. A concussion occurs only when an athlete experiences a loss of consciousness (LOC). **False**
2. Headache is most reported symptom **True**
3. The signs and symptoms of concussion are always apparent immediately after injury. **False**
4. Girls suffer concussions at the same rate as boys. **False**
5. All concussions are the same **False**
6. Athletes will acknowledge when they have sustained a concussion **False**

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What is a Concussion

A mild traumatic brain injury, or **concussion**, is a complex

pathophysiological process

affecting the brain, induced by traumatic biomechanical forces secondary to direct or indirect forces to the head.

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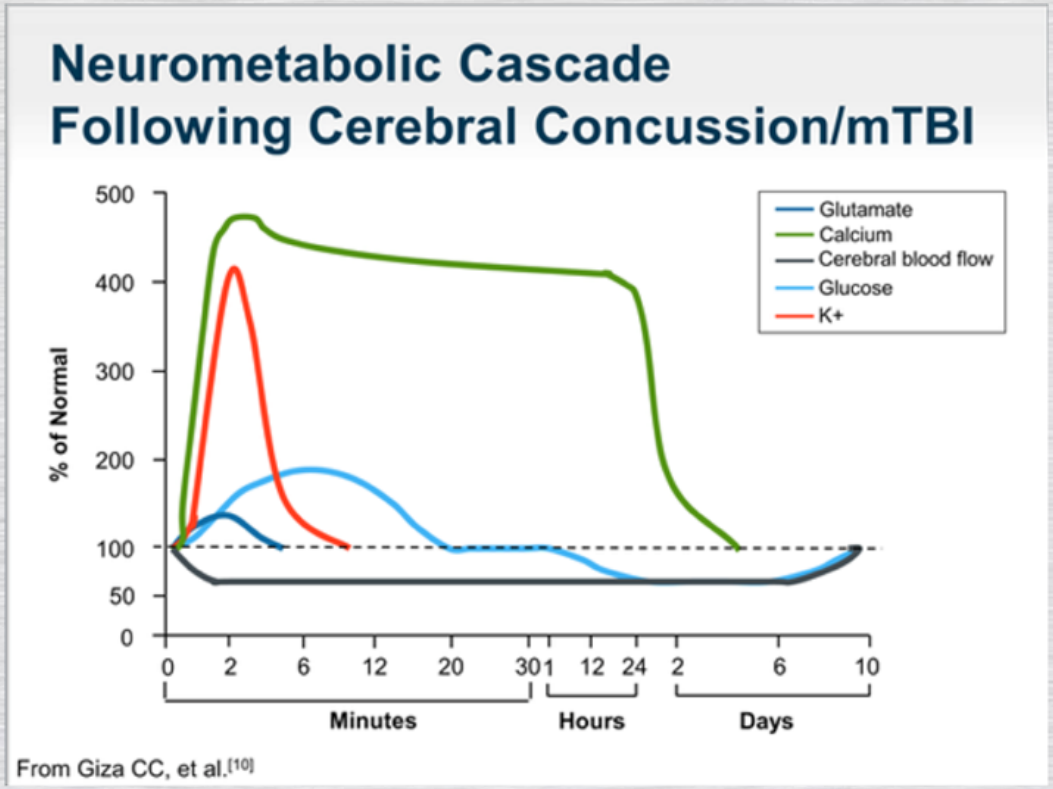
Cellular Energy Crisis

- **Multilayered Neurometabolic Cascade**
- **A complex cellular and vascular change that occurs in the brain following a concussion**



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SIGNS & SYMPTOMS

Athletes who experience *one or more* of the signs and symptoms listed below after a bump, blow, or jolt to the head or body may have a concussion.

