

Play patrol

Technology leads to strides in reducing severity of student-athlete injuries



By Chris Nicholson

By the time a 220-pound linebacker gets in his way, a high school running back has built significant momentum. The resulting collisions have been described with metaphors involving rams, brick walls and Mack trucks. Regardless of the analogy, these impacts can and do result in injuries for players of all ages.

The most frequent sports-related health issues in high school vary by activity, and include ankle, shoulder and knee injuries, and heat-related illnesses. Another common issue is overuse injuries—such as stress fractures, tendonitis and joint pain—and especially among girls. A study at The Ohio State University Wexner Medical Center and published in the *Journal of Pediatrics* looked at nearly 3,000 injury cases in 20 high school sports and found that girls' track, field hockey and lacrosse led all others in the rate of overuse injuries. (Boys' swimming and diving ranked a distant fourth in overuse injuries.)

A related issue, particularly among middle school athletes, is Sever's Disease, a condition that causes pain in the still-growing heel of adolescents. William Prieto, biology educator and athletic trainer in Pennsylvania's Chambersburg Area School District, says he used to see one to four cases a year, and now he's seeing that per season. "More of these kids are doing double duty and triple duty on their bodies," he says. Prieto has seen soccer and volleyball players finish practice at school and then go to practice or a game for a club team the same day. "Young bodies are absolutely not built for that level of activity."

But of all the sports-medicine issues, the champion is concussions. Athletics-related concussions cause 58 percent of emergency room visits for children 8 to 13 years old, and 46 percent for children 14 to 19 years old, according to the National Athletic Trainers' Association (NATA).

NATA also reveals that many districts are getting better at dealing with injuries, but there's still room for improvement.

Varsity football is a big deal at The Lawrenceville School in New Jersey. And athletic trainer Michael Goldenberg says tests for concussions are 10 times better and more prevalent than a decade ago. Some tests include checking an athlete's response to light, looking for physical signs of head trauma and asking questions, looking for any signs of amnesia.

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Cody Jenschke, ATC, head athletic trainer at Flower Mound High School in the Lewisville Independent School District in Texas speaks with an injured athlete while the team physician evaluates his hip during a game.

In its February report, “Athletic Training Services in Public Secondary Schools,” the association found the state of medical care for student athletes has improved. The evidence: 70 percent of public high schools

have access to an athletic trainer in some capacity—double the amount reported in 1994. Meanwhile, only 37 percent of public high schools have a full-time athletic trainer, which is low.

Club sports take their toll

Athletic trainers agree that a challenge in keeping student-athletes healthy is the proliferation of club sports, competitive travel teams and leagues that give kids more playing time around the year. Many of these leagues are often run as for-profit operations.

The issue for athletic trainers is the club teams keep kids playing for long periods of time away from the watchful eye of school coaches and health personnel—often without adequate medical oversight.

“Because of the club sports, many students are playing year-round, and come into the school season unrested, already fatigued,” says Bart Peterson, athletic trainer at Palo Verde High Magnet School in Tucson. “The joints and muscles are already stressed, and it creates a really high incidence of overuse injuries that we can’t prevent because they’re not happening at our school.”

Though Peterson’s concern is shared by many of his peers, the lure of club sports is hard for students to resist,

says Michael Goldenberg, director of athletics at The Lawrenceville School in New Jersey. Athletes and parents feel pressure to be discovered by college coaches, so they specialize and max out their schedule at a young age, he says. “They’re 14 years old and feeling like they have to play soccer or lacrosse or hockey all year round. It’s tough to fault the kid because they’re just trying to get seen, trying to make it to the next level.”

The only solution is more education, Peterson says. At the beginning of the school year he coordinates separate group meetings for athletes and parents to explain the importance of athletic conditioning and varying their activity level during the year. “We don’t necessarily say, ‘Don’t play the club sports,’ because that’s a lost cause,” he says. “But we do tell them about fatigue injuries, and how to listen to your body and how to follow your body’s directions. If that means to sit out the day, the game, or a couple of weeks, then you need to sit out—even if you are paying to play.”
—C.N.

“That’s great, but it’s a far cry from 100 percent,” says Larry Cooper, chair of NATA’s Secondary School Committee and head athletic trainer at Penn Trafford High School in Harrison City, Pennsylvania. He says some districts consider the school nurse adequate to give care, but that’s not enough because they lack a sports specialty. Also, nurses leave at the end of the school day, before practices begin—and according to Safe Kids Worldwide, 62 percent of organized sports-related injuries occur during practice.

Schools with small budgets might not be able to afford an athletic trainer. Cooper suggests hiring a certified trainer who is also qualified to serve in another position already in the budget, such as security officer, nurse’s assistant or health teacher. And he recommends seeking federal or state funding to help pay the salary of an athletic trainer. “An entire small school might have only 10 or 11 athletes, but they still deserve to have proper healthcare,” Cooper says.

