

Best Ways to Handle Sports Concussions

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Boulder
Community
Health 

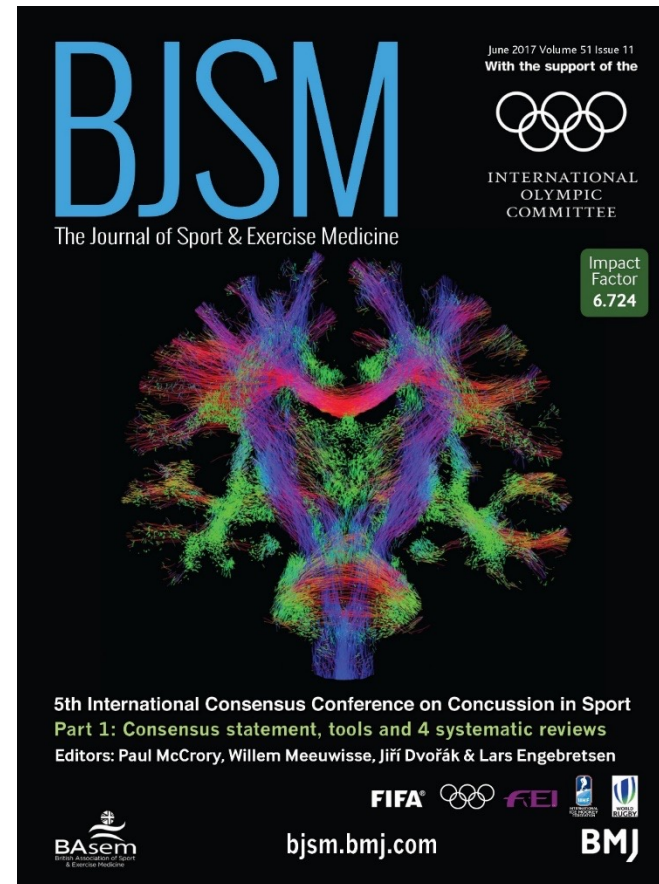


Concussion: What Happened?



Consensus Statement on Concussion in Sport: International Conference on Concussion

- 1st Vienna 2001
- 2nd Prague 2004
- 3rd Zurich 2008
- 4th Zurich 2012
- 5th Berlin 2016
- 6th It's COMING!!



SCAT5 SPORT CONCUSSION ASSESSMENT TOOL – 5TH EDITION
DEVELOPED BY THE CONCUSSION IN SPORT GROUP
FOR USE BY MEDICAL PROFESSIONALS ONLY

supported by
FIFA IOC FEI

Patient details
Name: _____
DOB: _____
Address: _____
ID number: _____
Examiner: _____
Date of Injury: _____ Time: _____

WHAT IS THE SCAT5?

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Preseason SCAT5 baseline testing can be useful for interpreting post-injury test scores, but is not required for that purpose. Detailed instructions for use of the SCAT5 are provided on page 7. Please read through these instructions carefully before testing the athlete. Brief verbal instructions for each test are given in italics. The only equipment required for the tester is a watch or timer.

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Recognise and Remove

A head impact by either a direct blow or indirect transmission of force can be associated with a serious and potentially fatal brain injury. If there are significant concerns, including any of the red flags listed in Box 1, then activation of emergency procedures and urgent transport to the nearest hospital should be arranged.

Key points

- Any athlete with suspected concussion should be REMOVED FROM PLAY, medically assessed and monitored for deterioration. No athlete diagnosed with concussion should be returned 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 to a medical facility for urgent assessment.
- Athletes with suspected concussion should not drink alcohol, use recreational drugs and should not drive a motor vehicle until cleared to do so by a medical professional.
- Concussion signs and symptoms evolve over time and it is important to consider repeat evaluation in the assessment of concussion.
- The diagnosis of a concussion is a clinical judgment, made by a medical professional. The SCAT5 should NOT be used by itself to make, or exclude, the diagnosis of concussion. An athlete may have a concussion even if their SCAT5 is "normal".

Remember:

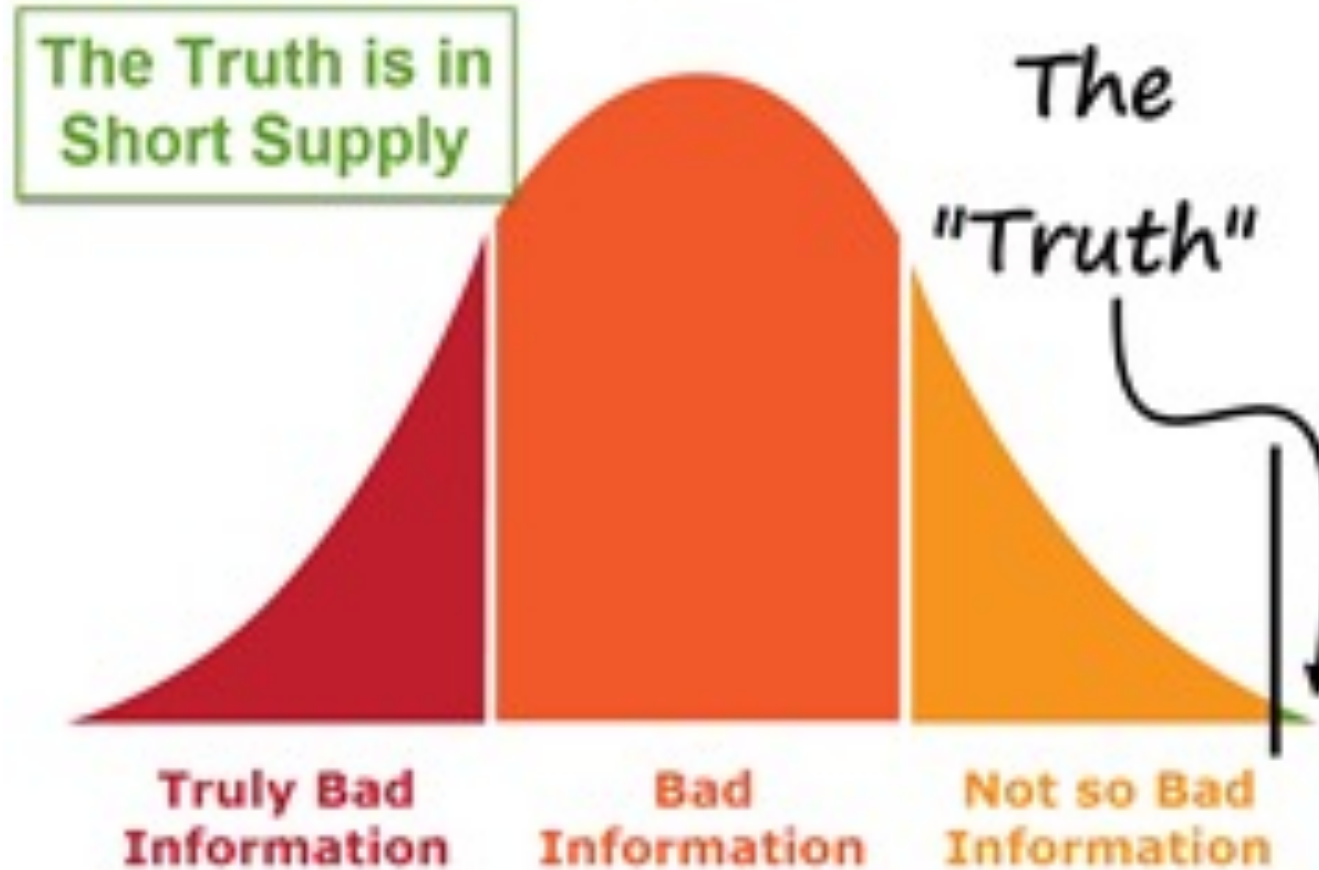
- The basic principles of first aid (danger, response, airway, breathing, circulation) should be followed.
- Do not attempt to move the athlete (other than that required for airway management) unless trained to do so.
- Assessment for a spinal cord injury is a critical part of the initial on-field assessment.
- Do not remove a helmet or any other equipment unless trained to do so safely.

