



NHL.com
Team Sites
Affiliate Sites

Welcome to the NHL.com Network

Free Shipping
on Orders Over \$75



Shop.NHL.com
SHOP NOW



equipment quiz

what's new

about your injury
acute care
injury calculator™
prevention
equipment quiz™
hockey nutrition
our staff
hockey docs™
sponsorship

Head / Facial Injuries

- **A comparison of facial protection and the incidence of head, neck, and facial injuries in junior a hockey players: a function of individual playing time.** (Am J Sports Med 2002 Jan-Feb;30(1):39-44)

Stuart MJ, Smith AM, Malo-Ortiguera SA, Fischer TL, Larson DR.

Mayo Clinic and Mayo Foundation,
Rochester, Minnesota.

A cohort of 282 elite amateur ice hockey players were analyzed to 1) record the number, type, location, and severity of head, neck, and facial injuries sustained during games; 2) examine the relationship between injuries and the type of facial protection (none, partial, or full) according to individual playing time; and 3) determine whether full or partial facial protection is associated with an increased incidence of concussions, eye injuries, and neck injuries. Fifty-two injuries (158.9 per 1000 player-game hours) occurred in players wearing no facial protection, 45 (73.5 per 1000 player-game hours) in players wearing partial facial protection (half shield), and 16 (23.2 per 1000 player-game hours) in players wearing full facial protection (full cage or shield). Players wearing no protection were injured at a rate more than twice that of players wearing partial protection and almost



We subscribe to the
[HONcode principles](#)
of the
[Health On the Net Foundation](#)



Medical Content has been

reviewed and approved by



Contact Us

terms & conditions

©2001 Sport Injuries Online
Inc.

seven times higher than those wearing full protection. Concussions occurred in four players wearing no protection, five players wearing partial protection, and two players wearing full protection; these differences were not significant. The risk of eye injury was 4.7 times greater for players wearing no protection compared with those wearing partial protection. No eye or neck injuries occurred in players wearing full protection. This study demonstrates that both full and partial facial protection significantly reduce injuries to the eye and face without increasing neck injuries and concussions

● **The role of the mouthguard in the prevention of sports-related dental injuries: a review.** Int J Paediatr Dent 2001 Nov;11(6):396-404

Newsome PR, Tran DC, Cooke MS.

Oral Diagnosis, Faculty of Dentistry, The University of Hong Kong

OBJECTIVES: This paper examines the literature dealing with oral-facial injuries received during participation in sport and the possibilities open to athletes for their prevention. In particular, the paper examines five different aspects of this topic: the risk of dental injury while playing sports, the role of the mouthguard in preventing injury, types of athletic mouthguard, implications for patients undergoing orthodontic treatment and behavioural aspects of mouthguard wear.

RESULTS: It is clear from this review that participation in a number of sports does carry a considerable risk of sustaining dental injury, not only in the so-called contact sports such as rugby and hockey, but also in less obviously dangerous sports such as basketball. Although some evidence exists to the contrary, the majority of studies have found the mouthguard to be the most effective way of preventing such injuries. It is also clear that the custom-fabricated mouthguard, in particular the pressure-laminated variety, is seen to afford most protection. Athletes undergoing orthodontic treatment present a particular problem as they are potentially at greater risk of injury because of increased

tooth mobility and the presence of orthodontic appliances. The fabrication of mouthguards for these patients is also problematic and the literature covering this is reviewed. As with other preventive measures, mouthguard usage is often less than the dental profession would like; the reasons for this are explored in a small number of studies. **CONCLUSION:** While much progress has been made in this area, the profession could do much more to promote the greater use of mouthguards.

Concussions in hockey: there is cause for concern. Med Sci Sports Exerc 2001 Dec;33(12):2004-9

Goodman D, Gaetz M, Meichenbaum D.

Human Motor Systems Laboratory, Simon Fraser University, Burnaby, B.C., Canada, V5A-1S6.

