Is The Evolution of Hockey Equipment For the Better?

Capstone Research

Kristen McMillen

May 12, 2014

As Alex Ovechkin once said “I’m okay. Russian machine never breaks.” He says this after being struck with a puck. I’m sure that twenty year ago it would have been a different story. How has the advancement of hockey equipment over the last twenty years changed the way hockey is played? The more aggressive play in hockey over the past twenty years has sparked the technological advancements in hockey equipment. The equipment in hockey has become smaller, less bulky, but more protective enabling the players to skate faster. Even though the equipment has been made better there seems to be more injuries now in hockey. The more aggressive play in hockey over the past twenty years has sparked the need for even more protective equipment.

Hockey was created in the late 1800s. From the late 1800s to now hockey is almost unrecognizable. Not only have the skills become better but the equipment has become more protective. The aggression of the game has increased over the years.

 Injury is a very common part of the game of hockey. With the equipment becoming substantially better and more protective you would figure the rate would be going down but, it continues to rise do to the more aggressive play. One of the most common injuries is concussions they occur in player of all ages. Concussions happen more often to players when they begin checking. As you can see in the table when checking is allowed the rates of concussion go up drasticly

.[[1]](#footnote-1)

The rate of concussion is larger now then it was twenty years ago. Your probably thinking how this can be considering the helmet that is manufactured now is more protective. There have also been new rules put in place to help reduce the rate of concussion. These new rules have failed to work. It seems no matter the precautions they are taking it is not helping.

Dr. Kennedy’s Evaluation of the sport of hockey, discusses the growing rate of injuries.[[2]](#footnote-2) With the rate of injury as high as it is, it makes hockey one of the most dangerous sports in America. Kennedy says that 70 percent of the sports injuries are contusions.[[3]](#footnote-3) Also he states that the most important issue to deal with in the game of hockey is cervical spine injuries, quadriplegia or complete paralysis. Over the years the rates of injury have increased. Spinal injuries are caused from players being checked or hit illegally. These injuries occur in player’s 15 to 25 years old for the most part. Kennedy also points out that 15 percent of players sustain concussions according to insurance data.[[4]](#footnote-4) 30 percent of all injuries in hockey are caused from harm to the head or neck.[[5]](#footnote-5) Hockey forwards are at the highest risk for these injuries. Kennedy says injuries deepened on the severity of play and if there was a preexisting condition. He states that the rules need to change and precautionary measures should be taken to prevent injuries.[[6]](#footnote-6)

A major problem in hockey out of Canada is eye injuries[[7]](#footnote-7). In 1972 to 1973 there were 287 eye injuries reported of those were players under the age of 18 and 20 were with blind eyes.[[8]](#footnote-8) With the number of eye injuries so high there was a need to help reduce such a high number. They put in place a rule saying children under the age of 18 must wear eye protection while playing hockey. Later in 1997 to 1998 in Canada the numbers of eye injuries were at an all-time low. There were 23 eye injuries, leaving only 4 people blind.[[9]](#footnote-9) All minor player in Canada are required to where full face protection. In the major junior league player are required to wear half shields. In the National hockey league no eye protection is required. There is controversy about wearing full face masks. Though some seem to believe that it is causing more harm to the spine. But after several studies across Canada it has been proven that spinal injuries have not increased due to full face masks. With the implement of full face mask not only has eye injuries significantly decreased but, also the number of facial and dental injuries have gone down as well.

