IIHF INJURY REPORTING SYSTEM 2009-10

INTRODUCTION

The IIHF introduced the IIHF Injury Reporting System (IRS) during the 1998-99 season. The IRS reports on the various types of injuries that occur in IIHF championships and the causal factors (mechanism of injury, area of ice, etc.) identified with these injuries. The IRS has finished its eleventh season and will be in its twelfth year of operation.

The IRS allows the IIHF to determine the trends of injuries in championships and also allows comparison with other leagues and sports that use a similar system. The data will help the IIHF make sound recommendations from the injury information in making the sport of ice hockey safer for all the participants.

The IIHF Medical Committee also introduced in the last six years the concept of the Game Injury Report where team physicians will submit a report after every game outlining the number of injuries. This method should allow the collection of injuries to be more complete and accurate than in previous years.

A computerized version of the IRS system was developed by Dr. Markku Tuominen and used as a pilot project for the 2006-07 season.

METHODOLOGY

The following information covers the 2009-10 season. Medical Supervisors who participated in IIHF championships were responsible for the collection of data in their respective championship and helped team physicians complete the IRS forms. Game Injury reports were collected from each team physician after every game to determine whether an injury occurred.

The definition of an injury was made in accordance with accepted international norms. The reporting of an injury and the completion of a form was made only when one of the following criteria was observed:

1. A player missed the rest of the game or the next day.
2. A player sustained a facial laceration.
3. A player had a dental injury
4. A player sustained a concussion
5. A player suffered a fracture

Reports were submitted for the following IIHF Championships:

1. 2010 IIHF World Championship
2. 2010 IIHF World Championship Division IA
3. 2010 IIHF World Championship Division IB
4. 2010 IIHF World Championship Division IIB
5. 2010 IIHF World U20 Championship
6. 2010 IIHF World U20 Championship Division IA
7. 2010 IIHF World U20 Championship Division IB
8. 2010 IIHF World U18 Championship
9. 2010 IIHF World U18 Championship Division IA
10. 2010 IIHF World U18 Championship Division IB
11. 2010 IIHF World Women U18 Championship
12. 2010 IIHF World Women U18 Championship Division I
13. 2010 Olympic Men Tournament
14. 2010 Olympic Women Tournament

INJURY RATE

The injury rate is used as a basis for calculating the risk of injury and can be used in comparison with other IIHF championships and other leagues (CHA) and sports (football, basketball). The injury rate was calculated using the following formula: # injuries / # players (team) x # games x 1,000 to give the number of injuries per 1,000 player-games.

The rate of injury was similar in the World Men and WM20 Championship. These two Championships also did have much change from the previous year. The injuries in the women's game increased substantially but this was due to the high number of injuries (7) reported by one team in the WW18 Division I championship.

	2005	2006	2007	2008	2009	2010
World Senior Championships	34.5	26.6	27.5	36.3	32.85	28.45
World U20 Championships	29	33.5	22.1	15.9	31.10	29.81
World U18 Championships	16.4	17.9	20.1	16.8	21.99	20.12
World Women Championship	11.3		11.5	10.2	12.24	

	2002	2003	2004	2005	2006	2007	2008	2009	2010
World Championship	25.1	29.2	35.7	34.5	20.2	33.3	40.6	40.58	40.58
World Championship Div I	22.7	19.6	36.6	37.9	18.1	21.1		21.21	21.21
World Championship Div. II	21.2	12.1	33.3	33.3	21.3	18.2		21.20	18.06
World U20 Championship	15.6	24.1	45.2	29	45.5	19.5	13.2	41.99	41.06
World U18 Championship	11.5	16.0	20.9	19	23.5	58.0	23.5	21.99	16.1
World Women Champ.	3.2	15.2	27.5	11.3	15.3	15.9	10.2	15.91	
World Women U18									23.1
Olympic Games Men					46.6				22
Olympic Games Women					15.9				11

The injury rate has remained the same as the previous year in the World Championship and the WM20 Championship. The World U18 Championship decreased over the last year. The Olympic Games had a very low injury rate in both the Men and Women Games. The Women U18 Championship had a high rate of injury especially in WW18I Championship where one team reported seven injuries.

INJURIES BY BODY PART

Facial Injuries

The World Championship had the greatest number of facial injuries (17) including 10 lacerations, 7 dental injuries, and one nasal and maxilla fracture. There was a progressive decrease in the number of facial injuries as the age level decreased (U20, U18) and as the division was lowered (Division I, Division II).

The full facemask is mandatory at the U18 Championships and a greater percentage of players wear the half or full visor in the lower division. It is interesting to note that facial injuries including lacerations (2) still occur in the U18 even though all players wear a full facemask.

Concussions

Concussions accounted for a small yet significant percentage (7.2%) in the 2010 Championships. The total number was 22 and this number represents a significant increase in the last year. There were 7 concussions in the World Championship.

