

CON

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As concussions have become more common throughout the past decade, West Side Story investigates the effect they can have on student-athletes and how treatment of concussions is advancing.

## EFFECTS AND PROTOCOL

Most students and athletes know the common symptoms of a concussion: headache, dizziness and confusion. But what many don't know are the feelings of debilitation and darkness one experiences during a concussion.

Cheerleader Ella Gibson '18 stated that she fell to the ground and just sat there for a second and that everything was just dark after getting her concussion. Football player Makhi Halvorsen '20 described a similar experience. Gibson continued to cheer while Halvorsen sat out for the rest of his football practice.

Grace Miler '19 illustrated lesser-grade symptoms when she first received her concussion, but reflecting on the injury made her change her opinions of it.

"I did not [pass out], I stayed standing up and I was able to kind of comprehend what was happening, but I could not see very well," Miler said. "It made me realize how

easy it is to get a concussion and how much it can affect you. When I used to hear that people got a concussion I thought that they just had a headache, but no. It hurts really bad, and it is something pretty serious."

After an athlete has suffered a concussion, there is a strict protocol that must be followed to ensure that there are no further damages. The protocol begins 24 hours after the symptoms have completely dissipated. The two protocols that are most prevalent at West are the REAP and SCAT5 test.

"The REAP protocol is the concussion management for the education side of recovery. The protocol stands for remove or reduce, educate, adjust or accommodate, or pace. It reduces the amount school work that piles up after a concussion when a kid misses school, allowing them rest time while they are returning from a concussion," West High athletic trainer Sheila Stiles said.

The SCAT5 is the most common test used to diagnose a concussion on the sidelines. But, the SCAT5 is a lot more effective if there is a neurocognitive baseline to compare to. This can be done by the athletic trainer and does not require a doctor to diagnose or treat an athlete, according to University of Iowa pediatric sports medicine specialist Andrew Peterson.

"I don't mind being the one to manage the concussion, but also if someone is really having some lingering symptoms or really struggling and I can't get a handle on it, that's when I really try to push

for [University of Iowa Sports Medicine] for the Concussion Clinic," Stiles said.

Not only was the effect of a concussion immediate on these athletes' ability to practice and compete, it also affected them in the classroom. At first, Halvorsen did not take a concussion test or know the culprit of his symptoms. This led to a drop in his ability to perform well in class.

"It was kind of hard remembering stuff for school, but it's slowly starting to come back," Halvorsen said roughly two weeks

**"CONCUSSIONS ARE DIAGNOSED BY SIGNS AND SYMPTOMS. IT'S NOT SOMETHING THAT YOU CAN TAKE AN MRI SCAN OF. IT GOES BY WHAT DO WE SEE AS THE MEDICAL PROFESSIONALS AND WHAT DO PEOPLE REPORT TO US HOW THEY'RE FEELING AFTER A TRAUMATIC BRAIN INCIDENT."**

- SHEILA STILES, ATHLETIC TRAINER

## TERMS TO KNOW

### CONCUSSION

**injury caused by a rapid acceleration or deceleration of the brain, causing chemical changes in brain and damaging neurons**

### CTE (Chronic Traumatic Encephalopathy)

**pathological condition involving degeneration of brain from repetitive microscopic injuries, such as microscopic hemorrhages**

### SCAT5

**a series of tests used to help determine if there is a concussion and to help with the recovery process**

### IMPACT TESTING

**a test athletes take once before the season starts and gives a baseline of short term memory and reaction time**

## BY THE NUMBERS

8.4%

of injuries diagnosed in the 2006-07 school year were concussions

24.8%

of injuries in the 2016-17 school year were concussions

18.1%

of boys soccer injuries are concussions

32.9%

of girls soccer injuries are concussions

14.8%

more girls soccer injuries were concussions than boys

*Source: National High School Sports-Related Injury Surveillance Study*

after first diagnosed. “My grades most definitely dropped for a little bit because [I] didn’t really know what was happening.”

Now, teachers are emailed to fill them in on the brain injury their student is experiencing. Just as athletes undergo a return to play protocol, the cognitive delays may promote a similar return to learning time period, which is usually within three weeks according to the American Academy of Pediatrics.

“Return to learn is the concept behind [students returning to school],” University of Iowa neurologist Mark Granner said. “It’s not something that coaches and trainers only have to know about, it’s something that teachers have to broadly be aware of too.”

The timeframe of a concussion’s effects in the brain vary widely based on the person. Dr. Peterson states that the average duration of symptoms is eight days. The best data is in high school boys where 95 percent of people are healed by the one month mark and 99.5 percent of people are healed by the six month mark.

At West High, athletes can expect to be sitting out for at least five days following diagnosis. This is because it will take this long to go through protocol to be ready to compete, but for many it takes longer than this. Stiles says that on average, athletes will not practice for a week to two weeks. He added that there are cases that are a lot longer while there are others right at the five days.

## IMPACT TESTING

Before the start of their seasons, seven teams participate in ImPACT test-

ing. This test is performed to establish a baseline to see if an athlete suffers a concussion during their season.

“Our contact sport athletes—[girls and boys] basketball, football, wrestling and [girls and boys] soccer—do ImPACT testing. It’s based solely on their performance alone; it’s not compared to anybody else. If their scores are similar or better to the scores they took at the baseline then we know their brain is most likely ready to return to activity,” Stiles said.

This year, the volleyball team has also been added to the list of teams that take the test. This baseline has become almost vital to diagnosing and recovering from concussions since there has never been a quantifiable method available before.

