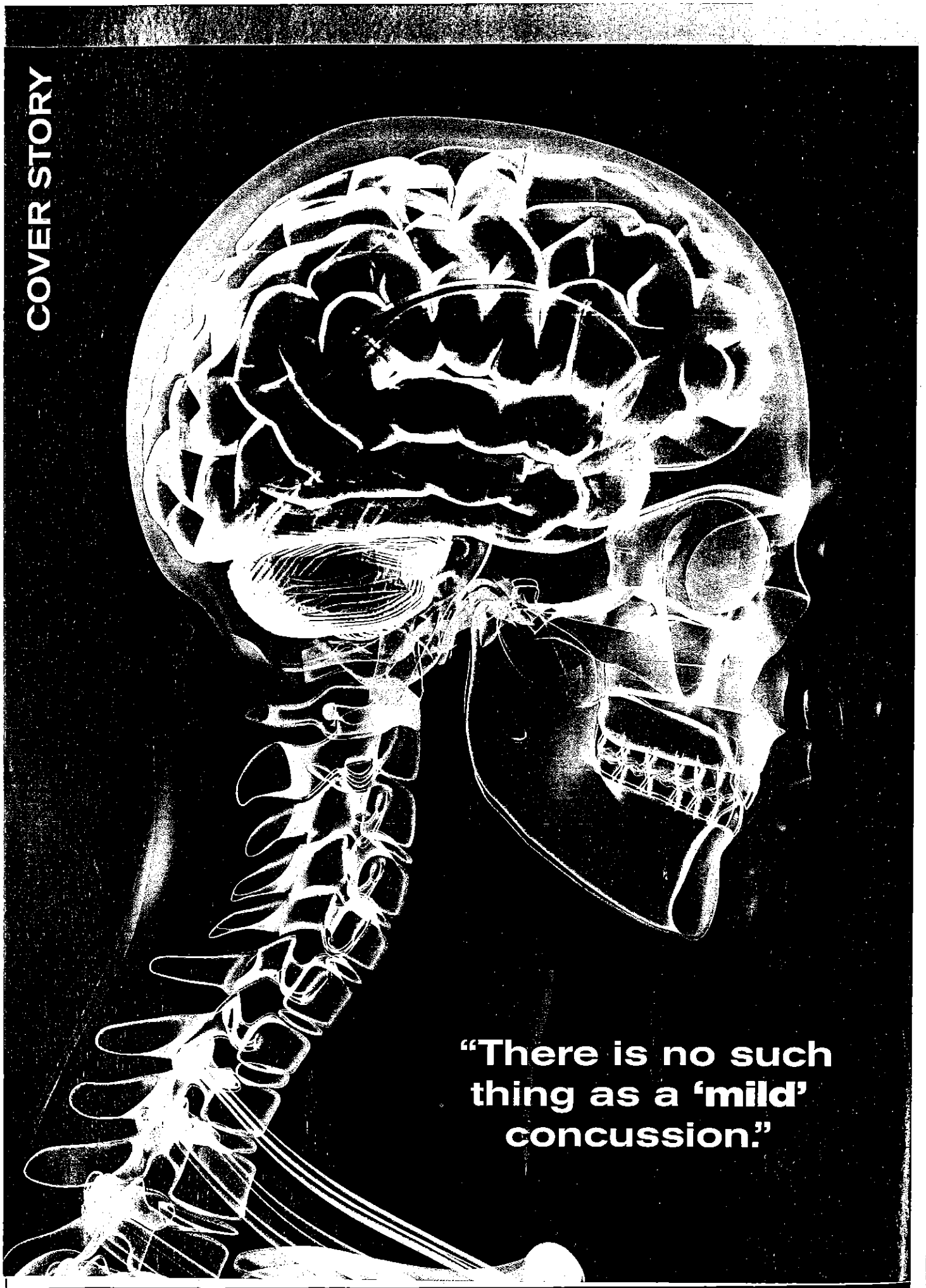

"There is no such thing as a 'mild' concussion."

What You're Missing When It Comes To Brain Injuries

Protocols, safety issues and legal concerns are changing constantly in concussion management—get up to speed

By Michael Austin, Editor-In-Chief

The 140-pound high school receiver comes across the field, catches a short eight-yard crossing route and promptly is met by the oncoming 185-pound linebacker who drives the ball carrier into the ground. The player's brain now has shifted inside his head. The hit has delivered about 100 g's of force[1] and the player most likely has a concussion.