Signs Observed by Coaching Staff

- Appears dazed or stunned
- Is confused about assignment or position
- Forgets an instruction
- Is unsure of game, score, or opponent
- Moves clumsily
- Answers questions slowly
- Loses consciousness (*even briefly*)
- Shows mood, behavior, or personality changes
- Can't recall events *prior* to hit or fall
- Can't recall events *after* hit or fall

Symptoms Reported by Athlete

- Headache or "pressure" in head
- Nausea or vomiting
- Balance problems or dizziness
- Double or blurry vision
- Sensitivity to light
- Sensitivity to noise
- Feeling sluggish, hazy, foggy, or groggy
- Concentration or memory problems
- Confusion
- Just not "feeling right" or is "feeling down"

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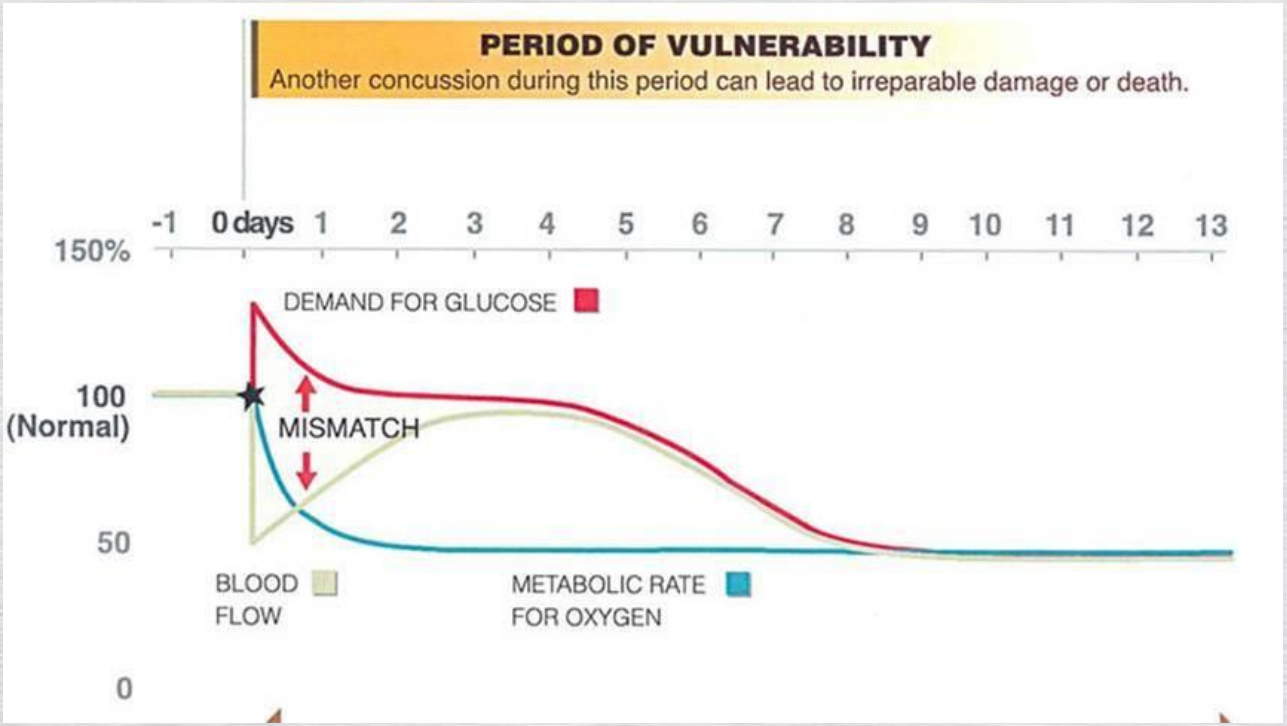

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Acute Sports Related TBI's

Life Threatening • Skull Fracture • Brain Bleed • Second Impact Syndrome	Imaging Needed CT Scan/MRI ***Structural Injury***
Mild TBI • Concussion Most common • Post Concussion Syndrome	• No Imaging Needed • Clinical Exam ***"Functional Injury"***

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Structural vs. Functional

Structural	Functional
Computer An axe through the CPU or monitor	Computer Looks normal but not processing programs quickly; Running slowly
Head Injury Skull fracture, brain bleed	Head Injury Trouble concentrating, slower processing speed, reaction time, etc.

