

ImPACT Concussion Management Program



Carver Athletic Department

** Information obtained in this presentation came directly from the Impact website
at www.impacttest.com*

What is a Concussion?

A concussion is a disturbance in brain function that occurs as a result of either a blow to the head or the violent shaking of the head
(Chemical)

Incidence of sports-related concussion is estimated at 300,000 concussions per year

The likelihood of an athlete in a contact sport experiencing a concussion may be as high as 19% per season

Common Signs and Symptoms

Signs observed

- Appears to be dazed or stunned
- Is confused about assignment
- Forgets plays
- Is unsure of game, score, or opponent
- Moves clumsily
- Answers questions slowly
- Loses consciousness (even temporarily)-**less than 10%**
- Shows behavior or personality change
- Forgets events prior to hit (retrograde amnesia)
- Forgets events after hit (anterograde amnesia)

Signs reported by athlete

- Headache
- Nausea
- Balance problems or dizziness
- Double or fuzzy vision
- Sensitivity to light or noise
- Feeling sluggish
- Feeling "foggy"
- Change in sleep pattern
- Concentration or memory problems

Post-Concussion Syndrome

Majority of athletes who experience a concussion are likely to recover

Some experience chronic cognitive and behavioral difficulties related to recurrent injury.

Symptoms may include:

chronic headaches, fatigue, sleep difficulties, personality change (e.g. increased irritability, emotionality), sensitivity to light/noise, dizziness when standing quickly, and deficits in short-term memory, problem solving and general academic functioning.

Post Concussion Syndrome

Occurs only occasionally but is devastating to those individuals who experience it. It is usually defined as having concussion symptoms that last for greater than a month after the initial blow.

SLEEP ISSUES - Initially, most concussed individuals are very fatigued and sleep more than usual. As the concussion persists, they may have difficulty falling asleep and sleep less than usual. Lack of sleep causes major difficulties and should be resolved before treating the next two issues.

CONCENTRATION AND MEMORY ISSUES - Inability to concentrate (focus) and poor memory, often associated with increased headaches during schoolwork, may cause poor school attendance and performance. It can take months, or even longer, to recover from this. Full neuro-cognitive testing and rehabilitation may be indicated in some cases.

DEPRESSION AND OTHER PSYCHIATRIC PROBLEMS - Although depression may be caused by the concussion itself, the persistence of symptoms and being unable to play may also cause depression. Psychotherapy and anti-depressant medication may be warranted.

Some athletes may not be able to return to contact sports due to the long term symptoms they have suffered as a result of their concussion.

Second Impact Syndrome

Suffering a second blow to the head while recovering from an initial concussion can have catastrophic consequences.

This has led to approximately 30-40 deaths over the past decade.

***Insert Video Clip*

Second Impact Syndrome

Concussion Management

- NO ADOLESCENT WITH A CONCUSSION SHOULD CONTINUE TO PLAY OR RETURN TO A GAME AFTER SUSTAINING A CONCUSSION.
- AN INDIVIDUAL SUSTAINING A CONCUSSION SHOULD CEASE DOING ANY ACTIVITY THAT CAUSES THE SYMPTOMS OF A CONCUSSION TO INCREASE (e.g. headaches, dizziness, nausea, etc.).
- SCHOOL ATTENDANCE AND ACTIVITIES MAY NEED TO BE MODIFIED.
- NEURO-COGNITIVE TESTING IS AN IMPORTANT COMPONENT FOR THE MANAGEMENT OF CONCUSSIONS.
- NO ATHLETES SHOULD RETURN TO CONTACT COMPETITIVE SPORTS UNTIL THEY ARE SYMPTOM FREE, BOTH AT REST AND WITH EXERCISE AND HAVE NORMAL NEURO-COGNITIVE TESTING.

Recovery

Manage Injury Properly

Athletes must be fully recovered before returning
to play

No signs of symptoms present

Allowed proper time to recover

Susceptible to additional concussions

ImPACT Program

University of Pittsburgh Medical Center

Concussion Management Program that is user friendly computer test that is set up like a video game and can be administered by a coach, trainer, or Physician

Program measures processing speed through a series of 10 test modules

Takes app. 20 minutes to complete

ImPACT Test Features

- Measures player symptoms
- Computer administered
- Can be administered on a lap-top for easy access and administration
- Assists physicians and athletic trainers in making difficult return-to-play decisions
- Permits individual and group administration
- Provides reliable baseline test information
- Results can be E-mailed or Faxed for fast consultation by a Neuropsychologist
- Produces comprehensive report of test results
- Automatically stores data from repeat testing
- Measures attention, memory, processing speed and reaction time
- Reaction time measured to 1/100th of second

