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Sooners use special helmet that alerts to possible injury

By Blake Jackson
Staff Writer

Any given Saturday, it could happen.

Malcolm Kelly streaks across the middle, jumps for a sailing pass and pays for it. Allen Patrick bursts through the line only to be met square and head-long by an opposing linebacker running just as fast in the opposite direction. Trent Williams, fighting to protect the quarterback, takes an elbow hard upside his helmet.

The player sees stars.

For a moment, he feels numb.

Thus marks the onset of a concussion, one of sport's most misunderstood — and most serious — injuries and the subject of a 2006 University of Oklahoma study.

Sometimes, the concussed player is knocked out momentarily. In that case, the athlete is immediately removed from the field and examined by medical experts on the sidelines.

But sometimes, the concussed player never goes down. Sometimes, he bounces back to his feet after a second or two.

Sports broadcasters call it being "shaken up."

Sometimes "shaken up" can be a killer.

'An epidemic state'

Exploring concussions and their long-term effects is a relatively new field.

OU head trainer Scott Anderson reports the number of scientific articles published on concussions has grown from between five and 10 in the 1960's to more than 150 in this decade.

"What you're seeing now is a great effort to catch up," Anderson said. "For as serious as the injury is, concussions have really been understudied. Football has changed. Guys used to wear leather strips on their heads, but as equipment has gotten bigger and better, hits have become harder and harder.

"We've reached an almost epidemic state."

According to the Brain Injury Association of America, football is responsible for approximately 250,000 head injuries per year.

In May, the American College of Sports Medicine published a study of more than 2,500 retired NFL players. The study found that those who had suffered at least three concussions during their careers tripled their risk of clinical depression over those without concussion.

Depression. Brain damage. Suicide.

The legacy — and the future — of America's favorite game has been thrust into a harsh spotlight.

Even high schools are looking for ways to deal with the growing stigma surrounding the issue.

"With higher-profile athletes suffering these injuries, everyone's aware of it," said Jared Hofer, head trainer at Casady High. "The likelihood of someone suffering multiple concussions isn't great, but a kid's life is more

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important than winning a state championship.”

The mind-reading helmet

At first glance, it looked like a typical, run-of-the-mill helmet.

Face mask. Ear holes. Hard-plastic shell.

But as Anderson and members of the NCAA sports science committee watched Rick Greenwald's demonstration at the NFL combine two years ago, it became clear to the OU trainer he was getting a glimpse into the future.

"The system *does not* diagnose head injuries," Greenwald said. "But it does provide an important tool for clinicians on the field. It could prevent further injury caused by repeated head trauma."

Greenwald's helmet is equipped with tiny airbags, scattered in between the foam padding. Each airbag serves as a sensor, the sensors are connected to a transmitter.

At impact, the airbags process their signal through a complex algorithm devised by Greenwald. If the impact registers greater than 98G — units of gravity or G-force — the signal is transmitted wirelessly to a remote computer and medical staff receive an electronic page.

All in a matter of seconds.

"I was immediately intrigued from a head injury standpoint and a heat-related injury standpoint," Anderson said. The helmet is also outfitted with a tiny thermostat to measure head temperature. "We quickly got on board."

At first, OU partnered with Greenwald's New Hampshire-based Simbex company on what Anderson called a "base level." The system is expensive — Anderson estimated a 40-helmet set at more than \$60,000 — and is only available in Riddell Brand helmets.

But a year later, almost every player on the Sooners' two-deep was equipped with HITS — Head Impact Telemetry System.

So when Malcolm Kelly jumps for a pass, or Allen Patrick bursts through the line or Trent Williams fights to protect the pocket, the Sooner sideline can monitor in real-time the potential for serious head injury.

There is a rub, however.

Instances of concussion are erratic. Some players experience concussion at impacts as low as 40G. Others experience concussion at impact thresholds greater than 98.

"Just because we don't receive a page on the sideline doesn't mean head injury hasn't happened on the field," Anderson said. "We still have to be vigilant of the things we've always watched out for during games."