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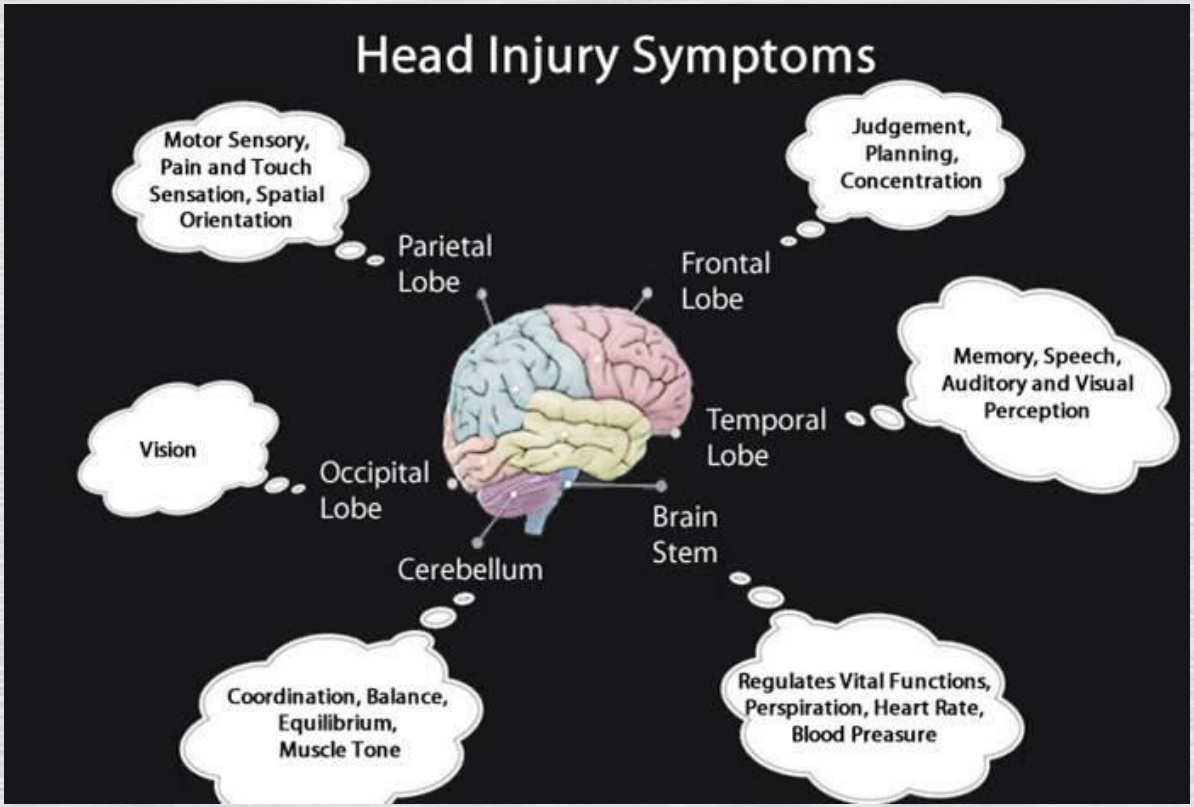
How is a Concussion Diagnosed?