Hockey is considered one of the most harmful sports throughout youth and adults Hockey is known to have a highest rate of injury or death in the sports world. There was one study done over a fifteen year period from 1982 to 1997.[[10]](#footnote-10) The study came to the conclusion that children under the age of 16 should not be able to check in the youth hockey leagues. They believe that the rates of concussions are way too high for children at such a young age. Younger children have a much higher chance of sustaining a disabling injury. In an anther study conducted by Sutherland in the state of Ohio they saw 706 boy injuries and one girl injury in the age group 5 to 14.[[11]](#footnote-11) Meanwhile, Daffner only saw four injuries and no concussions over the period of two seasons in a newly forming program in Kentucky with only 130 players. Daffner studied injuries among the ages of five to seventeen. His rate was extremely low among players of this age range.[[12]](#footnote-12) There was also a study in Minnesota that focused on 100 youth player over the course of on season. 15 out of the 100 youth players ended up with injuries. Most of the fifteen injuries were considered minor.[[13]](#footnote-13) The authors of the many studies in youth hockey have different scales as to what they consider injuries among youths. Although they seem to agree, as it has been reported by the same authors that studied youth hockey that the rate of injury has increased in the high school hockey level. They seem to think it increases because of the sport of hockey becoming more competitive. But there is also a notable difference between boys and girls who are involed in the sport of hockey the boy players have a significantly higher rate of injury then girl player of the same age that play with no checking.

In an article written by the Associated Press NHL player, Peter Mueller had a helmet custom made to better protect him after suffering a severe concussion, resulting in missing his whole NHL season that year.[[14]](#footnote-14) Mueller thinks if there is a player that is faster and stronger players will try to check them harder. This has always existed in the world of hockey and they will have more protective equipment allowing these catastrophic hit to be unavoidable in the game. The NHL has started expressing their concerns with how much helmets are protecting their players. Although they do say that even if the helmets do improve in protection, they do not think the rate of concussion of players at such a high caliber will decrease significantly.[[15]](#footnote-15) University of Ottawa head of Nuerotrama, Blaine Hoshizaki study hits similar to Mueller’s hit. He mainly studies Zdeno Chara’s hit on Pacioretty and the numerous hits on Sidney Crosby. He said that Pacioretty’s hit was much more violent than Crosby’s hits. Pacioretty’s suffered a head injury and spinal displacement. While Crosby only suffered a head injury. Later in a lab simulation of the collisions he came to the conclusion that if Pacioretty’s spine did not move, he would have had a faster return than Crosby. Crosby suffered dramatic brain tissue stress. Hoshizaki states that helmets are doing what they are aimed to do which is to protect from serious head injuries. But preventing concussions is still in the making. [[16]](#footnote-16) Helmets are designed for linear collision which consists from hitting your head off the ice. The impacts to the head that hockey players most likely are to receive are angular acceleration; where a player all of the sudden hits another player at full speed. Hoshizaki says, concussions will never be obsolete they will just get better at protecting against them.[[17]](#footnote-17) Cascade a company that makes hockey helmet has a mission to make helmets that better protect the players wearing them and they are doing just that. Cascade has come across cutting edge technology which helps to better destitute the energy absorbed in a hit between players. This technology is used in there M11 helmet and is beneficial to players of all ages.[[18]](#footnote-18)

 Hockey equipment has been change to tolerate shots, collisions and slashes. The equipment has come so far. The materials that formally were used to make equipment are now different and are more durable materials such as plastics and composite. [[19]](#footnote-19) Equipment now days are designed to sustain higher levels of impact. These changes cause players to be less interested in their own well-being. The change also allows the pace of the game to pick up causing more serious risks of injuries

 Elbow pads have gone from small flimsy pieces of equipment with little protection. Now, they have become twice the size with hard plastic outer covering with a more rigged structure. The pad also included a piece to protect the forearm. This piece comes down to your mid wrist which is about the top of your glove. This forearm piece attached to your elbow pad is to help protect against injuries from a slash with a stick. [[20]](#footnote-20) The new pad also is to close the gap between shoulder pads. The new design of elbow pad is supposed to help players of all ages stay safe. This new elbow pad is helping to protect the place were equipment does not cover and provide a new layer of protection.