Defined as:

- “Immediate and transient symptoms of traumatic brain injury (TBI)”
- Berlin expert panel modifications
 - *Sport related concussion is a traumatic brain injury induced by **biomechanical forces**. Several common features that may be utilized in clinically defining the nature of a concussive head injury include:*
 - SRC may be caused **either** by a direct blow to the head, face, neck **or** elsewhere on the body with an impulsive force transmitted to the head.
 - SRC typically results in **the rapid onset of short-lived impairment** of neurological function that **resolves spontaneously**. However, in some cases, signs and **symptoms evolve over a number of minutes to hours**.
 - SRC may result in neuropathological changes, but the acute clinical signs and symptoms largely reflect a **functional disturbance** rather than a structural injury and, as such; no abnormality is seen on standard structural neuroimaging studies.
 - SRC results in a range of clinical signs and symptoms that **may or may not involve loss of consciousness**. Resolution of the clinical and cognitive features typically follows a sequential course. However, in some cases symptoms may be prolonged.
- The clinical signs and symptoms cannot be explained by drug, alcohol, or medication use, other injuries (such as cervical injuries, peripheral vestibular dysfunction, etc.) or other comorbidities (e.g., psychological factors or coexisting medical conditions).

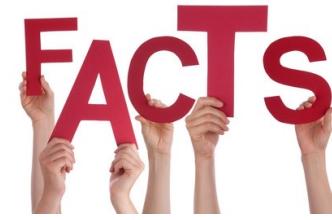
- No grading system –
 - no Simple vs Complex
- Unanimously retained the majority (80–90%) of concussions resolve in a short (7–10 day) period
- Although recovery time frame may be longer in children and adolescents

Concussion





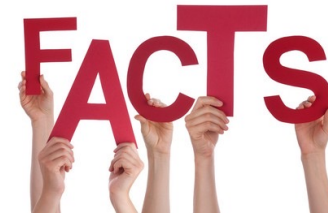
- You have to hit your head!
- You need a CT scan or an MRI to diagnose concussion!
- If you lose consciousness you are in big trouble!
- Helmets and soccer bands prevent concussion.



- You do NOT have to hit your head.
 - Can come from whiplash-type injuries
- CT scan, x-ray and MRI are NORMAL.
 - **Functional disturbance**
- The majority of concussions occur WITHOUT loss of consciousness.
- Helmets are important and protect against skull fracture/brain bleeds.



- Once your headache is gone you can play again.
- There is nothing to do for a concussion.
- Concussion causes CTE (chronic traumatic encephalopathy).

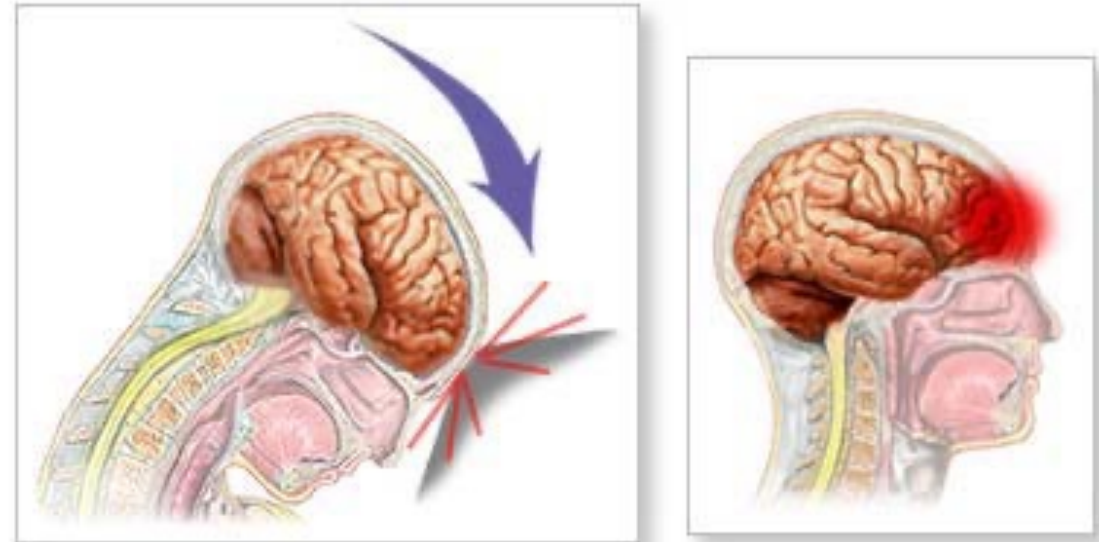


- Other symptoms can really be limiting with return to play, like dizziness.
- ACTIVE approach to concussion:
 - Restores hope in coaches and athletes.
- There is no study that directly links concussion to CTE (chronic traumatic encephalopathy).

Concussion

- Most common head injury in sports
- Caused by shearing forces with direct blow to the head, face, neck or elsewhere in the body and forces transmitted to head to create injury
- Changes way brain works
- May or may NOT lose consciousness (LOC)
 - LOC is not indicative of severity of injury
- Presents different for each athlete
 - Wide range of severity
- Can occur during practice or competition and in ANY sport

A concussion is a violent jarring or shaking that results in a disturbance of brain function

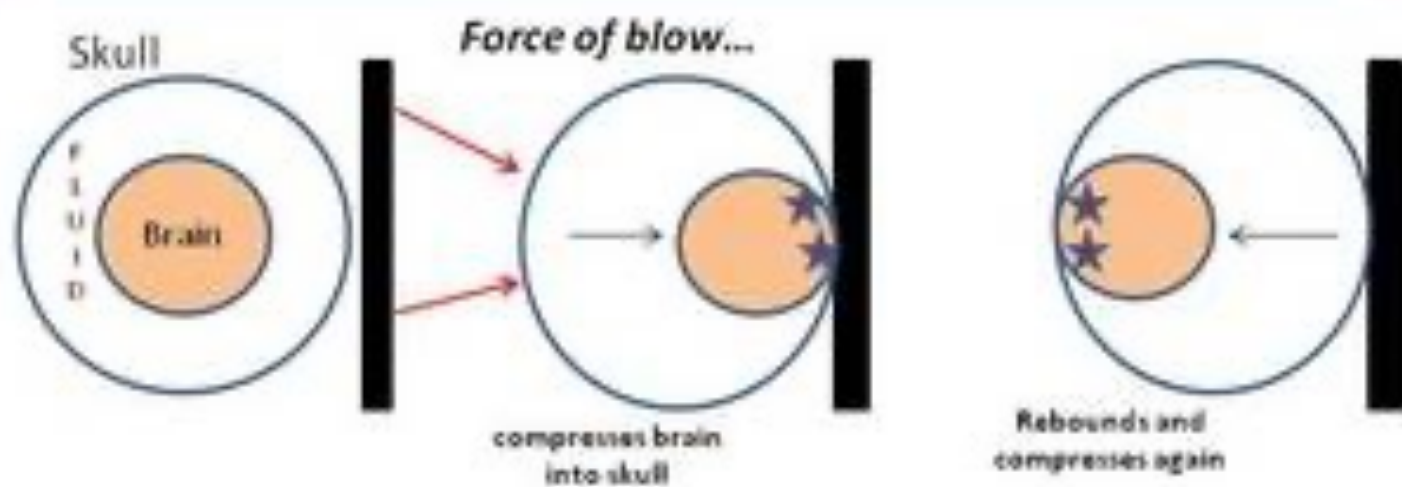


CONCUSSION SYMPTOMS & BRAIN MOVEMENT

Frequently defined as a head injury with a temporary loss of brain function, concussion can cause a variety of physical, cognitive, and emotional symptoms

