



USA Hockey Body Checking Rule Change: Comparison of Contact Situations between 12U and 14U USA Hockey Nationals Tournament

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<p>Body checking has been the most talked about subject in the field of ice hockey for the past years. National ice hockey associations have lately reviewed their body checking rules, one of them being USA Hockey, second largest national association in the hockey world.</p> <p>USA Hockey saw a noticeable dropout rate in the age categories where body checking was introduced and allowed (12 and under). For the season 2011-2012, USA Hockey decided to remove body checking from 12U ice hockey, still allowing body contact, raising the age of “full contact”(body checking) hockey to 14U.</p> <p>The goal of the rule change was, gradually introduce body checking to the players and retaining young athletes in the sport, focusing on educating the players and coaches, but at the same time keeping certain level of physicality in the game. USA Hockey wanted to do a research to find out if the players are used to the new rules and if the game is still physical, within the new rules.</p> <p>Data was recorded at the end of the season in the National tournaments in 2012, comparing the severity of contact and the rate of change of puck possession, in both 12U and 14U, hoping to see the effects of the rule change.</p> <p>After the data was analyzed, the results showed that at both of the age groups, there was a similar amount of contact situations recorded, with the main finding being that the players in 12U were used to the newly implemented rules, performing less severe contact with the opponent. USA Hockey is really pleased with the effects of the rule change, as in the following years they have seen increase in retaining the players in the sport, as well as insurance companies being happier with having to handle fewer injuries in the age groups.</p>	
<p>Keywords USA Hockey, Body contact, Body checking, Puck possession, Ice hockey, Rules</p>	

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1 Introduction

Ice hockey is watched and played all over the world. People gather up to watch the world's fastest team sport, amazing dekes, plays and hard checks. The latter has caused a lot of discussion over the international and national associations and media lately. Contact is part of the game, but lately we have heard more and more often about injuries related to contact situations in pro leagues as well as in junior hockey.

National associations have started to react to these unfortunate events and have started to research and rethink their view of body contact and especially junior contact. What can we do to prevent these unfortunate and unwanted situations? All the associations have taken the right step of making the illegal checking situation penalties bigger and the bans longer for contact situations that have nothing to do with the game that so many love.

There is an old saying: You can't teach an old dog new tricks. It is hard to get the older players to change their habits, but if the players learn to play the body according to rules at a young age, we don't need to teach them new tricks at older age. National associations have created lot of body checking teaching material, with emphasis on keeping the game clean, focusing on teaching the importance of clean checks and the responsibility of every players' own actions

USA and Canada, two biggest and also more known for their physical style of play hockey countries have also, just lately, reviewed their body contact rules in junior hockey. They have both raised the age for full contact hockey from 12 and under (12U) to 14 and under (14U). The rule change is quite similar to what European hockey associations have implemented the past 10 years. The main idea behind the rule change is to focus on playing the game, which is much more than just body contact, and introducing body contact gradually to the young and developing athletes.

Hockey Canada implemented a body checking rule change in 2013, removing body checking, but still allowing body contact, at peewee hockey (12U and younger) and also made it mandatory to build up a body checking manual, gradually teaching young players to perform body checks.

“A modification to playing rule 6.2b was approved, removing body-checking from Peewee levels and below within leagues governed by Hockey Canada, starting in 2013-14. In addition to this rule change, a work group has been directed to build a mandatory national checking and instructional resource program to support the progressive implementation of checking skills at the Novice to Peewee levels to better prepare players for body-checking at the Bantam and Midget level.”(Hockey Canada, 2013)

USA Hockey made the same rule change one year earlier, removing body checking from 12U and focused on educating the coaches and players.

USA Hockey, Inc., founded in 1936-37, is the National Governing Body for the sport of ice hockey in the United States. Its mission is to promote the growth of hockey in America and provide the best possible experience for all participants by encouraging, developing, advancing and administering the sport. Headquartered in Colorado Springs, Colo., USA Hockey is the official representative to the United States Olympic Committee and the International Ice Hockey Federation. (USA Hockey, 2013) USA Hockey approached the authors with the research, after the rule change was done for the season 2011-2012.

USA Hockey’s primary emphasis is on the support and development of grassroots hockey programs. USA Hockey is divided into 11 geographical districts throughout the United States. Each district has a registrar to register teams; a referee-in-chief to register officials and organize clinics; a coach-in-chief to administer educational programs for coaches; a risk manager to oversee liability and safety programs; and a skill development program administrator to facilitate learn-to-play programs for youth players and their parents. Each of these 11 districts have their own championships and at the end of the season National championship tournament is held annually. (USA Hockey, 2013)

USA Hockey Districts

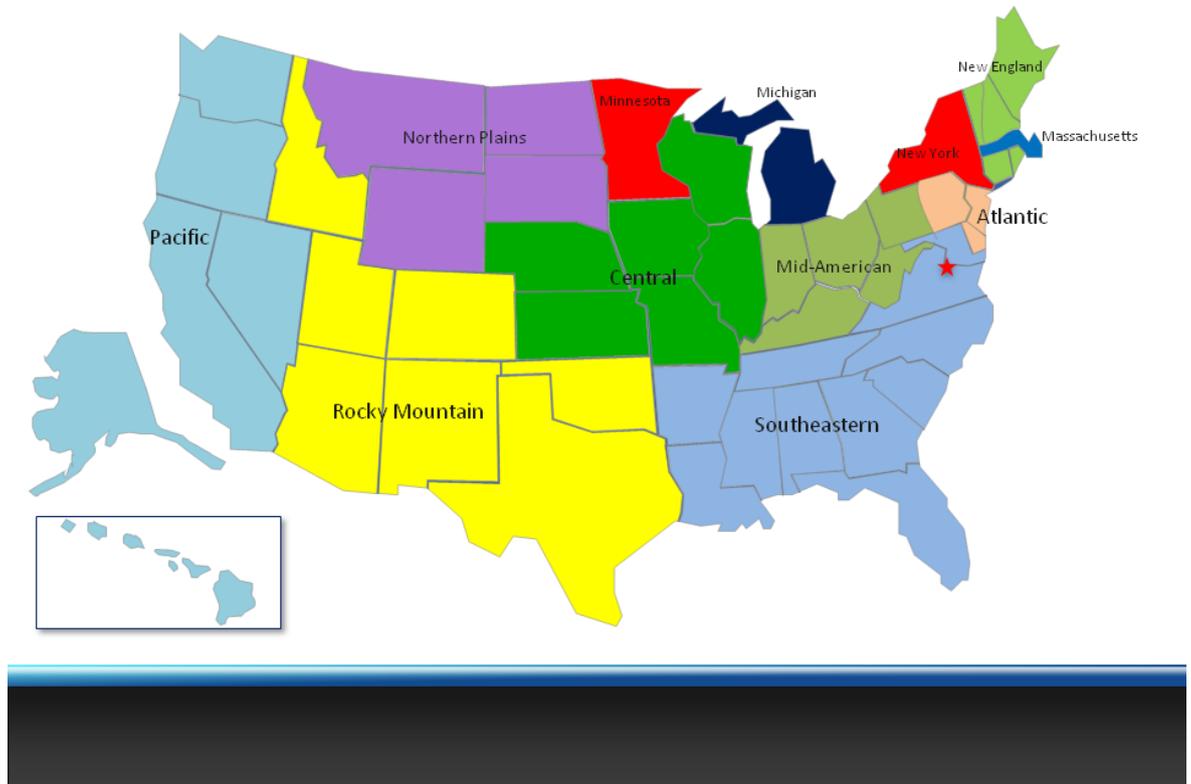


Figure 1. Districts of USA Hockey

1.1 Purpose of the study

USA Hockey implemented a body checking rule change for season 2011-2012. They raised the age of full contact ice hockey from 12U to 14U, but at the same time emphasizing the coaches to focus on teaching body checking in the 12U. The feedback they got from coaches and parents was that the 12U game is better, focusing on other aspects of the game, but still has contact in it. Reason for the rule change was that USA Hockey noticed a significant increase in dropping out of hockey at the age groups mentioned above.(Martel, 7.12.2011)

However, since there was no scientific proof of what actually happened, USA Hockey wanted to find out if the game is still physical, but within the new implemented rules. How does the rule change effect the way the game is played? USA Hockey wanted the game still to be physical, gradually implementing body contact and full contact to the developing athletes, but the focus to be on other aspects of the

game, like puck possession and goal scoring. After all, that is the goal of contact in ice hockey; gaining back the possession of the puck.

