

## REVIEW ARTICLE

# Sports Dentistry and Role of a Dentist: A Review

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## ABSTRACT

Sports dentistry is a recent and upcoming field in dentistry. It mainly includes the prevention and management of athletics-related orofacial injuries and associated oral diseases. Dental injuries are the most common type of orofacial injury sustained during participation in sports. The dentist can play a crucial part in informing athletes and their families, coaches, and patients about the importance of preventing orofacial injuries in sports.

**Keywords:** Sports, Facial trauma, Mouthguards, Dentistry.

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## INTRODUCTION

The word "Sport" is derived from an old combination of words that literally meant "to carry away from work."<sup>[1]</sup> Sports dentistry is the branch of dentistry that had been introduced in 1958, Brazil at the time of World Cup Soccer.<sup>[2,3]</sup> According to the International Academy for Sports Dentistry – "Sports Dentistry is referred as the branch of sports medicine that deals with the prevention and treatment of dental injuries and related oral diseases associated with sport and exercise".<sup>[1,4,5]</sup> Dental injuries are the most common type of orofacial injury sustained during participation in sport,<sup>[3]</sup> and various traumatic dental injuries occurred including luxation, intrusion, extrusion, and avulsion of tooth, fracture of the facial bones, and injuries to the temporomandibular joint.<sup>[5]</sup> Preventive measures such as helmets and mouthguards should be given during sports have changed the incidence of such injuries to the participating athletes. Sports dentistry have responded to these athlete's specialized needs and trying to provide them with the quality care which they deserve.<sup>[5]</sup>

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## Sports Injuries

The majority of sports-related injuries are musculoskeletal and 11–40% of all sports injuries involve the face.<sup>[6]</sup> Males are traumatized twice as often as females, with the maxillary central incisor being the most commonly injured tooth.<sup>[2]</sup> Individuals between the ages of 20 and 30 years are most frequently affected by jaw fractures, due to the maxilla being the largest component of the facial skeleton. The most common types of sports-related facial trauma are the soft tissue injuries and the fractures of the "T-zone" bones; the nose, the zygoma, and the mandible.<sup>[2]</sup> There are two broad types of sports injury risk factors.<sup>[6]</sup>

## Extrinsic Factors

Extrinsic risk factors are the injury predictors that are related to the type of activity demanded by a particular sport. Such as, the extrinsic factor of participation in running or jogging is more likely to produce a stress injury than that caused by engaging in contact sports such as American football or boxing.<sup>[6]</sup>

## Intrinsic Factors

Intrinsic risk factors are the biologic and psychosocial factors that may predispose a particular person to a particular kind of sports injury.<sup>[6]</sup>

### Age

Sports injuries usually occur in adolescents and young adults, and it should be taken in consideration that in young children, before the eruption of the permanent incisors, trauma directed to the primary dentition most often results in luxation injuries which are in marked contrast to the young permanent dentition.<sup>[7,8]</sup>

### Body size

Increased chance of injury for sports participants with increased body size; increased leverage due to the greater length of limbs and/or limb strength, and stress on joints due to additional weight.<sup>[9]</sup>

## Psychological and psychosocial factors

Any psychological factors such as anxiety, low self-confidence, or performance pressure may reduce the participant's attention to the challenges of the sport and/or

increase the possibility of fatigue, which may be an etiologic factor in sports injury.<sup>[10]</sup>

Evaluation of the facial injuries should begin with the initial assessment of trauma evaluation a simple remembrance; ABCDE is used as a memory aid for the order in which problems should be checked (A – airway, B – breathing, C – circulation, D – disabilities, and E – exposed environment control), and simultaneously resuscitation is begun. Head-to-toe evaluation of the trauma patient, including a complete history and physical examination, including the reassessment of all vital signs should be done.<sup>[3]</sup> Depending on the extent and the types of injury, three groups – children and adolescents, middle-aged athletes, and women are particularly involved for common facial injuries which are as follows:<sup>[3]</sup>

