

CONCUSSION in SPORT

Education Package for

Doctors

ImPACT





ImPACT



- Immediate Postconcussion Assessment and Cognitive Testing
- Computerised test
- Takes about 25 minutes to complete
- Baseline tests are suggested every two years
- If a concussion is suspected, the baseline report will serve as a comparison to a repeat ImPACT test
- The management of concussions should only be conducted by trained medical professionals.
- ImPACT's studies have indicated the verbal memory, visual memory, processing speed, reaction time and symptom scores assist in making a determination between concussed and non-injured individuals.

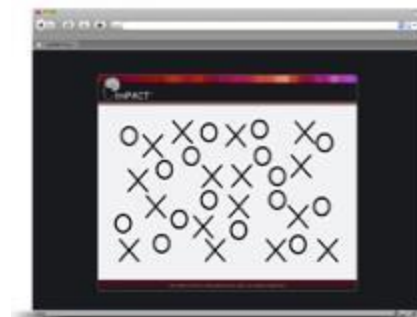
ImPACT

Section 1: Demographic Profile and Health History Questionnaire

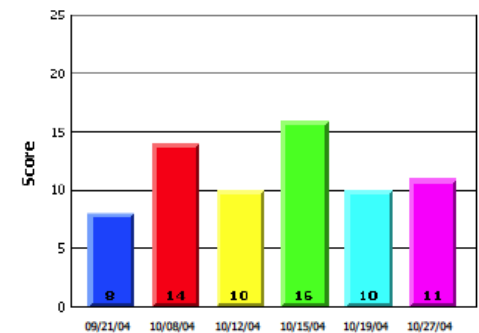
Section 2: Current Concussion Symptoms and Conditions

Section 3: Baseline and Post-Injury Neurocognitive Tests

Section 4: Graphic Display of ImPACT Test Scores



Impulse Control Composite



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Section 1: Demographic Profile and Health History Questionnaire



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Section 2: Current Concussion Symptoms and Conditions



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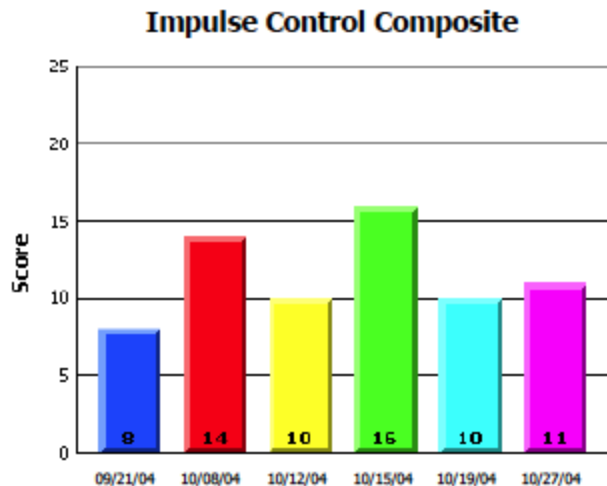
Section 3: Baseline and Post-Injury Neurocognitive Tests

- *Module 1: Word Discrimination*
- *Module 2: Design Memory*
- *Module 3: X's and O's*
- *Module 4: Symbol Matching*
- *Module 5: Colour Match*
- *Module 6: Three Letter Memory*



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Section 4: Graphic Display of ImPACT Test Scores



Composite 1: Verbal Memory Composite

- Total memory percent correct
- Symbol match (total correct hidden symbols)
- Three letters (total percent of total letters correct)

Composite 2: Visual Memory Composite

- Design memory (total percent correct score)
- X's and O's (total correct memory score)

Composite 3: Processing Speed Composite

- X's and O's (total correct (interference))
- Three-letters (average counted correctly)

Composite 4: Reaction Time Composite

- X's and O's (average correct RT (interference))
- Symbol match (average correct RT/3)
- Colour match (average correct RT)

Composite 5: Impulse Control Composite

- X's and O's (total incorrect (interference))
- Colour match (total commissions)

Total Symptom Composite

This score represents the total for all 22 symptom descriptors.

A lower score indicates fewer endorsed symptoms by the test-taker.