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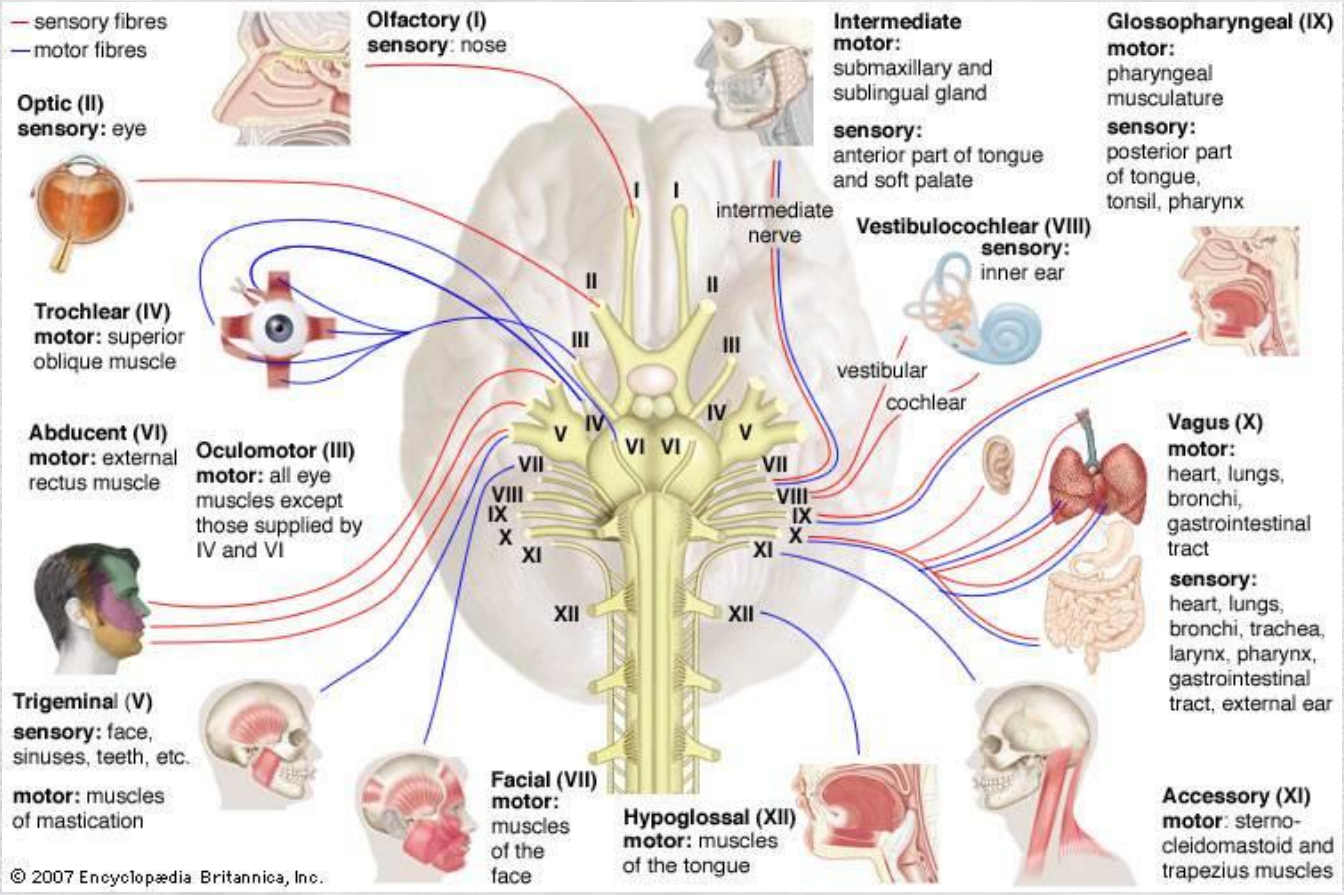
Method to the Madness



