INFORMATION REPORT

TO: Mayor and Members Board of Health	**WARD(S) AFFECTED:** CITY WIDE
COMMITTEE DATE: September 26, 2011	
SUBJECT/REPORT NO: Injuries in Hamilton (BOH11025) (City Wide)	
SUBMITTED BY: Elizabeth Richardson, MD, MHSc, FRCPC Medical Officer of Health Public Health Services Department	**PREPARED BY:** Sue Connell (905) 546-2424 ext.3089 Kate Brisley (905) 546-2424 ext. 3762 Erin Fuller (905) 546-2424 ext. 5255
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Council Direction:

The Board of Health, at its meeting of April 26, 2011, approved the following: "That staff report back to the Board of Health on the issue of sports related injuries, specifically head injuries in minor sports."

Information:

As presented in the 2009 Ontario Chief Medical Officer of Health's Annual Report, injuries are the leading cause of death for Canadians under the age of 45, and they are the 4th leading cause of death for Canadians of all ages[1].

Despite associated risks of injury, there are numerous, well-documented health benefits of physical activity. Physical inactivity cost Canada approximately $5.3 billion in health care costs in 2001[2]. Sports, through opportunities for physical activity, may reduce future health care costs and reduce the growing issue of childhood obesity. Organized sports also help to build social networks and leadership, problem-solving, decision-making and communication skills[3]. Although participation in sports does increase the risk of injury, it is important to continue to promote and encourage participation to realize these benefits.

The most frustrating thing about injuries, from a public health point of view, is that the vast majority of them are predictable and preventable.

The economic argument for prevention is extremely compelling when direct (e.g., medical care, hospital costs, rehabilitation costs, home care) and indirect (e.g., loss of productivity) costs are considered:

- Injuries of all types cost Canada $19.8 billion and 13, 667 lives in 2004[4].
- Injuries of all types cost Ontario $6.8 billion and 4, 643 lives in 2004[4].
- Injuries from physical activity cost Ontario $655 million in 1999[4].
- Sport collisions were the most expensive type of physical activity injury, costing Ontario $166 million in 1999. Among youth, sport collisions are the most costly type of physical activity injury, accounting for $61 million or 41% of total costs in this age group[4].

Sport and recreation related injuries account for ten percent of major trauma cases in Ontario[5]. Sports activities account for more than one quarter of all injuries among youth[6]. In 2005, approximately 16% of Hamilton residents 12 years of age and older reported at least one injury in the last 12 months that was serious enough to limit their normal activities (e.g. concussion or broken bone). Of those Hamiltonians who had been injured, almost thirty percent reported that their injury occurred while participating in sports or physical exercise[7].

Sport and recreational injuries can be examined based on the rate of injury or the severity of the injury sustained. Local data are not complete, which limits the ability to understand specific sport and recreational injury rates in Hamilton. In addition, comparison between various types of sports is difficult because studies use different methods to conduct their studies and to define injury. However, research studies have consistently identified that the highest injury risk is for ice hockey[8].

Ice Hockey

Ice hockey is a popular sport for Canadian young athletes[9]. However, nearly 500 Ontarians are hospitalized with a hockey-related injury and thousands more seek medical care in an emergency department each year[10]. Canadian data suggest that hockey injuries may account for up to 10% of all adolescent injuries[11]. Specifically, hockey causes the most spinal injuries of all types of organized sports in Ontario[12].

Due to the speed of play, equipment, and body checking, hockey is a high-risk sport. Many serious hockey injuries are caused by hits from behind and to the head. Spine and spinal cord injuries commonly result from a player hitting the boards head first[12]. Body checking is a significant risk factor for injuries including concussions[13].

Soccer

Soccer is the most popular sport among Canadian youth[9]. The incidence of concussions in soccer is equivalent to other contact sports such as football and ice hockey. Goalkeepers, females and young players are at higher risk of concussion[12]. Young players are at an increased risk due to weaker neck muscles and low skill level[15]. Head to head contact between athletes is the most common mechanism for concussion. Each year in Ontario, more than 6,500 people visit an emergency department and more than 200 people are hospitalized due to a soccer injury[15]. The likelihood of injury increases when the rules of sportsmanlike behaviour and fair play are overlooked[16].

Other Sports

Other organized sports pose a variety of injury risks to youth.

- Rugby: Popular in the UK and New Zealand, rugby uses minimal protective gear and involves full body contact. Head injuries are common and cervical spinal injuries occur. Risk factors for injury include age, experience, position and skill. In 1995, 0.5% of the Ontario population played rugby[12].
- Football: Although this is a contact sport with an element of risk, protective equipment is worn and most injuries are non-catastrophic[12]. Injuries are most frequent among young males[17]. The most common injuries are: bruises, muscle strains, and ligament sprains[12].
- Volleyball: Concussions are frequent in volleyball although they are rarely catastrophic. Consequently, volleyball is considered a low-risk sport. Acute injuries usually occur as a result of spiking and blocking[12].

The Role of Public Health

Research related to injury prevention intervention in sports is still developing and requires further study. Many of the actions which have been found to be effective are outside of the scope of Public Health (for example: further testing and improved design of protective equipment, improved skills and strength/conditioning training for participants, enforcement of rules and fair play) [18]. Effective prevention efforts which are within the mandate and scope of Public Health are the following:

- Encouraging and promoting use of appropriate safety equipment. Targets for this education should include coaches/trainers, parents and participants themselves.
- Advocating for access to safety equipment for low-income individuals
- Developing and implementing safety awareness campaigns to educate coaches, officials and the general public, about injury prevention knowledge and techniques. Particular attention should be given to concussion prevention and education about return to play; research has shown that participants often return

to play prematurely, placing them at greater risk for repeat concussions and other injuries[12].

