

Mouth guards in sports

The most significant factor in preventing sports-related or recreational injuries to the face and oral cavity is wearing basic protective devices, such as properly fitting helmets, facemasks, or mouth guards.

Graziano D. Giglio,
DDS, FACP



Dr. Graziano Giglio

maintains an interdisciplinary private practice in New York City and is a Clinical Associate Professor in the Postgraduate Prosthodontics Program at New York University College of Dentistry.

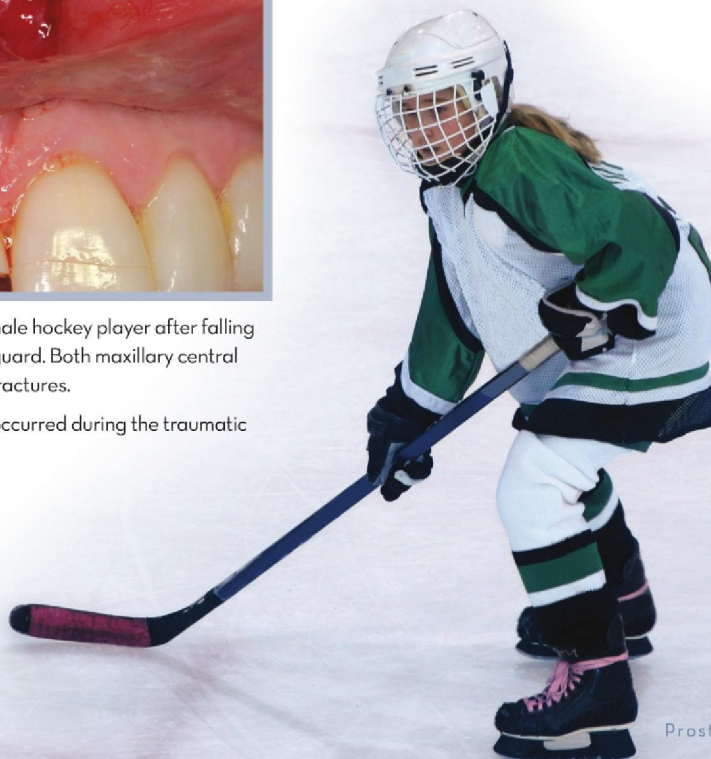


Fig. 1: The trauma sustained by a female hockey player after falling on the ice without wearing a mouth guard. Both maxillary central incisors suffered horizontal coronal fractures.

Fig. 2: The upper lip laceration that occurred during the traumatic injury depicted in Figure 1.

Well-fitted mouth guards prevent violent contact between the top and bottom teeth, which can result in soft tissue lacerations, tooth avulsions, tooth or bone fractures, root canals, and concussions.¹ Statistically, sports-related activities contribute to nearly one-third of all dental injuries.^{2,3,4} Figures 1 and 2 demonstrate typical injuries that may result.

The prosthodontist can play a pivotal role in informing patients, athletes and their parents, and coaches about the importance of prevention, diagnosis, and treatment of orofacial injuries in sports and recreational activities.





In order for a mouth guard to be effective for the patient, it should fulfill the following basic requirements:

1. Cover all the maxillary teeth to the distal (back) surfaces of the second molars.⁵
2. The labial edge of the mouth guard should extend to the gum line (within 2 mm of the sulcus).⁵
3. The palatal edge should end just above the gum line (approximately 2 mm above the gingival margin).⁵
4. The labial edge should be rounded and the palatal edge should be tapered.⁵
5. Be fabricated from a material approved by the U.S. Food and Drug Administration that can reduce the impact force to teeth, surrounding soft tissues, and bone.^{4,8}
6. Be comfortable, retentive, and fit properly.⁸
7. Be easy to clean.⁸
8. Not interfere with breathing or speech.^{4,5,8}

Fig. 3: (Above, left) The intaglio (tissue) surface view of a properly designed and manufactured custom-made mouth guard.

Fig. 4: (Above, right) The labio-intaglio (facial and tissue) view of a custom-made mouth guard with a rounded labial flange and a tapered palatal flange.



There are three types of mouth guards available for athletes:

Stock

A stock mouth guard is a ready-made or over-the-counter device available in a few sizes. It is inexpensive, provides a low level of protection, does not stay in place well, and is often not comfortable. Since retention is poor, the athlete holds the mouth guard in place by clenching his or her teeth together.

Self-adapting

A self-adapting mouth guard is known as the “boil-and-bite” type and is available over-the-counter. This device is a thermoplastic rim, which is heated in hot water and then placed in the mouth to be adapted to the teeth by biting down. They are relatively inexpensive and can be replaced frequently for young athletes with a mixed dentition (both primary and permanent teeth) or by individuals that are experiencing rapid growth. These mouth guards are often bulky and do not retain their shape over time.

Custom-made

A custom-made device is fabricated in a dental laboratory on a cast from an impression made by a dentist. This type of mouth guard is usually made of a thermoplastic material that is heated and adapted to the cast under pressure or with a vacuum form machine. Although it is the most expensive, it is the most protective, durable, and retentive of the three types available.^{4,5,8} Figure 3 demonstrates the intaglio (inner) surface view and Figure 4 shows the facio-intaglio (outer and inner) surface view.

The American College of Prosthodontists (ACP) supports the use of mouth guards for all contact sports and for any recreational activities that may potentially result in orofacial injuries. The ACP recommends the use of custom-made mouth guards to better protect the teeth and jaws from trauma during athletic activity.

Several options in the manufacture of custom-made mouth guards are available with respect to materials and developed techniques. The standard thickness is 4 mm for most contact sports. The prosthodontist should determine the necessary thickness of the device depending on the risk of injury involved with the particular sport or activity.

The prosthodontist should select the best materials for the construction, determine the design, and decide which activity or sport requires protection. Patients that have previously suffered orofacial trauma or concussion while participating in a sport or recreational activity need to be reminded of proper protective devices in order to reduce the risk of repeated injury to orofacial areas.

Custom-made mouth guards have proven to be the most effective means in the prevention of injuries



Fig. 5: The intraoral view of a custom-made mouth guard on a collegiate baseball player.

to the orofacial structures.^{1,4,5} They are superior to stock or self-adapting devices in comfort, retention, and prevention of injuries. Figure 5 shows the intraoral view of an athlete wearing a custom-made mouth guard.

The benefits far exceed the expenses when considering the fees and discomfort associated with a traumatic dental injury and subsequent treatment. In addition, the prosthodontist must stress that mouth guards should be worn during competition as well as during practice sessions. The profession should make every effort to promote the use of mouth guards in athletes and patients who participate in any sport or recreational activity that may lead to a potential injury to the orofacial region.⁴ ■

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