

HOCKEY

Concussions Plague Women's Hockey as Stars Are Sidelined

By **SETH BERKMAN** DEC. 18, 2015



Josephine Pucci in September. Pucci, who had three diagnosed concussions in college and one in high school, retired from hockey last summer at 24.

Credit Bryan Anselm for The New York Times

The gold medal game at the Sochi Olympics last year represented the pinnacle of women's hockey: a [captivating 3-2 overtime victory](#) by Canada over the United States that drew almost five million viewers on NBC.

But Amanda Kessel, a leading scorer for the Americans in Sochi and the college player of the year in 2013, has not played since, ending her career at Minnesota at 23 [because of lingering symptoms](#) from a [concussion](#) sustained before the Olympics. Her teammate

Josephine Pucci retired last summer at 24, cognizant of her concussion history.

A concussion kept Canada's Haley Irwin out until the Olympic tournament's semifinals. She assisted on the tying goal in the last minute of the final, but her symptoms returned after the Olympics. Another concussion, in January, has kept her from playing professionally in the Canadian Women's Hockey League.

"You feel completely lost and completely broken as an athlete," Irwin, 27, said in March after being left off Canada's roster for the world championships.



Pucci (24) defending against Canada during the gold medal game at the 2014 Winter Olympics in Sochi, Russia.

Credit James Hill for The New York Times

Women's hockey is a growing sport, evolving through quicker and stronger players who are finally being rewarded for their talents as paid professional athletes. But concussions have kept some of the best players away from the ice for extended periods as the sport struggles to combat an issue that football and men's hockey have failed at times to properly address. The N.H.L. is facing litigation,

with former players accusing the league of glorifying violence and ignoring the dangers of repeated [head injuries](#).

“The amount of players still getting concussions on the national level and college level, it’s too many,” said Pucci, whose sister’s hockey career was also ended by a concussion.

Women’s hockey penalizes body checking and does not have a history of fighting, creating a perception that the sport is safer than men’s hockey. But it is still a contact sport, particularly along the boards and around the goal. As the players grow faster and stronger, they create more powerful collisions, and enforcement of penalties can vary by level.

Despite increased public discussion, there is a dearth of information focused on concussions in women’s hockey. The few published studies available are unsettling.

An eight-year study released this year by the International Ice Hockey Federation analyzed women’s hockey injuries at the world championships and the Olympics. It found that concussions were the third most common injury (15.5 percent), behind contusions (28 percent) and [sprains](#) (20.8 percent).

A 2014 summary of self-reported concussions among [N.C.A.A.](#) student-athletes said that women’s hockey had the largest percentage of players who had experienced at least one concussion, [at 20.9 percent](#).

In 2012, Dr. Paul Echlin, who helped develop a [concussion curriculum in Canadian schools](#), led a small [study](#) of two Canadian college teams and found that female hockey players sustained concussions almost twice as frequently as men did.

The New York Times contacted every N.C.A.A. Division I women’s hockey program for concussion tracking, training and protocol details. Almost two-thirds of colleges did not respond with any information, some citing confidentiality issues. Only Cornell and New Hampshire provided all of the requested data.

USA Hockey and Hockey Canada did not provide staff members for interviews to detail their concussion programs, instead referring to information on their websites.



Pucci began playing at an early age. “I’ve put so much into hockey, and I’ve gotten so much in return,” she said, “but it’s to the point where I feel like it’s time to walk away before I give hockey the opportunity to take too much away from me.”

Credit Bryan Anselm for The New York Times

“The problem is these organizations are dancing around the issue,” Echlin said, citing concerns about participation numbers as a reason that national federations might not be more forthcoming.

Women’s hockey is not supported by the vast riches that back the N.H.L. and the N.F.L. After college, top players in North America can choose between two professional leagues: the [C.W.H.L.](#), which is in its ninth season and does not pay player salaries, and the National Women’s Hockey League, which began play in the fall and [offers salaries](#).

The C.W.H.L.’s physician, Dr. Laura Cruz, recognizes that women’s professional hockey has limited resources. Every N.H.L. game has several doctors and spotters who can identify players exhibiting signs of concussions during games. The C.W.H.L. and the N.W.H.L. employ smaller medical staffs at games.

Despite limited means, the C.W.H.L. has made an effort to continually update concussion tracking methods in recent years, Cruz said, and the N.W.H.L. has a player safety department to monitor dangerous plays. It [issued its first suspension](#) this month.

Female professional hockey players are eligible for league [health insurance](#), but it may not cover all concussion treatments, some of which can cost thousands of dollars. Professionals in North America make a maximum salary of \$25,000; the average N.H.L. salary is about \$2.5 million. In college, student-athletes are often covered under limited campus medical plans.

At the N.C.A.A. level, there can also be disparities in resources among larger and smaller institutions, said Dr. Jeffrey Kutcher, an associate professor of neurology at the University of Michigan.