Five years ago, your protocol may have been different, but now most coaches and administrators know the importance of removing the player from action.

But as that player's brain settles back inside his skull, even with the current protocols in place, are you ready for the reverberations rippling out from this on-field hit? Sure, the player has been removed from the game, but your job is not done. His safety is at risk with every decision you make in the following minutes, hours, days and weeks after a brain injury.

While your first goal is the player's safety, you also need to consider the legal ramifications of your actions following a potential brain injury to one of your athletes. Make the wrong step, place a player in jeopardy, and expect to be staring down a lawsuit from the parents of a teenager who trusted you to keep their child safe.

This isn't just a football problem. Media coverage focuses on the gridiron, but any time a player's head is placed in harm's way, a brain injury is a potential result.

"From what I see, football leads the pack by far but we're also seeing more girls and boys soccer players sustaining concussions," says Dr. Michael C. Koester, MD, ATC, who is the director of the Slocum Sports Concussion Program within the Slocum Center for Orthopedics and Sports Medicine in Eugene, Ore. "Interestingly this year, and this could just be a statistical blip, but it's worth noting we are seeing more girls volleyball players as well."

Whether you are the head coach of a football team, an assistant on the girls volleyball squad or the athletic director attempting to oversee a 20-sports department, you must stay up to speed on the latest development in concussion management to protect your players, your program and yourself.

Nothing 'Mild' About It

If the player in the earlier example didn't lose consciousness while lying on the field, many people may call this a "mild" concussion. It's a common mistake and something you hear every Monday morning after a Sunday full of NFL games. Let's get one thing straight—there is no such thing as a "mild" concussion. Qualifiers of any kind when discussing a concussion are a short-sighted strategy to lump brain injuries into the same category as an ankle sprain or knee strain.

"We should aim to remove all qualifiers ('mild' or 'significant' for instance) around the word 'concussion,'" says Stephania Bell, ESPN's injury expert and a board-certified

COACH & A.D. TAKEAWAYS

- The term "mild concussion" devalues the severity of brain injuries.
- If you suspect a player has a brain injury, remove that player from action and do not allow him or her to return until cleared by a doctor (whether your state requires it or not).
- If your school does not have a certified athletic trainer (ATC) on staff, establish a go-to person for brain injuries.

orthopedic clinical specialist, as well as a certified strength and conditioning specialist. "It has more to do with the expectations created by using some of these descriptors.

"First, there is no real way to measure the length of time it will take for an individual to recover or the impairments a person will experience immediately after a concussion. It can take hours, even days, for symptoms to fully emerge."

Without immediate symptoms, Bell adds that even determining an injury is a difficult task, which makes it more critical to pull out of action any athlete suspected of having a brain injury. She says over time the athlete could develop a headache, nausea, fogginess, light sensitivity or any of the other symptoms associated with a concussion. With the possibility of these symptoms developing later, she cautions against relying solely on a sideline screen.

"These sideline evaluations are our best attempts to try and determine whether impairments are present, which would suggest a concussion, but things like neurocognitive testing (which measure how the brain processes information—the ImPACT screen is an example) have to be performed later," Bell says. "The only real way to evaluate these injuries is in retrospect. Once the athlete has recovered, we can look back at the quality and degree of symptoms, and how long the recovery process took."

"Coaches should not be subjected to the role of medical evaluator—that is not their area of expertise ..."

Dr. Gerard Gioia, the director of the Pediatric Neuropsychology Program at Children's National Medical Center and the director of the hospital's Safe Concussion Outcome, Recovery & Education (SCORE) Program, says the medical community has "dropped the grading system" when it comes to concussions. He adds a common misnomer is the suggestion you must have loss of consciousness to sustain a concussion, which is not true.

"You can't call a concussion 'mild' just because someone isn't knocked out for 10 minutes. Most concussions do not involve a loss of consciousness," Gioia says.

New Protocols

Understanding the importance of the safety of players, state legislatures (in many instances working with state athletics associations) have taken the lead in establishing head-injury policies for high school sports. The state of Washington paved the way by passing Engrossed House Bill 1824, in which one section is known as the Zackery Lystedt Law.