- <http://en.wikipedia.org/wiki/Concussion>

When brain is concussed = skull and brain do not move together; they oppose each other



Concussive Symptoms

If any one or more of these components is present, a concussion should be suspected:

- **Somatic** –
 - headache, nausea, vision changes
- **Cognitive** –
 - feeling like in a fog, everything slowed down
- **Emotional symptoms** –
 - lability, more tearful, anxious
- **Physical signs** –
 - LOC, amnesia, vomiting
- **Behavioral changes** –
 - “not themselves”
- **Cognitive impairment** –
 - slowed reaction times, impaired ability to perform simple functions
- **Sleep disturbance** –
 - drowsiness, difficulty falling asleep



SIGNS OF A CONCUSSION



Loss of Consciousness



Disorientation



Incoherent Speech



Confusion



Memory Loss



Dazed or Vacant Stare

SYMPTOMS OF A CONCUSSION



Headache or Dizziness



Difficulty Concentrating



Sensitivity to Light



Ringing in the Ears

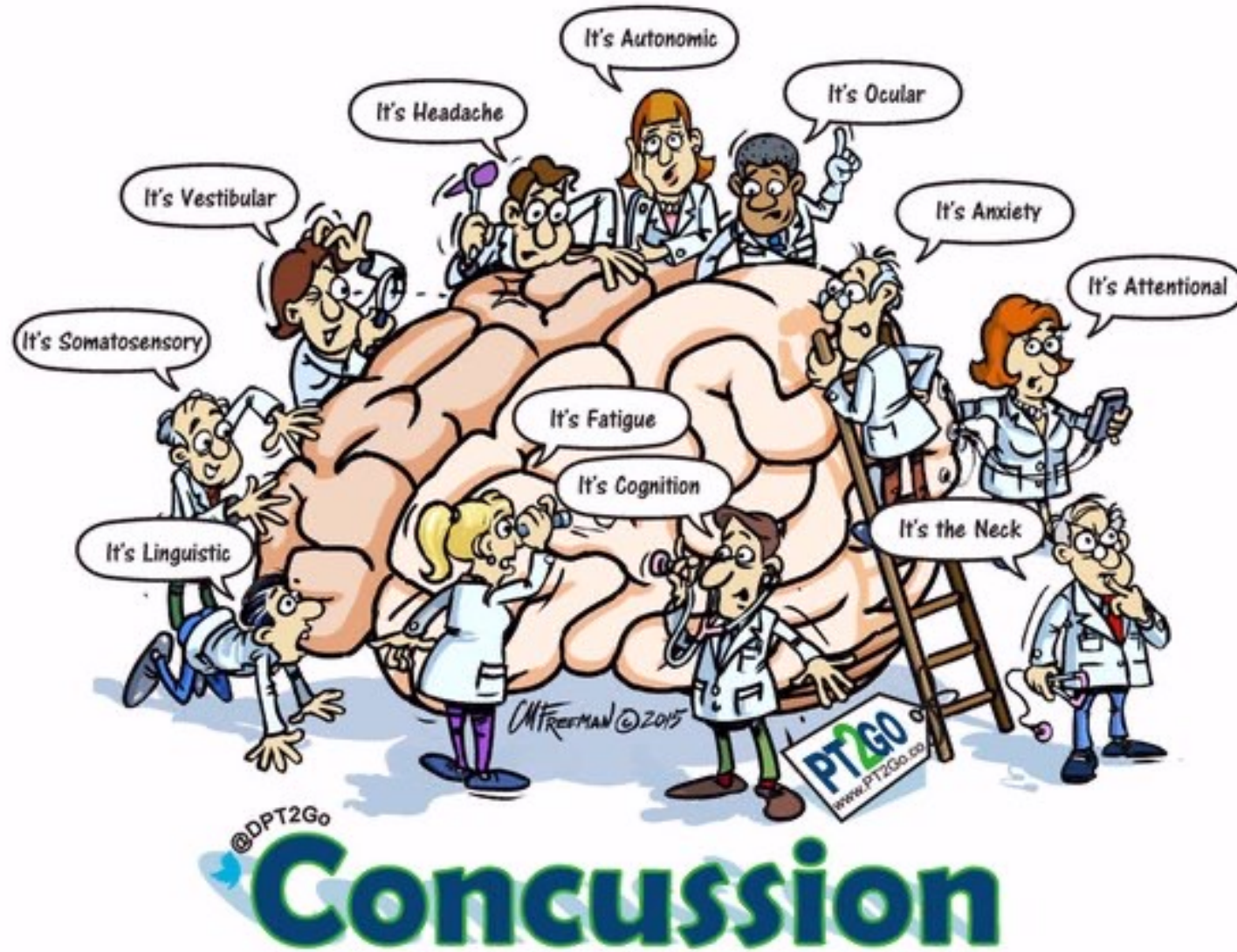


Fatigue



Vomiting

It's Not Really So Hard, Right?



