A new generation of athletic mouthguards

Today's mouthguards enhance performance, offer more protection and are more marketable

By Eric Yabu, DDS

Time to play a little “Dental Jeopardy!” Answer: gutta percha.

Question: What were the first athletic mouthguards made of? (OK, even Alex Trebek would've had a tough time with this one.)

Double Jeopardy! Answer: Has his own line of custom mouthguards.

Question: Who is Shaquille O'Neal?

Indeed, there is little doubt that today’s athletic mouthguards are not like your granddaddy's mouthguards, but more like Shaq Daddy's.

Mouthguard history

Athletic mouthguards, or mouthpieces, have been around for nearly 120 years since a London dentist named Woolf Krause developed them in 1890 to protect boxers from lip lacerations. Known as “gum shields,” they were made from gutta percha. Krause’s son Philip, also a dentist and an amateur boxer, refined the design and began making the shields from vella rubber.

Mouthguards were first introduced in the United States by Chicago dentist Thomas Carlos in 1916. For decades, mouthguards remained largely unchanged.

It was not until the early 1960s that a Canadian pediatric dentist named Arthur Wood, appalled by the number of dental injuries he saw in hockey players, developed a “mug guard” or “teeth guard” for which he was granted a patent in 1963. Dr. G. Dave Singh and Ray Padilla, published a preliminary study that suggests a customized mandibular orthotic may decrease the incidence of concussions. The study, however, did not attempt to explain the mechanism of protection.

While Mahercor Laboratories does not market their line of mouthpieces and mouthguards for their performance-enhancing effects and doesn’t claim to have specific studies to substantiate these benefits, some of the athletes that have been outfitted with their mouthpieces claim to have noticed a significant increase in strength, balance and speed.

They say that this study will show a significant increase in vertical jump as well as peak and average power, which should be approved by their marquee client Shaquille O'Neal. They also claim their mouthguard can improve balance, flexibility, endurance, agility and recovery.

The PFM's come as an upper mouthguard for contact sports or a lower splint-type mouthpiece for other sports such as golf or running. These guards may only be made by a certified PPM dentist who is trained in neuromuscular dentistry and generally retail in the $1,500 to $2,000 range.

Under Armour Performance Mouthwear

The most recent mouthpiece to enter the marketplace is the Under Armour Performance Mouthwear™ (www.makkaradvantage.com).

These mouthguards, developed by Nova Scotia dentist Anil Makkar, rely on the principles of neuromuscular dentistry. Simply put, this philosophy and treatment paradigm is based on the premise that the mandible is in its optimal position when the muscles of the head and neck are at rest. This “physiologic rest position” is achieved by using a TENS (transcutaneous electrical nerve stimulator) unit.

Makkar and his company claim to have a soon-to-be-released research study that confirms the performance-enhancing effects of their mouthguard versus traditionally fitted custom mouthguards.

They claim that this study will show a significant increase in vertical jump as well as peak and average power which should be approved by their marquee client Shaquille O'Neal. They also claim their mouthguard can improve balance, flexibility, endurance, agility and recovery.

The PFM's come as an upper mouthguard for contact sports or a lower splint-type mouthpiece for other sports such as golf or running. These guards may only be made by a certified PPM dentist who is trained in neuromuscular dentistry and generally retail in the $1,500 to $2,000 range.

Under Armour Performance Mouthwear

The most recent mouthpiece to enter the marketplace is the Under Armour Performance Mouthwear™ (www.makkaradvantage.com). The design is neither innovative nor proprietary, however, Under Tech is the only manufacturer of the three that can claim peer-reviewed, placebo-controlled studies to support their claims for performance enhancement.

Their mouthpieces do not rely on a CR or neuromuscularly determined bite, but simply the lack of pressure in the fossa area created

This image illustrates how a mouthguard moves the condyle of the TMJ joint away from the base of the skull.

A Pure Power Mouthguard.
YES!

IPS e.max
Lithium Disilicate

NOW FROM keller

- Cement or Bond
- CAD/CAM Accuracy
- Pressed Strength
- All-Ceramic Esthetics
- Only 4 Lab Working Days
- FREE SHIPPING when you bundle*
- Made in the USA
- Only $109

“e.max Lithium Disilicate is the most robust ceramic system tested to date”**

Log on to www.kellerlab.com to learn more

CALL FOR YOUR CASE PICK-UP TODAY!
1.800.325.3056 www.kellerlab.com

*No shipping charge when you bundle 2 or more cases in one box.
Offer only valid in the contiguous U.S. Additional charges apply for overnight service.
**MacCullum Fatigue and Durability Study
Petro C Svec, Ricarda Zanetti, Reto von Eich, and T. F. Thompson, NYU

Keller Laboratories, Inc. • 160 Larkin Williams Industrial Court • Fenton, Missouri 63026
by a multicomposite reverse wedge bite plate over the molars. This, their research claims, prevents the neuromuscular influence the brain from feeling pressure upon clenching.

That lack of pressure prevents the hypothalamic-pituitary-adrenal (HPA) axis from triggering, effectively interrupting the fight-or-flight response.

Their studies showed a trend for lowered cortisol levels and a significant reduction in lactic acid with the wedge appliance.

Like Maher and PPM, Under Armour’s Mouthwear comes in two different designs: an upper mouthguard for contact sports and a lower mouthpiece for non-contact sports. These appliances may be distributed by authorized providers who purchase a Launch Kit from Patterson Dental for $995. The laboratory fee is $120 per guard and the recommended retail price is $499.

Comparing the options

Overall, the three different manufacturers offer mouthguards that are very similar in design.

However, Maher recommends a CR-driven occlusal scheme to orthodontically correct the TMJ. PPM is based on neuromuscular principles and Bite Tech’s research concludes that performance enhancement is not related to a CR or neuromuscular bite.

Maher’s primary focus is on protection, studying its mouthpieces’ ability to reduce incidences of concussions in NFL players and even soldiers in Afghanistan.

PPM markets its appliances for their performance-enhancing benefits, boasting a cadre of loyal professional athlete users.

Under Armour also concentrates on performance enhancement, referencing its literature and an assortment of patents to back up its claims.

Evoking technology

From gum shields to mouthwear, from gutta-percha to multicomposites, from Woolf Krause to Shaquille O’Neal, mouthguard technology has evolved to produce appliances that are more protective, performance-enhancing and, maybe most of all, more marketable.

Dr. Eric Yabu is a general dentist in Oakland, Calif. His practice is the city of Oakland’s first certified “green” dental office. He is an assistant clinical professor at the U.C. San Francisco School of Dentistry and a team dentist for the University of California at Berkeley Sports Medicine Program.

You may contact him at:

Advanced Technology Dentistry
4174 Park Boulevard
Oakland, Calif. 94602
(510) 550-7000
www.oaklandlaserdentist.com

About the author

Dr. Eric Yabu is a general dentist in Oakland, Calif. His practice is the city of Oakland’s first certified “green” dental office. He is an assistant clinical professor at the U.C. San Francisco School of Dentistry and a team dentist for the University of California at Berkeley Sports Medicine Program.

You may contact him at:

Advanced Technology Dentistry
4174 Park Boulevard
Oakland, Calif. 94602
(510) 550-7000
www.oaklandlaserdentist.com