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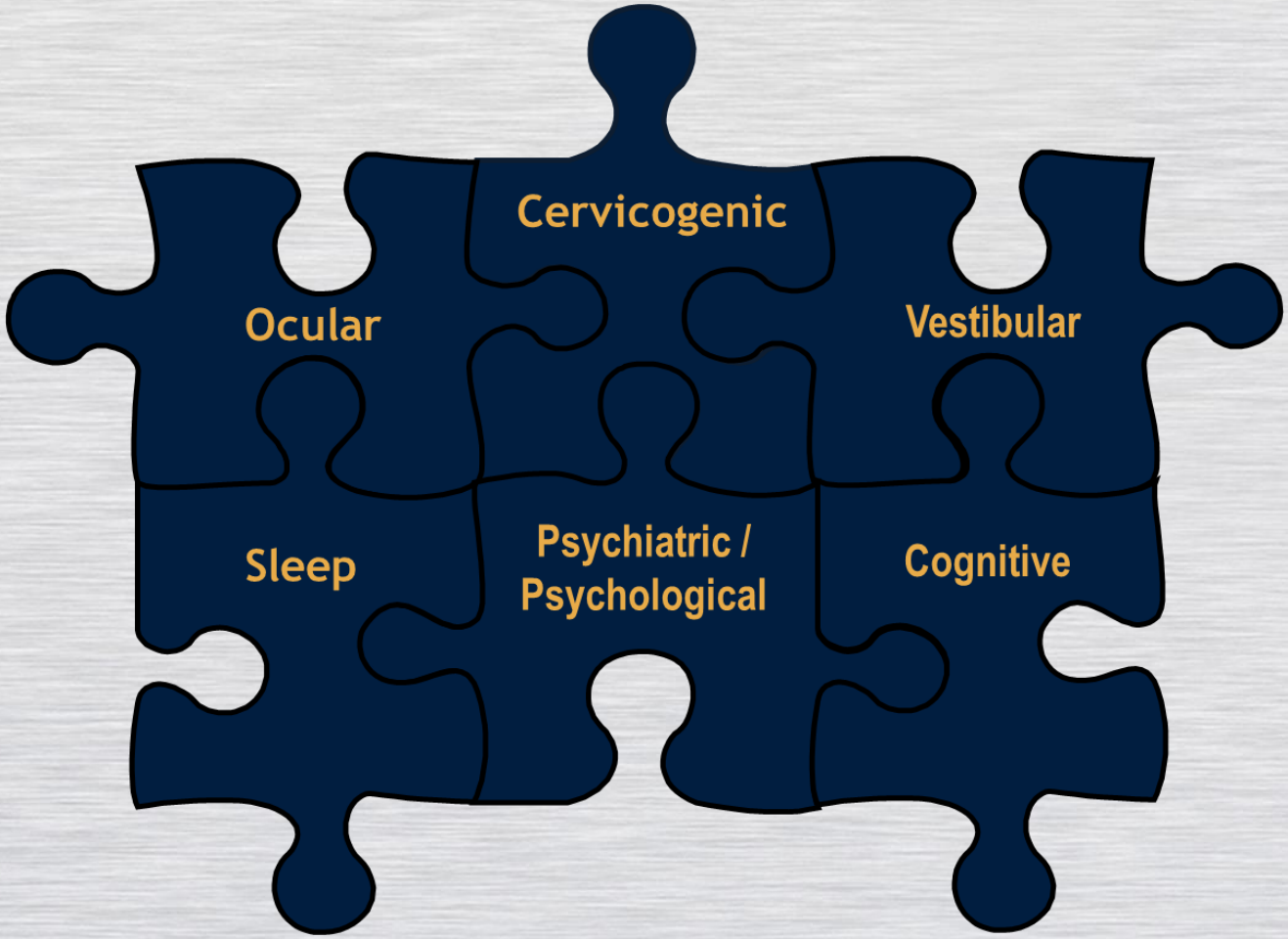
During the Exam: Physician will evaluate



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During the Exam: Physician will evaluate

1. **Cervicogenic** – Looking for neck pain or a whiplash mechanism of injury.
2. **Vestibular** – How the eyes, brain, and body works as one. The doctor completes a detailed eye and balance exam.
3. **Ocular** – Making sure the eyes are working together as a unit
4. **Cognitive** – Review of a detailed history, ImPACT testing review, and symptomology.
5. **Psychological/Psychiatric -** Family or past medical history outlining diagnosis of anxiety, depression, ADHD, etc.
6. **Sleep** – Review of one's normal sleep patterns and whether there has been any disruption.

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How do we protect our Athlete's?