PURPOSE: The purpose of the study was to document various aspects of concussion in Canadian Amateur hockey including demographics, causes, treatment, and prevention in order to guide future recommendations on how to reduce injury. **METHODS:** A detailed prospective and retrospective concussion history was obtained from British Columbia Junior Hockey League players over the course of two seasons (1998-2000). **RESULTS:** Higher rates of concussions occur in games versus practice, and there was an overrepresentation of forwards injured versus defensemen or goaltenders. There was between 4.63 and 5.95 concussions per 1000 player/game hours with the average age of the first hockey-related concussion in the 15th year. The greatest cause of concussion was contact with the ice and/or the boards. Fighting was not a major cause of concussion, although other illegal actions such as elbowing were. **CONCLUSIONS:** The primary recommendation to reduce the number and severity of concussions is to eliminate plays where there is a demonstrable intent to injure another player. Concussions in hockey are of considerable concern; however, there is now encouraging information with respect to the treatment of these injuries.

● **Evidence-Based review of sport-related concussion: clinical science.**

Clin J Sport Med 2001 Jul;11(3):150-9

Johnston KM, McCrory P, Mohtadi NG, Meeuwisse W.

Department of Neurosurgery, McGill University, Montreal, Quebec, Canada.

The clinical nature of sport-related concussion is discussed in this paper. Particularly highlighted are the difficulties with definition, injury severity grading, classification, and understanding of clinical symptoms. In addition, the well-recognized sequelae of concussion including the motor and convulsive manifestations are discussed in detail. Where possible, an evidence-based approach is adopted to assist the understanding of the literature in this complex area.

● **The assessment of sport-related concussion: the evidence behind neuropsychological testing and management.** Clin J Sport Med 2001 Jul;11(3):134-43

Grindel SH, Lovell MR, Collins MW.

Saint Vincent Sports Medicine Fellowship, Erie, Pennsylvania 16502, USA.

Because of the lack of valid evidence to support the current recommendations for the management of mild traumatic brain injury (concussion), many physicians, athletic trainers, coaches, and athletes have called into question the way concussions are treated in athletics. This review article discusses the current evidence for the management of concussion in high school, college, and professional sports. A complete review of the epidemiologic and neuropsychological studies to date is presented and critically reviewed, as are other assessment and management tools in concussion. The appropriate use of

neuropsychological testing, grading scales, and return-to-play recommendations are discussed in depth based on the current evidence. Additionally, areas requiring further research are identified and future trends are briefly discussed.

● **Concussion in sports: minimizing the risk for complications.** Am Fam Physician 2001 Sep 15;64(6):1007-14

Kushner DS.

Department of Neurology, University of Miami School of Medicine, Florida 33101, USA.

Mild traumatic brain injury, or concussion, is a common consequence of collisions, falls and other forms of contact in sports. Concussion may be defined as an acute trauma-induced alteration of mental function lasting fewer than 24 hours, with or without preceding loss of consciousness. The physician's responsibilities in assessing an athlete with concussion include determining the need for emergency intervention and offering guidance about the athlete's ability to return to play. Concussion may be complicated by cerebral edema related to the second impact syndrome, cumulative neuropsychologic deficits, intracranial bleeding or the postconcussion syndrome. The risk of complications is increased in athletes who prematurely return to play and in those with prolonged loss of consciousness or post-traumatic amnesia. An athlete with prolonged loss of consciousness or signs and symptoms that worsen or persist after a concussion should be evaluated in the emergency department. An athlete should not be allowed to resume sports participation until all symptoms of a concussion have resolved.

● **The cumulative effect of repetitive concussion in sports.** Clin J Sport Med 2001 Jul;11(3):194-8

Rabadi MH, Jordan BD.

Brain Injury Program, Burke Rehabilitation Hospital, White Plains, New York 10605, USA.

