

Concussions more damaging than thought

REPEATED HEAD INJURIES HAVE CUMULATIVE EFFECT

By Kevin Lamb

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DAYTON, Ohio - Even though Ben Mangan's two concussions were nearly three years apart, the second blow to his head literally knocked him into next month.

"I still don't remember much about that month," he said four years later, "but I do remember the headaches." Lights and noises especially triggered "a stab in your brain that hurt so bad, you didn't know what to do."

Research since Mangan's injuries, playing hockey at 13, then football at 15, for Tri-County North High School, has shown that sports concussions are more common, damage brain function more seriously and require more recovery time than was widely thought. Recovery time is essential, said Dr. Todd Maugans of Children's Medical Center, because "repeat concussions have a cumulative effect on the brain."

A previous concussion lowers the threshold for future ones, the University of Pittsburgh Medical Center discovered from sophisticated brain-function testing. Even mild head traumas then cause more severe symptoms and functional impairment, both of which take longer to go away. Compared to a person's first concussion, the fourth one makes him or her:

- More than six times more likely to lose consciousness.
- Nearly four times more likely to lose memory of events after the injury.
- Four times more likely to be confused.

One of every 10 high school athletes suffers a concussion each year, defined at Pitt as "a trauma-induced alteration in mental state" when a blow to the head or upper body causes the brain to shift violently within the skull. Head injuries in sports sent about 309,000 U.S. children to emergency rooms last year, most with concussions.

Football players, of course, are among the most vulnerable. Cleveland Clinic researchers reported in 2001 that 47 percent of them had at least one concussion and 35 percent had more than one. "But only 5 percent of those kids were removed from play," said Maugans, the neurosurgeon who directs Children's sports-related concussion prevention and management program for local schools.

The Children's program, like the Pitt research, became possible with Pitt's development of neuropsychological testing software that measures such brain functions as reaction time, memory, spatial orientation, verbal processing time and logical thinking skills. Called ImPACT, for Immediate Post-concussion Assessment and Cognitive Testing, it shows the extent of impairment right after a concussion and tells when brain functions are back to normal.

"I needed something more concrete and objective to test the kids to see if they're actually ready to play," said athletic trainer Robin Lensch at Kettering Fairmont High School, the first district to work with

Maugans in 2004. Kids knew they could play again by saying their headaches were gone. Doctors' varying return-to-play criteria often drew on misconceptions, such as thinking normal CAT scans mean brains have healed. "Now we can compare your test to your baseline test before the concussion and see if your brain and nerves are actually functioning correctly," Lensch said.