The study that we have done is the first stage of two parts. USA Hockey wants to do a follow up study after a few years to see how the rule change effects the way of playing the game at older age. Follow up study has not yet being done.

1.2 The structure of the thesis

This thesis begins with an explanation to why was this study done and with a short introduction to ice hockey. Theoretical part elaborates on how different styles of contact are defined, including players' and parents' knowledge about contact. This section also defines other key issues that are important for the study. In the following chapter, the authors will define the research questions. Next chapter is called research methods; this section explains thoroughly the whole study process, i.e. when was this study made? Where was it made? Who made it? Why it was made? This section also shows the data collection tool that the researchers used during the study. Following these chapters is the presentation of the results that the researchers discovered. The final section of this thesis is the discussion, which reviews the key results discovered by the researcher, the limitations of the study and the conclusions.

2 Theoretical part

This part of the thesis, will explain the meaning of the terms used and previous knowledge

2.1 A short introduction of Ice Hockey

Ice hockey is a fast-paced team sport which is played on ice. Ice hockey is called "the fastest game on earth". Two teams play against each other and during the normal play, both sides have six players on the ice at the same time, one of them being a goalie. The objective of the game is to score goals. The team that scores more goals, wins the game.

During the game there is always one team that plays offence and the other plays defense. The offensive team has the puck and tries to score a goal and at the same time the defensive team tries to prevent the other team from scoring. Ice hockey is a full contact sport and big part of the game revolves around the physical contact between players. Because of the body contact and fast speed of the game, it also carries with it an heightened risk of injuries.

Rules are designed to limit what actions and behaviors can be committed on the ice, Players who commit illegal act on the ice are given penalty by the referees and is then to sit on the penalty box for allotted amount of time. Rules state that the players are have to wear equipment that protects them. Equipment such as a helmet, mouth guard, throat protector, shoulder pads, elbow pads, pelvic protector, pants, gloves, and shin pads. (Hockey Canada 2008, 9 & Hockey Canada 2013a, 12, 80, 87, 89.)

"Ice hockey is the fastest team sport in the world with almost 2 million players, of all ages, participating worldwide. It is a fast-paced, team sport built on skill, speed, discipline and teamwork. It is a game that requires quick thinking and fast reactions

along with the development of many special skills such as skating, passing, puck handling and shooting." (IIHF, 2012)

2.2 Period

Playing time and number of periods is defined by rules which has been made by the leagues or organizations. It differs between age groups and the level of hockey. Playing time is the most commonly 60 minutes, which is divided into three 20-minute periods. The time runs when the puck is in the game, which means that when the referee whistles and stops the game the time stops as well.

Between every period is the intermission. This is the break that separates the periods. Length for the intermission differs between leagues, but is usually 15-18 minutes. In junior hockey the length might only be a couple minutes. During the intermission, teams try to regain their power, so that they can play the entire game with high energy.

If the game is tied after 60 minutes, then the teams play an over time. Over time is sudden death, so the team that scores the first goal wins. In the regular season, length of the over time is usually 5 minutes and if the game is still tied after that, then the teams shoot game winning shots to determine the winner. In the playoffs, there is no shootout, but instead the teams play multiple sudden-death 20-minute five-on-five periods, until one team scores. Again, juniors have different rules, depending on the age group and the level of hockey. (Livestrong, 25.4.2014)

2.3 Zones

Ice hockey rink is divided into three zones. Blue lines separates each zone. Central zone is called neutral zone or centre ice. Two other zones are called the end zones. These zones have also more commonly used names. The end where team is trying to score is called attacking zone or offensive zone. The zone where teams' own net is located is called defending zone or defensive zone. (IIHF, 2012, 6-7)

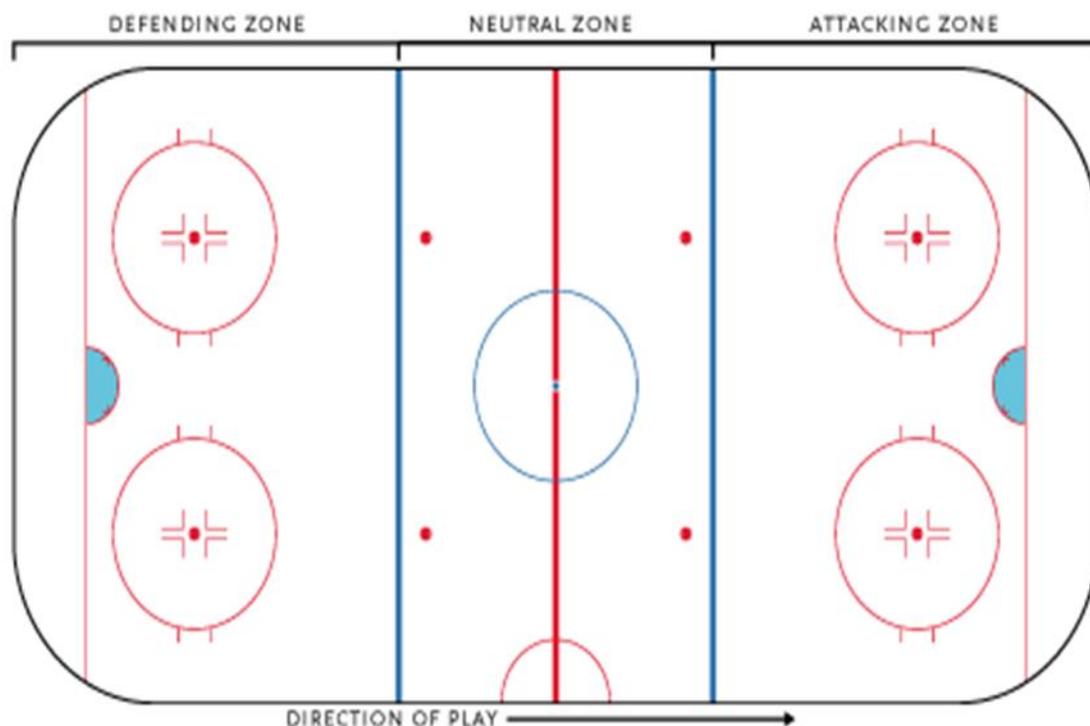


Figure 2. Picture of ice hockey rink and zones.

2.4 Contact situations and evaluation

Ice hockey is full of different kind of contact situations. You can perform different kind of contact with your stick and your body. In this study we will be focusing on the latter.

Making contact with your body is an effective way to recover the puck to your team, but like in every contact sport, the success of it is not guaranteed. For smart players,

contact situations are not avoidable, but there is a chance for them to keep the possession of the puck, if they are ready for the contact or if they are aware of the situation and succeed in keeping the puck in motion.

During the data collection, body contact situations were categorized into six different categories. The situations were divided into categories according to their severity (Martel, 25.1.2012):

1. Brush
2. Bump
3. Body contact
4. Body check
5. Blow up hit
6. Incidental contact

2.4.1 Brush

Brush is the lowest in severity of contact situations in this study. It can be explained as two opposing players' bodies making physical contact in a battle for the puck possession without either of the players noticeable being affected by it.

Brushes are the most frequent contact situations on the ice. The game is played on a small surface and players are always close to the puck. Even though brush is not an offensive move towards the opposing player, even the smallest disturbance in the balance of the player with the puck makes it easier for the opposing team to recover the possession of the puck. (Martel, 25.1.2012)

2.4.2 Bump

Bump is situation on the ice with a little bit more physical contact. As the name implies, it means two opposing players bumping in to each other, but again neither of the players are really affected by the bump, but it may disturb the balance of one of the players. These bump situations can be related to bumping cars in a carnival. The contact pushes the opposing player a little bit to the opposite direction and this is purely due to the contact, not because one of the players is making an offensive movement towards the other. (Martel, 25.1.2012)

2.4.3 Body contact

Body contact is already a clear effort from a player to play the body of the opposing player. It does not entail an offensive movement towards the opposing player, but it takes away the time and space from your opponent. The movement in body contact has to be to the same direction to the receiving player's, angling him away from e.g. the scoring area, or angling him to the boards. Normal age for allowing body contact in ice hockey is between the age of 11 and 12, depending on the country.

