

Mouthguards should be worn in contact sports

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In their well-designed, case-control investigation of mouthguard use in youth ice hockey players and the risk of concussion, Chisholm and colleagues¹ report that those wearing a mouthguard—whether custom-made or off-the-shelf—had lower rates of concussion than control participants. The point estimate suggests a considerably reduced risk, although the CIs are broad. The authors report differences in the estimate of reduced risk for custom-made and off-the-shelf mouthguards, with the latter (perhaps surprisingly) having a greater reduction, although again the CIs are broad. The authors are explicit that their study is not powered for precise estimates of this secondary analysis, so we must all be cautious in interpreting this latter observation.

NOVEL CONTRIBUTION

The primary observation—that mouthguards are associated with a lower rate of concussion—is an important contribution to the literature. The finding differs from that of the most recent systematic review of whether mouthguards can protect against concussion in contact sports, which concluded that ‘the effect of mouthguards on concussion risk was minimal’,² although the point estimate of the relative risk suggested a small benefit of wearing a mouthguard to protect against concussion. It is well established that mouthguards protect against orofacial and dentoalveolar injuries. The aforementioned systematic review and meta-analysis reported a relative risk of 2.3 (95% CI 1.0 to 5.1) for non-users compared with mouthguard users,² while another recent systematic review and meta-analysis reported a rarely seen OR of 0.07 (95% CI 0.05 to 0.08) for any dentoalveolar injury among those wearing a mouthguard compared with those who are not.³ This OR represents 93% lower odds of this injury while wearing the mouthguard.

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WHAT ABOUT MOUTHGUARDS FOR DENTOFACIAL INJURIES?

Despite this relatively strong evidence supporting the protective effect of mouthguards for orofacial injuries and the potential benefit against concussion, there are other important considerations in their use among sports players. In their systematic review of the prevalence of dentofacial injuries and mouthguard use in field hockey players, Vucic *et al*⁴ found that the prevalence of such injuries in junior (12.7%; 95% CI 8.5% to 17.0%) and senior (45.2%; 95% CI 39.3% to 51.0%) players was considerable. They reported that mouthguard use had increased considerably to 84.5% (95% CI 22.7% to 40.1%) over a 20-year period between the later 1980s and early 2000s.⁴ Interestingly, however, they also reported that many field hockey players think mouthguards are unnecessary and uncomfortable. Given the importance (at least field hockey) players give to comfort and necessity, it is important to recognise that another systematic review reported that custom-made mouthguards did not interfere with or improve athletes’ performance when compared with those without mouthguards, and that custom-made mouthguards showed the smallest range of changes in players’ performance compared with other types of mouthguards.⁵

CALL FOR ACTION

So mouthguards protect against orofacial injury and may do so against concussion in contact sports. Use of mouthguards should therefore be strongly promoted in such sports, and further research should be conducted to clarify their role in concussion prevention. To promote wearing mouthguards, we must recognise that behaviours and behaviour changes that are not supported by the environment in which they occur are difficult. Just as with obligatory seat belts and helmets, regulations that oblige all players to wear mouthguards in contact sports where the concussion incidence is above a certain level will result in virtually everyone wearing them. A recent systematic review among 12 sports identified rugby, ice

hockey and American football as those with the highest incidence of concussion.⁶ Using these and similar data to agree a cut-off could be a good approach. Today, boxing is the only professional sport for which mouthguards are mandatory. However, the US National Federation of State High School Associations⁷ and the US National Collegiate Athletic Association⁸ mandate mouthguard use in field and ice hockey, American football, boxing and lacrosse.

WHAT ABOUT THE COST?

Off-the-shelf mouthguards are considerably cheaper than custom-made mouthguards. As there is no evidence of difference in terms of their protective or performance effects, junior and amateur sports organisations and associations should work with producers of mouthguards to provide them as cheaply as possible, and even aim to subsidise them for all players in relevant sports.

In summary, mouthguard use should be regulated in sports with relatively high incidence of concussion, such as rugby, ice hockey and American football, and strongly promoted in all contact sports. Sporting federations and local organisers should aim to find partners to provide relatively cheap off-the-shelf mouthguards to support players from all socioeconomic backgrounds.

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