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## Concussion protocols instituted to save damage to brains

By John T. Miller



Photos Gint Federas

While an aging generation of athletes once joked about "seeing stars," or "having their bell rung," the current generation is becoming more aware of long-term damage as a result of concussions and taking extra precautions to avoid them.

A proliferation of sports medicine classes at the high school level, and a new set of protocols for recovery from a concussion have heightened awareness and safety nets around the injury, especially at the high school level.

Dr. Robert Mooney, a longtime Saranap resident who toiled in Kaiser Permanent's emergency departments for 30 years before joining Stat Med Urgent Care in Lafayette, says, "The goal is to get the athlete back to school and their sport as quickly and as safely as they can get there."

"The thinking on concussions has changed dramatically," says Mooney. "At Kaiser, I saw many patients with concussions and it struck me that these patients had nowhere to go to seek relief from their symptoms."

In his efforts to develop a concussion program after joining Stat Med, Mooney studied online through the University of Pittsburgh, where the book and movie "Concussion" was based. In the movie, and in real life, findings from slides of the brain of Pittsburgh Steelers Hall of Fame center "Iron Mike" Webster resembled patterns of Alzheimer's disease and punch drunk boxers.

"Over the last 20 years, some of the best literature has come out of the University of Pittsburgh," says Mooney, "and the procedures on how to treat concussions has changed drastically."

Currently, the California Interscholastic Federation has instituted protocols for recovery that sports teams in the state must follow. A student must first complete a five-stage recovery program called the Return to Learn Protocol, which prescribes guidelines for home, school, and physical activities. Mooney noted that it might take up to three weeks for a student to return to the classroom.

The student must next complete a Return to Play Protocol, with a certified athletic trainer, physician, or identified concussion monitor (a coach or athletic director, for example), initialing each stage. Before beginning the protocol, the student-athlete must experience at least two symptom-free days.

A Chicago Tribune article cited studies by David Hovda, the director of the UCLA Brain Injury Research Center, who said that a concussion sparks a biochemical energy crisis at the cellular level that begins when the brain, traumatized by a collision, causes its cells to leak potassium and absorb calcium.

Tests on animals have found that a concussion causes calcium to enter the cells and gum up the mitochondria, which are mini-power plants that create energy for the cells. This causes problems because the cells need extra energy to reclaim the potassium they lost.

Hovda said most people need at least one to two weeks to recover from a concussion, though a "miserable minority" can take months. Brains that have not healed completely are liable to be damaged further with repeated concussions, worsening the cellular energy crisis.

"If enough calcium comes in, it overrides the cell's ability to get rid of it, and the cell decides it's time to die," said Hovda.

This can cause the organ to atrophy and shrink, leading to symptoms of dementia as found in Webster's brain.

In addition to CIF-sponsored sports, Mooney sees many concussions from snowboarding, skating and skateboarding, due to the unforgiving surfaces involved. One local high school student is recovering from a slip in the shower.

Soccer players record the most cases of concussions, according to Mooney, but that is related to the high number of participants in the sport. He also admits that many cases may go unreported.

He generally recommends no medications for patients recovering from a concussion, as well as avoidance of alcohol or marijuana.



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[back](#)

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