Study made in University of Regina: Effects of the Implementation of Body Checking in Atom Hockey, 2006, defines body contact as:

“an individual defensive tactic designed to legally block or impede the progress of an offensive puck carrier. This tactic is a result of movement of the defensive player to restrict movement of the puck carrier anywhere on the ice through skating, angling and positioning. The defensive player may not hit the offensive player by going in opposite direction to that player or by extending toward the offensive player in an effort to initiate contact. There must be no action where the puck carrier is pushed, hit or shoved into the boards.”(Riemer & Dorsch, 2006)



Figure 3. Body contact

As the figure 3 shows, the player initiating contact (blue) is not performing an offensive movement towards the opposing player (white). The initiating player is taking away the space from the opposing player by making contact to his body and leaning into him.

2.4.4 Body checking

Body checking is the first kind of contact where the initiating player is allowed to extend his body towards the opposing player, making a clear offensive movement. In body checks you do not need to be skating to the same direction with the opposing player. These situations are much more explosive and physical as the direction of the movement is not necessarily similar to the opponent's.

Body checking is:

...an individual defensive tactic designed to legally separate the puck carrier from the puck. This tactic is the result of a defensive player applying physical extension of the body toward the puck carrier moving in an opposite or parallel direction. The action of the defensive player is deliberate and forceful in an opposite direction to which the offensive player is moving and is not solely determined by the movement of the puck carrier. (Riemer & Dorsch, 2006)

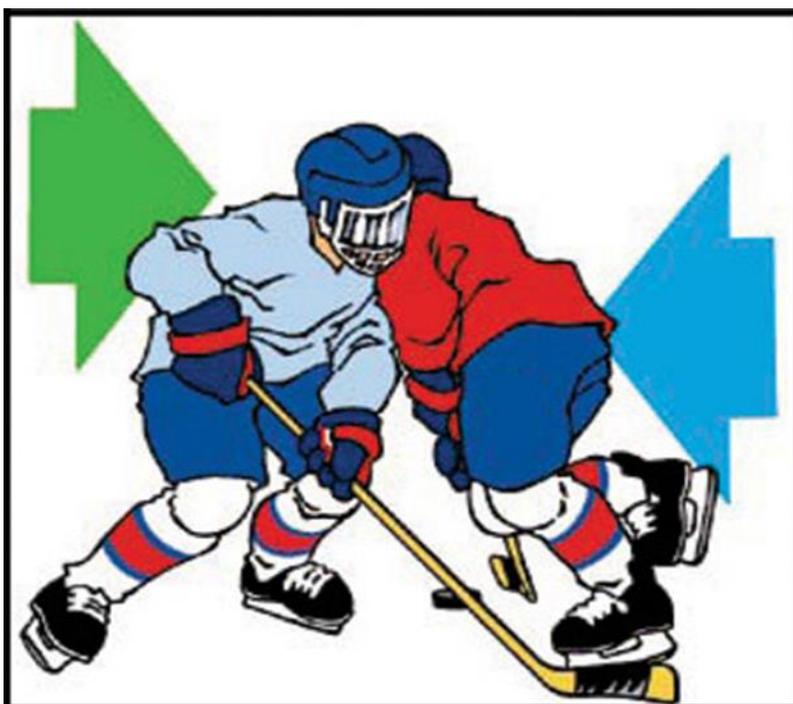


Figure 4. Body check

The Figure 4 shows a normal shoulder to shoulder check. As the picture implies, body check is a more severe situation than body contact (Picture 2). Offensive movements/lounges towards opposing player are allowed in body checking.

In other words, the difference between body contact and body checking is that; in body contact, the player initiating contact is taking the space and time away from the opposing player, by skating and angling the player, without an offensive movement,

when in body checking the contact is an offensive movement, that can come from the opposite direction and that aims to physically separate the player from the puck.

2.4.5 Blow up hit

Blow up hits are the most severe category. This type of contact is often really explosive. Blow up hits normally are really hard body checks, with the difference that the opposing player often is not ready for the hit. Blow up hits are usually those situations that you will see on a highlight reel. These situations are often legal, but the reactions from opposing team might lead to an altercation between the two teams. (Martel, 25.1.2012)

The difference between a blow up hit and any other type of contact situation is that after a blow up hit, it is quite hard for the player initiating the hit to recover the puck himself. In this situation, the initiating player throws his body more to the hit, making a much more offensive movement towards the opposing player.

Blow up hits often lead to penalties as the players are driving into their opponents with such a force, that it is hard to keep the check legal.

2.4.6 Incidental contact

As the name implies, these situations are not planned and are often accidental. In this study, all the contact situations that were accidental were marked as incidental contact, regardless of the severity of the situation. These situations, together with blow up hits, are the main reason for injuries in the sport, as the players are not ready for the contact. (Martel, 25.1.2012)

Playing the body in ice hockey is a skill that includes both delivering and receiving checks on the ice. Players are learning at a young age how to check and receive checks. At the end, the responsibility of any sort of body contact situation is always on the player who initiates the situation, but the receiving end of the situation needs to be

aware of what is happening on the ice as well. “Heads-up hockey” is a term that is talked about all over in the hockey world. It is important for the players to be able to see what is happening on the ice, not only to be prepared for a contact situation, but to be able to score goals and make plays, helping your team to reach the goal of the sport – to win a hockey game.

2.4.7 Goal of body checking, body contact and contact situations

The goal for body checking and body contact is not to hurt the opposing team players, but to gain back the possession of the puck. Hard hits boost the morale within the team, but the ultimate goal for any sort of contact is always the same. As ice hockey is a competitive sport and emotions run high, unfortunately the true goal of contact is sometimes forgotten.

Dr. Alan Ashare: Chair of USA Hockey Safety & Protective Equipment Committee & President states:

“The objective of a body check is to separate the opponent from the puck, not to separate him from consciousness.”

(Emahiser, Gregus and O’Connor, 2013)

Ice hockey is a game of scoring. The team with more goals at the end of the game will win. Thereby puck possession plays a critical role in the game. Body checking and body contact are a way of getting the puck possession back to your team in order to do what actually is the main goal of the game – score goals.

2.5 Knowledge and beliefs

Education and knowledge plays a huge role in this subject. National associations have started to produce great teaching manuals about body checking and contact for the coaches, but the coaches are just a small part of the game. Players and parents must be educated as well, as they often have false beliefs on what is body checking and contact and the purpose of it.

The meaning and goal of body contact or checking is not clear for all the players and parents. In a research made by Dr. Harold Riemer and Kim Dorsch (SHA Bodychecking Research Project), players and parents from Alberta (AB) and Saskatoon (SK), Canada, were asked for the purpose and goal of contact in ice hockey. The results were as follows:

The purpose of body contact and body checking is not clear for everybody. Even though the research showed that some of the parents have a good understanding of its purpose, a significant part of the parents cannot tell the difference between body contact and body checking, or use these terms to describe a similar action.

“I’ve had an excellent experience with minor hockey and I am happy my son is playing and that there is contact in the game. If they start young, they can learn the right way to hit and to take a hit. They know how to keep their heads up.”(Mother)
(Riemer and Dorsch, 2006)

The parents and players were asked seven questions about the goals of contact in ice hockey. Each statement was scored using a scale from 1 to 9, 1 meaning ‘strongly disagree’ and 9 meaning ‘strongly agree’.

Although the results seem quite similar, the parents’ answers (figures 6 and 7) show that they are agreeing more with the first four statements than the player. The parents think of contact as a way to frighten and even injure the opposing player, when the players focus more on making fair contact, understanding that the goal is not to hurt anyone. Surprisingly at the same time, the parents are rating the “positive goals of contact” (last 3 statements) as more important than the players.

Following questions were asked from the players and parents:

Body checking exists to...