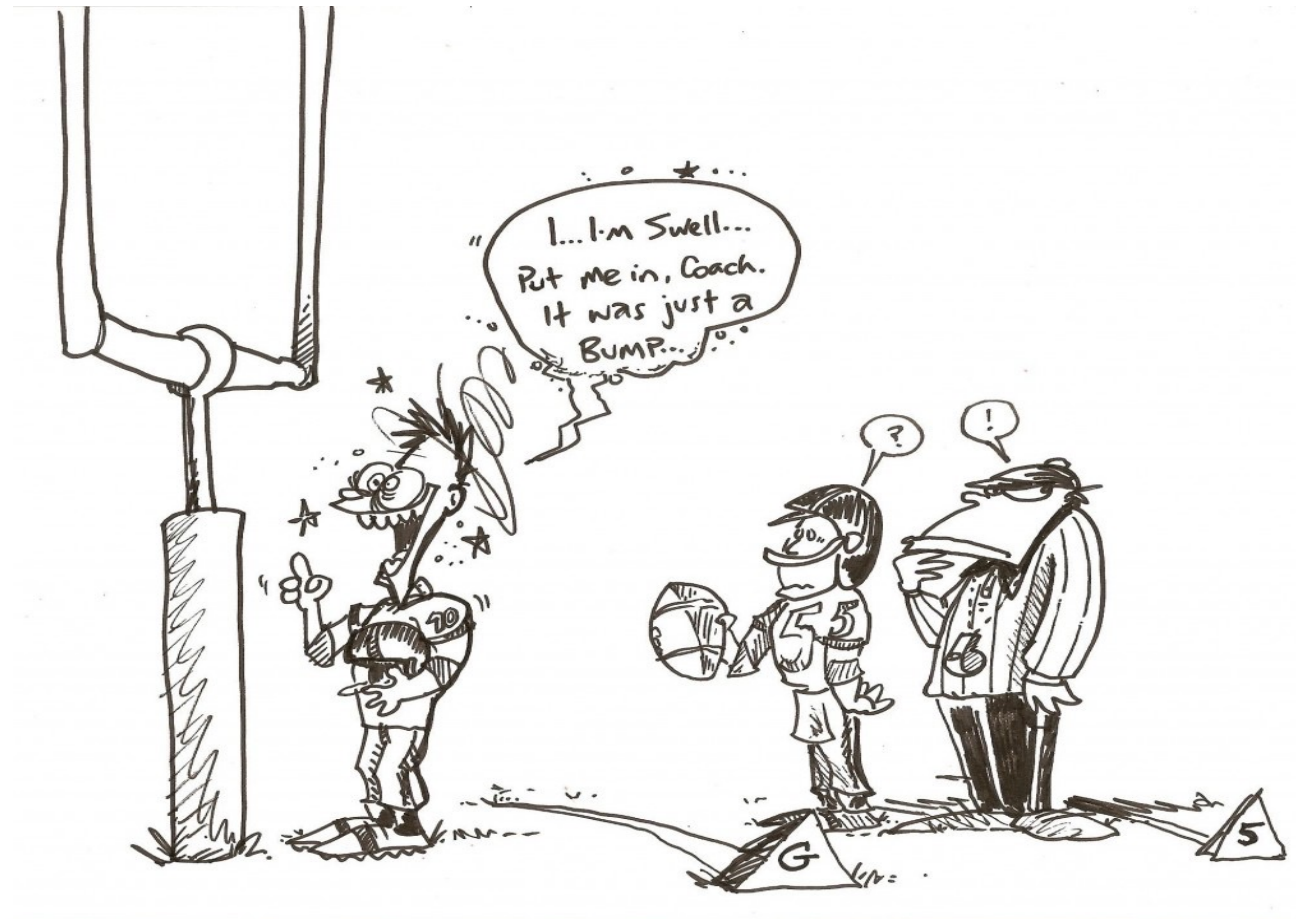
What To Do If You Suspect Concussion

- Symptoms can be:
 - rapid in onset; delayed; or appear, resolve, and then return later
- Ask specific questions about circumstances around event
- Don't leave athlete alone – make sure they have supervision in the following hours so they can be watched
- ***If suspect concussion, athlete should NOT be allowed to return to play on the day of injury.***
 - **Get athlete in for medical evaluation as soon as possible**



Concussion: What to Do When You Suspect Head Injury

- ***When in doubt, sit them out!***



What To Do If You Suspect Concussion

- ***Evaluation by medical professional as soon as possible***
 - Can be ER or urgent care
 - Primary care provider
- DO NOT stay at home and not go to school until symptom-free
 - Find out school policy
 - Return to learn education



- **KEY POINTS:**

- ER/urgent care is not for definitive management!
- Concussion = outpatient diagnosis and management
- Do not go to the urgent care/ER for sports return to play clearance!
- Remember, we are very fortunate in the district to have a district-wide policy which covers all students

Child SCAT5

SPORT CONCUSSION ASSESSMENT TOOL
FOR CHILDREN AGES 5 TO 12 YEARS
FOR USE BY MEDICAL PROFESSIONALS ONLY

supported by



Patient details

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ID number: _____
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SCAT5

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When To Worry?

- Prolonged loss of consciousness, especially over 5 minutes
- Other distracting injuries
- Repetitive vomiting
- Worse headache of life
- Unresponsive
- Rapid decline of consciousness
- Difficult to arouse



When to Worry?

When they look like THIS...



Coaches and Parents: Sideline Assessment

- Best practice = having a certified athletic trainer present for sporting activities
- “When In Doubt Sit Them Out”
- Ask sports specific questions
- Learn what signs and symptoms to watch out for
- Error on the side of caution



- **“Brain rest”** –
 - What do we do with this now?
 - Rest still has a role but it’s not the **WHOLE** story
 - May need a period of both physical **AND** cognitive rest
 - In the first week as a student, get them back to school
 - In school, remember **RETURN TO LEARN** comes first before **RETURN TO PLAY**



- **“Return to Learn”**

- If athlete/student tells you they are exhausted at the end of the day and feels terrible, find out what academic adjustments they are taking in school
- You can't “push through” a concussion without paying the price with interval worsening of symptoms
- Needs formal clearance from physician for return to activity/play
- DON'T TRY TO MANAGE THIS ON YOUR OWN; GET HELP!
- **All symptoms need to be resolved and then student/athlete starts a graded return to activity/play**



- CU Sports Medicine & Performance Center = medical responsibility to patients

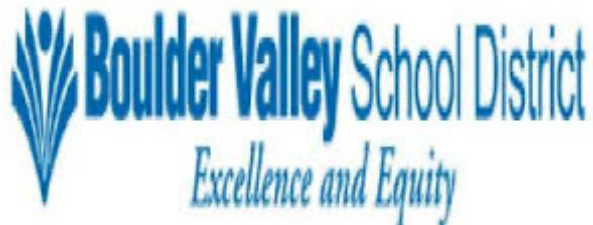


Sports Medicine and Performance Center

UNIVERSITY OF COLORADO | SCHOOL OF MEDICINE

IN PARTNERSHIP WITH BOULDER COMMUNITY HEALTH

- Boulder Valley School District = academic responsibility to students

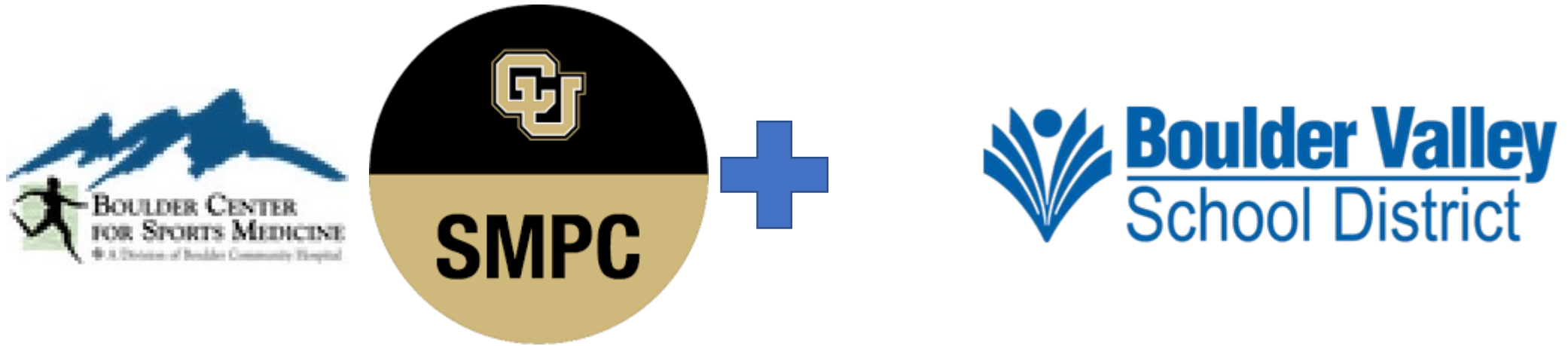


Return to Learn vs Return to Play



RETURN TO LEARN!





BVSD BRAIN INJURY RESOURCE TEAM





BVSD Brain Injury Resource Team

- Sherrie Ballantine-Talmadge, D.O.
 - Ann McNamara, PT
 - Shannon Aberton, ATC
- Stephanie Faren, MSN, MPH, RN, NCSN
- Christina Petrozella Norman, BS, BSN, RN
 - Allison Stamm, MA, CCC-SLP
 - Joan DePuy, RN, BSN



- **Boulder:**

- Eric McCarty, MD
- Shannon Aberton, ATC

- **Fairview:**

- Karin Van Baak, MD
- Nicholas Chabon, ATC

- **Nederland:**

- Sherrie Ballantine-Talmadge, DO
- To be announced, ATC

- **Centaurus:**

- Ortho Sports Medicine Fellows
- Edien Fernandini, ATC

- **Monarch:**

- Primary Care Sports Medicine Fellow
- Kyle Kahl, ATC

- **Broomfield:**

- Sherrie Ballantine- Talmadge, DO
- Dan Rosseau, ATC



Concussion Symptoms	Academic Adjustments Grouping
Headache, nausea, vision changes	Somatic
Feeling like in a fog, everything slowed down	Cognitive
Emotional lability, more tearful, anxious	Emotional symptoms
Vomiting	Physical signs
“Not themselves”	Behavioral changes
Slowed reaction times, impaired ability to perform simple functions, amnesia	Cognitive impairment
Drowsiness, difficulty falling asleep, fatigue	Sleep disturbance

- **Academic adjustments** – use this word instead of modifications.
- **Differentiation** - tailoring instruction to meet individual needs. Whether teachers differentiate content, process, products, or the learning environment, the use of ongoing assessment and flexible grouping makes this a successful approach to instruction.
- **504 plan** –civil rights law prohibiting discrimination based on disability in any program receiving federal financial assistance; this legislation defines a person with a disability as anyone who has a mental or physical impairment that substantially limits one or more major life activity.
- **IEP(Individualized Education Plan)**- can be referred to as plan or program; map that lays out the program of special education instruction, supports, and services kids need to make progress and thrive in school.
- *****A 504 plan isn't part of special education. It serves a different purpose than an IEP*****

BVSD Concussion Program

Step 1 Identify the concussion

- Health Care Provider diagnoses concussion
- Fills out form and student takes to health room/nurses room

Step 2 Concussion protocol started

- Flag in Infinite Campus of concussion start date
- Emails sent to all teachers informing student has concussion
- Tools and support for teachers go out to help differentiate to student needs

Step 3 Concussion protocol

- Initially focused on differentiation for the student based on their needs
- Different needs for different levels in school (elementary vs high school)
- Consider special considerations

BVSD Return to School/Play after Concussion Form

Section 2 is to be completed for ALL students; Section 3 is required for a student athlete's Graduated Return to Play process to begin.
Please ensure a copy of this form is turned into your school's health room.

