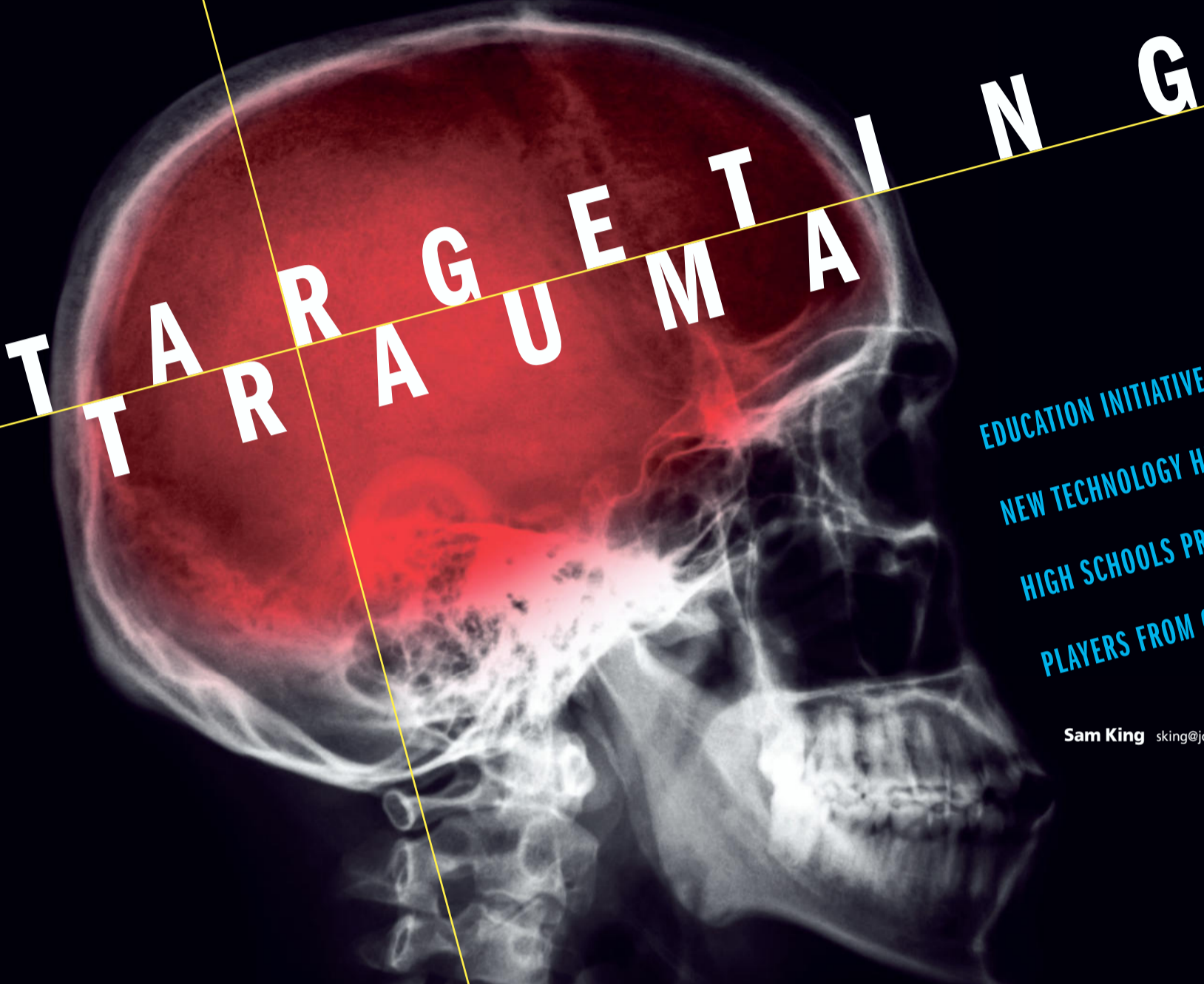


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EDUCATION INITIATIVES,
NEW TECHNOLOGY HELP AREA
HIGH SCHOOLS PROTECT
PLAYERS FROM CONCUSSIONS

Sam King sking@jconline.com

BY THE NUMBERS

5% to 10%
of athletes will experience a concussion during any given sports season.