- Physically hurt players on the other team
- Frighten or intimidate players on the other team
- Make teammates and fans cheer
- Take a person on the other team out of the play
- To create scoring chances
- Take a person on the other team off the puck
- Separate a player from the puck

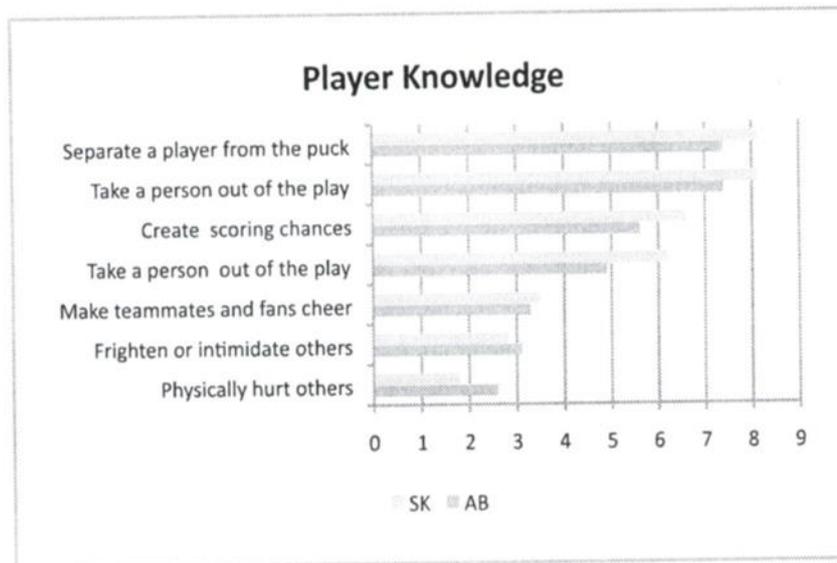
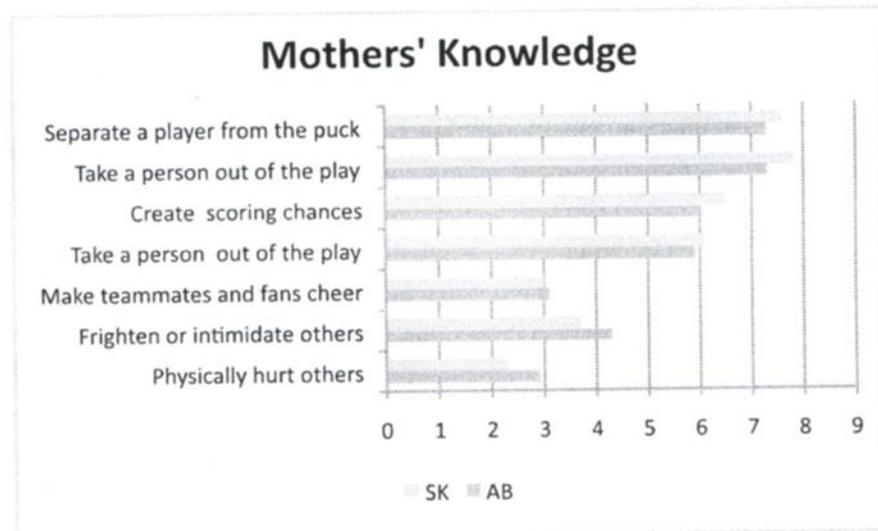


Figure 5. Players' knowledge of the goal of contact



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Figure 6. Mothers' knowledge of the goals of contact

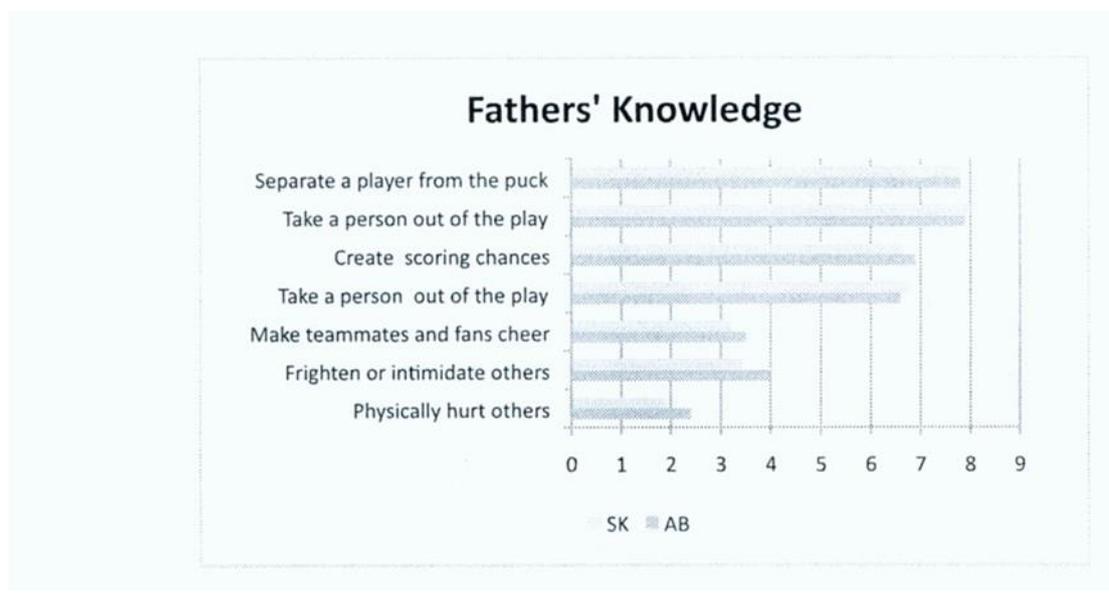


Figure 7. Fathers' knowledge of the goals of contact

2.6 Puck possession

In today's hockey puck control is the key to success, it is something you are trying to obtain all the time. Ice hockey is a scoring game and to be able to score, team needs to gain the possession of the puck. Puck possession means the actual physical contact with the puck. In other words the moment when the player has the puck in his stick. Possession in a hockey game changes frequently. (Kinding, B. 1994, 1)

Björn Kinding analyzed all the plays with equal strength in 1994 World Championship final game and 1994 Stanley Cup game. His finding was that the puck possession changes from one team to another 7, 7 times in every minute, which means that in a single hockey game puck possession changes 450 times. Kinding's conclusion was that the best way to keep puck possession is to give a defensive pass and the best way to lose it is dribbling. (Kinding, B. 1994, 1)

Possession of the puck can be gained in a number of ways. The team can gain puck possession after winning a face-off, after intercepting a pass, through defensive activity (stealing the puck from the opponent, etc.), retrieving the puck after a dump, retrieving the puck after a shot on a goal or gaining control of a loose puck (Saarinen, Mensonen & Small 2009, 15).

3 Research questions

USA Hockey wanted to find out if the way of playing the game was similar in both age groups, despite the new rule change; rising the age for body checking to 14U. The goal of the rule change is not to remove contact from youth hockey, but to gradually introduce contact to the players, making the sport less threatening and helping to keep the players in the game.

The age groups in question are also the age groups where puberty starts playing a bigger role. In a team you can have players who are physically much more developed, already reaching the peak of puberty, when some of the players can still be physically and mentally defined as kids. The size difference and physicality are among the main reasons for dropping out of the sport.

Following questions were the main focus of the research:

- Are the players in 12U used to the newly implemented rules?
- How does the rule change effect the game?
 - o Is the game physical in both age groups?
- How does the contact situations differ between 12U and 14U ice hockey?
 - o Goal for USA Hockey was not to remove contact from the sport, but instead gradually introduce contact to the players
 - o Ideally only differce being the severity of contact
 - o Other researched aspect results similar between age groups

In addition to the above questions, we also analyzed the relationship of contact and change of puck possession in the sport.

- Is the goal of contact to gain back the puck possession?

4 Methods

This part of the thesis explains the whole process and execution of the thesis.

4.1 Approach

USA Hockey was looking into their new rule change. They had received positive feedback from coaches and parents about the rule change applied for season 2011-2012. USA Hockey wanted to collect data from the 'Nationals' championship tournaments in Buffalo, NY, Wayne, NJ and Ashburn, VA at the end of the 2011-2012 season. The tournament gathers all the district champions to battle for the national championship.

Data collection was done to find out if players had adapted to the new rules. Goal for the rule change was to keep the game still physical within the new rules, but at the same time keeping the focus on regaining the possession of the puck in younger age groups. One of the ultimate goals was to allow smaller players to enjoy the sport and for them to be able to play on the highest national level, as well as retaining players in the field of ice hockey.

4.2 Data collection tool / parameters

We created a simple data collection tool to easily record body contact situations from the arena stands. This method turned out to be the best to collect such data, albeit of its simplicity. (Appendix 1)

The following items were marked down in the data collection tool:

1. In which period did the situation occur
2. Severity of the situation
3. Change of puck possession
4. Zone of the contact
5. Penalty called on the situation (illegal checks in both levels)
6. Visible injury to the players involved in the situation

4.2.1 Periods

In the National Championship Tournament each of the three periods is 16-17 minutes long, depending on the age group. We were recording 12U and 14U; 12U played 16 minute- and 14U 17 minute periods.

The reason why contact situations were recorded per period was to find out if teams play a less physical game towards the end of the playing time to avoid being penalized, disallowing opponent to create scoring chances on power play.

4.2.2 Severity

Ice hockey is a contact sport. 12 players, including goaltenders, are on the ice at the same time battling for the puck. Therefore contact situations are bound to happen. We categorized the severity of contact to find out how hard, and also how often, contact situations occur.