1999	11
2000	11
2001	3
2002	6
2003	3
2004	13
2005	12
2006	18
2007	11
2008	15
2009	12
2010	22

Dental Injuries

There were 10 dental injuries reported. This number represents a decrease from the 2009 season. It is important to note that there was a new IIHF rule introduced 4 years ago so that all players in the U20 age group are required to wear a mouth guard. There were no dental injuries reported in the WM20 or WM18 Championship.

1999 7
2000 4
2001 5
2002 10
2003 7
2004 10
2005 8
2006 10
2007 2
2008 6
2009 15
2010 10

Eye Injuries

There were no eye injuries during the 2009-10 season.

Upper Body Injuries

Upper body injuries made up 19% (33) of all injuries in 2010. This number is a decrease over from the last year and reflects approximately the same number as 2006-2008.

1999 15
2000 13
2001 20
2002 19
2003 29
2004 39
2005 54
2006 33
2007 30
2008 30
2009 43
2010 33

Shoulder injuries comprise the majority of upper body injuries (45.55%). The majority of shoulder injuries were AC joint sprains. Finger and hand/finger injuries were the next commonest group in the 2010 calendar year (33.4%). This number is higher than the previous year and may be caused by the high number of stick injuries.

Lower Body Injuries

Lower body injuries showed an overall increase in the number of injuries (56) in the past year and they accounted for a much greater percentage (32%) as the upper body category (19%). Knee injuries (19) were again the largest group (35.7%) affected in the lower body category. This number is an increase over the last season. The knee made up 35.7% of the injuries in the group.

There was a decrease in the number of reported knee injuries in the 2009 calendar year.

1999 8
2000 9
2001 5
2002 19
2003 10
2004 21
2005 15
2006 13
2007 30
2008 21
2009 15
2010 19

Ankle injuries were the next highest group and accounted for 19.6% of lower body injuries. Thigh injuries were the third largest group (17.9%). These percentages are similar to the previous year.

Spinal Injuries

There were seven spinal injuries in the 2010 calendar season. This number is almost the same as the previous year (6). The injuries were mainly soft tissue injuries and were not kept out of play for a long period of time.

1999 3
2000 4
2001 2
2002 3
2003 4
2004 8
2005 15
2006 7
2007 12
2008 7
2009 6
2010 7

Trunk Injuries

The total number of trunk injuries (9) increased in the 2009-10 season.

1999 6
2000 4
2001 6
2002 6
2003 6

2004 2
2005 16
2006 7
2007 10
2008 6
2009 5
2010 9

The clavicle and rib fractures accounted for the majority of injuries to this area.

INJURIES BY DIAGNOSIS

Lacerations and contusions were the largest group in this category (21.8%). They accounted for 37 injuries which is almost similar to the previous year (41). Fractures made up the next largest group and accounted for 14.1% (24) of the total injuries by diagnosis. This category is significant increase from the previous year. The sprain category was the next highest group at 13.5% (23) and is relatively the same as the previous year.

Neurotrauma showed a greater percentage group in the last year (12.4%) as the previous year (7.4%). The number of concussions has increased over the last year. This number is the greatest increase over the last 5 years.

1999 3
2000 8
2001 3
2002 6
2003 3
2004 13
2005 12
2006 18
2007 11
2008 15
2009 12
2010 21

Dislocations/subluxations were responsible for a very small percentage (4.7%) of injuries during the 2009-10 calendar year. The number of dislocations has remained relatively the same as last year. They involve predominantly the shoulder.

1999 8
2000 4
2001 7
2002 6
2003 3
2004 5
2005 17
2006 3

2007 10
2008 10
2009 9
2010 8

CONTACT WITH THE BOARDS

The majority of injuries occurred away from the boards (70.6%). This trend is apparent in all championships over the eleven years and is similar as last year (66%).

CAUSE

The majority of injuries were still caused by body checking (22.4%). A high number (27) and percentage (16%) of injuries were caused by the stick. This percentage is a decrease from last year (21%). Head checking caused 12.4% of the injuries. The puck caused 12.4% of injuries.

Checking from behind injuries were approximately the same in the last year and remained at 6.5% of the injuries. These percentages are similar to the 2009 season (6%).

1999 3
2000 3
2001 1
2002 9
2003 6
2005 15
2006 10
2007 12
2008 13
2009 10
2010 11

There were 2 fighting injuries during the 2010 season.

RETURN TO PLAY

The majority of players who were injured returned to play within one week (48.9%) in the 2010 season. However, there was an increase in the number of injured players (13.5%, n=23) that remained out of play longer than three weeks, which reflected the seriousness of the injuries. This number represents an increase over the 2009 season.

