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Abstract: The Use of a Custom Mandibular Athletic Mouthguard in the Prevention of Concussions in NFL Football Players.

The summary of the data generated from the use of the protective mouthpiece by New England Patriots football players, through years of work by Dr. Gerald J. Maher, D.M.D., F.A.H.N.P., is provided by Dr. Jeff Shaefer DDS, MS, MPH of the Harvard School of Dental Medicine.

Concussions in contact sports are an ongoing problem despite increased awareness in the use of preventative measures to control them. Football, hockey and boxing are recognized as the sports in which brain trauma is the most common. On a recent Sunday afternoon, three professional football players suffered moderate to severe concussions resulting in their removal from active playing status until their neurological stability was established. In relation to football, Pellman has done several studies, funded by the NFL, which identify the types of contact associated with and the kind of players who are most prone to concussion (1-3). Oblique blows to the head causing head acceleration are the most dangerous, while quarterbacks, wide-receivers and linebackers are the type of players most at risk for concussions. Other types of blows can also illicit concussions. Blows to the chin are dangerous as there is no protection from such a blow to prevent direct transmission of the force to the brain, while forces from other directions can be controlled by the player's helmet and facemask (4). Various studies have examined the benefit of mouth guards to prevent force transmission through the mandible from blows under the chin (5-13). The consensus from these studies is that mouth guards are successful in protecting oral structures but that their benefit in controlling concussions is unclear. Maher reports excellent compliance, satisfaction, and control of concussions in a case series of 22 New England Patriot football players who used a concussion prevention mouth appliance he constructed (14). Eleven of the Patriots had a prior history of concussions. These players found help controlling their potentially career-ending concussions through the use of Dr Maher's appliance. The use of Dr Maher's patented appliance has allowed the New England Patriots football team players to have the lowest number of concussions in the league (14). The purpose of this proposal is to investigate the benefit of a mandibular appliance for the control of concussions among football players. A retrospective analysis of NFL football players use of athletic mouth guards and the corresponding rate of orofacial injuries and concussions in those players using a mouth guard vs not using a mouth guard, maxillary vs. mandibular mouth guards, and hard versus soft mouth guards is proposed. Additionally, a prospective study involving college football players using a Maher mandibular appliance is proposed to measure the affect of this appliance on concussion rates in players without a history of concussion and in those with a prior history of concussion.

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