The law states, in part, "a youth athlete who is suspected of sustaining a concussion or head injury in a practice or game shall be removed from competition at that time." It goes on to say, "a youth athlete who has been removed from play may not return to play until the athlete is evaluated by a licensed health care provider trained in the evaluation and management of concussion and receives written clearance to return to play from that health care provider."

Since 2009, 39 other states, the District of Columbia and the Chicago passed similar laws protecting youth athletes (*see sidebar on page 27 about which 10 states do not have a comprehensive law on the books*). It's simple, if you don't follow the law and remove the player from action, you, your school district or both, depending on the state, can be held responsible.

Dustin J. Fink, MS, ATC, who runs the popular site TheConcussionBlog.com, says these protocols work if followed properly but more important is getting the message to coaches.

"Not all coaches follow this protocol because they are busy coaching," Fink says. "These protocols do nothing for the prevention of concussions but at least start hitting the biggest issue—the mismanagement of concussions."

Gioia says that the Centers For Disease Control and Prevention (CDC) has information available for anyone in your program who acts as a first responder to a potentially injured athlete. There are pocket cards and stickers with possible concussion symptoms to affix to clipboards. There also is a smartphone app to help coaches and administrators walk through dealing with the immediate needs of an injured athlete.

Gioia sums it up best when dis-

BRAIN-INJURY NUMBERS

The Centers For Disease Control and Prevention (CDC) offer statistics on the prevalence and occurrence of traumatic brain injuries (TBI) for young adults who play sports. Some of the most relevant findings for high school athletic directors and coaches include the following:

- Between the time from 2001-09, emergency room visits for sports-related TBIs for children and adolescents increased by 60 percent.
- The activities associated with the greatest number of TBI-related emergency room visits include bicycling, football, playground activities, basketball and soccer.
- The numbers and rates are highest in football (0.47 per 1,000 athlete exposures) and girls soccer (0.36 per 1,000 athlete exposures).
- Males made up 71 percent of all sports-related TBI emergency room visits from 2001-09.

cussing how coaches or administrators need to handle anyone with a suspected brain injury.

"For athletic directors and coaches, I want to hammer home the point, 'When in doubt, sit them out,'" Gioia says.

Understanding The Doctor's Assessment

When you sit out a player, he or she needs medical clearance to return to practice and games. Koester says with the increased awareness of how brain injuries are impacting the lives of today's teenagers, more parents are seeking out experts in the field rather than their family doctor. He adds that even when an athlete goes to the family doctor first, there are a lot more referrals to experts to do the heavy lifting in diagnosing and providing consent to return to the playing field.

Koester describes a multi-faceted approach he takes to assessing a player. He wants the people most involved in the teenager's life to stay in close contact and report whether the patient seems irregular in everyday actions or if he or she seems "unsymptomatic."

Koester says he uses a neurophysical exam, typically an ImPACT exam (which he says only is a viable option when a trained medial professional uses it), to provide a computerized neurocognitive assessment to aid in his final decision.

"Before allowing an athlete back to the team, I need to see how that person is performing in school," Koester says. "Is he or she catching up or struggling? The first goal is to get them comfortable in the classroom again."

Fink agrees with Koester and says he bases his final decision upon school and not athletics.

"The No. 1 goal is to get the student-athlete back to school without symptoms or ramifications before even thinking about a return to the sport," Fink says. For coaches anxious to have the player return to the field, Fink tells them every athlete is different and to expect an eight-day recovery at the very minimum. He explains this as "eight days from injury to the first non-padded practice," so there is no confusion about his plan.

Utilizing A Certified Athletic Trainer (ATC)

Gioia cites recent National Athletic Trainers Association research, reporting only 42 percent of high schools in the United States have an ATC on staff. He says if school administrators are serious about the safety and protection of their students, especially when it comes to brain injuries, then every high school needs to employ an ATC.

"There was a high school soccer study that showed having an ATC on staff made it eight times more likely a concussion is recognized and diagnosed," Gioia reports.

For Fink, who is an ATC in central Illinois and someone who has suffered 11 diagnosed concussions in his life (three of which came while playing high school sports), having an ATC at your school is imperative due to the personal relationships the athletic trainer develops with students. This makes spotting a potential brain injury much easier.

