

Concussion Assessment and Management Portfolio (CAMP)

The purpose of the Concussion Assessment and Management Portfolio (CAMP) is to provide a convenient multi-application and multi-discipline forum for those who render care to the concussed athlete. Having several examination and assessment options available can make the plan of care more productive and results can be viewed from different perspectives. The assessor can document signs and symptoms, tests given with results, questions asked with answers as well, as to produce an individualized portfolio to track progress and to share with the athlete's other health care providers if needed.

Why should more than one assessment tool be used?

Utilization of more than one assessment tool provides the healthcare provider with a broader spectrum of evaluation instruments. In 2010, the American College of Sports Medicine concluded that multiple symptom scales and assessment tools are available with no single tool showing clear superiority. Many tools remain based more on expert opinion than rigorous scientific evaluation. A multifaceted approach to sports concussion is advised. ***The sports medicine practitioner must not rely on any one tool in managing concussion and must be aware of the strengths and limitations of whichever method is chosen to incorporate into a concussion evaluation and management plan.***

In 1999, a survey among athletic trainer across the nation was implemented to assess concussion assessment tools used. 95% reported using the clinical examination, 85% used symptom checklist, 48% used the Standardized Assessment of Concussion, 18% used neuropsychological testing, and 16% used the Balance Error Scoring System. The most frequently used concussion grading scale and return-to-play guidelines belonged to the American Academy of Neurology (30%). When deciding whether to return an athlete to play, certified athletic trainers most often used the clinical examination (95%), return-to-play guidelines (88%), symptom checklist (80%) and player self-reporting (62%). Only 3% of certified athlete trainers surveyed complied with the recent position statement, which advocate using symptom checklist, neuropsychological testing and balance testing for managing sport related concussion. ***Conclusion: findings suggest that various assessment methods and tools are currently being used, but clinicians must continue to implement a combination of methods and tools in order to comply with the National Athletic Trainers' Association position statement***

Taken from Current Trends in Athletic Training Practice for Concussion Assessment and Management. Andrew J. Notebaert; Kevin M. Guskiewicz; JNATA. 2005; 40(4); 320-325

Special Thanks to Phil Hossler MS, ATC for providing a lot of the information contained in this packet.

Initial Head Injury/Concussion Evaluation Forms

The value of documenting initial findings thoroughly and quickly cannot be overstated. A systematic form of findings such as the following five

- CAMP Initial Head Injury Evaluation Form
- CDC Concussion Signs and Symptoms Checklist
- Sport Concussion Assessment Tool (SCAT)
- Acute Concussion Evaluation (ACE)
- Standardized Assessment of Concussion (SAC)

allow the examiner the opportunity to document the athlete's starting point along the road to recovery.

No attempt has been made to compare or rank the effectiveness of these tools. The examiner may develop a preference or choose to use one or more randomly.

Photocopy the following form as often as necessary

CAMP Initial Head Injury Evaluation Form

Documentation of findings using a systematic method of examination and subsequent assessment of severity in the initial care of a head or brain injury is critical.

Athlete _____

Date of Concussion _____

Sport _____

Witness(es) _____

Details of Injury/Events:

Previous number of concussions 1 2 3 4 5

Last reported concussion was when? _____

LOC Yes No

If yes, duration _____

Amnesia Before (Retrograde) – Are there any events just BEFORE the injury that you/ person has no memory of (even brief)? Yes No

If yes, duration _____

Amnesia Before (Anterograde) – Are there any events just AFTER the injury that you/ person has no Weak emory of (even brief)? Yes No

If yes, duration _____

❖ Check all that are present and indicate athlete's perception of severity/discomfort (1=minor or low 6=significant or high)

Headache 1 2 3 4 5 6 Tinnitus 1 2 3 4 5 6

Dizziness 1 2 3 4 5 6 Light sensitivity 1 2 3 4 5 6

Noise sensitivity 1 2 3 4 5 6 Vomiting 1 2 3 4 5 6

Nausea 1 2 3 4 5 6 Numbness 1 2 3 4 5 6 Location _____

Neck Pain Absent Present

Blurred or Double Vision Yes NO

❖ Examiner's Perceptions and Findings

(1=minor or low 5=significant or high)

Eyes reactive/able to follow movement Yes NO

Overall Facial Expressions Normal Vacant Off a little

Romberg Test Normal Minor Waver Significant Waver

Pulse _____ bpm

Blood Pressure _____

❖ Balance

Eyes open Poor Fair Good

Eyes closed Poor Fair Good

❖ Limb Strength

Right Arm - Normal Weak Left Arm - Normal Weak

Right Leg - Normal Weak Left Leg - Normal Weak

❖ Gait

Forward Strong Waver

Backward Strong Waver

❖ Sensory/Tactile Sense

Unaffected Weak

Location _____

❖ Head/facial wounds

Absent Present

Location _____

❖ Memory Questions – Is the student able to ...

