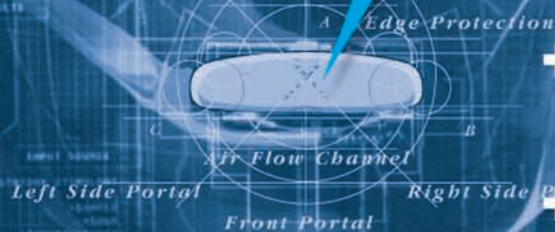


A Supplement to
Compendium
of Continuing Education in Dentistry®

**THE FUTURE
OF ATHLETIC
PERFORMANCE**



- + Performance-Enhancing Mouthwear™
- + Performance Enhancement and Oral Appliances
- + The Effects of Mouthpiece Use
- + Reaction Time and Mouthpiece Use
- + The Role of Intraoral Protective Appliances

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of Continuing Education in Dentistry®

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The Role of Intraoral Protective Appliances in
the Reduction of Mild Traumatic Brain Injury

P. D. Halstead

Dear Readers,

In 1961, I had a sound reason to become involved with the understanding and treatment modalities of a TMD (temporomandibular dysfunction). I was the patient!

A doctor gains additional understanding of a disease or illness when the patient is oneself. The associated physiologic manifestations brought about by temporomandibular joint (TMJ) problems are difficult to understand. How can the articulation of two bones cause such problems? While localized joint pain makes intuitive sense, associated anatomic pain away from the joint space and violent bouts of vertigo are harder to rationalize. I desperately needed to engage in a commonsense self-evaluation and splint design to solve my problem. That is why over 40 years ago I began the lifelong process of understanding mandibular positioning through occlusal interception.

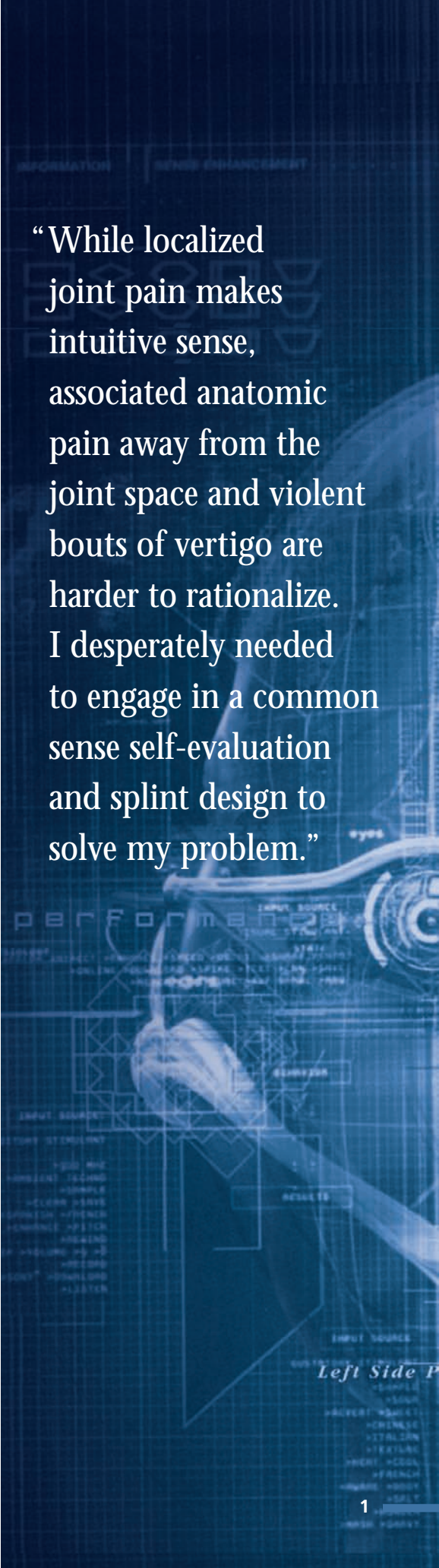
My journey began with a three-unit gold onlay bridge replacing tooth No. 19. The bridge fit the teeth but the occlusion caused problems, and my TMD started then. I sought the advice of dentists and medical doctors, but no one could give me relief. In their defense, they were working with TMJ treatment modalities that were in their genesis back then. Many different mandibular positioning devices were created for my problem, including upper and lower appliances of all shapes and sizes. Some were made from acrylic and others from cast metal. Every conceivable functioning design was fabricated until the condylar pressure that led to inflammation and pain in the joint, surrounding tissues, and structures could be eliminated.