Goalie pads today are ten times better than they ever were. They used to be stuffed with hair to provide a layer of light weight protection. My how things have changed for elbow pads. Now goalie equipment is injected with foam to create a greater barrier against shots and keep the goalie’s pad light weight. It also it allows the goalie to remain flexible. The new materials that are mostly used in goalie pads are nylon, cell foams and plastic, inside the pads to maintain good defections.[[21]](#footnote-21) But the goalie equipment has to fall under much regulation to maintain a shooting space for players and the goalies to rely on their natural athletic abilities.[[22]](#footnote-22) Not only has the goalie pads changed, but the sticks have changed as well. They have changed to carbon fiber which is more durable than wood. It also is lighter on their arms.

Throughout the years hockey sticks have gone from wood to composite. The new sticks are now made with carbon fiber and graphite. Even though most hockey sticks look the same besides their varying graphic design they are different. There is much thought that goes into such a simple piece of equipment. Great consideration of the consumer’s ideas and needs are brought to the designer’s attention before he begins to make their new stick. There are many variations that the stick can have. Flex is one variable, it controls how ridged the stick is. There can be different places within the stick, where it will flex is the most important. The point of flex can vary in every stick depending on the personal preference of the consumer. Flex is important because it makes shots harder. When your weight transfers from back to front the bend of the ‘flex’ causes the shot to move at a much higher rate of velocity and have a higher accuracy.[[23]](#footnote-23) Composite sticks are the latest and greatest of hockey stick technology but there is a down side to composite. A player such as Gretzy who used to play in the NHL says they lose the feeling of the puck on their stick and Gretzy refused to change to composite sticks.[[24]](#footnote-24) The composite stick is lighter which plays a major roll for players, now making them faster on the ice. The composite stick being lighter also has improved stick handling. When players used to play with wooden sticks the ability to moves quickly with precision was affected by the heavy breakable wood. The new change in technology with the composite sticks has made more variables within the stick for the player to customize the stick to their specific needs, to further develop their stick handling. The changes in the skill set of hockey players from when wooden sticks were used to now have changed just by improving a sticks technology.

Even with technology in equipment changing year after year is it for the better? Branden Shananahan seems to think that ever changing equipment is posing a bigger problem for players. Shananah is a three time Stanley Cup Champion and a future Hall of Famer. Shananahan is also the National hockey leagues, Vice President to player safety.[[25]](#footnote-25) He has a nine year old son Jack. Shananhan disciplines many players of the NHL he is unyielding with them as well as he is with his son Jack. [[26]](#footnote-26) As Shananhan goes on to talk about equipment he states “They’re too hard,’’ Shanahan said of his son’s shoulder pads. “When he gets to an age where there’s body checking, I won’t let him wear things like this.’’[[27]](#footnote-27) Shanahan is not the only one feeling this way Bruins president Cam Neely says “Personally, I’d rather have a player with a separated shoulder than someone with a concussion, “I don’t know why it’s that difficult to look at the equipment and say, We really need to do something with the shoulder pads and elbow pads. ’’[[28]](#footnote-28) Many others involved in the hockey world see these same issues brought up by Neely and Shanahan. There have been many amazing technological advancements though out the game of hockey to make the sport safer for players. This evolution of equipment has not only made the sport more dangerous for small boys and girls at the age of thirteen but it have made it more dangerous for grown men and women twice there size. Yes some of the evolution of equipment has made the game safer, but the evolution has gone too far and instead of doing its job of keeping every one safe. The equipment ends up hurting the surrounding players. These advancements allow players to become the Hulk or Iron Man. These pieces of equipment are put on some of the strongest athletes in the world and can cause catastrophic injuries.

Although the evolution of equipment in hockey over the past twenty years has been great and helpful it has come too far and a change is needed to figure out how to fix the imbalance of equipment. There needs to be a happy medium of equipment being strong and protective but it also needs to be safe for the other players in the game.

Bibliography

Advameg Inc. "How Products Are Made." How Hockey Stick Is Made. 2006. Accessed March 18, 2014. http://www.madehow.com/Volume-4/Hockey-Stick.html.