Yes No Perform a sequence of 3 or 4 simple mathematical functions such as
 $12/3 + 6 - 2 = ?$ $5 \times 3 - 6 + 3 = ?$

Yes No Repeat months of the year backwards

Yes No Answer 'Same Day' questions such as position played, score, opponent, day of week, time

Overall Impressions

❖ 7-day Symptom Chart started Yes No

❖ Communications

Yes No Spoke with parents same day

Yes No Athlete released? If Yes, to
 Parent Sibling Friend Neighbor EMS

Yes No Concussion Informational/Instructional Sheets Explained/Provided

7-Day Symptom Self-assessment Chart

Concussed student athletes should be closely monitored on a daily basis by the certified athletic trainer, school nurse, coaches and parents. Changes in personality, school work, behavior, memory, sensitivity to light and noise or headaches should be reported to medical personnel for further investigation as needed.

The following is an example of a daily symptoms reporting chart that may be utilized to monitor the concussed athlete over the initial 7 days.

Photocopy the following form as often as necessary

7-Day Symptom Self-assessment Chart

Athlete _____
 Date of Concussion _____ Date for Day1 _____
 Completed by _____

Describe the student-athlete's symptoms during the first week after the injury.

0(not experiencing) through 6(severe)

	Date _____						
	Day 1	Day 2	Day 3	Day 4	Day 5	Day 6	Day 7
Headache	_____	_____	_____	_____	_____	_____	_____
Neck Pain	_____	_____	_____	_____	_____	_____	_____
Nausea	_____	_____	_____	_____	_____	_____	_____
Balance/dizziness	_____	_____	_____	_____	_____	_____	_____
Irritability	_____	_____	_____	_____	_____	_____	_____
Fatigue	_____	_____	_____	_____	_____	_____	_____
Trouble Sleeping	_____	_____	_____	_____	_____	_____	_____
Excessive Sleeping	_____	_____	_____	_____	_____	_____	_____
Light Sensitivity	_____	_____	_____	_____	_____	_____	_____
Noise Sensitivity	_____	_____	_____	_____	_____	_____	_____
Visual Disturbances	_____	_____	_____	_____	_____	_____	_____
"In a Fog" Feeling	_____	_____	_____	_____	_____	_____	_____
Memory Difficulty	_____	_____	_____	_____	_____	_____	_____
Concentration Difficulty	_____	_____	_____	_____	_____	_____	_____
Personality Changes	_____	_____	_____	_____	_____	_____	_____
School/Study Difficulty	_____	_____	_____	_____	_____	_____	_____

If the patient put a number ask what "was the cause" put response bellow with the date:

Date: ___ **Symptoms:** _____

Causes: _____

Date: ___ **Symptoms:** _____

Causes: _____

Date: ___ **Symptoms:** _____

Causes: _____

Date: ___ **Symptoms:** _____

Causes: _____

Date: ___ **Symptoms:** _____

Causes: _____

Date: ___ **Symptoms:** _____

Causes: _____

Date: ___ **Symptoms:** _____

Causes: _____

Computerized Neurocognitive Testing Assessment

Neurocognitive tests assess the function of the brain and how it relates to specific thought processes and behaviors. The sensitivity and specificity of computer-based neurocognitive testing, when used in conjunction with the athlete's report of symptoms, allows schools to assess a concussed athlete's condition and level of recovery more accurately than merely asking symptom-based questions. A computerized neurocognitive test is one tool, when accompanied by a thorough medical examination that may assist a qualified physician with the return-to-play decision.

Computer-based neurocognitive assessments are the most commonly utilized evaluative technique employed for the assessment of sport-related concussion. Although a neurocognitive test will never replace a thorough clinical exam by an experienced clinician, it can be a valuable tool in safely returning an athlete to participation.

Baseline neurocognitive tests evaluate the healthy athlete's decision-making ability, reaction time, attention, and memory. In the event of an injury, a re-test would give the physician additional information to safely return that athlete to competition.

Typically, neurocognitive tests should be performed during pre-season to establish a baseline score for athletes (girls and boys) in such sports as football, soccer, wrestling, ice hockey, lacrosse, and basketball. While every athlete deserves such monitoring, a school district should determine the costs to purchase the tests, administration requirements, staff time, number of athletes/sports to be tested, and availability of computer labs to administer the test.

In the event that an athlete sustains a concussion, the multi-component test is administered again and then compared to the athlete's previous baseline test. This is a tool that is used in conjunction with other measures to determine if the athlete needs to seek further medical supervision. It should only be used as a tool, and should not be the only deciding factor in returning a concussed athlete to play.

If used correctly, computer-based neurocognitive testing will...