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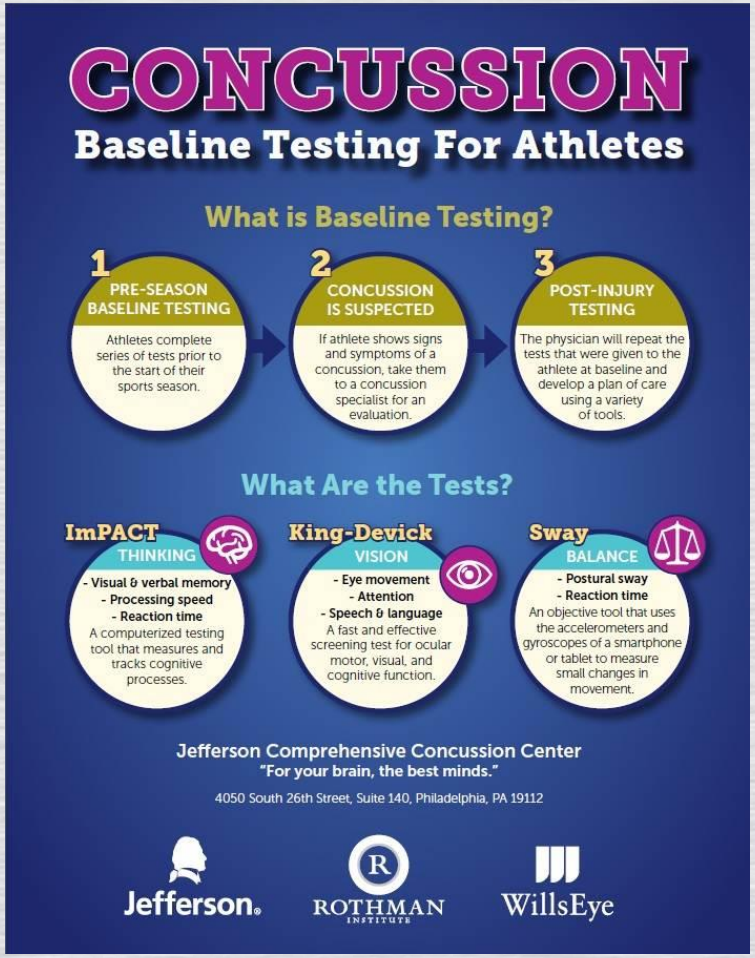
Baseline Testing



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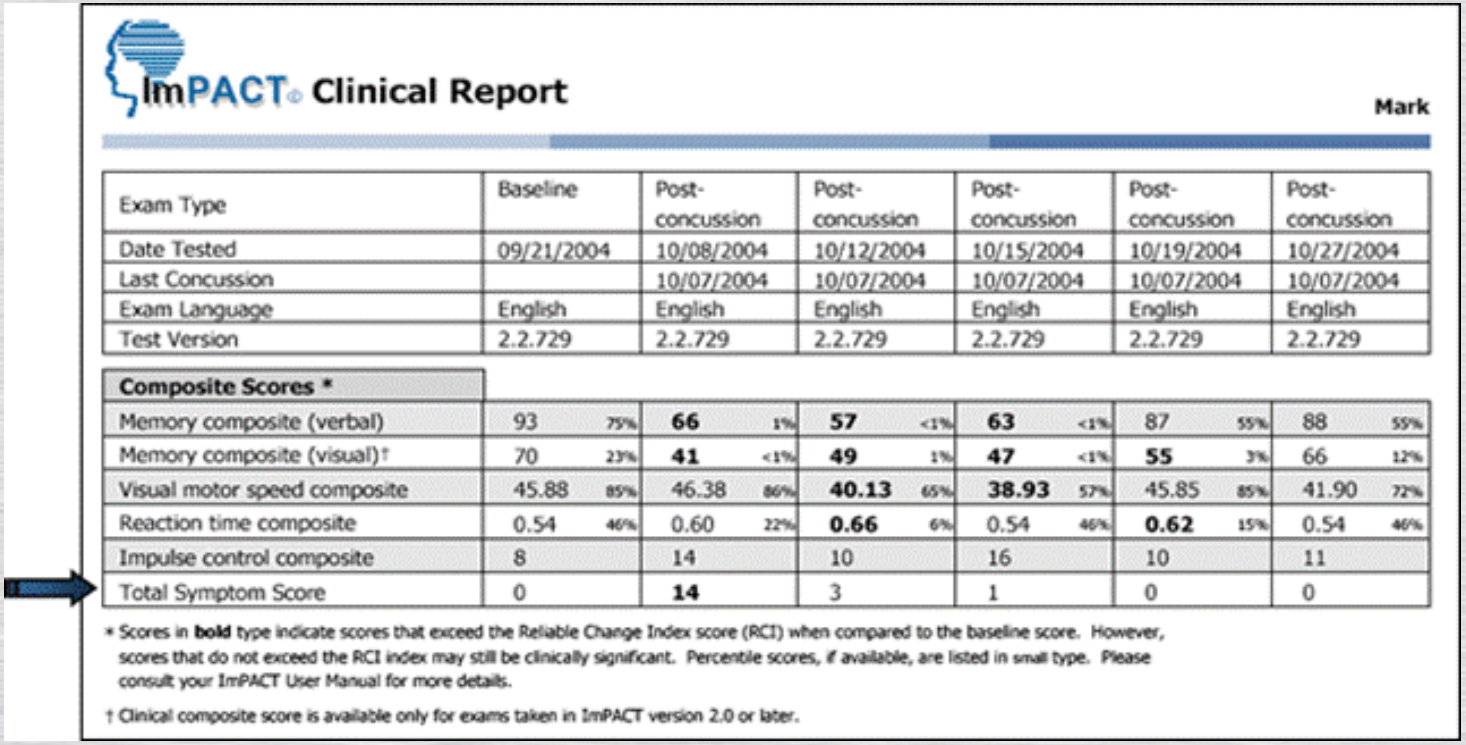
ImPACT – Cognitive



