



Mouth guards as we know them have been around for over a century. Originally designed to prevent lip and gum lacerations in boxing, they have evolved to provide excellent protection for teeth and surrounding soft tissue. They are available in many forms, from inexpensive self-formed boil-and-bite models up to professionally fitted custom laminated models. It is widely accepted that a properly fitting mouth guard can provide effective protection from dental injury.



However, widespread claims have now surfaced that mouth guards can also prevent concussions. Proponents suggest that the mouth guard inserted between the upper and lower dentition introduces a ride-down space within the temporomandibular joint (also known as the jaw joint) which prevents the jaw from slamming into the base of the skull. Detractors suggest that there is currently no scientific evidence to support such claims. In reality, the study of a mouth guard's influence on head acceleration is limited by the difficulties associated with medically monitoring a large control group wearing identical products and sustaining similar collision events.



To solve this problem objectively, Biokinetics developed a surrogate headform having an articulating mandible, dentition and force sensors positioned in the jaw ([read more](#)). A mouth guard is formed to match this headform's dentition followed by impact tests to measure the

mouth guard's effectiveness in terms of force transmission and head acceleration. Experiments can be designed to simulate any collision scenario, sports or otherwise, where a mouth guard's protective performance must be determined.