“Every organization that touches the sport needs to be involved and working together,” said Kutcher, who is the director of the N.B.A.’s concussion program. “But that has to be coordinated and real.”

The [N.C.A.A.](#) advocates uniform concussion policies for all members, but some players said concussion information was often relayed in broad strokes and only in preseason training sessions that lasted under an hour.

Digit Murphy coached women’s hockey for almost 30 years. She said that with a growing platform, players had the ability to force change and initiate more dialogue with the sport’s governing bodies.

“I really believe someone is going to get killed,” Murphy said. “The sport has gone through so many iterations — N.H.L. and USA Hockey has increased awareness of it, but as you compete for higher stakes, you have this inability to care about the consequences of playing the sport because you’re so focused and intensely involved in the game.”

She added, “When athletics becomes a business, anything that becomes an elephant in the room is not discussed.”

Women with concussion histories described memory deficits and fears of chronic traumatic [encephalopathy](#), a degenerative brain disease that has been diagnosed in dozens of former football and hockey players. Many share a familiar script of being holed up in dark rooms, sometimes having to abandon school, jobs and their playing careers.

Paige Decker sustained a career-ending concussion in November 2013 when she was playing for Yale and was blindsided by a check that sent her head crashing to the ice.

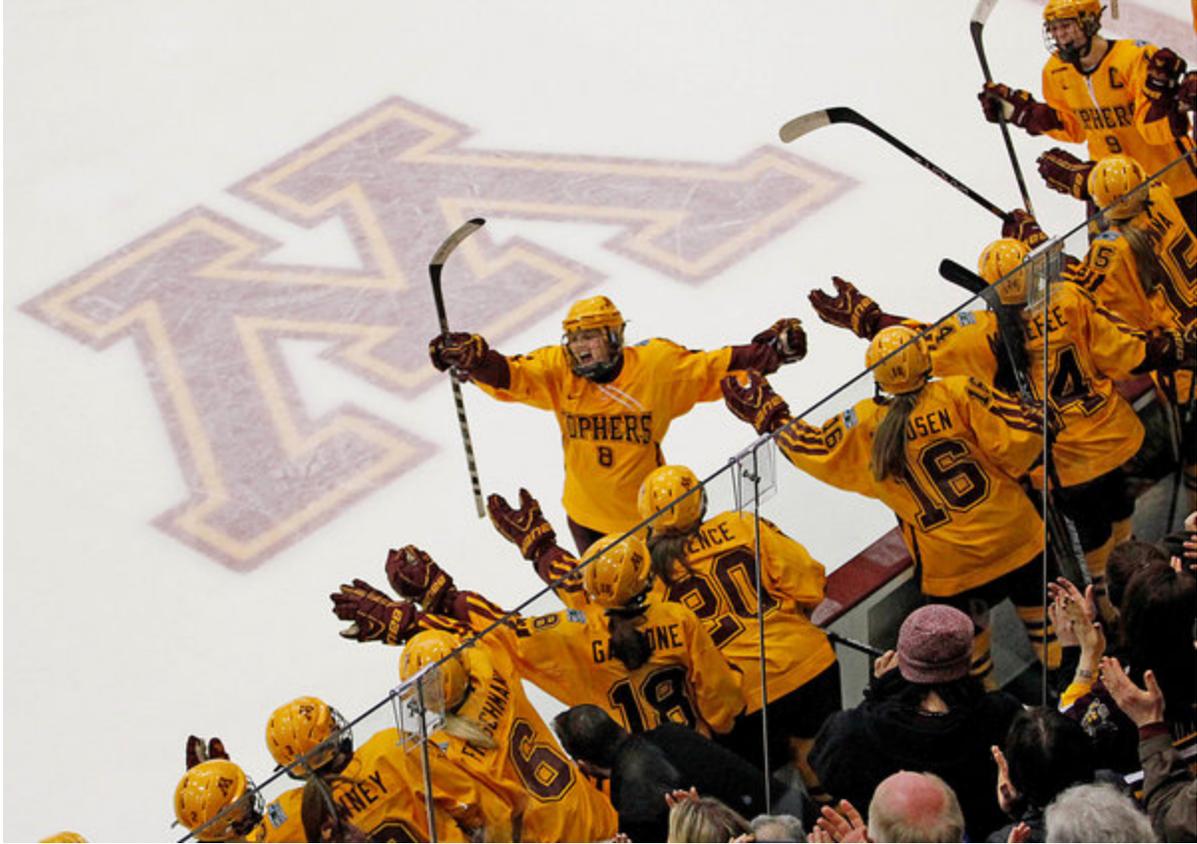
Decker has visited more than 40 physicians throughout North America, searching to alleviate the daily pains that saturate her nerves and muscles. She often leaves only with misdiagnoses and thousands of dollars in bills that her insurance does not cover. She compared her constant headaches to barbed wire constricting her brain.