Student Name: _____ DOB: _____

School: _____ Grade: _____

Date of Injury: _____ Date of HCP Visit: _____

SECTION 1: INJURY DETAILS

DESCRIPTION OF INJURY: (How did injury occur? Initial symptoms?)

Printed Name: _____ Date: _____

SECTION 2: INITIAL EVALUATION (To be completed by HCP)

____ Student has been diagnosed with a concussion. Academic adjustments should be determined by school staff and provided until symptoms have resolved. Suggested date to return to school: _____

____ Student should be re-evaluated on (Date) _____

Note: All physical activity (P.E., recess, etc.) will be restricted until the student is cleared.

SECTION 3: RETURN TO PLAY PERMISSION (To be completed by HCP)

I have examined the above-named student ~~after~~ following his/her injury and have determined the following:

____ In my professional judgment, it is safe for the student to return to play in interscholastic sports or intramural athletics and permission is granted for the student to begin the Graduated Return to Play process. **NOTE:** The Return to Play protocol will not progress until the student has completed the Return to Learn Protocol.

____ Permission is **NOT** granted for the student to begin the Graduated Return to Play process until they have been re-evaluated.

RE-EVALUATION DATE: _____

Signature of Health Care Provider: _____

Printed Name of Health Care Provider: _____ Date: _____

Office Phone: _____ Email Address: _____

____ I understand the implications of concussion in youth and have been educated on the management of my child's concussion. I give my permission for my child to begin the Graduated Return to Play process when they are free of concussion symptoms and are no longer receiving academic adjustments.

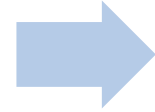
Signature of Parent: _____ Date: _____

Printed Name of Parent: _____

BVSD Concussion Program

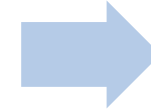
Step 4: Student symptomatic and gets differentiation

- Consider Teacher Feedback Form
- Frequent conversations between teacher and student
- Regular follow up at doctor's office



Step 5: Reassess at **3 WEEKS**

- This is what the EDUCATORS asked for
 - Where is this going
 - How much longer
 - Does a 504 need to be considered



Step 6: Clear to start RTP in sports and PE

- Student is doing well in school and concussion symptoms are resolved and can progress through
- Date of concussion resolution goes into Infinite Campus (*student cleared of academic adjustments)
- May or may not have ATC to help

BVSD Teacher Feedback Form - Concussion

Student Name: _____

Date: _____

Date of Concussion: _____

Concussion Team Leader: _____

Teachers: To ensure appropriate brain rest and opportunity for recovery, we are asking for feedback on any adjustments or symptoms continuing in your classroom(s). Information should be returned to the Concussion Team Leader.

Your Name and Class Taught	Is the student still receiving any academic adjustments in your class? If so, what?	Have you noticed, or has the student reported, any continuing, new or worsening symptoms lately? <small>(e.g. complaints of headaches, dizziness, difficulty concentrating/ remembering, irritability, fatigue)</small>	Do you believe this student is performing at their pre-concussion learning level?
Name: _____ Class: _____	Yes, adjustments include: No	Yes No	Yes No Don't know Date: Signature:
Name: _____ Class: _____	Yes, adjustments include: No	Yes No	Yes No Don't know Date: Signature:
Name: _____ Class: _____	Yes, adjustments include: No	Yes No	Yes No Don't know Date: Signature:
Name: _____ Class: _____	Yes, adjustments include: No	Yes No	Yes No Don't know Date: Signature:

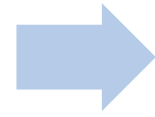
This material is adapted from the Center for Concussion, Rocky Mountain Hospital for Children, RFA? (MVA)

This form is to be completed initially 3 weeks post-concussion and will be used to assess the need for a formal 504 if symptoms are still present at that time.

BVSD Outreach Concussion Program

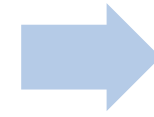
Step 7: Student starts gradual return to play process

- If ATC present, then they are working through with student athlete
- If no ATC present, will need instruction from physician
- For P.E. teacher is working through this



Step 8a: Full return to play without complication

- Student is participating in all activities at school without difficulty, no follow up needed
- Student athlete is participating with varsity/organized sports without issue



Step 8b: Unable to progress without symptoms

- May need additional PT or further evaluation
- If the student or student athlete is not acting ok, the school can bring it to the parents attention and request further evaluation

Remaining Concussion Symptoms

Academic Adjustments and Treatment: 504

Headache, vision changes

PT or more focused vision therapy

Exacerbated pre-existing mood disorders

Medication changes/additions

Exacerbated pre-existing learning disabilities, i.e., dyslexia

Speech pathology/cognitive therapy

Concussion unleashed a formal NEW learning disability, psychiatric disease

Neuropsychology evaluation

Additional MSK issue that needs to be treated

Further sports med evaluation: X-rays, MRIs, injections

Exacerbated underlying sleep disorder

Cognitive impairment - Sleep medicine consult



Concussion: It's All About the Team

Academic

- Student
- Family
- Teacher
- Coach
- Principal/Vice-Principal
- Guidance Counselor
- School nurse/school para
- Athletic Trainer (in the school)
- School Psychologist
- School Speech Pathologist
- Athletic Secretary

Medical

- Student
- Family
- Athletic Trainer (in clinic and at school)
- Lead Health Care Provider
- Physical therapist
 - MSK, vestibular, oculomotor, cognitive
- Occupational therapist
 - Trauma therapy, vision therapy
- Optometry
 - Neuro-Optometry
- Speech pathology/ Cognitive therapy
- Massage therapy
- Psychologist
- Neuropsychologist

Academic Options

- Nurses office for break
- Sunglasses/hat in school
- Decreased bright screens
- Decrease busy areas (lunchroom and hallways)
- Short burst of activity in 20-30 minutes
- Use symptoms to help figure out best academic adjustments
- Use other forms of learning like auditory
- Remind students how important sleep is
 - Encourage normal sleep patterns, no napping
- Consider pass/fail
- Decrease overall workload
- Prorating work
- No more than 1 test per day
- Take test in quiet place
- No standardized testing
- Oral testing
- Exemption from pop quizzes or the tests
- Crucial assessment for overall grade
- IEP or 504 plan

Game Changers: Concussion Modifiers

- **Symptoms Number**
 - Duration (10 days)
- **Severity**
 - Signs Prolonged loss of consciousness, amnesia
- **Sequelae**
 - Concussive convulsions
- **Temporal Frequency**—
 - Repeated concussions over time
- **Timing**—
 - Injuries close together in time
- **“Recency”**—
 - Recent concussion or traumatic brain injury
- **Threshold**
 - Repeated concussions occurring with progressively less impact force or slower recovery after each successive concussion
- **Age**
 - Child and adolescent (<18 years old)
- **Co- and pre-morbidities**
 - Migraine, depression or other mental health disorders, attention deficit hyperactivity disorder, learning disabilities, sleep disorders
- **Medication**
 - Psychoactive drugs, anticoagulants
- **Behavior**
 - Dangerous style of play
- **Sport High risk activity**
 - Contact and collision sport, high sporting level

