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New helmet design aims to reduce head injuries

Andrew Petersen | Posted: Tuesday, October 19, 2010 2:00 am

New concussion studies are released seemingly every week, and with them come new hopes and new questions.

As more attention is paid to concussions in sports, suggestions to limit the frequency of the brain injuries keep piling up. There's no universal agreement on what future steps to take, but everyone from medial personnel to equipment manufacturers acknowledges that the status quo isn't acceptable.

"I think a lot of people still think a concussion is lost of consciousness or maybe acting goofy or wobbly," Dr. Jessica Ellis said.

It's now known that significant damage can be done without an athlete displaying such obvious symptoms.

The best advice is avoiding a hit to the head - a tall order in unpredictable sports, particular collision-heavy football. And not playing isn't an appealing option to most of the 1 million-plus high school players.

But in-game strides in safety have been taken and continue to be developed.

Latest gear

One of the most widespread evolutions has come in the protective qualities of football helmets. In the 1960s, the plastic helmet first gained popularity, but in the past decade much more attention has been given to the quality of interior padding.

In 2002, Riddell released its Revolution helmet, featuring redesigned padding and an inflatable liner. Four years ago, the University of Pittsburgh Medical Center published three years worth of research indicating that Revolution wearers are 31 percent less likely to suffer a concussion.

"The Revolution has been wildly successful, and I think it's been because our customers all have an interest in protecting their athletes," Riddell vice president of research and development Thad Ide said. "If you have a product that's demonstratively better, that's hard to ignore."

Riddell has updated that helmet, and upstart company Xenith last year made its X1 helmet widely available. The X1 has individual pads designed to work like car airbags to absorb a blow.

Perhaps the biggest drawback from these helmets is the cost. The X1 costs more than \$300, and Riddell's latest Revolution speed goes for more than \$200.

Of course, any helmet has to be properly fitted to have any effect, Ellis pointed out.

Some have touted mouth guards as an important key in fighting concussions. The idea is that a protected jaw is less likely to be driven into the lower portion of the brain.

Equipment manufacturers and dentists (who can make custom guards) trumpet this reasoning, but no independent research has confirmed any correlation between guarded mouths and concussions.

Rules adaptation

Ellis' concern with any equipment dubbed "safe" is athletes responding by playing with reckless disregard for safety.

"(Concussions) are always going to be part of the game," she said. "But you can demonstrate good tackling techniques."

Head-to-head collisions make all the ESPN highlight reels, but they're dangerous. It's the totally unscripted mess of a special teams play that's particularly concerning.

The journal *Research in Sports Medicine* published a report last year that 33 percent of injuries sustained during high school kickoffs and punts were deemed "severe." Twenty percent of those injuries were concussions.

"We have to change the culture of leading with your head," Pleasant Valley certified athletic trainer Jason Viel said. "I suspect down the line this will lead to rule changes."

Before the Super Bowl last February, NFL commissioner Roger Goodell proposed an eventual ban on use of three-point stance, in which linemen begin a play with their torsos parallel to the ground. The more upright two-point stance encourages leading with arms.

Any change that dramatic seems still a long way off, but the National Federation of State High School Associations has made several tweaks to its tackling policies. In 2007, the NFHS banned helmet contact with a player on the ground, a player being held up by other defenders and against "a defenseless opponent."

Another possibility that's been proposed has been limiting the amount of full contact in practices.

According to the National High School Sports-Related Injury Surveillance Study during the 2009-10 school year, 35.8 percent of football concussions occurred in practice.

What's next

For all the steps already have been taken, more oversight could be on the horizon.

On Sep. 30, the U.S. House of Representatives passed the Concussion Treatment and Care Tools Act. If HR 1347 is signed into law, eventually national guidelines would be put in place pertaining to the treatment of concussions of athletes age 5 to 18.

Additionally, the Protecting Student Athletes from Concussions Act is pending committee research within the House. This legislation would require public school districts to draw up their own specific concussion policies, as several Quad-City schools already have done.

Last Friday, USA Today reported that the Army has developed a blood test that can diagnose a concussion by identifying unique proteins generated by damaged brain cells. Various studies have suggested that upwards of 50 percent of all concussions go undiagnosed, often because traditional symptoms are not present.

Practical application of such tests within sports remains speculation, but Goodell and the NFL have already shown interest.

"We've gotten more cautious and rightfully so," Viel said. "There's too much media attention right now that something won't change."