“Concussions are diagnosed by signs and symptoms. It’s not something that you can take an MRI scan of. It goes by what we see as the medical professionals and what people report to us on how they’re feeling after a traumatic brain incident. So the test gives us tangible data to go off of how the kid is progressing or not progressing and how they feel immediately after having an episode,” Stiles said.

However, Gibson believes that she received lesser quality treatment due to the fact that cheerleading does not participate in ImPACT testing.

“It felt a little different just because there wasn’t much structure to how I went through things. I’d heard from all my friends [on the football team] they do testing before the season even starts to compare it to if they get [a concussion] during the season. So, there’s nothing to compare my scores to.

It’s all based on how I feel and so I was just basically going off nothing,” Gibson said.

Since the number of concussions has increased, Stiles believes that ImPACT testing should be extended to the cheerleading team as well.

“The research is showing a high incidence of concussions in the sport of cheerleading and especially when we have the competitive cheer where they’re doing more tumbling,” Stiles said.

Although ImPACT Testing is a positive step to finally solving the mystery of concussions, there are also some drawbacks to using this test.

“The ImPACT [Test] is a double edged sword. You can do really well on your baseline and then never get back to that,” Stiles said.

## DAMAGES TO BRAIN FUNCTION

A few areas of the brain can be pinpointed as promoting the most symptoms. Specifically, global cerebral dysfunction can cause several other parts of this organ to be injured, according to Peterson.

“Your brain sits inside your skull in some fluid. When you hit your head, your brain can slam against the skull where it hit or it can also go backwards in [a] whiplash effect. There can also be some sort of shearing, like spinning,” said Stiles.

As the control center of the body, it can cause numerous other organs to malfunction, especially those located near the head and neck.

“Your occipital lobe is in the very back and controls your eyes. So that’s where you

might [have] double vision problems in general and the light bothering you," Stiles said.

This makes it more common for athletes to experience blackouts and issues pertaining to vision upon injury, such as those that Halvorsen did.

"I just felt really slow and I blacked out, which scared me because I kind of lost my breath and came back. Everything was darker," he said.

## KNOWING THE EFFECTS

Despite knowing the dangers of concussions, Dr. Granner allowed his son, Alex Granner '18, to play football in sixth grade.

"We considered it pretty carefully. We understood there was risk of traumatic brain injury, including concussion risk. In fact, one of the kids he played basketball with at that time had already had a concussion earlier in fifth grade when he was playing tackle football," Dr. Granner said.

"Behind the scenes, his mom and I were hoping he did not really go farther than that and that's what ended up happening," he said.

In line with his parents' beliefs, Alex decided after one year that he did not enjoy the sport and chose to stop playing.

"They sort of steered me away from it because it's not the best sport to play long-term. I didn't like it either because... I only touched the ball like once per game," Alex said.

Although Dr. Granner did not want his son to play the sport, he has held season tickets to Iowa football for twenty-five years.

"I cringe when I see players getting hit with the ball. I cringe when I see them going down on the turf," he said. "It's tough, knowing what the risks are to the brain and the nervous system. It's a little bit conflicting."

## FUTURE OF SPORTS

Since chronic traumatic encephalopathy (CTE) was discovered in the early 2000s, knowledge on the subject has slowly begun to accumulate. However, it was not until the movie "Concussion" was released in late 2015 that the public began to worry about the condition.

Though it has been known for over a decade, there are still comparatively little known facts about CTE. Additionally, most of the research has been done on the brains of former professional football and hockey play-

## MOST COMMONLY REPORTED SYMPTOMS

40.1% HEADACHE

15.3% DIZZINESS

8.6% CONFUSION

6.4% AMNESIA

3.9% LOSS OF CONSCIOUSNESS

Source: *Journal of Athletic Training*



ers, discluding many age groups and athletes.

"The brains that have been examined so far are people who've played professional football, but every professional football player played high school football and played college football, too, so it's really not known if there's a certain risk win-

dow or if stopping at a certain age reduces your risk or not," Dr. Granner said.

The lack of evidence of a correlation between this condition and high school athletes may resolve in coming years, but for now students look to their diagnoses as signs of whether to continue participation in their sport.

"It also made me a lot more cautious about high school cheer and how unsafe it is, because in all my three years of cheering, no one has ever gotten injured [as much]," Gibson said. "It's been the first two months [and I have had] head-neck injuries, which shouldn't be happening so that makes me a little nervous."

Halvorsen, having never suffered a serious injury from football, was taken off guard when he was diagnosed with a concussion. Now back to playing, he takes safety into account when tackling.

"Now I'm just a little more cautious. I'm a little more safe with the way I hit people, because I didn't like having a concussion, so I don't want to give someone [one] even if it's an accident," he said.

Even before diagnosis, Halvorsen clashed with his mother on their opinions of football.

"She always tells me that later on in life, people are just going to stop playing because they're going to realize how bad of a sport it is [due to the] injuries. It's not going to stop me [though]," he said. "Personally I feel safe enough because it wasn't a huge concussion. I feel like maybe if it was my second concussion or third then maybe I'd be more scared about it, might take a break for a year or something like that, [but] I feel like it's very hard to get one. You don't just get one from a little hit; it takes a big hit to get one."

While having experienced this risk, Halvorsen still has a passion for the sport, driving him to keep playing after having experienced the head trauma.

"It's my favorite thing to do," he said. "I'm just going to keep going until I'm going to have to stop at some point but I'm just going to keep going."

Dr. Granner, as a parent having experienced his son playing football, believes he members the demographic that may ultimately decide the fate of high-concussion sports.

"It's impossible to make football a completely safe sport, but the reality is soccer isn't a safe sport and basketball isn't completely a safe sport either," he said. "If the sport faces an uncertain future, in my opinion it's going to be in the hands of parents who either let their kids play or not."