- Developing and/or advocating for injury prevention policies in sports. (e.g. eliminating body checking in hockey).

The following is a summary of current Public Health Services activities and programming in the area of sports and recreation injuries:

- Collaboration with Think First (a national brain and spinal cord injury foundation), the Hamilton Safe Communities Coalition, and the Helmet and Gear Committee (comprised of multiple community agencies and volunteers) to plan, develop and implement activities to promote education and awareness to Hamilton residents about brain and spinal cord injury prevention (e.g., connect local bike co-op with Think First to distribute bike helmets and information, provide helmet fitting training to Good Shepherd staff members, and support local organizations to provide helmet fitting information to attendees at a Tiger Cats game).
- Provision and development of classroom resources for Hamilton schools to teach and promote safety messages aligned with the Ontario education curriculum addressing the topics of safety and injury prevention.
- All Hamilton students in Grades 6 through 8 participate in an interactive assembly-style presentation delivered by two Public Health Nurses. This presentation includes, but is not limited to, information about steps to be taken to prevent sports and recreation related injuries. This age group is targeted because research has shown that use of helmets and safety gear begins to decrease in this age group, while injury rates remain high.

Additional planned activities for 2012 include:

- Continuing to partner with the Chronic Disease Prevention Team to promote children's involvement in physical activity.
- Working with minor sports organizations to educate parents and coaching staff that head injuries are not an inevitable part of minor sport and are often preventable.
- Increasing awareness about health management issues, such as return to play guidelines following a concussion.
- Addressing barriers (eg. cost) to using appropriate protective gear.
- Informing sports organizations about strategies to create supportive environments including rules for fair play.
- Exploration of additional collaboration with the Recreation Division in the Community Services Department.

References

1. Chief Medical Officer of Health (2010). Public Health – everyone's business. Retrieved from: http://www.health.gov.on.ca/en/public/publications/ministry_reports/cmoh_09/cmoh_09.pdf
2. Statistics Canada (2007). Physically Active Canadians. Health Reports, 18(3). Retrieved from: http://www.statcan.gc.ca/pub/82-003-x/2006008/article/phys/10307-eng.pdf
3. Statistics Canada (2008). Kids' sports. Canadian social trends, 11(008). Retrieved from: http://www.statcan.gc.ca/pub/11-008-x/2008001/article/10573-eng.pdf
4. SmartRisk (2006). The economic burden of injury in Ontario. Retrieved from: http://www.smartrisk.ca/downloads/burden/EBI-Ont-2006.pdf
5. Canadian Institute for Health Information (2006). Ontario trauma registry 2006 report: Major injury in Ontario. Ottawa: CIHI.
6. Canadian Institute for Health Information (2011). Ontario trauma registry 2011 report: Major injury in Ontario, 2009-2010 data. Ottawa: CIHI.
7. Applied Research and Evaluation Team, Hamilton Public Health Services (2010). Injury in Hamilton: An overview. Retrieved from: http://enet/phcs/phs/RE/re_phacts-projects.asp
8. Spinks, A. B., & McClure, R. J. (2007). Quantifying the risk of sports injury: A systematic review of activity-specific rates for children under 16 years of age. British Journal of Sports Medicine, 41, 548 – 557.
9. Statistics Canada (2010). Top 10 sports of children, 1992 and 2005. Retrieved from: http://www41.statcan.gc.ca/2009/20000/tbl/cybac20000_2009_000_t11-eng.htm
10. SmartRisk (2006). Hockey injuries. Ontario Injury COMPASS An Analysis of Injury Issues in Ontario, 3(1). Retrieved from: http://www.oninjuryresources.ca/downloads/Compass/2006/2006-01-OICompass-hockey.pdf
11. Emery. C. A., Hagel, B., Decloe, M., & McKay, C. (2010). Risk factor for injury and severe injury in youth ice hockey: A systematic review of the literature. Injury Prevention, 16, 113 – 118.
12. Tator, C. H. (2008). Catastrophic injuries in sports and recreation: Causes and prevention – a Canadian study. Toronto, ON, Canada: University of Toronto Press.
13. Zemper, E. D. (2010). Catastrophic injuries among young athletes. British Journal of Sports Medicine, 2010(44), 13 – 20.
14. Al-Kashmiri, A., & Delaney, J. S. (2006). Head and neck injuries in football (soccer). Trauma, 2006(8).

15. SmartRisk (2007). Soccer injuries. Ontario Injury COMPASS An Analysis of Injury Issues in Ontario, 4(6). Retrieved from: http://www.oninjuryresources.ca/downloads/Compass/2007/2007-06-OICompass-soccer.pdf

16. ThinkFirst (2006). Playing smart soccer. Retrieved from: http://www.thinkfirst.ca/downloads/resources/ThinkFirst-SmartSoccer.pdf

17. SmartRisk (2006). Football and rugby injuries. Ontario Injury COMPASS An Analysis of Injury Issues in Ontario, 3(10). Retrieved from: http://www.oninjuryresources.ca/downloads/Compass/2006/2006-10-OICompass-football.pdf

18. Klugl, M., Shrier, I., McBain, K., Shultz, R., Meeuwisse, W. H., Garza, D., & Matheson, G. O. (2010). The prevention of sport injury: An analysis of 12000 published manuscripts. Clinical Journal of Sport Medicine, 20(6), 407 – 412.

19. Cusimano, M., Taback, N., McFaull, S., Hodgins, R., Bekele, T., Elfeki, N., & Research Team in Traumatic Brain Injury and Violence, C. (2011). Effect of bodychecking on rate of injuries among minor hockey players. *Open Medicine, 5*(1). Retrieved August 17, 2011, from: http://www.openmedicine.ca/article/view/246/391.