1999 10
2000 10
2001 6
2002 20
2003 27
2004 19
2005 28

2006 11
2007 17
2008 13
2009 19
2010 23

TYPE OF INJURY

The vast majority of injuries (94.7%) were acute in nature and this trend is evident in all twelve years.

POSITION

The wing position was the most commonly injured position at 40.6% considering that there are two wing positions. The next highest group was the defence position at 38.2%. The centre is injured 17.6% of the time. The goalkeeper is the least injured in all the positions (2.4%).

TYPE OF SITUATION

Regular play (78.8%) accounted for the majority of injuries in the 2009-10 calendar year. The power play situation was responsible for only 2.9% of the injuries. The penalty killing situation was responsible for only 1.8% of the injuries.

ZONE

The visitor zone was the highest zone of injury (37.6%). The home had almost the same percentage of injury (36.5%). The lowest zone of injury is the neutral zone (20%).

PERIOD

The distribution of the injuries by period reveals that the second period had the highest percentage of injured players (36.5%) during the game. There are very few injuries sustained during the practices in the Championships (7.8%). There were few overtime injuries (1.8%). Interestingly, there were also injuries in the warm-up (1.8%)

First	26.3%
Second	36.5%
Third	25.1%
Practice	7.8 %
Overtime	1.8 %

ANALYSIS

The IIHF Injury Reporting System has been in operation for the last twelve years. Medical Supervisors in cooperation with the team physicians were able to collect 174 injury reports for 14 championships and this information is valuable in analyzing trends and injury patterns in the IIHF championships. The IIHF was able to report on 309 games in the 2009-10 calendar year. For the fourth year, a computerized system was used to accumulate the injury data and proved very beneficial and efficient

in giving the injury information for the year 2009-10 season. There were again a significant number of reported injuries in the 2009-10 season.

The IIHF Medical Committee introduced the concept of Game Injury reports 6 years ago whereby the team physician submitted an injury report after every game. The rate of collection in the 2010 season was again almost 100% due to the cooperation of the team physicians and the diligence of the Medical Supervisors. The collection of these reports may reflect the accurate reporting of the injuries. The reporting of injuries has improved as team physicians, Medical Supervisors become familiar with the system and appreciate the usefulness in assessing injury trends for all hockey players so that prevention can be instituted in the sport.

The total injury rate has remained approximately the same as in the previous year.

1999	17
2000	25
2001	16
2002	20
2003	18
2004	30
2005	29
2006	20
2007	23
2008	21
2009	27
2010	25.6

The injury rate is the highest in World Championship and World U20 Championship and lowest in the Olympic Games (Men and Women). The injury rate is approximately the same in the U20 Championships and the World Championship. The injury rate in the World U18 Championship increased slightly this year. The female game had a higher rate of injury this year as one team reported a high number of injuries in one Championship (WW18 Division I - 7) which has given the overall impression that there were a greater number of injuries. The injury has remained relatively stable and low in the women's game.

Facial injuries are still responsible for the greatest number of injuries in IIHF championships. A discouraging trend is the high number of facial lacerations and dental injuries in the World Championship. These numbers are similar to the previous year. Of interest in the facial category is the number of sticks that caused a facial laceration where no penalty was called (82%). The percentage of stick injuries where a penalty was called has however increased in the last year. It is hoped that continued rigorous officiating and the fair play ideal will help to reverse this trend in the next year especially with respect to facial injuries. There was an overall increase in the number of facial lacerations in the last year although there were fewer games played or documented this year.

Concussions increased substantially in IIHF Championships over the last year. There were 21 concussions in the 2010 calendar year. This number is a great increase from the previous year (12) and is the highest over 12 years. The concussions occurred mainly in the World Championship and World U20 Championship. There were also concussions in the World U18 World Championship (3)

and one concussion in the World Women U18 Championship. The no head-checking rule was introduced 4 years ago but seemed to make no difference in the number of concussions over the past 4 years as the number has remained relatively the same or even increased in the last year.

Dental injuries (10) were decreased in the 2010 season. All players in the U20 Championships are obliged to wear a mouth guard. It was noted that some players are not even wearing their mouth guard. Furthermore, the dental survey has shown that only approximately 55-60% of players wear the custom made mouth guard. It must be noted that there were no dental injuries in the WM20 or WM18 Championship.

It is very interesting to note that a penalty was called in only 18.5% of injuries. In other words no penalty was called 81.5% of the time. This statistic is disturbing as many of the injuries caused by a stick to the face or forearm/wrist area were not assessed a penalty. There was optimism as the more rigorous officiating and the emphasis on enforcing stick infractions, checking from behind and head checking has resulted in a higher number of penalties being called in these injury situations. During the 2005-06 season, only 19% of stick injuries involved a penalty whereas in the season 2007-08 a penalty was called in 26% of these injuries. In the 2009-10 season there were even fewer stick penalties (18.3%) called for this infraction. There were 27 stick injuries (16%) which is a decrease from last year (34).