Beland, Jean-Francois. "Patent US6205583 - Adjustable Elbow Pad - Google Patents." Google Books. March 27, 2001. Accessed February 28, 2014. http://www.google.com/patents/US6205583.

Constantin, Serban A., BSc, Andrew Howard, MD, and Allison Macpherson, PhD. "A Systematic Review of the Association Between Body Checking and Injury in Youth Ice Hockey." In Clinical Journal of Sports Medicine, by Joel M. Warsh, BSc, 134-44. 2nd ed. Vol. 19. New York City: Lippincott Williams & Wilkins, 2009. Accessed April 6, 2014. http://journals.lww.com/cjsportsmed/toc/2009/03000.

Cusimano, Michael D., Nathan A. Taback, Steven R. McFaull, Ryan Hodgins, Tsegaye M. Bekele, Nada Elfeki, and Canadian Research Team in Traumatic Brain Injury and Violence. "Images in This Article." Open Medicine. March 15, 2011. Accessed May 20, 2014. http://www.ncbi.nlm.nih.gov/pmc/articles/PMC3205817/figure/table5/.

Ernst, Maxwell E. "Illumin - Composite Technology and the Hockey Stick Revolution." Illumin - Composite Technology and the Hockey Stick Revolution. 2012. Accessed February 28, 2014. https://illumin.usc.edu/printer/223/composite-technology-and-the-hockey-stick-revolution/.

"Goalie Equipment - How Times Have Changed!" Goalie Equipment - How Times Have Changed! Accessed May 08, 2014. http://www.streetdirectory.com/travel\_guide/42132/recreation\_and\_sports/goalie\_equipment\_\_\_how\_times\_have\_changed.html.

"HIPRC: Best Practices." HIPRC: Best Practices. Accessed April 28, 2014. https://depts.washington.edu/hiprc/practices/topic/recreation/icehockey.html.

"History of the NHL Officials' Equipment." Officials Association. January 20, 2003. Accessed February 24, 2014. http://www.nhlofficials.com/display\_article.asp?articleID=3.

"How Hockey Equipment Has Changed - Made Man." Made Man. Accessed May 08, 2014. http://www.mademan.com/mm/how-hockey-equipment-has-changed.html.

Kennedy, Michael A., Dr. "ICE HOCKEY AND TRAUMATIC INJURIES: THE MOST DANGEROUS SPORT IN THE USA | Expert Medical Care." ICE HOCKEY AND TRAUMATIC INJURIES: THE MOST DANGEROUS SPORT IN THE USA | Expert Medical Care. Accessed March 30, 2014. http://www.expertmedicalcare.com/ice-hockey-and-traumatic-injuries-the-most-dangerous-sport-in-the-usa/.

Press, Associated. "NHL Looking at Helmet improvements." ESPN. September 29, 2011. Accessed May 07, 2014. http://espn.go.com/nhl/story/\_/id/7036092/nhl-players-researchers-take-hard-look-helmets.

Reebok International Ltd, and NHL. "The History of Hockey Equitment." NHL. 2007. http%3A%2F%2Fstars.nhl.com%2Fext%2Fpdf%2FNHL\_UniformBooklet.

Shinzawa, Fluto. "NHL Seeks Improvements in Equipment Safety - The Boston Globe." BostonGlobe.com. May 20, 2012. Accessed May 12, 2014. http://www.bostonglobe.com/sports/2012/05/19/nhl-seeks-improvements-equipment-safety/qCK53CUq1upvel3SC9aidK/story.html.

Soller, Jon. "Making Shafts." Making Shafts. 2007. Accessed March 20, 2014. http://www.sollercomposites.com/MakingShafts.html.

Willer, Barry, Beth Kroetsch, Scott Darling, Alan Hutson, and John Leddy. "Injury Rates in House League, Select, and Representative Youth Ice Hockey." Medicine & Science in Sports & Exercise 37, no. 10 (2005): 1658-663.