78%
of concussions occur during games.

47%
of athletes don't report feeling any symptoms after a concussive blow.

25 mph
the average impact speed of a football player tackling a stationary player.

— Sports Concussion Institute

TEARS STREAMED DOWN Evan Stitz's cheeks as paramedics hefted the stretcher he lay on into the back of an ambulance, which carried him away from the football field where he just took a series of shots to the head. ■ Stitz thought he was paralyzed. ■ The South Newton High School senior pinpoints three plays that caused the temporary loss of his arms and legs. ■ The Rebels' tight end, linebacker, punter and kicker prides himself on never coming off the field. So after two blows to the head — one in the middle of a pile fighting for a fumble and the other after scooping up a fumble and running with it — Stitz kept to himself. When the third happened, he had no choice. ■ Stitz missed the next six games, wiping out more than half of his senior season. **See TRAUMA, Page 4A**

Police arrest suspect in shooting death of teacher

Emma Ea Ambrose
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Lafayette police arrested an 18-year-old suspect early Saturday morning in the shooting death of art teacher Kristi Redmon.

Darius Javon Printup was arrested on a preliminary charge of murder and booked into Tippecanoe County Jail at

4:14 a.m., according to the Lafayette Police Department.

Redmon's body was found Wednesday night outside her home on Ridgeway Avenue. Neighbors reported hearing several shots in the area. A Thursday autopsy confirmed Redmon, a teacher at Miami and Edgelea elementary schools, died from gunshot wounds in a homicide. Printup previously was arrested in

May for possession of marijuana or marijuana products, according to LPD's arrest log. Records also indicate that Printup was homeless at the time of his arrest.

Printup's Facebook page reveals he is originally from Detroit. His profile also states he is a rap artist by the name

See ARREST, Page 11A

USA TODAY



TURN UP THE VOLUME

Donald Trump amplifies position on the media and rigged elections as misconduct allegations against him add up. **1B**

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TRAUMA

Continued from Page 1A

"I was too stubborn to come off the field," he said. "I should have."

A 2004 study conducted by the Clinical Journal of Sports Medicine determined that less than half of concussed high school football players reported the injury. Most (66.4 percent) believed the injury wasn't serious enough. Many knew reporting a possible concussion also would force them off the field — at least temporarily.

So they continue to play through head injuries.

Not long ago, if players did not report a headache or show signs of trauma, athletic trainers and coaches might have cleared them to play. Now, however, athletic departments are taking measures — including new technology and education initiatives — to ensure players with possible concussions are not sent back onto the field in contact sports in which injuries are common.

Headaches and head injuries

Evidence suggests high school players are not immune to the head injuries suffered at college and National Football League levels. In fact, a 2013 study by the Institute of Medicine found high school football players suffer 11.2 concussions every 10,000 practices and games, nearly double the 6.3 rate among college players.

In 2009, Boston University scientists discovered that the brain of a deceased 18-year-old who had suffered multiple concussions playing high school football showed evidence of chronic traumatic encephalopathy, a degenerative disease resulting from repetitive brain trauma that can include memory loss, impaired judgment, depression and, over time, dementia.

Stitz suffered similar symptoms, including headaches and a sensitivity to sound and light. For three weeks, he wore sunglasses in the gym to watch volleyball matches.

His symptoms lingered more than a month, but experts say some concussions can take several months to heal.

Minimum time to recover from a concussion is about one week, said Dr. Michael Krauss of the Lafayette Orthopaedics Clinic.

That was the case for Lafayette Jeff offensive lineman Ameer Detrick.

Detrick performed a simple block during a scrimmage a year ago, when he was struck in the head by two defenders. After the play, Detrick became lightheaded and his legs felt helpless as he walked to the sideline.

"It was like I was getting ready to fall down," the Broncho senior recalled.