The knowledge gained from personal evaluation of mandibular repositioning devices led to the creation of what is today known as “the reverse wedge”—a simple yet effective device through which a predictable increase in the distal portion of the posterior teeth and a lesser dimension in the premolar area positions the mandible to bring the head of the condyle slightly out of the fossa. By relieving abnormal and/or over-pressures in the TMJ, I became pain-free.

I could not predict 40 years ago that my suffering would lead to performance-enhancing mouth wear. I invite you to enjoy this very special supplement to *Compendium of Continuing Education in Dentistry* introducing this new field of dentistry.

Respectfully,

Paul Belvedere, DDS
Private Practice
Minneapolis, Minnesota



“While localized joint pain makes intuitive sense, associated anatomic pain away from the joint space and violent bouts of vertigo are harder to rationalize. I desperately needed to engage in a commonsense self-evaluation and splint design to solve my problem.”

the source of stress.¹ However, stress's interference outlives its usefulness and becomes detrimental when chronic.

Cortisol, the “stress hormone,” is essentially the trigger for adrenaline. Cortisol belongs to a class of hormones called glucocorticoids, which affect almost every organ and tissue in the body.¹ Scientists believe cortisol has hundreds of positive effects in the body but its most important job is to help the body respond properly to stress. Cortisol helps maintain blood pressure and cardiovascular function and is essential to normal functioning but needs to remain in proper balance.¹ At excessively high levels, particularly for long periods, the whole endocrine system is affected negatively. High cortisol levels limit peripheral vision, decrease metabolism, cause fatigue, reduce muscle-building, and suppress the immune system.¹

The results of tests showing, among other benefits, a significant increase in endurance as well as a marked reduction in cortisol during stress, indicate that a properly designed oral appliance can interrupt the fight-or-flight signal by preventing the completion of the clenching mechanism.

CURRENT TECHNOLOGY

Various companies throughout the years have sought to deliver the “power position” through mouthguards; however, no studies to substantiate their claims have appeared in peer-reviewed journals. The products employed uniform-thickness bite plates that essentially locked or fixed the position of the jaw. All were bulky, uncomfortable, and hard to retain, and none proved successful.

What was needed was a device that would effectively “short circuit” the HPA process by preventing the completion of the clenching mechanism, thereby interrupting the fight-or-flight signal. This then clears the channels for enhanced performance and prevents the negative effects of stress from overloading the system. In simple terms, a person

needs an oral appliance that prevents teeth from occluding or clenching under stress and halts the body's preconditioned flight-or-fight reflex.

Researchers have studied a unique oral device that unlocks the body's true potential and delivers performance enhancement without drugs. A simple wedge was the solution. Properly placed in the mouth, it enhances athletic performance in multiple ways and reduces stress.

The wedge is a multicomposite (elastomer, polymer) bioengineered intraoral device that relieves pressure on the temporomandibular joint that occurs each time the jaw clenches during stress. The wedge relieves this pressure by causing the lower jaw to be moved into the “optimal safety power position.” The desired movement of the jaw is achieved by positioning a “reverse wedge” bite plate over both sets of rear molars. Subsequently, when the teeth are clenched—exerting pressure—

the twin wedges provide the necessary pivot points that induce the mandible (lower jaw) to move downward in a slight arc.

This supplemental issue of *Compendium* includes a number of reports on the various effects of these devices, including a literature review of research focusing on stress control, cortisol production, and a mechanism to interrupt a complex neuropathway that is being massively overworked in modern society.

DISCLOSURE

The author is an employee of Bite Tech Inc.

REFERENCE:

1. Stress system malfunction could lead to serious, life threatening disease. National Institute of Child Health and Human Development Web site. <http://www.nichd.nih.gov/news/releases/stress.cfm>. Accessed April 6, 2009.

SCIENTISTS ARE
REVIEWING KNOWN
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DOUBLE BLIND STUDIES
WITH REMARKABLE
RESULTS. THEIR
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