Helpful Hints

- Athletes may not recognize previous concussions
- Missed previous concussions
- Helpful to get previous concussion history
- Coaches/teammates may or may not be able to give accurate histories
- Previous head, neck, face injuries
- Typically, athletes under report symptoms
- Fear of removal from game/sport



Graduated return-to-sport (RTS) strategy

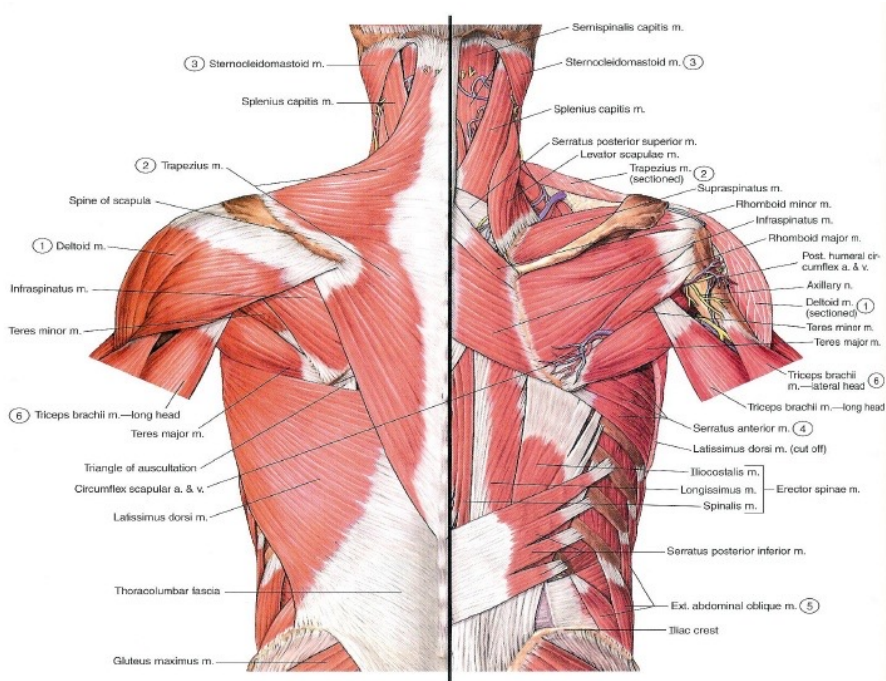
- NOTE: An initial period of 24–48 hours of both relative physical rest and cognitive rest is recommended before beginning the RTS progression.
- There should be at least 24 hours (or longer) for each step of the progression. If any symptoms worsen during exercise, the athlete should go back to the previous step. Resistance training should be added only in the later stages (stage 3 or 4 at the earliest). If symptoms are persistent (eg, more than 10–14 days in adults or more than 1 month in children), the athlete should be referred to a healthcare professional who is an expert in the management of concussion.

Stage	Aim	Activity	Goal of each step
1	Symptom-limited activity	Daily activities that do not provoke symptoms	Gradual reintroduction of work/school activities
2	Light aerobic exercise	Walking or stationary cycling at slow to medium pace. No resistance training	Increase heart rate
3	Sport-specific exercise	Running or skating drills. No head impact activities	Add movement
4	Non-contact training drills	Harder training drills, eg, passing drills. May start progressive resistance training	Exercise, coordination and increased thinking
5	Full contact practice	Following medical clearance, participate in normal training activities	Restore confidence and assess functional skills by coaching staff
6	Return to sport	Normal game play	

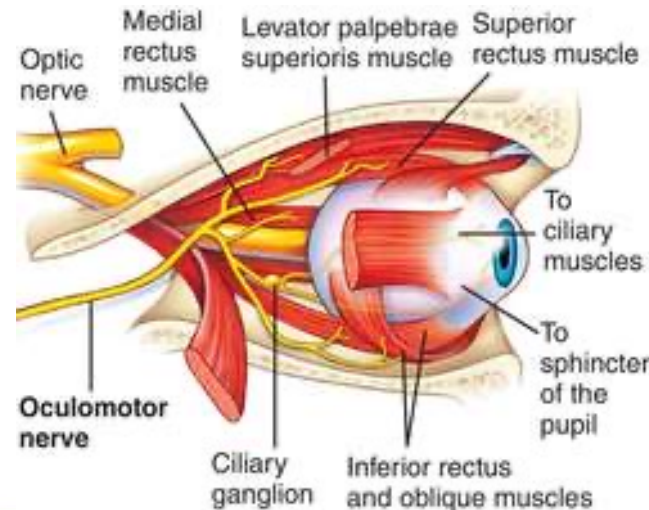
Rehabilitation stage	Functional exercise at each stage of rehabilitation	Objective of each stage
1. No activity	Symptom limited physical and cognitive rest.	Recovery
2. Light aerobic exercise	Walking, swimming or stationary cycling keeping intensity <70% maximum permitted heart rate. No resistance training.	Increase HR
3. Sport-specific exercise	Skating drills in ice hockey, running drills in soccer. No head impact activities.	Add movement
4. Non-contact training drills	Progression to more complex training drills, e.g. passing drills in football and ice hockey. May start progressive resistance training)	Exercise, coordination, and cognitive load
5. Full contact practice	Following medical clearance participate in normal training activities	Restore confidence and assess functional skills by coaching staff
6. Return to play	Normal game play	