ImPACT Program

Measures multiple aspects of cognitive functioning in athletes, including:

Attention Span

Working Memory

Sustained and Selected working time

Response Variability

Non Verbal Problem Solving

Reaction Time

ImPACT Test Information

Test Section 1: Subject Profile and Health History Questionnaire

- **Test Section 2: Current Symptoms and Conditions**
- **Test Section 3: Neuropsychological Tests (Baseline and Post-Concussion) – Test Modules**
 - **Word Memory**
 - **Design Memory**
 - **X's and O's**
 - **Visual Attention Span**
 - **Symbol Matching**
 - **Color Match**
 - **Three letters**
- **IV. Injury Description – rating scale of 1-6**
- **V. Graphic Display of Data**

ImPact Testing/Evaluation

All impact sport athletes will be tested at the start of the season

All tests are good for one year

Post Concussion Testing – Test post injury within 24 – 72 hours

Information is sent out to clinical psychologist

South Shore Hospital – Dr. Jane Kent, and

University of Pittsburgh Medical Center

All testing information is stored in a secure database

***Sample clinical report*

Mark

Organization:	Sample Hockey Team		
Subtest ID#:	116-09-2000		
Date of birth:	01/01/86	Age:	28
Gender:	Male	Height:	73 inches
Handedness:	Right	Weight:	190 lbs
Native country / region:	Canada	Second language:	(None)
Native language:	English	Years speaking:	0
Years of education completed excluding kindergarten:	12	Received speech therapy:	No
Diagnosed learning disability:	No	Problems with ADD/Hyperactivity:	No
Attended special education classes:	No	Repeated one or more years of school:	No
Current sport:	Hockey	Current level of participation:	OWL
Primary position/level/class:	LW/C	Years experience at this level:	3

Number of times diagnosed with a concussion (excluding current injury):	0
Concussions that resulted in loss of consciousness:	0
Concussions that resulted in confusion:	0
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:	0

Concussion history: **18/07/2004**

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	Treatment for substance/alcohol abuse:	No

Exam Type	Baseline	Post-concussion	Post-concussion	Post-concussion	Post-concussion	Post-concussion
Date Tested	08/21/2004	10/06/2004	10/12/2004	10/19/2004	10/26/2004	10/30/2004
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	2.2.079	2.2.079	2.2.079	2.2.079	2.2.079	2.2.079

Composite Scores *							
Memory composite (verbal)	93	94	88	94	97	94	87
Memory composite (visual)	93	94	88	94	97	94	87
Visual motor speed composite	45.88	46.28	48.13	46.93	48.93	45.83	41.90
Reaction time composite	0.54	0.60	0.66	0.54	0.54	0.62	0.54
Impulse control composite	8	14	10	15	10	11	11
Total Symptom Score	0	28	3	1	0	0	0

* Scores in **bold** type indicate scores that exceed the Relative Change Index score (RCI) when compared to the baseline score. However, scores that do not exceed the RCI may still be clinically significant. Reference scores, if available, are listed in red type. 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:	10/07/2004
Loss of consciousness:	None
Retrograde amnesia:	None
Anterograde amnesia:	None
Confusion / disorientation:	None
Returned to play:	Did not return
Taken to hospital:	
CT/MRI scan of head:	None
Point of impact:	
Mouthguard type:	Vacuum form
Mouthguard condition:	Good
Mouthguard manufacturer:	
Helmet manufacturer:	
Helmet model:	
Helmet size:	
Symptoms:	Headache, dizziness or balance problems
Description of injury and additional information:	Was hit from behind into the boards by an opposing player. He went in almost head first.

