



Concussion

crackdown

Why many concussion management policies and practices aren't cutting it—and how officials can get on the right track to increase athlete safety

By Chris Nicholson

Fans at a University of New Haven football game might notice an odd sideline sight: medical personnel with their heads hunched over smartphones. But these athletic trainers are not checking text messages or updating their Facebook status. Rather, they are monitoring real-time data about the force of their players' on-field collisions.


In 2013 the Connecticut university became the first to use Triax Technologies' headband collision sensors during competition, starting with the football team and the men's and women's soccer teams. The sensors measure impacts to the head and wirelessly transmit the data to a computer or smartphone on the sideline. Athletic trainers monitor the readings and follow up on the health of players involved in potential concussion-causing collisions.

"We felt that anything we could do to perhaps give us an opportunity to protect the health and safety of our student athletes was a good thing," says Deborah Chin, UNH's associate vice president and director of athletics and recreation. "No matter what piece of information came from it, it was more than what we had."

The university's sports medicine team coordinated the program with the team physician, who subsequently consulted with a concussion specialist. All agreed the data they were receiving helped identify concussions that previously may have gone unnoticed, Chin says. She emphasizes that sensors don't make a diagnosis—but they do identify athletes to examine for symptoms.

In just two years, the university has expanded use of the devices to women's lacrosse and men's and women's basketball, making them mandatory for athletes on those rosters.

Springfield College in Massachusetts and Santa Barbara City College in California are also now using Triax, and other athletic programs have adopted similar technology. Louisiana State University and Lebanon Valley College in Pennsylvania use Brain Sentry, a small device that attaches to a helmet, flashes when a player is hit hard and tallies the number of hits received in a game and throughout the season. Last year the University of Kansas and the University of South Carolina began using Vector Mouthguards, sensors that measure the force of head impacts and send an alert to sideline athletic trainers when a collision is hard enough to cause a concussion.

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Technology to the rescue: The University of New Haven is among the growing number of institutions using sensor technology to help athletic trainers know when it's time to pull a player who takes a big hit for a medical evaluation.

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Sensors represent one of the few areas in which concussion management is progressing well, experts say, because they actually help address a problem. New helmet technology doesn't change the way the brain moves in the skull, says William White, president of Brain In Play International clinical center in Rhode Island and co-author of the book *Winning The War Against Concussions In Youth Sports* (CreateSpace, 2014). And the habits of old-school, play-tough coaching still haunt too many fields of college sports. Positive movement in this arena has been slow, but it exists, albeit mostly because the issue has finally penetrated the public consciousness.



Headband collision sensors, worn under a player's helmet, are used by some colleges to measure impacts to the head.

The road to policy

Concussions and alleged mishandling of athletes who have suffered head injuries have made headlines over the past few years. A few prominent examples:

- **University of Michigan** quarterback Shane Morris was left in a game in 2014 despite signs of concussions apparent even to the untrained eyes of spectators watching the national broadcast, prompting school President Mark Schlissel to issue a public apology and order an immediate review of the athletic department's in-game safety procedures.

- In June, former **University of Illinois** soccer player Casey Conine filed a lawsuit against the school, claiming that in October 2014 she was left in a game and was never evaluated after banging heads with

another player and receiving a concussion, and that two weeks later she was put back on the field without the university-mandated clearance from a physician.

- A class-action lawsuit against the NCAA was nearly settled last year with the creation of a \$70 million fund to test current and former college athletes for brain trauma, plus \$5 million for concussion-related research. But preliminary approval was denied by the judge, who doubted that the plan would work financially and logistically. A new settlement was proposed in April and is awaiting approval.

In 2014, the NCAA announced two

notable efforts to address concussion issues. The first was a \$30 million partnership with the U.S. Department of Defense to study 37,000 male and female NCAA student athletes for three years to monitor the risks, treatment and management of concussions.

The second announcement was for a set of guidelines to diagnose and manage sport-related concussions. Examples of guidelines include annually providing educational materials to athletes, coaches and others in the athletics program; conducting a preseason baseline assessment to be used as a comparison when an athlete is injured; and doing a clinical evaluation at the time of injury.

The guidelines also suggest basing a return-to-play protocol on the "Consensus Statement on Concussion in Sport," a paper released at the International Conference on Concussion in Sport held in Zurich in 2012. That paper offered a progression of steps:

1. Removal of the athlete from play
2. Light exercise
3. Sport-specific exercise
4. Non-contact training drills
5. Full-contact practice
6. Return to play

Each step requires at least 24 hours of being asymptomatic, meaning the entire protocol would likely not return a concussed player to the field in less than one week.

Despite the guidelines, a **Harvard**

study reported in October 2014 that the NCAA does not monitor compliance, and that while 93 percent schools do have a concussion management plan, many do not meet the NCAA's suggested standards. For example, only 76 percent of schools offered annual concussion education to their athletes.

Also, the lack of a consequence-based mandate means the guidelines are easy to ignore, says Ramogi Huma, president of the National College Players Association and a former UCLA linebacker. With universities free to create and carry out their own protocols, powerful coaches can sidestep rules. Teams or conferences may fear

losing competitive advantage with strict standards that sideline players when other teams might keep injured stars on the field.