ACTIVE MANAGEMENT: Role of Physical Therapy in Concussion Management

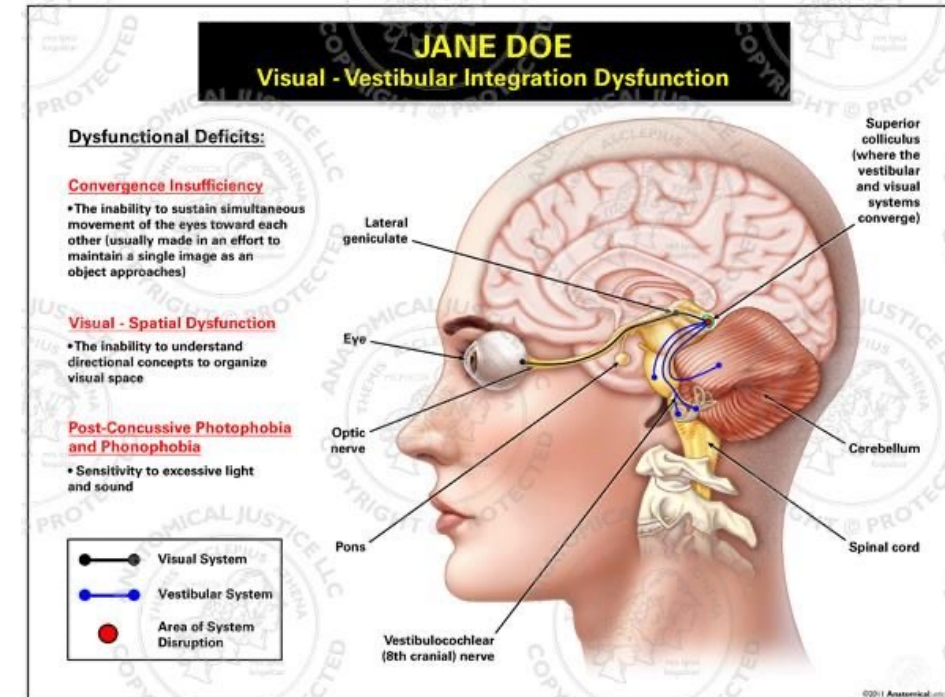
Muscular system



Oculomotor system



Vestibular system

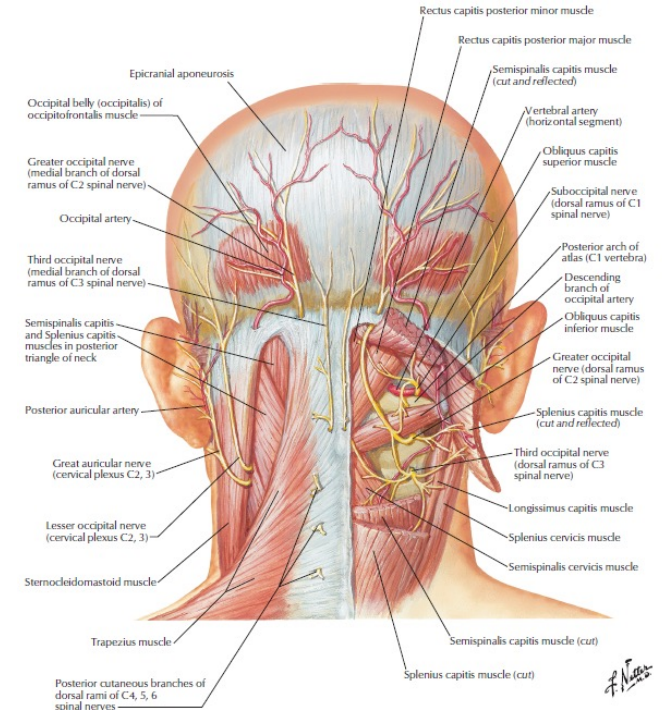


Concussion Physical Therapy: Muscular System



Muscular system

- Neck pain/stiffness
- Upper back pain/stiffness
- Headaches
- Dizziness



Treatment based on findings:

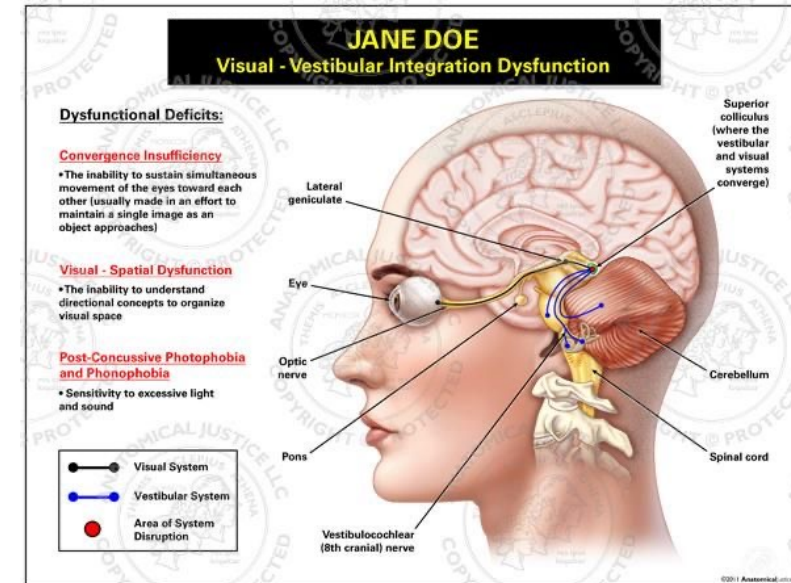
- Work on soft tissue: massage, trigger point dry needling
- Work on joints in spine: manual therapy, joint mobilizations, joint stabilization
- Muscle balancing exercises: stretch what is tight, strengthen what is weak

Concussion Physical Therapy: Vestibular & Oculomotor Systems



Vestibular system

- Complaints of dizziness
- Balance problems
- Difficulty reading
- Headaches



Treatment based on findings:

- Exercise in the clinic
- Home exercises for eyes, balance, head motion

Concussion Physical Therapy: Exertional Therapy

Exertion/return to play

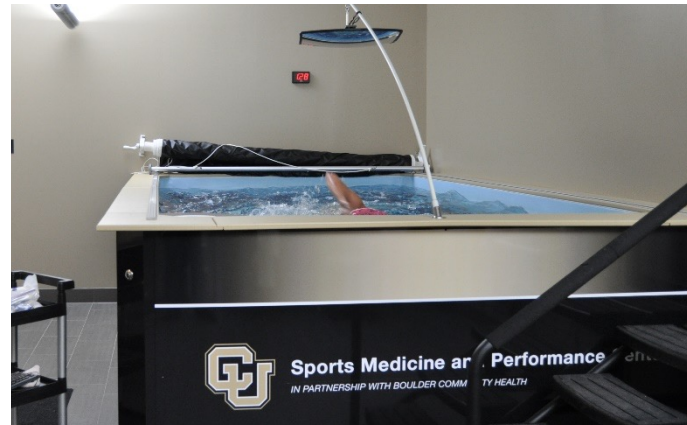
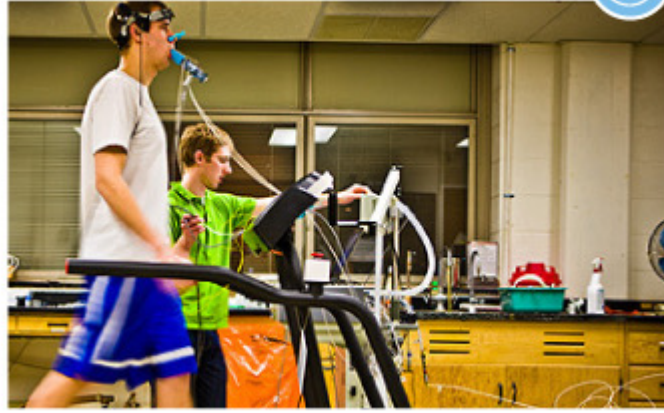
Exertion testing:

- Cardio
- Functional
- Sport spec

Exertion therapy:

- Follow graduated return to play guidelines
- Gradual increase in difficulty
- Takes into account sport/activity goals and vestibular/balance needs





Sports Medicine and Performance

IN PARTNERSHIP WITH BOULDER COMMUNITY HEALTH

- This is NOT the solution
 - Has some value
 - Clinical aid
- Large variability in testing
- Needs pre-injury testing with serial follow-up
- If you don't have someone who can properly interpret the results, this is not helpful
- *It is PART of the entire picture of concussion management and NOT a definitive tool to use for Return to Play*
 - *Not the SOLE decision on return to play*
- Learning effect if done too often or not correctly that can alter interpretation