12U is allowed to make body contact, angling the opposing player to the boards, without an offensive movement towards him/her. 14U is allowed to make body checks, in which they are allowed make the offensive movement.

The severity of the situations was recorded on a scale from 1 to 6. The severity was recorded to see what the focus of the contact situations was. Is the goal of the situation e.g. to get the puck back to your own team or an intent to hurt/intimidate the opposing player.

The new rule change allows 12U to perform body checks (number 3 on the scale), bumps (2), brushes (1) and incidental contact (6), when in 14U ice hockey, all of the six categories are allowed, for as long as the contact is performed legally.

4.2.3 Change of puck possession

The goal for a contact situation should be gaining back possession of the puck. Change of possession was recorded to see if 12U was adapting to the new rules, focusing more on just gaining back the possession, rather than trying to hurt the opposing player. It is a simple fact that you cannot win ice hockey games without scoring goals and you need to have the puck to score goals.

Puck possession is an important part of modern ice hockey. Team controlling the puck is creating more scoring chances and therefore also scoring more goals. The time your team is having the possession of the puck, opponent must work and spend energy on trying to get it back.

4.2.4 Zone of the contact

Zone of the contact was recorded to see if players try to gain the puck back to their team as soon as possible. This information combined with the severity of the situation tells a lot about the way hockey is played nowadays. Trying to get the possession back in the offensive zone to great a quick scoring chance or in the defensive zone to prevent opponent from scoring goals.

4.2.5 Penalties called, illegal contact situations

Penalties called on a contact situation is quite a clear indicator if the players, especially in 12U level, are adapting to the new rule change, as most of the players had played ice hockey with the old rules, allowing them to perform body checks. In 14U this information was also useful to find out if the players were able to perform legal body contact.

4.2.6 Visible injuries

Injuries are unfortunately one of the most talked topic in ice hockey at the moment. No-one wants to see them, but unfortunately injuries always occur in contact sports.

Injury data was collected to find out whether there is a difference in the injury rate in the two age groups playing with different rules. Visible injuries were recorded if the injured player was not able to get off the ice on his/her own, or if he/she was visibly injured (e.g. limping back to the players' bench after a contact situation).

4.3 Data collection

Data collection was the most demanding parts of this study. USA Hockey hosted their National Championship Tournaments over one extended weekend in three different locations. The three locations were divided according to the level of hockey; Tier 1 and 2 (with Tier 1 being the best level in the whole nation).

4.4 Locations

Tier 1 tournament was hosted in Amherst Buffalo, NY. This tournament gathered all the best teams from each region in the USA. Our study focused on the 12U and 14U tournaments, but 16U and 18U were also playing at the same time. 12U Tier 2 tournament was hosted in Ashburn, VA, and 14U Tier 2 tournament in Wayne, NJ.

4.5 Data recorders

Data was recorded by altogether four person in these three locations. 12U and 14U Tier 2 was recorded by two persons working for USA Hockey. Tier 1 tournament results were recorded by two persons in Buffalo, one of them working for USA Hockey and the other being one of the authors of this study. We managed to record altogether 48 games in these 3 locations.

4.6 Data analysis

Data analysis was done in the months following the tournaments in 2012. The results were handed over to USA Hockey on June 4, 2012, to be used in USA Hockey's annual congress.

5 Results

In this section we will go through the results of the data collection, providing supporting data and answers to the research questions:

1. Games recorded
2. Average number of contact situations
3. Severity
4. Change of puck possession
5. Zone of contact
6. Contact situations each period
7. Penalties
8. Injuries

5.1 Games recorded

The results were gathered from all three locations during the month following the tournaments. Altogether 48 games were recorded, in which over 2500 contact situations occurred.

32 Games were recorded in the 12U Tier 1 & 2, and 16 games in the 14U Tier 1 & 2. The recorded games were randomly chosen by the data recorders.

5.2 Contact situations

We recorded 1684 contact situations in 12U (32 games) and 854 contact situations in 14U (16 games).

Table 1. Showing recording data of amount of games and contact situations

USA Hockey Body Contact Study

Age group	12U	14U
Games Recorded	32	16
Contact situations	1684	854
Av. contact situations	52.6	53.4

As visible in Table 1, there were on average over 50 contact situations in each game . In 12U the average number of contact situations was 52,6 and in 14U the average was 53,4.

USA Hockey did not want the rule change to effect the way the game is played, other than less severe contact occurring in 12U. The goal was to keep the game similar to 14U, including the amount of contact. All of the results support the hypothesis from USA Hockey. Other than severity, the results from other recorded aspects, are almost identical with 14U (the exception being the tier difference). As table 1 shows, the amount of contact in both age groups is almost the same. Over 50 contact situations occurred in both age groups – difference being less than one contact situation between the age groups. In both age groups, game is still physical, but within the new rules.

5.3 Severity

Severity is the main focus of the results, as this result will tell us if the players had gotten used to the recently implemented rules.

Majority of body contact situations in 12U should be rated as 3 or less on the severity scale from 1-6 (contact situations rated above 3 should be called out as a penalty by the referee).

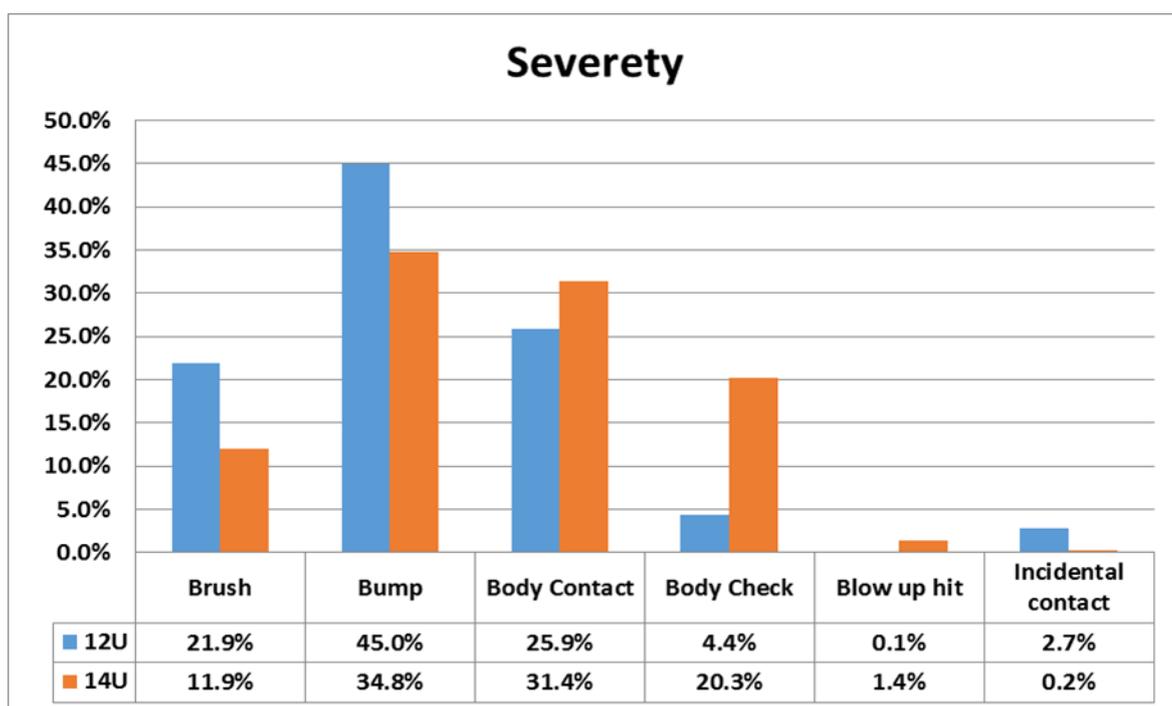


Figure 8. Severity scale of occurred contact situations in both 12U and 14U

As the Figure 8 shows, 92,8% of the contact situations occurred in 12U are within the new rules, and only 4,5% of the contact situations were too severe as the new rule change allows 12U players perform body contact(3) and less severe bumps(2) and brushes(1).

In both age groups, majority of the contact situations were less severe than the rules allow. In 12U almost 67 % of the contact situations were only brushes and bumps, and one fourth of the situations were body contacts.

In 14U 98,4 % of the contact situations were body checks or less severe. Over 78% of the contact situations in 14U are within the rules for 12U. Amount of incidental contact is almost nonexistent.

