



Ahead of the Game:

Protecting Young Athletes From Brain Injury, Concussion, and CTE

By Malia Jacobson

As young athletes everywhere don helmets and pads for fall and winter sports, parents might feel conflicted about cheering them on. This spring, the family of Tyler Hilinski, the 21-year-old Washington State University quarterback who died by suicide in January, revealed that Tyler's athletic career may have contributed to a decline in his emotional and mental health.

Autopsy results showed that Tyler had CTE, chronic traumatic encephalopathy, a degenerative brain disease thought to result from repetitive brain injuries. Over time, the disease kills brain cells and is linked to cognitive and behavioral changes, including aggression, depression, and problems with impulse control.

Though Tyler's death is not linked conclusively to CTE, the tragedy raises questions about how to keep sports-minded kids—and their developing brains—safe. Here's what to know before your kid laces up.

What is CTE and should I be worried about it?

"The last several years have seen many sports come under the microscope as we try to fully understand the risks associated with sports participation, especially contact sports," says Samuel R. Browd, M.D., Ph.D., director of the UW Medicine Sports Health and Safety Institute and the Seattle Children's Sports Concussion Program. First discovered 90 years ago, CTE was rarely diagnosed until 2005, when evidence of CTE was found in the brain of former Pittsburgh Steeler Mike Webster.

Over the past decade, scientific understanding of brain trauma has advanced the study of CTE, which has been found in the brains of 99 percent of NFL players and 91 percent of college football players, according to a report published in the *Journal of the American Medical Association*.

Per the Concussion Legacy Foundation, CTE is caused by repeated (think hundreds or thousands) of brain traumas, generally sustained over years of participation in contact sports. Over time, a protein called Tau forms clumps that spread through the brain, killing vital brain cells and contributing to permanent, progres-

sive cognitive decline. Symptoms of CTE, which can sometimes resemble those of dementia, include aggression, impaired memory, emotional instability, and slowed thinking.

The vast majority of CTE cases result from tackle football, according to the Concussion Legacy Foundation. But CTE has been also found in the brains of boxers, soccer players, hockey players, military veterans and victims of domestic violence. Emotional and behavioral symptoms like depression and impulse control tend to appear in the 20s and 30s, while cognitive decline appears later, in the 40s and 50s.

What are the signs of concussions?

Most kids have weathered a head bump or two—and while brain injuries should be taken seriously, a single concussion has never been shown to cause CTE. But caregivers and coaches should be vigilant about preventing and treating concussion, says Browd. "We need to encourage safe play, proper training, coaching and equipment, and immediate removal from play when a concussion is suspected."

There are no blood tests for concussion, so doctors use observed and reported signs and symptoms to determine whether one occurred. Symptoms can appear immediately, but some take hours or days to emerge.

Immediate signs include headache or a feeling of pressure in the head, dizziness, fatigue, brain fog, and "seeing stars." Less immediate symptoms include disorientation, sensitivity to light, changes in eating or sleeping patterns, and irritability.

My kid's in sports — what precautions can I take?

First, ensure that all coaches and support staff are trained to recognize and respond to concussion. Contact the athletic director at your child's school to ask about what type of training coaches receive.

Insist on a properly fitted helmet that's worn for all contact activities, including practice.

If your child is diagnosed with a concussion, follow your healthcare provider's recommended treatment plan, and don't send your child to practice or a game until cleared for play by his or her physician.

Finally, consider delaying exposure to high-contact game play. Recent research suggests that the age at which contact sports begin can affect the lifelong risk for CTE; exposure to head impacts before age 12 is associated with more negative outcomes than impacts that occur later on.

"Rules are being explored to reduce exposure to contact, like eliminating kickoffs for ages 5-10 in youth football, and raising the age of first contact exposure, which would mean no 'heading' in soccer for players age 10 and under," says Browd.

"This is an area of active research nationally," notes Browd, a father of two. "We all want the same thing...healthy, safe and active kids."

Service award winners

Genevieve Leroux, age 12, of Gatineau, Quebec, and Marcus Deans, age 16, of Windsor, Ontario have each been named a winner of the 2018 Gloria Barron Prize for Young Heroes. Each year, the Barron Prize celebrates 25 inspiring, public-spirited young people from across the U.S. and Canada who have made a significant positive difference to people and the environment. Fifteen top winners each receive \$10,000 to support their service work or higher education.

Genevieve created Milkweed for Monarchs to help protect Western Migratory Monarch butterflies and to raise awareness that they are threatened by extinction. A member of Jane Goodall's Roots & Shoots program, Genevieve focuses on the planting and nurturing of milkweed plants—monarchs' sole food source during their caterpillar phase. She grew up in San Luis Obispo, California, which provides a critical migratory route and dozens of overwintering sites for monarchs. Passionate about protecting the butterflies, Genevieve convinced the mayor to involve the city in monarch conservation. As part of that, she recently planted native milkweed in demonstration gardens throughout her hometown.

She recently relocated to Western Quebec, where she is establishing a plan to help with Eastern Migratory Monarch butterfly conservation. "Butterflies only come out of their chrysalis and fly away when the temperature is just right," says Genevieve. "I think people make a difference in the same way. When it matters most and the situation is just right, people rise to the occasion and take action."

Marcus (www.marcusdeans.wixsite.com/marcusdeans) has invented a water filter for use in developing countries that costs just \$2 to manufacture and is made from everyday materials. His filter, called NOGOS, uses just sugar, sand, and seashells to completely remove contaminants, including bacteria, from dirty water. His invention earned him first place at the Canada-Wide Science Fair and a berth on Team Canada at the INTEL Science Competition. He will soon begin field testing his filter and refining the design for mass production.

Marcus began his work at age 12, moved by a photo of an African girl drinking filthy water. He decided to use his love of science and technology to build a simple, inexpensive filter and began exhaustive research.

The Barron Prize was founded in 2001 by author T. A. Barron and was named for his mother, Gloria Barron. Each year's 25 Barron Prize young heroes reflect the great diversity of America.

For more information, visit www.barronprize.org