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RICHARD ZEDNIK'S INJURY LEADS TO RESEARCH ON NHL SAFETY GEAR

"My first thought was, oh no, this guy's going to die," recounts Leslie Bisson, MD. "I saw him skating, sort of gliding past our bench, with his hand up to his neck, absolutely ashen white, with this terrible look on his face, and blood pouring out from under his hand."

Bisson, team physician for the Buffalo Sabres professional hockey club, was behind the team's bench at HSBC Arena in downtown Buffalo on a frigid night in February 2008 when Richard Zednik, a forward on the opposing Florida Panthers team, came within a fraction of an inch of dying from a neck wound.

Zednik had just emerged from what appeared to be an unexceptional fracas near the corner of the rink where Bisson sits and monitors, anxiously, every Sabres home game. During the scramble, however, a teammate's skate had nicked the 32-year-old left-winger's neck, cutting three-quarters of the way through his right carotid artery.

In an instant, the raucous arena was reduced to dismal silence as the wounded hockey player skated to his bench as spurts of dark red blood splashed onto the ice, marking his route across the rink.

STORY BY PATRICK KLINCK

PHOTO BY DOUGLAS LEVERE

“There’s a culture in the league to the effect that the more equipment you wear, the bigger baby you are.”
—Leslie Bisson, MD

Bisson, a clinical assistant professor in UB’s Department of Orthopaedics, responded instinctively to the crisis. In his haste to get to Zednik’s aide, he tore off the gate separating him from the hallway where players exit the ice. At least, that’s what an usher later told him. “I just remember taking it and throwing it out of the way and sprinting around,” says Bisson. “I ran as fast as I could over to Zednik and took my hand and shoved it up onto his neck.”

He asked the visibly weakened hockey player, “Are you able to walk?” and Zednik said that he was. “Well, walk with me to our training room for a second,” Bisson recalls saying, “so we can lay you down and get control of this thing.”

Once in the training room Bisson used a rolled-up towel to apply pressure to the artery. He kept on applying pressure during the ambulance ride to Buffalo General Hospital (BGH), right up until his patient was handed over to the care of Richard McCormack, MD, chief of emergency medicine at BGH and a clinical associate professor in UB’s Department of Emergency Medicine, who had been alerted ahead of time. Sonya Noor, MD, a vascular surgeon and clinical assistant professor in UB’s Department of Surgery, performed the operation to repair the artery.

Had Bisson not been able to staunch the flow, Zednik would have bled out in just four or five minutes. Had the artery been completely severed, there was probably nothing Noor could have done to save him.

The incident followed by just five months a paralyzing spinal injury to Buffalo Bills’ tight end Kevin Everett. As fate would have it, Bisson, who also serves on the Bill’s medical staff, was first on the scene to reach Everett. Emergency medical staff for both the Bills and the Sabres subsequently earned national accolades for the decisive steps taken in the first few crucial moments after the injuries occurred. Their actions saved Zednik’s life and mitigated the damage to Everett’s cervical spine.

STUDYING NECK GUARDS

Each of the accidents weighed heavily on Bisson. After the horror of coming upon Everett’s motionless body lying on the field, he even considered quitting. “I came home to my wife and said to her ‘I just saw the most miserable thing I’ve ever seen in my life,’” he told a *Buffalo News* reporter. “I don’t know why I do this.”

Instead of giving up, Bisson started looking for ways to prevent future sports tragedies and near tragedies from hap-

pening. In addition to teaching sports medicine at UB and maintaining his own orthopedic practice, he devotes about 15 to 20 hours a week to conducting research. Among other research interests, Bisson is now leading a study on neck lacerations in the National Hockey League (NHL), gathering data on their frequency and severity to determine just how much of a risk there really is. In the process, he’s building a knowledge base that can be used to inform any future decisions on how to deal with the problem.

“It was such a profound episode when Richard Zednik got his laceration and almost died,” Bisson says. “One question, as you’re organizing your thoughts after the event has passed, is whether this could happen again and what we can do to prevent it. I’ve got a son, nine years old, who plays hockey. I coached his team last year, so I’m in the arena a lot. All these kids wear neck guards, but there’s no evidence as to whether or not that works. There’s not a lot of research in this area. Nobody wears a neck guard in the NHL, so you see something like that happen and you wonder if someone is going to die the next time.”

It wasn’t until Bill Masterton of the Minnesota North Stars hit his head on the ice and died in 1968 that professional hockey

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players started wearing helmets routinely, and the league didn’t mandate their use for another 11 years. A native Minnesotan, Bisson, at 44, is of an age to remember the controversy over wearing helmets, but he is not jumping on any bandwagon to mandate the wearing of neck guards in the NHL just yet.

“Right now I’m thinking let’s just get some information,” he says. “There’s data out there, so let’s gather it and see what it tells us.”