ImPACT© Clinical Report

Mark

Exam Type	Baseline	Post-concussion	Post-concussion	Post-concussion	Post-concussion	Post-concussion
Date Tested	09/21/2004	10/08/2004	10/12/2004	10/15/2004	10/19/2004	10/27/2004
Last Concussion		10/07/2004	10/07/2004	10/07/2004	10/07/2004	10/07/2004
Exam Language	English	English	English	English	English	English
Test Version	2.2.729	2.2.729	2.2.729	2.2.729	2.2.729	2.2.729

Composite Scores *												
Memory composite (verbal)	93	75%	**66**	1%	**57**	<1%	**63**	<1%	87	55%	88	55%
Memory composite (visual)†	70	23%	**41**	<1%	**49**	1%	**47**	<1%	**55**	3%	66	12%
Visual motor speed composite	45.88	85%	46.38	86%	**40.13**	65%	**38.93**	57%	45.85	85%	41.90	72%
Reaction time composite	0.54	46%	0.60	22%	**0.66**	6%	0.54	46%	**0.62**	15%	0.54	46%
Impulse control composite	8		14		10		16		10		11	
Total Symptom Score	0		**14**		3		1		0		0	

* Scores in **bold** type indicate scores that exceed the Reliable Change Index score (RCI) when compared to the baseline score. However, scores that do not exceed the RCI index may still be clinically significant. Percentile scores, if available, are listed in small type. Please consult your ImPACT User Manual for more details.

† Clinical composite score is available only for exams taken in ImPACT version 2.0 or later.

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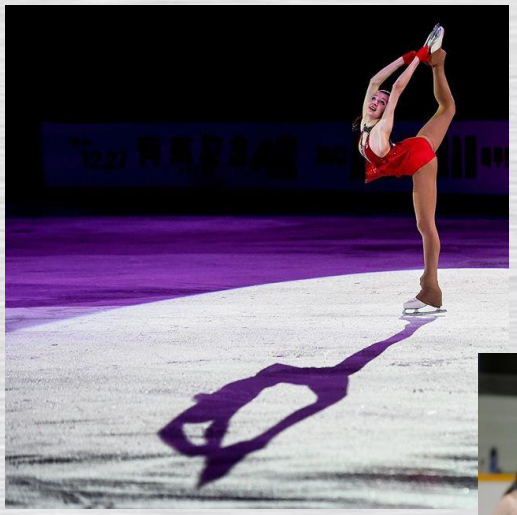
Understanding your Role

- ✓ Stay Informed
- ✓ Know the State law
- ✓ Manage and understand Equipment
- ✓ Baseline Testing
- ✓ Recognize and Refer



Athlete

Coach

Parents

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Understanding the State Law

Pennsylvania

- ✓ Outlines safe return to play
- ✓ Getting parents and athletes educated
- ✓ Getting coaches educated
- ✓ Penalties for not adhering to the law

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Return to Play

TABLE 6 6-STEP RETURN-TO-PLAY PROTOCOL

PHASE	REHABILITATION	OBJECTIVE
Phase 1	Baseline	Patient must be on physical and cognitive rest with no symptoms for at least 24 hr.
Phase 2	Increase heart rate	The goal is to increase heart rate for 5-10 min through mild activity such as walking, light jogging, or an exercise bike.
Phase 3	Moderate exercise	In this phase the goal is limited body and head movement through more moderate intensity activities such as brief running or moderate weight lifting.
Phase 4	Noncontact exercise	The goal is to increase intensity but avoid contact. Activities could include more intense running, stationary biking, or noncontact sport-specific drills.
Phase 5	Practice	Reintegrate into full contact practice.
Phase 6	Play	Return to competition.