Eventhough most of the players in the tournament played already last year in the same 12U age group with body checking, the results show that they have been able to adjust to the rule change. As you can see from the severity graph (Figure 8), 92,8% of the contact situations are body contact or less severe. From the remaining 7,2%, only 4,4% are body checks and 2,7% are incidental contact. These numbers not only prove that the players in 12U are used to the new rules, but also that they understand that the contact does not have to be always the hardest possible. 66,9% of the contact occurred in 12U is less severe than body contact. Brushes and bumps make up the majority of the contact in 12U.

The severity of the contact is the difference between the two age groups, as it should be after the rule change. Even though 14U is allowed to perform body checks, the majority of contact is less severe than allowed by the rules. As figure 8 shows, 98,4% of contact situations in 14U are body checks or less severe. The rule change has no apparent impact on the game. In both age groups, a clear majority of contact is within the rules, making the only noticeable difference in the game between the age groups the rule difference. The rule change does not affect the way the game is played and it has already shown USA Hockey an increase in retaining players in the sport.

5.4 Change of puck possession

Change of puck possession is also one of the main focusses of this thesis, because the reason for contact situations in ice hockey should be gaining back the possession of the puck. As the data was recorded, we considered a successful change of possession being following; your own team gaining back the puck possession, not necessarily the player performing contact with the opposing player. Especially in 14U, with body checks, gaining back the possession yourself after a body check is sometimes hard as body checking is a more offensive movement.

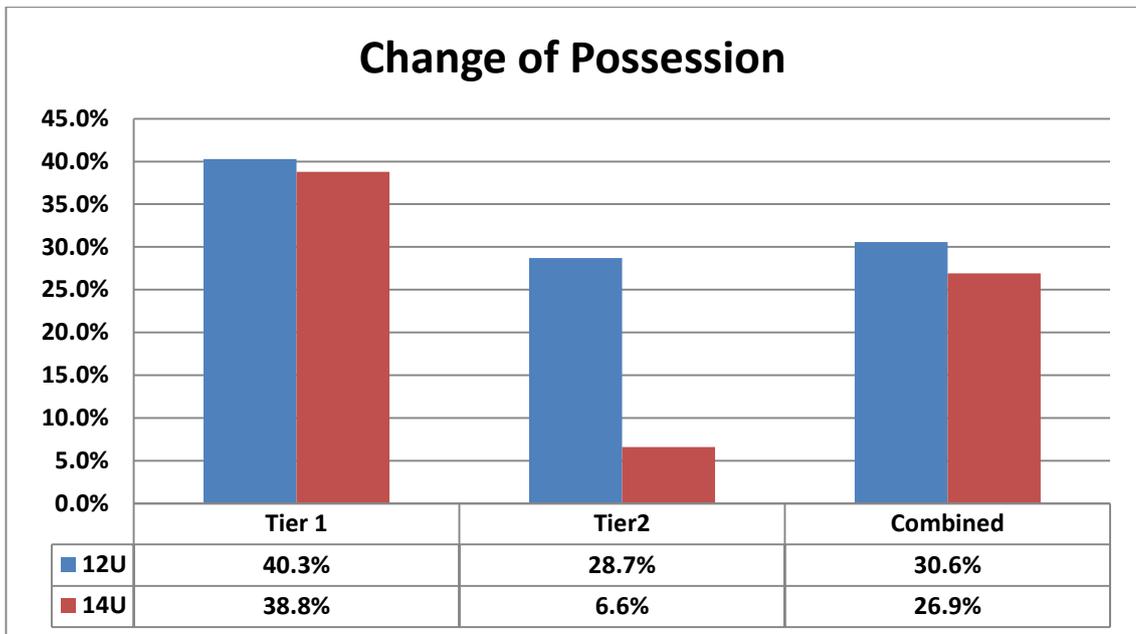


Figure 9. Change of possession percentage in both age groups and levels

As figure 9 implies, players in 12U and 14U Tier 1 are more focused on gaining the possession back, explaining the lack of hard blow up hits (Figure 8.). In 14U Tier 2 the percentage of change of possession is only 6.6% when in Tier 1 the same statistic is 38.8%. In 12U Tier 2, change of possession percentage is over 10% lower than in the Tier 1.

As the results (Figure 9.) indicate, the difference is not between the age groups, but between the skill levels. Better and especially smarter players are playing in Tier 1 and there the percentage of change of possession is around 40%. The result is excellent, taking into consideration the purpose of the rule change. It shows that when the players are performing contact, they are actually winning the puck possession back to their own team. Over third of the contact situations end up with change of puck possession.

In Tier 2 the results are not that promising. In 14U the percentage of change of possession is only 6, 6 % and 12U 28, 7 %. In 14U the percentage is really low and it indicates that players are not concentrating on gaining back the puck possession. In Tier 2 the players are not as good and not as smart as the players in Tier 1 are. Therefore the players might not even know what the goal of contact is. Normally when the skill level is not that high, players are concentrating on other things e.g. hurting opposing players. This study shows that the percentage of blow up hits (Figure 8.) in 14U is very low and

so is also the amount of injuries, which means that the players are not just concentrating on "killing" the opponent. Combined results for both age-groups from change of possession is almost the same.

5.5 Zone of contact

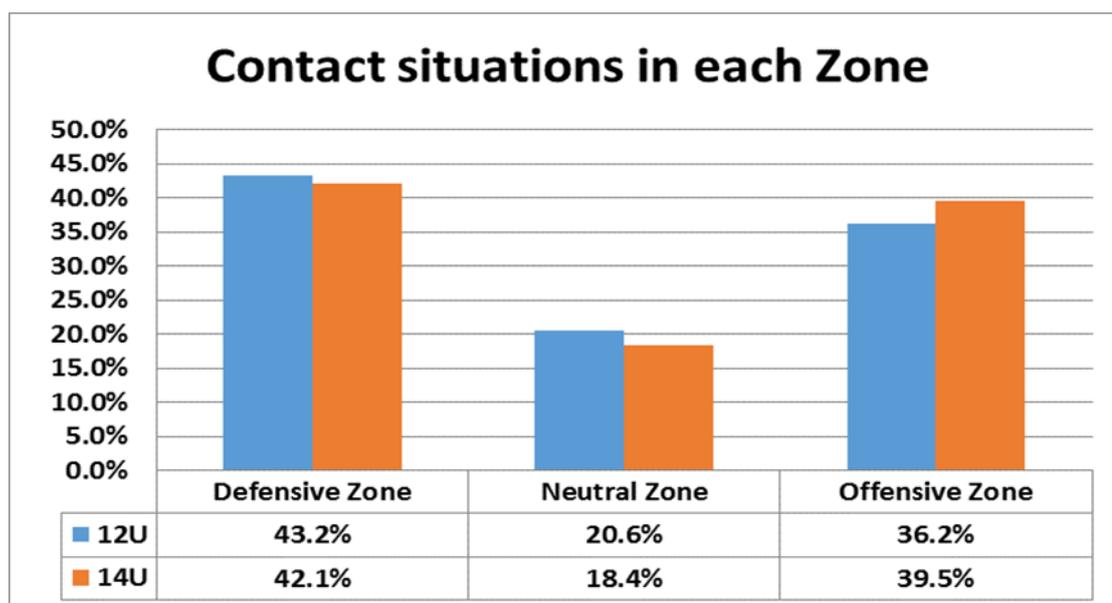


Figure 10. Shows percentage of contact situations in each zone

Contact situations are occurring quite evenly in both 12U and 14U. Most of the contact situations take place in the defensive zone. In 12U 43, 2% of the contact situations occur in the defensive zone. In 14U this number is a bit less at 42, 1%.

When we move to the neutral zone, the amount of the contact decreases considerably. In 12U it is 20, 6%, which is less than half than what it is in the defensive zone. In 14U the amount of contacts is even lesser at 18, 4%. The numbers of offensive zone contact situations are again close to the defensive zone numbers. In 12U the amount of contact situations is 36, 2% and in 14U it is a bit more at 39, 5%. The differences between the age groups are insignificant, proving that there is no noticeable difference in contact situations in the zones of contact between the two age groups.

