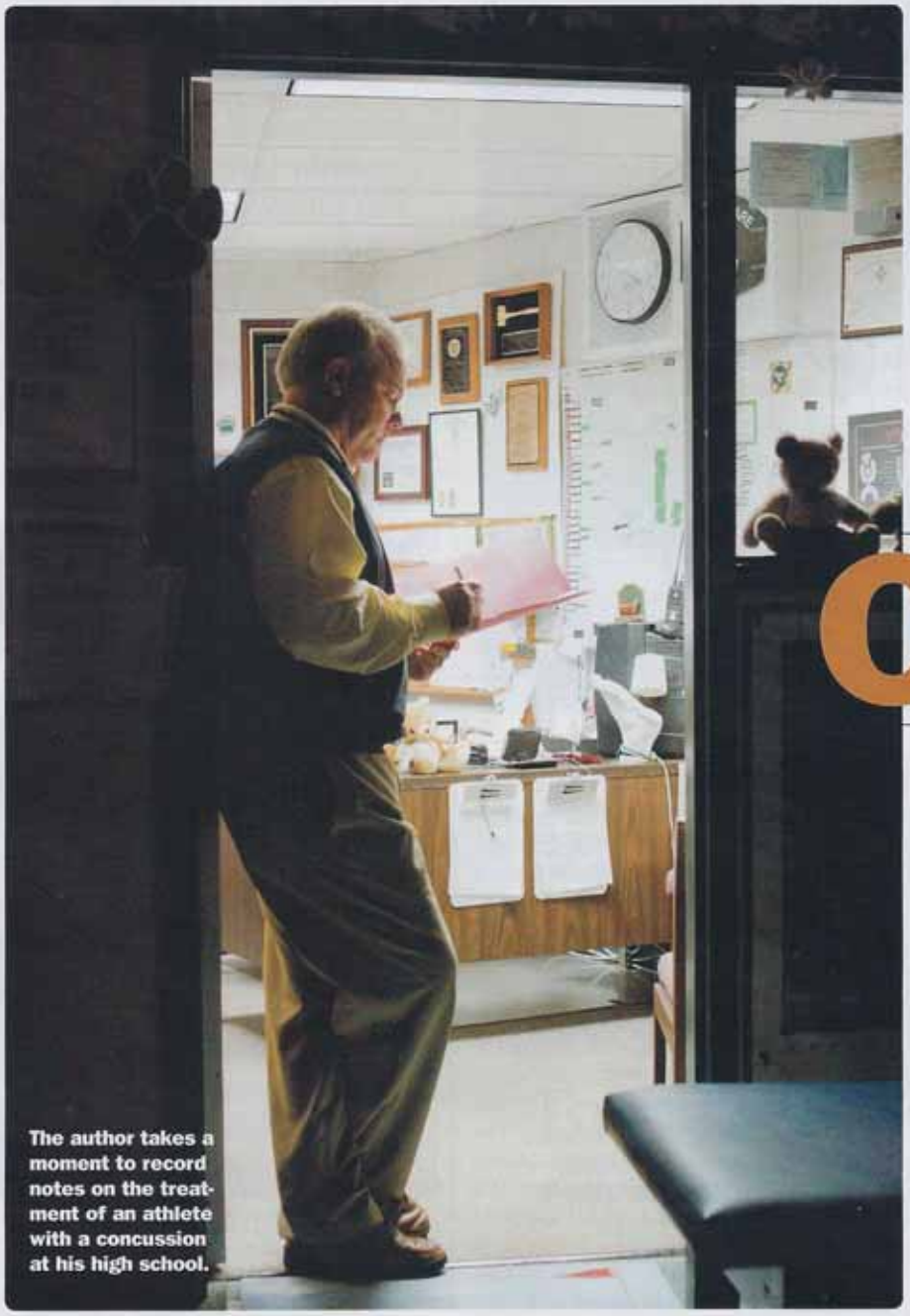
Upgrading Protocols

The standard of care for treating an athlete with a concussion is advancing at breakneck speed. That's why it's critical your staff follows the latest guidelines—and documents everything.