The increased popularity of contact sports worldwide exposes a large number of participants to both acute and chronic traumatic brain injury. Chronic traumatic brain injury (CTBI) represents the cumulative, long-term neurological consequences of repetitive concussive and subconcussive blows to the brain. Although this condition has been described primarily in boxing, it may be anticipated in other contact sports such as soccer, football, ice hockey, and the martial arts. Since treatment options in CTBI are relatively limited, the prevention of CTBI is of paramount importance. Minimizing the frequency and severity of acute brain injury in sport will be instrumental in accomplishing this goal. The prevention of CTBI will need to be sport specific and will undoubtedly rely on limiting the exposure of high-risk athletes, utilizing of protective equipment, enforcing strict rule adherence, training and supervising athletes, and increasing medical surveillance

Recommendations for grading of concussion in athletes. Sports Med 2001;31(8):629-36

Leclerc S, Lassonde M, Delaney JS, Lacroix VJ, Johnston KM.

McGill Sport Medicine Clinic, McGill University, Montreal, Canada.

Mild sports-related concussions, in which there is no loss of consciousness, account for >75% of all sports-related brain injury. Universal agreement on concussion definition and severity grading does not exist. Grading systems represent expertise of clinicians and researchers yet scientific evidence is lacking. Most used loss of consciousness and post-traumatic amnesia as markers for grading concussion. Although in severe head injury these parameters may have been proven important for prognosis, no study has done the same for sport-related concussion. Post-concussion symptoms are often the main features to help in the diagnosis of

concussion in sport. Neuropsychological testing is meant to help physicians and health professionals to have objective indices of some of the neurocognitive symptoms. It is the challenge of physicians, therapists and coaches involved in the care of athletes to know the symptoms of concussion, recognise them when they occur and apply basic neuropsychological testing to help detect this injury. It is, therefore, recommended to be familiar with one grading system and use it consistently, even though it may not be scientifically validated. Then good clinical judgement and the ability to recognise post-concussion signs and symptoms will assure that an athlete never returns to play while symptomatic.

Sport and recreation-related head injuries treated in the emergency department. Clin J Sport Med 2001 Apr;11 (2):77-81

Kelly KD, Lissel HL, Rowe BH, Vincenten JA, Voaklander DC.

Department of Rural Health, Faculty of Medicine, Dentistry and Health Sciences, University of Melbourne, Shepparton, Victoria, Australia. karendk@unimelb.edu.au

OBJECTIVE: Head injury (HI) in sport is common and can have serious consequences. This study examines the epidemiology of sport/recreational (SR)-related HI presenting to the emergency department (ED). **DESIGN:** Retrospective review of medical records. **SETTING:** Five EDs in the Capital Health Region (Edmonton) located in the province of Alberta, Canada. **PATIENTS:** All persons in a 1-year period reporting to the EDs with an HI. HI was defined as IC9-CM coded skull fracture, loss of consciousness, or concussion. **MAIN OUTCOME MEASURES:** Hospitalization, utilization of diagnostic testing, and discharge destination. **RESULTS:** In total, 10,877 (3%) of 288,948 ED encounters were for sports and recreational injuries; 358 (3%) were for HI. Males (71%) were more frequently injured; patients < 20 years old were involved in 66% of all HI cases. The highest proportion of HI

occurred during ice hockey (21%), cycling (13%), and playground-related activities (8%). 9% of HI were hospitalized (versus 4% admission rate for other SR injuries: $p < 0.01$). CONCLUSIONS: These results demonstrate the utility of an ED-based injury registry and indicate that patients with HI presenting to the ED from SR activities are common. These injuries appear to be more severe than other types of SR injuries treated in the ED.

● **Neuropsychological test performance prior to and following sports-related mild traumatic brain injury.** Clin J Sport Med 2001 Jan;11(1):23-31

Echemendia RJ, Putukian M, Mackin RS, Julian L, Shoss N.

Department of Psychology, The Pennsylvania State University, University Park 16802, USA.