Athletic trainer Jeff Clevenger quickly administered a series of tests that revealed Detrick was struggling with balance and loud sounds — both concussion symptoms.

His day was done.

Detrick missed one game before his brain returned to normal and he was cleared to return. He has had no issues since.

Across town, Jack Bradford, another offensive lineman, was not as fortunate.

In this year's Aug. 19 season opener at Lawrence Central, the McCutcheon High School senior went low on a block before hitting his head on the ground.

"It looks like I blacked out on film, but I don't remember," Bradford said.

When he went to the sideline, Bradford said his head hurt. A teammate alerted athletic trainer Ashley Anderson, who asked Bradford who she was.

He didn't remember.

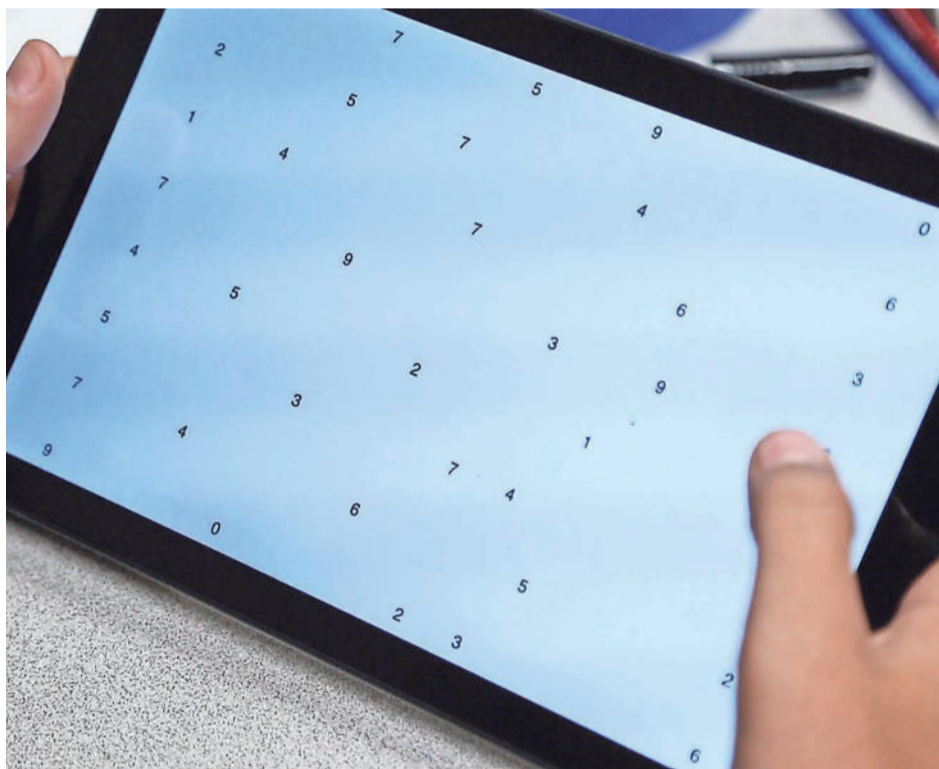
Like Detrick, Bradford had no balance, and bright lights bothered him.

In the following weeks, the



PHOTOS BY JOHN TERHUNE/JOURNAL & COURIER

Frontier football coach Jamie Sailors reviews the King-Devick test his son Brooks took using using an iPad on Tuesday, following practice in Chalmers. Brooks suffered a concussion the first game of the season. Using the King-Devick app on an iPad helps the team determine the severity of head injuries.



Brooks Sailors works through the King-Devick test. Indiana's concussion law states a player with a suspected head injury must be removed from the game or practice and cannot return until a licensed health care provider gives written clearance.

concussion also caught up with him in classes, where he had trouble concentrating.

"I had really bad headaches," Bradford recalled. "I was really nauseous. I couldn't really read or write just because it hurt so bad."