- a. Soft Tissue Injuries: The face is often the most exposed part of the body in athletic competition and injuries such as abrasions and lacerations are common mostly at lip, brow, and cheek.
- b. Temporomandibular Joint Injuries: During mild and severe trauma, the condyle can be forced posteriorly to the extent that the retrodiscal tissues are compressed. Inflammation and edema can result in forcing the mandibular condyle forward and down in acute malocclusion.
- c. Jaw Fractures: Zygomaticomaxillary complex “tripod fracture” is the most common type of facial fracture and involves separation of all three major attachments of the zygoma from the rest of the face.
- d. Tooth Intrusion and Avulsion: Tooth intrusion occurs when the tooth has been shifted into the alveolar process, and 2–16% of sports injuries to orofacial regions contain avulsion of teeth.

### Preventive Measures

In the current scenario, helmets, facemasks, and mouthguards are required to reduce the severity of sports-related traumatic injuries to the head, face, and mouth of a sportsperson. Helmets protect the bones of the skull from fractures, and the brain and central nervous system from direct concussions, unconsciousness, brain damage, paralysis, and death. Facemasks are designed to protect the eyes, nose, zygomatic arches, and mouth from traumatic forces such as a fist, or stick directed toward the face.<sup>[11]</sup> Mouthguards or “gum shields” were originally developed in 1890 by Woolf Krause, a London dentist, as a means of protecting boxers from lip lacerations. The risk of jaw fractures in sports can be reduced by wearing a mouthguard especially in contact sports; mouthguard can also protect the teeth, lips, cheeks, and tongue.<sup>[12]</sup> The American Dental Association

**Table 1:** Sports necessary for the use of mouthguards

Acrobatics	Handball	Soccer
Basketball	Ice hockey	Softball
Bicycling	Gymnastics	Squash
Boxing	Martial arts	Surfing
Extreme sports	Rugby	Volleyball

recommends wearing a mouthguard for the following sports: [Table 1]<sup>[3]</sup> The American Society for Testing and Materials and the manufacturers of mouthguards have classified the mouthguard into three types:<sup>[13]</sup>

1. Stock Mouthguards: Stock mouthguards are made of rubber, polyvinyl chloride, or a polyvinyl acetate copolymer. The advantage is that this mouthguard is relatively inexpensive but is available only in limited sizes.<sup>[13]</sup>
2. Mouth-formed Protectors: There are two types of mouth-formed protectors: The shell-liner and the thermoplastic mouthguard. The shell-liner type is made of a preformed shell with a liner of plastic acrylic or fabricated by placing freshly mixed ethyl methacrylate into a hard shell, which is then inserted into the athlete’s mouth and molded over the maxillary teeth and soft tissue.<sup>[14]</sup> The preformed, “boil and bite” consist of 90% is immersed in boiling water for 10–45 s, transferred to cold water and the softened material is then placed into the athlete’s mouth, where it is molded with finger pressure as well as with facial and intraoral muscular movements to enhance adaptation to the hard and soft tissue structures of the mouth.<sup>[15]</sup>
3. Custom Made Mouth Protectors: This is the superior of the three types and the most expensive is made of thermoplastic polymer and fabricated over a model of the sportsperson’s dentition and it is made by the dentist and fits exactly to the sportsperson’s mouth.<sup>[15]</sup>

### Role of Dentist

The dentist should do the counseling about the prevention of trauma, correction of malocclusion, removal of impacted teeth, use of mouth protectors, and provide the treatment of any anomaly and prevention of pathology.<sup>[11]</sup> Dentist as an oral health professional has a responsibility to become and remains educated and convey that education on to the community regarding the issues related to sports dentistry and specifically to the prevention of sports-related oral and maxillofacial trauma.<sup>[15]</sup>

### CONCLUSION

Dental and orofacial traumatic injuries are nowadays very common during the participation in organized and

unorganized sports. Dentist as a health professional should be present there at sports field and must have a sound clinical experience and knowledge about sports-related orofacial injuries and sports dentistry should make it compulsory the use of mouthguards in all sports starting at the local and state levels and all preventive programs should include information preventive measures such as helmets and mouthguards, for better awareness of the general population.

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