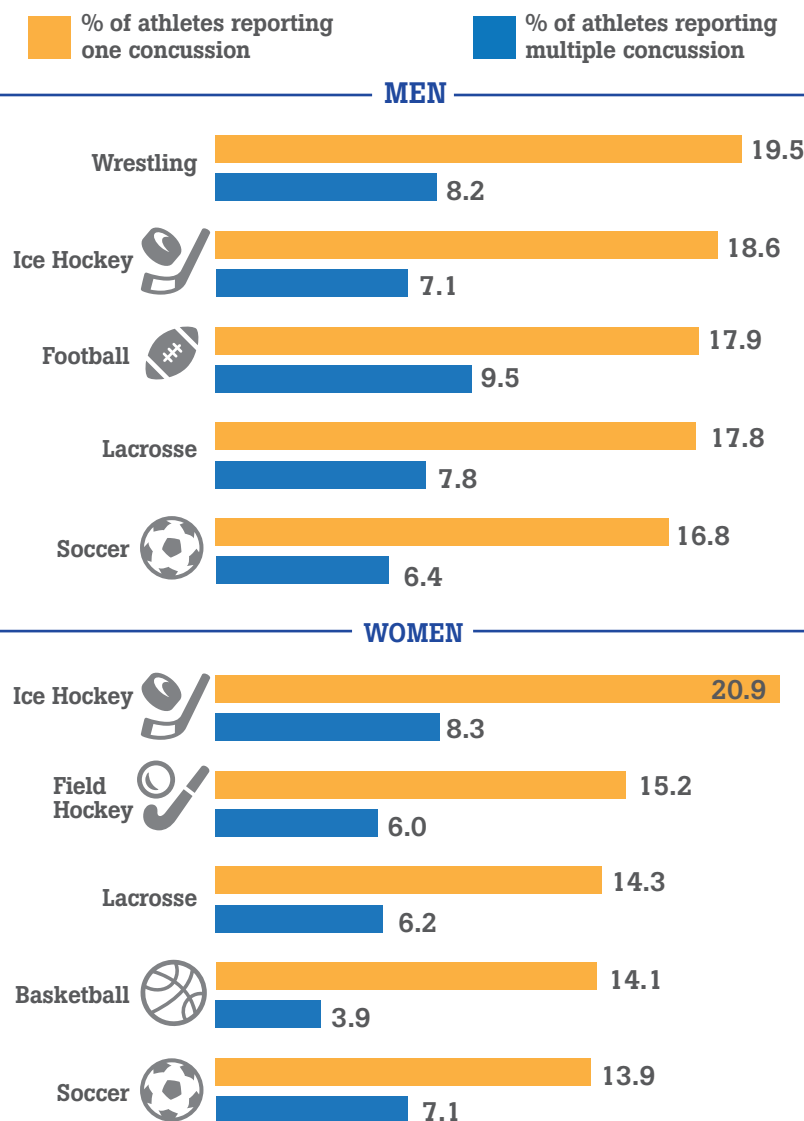
"What needs to happen is a nationwide policy, from the top, that is actually enforced.," Huma says. "When the NCAA enforces these types of policies with the vigor that they enforce whether or not someone got a free tattoo, then you'll have some change."

Cultural obstacles

The no-pain, no-gain mantra of sports culture may hamper efforts to better manage concussions.

Blame can be directed at some coaches, who leave head-injured players on the field, or return athletes to competition before they're ready, Huma says. "Coaches fear the injuries that put players out for a season—a torn ACL, neck injuries

COLLEGE SPORTS WITH HIGHEST CONCUSSION RATES



Source: "Self-Reported Concussion among NCAA Student-Athletes," NCAA, February 2014

BRAIN MATTERS: NEW RESEARCH OFFERS GOOD AND BAD NEWS

New science has improved experts' views on concussions, both in terms of how serious they can be and how best to recover from them.

William White, president of Brain In Play International clinical center in Rhode Island and co-author of *Winning the War Against Concussions in Youth Sports* (CreateSpace, 2014) says MRI technology called diffuse tensor imaging, or DTI, has led to two major findings:

1. Concussions are more severe and longer-lasting than originally thought. Previously, common wisdom was that concussed athletes recovered adequately within seven to

10 days, but DTI research shows that the effects of these injuries generally last four months or longer. Even hits that don't cause concussions on their own can accumulate and become just as serious.

2. Best practices for general health also help diminish the effects of a concussion, and accelerate recovery, DTI research shows. Endurance exercise (jogging, swimming), progressive muscle relaxation (systematically tensing and relaxing muscles) and good nutrition (fresh fruits and vegetables, greens, fresh fish, etc.) can all lessen concussive damage and get a player back in action faster.

CONCUSSION POLICIES OF MAJOR ATHLETIC CONFERENCES

American Athletic—Annual concussion education is required for on-field officials. Game-day medical staff must have a written sideline communication plan for concussions and a pre-game meeting with on-duty EMTs.

