Reference
1. Marchie A, Cusimano MD. Bodychecking and concussions in ice hockey: Should our youth pay the price? [editorial]. *CMAJ* 2003;169(2):124-8.

Twenty-five years ago the Canadian Association of Surgeons (Western Division), of which I was a member, wrote to hockey administrators condemning the violence that was creeping into hockey. Unfortunately, as outlined by Anthony Marchie and Michael Cusimano,[1] the level of violence has only increased since then.

The commentators on CBC's *Hockey Night in Canada* have, in my view, been partly responsible for this increase. First came Howie Meeker and his admonition to "finish the check." When youngsters become old enough to play in leagues where bodychecking is allowed, they are urged by coaches and sometimes parents to finish the check — in other words, to violently hit their opponent, whether or not he or she has the puck. Then along came Don Cherry, who seems to emphasize hitting as the most important skill in hockey, with his "rock 'em, sock 'em" version of the sport.

Marchie and Cusimano[1] do not address the question of how the interpretation of the rules relates to bodychecking. Professional hockey is about entertainment and money. Thus, in professional hockey and, to a lesser degree, professional junior and minor hockey, referees are instructed in how to enforce the rules, so as not to slow the tempo of the game. What today is accepted as bodychecking would in my time have been called charging, boarding or even intent to injure.

A change in attitude is needed to curb hockey violence. Bodychecking should be curbed by enforcing established rules and dealing appropriately with the violence that permeates hockey and, some would say, society at large. Children do not need to be taught how to give or take bodychecks; rather, they should be learning how to skate, stick-handle, pass and shoot, as well as how to carry and pass the puck with their heads up, to avoid the occasional legal bodycheck.

Let's take the violence out of hockey by enforcing the rules, not by trying to remake the game.

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Reference
1. Marchie A, Cusimano MD. Bodychecking and concussions in ice hockey: Should our youth pay the price? [editorial]. *CMAJ* 2003;169(2):124-8.

There are several problems with the analysis of bodychecking and concussions by Anthony Marchie and Michael Cusimano.[1] They quote statistics from the popular media alongside those from peer-reviewed journals, their essay contains some inaccurate numbers, and they are selective in their use of the available data.

For instance, citing Honey's review[2] of articles published between 1966 and 1997, they state that there were 2.8 concussions per 1000 player-hours for participants aged 5 to 17; however, the concussion rates reported in the 4 studies reviewed by Honey[2] were 0.0, 0.5, 1.5 and 2.8, and only the last of these had data for players 5 to 17 years (the age range was narrower for the other 3 studies). Furthermore, Marchie and Cusimano neglect to share 2 major conclusions of that review:[2] that the incidence of concussion increases with the level of play and that it has been decreasing in children 5 to 14 years of age.

Elsewhere, Marchie and Cusimano use injury data from high school, university and elite-level players to support their conclusion that our children, and perhaps Canadian society as a whole, would be better off if there was no more checking at the youth level. However, the data from the cited studies[3-5] support the concept that injury rates climb along with the size and speed of the players.

The American Academy of Pediatrics also endorses the no-checking concept for children.[6] They weight heavily data from a small prospective study of hockey injuries in 150 boys, 9 to 15 years of age, over a season.[7] However, most of the 52 injuries (sustained by 44 players) were contusions, sprains and strains. Disability was defined as time away from physical activity, not days missed from school or admission to hospital. Fracture, not concussion or catastrophic injury, is why the American Academy of Pediatrics suggests that checking should be proscribed.

Current data do not support the notion that serious injury is a major risk of ice hockey at the more junior levels. It is only when speed and strength outpace judgement, in mid and late adolescence, that the game becomes hazardous. Rather than banning checking in the younger age groups, a concerted international effort should be made to rid hockey of dangerous behaviours, such as checking from behind. Catastrophic injury in football dropped dramatically when spearing was eliminated in the 1970s.[3] Surely similar rule changes could be instituted and enforced for hockey.