OBJECTIVE: To examine the utility of neuropsychological tests in assessing college athletes prior to and following a sports-related mild Traumatic Brain Injury (mTBI). **DESIGN:** A prospective study of college athletes who sustained mTBI while engaged in sport. Preinjury baseline neuropsychological test data were obtained for athletes at risk for mTBI. Following an mTBI, the athlete and his or her matched noninjured control were evaluated at 2 hours, 48 hours, 1 week, and 1 month postinjury. **SETTING:** Male and female athletes from a Division I college. **PARTICIPANTS:** Male and female athletes from the football, men's ice hockey, men's and women's soccer, and men's and women's basketball teams at Penn State University. A total of 29 injured and 20 noninjured athletes participated in the study. **INTERVENTIONS:** Neuropsychological test batteries were administered at baseline and serially following mTBI. **MAIN OUTCOME MEASURES:** Post-Concussion Symptom Checklist, Hopkins Verbal Learning Test, Symbol Digit Modalities Test, Stroop Color-Word Test, Trail Making Test, VIGIL/W, List Learning, Digit Span, Penn State Cancellation Test, and Controlled Oral Word Association. **RESULTS:** Neuropsychological test data yielded

significant differences between injured athletes and controls at 2 hours and 48 hours following cerebral concussion; injured athletes performing significantly worse than controls. Injured athletes reported a significantly greater number of postconcussion symptoms 2 hours following injury but not at the 48-hour assessment. No multivariate group differences were found at 1 week, but univariate analyses suggested significant differences on a few measures. At 1 month postinjury, a statistically significant difference was found on one measure with injured athletes marginally outperforming controls. **CONCLUSIONS:** Neuropsychological tests are useful in the detection of cognitive impairment following mTBI. The test data appear to be more effective than subjective report of symptoms in differentiating between injured and noninjured athletes at 48 hours postinjury. Although significant individual variability existed, most injured athletes recovered within 1 week of injury. A battery of tests, rather than any single test, is necessary to capture the variability that exists among injured athletes.

● **Cerebral concussion in athletes: evaluation and neuropsychological testing.**

Maroon JC, Lovell MR, Norwig J, Podell K, Powell JW, Hartl R. *Neurosurgery* 2000 Sep;47(3):659-69; discussion 669-72

Department of Neurosurgery, University of Pittsburgh Medical Center, Pennsylvania 15213, USA.

OBJECTIVE: To conduct a topic review of studies related to cerebral concussion in athletes, as an aid to improving decision-making and outcomes. **METHODS:** We review the literature to provide an historical perspective on the incidence and definition of and the management guidelines for mild traumatic brain injury in sports. In addition, metabolic changes resulting from cerebral concussion and the second-impact syndrome are reviewed, to provide additional principles for decision-making. Neuropsychological testing, as it applies to athletes, is discussed

in detail, to delineate baseline assessments, the characteristics of the neuropsychological evaluation, the neuropsychological tests used, and the methods for in-season identification of cerebral concussion. Future directions in the management of concussions are presented.

RESULTS: The incidence of cerebral concussions has been reduced from approximately 19 per 100 participants in football per season to approximately 4 per 100, i.e., 40,000 to 50,000 concussions per year in football alone. The most commonly used definitions of concussion are those proposed by Cantu and the American Academy of Neurology. Each has associated management guidelines. Concussion or loss of consciousness occurs when the extracellular potassium concentration increases beyond the upper normal limit of approximately 4 to 5 mmol/L, to levels of 20 to 50 mmol/L, inhibiting the action potential and leading to loss of consciousness. This phenomenon helps to explain the delayed effects of symptoms after trauma.

CONCLUSION: Neuropsychological testing seems to be an effective way to obtain useful data on the short-term and long-term effects of mild traumatic brain injury. Moreover, knowledge of the various definitions and management strategies, as well as the utility of neuropsychological testing, is essential for those involved in decision-making with athletes with mild traumatic brain injuries.

● **Head and neck injuries among ice hockey players wearing full face shields vs half face shields.** JAMA 1999 Dec 22-29;282(24):2328-32

Benson BW, Mohtadi NG, Rose MS, Meeuwisse WH.

Faculty of Medicine, University of Calgary, Alberta, Canada.

Summary:

This study examined over 600 varsity hockey players and found that wearing full face shields reduced the risk of facial and dental injuries without

increasing the risk of
concussions or neck injuries..
([click here to read on-line](#))

● **Medicolegal aspects of athletic head injury.** Clin Sports Med 1998 Jan;17(1):71-82

Davis PM, McKelvey MK.