Bradford returned to the starting lineup on Sept. 16 after missing three games — including big county rivalry matchups against West Lafayette and Lafayette Jeff. Although sitting on the sideline was difficult, Bradford acknowledges retaking the field with a concussion could have been detrimental to his long-term health.

The diagnosis

When Detrick was dinged last year in a Lafayette Jeff scrimmage, Clevenger immediately met him at the sideline.

Detrick recalled Clevenger asking him to walk in a straight line.

"I was terrible at it," Detrick said. "Then he had me balance on one foot, and I couldn't do that. He had me follow his finger. It made me really dizzy."

The exercise seems like common practice, but not long ago, it wasn't.

In earlier years, if players didn't have a headache within 10 minutes of a collision, then they were OK to return to practice, said Marion Vrugink, who has

been West Lafayette's athletic trainer since 1982.

"We don't do that anymore," Vrugink said. "If they have any symptoms at all, we are going to hold them and wait until they've been symptom-free for days, typically a week, before we let them be in a contact sport."

A potentially concussed player nowadays must respond to a series of questions, varying from simple inquiries to somewhat complex ones that force the brain to work atypically.

Can you recite the months of the year?

That should be pretty easy.

Now do it backward.

Players should be able to be complete that without much thought, too.

Indiana's concussion law states a player with a suspected head injury must be removed from the game or practice and cannot return until a licensed health care provider gives written clearance.

Clevenger's assessment protocol includes the series of tests Detrick went through but also basic questions players should know, such as the quarter of the game or the opponent.

"We are very cautious with our kids — and not just our football players but all of our athletes that come in," Clevenger said.

At Unity Healthcare, Krauss

sees patients with concussions 250 to 300 times a year, most of them high school or junior high athletes and two-thirds of them football players.

Sometimes, he must break the bad news that a player is not ready for contact. Even if someone is, it's not an instant return to knocking pads on the gridiron.

"We gradually work them back into their sport with light conditioning, then (get) more aggressive," Krauss said of his post-concussion protocol. "It's a gradual stepwise process. Most resolve in seven to 10 days, but there's no great treatment that we use. There's a lot of different things."

Another alternative

Cody Lehe's high school career-ending — and nearly life-ending — head injury in 2006 is a constant reminder to the Frontier School Corp. community of the severity of concussions.

The former Frontier football team captain took a vicious hit when he went to block a defender and the two players' cracked helmets. He was checked by coaches, missing a small portion of a first-round sectional playoff victory, but returned to finish the game, as told in Jim Cooley's book "The Impact of Cody Lehe."

Four days later, Lehe's moth-

er took him to the hospital after he complained of a headache. A CT scan came back normal, but the doctor advised Lehe not to play as long as his headache remained. Lehe returned to the practice field that day and was again hit in the head. He collapsed walking off the field and began having seizures.

Another CT scan showed Lehe suffered second impact syndrome, the result of receiving a second concussion before symptoms from a previous concussion had subsided.

Lehe now requires a wheelchair.

"We talk more about concussions now than we ever used to, and I feel like if we had just known then what we know now to be true about concussions, things might have turned out a little different," Lehe's mother, Becky, told the Journal & Courier in 2014.

Ten years after Lehe collapsed on the practice field, Frontier athletic director and football coach Jamie Sailors is doing everything in his power to prevent a similar tragedy.

So, when 2008 South Newton graduate Ben Welsh approached Sailors about an app that can catch concussion symptoms from the sideline, it was an easy decision.

Sailors this year implemented the King-Devick Test in all sports programs at a cost of \$20 per athlete, paid by the parents. The fee covers the athlete, regardless of the number of sports they participate in.

Welsh works for King-Devick Test Inc., which is associated with the Mayo Clinic. He recently reached out to a handful of Lafayette-area schools about using the King-Devick Test to identify concussions. Besides Frontier, only his alma mater agreed.

"One of the issues when talking with athletic trainers — and this is definitely in the minority, but it does surface a little bit — is that this is threatening their job in a way," Welsh said. "By no means is that what we're trying to do at all. The athletic trainers who get it see this as a way to make their job easier."

