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# The effect of visors on head and facial injury in National Hockey League players

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## KEYWORDS

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(NHL);  
Face visor;  
Visor

**Summary** There has been an increase in the number of concussions sustained by players in the National Hockey League (NHL). While wearing a helmet is now required by the NHL, the face visor remains optional. It is unknown to what degree face visors influence concussion, other head injury and eye-injury rates at the professional level. Data from the 2001–2002 NHL season were examined. It was found that wearing a face visor did not significantly influence the prevalence of concussion. Visor protection did, however, minimise eye-injuries and other, non-concussion head injuries. These data suggest that, while a visor may prevent some head and eye-injuries, other measures may be necessary to reduce the number of concussions. © 2006 Sports Medicine Australia. Published by Elsevier Ltd. All rights reserved.

## Introduction

The increased rate of reported head injuries in ice hockey has caused a growing concern over the short- and long-term effects of concussions. Physical contact is expected and often a desirable part of the game.<sup>1,2</sup> As the game has evolved, players have increased in size.<sup>3,4</sup> Rapid growth, combined with bigger and faster players, is thought to have resulted in an increased number of injuries.<sup>1,5,6</sup> Regardless, coaches, peers, broadcasters and experts praise players who have a physical and rough demeanour.<sup>7</sup>

The National Hockey League (NHL) has expanded from 6 teams in 1967 to 30 teams in 2000.<sup>8</sup> During this time, a migration of many highly skilled players from Europe and the former Soviet Union to the NHL has occurred.<sup>3</sup> A further transformation that has taken place during this time involved the improvement of equipment and the attention paid to player safety. For example, the helmet was made mandatory in the 1979–1980 NHL season for any player entering the league from that point on.<sup>3</sup>

Despite the helmet's introduction, there has been an alarming increase in concussion rates in the NHL.<sup>4,6</sup> Wennberg and Tator analysed the increase of concussion in the NHL over a 15-year period (1986–1987 to 2001–2002) and from 1997–1998 to 2001–2002 the reported concussion rate tripled that of the previous decade.<sup>4</sup> Even with this consid-

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erable increase some researchers suggest that many instances of concussion still go undiagnosed.<sup>9,10</sup> Athletes may be hesitant to describe concussive symptoms and may be under significant stress or pressure to return to play.<sup>10</sup> It is also possible that, when a concussion grading system is used, low grade injuries are missed.<sup>9</sup>

The identification of a concussion and post-concussion symptoms (PCS) is one of the most challenging issues facing medical professionals. Headaches, dizziness, nausea, decreased concentration, fatigue and/or memory alteration may be symptoms of concussion but also commonly occur in normal populations. Historically it has been difficult to measure severity or recovery from concussion objectively and until recently the universally accepted definition was considered to be rather limited.<sup>11</sup> The adoption of universal criteria has standardised the diagnosis of concussion, increasing the validity of findings based on such diagnoses.<sup>11</sup>

A significant body of research has focused on the prevalence of concussions in ice hockey, in an attempt to identify factors that may increase the likelihood of concussions. These include: (a) players being bigger and faster<sup>4</sup>; (b) the introduction of newer glass and equipment and harder boards<sup>4</sup>; (c) the sport's inherent physical nature<sup>1,2,4</sup>; (d) differences in facial protection<sup>12–14</sup>; and (e) differences in individual playing time.<sup>14</sup> Other factors include gender differences (females more likely than males to suffer a concussion),<sup>15</sup> and pre morbid expectations that result in making symptoms consistent with one's expectations.<sup>16</sup>

Of particular interest is research that indicates that differences in facial protection might play a role in the prevalence of concussion and/or other head and eye-injuries. These studies have suggested that players wearing no facial protection are injured at significantly higher rates than those wearing partial (i.e., half-visors) and full protection.<sup>14,17,18</sup> Despite this, the majority of players in the NHL do not wear a visor.<sup>19,20</sup> Visors have been reported to reduce peripheral vision while not offering significantly greater protection against head injuries.<sup>14,19</sup> Further, visors can fog up during the course of a game and may potentially limit vision.<sup>19</sup> Many players "look down" upon the visor, believing that wearing no facial protection is a sign of increased masculinity and toughness, while wearing facial protection made them feel like a target for the opposition.<sup>14</sup>

Research on ice hockey has indicated that, while facial protection does not significantly reduce the occurrence of concussion, it may reduce severity. These studies compared partial and full facial pro-

tection and did not include data on players with no facial protection.<sup>12,13</sup> Stuart et al.<sup>14</sup> did compare the concussion rates of players wearing no, partial and full facial protection and found no significant difference in the rate of concussion. Because of this, it was hypothesised that the difference in the use of facial protection and style of play might affect the number of concussions and related head injuries, including eye-injuries. Unlike the studies of Benson et al.<sup>12,13</sup> and Stuart et al.<sup>14</sup> who examined data from the United States Junior A level<sup>14</sup> and Canadian university hockey teams,<sup>12,13</sup> this study analysed data from the NHL. This allowed for a significantly larger participant pool. Statistics for all games played in the season were available, unlike previous studies.<sup>12–14</sup> Finally, this study examined data on players whose concussions are likely most accurately diagnosed because of the NHL's Neuropsychological Program, started in 1997.<sup>4</sup>

## Method

Statistical and injury data were compiled on the 2001–2002 NHL season. For purposes of this study an injury was therefore defined as any injury (concussion, eye-injury or other non-concussion head injuries) that resulted in at least one full game of missed playing time. Non-concussion head injuries included injuries such as breaks (e.g., fractured nasal bones). This category did not include minor facial injuries such as lacerations.

All injury data (concussions, eye-injuries, non-concussion head injuries) were obtained from *The sporting news: 2003–04 hockey register*<sup>21</sup> (which contained data on the 2001–2002 season). This resource provides detailed career information on all NHL players currently active (e.g., not retired). Included in this information is a player's injury history detailing the type of injury, the date of occurrence and the number of games missed. The grade of concussion was not available.

A number of indicators were employed to determine visor use to increase the reliability of the data. Visor data were acquired from two sources: the 2002–2003 Topps base set of NHL hockey cards; and *Electronic Arts Sports (EA Sports) NHL 2003* (Electronic Arts, Redwood City, CA), both of which featured in-game photographs of the players and/or biographical photographs and information of the player's choice of helmet (visor or no-visor). EA Sports obtained this information through player participation and interviews. The 2002–2003 Topps base set featured live action in-game pictures of NHL players (from 2001 to 2002 season). Both prod-

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