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ImPACT™ Clinical Report

Exam Type	Baseline	Post-Injury 1	Post-Injury 2	Post-Injury 3	
Date Tested	08/17/2010	01/10/2011	01/17/2011	01/27/2011	
Last Concussion		01/08/2011	01/09/2011	01/09/2011	
Exam Language	English	English	English	English	
Test Version	2.0	2.0	2.0	2.0	

Composite Scores	Percentile scores if available are listed in small type.								
Memory composite (verbal)	76	15%	61	1%	68	4%	93	71%	
Memory composite (visual)	85	86%	56	14%	63	21%	81	73%	
Vis. motor speed composite	36.8	35%	30.3	6%	31.08	9%	44.05	70%	
Reaction time composite	0.58	39%	0.79	2%	0.81	1%	0.52	75%	
Impulse control composite	11		13		9		7		
Total Symptom Score	4		19		28		3		

Cognitive Efficiency Index: **0.16** **0.13** **0.3** **0.53**



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ImPACT Clinical Report TM

CHC

Organization: **Sample High School**

Subject ID#: **111-11-1111**

Date of birth: **11/01/90** Age: **15**

Gender: **Male** Height: **71** inches

Handedness: **Right** Weight: **168** lbs

Native country / region: **United States of America** Second language: **(None)**

Native language: **English** Years speaking: **0**

Years of education completed excluding kindergarten: **8** Received speech therapy: **No**

Diagnosed learning disability: **No** Problems with AOD/Hyperactivity: **No**

Attended special education classes: **No** Repeated one or more years of school: **No**

Current sport: **Ice Hockey** Current level of participation: **AAA midjet minor**

Primary position/level/class: **left wing** Years experience at this level: **4**

Number of times diagnosed with a concussion (excluding current injury): **3**

Concussions that resulted in loss of consciousness: **1**

Concussions that resulted in confusion: **2**

Concussions that resulted in difficulty remembering events that occurred immediately after injury: **0**

Concussions that resulted in difficulty remembering events that occurred: **0**

Total games missed as a result of all concussions combined: **3**

Concussion history: **01/01/2002, 02/01/2002, 02/01/2003, 01/22/2006, 01/24/2006**

Treatment for headaches by physician: **No** Treatment for psychiatric condition (depression, anxiety): **No**

Treatment for epilepsy / seizures: **No** Treatment for migraine headaches by physician: **No**

History of brain surgery: **No**

History of meningitis: **No** Treatment for substance/alcohol abuse: **No**

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ImPACT Clinical Report TM

Exam Type	Post-concussion	Post-concussion	Post-concussion	Post-concussion	Post-concussion
Date Tested:	01/26/2006	01/26/2006	02/19/2006	02/24/2006	03/12/2006
Last Concussion:	01/24/2006	01/24/2006	01/24/2006	01/24/2006	01/24/2006
Exam Language:	English	English	English	English	English
Test Version:	4.3.805	4.3.805	4.3.805	4.3.805	4.3.805

Composite Scores *										
Memory composite (verbal)	54	-1%	67	1%	72	1%	79	8%	78	8%
Memory composite (visual)	58	-1%	47	1%	72	8%	70	8%	70	8%
Visual motor speed composite	19.00	1%	24.66	1%	30.80	3%	33.63	4%	31.08	3%
Reaction time composite	1.19	-1%	0.80	1%	0.64	1%	0.58	4%	0.55	4%
Impulse control composite	13		5		4		5		9	
Total Symptom Score	31		24		15		13		17	

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

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

Concussion Details	
Date of concussion	01/24/2006
Loss of consciousness	None
Retrograde amnesia	1-5 minutes
Anterograde amnesia	6-15 minutes
Confusion / disorientation	1-59 seconds
Returned to play	Did not return
Taken to hospital	
CT/MRI scan of head	
Point of impact	Nasal, midline
Mouthguard type	
Mouthguard condition	
Mouthguard manufacturer	
Helmet manufacturer	
Helmet model	
Helmet size	
Symptoms	Headache, dizziness or balance problems, visual changes, nausea, personality change, fatigue
Description of injury and additional information	Hit in the face with a puck.

The information provided in this report should be viewed as only one source of information regarding the athlete's state of functioning. Diagnosis or return to play decisions should not be based solely on the data generated by ImPACT but should be based on an evaluation made by qualified medical personnel in accordance with usual and standard medical practice. If an individual is suspected of suffering a mild traumatic brain injury or concussion, the individual should be evaluated by medical personnel and should be followed carefully for the emergence of symptoms.


Consultation is recommended to help facilitate proper interpretation of the information provided in this report. For initial post-injury consultation you are urged to contact Dr. Mark Lovell or Dr. Philip Collins at ImPACT Applications. To facilitate proper interpretation of the test data, there will be no charge for the initial post-injury consultation.

Dr. Mark Lovell can be reached at:
412-432-3870 (Office)
412-432-3881 (Secretary)
lovelm@upmc.edu

Dr. Philip Collins can be reached at:
412-432-3868 (Office)
412-938-6714 (Pager)
collinsp@upmc.edu

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ImPACT BASELINE COMPARISON



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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Questions?





Assessment