An initial review of the literature turned up individual case studies of neck lacerations but no hard numbers about the frequency of that type of accident, making it impossible to determine the actual risk. The NHL does maintain a database of every injury that happens in the league, however, which Bisson’s group has been able to use as a primary source.

“We’ve got something of a control group in the NHL,” says Bisson. “We know how many teams are in the league, how many games they play, how many players suit up for each game, how many minutes they play. So you can look back over a given time period and see how many of these neck lacerations have occurred and what the risk is. So far we’ve found in

looking at the database that there’s about one skate laceration to the neck a year in the NHL. One a year doesn’t sound like a lot but it is more often than you would think.”

Working with his colleagues over the border, Bisson is also collecting data on the frequency of neck lacerations in Canadian amateur hockey, where neck guards are mandatory, to compare to the NHL numbers.

Gathering frequency data was step one of the study. The second part is to determine just where players are getting cut. Researchers are contacting players who have had lacerations and questioning them about the severity and exact location of their injuries, with the aim of creating a composite neck drawing that will show whether some parts of the neck are more vulnerable than others.

“The aim of the study is not to answer the question should somebody be wearing neck protection, because we don’t have precisely comparable groups of protected and unprotected players where we can compare the injuries,” says Bisson. “The aim of the study is to quantify the risk of a neck laceration in people who aren’t wearing neck protection as a routine, and then to see if there are specific sites that seem to have a predilection to being lacerated. So, if a person wanted to design or wear a neck guard, there would be some rational thought process behind deciding what type of equipment ought to be used.”

PLAYERS TALKING THE TALK

The design of current neck guards is not based on any research. It’s based on comfort and guesswork. There is a promising new material that Bisson has heard about, however, that might improve upon the design. Glen Maron, MD, a maxillo-facial surgeon who works with the NHL Atlanta Thrashers, told Bisson about the material, explaining that it is pliable like cloth until it is struck forcefully, and then it instantly stiffens up. “The idea is that you could create a guard that is soft and supple when you’re moving your head around, but which offers some degree of protection if you get hit real hard or real quickly,” Bisson reports. Such a material might protect against neck lacerations and injuries to the throat that occur from flying pucks and errant sticks, as well.

Any decision to mandate neck protection would be collectively bargained between the NHL, which has its rules and equipment committees, and the NHL Players’ Association. “They want to do things that are in the best interest of their players, but they want it to be data-based rather than ‘We think this would work, so let’s try that for a while,’” says Bisson.

“There’s a culture in the league to the effect that the more equipment you wear, the bigger baby you are. They talk to each other on the ice, so if you’ve got a guy that’s dressed up like a knight, he’s going to get a hard time from the other players. They’re going to make his life miserable. If the chance that he

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JOHN HICKEY/THE BUFFALO NEWS



RICHARD ZEDNIK, CENTER, THE NIGHT HIS CAROTID ARTERY WAS CUT BY A TEAMMATE’S SKATE.

“IN THE *PNAS* PAPER, much of what we are suggesting could work for addictive behaviors can be directly translated to some of the more severe aspects of AIDS dementia,” says Schwartz.

He adds that AIDS dementia is usually irreversible and fatal but that the collaboration with Prasad’s group

has given them a promising new avenue to study.

“We think that by using this nanoparticle technology, we might be able to bring antiviral drugs into the brain,” he explains.

In addition, Schwartz reports that his group is looking at a range of other diseases that could be similarly targeted.

“In fact, the brain is one of the hardest organs to target,” he says. “Now that we know it is possible to do that, it opens the possibility that we can consider doing this for a whole range of tissues. Currently we are planning to look at targeting prostate cancer and asthma.”

Prasad notes that the team also is studying how to combine other kinds of silencing RNA technologies with nanoparticles to potentially turn off the genes involved in a range of diseases and addictive behaviors, including gambling and obesity.

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—SUPRIYA D. MAHAJAN, PHD

HOCKEY, CONTINUED FROM PAGE 15

gets some throat injury is very, very small for him personally, it may not be worth it just for the headaches he’ll get from opponents, because they do get chirped at.”

Another potential objection to neck guards is that they might deflect skate blades to other vulnerable regions of the head and neck area and cause even more serious injuries, but again, there is no good evidence yet.

EMERGENCY RESPONSE GUIDELINES

After the Zednik incident, Bisson participated in efforts to develop a set of emergency preparedness guidelines that were recently adopted by the NHL.

Each year, members of the Team Physicians Society convene in the city where the NHL All-Star Game is held to conduct a hockey trauma course for all the team doctors. “I gave a talk on vascular injuries at our team physicians’ meeting in January of this year because I’ve become sort of an expert on it now, if there is such a thing as a major-vascular-injury-in-an-NHL-rink expert. I’ve dealt with one of them so I’ve seen as many as anybody. They wanted to know what worked and what we are going to do to improve things next time.”

