Footballers' head injuries could decrease thanks to Simbex's specialized helmet.

Technology

High hopes for wired helmet

Cutting-edge helmet could help athletes anticipate concussions

By DAVID SILVERBERG

The National Football League has banned hits on the head, but that hasn't kept the athletes from getting hurt. It's a fact of life. Players, however, don't always have to endure their pain in silence, which is where a new geekified helmet comes in.

A $1,000 football helmet has been produced to analyze the severity of impacts to players' heads. It doesn't prevent concussions, but instead wirelessly transmits data to a computer about what kind of hits an athlete took.

Developed by Simbex, a New Hampshire company specializing in biomechanical feedback, the specialized helmet is outfitted with the Head Impact Telemetry (HIT) system. Sensors lining the inside padding record hits to the head in real time, shuttling the data to a sideline computer.

When an impact exceeds a certain magnitude, the software alerts staff that a player has taken a significant hit. HIT technology also detects where the player got dinged. The helmet isn't a diagnostic tool, but it can alert players and coaches to the possibility of concussion.

Researchers at the University of North Carolina at Chapel Hill used Simbex's system on 8 of the school's players from 2004 to 2006 and published some intriguing conclusions. Six of the 13 concussions monitored came from hits to the crown. Also, players in the study were 6.5 times more likely to have sustained an impact greater than 80 g-force units to the top of the head rather than the front, sides or back.

G-force, a measure of acceleration against gravitational pull, is the unit of choice when calculating sport hits. By comparison, our bodies take a maximum of 4.5g on roller coasters. Football tackles can register as high as 100g.

There's another problem beyond the actual hit.

"The biggest challenge with diagnosing head injuries is that you can't see them," says Simbex founder and president Rick Greenwald. "And players are very reluctant to report concussions, especially in hockey and football."

A survey of U.S. schools supports Greenwald's contention. Athletic trainers report that 5 per cent of high school football players endure concussions each season, but anonymous player questionnaires bump the number up to 15 per cent.

"We need to better understand the injury itself so we can treat it properly," Greenwald asserts.

He points out that the public is often misinformed about what a concussion looks like. You don't need to be knocked unconscious on the field to get your brain rocked, Greenwald says. "Athletes who look fine in the post-impact period may have suffered a serious brain injury."

A major helmet manufacturer sees tremendous potential for HIT technology to help players, both amateur and professional. Several months ago, Riddell released a consumer version of the HIT helmet called Revolution IQ, costing $1,000 each.

A parent or coach can use Web applications to find out the kind of hits a kid is taking to the head, while also checking the symptoms related to concussions.

Riddell tells NOW the company anticipates shipping the Revolution on a larger scale in the future. And what about the National Football League?

“The NFL is hesitant to use on-field tech that could be disruptive to the game,” says Thad Ide, vice-president of research and development at Riddell. “They’ve been reviewing it, but nothing so far.”

The HIT system isn’t just focused on football players. Ide hopes the helmet can be used in hockey and even baseball. Also, Greenwald is turning Simbex’s sights away from the playing field.

A HIT helmet for military personnel is currently under evaluation by the U.S. Army. It monitors the acceleration, force and pressure caused by explosive attacks.

“From a medical perspective, these helmets can act as a black box,” says Greenwald. “We can better understand the severity of impacts on the battlefield and creative protective measures in the future.”

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