5.6 Contact situations in each period

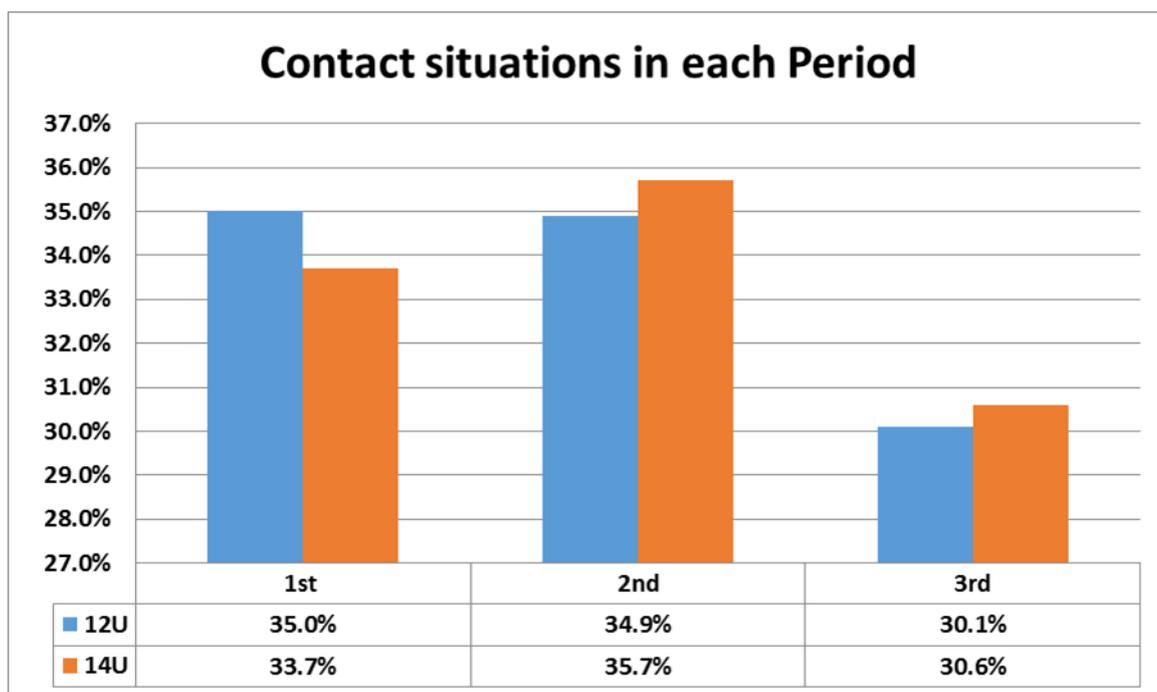


Figure 11. Shows percentage of contact situations in each period

Contact situations are occurring quite evenly in the first and second period. Especially in 12U the difference in contact situations between first and second period is minimal at only 0, 1%. In 12U, 35% of the contact situations happen in first period and 34, 9% in the second.

In 14U most of the contact situations (35, 7%) happen in the second period. In 14U the difference between first and second period is also minimal at only 2, 0%. In both age groups, the third periods were the periods where the least contact situations happened. In 12U 30, 1% of the contact situations occurred in the third period and whereas in 14U this number was 30, 6%. The results are similar between the age groups, both of them performing less contact in the last period.

5.7 Penalties and Injuries

In 12U, there were a total of 99 penalties called from contact situations. 6% of contact situations caused a penalty. In 14U less than 3% of contact situations led to a penalty. These numbers are low and prove that in both age groups the players know how “hard” they are allowed to play.

There were only 8 contact related injuries (4 in both age groups) noticeable for the data collectors. This implies that the players know how to perform contact (initiate and receive) and that the players are concentrating on getting the puck back instead of trying to hurt the opponent.

There is not a big difference in contact situations in these age groups. Data recorders recorded 1684 contact situations in 12U (32 games) and 854 contact situations in 14U (16 games). The difference between the amounts of contact situations per game (Table 1.), in each period (Figure 7.) or in each zone (Figure 6.) that took place in 12U and 14U is not significant. In both age groups, the average was little over 50 contact situations in each game.

The differences in playing the body are in the severity of the contact (Figure 4.). In 12U players cannot perform body checks as in 14U. Clearly the biggest difference is the newly implemented rule change. In 14U, one fifth of the contact situations were body checks and in 12U the number was only 4, 4% (as it is an illegal act and leads to a penalty). Even though players in 14U are allowed to perform body checks, over 78% of the contact situations are within the rules for 12U.

6 Discussion

6.1 Skill difference

The players are still young and education about contact situations is really important. On the highest levels (Tier 1 and Tier 2) you have really good coaches, who know the game and who have also played it themselves. Nowadays the coaches are really teaching the ways and the aim of contact in ice hockey, which creates safer surroundings for the players.

The players in both age groups and Tiers are the best players of the nation. These players are technically and tactically more developed than the average ice hockey player in the same age group. The players are smarter and able to read the game; seeing what is needed to be done in each of the situations, focusing on gaining the puck possession, scoring goals and playing fair ice hockey.

6.2 Severity

The severity of the contact situations is the main focus of the study. The result is what USA Hockey had hoped for. In 12U, 92.8% of the contact situations are within the new rules, which proves that the players have adapted well to the new rules.

This does not only please USA Hockey, but also provides more opportunities for the smaller players, as well as serve to the satisfaction of insurance companies in the USA. “I do know that our insurance provider is happy with fewer injuries at 12U. The feedback we have received from the field has been positive.

We have seen a positive spike in retained players from 10U to 12U. It is only a small percentage, as we already have a rather high retention percentage anyway.”

(Ken Martel, Technical Director, American Development Model, USA Hockey)

The rule change was done to retain more players in the game. Contact situations can be scary for smaller players and for concerned parents, and may cause them to drop

out of the sport. With the rule change, the players are introduced to full contact ice hockey slowly, making it easier for smaller players to learn to receive and initiate contact accordingly and to learn to read the situations on the ice – seeing what is happening or going to happen.

The results also show that in 14U, players are more focused on separating the player from the puck rather than trying to separate him from consciousness (exception being Tier 2 in 14U, where players do not necessarily have as developed game sense as in Tier 1). Smart players (game sense) can see the game better and are able to react accordingly to the situations. E.g. being focused to get the possession of the puck back instead of just performing contact with opponent.

6.3 Blow up hits

The amount of blow up hits is so small, one could almost say, they do not exist. These situations are the biggest reason to contact related injuries, as usually the receiving player is not prepared to receive contact. The amount of blow up hits being as low 1.5% of all 2538 contact situations in all 3 tournaments proves that the players are not looking for “career ending” situations, at least not in these age groups and levels.

6.4 Change of possession

As already stated, the goal of any kind of contact is not to hurt or injure the other player, but to get the puck possession back to your team. Ice hockey is a scoring game and you need to have the puck to score goals. The ‘change of possession’ results show, what the players in each age group and level are trying to achieve by making contact with the opposing player.

In Tier 1 the percentage of change of possession is around 40%, 14U being little under. The number is pleasing as more than every third of the contact situations will result in regaining the puck back to your team, proving that the players are thinking of actually playing the game and scoring.

For some, the number might not sound so high, especially since we have been repeating the goal of contact situations (gaining back the possession of the puck). One needs to keep in mind that ice hockey is played on a small surface with 10 players battling for the puck at the same time.

At times there might be 10 players on 1/6th of the whole ice surface. Even if you manage to separate the puck from the opponent by making contact, the puck is free for the first player to pick it up, and it might not always be your teammate.

As stated before, we considered a successful change of possession as following: your own team gaining back the puck possession; not necessarily the player performing contact with the opponent player. The chances of gaining the possession in battle for a loose puck are decreased. In other words, a successful separation of opposing player from the puck does not guarantee your team the possession of the puck.

In 14U Tier 2 the number of change of possessions is much lower at only 6.6%. The result might be this low, because the players in Tier 2 are not as “smart” as in Tier 1. In 14U you are also battling puberty. In this age, the players are trying to showcase dominance over their opponents. Performing hard contact, disregarding the end result, is normal.

Combined results from change of possession are not that different, with the difference being only about 4 %. This is explained by the different amount of games recorded in each age group and skill level. The combined change of possession percentage proves that both age groups are focusing on gaining back the possession of the puck.

6.5 Zones

The contact situations result in every zone tells us that most of the contact occurred in the defensive zone. In the offensive zone, body contact situations took place second to most and in the neutral zone the least. In both age groups the results were almost the same. In 14U players are allowed to body check and 12U they can only make body contact, but no body checks.