The information provided to this report should be viewed as only one source of information regarding the athlete's level of functioning. Decisions to 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 by 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:
 413-432-2670 (Office)
 413-432-2682 (Residence)
 mark@igms.ats

Dr. Philip Collins can be reached at:
 413-432-2668 (Office)
 413-458-6714 (Home)
 phil@igms.ats

Exam Type	Baseline	Post-concussion	Post-concussion	Post-concussion	Post-concussion	Post-concussion
Date Tested	09/21/2004	10/04/2004	10/12/2004	10/15/2004	10/19/2004	10/20/2004
Last Concussion		10/01/2004	10/03/2004	10/03/2004	10/03/2004	10/03/2004

Word Memory	WVC = F	WVC = J	WVC = J	WVC = J	WVC = S	WVC = J
Hits (immediate)	12	11	9	11	11	12
Correct distractors (immed.)	12	11	10	12	12	12
Learning percent correct	100%	92%	79%	96%	96%	100%
Hits (delay)	11	9	8	4	5	10
Correct distractors (delay)	8	6	5	10	7	7
Delayed memory pct. correct	79%	67%	58%	58%	50%	71%
Total percent correct	90%	77%	67%	77%	77%	89%

Design Memory						
Hits (immediate)	8	7	9	5	8	11
Correct distractors (immed.)	9	9	5	8	9	10
Learning percent correct	71%	67%	58%	58%	71%	88%
Hits (delay)	9	9	8	7	9	8
Correct distractors (delay)	9	7	5	5	7	6
Delayed memory pct. correct	75%	80%	58%	50%	67%	58%
Total percent correct	73%	76%	56%	52%	69%	73%

X's and O's						
Total correct (memory)	8	3	5	5	5	7
Total correct (interference)	115	107	93	101	110	112
Avg. correct RT (interference)	0.45	0.45	0.64	0.47	0.48	0.46
Total incorrect (interference)	7	14	8	14	8	10
Avg. incorrect RT (interfer.)	0.37	0.37	0.50	0.40	0.44	0.37

Symbol Match						
Total correct (visible)	27	27	37	37	27	26
Avg. correct RT (visible)	1.29	1.42	1.29	1.29	1.29	1.22
Total correct (hidden)	8	5	4	6	8	7
Avg. correct RT (hidden)	1.06	1.38	1.18	1.37	1.38	1.08

Color Match						
Total correct	9	9	8	9	9	9
Avg. correct RT	0.28	0.32	0.39	0.28	0.34	0.25
Total commissions	1	0	2	2	2	1
Avg. commissions RT	0.37	0.50	1.68	0.54	0.40	0.20

Three Letters						
Total sequence correct	5	2	2	1	5	5
Total letters correct	15	10	9	7	15	15
Pct. of total letters correct	100%	67%	60%	47%	100%	100%
Avg. time to first click	1.95	2.42	1.89	1.20	1.31	1.31
Avg. counted	21.2	21.0	20.0	18.2	21.2	21.2
Avg. counted correctly	21.0	21.0	19.0	17.2	21.4	18.6

Exam Type	Baseline	Post-concussion	Post-concussion	Post-concussion	Post-concussion	Post-concussion
Date Tested	09/21/2004	10/04/2004	10/12/2004	10/15/2004	10/19/2004	10/20/2004
Last Concussion		10/01/2004	10/03/2004	10/03/2004	10/03/2004	10/03/2004

Headache	0	2	1	0	0	0
Nausea	0	0	0	0	0	0
Vomiting	0	0	0	0	0	0
Balance Problems	0	0	0	0	0	0
Dizziness	0	1	0	0	0	0
Fatigue	0	2	0	0	0	0
Trouble falling asleep	0	2	0	0	0	0
Sleeping more than usual	0	0	0	0	0	0
Sleeping less than usual	0	2	0	0	0	0
Drowsiness	0	0	0	0	0	0
Sensitivity to light	0	0	0	0	0	0
Sensitivity to noise	0	1	0	0	0	0
Irritability	0	2	0	0	0	0
Tiredness	0	0	0	0	0	0
Nervousness	0	0	0	0	0	0
Feeling more emotional	0	0	0	0	0	0
Numbness or tingling	0	0	0	0	0	0
Feeling slowed down	0	1	0	0	0	0
Feeling mentally foggy	0	1	1	0	0	0
Difficulty concentrating	0	0	1	1	0	0
Difficulty remembering	0	0	0	0	0	0
Visual problems	0	0	0	0	0	0
Total Symptom Score	0	14	3	1	0	0

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Parental Involvement

Letter to Parents/Permission

Athletic Trainer/Physician evaluations

www.impacttest.com

Organizations Using ImPACT Program

National Football League (NFL)

Major League Baseball (MLB)

Major League Soccer (MLS)

*National Basketball Association (NBA)

*National Hockey League (NHL)

Olympic Organizations

Swedish World Cup Soccer Team, US Olympic Training Center, US Soccer, USA Boxing, USA Hockey, USSA - US
Ski Association

Professional Automobile Racing

US Military