- Help determine severity of concussion
- Provide valuable information to the athlete, parents, athletic trainers, physicians
- Provide information on academic deficits associated with concussion
- Promote safe return to play
- Reduce liability for school districts

Commercially available neurocognitive software programs are available from:

- ✓ Axonsports @ www.axonsports.com
- ✓ Cogstate Sport @ www.cogsport.com
- ✓ HeadMinder CRI (Concussion Resolution Index) @ www.headminder.com
- ✓ ImPACT (Immediate Post-Concussion Assessment and Cognitive Testing) @ www.impacttest.com
- ✓ CNS Vital Signs @ www.cnsvs.com

Return to Play Guidelines

The decision to return to competition should not be solely dependent on athlete-reported symptoms because the athlete also has a conflict of interest. The athlete's desire to return to activity may overrule common sense and health concerns. Returns to play decisions are based on the concussion's severity, length and the athlete's history of prior head injuries. Research demonstrates that athletes underreport their conditions due to a desire to return to competition.¹ While the athlete reporting symptoms plays a role, input from neurocognitive testing, parent(s), teachers, coaches, friends, a certified athletic trainer and the physician should guide any such decision.

Schools should have conservative policies in place to deal with athletes who sustain repeated concussions. Such policies range from removal for the rest of the game to disqualification from participation for the rest of the season to complete disqualification from participation in contact sports. These policies should be established after reviewing state athletic association and legislative guidelines and recommendations from medical associations such as the American Medical Association, the American College of Sports Medicine, the American Academy of Neurology and the National Athletic Trainers' Association. Policies should be based on continuation of symptoms, repeated concussions and other physician guided factors.

Usually concussed athletes start to recover rapidly once the feelings of foginess and feeling slowed down disappear. When they have no headaches or other concussion symptoms, athletes can begin the concussion graduated return-to-play exercise program under the care of a certified athletic trainer, physician or other medical personnel that was recommended at the Prague Concussion Conference. 3

It is important to remember that if headaches or other symptoms occur during any step, the activity needs to be stopped. The athlete should then wait 24 hours and start at the previous level which did not produce any symptoms.

Source: Concussion Policy- A Construction Guide for Schools, Hossler, P. and Collins, M. Lash Publishing, 2010

¹ Van Kampen, M., Lovell, M., Pardini, J., Collins, M., & Fu, F. (2006). The Value added of neurocognitive testing following sports-related concussion. *The American Journal of Sports Medicine*. 34 (10); 1630-35

² Guskiewicz, K.M., Bruce, S.L., Cantu, R.C., Ferrara, M.S., Kelly, J.P., McCrea, M., Putukian, M., Valovich, M., & Tamara, C. (2004). National Athletic Trainers' Association Position Statement: Management of Sport Related Concussion, 39 (3), 280-297.

³ McCrory, P., Johnston, K., Meeuwisse, W., Aubry, M., Cantu, R., Dvorak, J., Graf-Baumann, T., Kelly, J., Lovell, M., & Schamasch, P.

(2004). Summary and Agreement Statement of the 2nd International Conference on Concussion in Sport. Prague: The 2nd International Conference on Concussion in Sport.

6 Step Return-to-Play Process:

Rehabilitation Stage	Functional exercise	Objective of stage
1. No activity	Complete cognitive (e.g. mental) rest	Recovery
Follow up Impact Test	Must pass 100%	No symptoms
Exertion test	Sprints, push-ups, Sit-ups	No symptoms
2. Light aerobic exercise	Walking, swimming or stationary bicycle keeping intensity less than 70% of maximum predicted heart rate	Increase heart rate
Continue 2.	Light cardio/weights	Increase heart rate
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	Exercise, coordination and use of brain
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	

Source: Concussion Statement on Concussion in Sport: the 3rd International Conference on Concussion in Sport held in Zurich, November 2008.

CAMP Return-to-Play Recording Sheet

Return-to-play assessments and results should be recorded for each athlete for the entire duration of the episode. This convenient Recording Sheet summarizes results for ease of viewing and tracking the athlete's improvement. *Copy this page as often as necessary.*

Athlete _____
 Date of Concussion _____
 Doctor _____

Date		Step	Activity Results/ Reactions
Results			
Date		Step	Activity Results/ Reactions
Results			
Date		Step	Activity Results/ Reactions
Results			
Date		Step	Activity Results/ Reactions
Results			
Date		Step	Activity Results/ Reactions
Results			
Date		Step	Activity Results/ Reactions
Results			

Post-Concussion 8- Week Chart

A Post-Concussion 8- Week Chart helps caregivers identify and monitor symptoms and other changes that may be persisting longer than one week. This next tool helps parents and schools provide sustained information for the physician, school nurse, teachers, coaches and athletic trainers.