1. Cusimano, Michael D., Nathan A. Taback, Steven R. McFaull, Ryan Hodgins, Tsegaye M. Bekele, Nada Elfeki, and Canadian Research Team in Traumatic Brain Injury and Violence. "Images in This Article." Open Medicine. March 15, 2011. Accessed May 20, 2014. http://www.ncbi.nlm.nih.gov/pmc/articles/PMC3205817/figure/table5/. [↑](#footnote-ref-1)
2. Kennedy, Michael A., Dr. "ICE HOCKEY AND TRAUMATIC INJURIES: THE MOST DANGEROUS SPORT IN THE USA | Expert Medical Care." ICE HOCKEY AND TRAUMATIC INJURIES: THE MOST DANGEROUS SPORT IN THE USA | Expert Medical Care. Expert Medical Care, n.d. Web. 30 Mar. 2014. [↑](#footnote-ref-2)
3. ibid [↑](#footnote-ref-3)
4. ibid [↑](#footnote-ref-4)
5. ibid [↑](#footnote-ref-5)
6. ibid [↑](#footnote-ref-6)
7. "HIPRC: Best Practices." HIPRC: Best Practices. N.p., n.d. Web. 28 Apr. 2014. [↑](#footnote-ref-7)
8. ibid [↑](#footnote-ref-8)
9. ibid [↑](#footnote-ref-9)
10. Willer, Barry, Beth Kroetsch, Scott Darling, Alan Hutson, and John Leddy. "Injury Rates in House League, Select, and Representative Youth Ice Hockey." Medicine & Science in Sports & Exercise 37.10 (2005): 1658-663. Print [↑](#footnote-ref-10)
11. Willer, Barry, Beth Kroetsch, Scott Darling, Alan Hutson, and John Leddy. "Injury Rates in House League, Select, and Representative Youth Ice Hockey." Medicine & Science in Sports & Exercise 37.10 (2005): 1658-663. Print [↑](#footnote-ref-11)
12. ibid [↑](#footnote-ref-12)
13. ibid [↑](#footnote-ref-13)
14. Press, Associated. "NHL Looking at Helmet improvements." ESPN. ESPN Internet Ventures, 29 Sept. 2011. Web. 07 May 2014. [↑](#footnote-ref-14)
15. ibid [↑](#footnote-ref-15)
16. ibid [↑](#footnote-ref-16)
17. ibid [↑](#footnote-ref-17)
18. ibid [↑](#footnote-ref-18)
19. "How Hockey Equipment Has Changed - Made Man." Made Man. N.p., n.d. Web. 08 May 2014. [↑](#footnote-ref-19)
20. Beland, Jean-Francois. "Patent US6205583 - Adjustable Elbow Pad - Google Patents." Google Books. March 27, 2001. Accessed February 28, 2014. http://www.google.com/patents/US6205583. [↑](#footnote-ref-20)
21. Goalie Equipment - How Times Have Changed!" Goalie Equipment - How Times Have Changed! N.p., n.d. Web. 08 May 2014. [↑](#footnote-ref-21)
22. ibid [↑](#footnote-ref-22)
23. Ernst, Maxwell E. "Illumin - Composite Technology and the Hockey Stick Revolution." Illumin - Composite Technology and the Hockey Stick Revolution. 2012. Accessed February 28, 2014. https://illumin.usc.edu/printer/223/composite-technology-and-the-hockey-stick-revolution/. [↑](#footnote-ref-23)
24. ibid [↑](#footnote-ref-24)
25. Shinzawa, Fluto. "NHL Seeks Improvements in Equipment Safety - The Boston Globe." BostonGlobe.com. N.p., 20 May 2012. Web. 12 May 2014. [↑](#footnote-ref-25)
26. ibid [↑](#footnote-ref-26)
27. Shinzawa, Fluto. "NHL Seeks Improvements in Equipment Safety - The Boston Globe." BostonGlobe.com. N.p., 20 May 2012. Web. 12 May 2014. [↑](#footnote-ref-27)
28. ibid [↑](#footnote-ref-28)