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Kudos to Anthony Marchie and Michael Cusimano[1] for their informative and valuable article regarding an issue that affects many Canadian families. However, the authors make an erroneous extrapolation. In examin-

ing violent acts perpetrated by hockey teams in Stanley Cup final series, as indicated by recorded penalties,[2] Marchie and Cusimano note that "teams playing with less violence were more likely to win. Compared with more violent teams, they had on average over 7 more shots on goal per game and 53 more shots on goal over a 7-game series." Stating that victory resulted from less violence is a fallacy. Teams can play with extreme violence yet contain their actions to that which is within the rules; no penalty is incurred, even though significant violence is employed. In addition, less skilled teams may resort to a more physical and thus more violent strategy in an attempt to win the game.

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The excellent article by Anthony Marchie and Michael Cusimano[1] highlighted the fact that even minor concussions are serious injuries. The authors recommend caution in deciding when or whether hockey players should return to play after a concussion. This principle should apply to athletes in all sports, not just ice hockey. Traumatic brain injury can occur in a variety of sports,[2] and other sports with high risks for head injury include boxing, football, wrestling, soccer and rugby.[3] For example, one study showed evidence of neuropsychological impairment in amateur soccer players,[4] whose performance on tests of planning and memory was inferior to that of amateur athletes involved in swimming and track. As pointed out by Marchie and Cusimano,[1] physicians need to educate the public about brain injury and help to reduce the risk of our youth experiencing permanent cognitive deficits as a result of sports.

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[The authors respond:]

As R. van Reekum notes, legal bodychecks are often the cause of trauma and concussions; only 8% of injuries are caused by illegal checks.[1] However, stricter enforcement of existing rules would not solve the problem, as Angus Juckes and Ian Ross suggest.

It is difficult to see how anyone can perceive entertainment value in bodychecking, especially if its victims are children and youth. The American Psychiatric Association has concluded that, in addition to desensitizing viewers, violence in entertainment promotes more such violence.[2] Neal Shaw's suggestion that violence and aggression are often manifested in legal bodychecking raises the important question of whether these are values we wish to foster in the next generation of citizens.

Yet remaking the game is unnecessary. For example, most high school and women's hockey games are already played without bodychecking, and the injury rates in these settings are much lower than in the National Hockey League (NHL).[3] What needs remaking is attitude: we need to refocus the game on fun, skill and sportsmanship, rather than violence and aggression.

Although his review of our references is admirable, Ross's comments are limited in applicability, given that many athletes underreport injuries such as concussions. Because concussions are often missed or misdiagnosed,[4] the incidence is probably much higher than that reported.[3,5] Ross also fails to mention that Honey's review[6] indicated that 2 studies reporting no concussions did not have large enough sample sizes to allow definitive conclusions. Nonetheless, a conservative estimate of 1 or 2 concussions per 1000 player hours,[6] for 560 000 registered minor hockey players who average 15 hours on ice per season, would yield at least 8000 to 16 000 concussions alone for the upcoming season in Canada. On the basis of an injury rate of 15 per 100 players (9 to 15 years of age) per season,[7] we would expect bodychecking to account for the majority of the 84 000 injuries in the 2003/04 minor hockey season.

Some people, including various media pundits, coaches, parents and health care professionals, have suggested — erroneously — that the benefits of checking outweigh the risks, even for young children and adolescents. They argue that this technique must be learned to minimize the risk of injury at older ages, but the data do not support this contention. The incidence of concussion and other injuries consistently increases with increase in bodychecking experience, reaching its zenith at the elite levels in collegiate leagues and the NHL,[3,6,8] and is associated with significant risk of fracture,[9-11] concussion[8,12] and spinal injury.[13] One concussion is a risk factor for a second one, and those who have sustained 3 or more concussions are 9 times more likely to have altered mental status than those without prior concussion.[14] A frequently overlooked cost is that of attrition from the sport, which is greatest in those 13 and 14 years of age, when differences in the size and weight of players are also at their greatest.[11]

When these reasons against bodychecking are considered along with the concept of patient autonomy, we are compelled to recommend banning bodychecking until players are at least 17 or 18 years of age. It should be permitted thereafter only if players have given proper informed consent. Parents and young players need to know the risks before starting play in a contact league, and physicians should take into account not just when but if a player