Davis, White & Pettingell, L.L.C., Boston, Massachusetts, USA.

This article reviews the legal aspects of head injuries resulting from a variety of athletic activities, focusing primarily on head and brain injuries resulting from the playing of football, boxing, horseback riding, winter sports (hockey and skiing), and soccer. Part 1 give a general overview of the occurrence of head injuries in athletics and the potential for litigation. Part 2 reviews the history of and increase in sports injury litigation, as well as resulting changes in the law. In Part 3, the current status of athletic head injury litigation, the parties involved, types of claims brought, and viable defenses are discussed. Finally, Part 4 reviews different ways to reduce athletic head injury litigation through better equipment design and adequate warning and instructions for users and coaches.

● **Brain injury in ice hockey.** Clin J Sport Med 1998 Jan;8(1):43-6

Honey CR.

Division of Neurosurgery, University of British Columbia, Vancouver, Canada.

OBJECTIVE: To review the incidence of brain injuries sustained while playing ice hockey. DATA SOURCE: MEDLINE was searched for articles from 1966 to 1997 relating to ice hockey and injuries. Additional references were reviewed from the bibliographies of the retrieved articles. STUDY SELECTION: All clinical study designs were included. DATA EXTRACTION AND SYNTHESIS: In

reviewing the literature, particular attention was paid to the relative strengths of the different study designs. Rates of head injuries were recorded (or calculated if possible) from the data. MAIN RESULTS: The most common brain injury was concussion. The incidence of concussion (per 1000 player-hours) ranged from 0.0 to 0.8 for players aged 5 to 14 years, from 0.0 to 2.7 for high school players, from 0.2 to 4.2 for university players, and from 0.0 to 6.6 for players on elite teams. The incidence of concussion increases with higher levels of play, is higher in game play than practice for elite players. Is reduced by appropriate helmets, and is showing a downward trend for players aged 5 to 14 years. Other brain injuries included rare epidural and subdural hematomas that can be lethal. Recommendations for the further reduction of brain injuries and guidelines for future studies of the incidence of head injuries in hockey are provided.

● **Head, neck, and facial injuries in ice hockey: the effect of protective equipment.** Clin J Sport Med 1997 Jul;7(3):162-7

Rampton J, Leach T, Therrien SA, Bota GW, Rowe BH.

Emergency Department, Sudbury General Hospital, Ontario, Canada.

OBJECTIVES: To determine the factors and behaviors associated with facial, head, and/or neck injuries to those engaged in ice hockey; the use of protective equipment was also examined. DESIGN: Prospective case series. SETTING: Emergency Department of Sudbury General Hospital. PATIENTS: All patients presenting to the emergency department with a head, neck, or facial injury while playing hockey between the months of October and March 1993-94 and 1994-95 were included in the study. Physicians completed data forms on each patient. Information was validated by review of the emergency-room records; further information was obtained by telephone. RESULTS: A total of 226 patients were identified with ice-hockey-related head, neck, or facial injuries.

Most injuries involved males (99%), and the mean age of patients was 23.9 (range, 4-63). Injuries occurred most frequently to the face [192 (85%)]. Many of the injuries were minor, with a mean injury severity score of 1.5 (range, 1-25). However, three patients (1%) required hospital admission, and one teenager suffered a serious spinal fracture. Protective facial hockey equipment use was low in our sample, except among younger injured players. Most of the facial injuries occurred in mature athletes playing recreational hockey. Full facial protection reduced the chance of upper facial injury ($p = 0.0001$), but the risk of such injury while wearing a half-visor was the same as while wearing no facial protection at all ($p > 0.05$). From the current study, we estimate that these hockey injuries result in approximately 2.7-3.0 million dollars of direct acute-care medical expenditure per year in emergency departments throughout Ontario.

CONCLUSIONS: Head, neck, and facial injuries suffered during ice hockey participation are common problems presented to emergency departments. Moreover, serious injuries can occur while playing this sport. Most injuries appear to be preventable, and facial protection appears to be less frequently used, especially by older men, than is currently recommended. Prevention strategies are discussed.