When a team is playing in their defensive zone, they are normally playing without the puck and trying to win the puck back to their own team and score. Teams are trying to gain puck possession by using their body or their sticks. That is also why most of the contact situations happen in the defensive zone. In the offensive zone, the number of contact situations were second to most and the reason to this is most likely because teams are trying to forecheck the puck back to their own team by skating and using their body. One big reason why the amount of contact situations were much higher in the defensive and offensive than in the neutral zone is that the game is slower in the end zones. When the game is slower, players can easily try to initiate contact with opposing players. In many cases the puck carrier might even be standing still, which makes initiating contact much easier.

In junior hockey, or at least in the 12U and 14U, neutral zone game does not exist. Most of the junior teams have some kind of a system on how they play in the end zones, but when the puck comes to the neutral zone, teams usually do not have any tactics. E.g. trying to force the puck carrier towards the boards through cooperation of the forwards, perform contact and steal the puck. It is just a space between the end zones and maybe that is the reason why there were noticeably less contact situations in the neutral zone. Also, normally the speed is much faster in the neutral zone, which makes legal contact much harder.

6.6 Period

The results from the study showed that the least contact situations took place in the third period. Both age groups had the same kind of results. There are couple of reasons, why there were not so many contact situations in the third period. One is that a hockey game lasts 60 minutes and normally in the last period, the teams are getting tired. When players are tired, they are trying to avoid using too much energy and one way to do this, is not to initiate contact. Every time player battles or initiates contact, he loses energy.

In the last period, when the result is tight, coaches might advise the players to play smart and to stay inside the game all the time. This may affect the game, so that the players do not want to “over play” situations – they do not give hard pressure and make contact with the opposing players. Also fear of getting penalties in the last period, when the game is tight, might have something to do with these results.

In 12U, amount of contact situations in the first and second period was close to same. In 14U, most of the body contact situations took place in the second period. Players are, of course, fresh when the game starts and also still relatively fresh in the second period. This explains why most of the contact situations occurred in the first and second periods. Usually teams are trying to get momentum early in the game by making couple of good and hard “hits”. Especially in the junior games, physical game might scare the opposing team so that they cannot play their own game anymore. That is why usually teams are giving more pressure and contact early in the game.

In 14U, most contact situations took place in the second period. One possible explanation for that might be, that in the second period the change distance grows and it is harder to go and change. When players cannot go and change, they have to stay on the ice longer. E.g. team that plays with the puck, plays in their offensive zone and the team that does not have the puck, they play in their defensive zone. After one minute of playing on the ice, the players will get tired. They cannot go change, because the distance is so long (especially for the defending team) and they do not want to take the risk that the opponent could create a scoring change through the man-up situation on the ice. When players get tired, the speed is not that fast, which also makes checking easier.

6.7 Penalties and injuries

The study showed that there were not many penalties or injuries in the recorded games in both age groups. It is a positive sign and there are a few main factors we can bring up which may be part of the reasons why the numbers were so low. In both age

groups, players were smart enough to understand how hard they can play. That indicates that coaches have taught their players how to perform contact and how to play the body.

Of course it all starts from the practices; how much focus coaches and players are putting in contact situations. In Europe in junior hockey practices, players usually play so that there is not a lot of contact. That is why it is important that the coaches demand physical game also during practices. It is impossible to teach and practice making and receiving contact if nobody does not do any "hits" in practices. "What you do in practice, you are also going to do in the game". And if something unwanted happens, the coach can react immediately and teach the player what he/she should have done differently or better.

Also important in the contact situations is the role of the puck carrier. He/she is also responsible. "Keep your head up and be ready for the contact" is something that the coaches should demand all the time. If you do not play the game with your head up, your playing career might not be that long. Especially in junior hockey, many situations that lead to injuries occur when the puck carrier is not ready to receive contact.

In junior hockey most of the coaches are so called "dad coaches"; they become coaches because their son or daughter is playing. It might even be the case, that they have never played the game themselves. Junior coaches have the most important position in ice hockey business. They are the guys that teach the players how to initiate and receive contact. The coaches should demand that players make fair contact and talk about respecting the opponent and the game at all times. When players do not receive any feedback about their way of play, they do not know if they are doing a good job or if there is something that they should improve. This study shows that the coaches in USA Hockey have done a great job what comes to teaching the players about body checking and body contact.

What happens when the coach is just a "dad coach" and he does not have any idea about the sport, but still wants to be part of it? How can he teach something, that he has no knowledge of? In many of the bigger hockey countries, the hockey federations

are educating coaches, so if you want to learn, you can always find help. Nevertheless, you still see many coaches in junior hockey doing nothing when they see their own player delivering a bad “hit”. Referees cannot see everything, and if the coach sees something, it is his duty to give feedback about the situation. When the coach is smart and intelligent, players will learn to play smart and fair.

6.8 Limitations

The National Tournament was held in 3 different locations over same period of time. This made it impossible for the data recorders to meet up before the tournament started, to discuss what each of the severity categories meant for each of them. All four recorders however have a solid background in ice hockey; three of the recorders are working for USA Hockey and one being an ice hockey coach.

In the Tier 1 tournament, the recorders watched couple of the first games together to get to the same “line of thought” about the severity categorization of the situations.

The tournaments, where the data was recorded, were the final tournaments of the season for each of the age- and skill levels (Tier 1 being the highest and Tier 2 the second highest level in the whole country). The results of the study might have been different if the levels of hockey would have not been the highest in the nation.

Usually when the level of hockey goes down, the game turns a little bit more aggressive due to lack of knowledge of the coaches and varied goals of the players. Unfortunately we did not have the chance to widen the data pool by recording games throughout the whole season and different skill levels.

Lack of follow up is also one of the limitations of the study. The results from the follow up study could have been compared to the results we got, as the players who played in the 12U at the time of the study are now playing in the 14U or older. Ratio between severity and change of puck possession results could have supported the idea of players being more focused on gaining back the puck possession.

6.9 Reliability, validity and future research

The study can be considered reliable, as one of the authors of the thesis has been involved in the process from the beginning. He has been in Buffalo collecting the data and he has analyzed the results. The study may not be considered valid. It gives a little idea and shows some direction of the effectiveness of the rule change, but in the end there is not have enough data that we could generalize the results of the study. All the games were recorded in one tournament. Data was collected from 48 different games, where the skill level did not differ a lot as the data was recorded in the “Nationals” tournament, which gathers the best teams to play. This is the reason why the study does not provide even national results, but results from the best players in the nation. In the future researchers could expand the research by evaluating more games, in a large scale in USA and watch games of a different skill level. If these results are good researchers could expand the area further e.g. to Europe and European Ice Hockey Federations.

6.10 Conclusion

USA Hockey is pleased with the results of the study and the results of the rule change, as they have already seen an improvement in retaining players in the sport and e.g. insurance companies are happier with fewer injuries in these age groups.

A further research has to be done to see if these results would be duplicated. 12U players from this research period are now playing in 14U. Follow up study research can then be compared to the results of this research, comparing these results to the results from today’s 14U results. Results from follow up study should be similar to this research to prove that the players are raising the level of severity as the rules allows it.

This research ultimately reached its purpose, proving that the players are used to the rule change and playing accordingly, as well as showing that there is no difference between these age groups, in the way the game is played. USA Hockey’s purpose for the

rule change has being met, as the game is similar between the age groups, difference being the severity of contact situations, as it should be after the rule change.

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Attachments

Attachment 1. Appendix 1 (Data collection tool)



USA Hockey Body Contact/Body Checking Study (14U/12U Comparison)

Data Recorder:

Date:

Age Group: 14U / 12U

Level: T1 / T2

Team A:

Team B:

Period 1	Period 2	Period 3

Incident Scale:
 1 – Brush
 2 – Bump
 3 – Body Contact
 4 – Body Check
 5 – Blow up - Hit

Gaining puck possession:
 1- YES
 2- NO

Zone:
 D – Defensive Zone
 N – Neutral Zone
 O – Offensive Zone

Outcomes:
 P – Penalty called on the contact
 ○ – Injury occurs on incident (circle the incident)

Attachment 2. Data collection

Severity

Age:	Brush	Bump	Body Contact	Body Check	Blow up hit	Incidental contact	Total
12U	369	758	436	74	1	46	1684
14U	103	297	268	173	12	2	855

Change of puck possession

Age:	Tier 1	Tier2	Combined
12U	112	403	515
14U	209	21	230

Zone of contact

Age:	Defensive Zone	Neutral Zone	Offensive Zone
12U	727	348	609
14U	360	157	338

Contact in each period

Age:	1st	2nd	3rd
12U	589	588	507
14U	288	305	262