By Phil Hossler



The author takes a moment to record notes on the treatment of an athlete with a concussion at his high school.

BILL STRECHER

OVER THE PAST YEAR, the amount of attention focused on concussions has reached new heights. The media is educating the public on the dangers of the injury, state legislators have enacted new laws to protect young people, and every level of athletics is examining how to decrease the incidence of hard hits to the head.

Despite these advances, there is much about concussions that is not well known. One ongoing area of confusion is exactly how to treat athletes with a concussion and when to allow them to return to play. Unlike a broken bone or a torn ligament, a concussion does not provide easy-to-read signs of when it has occurred and when it has healed—there is not a quick test to perform or a simple protocol to follow.

However, allowing an athlete to return to action with a concussion or before complete recovery is extremely dangerous. Not only is the healing process hampered by activity, new research has shown the devastating effects of receiving a second concussion before the first has cleared, which can

include long-term mental and psychological problems.

In response to all of the above, athletic departments need to upgrade their policies and procedures for dealing with this injury. It is no longer acceptable to simply record, evaluate, and monitor a concussed athlete. Athletic departments must now develop a "portfolio" mentality when handling concussions, which includes multiple views, multiple forms, and multiple tests in order to assess the injury from a variety of perspectives.

The latest recommendations on treating concussions call for a multi-pronged approach. Utilization of several assessment tools is essential, as well as tools for more thorough diagnostic tests, communication, and return to play decisions. The goal is an individualized portfolio to track progress and share with the athlete's other healthcare providers.

READY FOR CAMP

As recently as a few years ago, athletes were re-entering games after a hit to the head as soon as they passed a quick sideline test. Athletes were asked to do a simple balance or cognitive drill, and if they scored high enough, they were cleared to play. We now know that assessing a concussion is not so cut-and-dried.

To start, athletes with concussions can exhibit varying symptoms. For example, while one athlete might briefly lose consciousness, another might not. The list of possible signs and symptoms is lengthy and must be understood by the assessor in order to ensure they don't miss or underestimate a concussion.

Secondly, no one test has proven 100 percent effective in assessing the severity of a concussion. In fact, many of these tests are based more on opinion than rigorous scientific evaluation.

That's why the latest recommendations on assessing concussions call for a multi-pronged approach. The National Athletic Trainers' Association (NATA) position statement on concussions says, "a combination of tests for cognition, postural stability, and self-reported symptoms" should be used. The American College of Sports Medicine has also concluded that while multiple symptom scales and assessment tools are available, no single tool has proven superior.

In other words, utilization of several assessment tools is essential. Understanding the situation from many different perspectives leads to safer decisions.

So what exactly does a multi-pronged approach entail? To make the concept simpler, I have created a tool called the Concussion Assessment and Management Portfolio (CAMP).

When you were getting ready to go to summer camp as a youngster, you were given a list of things you would need to pack. When healthcare professionals treat a concussed athlete, CAMP provides a list to ensure they are thoroughly prepared for handling the situation. It includes tools for: initial evaluations, tracking progress, more thorough diagnostic tests, communication, and return to play decisions.

Just as important, it also allows for thorough documentation. Using the CAMP process enables the assessor to document signs and symptoms, test results, and feedback from the athlete. It produces an individualized portfolio to track progress and to share with the athlete's other healthcare providers.

INITIAL EVALUATION

According to the NATA, only 42 percent of the nation's high schools have the services of a certified athletic trainer. As a result, a large number of coaches are forced into making the initial decision on the severity of a head injury. The most prudent philosophy is this: If there are signs of a concussion, assume that it is a concussion. The National Federation of State High School Associations (NFHS) says the first step for coaches, as well as athletic trainers, is to remove the athlete from play immediately.