From May KH, et al.[11]

Complete Steps 1-3 on **Land**

Once completed and symptom free, begin on **Ice**:

Day 1: Solo skating, getting use to be back on skates/ice

Day 2: Solo skating, Increase speed on ice

Day 3: Solo skating, May do slow and controlled turns

Day 4: More figure skating specific techniques

Day 5: Full practice

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Recognize and Refer

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Recognize and Refer

- ✓ **Rule out life threatening injury**
  - Cervical spine (neck injury)
  - Structural TBI
- ✓ **Removal from Play**
  - May not return to play until cleared by physician or licensed healthcare provider
- ✓ **If available, athlete should be evaluated by a licensed healthcare provider**
  - MD
  - Certified Athletic Trainer
  - Nurse
  - EMS
- ✓ **Speak with parent and inform them that child sustained a head injury**
- ✓ **Utilize informational packets**
- ✓ **Document the incident**

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Dangerous Signs and Symptoms

- Headache that gets worse
- Weakness, numbness or decreased coordination.
- Repeated vomiting or nausea.
- Slurred speech.
- Very drowsy or cannot be awakened.
- Have one pupil larger than the other.
- Have convulsions or seizures.
- Cannot recognize people or places.
- Are getting more and more confused, restless, or agitated.
- Have unusual behavior.
- Lose consciousness

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Crossing the Finish Line

✓Symptom free at school & play

✓ Clearance from a physician trained in concussion management

✓ Completed gradual return to play

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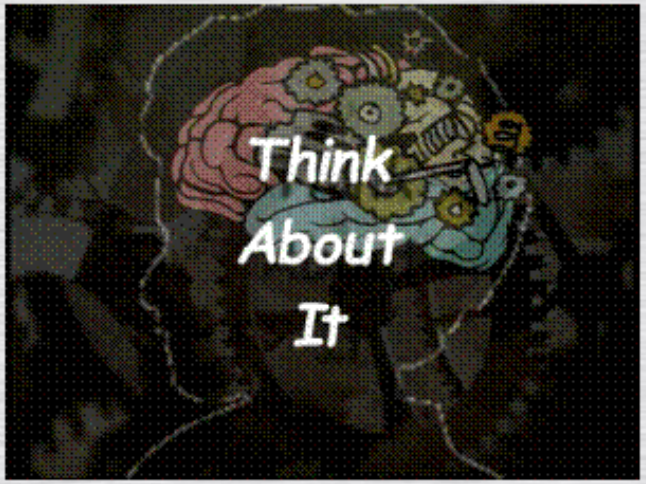
Concussion Policy

- ✓ **Proactive**
- ✓ **Benefits**
  - **Eliminates questions**
- ✓ **Ensures you are adhering to state law.**
- ✓ **Keeps you and your athletes safe**



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Athletes

- ✓ Stay educated about concussions
- ✓ Take ownership
  - ✓ Equipment
  - ✓ Yourself
- ✓ Use proper technique
- ✓ Speak up
  - ✓ Yourself
  - ✓ Teammates

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Recap

1. Stay Educated
2. Recognize and Refer
3. Know your Role
4. Think about a Concussion Protocol
5. Start the season off Right – Baseline Testing

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Helpful Websites

www.cdc.gov/concussion/

www.nata.org

www.rothmaninstitute.com/concussions

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References

- Collins, Michael et. Al. Advancements in Assessment, Management, and Rehabilitation. The Science of Concussion.
- 2013 1-12.
- Tassinari, JT. Untreated Oculomotor Dysfunction. Opt Vis Dev 2007; 38(3);121-124
- Model Policy and Guidance for Prevention and Treatment of Sports Related Concussion and Head Injuries.
- Children's vision information network, Vision and Reading. www.childrensvision.com
- http://www.axonpotential.com/the-athletic-brain/
- http://cheerleading.about.com/od/coachingcheerleading/a/safety.htm

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