

# Prevention of Sport-related Facial Injuries

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## KEYWORDS

- Epidemiology • Prevention • Facial injuries • Sport injuries • Eye injuries
- Dental injuries • Maxillofacial injuries

## KEY POINTS

- Strong evidence surrounding the effectiveness of protective equipment and rule changes is limited.
- Rule changes mandating mouth guards and eye protection have been effective at reducing the risk of oral and eye trauma.
- Protective standards can assist with ensuring the equipment purchased is capable of withstanding the forces of the sport, but the difference between equipment that meets the standard and equipment that does not meet the standard has not been evaluated using prospective studies.
- Mouth guard use, regardless of type, is associated with a reduction in oral trauma but custom-fitted mouth guards may increase comfort and breathability, and may offer superior protection.

## INTRODUCTION

Sport-related facial injuries represent more than 41% of the injuries seen at emergency clinics.<sup>1–20</sup> Such injuries often result in surgical procedures that lead to extended periods of time away from sport and can be potentially career ending.

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Primary prevention strategies are essential for continued participation in sport and the general health of athletes. This article evaluates some of the strategies used for the prevention of sport-related eye injuries, oral injuries, and overall facial injuries, as well as providing sport-specific considerations in preventive measures.

## EYE PROTECTION

Understanding the full effect of wearing eye protection is difficult because of the lack of accurate and consistent injury surveillance with consideration of exposure to risk (ie, participation exposures or hours).<sup>21</sup> Features of sports that may place athletes at higher risk of eye injury include balls, bats, and sticks that come into close range or contact.<sup>21</sup> Strategies to reduce eye injuries include rule changes and eye protection equipment.

In 2004, the American Academy of Pediatrics and the American Academy of Ophthalmology recommended protective eyewear for all youth participating in baseball/softball, basketball, bicycling, boxing, fencing, field hockey, football, full-contact martial arts, ice hockey, lacrosse, paintball, racquet sports, soccer, street hockey, track and field, water polo/swimming, and wrestling.<sup>22</sup> However, very few of those sports have mandatory eye protection and it is often up to the players to regulate their use.

Several standards for sport eye protection exist in Australia and New Zealand,<sup>23</sup> Canada,<sup>24</sup> the United Kingdom,<sup>25</sup> and the United States.<sup>26</sup> Such standards are primarily intended for racquet sports; however, some identify other sports for which they are appropriate (eg, lacrosse, field hockey, basketball, baseball, and soccer).<sup>26,27</sup> In the United States, field hockey<sup>28</sup> and women's lacrosse<sup>29</sup> have additional standards for eye protection. Eye protection is often made with polycarbonate plastic at least 3 mm thick, which is both durable and impact resistant.<sup>30</sup> Prescription glasses and contact lenses do not adequately prevent eye injuries, and may introduce additional injury risk.<sup>30,31</sup>

Mandatory eye protection has been examined in floorball, lacrosse, and field hockey. This rule enforcement has been found to be effective in reducing injury risk by 69% to 84% and has led to a dramatic reduction in eye injuries seen in the emergency department (**Table 1**).<sup>32,33</sup>

Although it is clear that protective eyewear is effective at preventing eye injuries, participants may choose not to wear it for several reasons. These reasons may include lack of interest, discomfort, disruption of their sight, wearing prescription glasses, not believing there is a risk, or simply a preference to not wear them.<sup>34–36</sup> Educational efforts have shown some effectiveness at changing protective eyewear behavior, but such efforts have not been linked to injury reduction.<sup>37</sup>

## ORAL PROTECTION

The goal of a mouth guard is to dissipate the force between the upper and lower teeth and act as a shock absorber,<sup>30,38</sup> which can help protect the lips and tissue inside the mouth from laceration as well as the teeth and the jaw from dislocation.<sup>38</sup> There are 3 types of mouth guards: custom-fabricated guards made by dental professionals using a model of the patient's teeth and vacuum-forming or heat-pressure lamination; form-fitted, boil-and-bite guards made by the athlete biting the mouth guard; stock guards, bought directly over the counter for immediate wear.<sup>38</sup>

The American Dental Association recommends that mouth guards be worn in any sport that poses a risk to the mouth, including acrobatics, basketball, boxing, equestrian events, extreme sports, field hockey, football, gymnastics, handball, ice hockey,

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