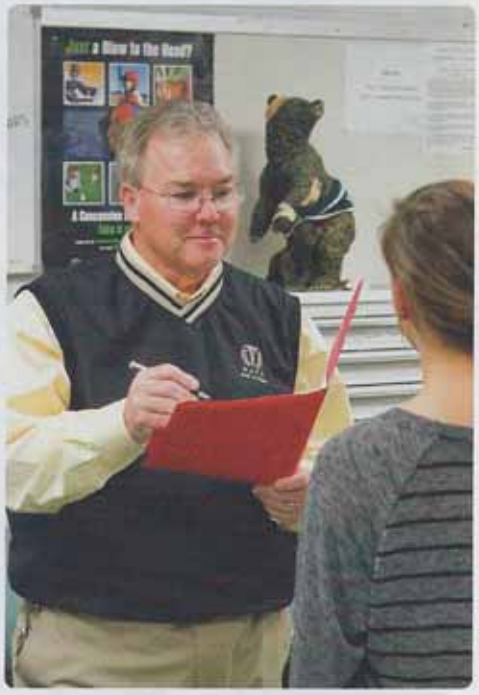
Why is it critical to not allow an athlete to continue to play with a concussion? The more research that is conducted, the more we learn of the risk of greater damage if a concussed athlete is not kept off the field or court.

First of all, recovery from a concussion requires complete rest. If an athlete continues to play, his or her head is being put through vigorous exercise that it is not ready for. In fact, new research suggests student-athletes who are too active not just on the field, but at home and school, may be hindering their recovery.

An even more important reason to keep players off the field is to ensure there is not a second concussion. It won't take as much force to receive that next concussion, which can often be much more damaging. Young athletes, whose brains and skulls are immature, may even risk death by going back on the field too soon.

In addition, recurrent concussions have been linked to depression and early dementia. Brain autopsies have found that athletes who suffered numerous concussions can develop chronic traumatic encephalopathy (CTE), a brain disease linked with cognitive impairment and depression.

Last April, a University of Pennsylvania football player who suffered several concussions committed suicide and was found to have the early stages of CTE. In November, a high school football player in North Carolina took his life after suffering several hard blows to his head over the course of the season. And in October, a Virginia high school football player did the same after one concussion during the 2010 season, which followed another one the year before. Doctors are quick to point out that the reasons



BILL STRECHER

At East Brunswick, athletes with concussions report to author Phil Hossler every day. They also perform a self-assessment for a minimum of seven days.

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for committing suicide are complicated, but the stories are alarming nonetheless.

The first part of CAMP includes tools for the initial evaluation. Anytime it is suspected that an athlete may have a concussion, an assessment should be performed immediately.

In conducting initial assessments, there are several tools to choose from. (See "First Step" on page 40.) An effective initial test should have:

- the ability to record signs and symptoms from a provided list
- the ability to record findings at varying time lengths
- mental and physical dexterity tests
- immediate and delayed memory tests.

I give forms to the athlete's parents to monitor changes in their child. Involving the parents has the benefit of recording symptoms that may be present outside of school and helps them be a part of the process.

Along with its role in discovering if a concussion has occurred, the initial evaluation is the starting point in treating the athlete. A key element of caring for a concussed athlete is to monitor their progress using follow-up evaluations, based on the initial assessment.

MONITORING RECOVERY

The next step of CAMP, monitoring the athlete, is where the multi-prong strategy really starts to come into play. Concussed student-athletes should be closely watched on a daily basis by a certified athletic trainer, school nurse, coaches, and parents. During this early recovery stage, we are looking for any changes in personality, school work, behavior, or memory, sensitivity to light and noise, headaches, and other symptoms related to neurocognitive function.

To help keep track of such symptoms, I use two forms: the Post-Concussion 7-Day Symptom Scale and the Post-Concussion 8-Week Checklist. These forms provide an easy way to write down any symptoms the athlete has, from headaches to trouble sleeping to behavior changes. I give these forms to the athlete's parents and ask them to use the list of symptoms to identify and monitor changes in their child. Involving the athlete's parents has the benefit of recording symptoms that may be present outside of school and helps the parents feel they are a part of the recovery process.

In addition, concussed athletes report to me every day. They perform a self-assessment of their signs and symptoms each visit for a minimum of seven days.

Even after they have been released from daily monitoring, athletes should be checked frequently. Asking the athlete about the reoccurrence of any symptoms will help ensure the healthcare professional doesn't miss an important clue regarding the athlete's complete recovery.