"As an athletic trainer, I am armed with various techniques, tools, protocols and education in the area of concussions; however my biggest weapon is knowing the individual," Fink explains. "I perform balance testing along with standard who/what/when/where questions, delayed recall, numbers, simple math, etc. However, because I work at a high school

10 STATES WITHOUT CONCUSSION LAWS

At the time of this writing, there are 10 states in the U.S. without official concussion laws designed to protect student-athletes as cited by the American Academy of Physical Medicine and Rehabilitation. Some states have introduced legislation but it has not been finalized or approved. One state has a law but it does not require removal from play or clearance to return. These states include:

- **Arkansas:** Nothing pending.
- **Georgia:** A bill was to be voted upon in 2012 but was opposed by private sports leagues, churches and other groups because it applied to them as well as the public schools.
- **Mississippi:** A bill was approved by the House in 2012 and is awaiting a signature from the governor.
- **Montana:** Nothing pending.
- **Nevada:** A bill was introduced in 2011. It still hasn't been passed.
- **Ohio:** Legislation pending.
- **South Carolina:** Nothing pending.
- **Tennessee:** Advocates who pushed for the bill were unhappy with language in regard to the return to play.
- **West Virginia:** Bill is up for debate due to language regarding whether volunteers receive legal immunity.
- **Wyoming:** Has a law on the books but it does not require removal of athletes from action and does not require medical clearance to return.

and see the students daily, I get to know them well and usually identify a concussion in 10 to 15 seconds of just getting to the injured athlete because of general demeanor and clinical presentation."

For Fink, this also takes the pressure off the coach. Fink makes the final decision to remove the athlete from competition. The coach or athletic director does not have to make this call.

Bell says there is no substitute for having an ATC on staff but if one is not available, then the school's plan needs to include a medical professional so the athlete receives a proper evaluation.

"Coaches should not be subjected to the role of medical evaluator—that is not their area of expertise and it opens up a whole realm of negative possibilities, including liability," Bell says. "It also presents a potential conflict of interest."

"There is an assumption of risk in contact sports but that assumption goes away after a child is injured the first time."

Koester understands every school district cannot afford a full-time ATC (although he also says it's one of the best ways to keep athletes safe) but agrees with Bell and insists efforts need to be made to partner with a local physician.

"Every school needs a go-to person who is not the athletic director or coach," Koester explains. "This go-to person is clear on all policies and procedures and has completed mandatory education on the topic. Things are improving but we're still seeing too many times when coaches allowed athletes to play before their brain was fully healed."

SLOWING CONCUSSIONS ON 3 FRONTS

The number of diagnosed concussions is rising. The information being released about the dangers of multiple brain injuries is alarming. It's now common to find people on both sides of the debate about allowing teenagers to participate in contact sports. Whereas a decade ago it would seem crazy even to have the conversation.

Fear not, coaches and athletic directors. Dr. Gerry Gioia, the director of the Pediatric Neuropsychology Program at Children's National Medical Center and the director of the hospital's Safe Concussion Outcome, Recovery & Education (SCORE) Program, says there are three fronts of advancement to stem the tide against the rising swell of concussions.

1. Limiting Exposure. Reducing the number of instances where players could sustain a brain injury is a place to start keeping athletes safer. Dr. Gioia references the NFL policy of only allowing 14 contact practices during the regular season and how the Ivy League now mandates just two full-contact practices a week for its football teams, which is three less than is allowed by the NCAA.

2. Neck/Shoulder Strengthening. Dr. Gioia references a study where unprepared hockey players who take checks have a higher concussion rate than those who do not, which is a sign that athletes need to strengthen the muscles supporting the head.

"When these muscles are prepared, they help distribute the force of a blow much better than when they are not," he says. This topic also was covered in a research article from Dr. Ralph Cornwell in the August 2012 issue of *Coach And Athletic Director*.

3. Technique. The way the game is taught and officiated needs to change. This is something in the control of coaches, officials and people associated with football specifically.

"Players must reduce throwing their head into dangerous situations," Dr. Gioia says. "We must examine the game for better coaching techniques and fair play." He points to the Heads-Up Football program by USA Football, which depicts the proper way to tackle and hit a player rather than spearing with a helmet, as a good example to follow.

Ready For A $3M Lawsuit?

The new protocols calling for player removal only work if followed and if your school doesn't have an ATC on staff or a medical professional as the go-to person, then you start to enter a gray area. For coaches or athletic directors debating whether to allow a player to return to the field before he or she is ready, or worse yet to cover it up from the parents of the player, consider the case of Zach Frith.