Like Welsh, the sales reps for the King-Devick Test are former student-athletes.

Welsh uses his own experiences to toe the line between trying to sell a product and educating athletic programs, youth sports clubs or fitness centers



JOHN TERHUNE/JOURNAL & COURIER FILE

Cody Lehe shakes hands with his mother, Becky Lehe, after completing his physical therapy session. Cody Lehe sustained a traumatic brain injury playing football while concussed.



JOHN TERHUNE/JOURNAL & COURIER

Josh Auger fits football players from Lafayette Jeff with sensors to measure impact September 9, prior to the Bronchos game with Harrison. Auger is a graduate student studying mechanical engineering at Purdue.

on the importance of an app that can identify a lapse in brain activity. In fact, it wasn't so long ago that Welsh missed a portion of his final basketball season at South Newton, after his head slammed against a wooden floor.

"I was right there in their shoes," said Welsh, who played football at the University of Dayton after high school. "I was one of the guys, as silly as it sounds to me now, that if I thought I was healthy enough, I would lie about any symptom I had. You can't lie to this. I feel very lucky nothing ever happened, but who knows what that means for the future with the more we learn about CTE."

The King-Devick Test includes three series of random numbers on a white background, similar to reading off of a large index card. A potentially concussed player reads the numbers in order from left to right, one line after another.

Players take the test prior to the season to determine their base score, which is the number of seconds it takes to complete all three readings. The monitor tells the application how many incorrect or missed numbers were read, which docks the score accordingly.

Coaches can administer the test at any time but usually do so after a suspected concussion or hard hit to the head.

A higher — or slower — score than the baseline results in being held out.

Sailors uses the test during practice, when the Falcons are without the luxury of an athletic trainer.

"If a kid gets hit and he's a little woozy, then we will have him take the test and see where he's at. If he's above his baseline, we know something might be going on," Sailors said. "This isn't going to replace a trainer on the sideline for us. They still have the authority on game night, but

ABOUT CONCUSSIONS

Concussion: A brain injury caused by a blow to the head or body, altering brain functions.

Chronic traumatic encephalopathy (CTE): A disease found in people who have had repeated blows to the head, oftentimes suffering multiple concussions. Brain tissue degenerates and can lead to depression, memory loss, confusion and dementia.

Second impact syndrome: Occurs when a second concussion occurs before symptoms from a previous concussion subside. Second impact syndrome can lead to fatal brain swelling.

Concussion symptoms

According to the Mayo Clinic, concussions can cause headaches, temporary loss of consciousness, confusion, amnesia, dizziness, ringing in the ears, nausea, vomiting, slurred speech, delayed response to simple questions, fatigue, lack of concentration, sensitivity to light and noise.

Concussion recovery

There is no timetable for a concussion to subside. One week is typically minimum. Most see improvement within one month. Post-concussion syndrome can cause longer-lasting effects.

at least we can track it here at school. Us coaches, we're not experts in concussions."

The first test subject, strangely enough, was Sailors' son Brooks, who was hit in the head during a game in late August. When he took the King-Devick Test, his score was much slower than his baseline.

On Sept. 22, Brooks Sailors took the test again, finally completing it at his baseline score. At the same time, Krauss pronounced him symptom-free and cleared him to return to football activities

Education in place

When Terry Peebles played high school football in the late 1980s and early '90s, concussions were an afterthought.

"I don't think in my four years of high school football that I ever heard the word concussion," said Peebles, who played for Cathedral in Indianapolis, before a college career at Hanover.

Peebles now is the head coach for Harrison High School. The Raiders are one of

three Tippecanoe County football programs volunteering for research headed by Larry Levere, the director of athletic training education at Purdue University, and engineering professors Eric Nauman and Tom Talavage of the Purdue Neurotrauma Group. Lafayette Jeff and West Lafayette also are participating.

Peebles is an advocate for safety in the game. In March, he spoke on a panel that included Talavage, Nauman and others about concussions and sports justice. When asked, he agreed for his team to be a part of Purdue's study.