Big 12—Team medical staffs have full autonomy regarding athletes' post-injury playing status.

Big Ten—Regulations include disciplinary action against member universities that do not comply with the conference's concussion-management standards.

The Ivy League—Full-contact football practices are limited to two per week during the season.

Southeastern Conference (SEC)—An independent, conference-hired medical observer who has the authority to halt play and remove a player is required at all games. The observer monitors the sidelines and the playing field from the television replay booth.

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and shoulder injuries,” he says. “They don’t fear concussions because they know that physically, players can play through concussions.”

David Lombardo, head women’s soccer coach at **James Madison University** in Virginia, disagrees. He acknowledges that as a whole, college sports needs to handle the concussion question better, but says, “I don’t know any coaches who want to risk a young athlete’s health and welfare.” Moreover, he believes coaches throughout the NCAA support improved sideline diagnostic techniques because they remove the guesswork about whether to remove a player from the field.

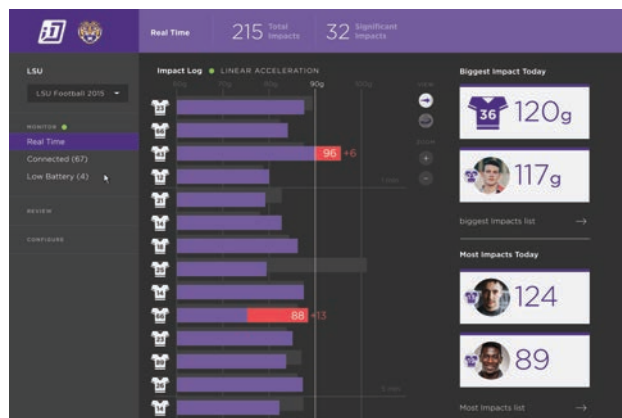
There’s truth to both those points of view, says William White of Brain In Play. “There’s major variability with coaches at the NCAA level getting this right,” he says, adding that some are educated and responsible, while others believe the issue is overhyped. “You want to be overly conservative with how you’re managing this, because you never know when a kid’s brain at the NCAA level may be more vulnerable than you realize.”

White says students are at fault, too, for staying in the game when they know they shouldn’t. “The culture probably couldn’t be worse, because in college if you dare to sit down for one second, you could lose a scholarship and there are 10 kids willing to take your place,” he says. The data supports his point: Last October a joint study by Harvard and **Boston** universities revealed that college football players report only one in 27 head injuries to their coaches or athletic trainers.

Also, a concussed athlete may not have the immediate mental ability to recognize their injury. “If they’re walking around with a damaged brain from a concussion, they might not know to sit down, because their judgment is impaired,” White says.

Best practices

One of the easiest ways to reduce the rate of concussions is to restrict the number of full-contact practices, says Huma of the National College Players Association. “It’s a simple change that will cost no money,” he



Brain scanning: Like similar technologies, the Vector Intelligent Mouthguard from i1 Biometrics uses embedded technology to allow athletic trainers to view the impacts and accelerations a player’s brain experiences during play from the sidelines.

says. NFL players have full-hit practices only about once per week, while NCAA football teams may have as many as five, he adds.

Also important is ensuring a qualified and diligent sports medicine staff. “A coach’s job is to push kids past their comfort level, and the athletes’ job is to push themselves past their comfort level,” says Randy Cohen, associate director of athletics for CATS Medical Services at **The University of Arizona**. “That’s what makes an athlete better.”

But athletic trainers, “who have an unbiased opinion because their job priorities are not about winning and losing,” should be there to say, “This is a little too far,” Cohen adds.

Those athletic trainers need what Cohen terms “autonomy of care”—the ability to make decisions about players’ health without fearing repercussions from the coaching staff or anyone else in the athletic department. “No athletic director I’ve

worked with has ever influenced any medical decision we’ve ever made—never even tried to question it,” he says. “But on paper, you need to avoid conflict of interest.”

Policy is critical to keeping athletes safe, says Jim Thornton, director of sports medicine and athletic training services at **Clarion University** in Pennsylvania and past president of the National Athletic Trainers’ Association. Protocols about treatment and when athletes can return to play should be created by the team physician and athletic training staff, and vetted by the university attorney. “I don’t care if a coach makes \$7 million a year—a coach should not have anything to do with medical decisions,” Thornton says. “That policy needs to be followed when a concussion takes place, regardless of the competition, regardless of who’s winning, who’s losing, what player it is.” **UB**

Chris Nicholson, UB’s contributing editor, is based in Connecticut and New York City.

CONCUSSION DOCS TO KNOW

NCAA Guidelines and Concussion Management Plan

www.ncaa.org/health-and-safety/concussion-guidelines

NCAA “Concussion Safety Protocol Checklist”

<http://UBmag.me/concussionchecklist>

“Consensus Statement on Concussion in Sport” (from 4th International Conference on Concussion in Sport, 2012)

<http://UBmag.me/concussionconsensus>

NATA Concussion Management Position Statement

<http://UBmag.me/NATAposition>