Decker, 23, left a consulting job in Boston a year ago because of her health. She is largely confined to her parents' house in Connecticut.

"That's the worst feeling in the world, to not know how to get your life back," Decker said. "I can't even articulate — there's no more raw, darker, deeper emotion of that helplessness."

Decker's injury has left no jarring scars, but two pink earplugs signal her discomfort. They reduce the chalkboard-scratching sensations that permeate her head whenever her Labrador retrievers bark or any high-pitched noise emanates nearby.

Decker said women's hockey should explore more repercussions for illegal physical play. Suspensions and fines are rare.



Minnesota forward Amanda Kessel (8), the college player of the year in 2013, after scoring against Boston University in that year's N.C.A.A. championship game. Minnesota won, 6-3. Kessel has not played since the 2014 Olympics because of concussion symptoms.

Credit Stacy Bengs/Associated Press

The player who hit Decker was called for interference, her third infraction of the game. She returned to play after serving a two-minute penalty.

“That penalty didn’t have to happen,” Decker said. “I didn’t have to go through two years of suffering.”

At the time of her injury, Decker said, Yale’s medical staff estimated that she would return from her injury within 10 days. When she did not, she sought alternative treatments through Internet searches and colleague recommendations, unaware of the dangers that some unproven cures carried.

Decker visited Dr. Ted Carrick, whose methods include using a GyroStim, or rotating chair, an alternative method with [varying effectiveness](#). Pucci attributed part of her recovery to visits with Carrick, who also treated the Pittsburgh Penguins star Sidney Crosby. But Decker said she felt awful after the procedure.

Some players seek other untraditional cures like hyperbaric chambers. Decker eventually traveled to Vancouver, British Columbia, to receive prolotherapy, which included an injection of Novocain and dextrose in her neck. When her symptoms returned, she was referred to a local physician who could recreate the dosage.

Decker received 14 injections, causing her neck to swell like a balloon, she said.

“The most excruciating pain I ever experienced in my life,” she said.

Decker added that she knew six college teammates with long-term concussion symptoms. Two teammates, Ashley Dunbar and Lynn Kennedy, sustained career-ending concussions within weeks of Decker’s.

“You see it happening, you know it happens, but for whatever reason I just never really thought that could be me,” Kennedy said.

Asked why there was a rash of concussions in women’s hockey, players, neurologists and physicians offered various reasons, including inconsistent refereeing, inadequate helmets and skill-level disparities.

Some players said they had not learned how to take a hit in youth hockey. Many do not experience more physical play, including checking, until reaching college or higher levels of competition.

Body checking caused 30.8 percent of the concussions in the I.I.H.F. study, but a penalty was called in only 25 percent of the incidents in which a concussion was caused by a body check.

Head injuries can also occur through unintended collisions, which were the leading cause of concussions in the I.I.H.F. study. During a practice drill in 2010, Minnesota goalie Alyssa Grogan dived for a poke check, and a player fell and kneed her in the forehead while another landed on the back of her head. It was her first concussion, but she was forced to retire and missed three semesters at the university.

Even after multiple concussions, leaving the game can be difficult. Despite new professional opportunities, options are limited after college. Participation in the Olympics can lead to thousands of dollars in performance bonuses. Some players hide symptoms to prolong their careers.

Against the advice of some doctors, Pucci, who had three diagnosed concussions in college and one in high school, worked her way back to make the 2014 Olympic roster. But in Sochi, she said, she knew that she would soon leave the game.

“I’ve put so much into hockey, and I’ve gotten so much in return, but it’s to the point where I feel like it’s time to walk away before I give hockey the opportunity to take too much away from me,” Pucci said.

Pucci has known Decker since youth hockey, and they have discussed creating a nonprofit organization to address concussions. Pucci works in clinical research at a cerebral vascular lab at NewYork-Presbyterian Hospital/Columbia University Medical Center and hopes to focus her work on concussions in the future.

For now, Decker occasionally posts on a blog she created in September, [The Invisible Injury](#), while the hockey sticks in her garage gather dust.

She enrolled in a comprehensive concussion evaluation program with Kutcher at Michigan and said she was making “slow but steady progress.”

Decker said she did not know the best solution for curbing concussions in women’s hockey. Like many players, though, said believes that more awareness would make a difference.

“You see left and right in doctors’ offices and wherever, your quick little synopsis of what a concussion is, what are symptoms,” she said. “Everyone knows those; it’s textbook. But when you get beyond the typical couple of weeks’ recovery, it’s like, then what happens? That was the challenge I faced.”

Decker added: “There wasn’t a clear-cut path for me or guidance as to what that next step should be. You can’t be running around like a chicken with its head cut off trying to get help. There’s a lot of room for improvement in terms of concussion awareness and what that actually means.”