"It doesn't do me as a football coach any good to hurt my own players, so we want to keep them as safe as possible," Peebles said. "I think it makes the kids more aware, too. They know they can't use their head and use the proper form we spend all summer teaching."

Participating players sign a consent form and wear a sensor behind their ear at every practice and game. Purdue graduate students are onsite to apply the X2 biosystems sensors — re-



JOHN TERHUNE/JOURNAL & COURIER
Terry Peebles, left, is the head coach for Harrison football. Peebles is an advocate for safety in the game. He recently agreed to work with the Purdue Neurotrauma Group to study concussions.



PHOTO COURTESY OF LORI MURPHY

South Newton High School senior Evan Stitz, kicking, suffered a concussion this season that caused him to miss five games.

AT JCONLINE

Video: Learn more about the tech high schools are using.

ferred to as an X-Patch — and collect them from players on their way off the field.

Players are scanned before the season, then again at mid-season and after the season ends.

It's an ongoing study of high school football players by the group that started gaining national attention in 2010 and became a centerpiece story in Sports Illustrated.

"What Tom does with the MRI is not just what clinicians do," Nauman said. "They can see structure. Tom can see structure, how it is functioning and the brain chemistry all at the same time. Part of the reason clinicians have trouble accepting what we're seeing is that a typical clinician only does about one-tenth of what an actual MRI can actually do. Tom probably gets out to about 90 percent."

Now with seven seasons of tracking youth players, the data received will be key moving forward.

"The most important result is that players can show dramatic changes in their brain function, even without symptoms," Nauman said.

At Delphi, the Oracles wear Guardian Caps, a padded liner that covers the outside of the helmet. It is said to reduce impact by 33 percent, although that's been disputed by the American Academy of Neurology, which said in February 2015 that helmet add-ons, such as Guardian Caps, do not limit the number of concussions.

The increased use of technologies to track concussions and implementation of education show a shift among high school football programs, associations and states to protect players from long-term brain damage.

Between 2009 and 2012, 43 states, including Indiana, passed laws regarding concussions in youth and high school athletes.

The Indiana High School Athletic Association's stance on concussion protocol dates back to 2008, when the organization followed the lead of the National Federation of High Schools, whose policy states that a concussed athlete must be removed from play and cannot play again that day.

The IHSAA mandates that coaches take online courses on

concussion awareness. In 2010, Indiana became the first state to require such training. The National Federation of High Schools created the online course at www.nfhslearn.com in 2010.

In 2014, Indiana approved a law that made it the first state to require concussion awareness training for high school and youth football coaches. Among the laws written by Sen. Travis Holdman, R-Markle, is a 24-hour waiting period for a player suspected of a concussion.

"The responsibility of us collectively as an association, as a staff, as a member school, administrators and coaches — I think we have a collective duty to ensure the health and safety of our athletes," IHSAA commissioner Bobby Cox told the Richmond Palladium-Item last July.

Obviously, head injuries are not strictly related to football, but it is far and away the sport producing the most concussions, national studies say.

Between 2009 and 2014, for example, Vrugink treated 23 concussed football players at West Lafayette, an average of nearly four per season. Last year, two Lafayette Jeff cheerleaders suffered concussions — just as many as football players.

Today's players are more forthright in admitting when there's a symptom, Krauss said, but there are still some who will ignore a symptom to stay on the field.

"A kid can be having headaches and look good on an exam, but he may still be having continuing symptoms. That happens a lot," Krauss said.

Stitz knows that now. Not self-reporting cost him six games and may have cost his team, too.

In his first game back, Stitz kicked the game-winning point in a 37-36 victory over Iroquois West.

The initial prognosis was Stitz might return in four weeks. It took him six.

But at least he came back.

"What happened to me, I don't want anything to happen like that to anybody," Stitz said. "It's the first time I've had a concussion. I never thought I would get any kind of head injury. I knew there might be (risks). You never know it's going to happen to you."

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