New knowledge

Recent research has made the breadth of the problem harder to ignore. William White,

president of Brain In Play International and co-author of *Winning The War Against Concussions In Youth Sports*, points to a relatively new MRI technology called diffuse tensor imaging, or DTI, which has enabled breakthrough studies of concussions that have revealed two major findings:

1) The effects of a concussion last longer than previously thought. Most experts would say within seven to 10 days a student could return to the classroom or maybe back to sports in limited way, White says. “But DTIs are showing that there’s white matter damage that can generally last four months or longer. And youth brains are particularly vulnerable because we’re talking about a developing organ,” he says.

Considerable time off the field is becoming a more accepted remedy. But students also need time away from class and schoolwork to allow the brain to heal and to prevent issues from recurring later in life, Cooper says. And that “means not doing homework, not looking at a whiteboard not reading a computer, not texting, and not taking a test until those symptoms have resolved,” he says.

2) The second finding from DTI research offers good news: Endurance exercise (jogging, swimming), progressive muscle relaxation (systematically tensing and relaxing muscles) and good nutrition (fresh fruits and vegetables, greens, fresh fish) can accelerate recovery, White says.

Attitudes regarding concussions and return-to-play procedures have been shifting in part because laws have forced the issue: In 2009 Washington became the first state to enact a return-to-play law, and now all 50 states have followed suit.

In Illinois, the first class-action suit against a state high school football association is seeking stricter return-to-play standards, mandatory on-field medical personnel, and a fund for monitoring the health of former players. Attorney Joseph Siprut on the case says he plans to bring a similar challenge to every state in the U.S.

Districts updating or fortifying their return-to-play policies can look to NATA, which last year released a peer-reviewed set of protocols, including:

- A preseason baseline exam to be used as a comparison when an athlete is injured
- No return to competition the day of a suspected concussion
- Daily exams to monitor recovery
- Possible referral to a neuropsychologist for additional treatment and therapy

Educating constituents

Almost half of athletes injured during

games won’t fess up because they want to continue playing, according to a 2014 report by Safe Kids Worldwide. One problem is that many young athletes don’t know the difference between pain that is temporary and pain that signals an actual injury, says Prieto of Chambersburg schools.

Another issue is coaches: Some have not instituted a teamwide, health-first mentality, while “old school” coaches think no



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Varsity girls' soccer players are also at risk of injury. Above, the Lawrenceville School team competes in recent game. According to a report in the *Journal of Head Trauma Rehabilitation*, girls aged 15 to 19 who play soccer have a greater chance to incur brain injury, compared to other sports.

pain means no gain, says Bart Peterson, athletic trainer at Palo Verde High Magnet School in Tucson.

Yet many coaches have changed their approach to concussions in recent years, reflecting a willingness to let brain injuries heal before returning athletes to the field.

Another problem is parents who are

undereducated about sports injuries or overzealous to keep their children in the game. More than half of youth coaches said they've been pressured by parents to put their injured child back on the field, the Safe Kids Worldwide report says.

Experts agree that a key to better managing return-to-play decisions is to continue

to educate coaches, parents and the athletes. Schools must do more than just have parents sign a waiver, says White, of Brain In Play International. "You have to get after these kids, and get after these parents, and engage them. If you can do that, you can start to get people a little more involved."

But the ideal solution goes beyond just teaching the dangers of concussions. White proposes an honor code that all athletic programs should integrate into the culture. The code says that no one will play with a head injury, and if someone suspects they or any player has a head injury, they will report it to their parents and the coach.

Evaluation and prevention

Other good news is that concussions are becoming easier to identify, says Michael Goldenberg, athletic trainer at The Lawrenceville School, a private school in New Jersey. Tests for concussions are 10 times better and more prevalent than a decade ago, he says. Sideline assessments include evaluating the player's level of consciousness, looking for signs of amnesia (can the athlete remember plays?), checking response to light, and looking for physical signs of head trauma (such as swelling).

Smarter ways of reducing the rate of concussions have also been developed.

Schools are limiting the amount of full-contact practice athletes are allowed each week and requiring students recovering from concussions to practice a few days before playing in a game again. Changing playing techniques also helps: For example, USA Football, the governing body for amateur leagues, encourages coaches to teach players "heads-up tackling" (i.e., not leaning into a tackle head-first), which reduces the incidence of helmet collisions.

Still, the key to all of this working is the students, White says. "If they know a little more, if they know what's in it for them," White adds, "they'll buy in more. They will prolong their careers." **DA**

NATA's complete recommendations can be viewed at <http://DAMag.melbp>

Chris Nicholson is contributing editor.

Sports and injury

Sports with highest rate of TBI (traumatic brain injury) among school-age children, from 2001 to 2012

Boys 10-14 years old: football (25%), bicycling (16%), basketball (10%), baseball (7%), in-line/roller/board skating (6%)

Boys 15-19 years old: football (31%), bicycling (10%), basketball (10%), soccer (7%), snow sports (5%)

Girls 10-14 years old: soccer (13%), basketball (12%), bicycling (10%), gymnastics (7%), softball (7%)

Girls 15-19 years old: soccer (16%), basketball (15%), gymnastics (10%), snow sports (7%), softball (7%)

Source: "Trends in Sports- and Recreation-Related Traumatic Brain Injuries Treated in US Emergency Departments," *Journal of Head Trauma Rehabilitation*, May-June 2015