The athlete should understand why monitoring over an extended period of time is necessary. Even when the athlete feels better, changes may occur and their condition can actually worsen over time. By tracking symptoms, these changes can be identified and brought to the attention of everyone involved in the student-athlete's recovery.

However, it's also important to not rely on the student-athlete alone to report symp-

toms, since the athlete's desire to return to activity may overrule common sense and health concerns. Research demonstrates that athletes often underreport their condition in order to get back to competition. Clinicians should be sure to use tests not controlled by the athlete to verify the athlete's self-reporting of symptoms.

RETURNING TO PLAY

A study conducted earlier this decade found that athletes were returning to play after a concussion far too early. It showed that 30 percent of all high school and collegiate football players who sustained concussions returned to competition on the same day of injury, and the remaining 70 percent averaged four days of rest before playing again. Many return-to-play guidelines call for the athletes to be symptom free for at least seven days before returning to participation after a concussion.

But even the seven-day recommendation should be viewed as only a guideline. It is much better for all parties to follow a process that carefully monitors progress, instead of simply waiting a certain number of days before allowing the athlete to play again.

Usually, concussed athletes start to recover rapidly once the feelings of fogginess disappear. When they have no headaches or other concussion symptoms for a pre-determined number of days, athletes can begin the graduated return-to-play exercise program under the care of a certified athletic trainer or physician. Recommended at the 2008 Zurich Concussion Conference, the program includes the following stages:

1. **No Activity:** Complete cognitive (mental) rest with the objective of recovery.

2. **Light Aerobic Exercise:** Walking, swimming, or use of a stationary bicycle, keeping intensity less than 70 percent of maximum predicted heart rate. The goal is to increase the heart rate in order to assess how the athlete reacts to this small amount of exertion.

3. **Sport-Specific Exercise:** This can include any simple movement activities without the risk of head impact like skating drills in ice hockey or running drills in soccer to assess the athlete's response.

4. **Non-Contact Training Drills:** The athlete progresses to more complex training drills, such as passing drills in football and ice hockey. Here, we are assessing if the athlete can coordinate movements during exercise, which tests brain function coupled with the sport activity.

5. **Full-Contact Practice:** Following medical clearance, the athlete participates in normal training activities. The goal here is to restore confidence and allow the coaching staff to assess functional skills.

6. **Return to Play:** Normal game play is allowed, with close monitoring for any symptoms.

These checklists, forms, and tools may be used for initial concussion assessment.

GRADED SYMPTOM CHECKLIST

The National Athletic Trainers' Association (NATA) recommends the use of the Graded Symptom Checklist. This includes scales that allow a Likert-type rating of concussion-related symptoms, permitting the quantification of severity and/or duration. A list of 27 symptoms are assessed at the time of injury, two to three hours post-injury, as well as 24, 48, and 72 hours post-injury.

ACUTE CONCUSSION EVALUATION

The ACE is intended to provide an evidence-based clinical protocol to conduct an initial evaluation and diagnosis of a head injury. It is more extensive than the Graded Symptom Checklist. The ACE provides a myriad of components such as injury characteristics, symptom checklist, risk factors for protracted recovery, and a list of red flags for acute emergency management along with a detailed explanation. It is available from the Centers for Disease Control and Prevention.

STANDARDIZED ASSESSMENT OF CONCUSSION

The SAC was designed to assess orientation, immediate memory, concentration, and delayed memory recall. A standardized neurological screening is used to assess strength, coordination, and sensation, as well as document the occurrence and duration of loss of consciousness and post-traumatic amnesia. Also included are exertional maneuvers as well as three different versions to allow follow-up testing. All parameters include a detailed explanation of how to administer them to ensure consistency.

SPORT CONCUSSION ASSESSMENT TOOL

The SCAT provides broad explanations of signs and symptoms the athlete may experience including post concussive areas, signs to look for 24-48 hours post-injury, and a symptoms checklist. The examiner is provided explanations on how to use examination areas such as signs, memory, symptoms scale, cognitive assessment and neurologic screening.