In October 2005, well before any state passed a law protecting athletes, 14-year-old Frith, a freshman at Higginsville High School, Higginsville, Mo., suffered a concussion while playing wide receiver in a freshman football game. His doctor's orders, which were personally delivered to the school by his parents, were to stay off the field for a few weeks. The fear was he'd suffer another concussion before the first had time to heal, which is devastating to a still developing brain like that of an adolescent.

Frith decided to show up to practice anyway and his coaches, who didn't inform Frith's parents, allowed him to take the field. A few days later Frith's mother went to the school to pick him up for a doctor's appointment—that's when she found him involved in a full-contact drill with seniors. Frith only weighed 115 pounds at the time.

As Frith's behavior, mannerisms and functioning began to deteriorate, neurological experts determined his brain had been permanently damaged. He couldn't remember how to get from one class to the next. His mother reported his IQ plummeted to 69, and his temper and cursing, which were non-existent prior to the injury, were out of control. In 2009, Frith's family received a $3 million settlement from the Lafayette County C-1 School District via its insurance company.

Frith's lawyers, John Parisi and Douglas Bradley of Shamberg, Johnson & Bergman in Kansas City, say the coaches and administrators had a duty to protect Frith by not allowing him on the field.

"Adolescents are more susceptible to the repetitive concussion problem due to the rapid development of the brain during the teenage years."

"We learned in this case about the adolescent and brain development. Adolescents are more susceptible to the repetitive concussion problem due to the rapid development of the brain during the teenage years," says Parisi, who played organized football in the 1960s and '70s and admits to "having his bell rung" a few times as they mistakenly called it back then. "In the matter of two weeks, his life was ruined."

Beyond the scope of simply allowing Frith back on the field, the coaches at his school kept the information from his parents. With no knowledge about their son playing football again, Parisi says Frith's parents suspected him of taking drugs due to his strange and erratic behavior.

Bradley says it's imperative coaches are vigilant about questioning athletes and keeping them off the field if there is any suggestion of a brain injury. "Most high school athletes do not want to admit they are not thinking clearly," he says. "[With proper education] coaches can adequately recognize the symptoms when they are taking place. We need to educate our players too."

This isn't to say every school district in the country is at risk for a potential lawsuit when a player suffers a concussion. Parisi and Bradley stress where the coaches at Higginsville went wrong was allowing Frith back on the field.

"There is an assumption of risk in contact sports but that assumption goes away after a child is injured the first time," Bradley says. "After that, it's up to the people in charge to recognize the situation, remove the player and not allow him or her to return until cleared to play."

"This was a rare event in that the magnitude of the brain injury was so great because of the successive concussions," says Parisi, who adds that when researching the Frith case they came across dozens of other players who returned to play too soon. "The brain will heal if you take the player out. It may take more than six months, which is something coaches may not want to hear." CAD

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[1]Higgins, M. (2009, December 18). Football Physics: The Anatomy Of A Hit. *Popular Mechanics*.

CREATE A CONCUSSION-AWARENESS CULTURE IN YOUR PROGRAM

By Jim Osborne, certified brain Injury specialist, former high school and college basketball coach, current staff member, Education Division, Immaculata University, Pa.

It's up to you, as coaches, to design practices with safety in mind. Remember that many little hits (second impact syndrome) can lead to a concussion. It's not just the knockout hits). Be observant and know the warning signs of a concussion, such as headache, nausea, dizziness, disorientation, loss of memory or consciousness.

Let a medical professional make the call regarding return to play. The old standard of seven to 10 days symptom-free does not apply anymore. In some cases, 30 to 45 days may be required. Each injury is unique and only pre- and post-tests establish a proper and safe timeline.

The risk of Mild Traumatic Brain Injury is three times as likely to occur from a blow to the head after one concussion, and eight times as likely to occur after a third concussion. The consequences and effects of multiple concussions are evident following recently published studies finding Chronic Traumatic Encephalopathy (CTE) in the football and boxing community.

No player should feel pressured by adults or peers to return too soon. Coaches must be proactive and establish protocols for the education, prevention and treatment of concussions in your community's student-athletes. Ask your recreation board or athletic department what policies and training are in place for coaches, parents and student-athletes. Their goals are the same as yours in keeping the experience safe and rewarding. It is a team effort.