ImpACT Clinical Report

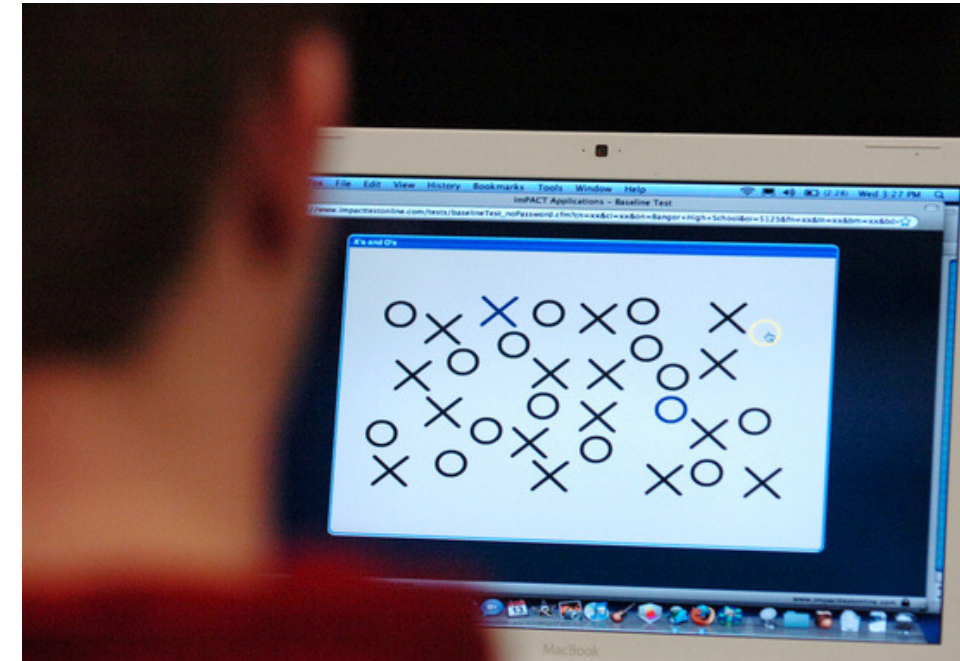
Test Subject

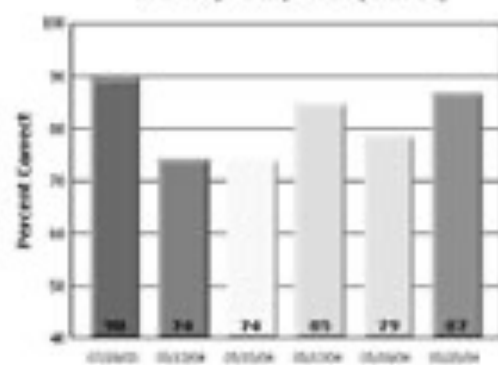
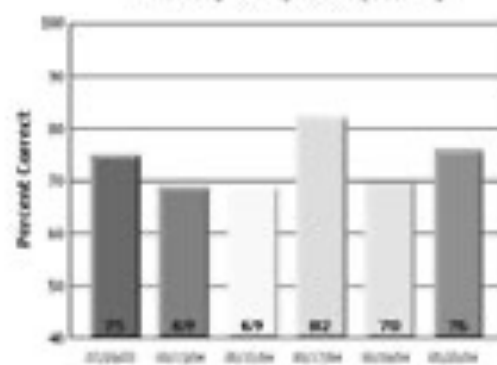
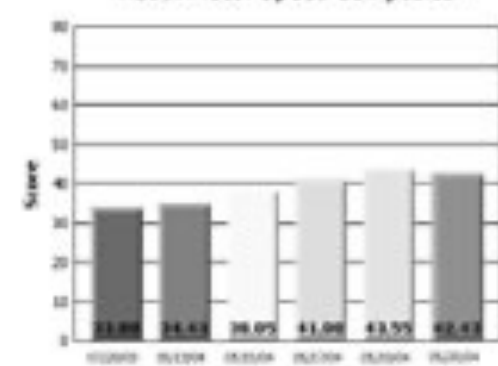
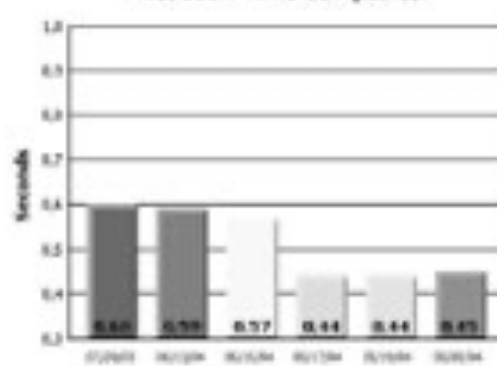
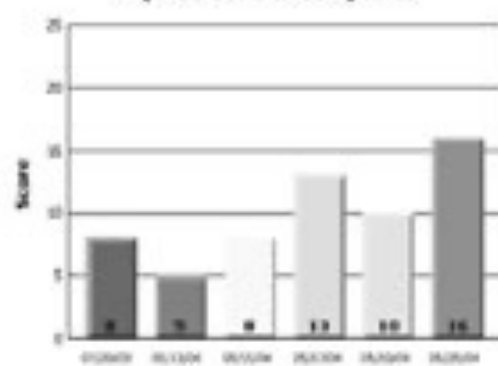
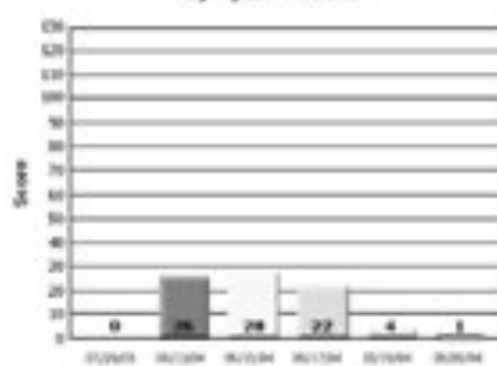
Test Subject

Exam Type	Baseline	Post-concussion	Post-concussion	Post-concussion	Post-concussion	
Date Tested	08/14/2004	08/31/2004	09/07/2004	09/14/2004	09/23/2004	
Last Concussion		08/25/2004	08/25/2004	08/25/2004	08/25/2004	
Exam Language	English	English	English	English	English	
Test Version	3.4.804	3.4.804	3.4.804	3.4.804	3.4.804	
Composite Scores *						
Memory composite (verbal)	81 29%	58 <1%	67 1%	64 <1%	70 3%	
Memory composite (visual)†	73 29%	47 <1%	49 1%	53 3%	53 3%	
Visual motor speed composite	37.23 45%	25.45 1%	30.40 12%	33.55 24%	37.00 44%	
Reaction time composite	0.61 17%	0.74 1%	0.62 15%	0.65 7%	0.56 13%	
Impulse control composite	3	9	6	11	7	
Total Symptom Score	0	57	22	14	16	

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/research composite score introduced in ImpACT version 2.0. All other composite scores are identical to ImpACT version 1.1.




ImPACT™
Memory Composite (Verbal)

Memory Composite (Visual)

Visual Motor Speed Composite

Reaction Time Composite

Impulse Control Composite

Symptom Score


Second Impact Syndrome

- Rapid brain swelling & herniation after second head injury while still recovering
- Can be mild & athlete sees dazed
- Progress to collapse, rapidly dilating pupils, coma & respiratory failure in *minutes!*
- May be over-reported, but this is why the laws for concussion exist in each state
- **NO SYMPTOMATIC ATHLETE CAN RETURN TO PLAY!**



Where Do We Go From Here?

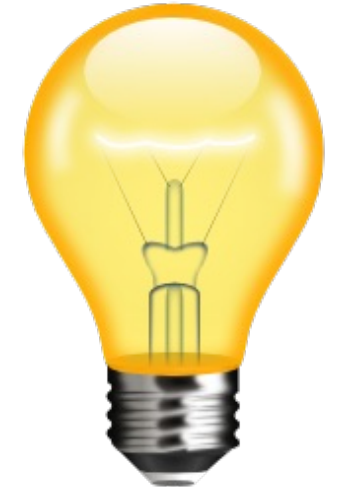


Boulder
Community
Health



What Have We Learned:

- Kids graduate and teachers change jobs
- Kids and teachers *MUST* talk
- Bridging between school nurses, the health room paras, and school athletic trainers is **ESSENTIAL**
- Coaches need education as well
- Speaking the same language is critical
- Concussion doesn't matter until it matters!
- Once you have seen one concussion, you have seen one concussion
- Concussion programs work



It's kind of fun to
do the impossible.

- *Walt Disney*



Special Appreciation

We could never have been so successful without all these people and more!

- Students and their families
- BIRT
- Stephanie Faren
- Cristina Norman
- Kate Fatica
- Harry Waterman
- Shannon Aberton
- Ann McNamara
- All the BVSD ATCs in the schools and ATCs in the clinic
- CUSM & PC Concussion PT Team
- All the Boulder concussion collaborating health care providers
- Joan DePuy
- Allison Stamm
- CUSM&PC Front desk team

Questions? Concerns? Comments?