An optimistic trend is the percentage of penalties called in head checking (42.9%) and hitting from behind (54.5%) which is a significant improvement over last year.

Shoulder injuries make up the greatest percentage of upper body injuries. The shoulder injuries occurred in all championships. AC joint separations continue to make up the majority of these injuries, followed by dislocations/subluxations (8), which is similar as in the last year (9). The hand and finger injuries were the next highest group (33%). Wrist injuries were decreased over the last year.

Lower body injuries were increased in the 2009-10 calendar year. Lower body injuries accounted for 32% of the injuries. Unfortunately, the number of upper body injuries increased in the last year (56).They occurred in all championships on a uniform basis. Most of the injuries were caused by a body check.

Knee injuries accounted for the greatest number (19) and percentage (35.7%) of lower body injuries. This number is a small increase from the previous year (15).

There were 7 spinal injuries in the past year. The spinal injuries were mild in nature and did not cause much absence from play. There were also a small but significant number of checking from behind (11) and head checking injuries (21) in the 2009-10 season. This number is similar to the previous year for the checking from behind injuries but there was a significant increase in the number of checking from behind injuries from last year (13).

There were few injuries that involved the trunk area (5.1%) including the chest, abdominal and pelvic area. These injuries were mainly in the clavicle and rib area.

The majority of injuries occurred this year in the visitor zone (37.6%) away from the boards. The neutral zone (20%) was the lowest zone of injury.

There seems to a higher risk in the injury rate at the wing position but the difference between the wing and defense and center position is very small. The risk of injury in the goalie position is the lowest of all the positions.

There were a greater number of injuries in the second period (36.5%). This trend is similar as in many other years where the second period is often the highest period of injury.

Regular play (5/5) accounted for the vast majority of injuries. There is less contact in the power play or penalty killing situation that accounts for very few injuries.

Most players return to play within one week. However, there were a greater percentage of players (13.5%) who could not return to play within three weeks because of the serious nature of the injury. This percentage is a small increase from last year (11%). The majority of players returned to play within three weeks in the Women U18 Championships (96%).

CONCLUSION

The computerized version of the IRS system should continue to be used with small modifications in the 2010-11 season.

The IIHF Injury Reporting System should be used in all championships where a Medical Supervisor is present. Medical Supervisors and Directorate Chairmen play a vital role in encouraging team physicians to submit the forms before the end of the championship. The Game Injury Reports have enabled the IIHF Medical Committee to determine the true rate of injuries as team physicians are reporting all of the injuries occurring in the IIHF Championships.

There should be no changes in the 'no body-checking' rule and the use of the full visor in the women's game as the injury rate is usually much lower than in the men's game. The high injury rate reflects a high number of injuries reported in one Championship. Injury reports should continue to be collected for all the Women Championships so that accurate information can be collected on the injuries in the women's game. The 2009-10 season was able to record all of the injuries in the World Women U18 Championship. The rate of injury was high in that Championship but caution should be exercised in that one team in the WW18 Division I had 7 injuries.

The enforcement of the rules has improved in the past year as a greater percentage of penalties have been called especially in injuries from hitting from behind and checking to the head. There still needs to be increased vigilance in stick injuries.

The no head-checking rule should be strictly enforced to decrease the number of concussions in the upcoming season. The checking from behind rule should continue to be strictly enforced, and this vigilance is needed to reduce the number of injuries in the 2010-11 season.

The results were discussed with the Director of Officiating Konstantin Komissarov who is also concerned about the high number of injuries especially caused by the stick which did not involve a penalty. A new project was discussed whereby the Medical Supervisors at the WM, WM20 and WM18 championships would review on a daily basis during the Championship with the Referee

Supervisor the injuries by video to validate the injury reports submitted by the team physician and also determine whether a penalty should have been assessed in an injury situation. In this way, feedback can be given directly to the Referee Supervisor and hopefully this strategy can lead to a better understanding of the injuries and their causes.

The use of custom made mouth guards should be strictly enforced in the U20 Championships in order to decrease the number of dental injuries

The increase in the number of knee injuries is a discouraging sign and the enforcement of body checking (low hits) to the lower body should be strictly enforced.

The serious injury rate (return to play after three weeks) should continue to be closely monitored in the 2010-11 season in all Championships as there was an increase in the serious injury rate (>3 weeks) from last year.

The promotion of fair play and respect, rigorous officiating, 4-man officiating system and application of stick infractions, new rules (no head checking) and proper equipment, including the use of mouth guards, will hopefully eventually lead to a reduction in injury rates over the next years. There was an apparent decrease in the overall injury rate until the 2008-09 season where the trend has been reversed and has lead to a higher injury rate similar to the 2006-07 season.