Head, face and neck injuries in hockey: a descriptive analysis. J

Emerg Med 1996 Sep-Oct;14(5):645-9

Deady B, Brison RJ, Chevrier L.

Royal Columbian Hospital, New Westminster, British Columbia, Canada.

Patients presenting to the emergency departments in Kingston, Ontario, between 1 October 1992 and 30 April 1993 with head, face, and neck injuries from playing ice hockey, regardless of the age of the player or whether the play was recreational or league, were enrolled in this prospective descriptive case series analysis to document the type and mechanism of injury in relation to the use of protective head and neck gear. A total of

119 such injuries were seen, 84 (71%) of which were lacerations. Players aged 20-34 years were most frequently injured, most commonly through contact with sticks and pucks while wearing helmets but no face shields. Strict enforcement of the rules is required to minimize injuries. Further study is required to determine the reasons for the incomplete protection afforded by helmets and face shields noted here

● **Concussion among Swedish elite ice hockey players.** Br J Sports Med 1996 Sep;30(3):251-5

Tegner Y, Lorentzon R.

Ermeline Clinic, Lulea, Sweden.

OBJECTIVE: To evaluate the frequency of concussion in Swedish ice hockey and to establish a uniform grading and treatment model for concussions of different severity. **METHODS:** Frequency of concussion was investigated in two studies, one retrospective and one prospective. In the retrospective study, all Swedish elite ice hockey players (n = 265) were asked to answer a questionnaire on the number and treatment of previous concussions. Only concussions diagnosed by a doctor were recorded. The questionnaire was completed by 227 players (86%). In the prospective study, all injuries including concussions occurring during game and practice in the Swedish Elite League (n = 12 teams) were recorded during four years. The causes of injury, referees judgements, diagnosis, treatment, and time absent from ice hockey were registered on special cards. **RESULTS:** In the retrospective study, 51 out of 227 players (22%) in the Swedish Elite League reported at least one concussion. In the prospective study, 52 concussions were reported. The incidence of a concussion is at least one concussion every year/team or a yearly risk of about 5% for a player to sustain a concussion. Most concussions occurred during league play (81%). Body contact (checking or boarding) was the most common cause of concussions. The players were absent from full training and play on a mean of 6 d. **CONCLUSIONS:** As this injury is

potentially dangerous it must be treated seriously according to a simple treatment model presented. In cases of repeated concussions during the same season, a longer period of time away from play is suggested. In players who have sustained several concussions over the years a thorough medical examination including EEG, CT/MRI, and neuropsychological tests should be performed. If any of these is pathological the player should be advised to give up ice hockey

- **The effect of the mandatory use of face masks on facial lacerations and head and neck injuries in ice hockey. A prospective study.** Am J Sports Med 1995 Nov-Dec;23(6):773-5

LaPrade RF, Burnett QM, Zarzour R, Moss R.

Department of Orthopaedic Surgery,
University of Texas Medical Branch,
Galveston 77555-0792, USA.

A 4-year prospective review of lost-time injuries and facial lacerations was performed for a National Collegiate Athletic Association Division I, intercollegiate ice hockey team. The total injury exposure time consisted of 798.5 practice hours and 163 games. There were 16 facial lacerations, with an incidence of 14.9 per 1000 player-game hours and 0.1 per 1000 player-practice hours; both incidences were found to be less than in previous comparable studies where the use of face masks was not mandatory. In addition, there were eight lost-time head and neck injuries that accounted for 6.3% of all lost-time injuries. We found that the mandatory use of face masks in intercollegiate ice hockey results in a reduction in facial lacerations and no increase in overall head and neck injuries.

- **Hockey helmets, face masks, and injurious behavior.** Pediatrics 1995 Mar;95(3):419-21

Murray TM, Livingston LA.

Department of Physical Education, Wilfrid Laurier University, Waterloo, Ontario, Canada.