SPORT CONCUSSION ASSESSMENT TOOL 2

The SCAT2 combines features from the SAC, Glasgow Coma Scale, Maddock sideline assessment questions, and balance assessments and includes an informational sheet to give to the athlete. It provides efficient immediate as well follow-up parameters.

CDC CHECKLIST

The Centers for Disease Control and Prevention has included within its recently released Heads Up to Schools—Know Your Concussion ABC's, a grading chart entitled "Concussion Signs and Symptoms Checklist." The checklist provides nine observed signs, nine physical symptoms, five cognitive symptoms, and four emotional symptoms to be reviewed immediately and then at 15 minutes, 30 minutes, and undetermined minute intervals. There is also a listing of danger signs which require more immediate action and a place to indicate resolution of the injury.

FIRST STEP

During this process, 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 re-start at the previous level that did not produce any symptoms.

The healthcare professional should also be monitoring recovery by utilizing assessment testing. Currently, the gold standard for this is baseline neurocognitive testing, which evaluates the athlete's decision-making ability, reaction time, attention, and memory. Neurocognitive tests are performed on all athletes during the preseason to establish a baseline score. In the event that the athlete sustains a concussion, the multi-component test is administered again and compared to the athlete's baseline test.

In addition to neurocognitive testing, the Balance Error Scoring System (BESS) provides a portable, cost-effective, and objective method of assessing static postural stability, and takes approximately 10 minutes to conduct. The athlete is timed and scored as they hold single leg, double leg, and tandem stances on two different surfaces, one stable and one unstable, for 20 seconds. Each of the tests is scored by counting the errors or deviations from the proper stance by the athlete.

THE PORTFOLIO

Recently there have been many rules changes and state laws enacted to protect athletes from returning to competition too soon after a concussion. Most of the new legislation and governing body rules require a physician to clear the athlete to return to play. While this is an important step in keeping our athletes safe, it should be only one part of the return-to-play criteria. It is very difficult for a doctor to determine an athlete's readiness to go back on the field through a 15-minute office visit. A physician needs a full report on the athlete's progress in order to make an informed decision.

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That's where all the testing described in the previous sections comes into play. When assessing the athlete, a physician will look at the severity of the concussion, duration of time for recovery, and the athlete's history of prior head injuries. But, to make a truly informed return-to-play decision, the doctor will also need to carefully examine the results of the tests and data compiled by the athletic trainer.

This leads us to what may be the most critical aspect of concussion assessment: documentation. School based healthcare providers need to document and share all assessments, tests, and forms with the athlete's physician. They should also make an introductory call to the athlete's physician and explain the assessment and documentation procedures.

It is key that the testing and monitoring be recorded systematically and in a way that is easily interpreted by a physician. To accomplish this, I use an Evaluation Log, which records all tests and their results for the entire duration of the episode. It summarizes multiple results from multiple assessment tools to make viewing and tracking the athlete's improvement easier.

In addition, I have found it immensely helpful to keep two additional logs. One is a Communication Log. Consistent communication about a concussed athlete is critical and should occur among everyone working with the athlete. Take the time to share test results, concerns, and plans with them and provide them with educational materials.

The final documentation is a Return-to-Play Log. Recording steps, dates, and athlete reactions when utilizing systematic return-to-play criteria is of paramount importance. Documentation of progress and/or difficulty will be useful when speaking with parents, coaches, and physicians.

Tracking all conversations, therapy sessions, evaluation tools, dates, and athlete reactions will allow the physician to make a much more informed decision. It may also be legally prudent. Documentation of actions may prove invaluable should legal actions be taken.

Today, there are many more tools available to help us assess and treat concussions than ever before. In order to ensure the safety of our athletes, we must implement these resources into our protocols. If we don't, the long-term ramifications can be devastating.

> To access forms, sample logs, and references for this article, enter "Upgrading Protocols: Bonus Materials" into the search engine at: **www.AthleticManagement.com**

BILL STRECHER

Along with using baseline neurocognitive testing, assessing static postural stability can be worthwhile. The athlete is timed and scored while holding various stances.