



## Developments in Mouthguard Technology: Increasing Protection and Comfort

Lewis Rolad\*

Department of Dentistry, Newcastle University, Newcastle, United Kingdom

### DESCRIPTION

Mouthguards have become indispensable protective gear for athletes participating in various sports, offering vital defense against dental injuries, concussions, and other oral traumas. However, conventional mouthguards have often been disapproved for their discomfort and limited effectiveness. Fortunately, recent advancements in materials, design, and manufacturing techniques have stimulated the development of a new generation of mouthguards. These innovations focus on improving comfort while enhancing protection, ensuring athletes can perform at their best while staying safe. It is the latest developments in mouthguard technology, highlighting their significance in sports safety and performance enhancement. The evolution of mouthguard technology has been marked by significant milestones aimed at addressing the limitations of traditional mouthguards.

Historically, mouthguards were rudimentary devices made from materials like rubber, offering basic protection but often causing discomfort and interference with breathing and speech. One advancement is the introduction of thermoforming techniques, which involve heating a mouthguard material until it becomes pliable and then molding it to fit the individual's teeth and gums. Additionally, thermoforming allows for the integration of advanced impact-absorbing materials, such as Ethylene Vinyl Acetate (EVA) or silicone, which provide superior shock absorption compared to traditional materials. The adoption of Computer-Aided Design (CAD) and three-dimensional printing technologies has revolutionized mouthguard manufacturing. CAD software enables the creation of highly customized mouthguards based on digital scans of an athlete's oral anatomy, ensuring an optimal fit and maximum protection. 3D printing then allows for the rapid production of designed mouthguards, further enhancing comfort and performance.

Customized fit and advanced materials ensure that modern mouthguards are comfortable to wear, allowing athletes to focus on their performance without distraction or discomfort.

Advanced impact-absorbing materials and innovative design features enhance protection against dental injuries, concussions, and other oral traumas, reducing the risk of serious harm during sports and physical activities. Comfortable and secure mouthguards enable athletes to breathe and communicate more effectively, optimizing their performance on the field. Modern mouthguards are constructed using high quality materials and advanced manufacturing techniques, ensuring durability and longevity even under difficult use. Many advanced mouthguards are designed with features that facilitate proper hygiene and maintenance, reducing the risk of oral infections and protracting the mouthguards lifespan. Custom-fit mouthguards offer essential protection against dental trauma and head injuries, allowing athletes to follow their passion with confidence. Customized mouthguards provide peace of mind for participants of all ages and skill levels, minimizing the potential for dental emergencies.

Future directions may include the integration of sensor technology to monitor impact forces in time, providing valuable data for injury prevention and performance optimization. Additionally, further improvements in material science and manufacturing processes may lead to even lighter, more durable, and customizable mouthguards. Customized mouthguards, while highly effective, can be costly and may not be readily available to all athletes. Addressing these trials will require collaboration between researchers, manufacturers, sports organizations, and healthcare professionals to ensure that advanced mouthguard technology is accessible to athletes of all backgrounds and skill levels.

Advancements in mouthguard technology have transformed the landscape of sports safety, providing athletes with unparalleled comfort and protection against dental injuries and concussions. Through innovations in materials, design, and manufacturing techniques, modern mouthguards offer a customized fit, superior impact absorption, and enhanced performance across a wide range of sports and activities.

**Correspondence to:** Lewis Rolad, Department of Dentistry, Newcastle University, Newcastle, United Kingdom, E-mail: rolad@gmail.com

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