The Team Physicians Society sets standard protocols for all teams to follow in the event of various emergencies, based on the collective experiences and expertise of its members. Then

the teams customize the standards to the unique circumstances of their own arenas. In one city, an ambulance that had to cross railroad tracks was stuck waiting for a train to pass, calling for the development of an alternate route to the nearest hospital.

“We have a team meeting at the beginning of every season,” says Bisson. “I call together our training staff and the other medical doctors and our security personnel and the ambulance drivers and everybody else, and we work through the scenarios that could possibly happen, the ones that could be life-threatening. A guy gets hit in the chest and his heart stops. What would you do? He gets hit in the throat. What do you do? A major airway, a major laceration, eye injuries, you can imagine all sorts of crazy things, so we try to focus on the ones that would be most likely among those extremely rare injuries to occur and we say, ‘Let’s figure out if there’s any little barriers that could interfere with us getting treatment for this person,’ and we’ve established protocols that way, as have all the teams in the NHL.”

The key to effective emergency response, Bisson says, is anticipation. When you know what to expect and everyone knows in advance what they are supposed to do, you get the kind of results that save lives.

NOT ALL FUN AND GAMES

While it might seem fun to have access to all the rink-side and sideline excitement surrounding two professional sports teams, hobnobbing with the elite players of the NHL and

“It may be possible to target the biomarkers of specific addictions or compulsive behaviors with similar technologies,” he explains.

“This research has reinforced our sense of how valuable are our interactions with basic physical scientists like Dr. Prasad and his group,” says Schwartz.

“The partnership between the Institute and the Department of Medicine is the basis of translational medicine,” Mahajan concurs. “The biologists are talking to the chemists

and vice versa and we are all understanding each other.”

The researchers are active participants in the strategic strength in Integrated Nanostructured Systems identified in the UB 2020 planning process, which brings together researchers in the life sciences, medicine and engineering to promote interdisciplinary advancements.

Additional coauthors on the paper are Earl J. Bergey, PhD, research associate professor in chemistry; Rui Hu, senior research sup-

port specialist and Hong Ding, PhD, Ken-Tye Yong, PhD, Rajiv Kumar, PhD, all postdoctoral associates in the Institute for Lasers, Photonics and Biophotonics.

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the NFL, consider that the official team physician is in effect the official team worrier. It’s evident that Bisson’s concern for his players’ welfare extends on and off the playing field.

“I’m watching the game differently than you are,” he says. “I’m stressing out. I don’t want anybody to get hurt. I’m ready to have to run onto the field at any second and deal with somebody who’s paralyzed. I watch the play, and then I really watch the end of the play, and I’m looking at this tangle of bodies to make sure that I see everybody stand up. We’re watching a different game.”

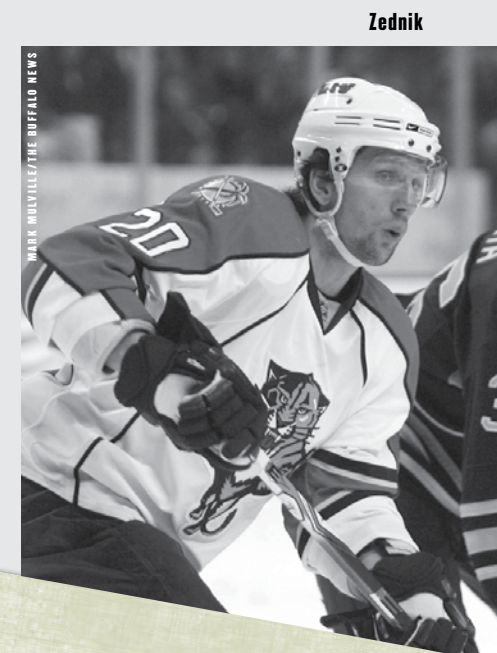
Bisson reports that the neck laceration research project is about three-quarters of the way complete. A case report on Zednik’s injury coauthored with McCormack, the attending emergency room physician at BGH, and Noor, Zednik’s surgeon, is pending publication in the *American Journal of Sports Medicine*.

“If there were compelling data that came out of this study,” Bisson says, “plus some other studies that indicate it’s really obvious people should be wearing a neck guard, that’s how the decision should be made. I don’t expect this one study to answer that question. I think it’s a first step toward deciding how much we should worry about neck lacerations happening. Is it

incredibly rare? Was Richard Zednik’s injury the equivalent of being hit by lightning? I don’t know if we’d have to make everybody wear neck guards for that. On the other hand, maybe it’s happening more often than we think and we’re just lucky that it hasn’t been deep enough to kill somebody.”

Although Zednik missed the rest of the 2007–08 season, he had a great year with the Panthers in 2008–09. Like the rest of the players in the league, he hasn’t been wearing a neck guard. **BP**

Patrick Klinck is a freelance writer based in Buffalo. He was at HSBC Arena the night Richard Zednik was injured.



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