OBJECTIVE. To educate physicians about factors that contribute to injurious behaviors in ice hockey and to propose that the medical community play a role in advocating change within the sport. **METHODS.** A review of relevant literature on the topic was conducted, with information drawn from scientific journal publications, conference proceeding, theses, and newspaper publications. **RESULTS.** The introduction of mandatory head and facial protection has been effective in virtually eliminating ocular, facial, and dental injuries in youth hockey, but it has also been problematically linked with an increase in catastrophic spinal injuries. Players adopt a false sense of security when donning the equipment, leading them to take excessive and unwarranted risks because of the protection they are supposedly afforded. The addition of these protective devices has also altered how officials perceive game situations, leading them to be more lenient in administering penalties. The net result has been an increase in illegal and injurious behaviors, such as checking from behind. **CONCLUSION.** Physician advocacy may play an important role in effecting change within the sport.

● **Head injuries in ice hockey exemplified by the National Hockey League "Hockey Canada" and European teams]** Unfallchirurg 1993 May;96(5):259-64

[Article in German]

Biasca N, Simmen HP, Trentz O.

Departement Chirurgie, Universitatsspital Zurich.

Ice hockey is one of the fastest and roughest of all sports. Based on prospective injuries reports of the North American National

Hockey League, the Canadian Amateur Hockey Association and three European teams (USSR, Sweden and Switzerland) the patterns, topography, circumstances and sequelae of the head injuries related to ice hockey are described. Although mandatory helmets and face masks have reduced the large number of facial and eye injuries, the rates of head injury and concussion are still too high. A number of steps must be taken by the hockey organisations, players, equipment manufacturers and health-care professionals to prevent injuries for specific prevention of head, face and eye injuries the rules should be strictly enforced, e.g. no checks from behind, high-sticking penalties, and mandatory helmets with face masks

- **Shock Absorption Capacities of Mouthguards in Different Types and Thicknesses**, Bemelmanns, P. Pfeiffer, P., *International Journal of Sports Medicine*; 22: 3149-153, 2001

Summary:

This biomechanical study tested different types of mouthguards in a laboratory setting using direct impact. The authors found the "boil and bite" mouthguards to be inferior to other types. Click [here for the abstract](#).

- **Do Mouthguards Prevent Concussion?**, McCrory, P, *British Journal of Sports Medicine*; 35: 81-82, 2001

Summary:

This editorial examines the evidence behind prevention of concussion with mouthguards and finds the evidence lacking.

- **Dietary Supplement Creatine Protects Against Traumatic Brain Injury**, Sullivan, P.G., Geiger, J.D., Mattson, M.P., Scheff, S.W. *Annals of Neurology* 2000;48 (5): 723-729

Summary:

This laboratory experiment found that dietary creatine supplementation reduced the extent of brain damage from injury that was induced in rats. The authors suggest that creatine may have a neuroprotective effect in brain injury.

- **Electrophysiological Evidence for the Cumulative Effects of Concussion**, Gaetz M., Goodman D., Weinberg H. *Brain Injury*;14 (12):1077-88, 2000

Summary:

This study on junior hockey players showed changes in both post concussion symptoms and electrophysiologic parameters if they had 3 or more concussion, as compared to players with no concussion history. The authors believe that these results indicate cumulative effects of injury.

- **Brain injury in ice hockey**. Honey CR. *Clinical Journal of Sport Medicine* 1998;8 (1):43-6

Summary:

This review of the medical literature from 1966 to 1997 was done to determine how common brain injuries are in the sport of hockey. The rate of mild brain injury (also called concussion) was found to be higher in more elite players, and higher in games as compared to practices. The use of appropriate helmets was found to reduce the risk of concussion.

- **Concussions in Athletes Produce Brain Dysfunction as Revealed by Event-Related Potentials**, Dupius, F., Johnston, K., Lavoie, M., Lepore, F., Lassonde, M., *Clinical Neuroscience and Neuropathology*; 11 (18):

4087-4092, 2000

Summary:

A new study on athletes has been done using event-related potentials (ERP) and shows that brain activity is reduced after concussion. These finding also correlated well with post-concussive symptoms.

[Back to Top](#)