The combined use of the Post-Concussion 7-Day Symptom Chart and the following expanded checklist greatly enhances the efforts of parents, nurses, physicians and athletic trainers to recognize and track signs and symptoms over an extended period of time. This is important since symptoms and other changes may last longer than 1 week for some student-athletes.

The Post-Concussion 8-Week Chart is a detailed tool for gathering information, tracking recovery and identifying difficulties over an 8 week period. It tracks changes in the three areas most often affected by a concussion: physical changes, cognitive changes (thinking and learning) and behavioral changes.

It is important to emphasize to the athlete why monitoring over an extended period of time is valuable and necessary. Even when the athlete feels better and may have even returned to activity and school, changes may occur and improvements may stop or even reduce over time. By monitoring these three areas, changes can be identified and brought to the attention of everyone involved in the student-athlete's recovery.

Symptoms and other changes may last longer than 1 week for some student-athletes. The Post-Concussion Chart below is a more detailed method for gathering information, tracking recovery and identifying difficulties over an 8 week period. It tracks changes in the three areas most often affected by a concussion – physical changes, cognitive changes (thinking and learning), and behavior changes. This chart provides more detailed information for the doctor, parents, school nurse, teachers, coaches and athletic trainers. It is important to discuss any changes, concerns or questions with the student-athlete's doctor.

Photocopy the following form as often as necessary

Post-Concussion 8- Week Chart

Athlete _____

Date of Concussion _____

Doctor _____

Symptoms or Change (0 = None - 6 = Sever)	Week Number Since Injury							
	1	2	3	4	5	6	7	8
Physical								
Headaches								
Dizzy or lightheaded								
Vomiting or nausea								
Numbness or tingling								
Loses balance, drops things, trips								
Feels worn out/exhausted, tires easily								
Drowsy, sleepy or needs extra sleep								
Trouble falling asleep								
Light or noise sensitive								
Blurry vision								
Ringing in ears								
Thinking and Learning	1	2	3	4	5	6	7	8
Confused or in a fog								
Mixes up time and place								
Lower attention/concentration								
Forgetful/difficulty with memory								
Gets frustrated with new learning								
Homework takes longer								
Hard to organize thoughts or words								
Misunderstands things								
Behavior	1	2	3	4	5	6	7	8
Restless or irritable								
Impulsive actions								
Easily upset and loses temper								
ad or depressed mood								
Anxious or nervous								

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Communications Log

Consistent communication is critical when an athlete has been concussed. Parents want to speak with you to retrieve information as well to gain a sense of comfort. Physicians should be contacted and used as a resource. Documentation of your actions may prove invaluable should legal actions be taken or even simply to avoid hard feelings or misunderstandings.

Conversations and electronic messages with parents, physicians, school nurses, coaches and the athlete should be routinely documented using a form similar to this one.

Photocopy the following form as often as necessary

CAMP Evaluation Recording Sheet

Tests utilized and results should be recorded for each athlete for the entire duration of the episode. This convenient Evaluation Recording Sheet summarizes multiple results for the ease of viewing and tracking the athlete's improvement.

Utilization of more than one assessment tool provides the healthcare provider with a broader spectrum of evaluation instruments. In 2008, the American College of Sports Medicine stated that those implementing a concussion assessment protocol for athletes at risk for concussion should consider combining the neurocognitive assessment with other evaluative tools known to be sensitive to the effects of concussion.

CAMP Pre-participation Consent/ Acknowledgment of Risk Form

For the student

I have read the enclosed material that includes eligibility rules and fully understand my responsibility to my team, school and myself. I grant permission for school personnel to render necessary first aid and follow-up care in the event of injury. I understand the potential seriousness of concussion and will report any occurrence to my coach or athletic trainer.

Possible Concussion Symptoms May Include: Headache, nausea, neck pain, balance problems or dizziness, double vision, sensitivity to light or noise, ringing in the ears, feeling foggy or groggy, concentration or memory problems, or confusion.

For the parent(s) or guardian(s)

My son/daughter has read the above material, fully understands his/her responsibilities and has my permission to participate. I/we realize that such activity involves the potential for injury which is inherent in all sports and acknowledge that even with the best coaching, use of the most advanced protective equipment and strict observance of rules, injuries are still a possibility. On rare occasions these injuries can be so severe as to result in total disability, paralysis or even death. I/we understand concussion can be dangerous and will monitor my child and work with school and medical personnel to care for him/her in the event of a concussion. I/we acknowledge receipt of the page on concussion signs and symptoms. I/we give school personnel permission to provide emergency care and follow up care as necessary in the event of injury.

Parent Signature

Athlete Signature

Date

Taken from Concussion Policy- A Construction Guide for Schools, Hossler, P. and Collins, M. Lash Publishing, 2010