

ORAL HEALTH & PERFORMANCE

A hidden connection: How oral health drives performance

Gerard Anton

ODONTOSPORT
PERFORMANCE DENTISTRY

SPORTS DENTISTRY

When the mouth decides a competition

In 2004, I was not a dentist. I was an athlete on the Spanish national biathlon team and a member of the military ski team. My life revolved around training, competition, and performance. Like any high-level athlete, my entire focus was on physical condition, technique, equipment, and planning. Oral health was simply not considered by anyone.

Four days before competing in a European Championship in Bad Reichenhall (Austria), intense pain appeared in the back of my mouth. A severe infection around my wisdom tooth (tooth 28). The inflammation increased rapidly, the pain was constant, and sleeping became difficult exactly when I could least afford it.

The team doctor acted as was common at the time and, in many sporting contexts, still is today: antibiotics, anti-inflammatories, and compete. The pain subsided significantly. From a clinical standpoint, the problem seemed “under control.”

But the competition was a failure.

I did not perform. I felt heavy, flat, without spark, with a fatigue that was hard to explain. It wasn't just the pain. Something wasn't right. At the time, I attributed it to stress, travel, and competitive pressure. Neither I nor anyone else considered the mouth as a determining factor in performance.

Years later, already a dentist specialized in sports dentistry, I understood what had really happened.

Today we know that an active oral infection is not a local problem. It is a systemic inflammatory focus that alters immune response, recovery, sleep, and perceived effort. We also know that the use of antibiotics especially in competitive contexts can significantly affect physical performance. Current scientific evidence suggests performance reductions of up to 20–25%, related to alterations in the microbiota, energy metabolism, and inflammatory response.

In 2004, none of this was taken into account.

That experience was, unknowingly, the first turning point. Years later I would understand that it was not a bad competition, but a lesson ahead of its time:

oral health can determine an athlete's performance, even when the pain has disappeared.

This document is born from that personal experience, but above all from what science and clinical practice now confirm:

the mouth is not an isolated element. It is a key piece within the system that sustains athletic performance.

From athlete to sports dentist

My name is Gerard Anton. Before dedicating myself to dentistry, I was a competitive endurance athlete not elite in the strictest sense, which I reserve for European or Olympic champions but I competed for more than 15 years in endurance sports such as biathlon, duathlon, triathlon, adventure racing, marathon, ultramarathon, trail running, cross-country skiing, and mountain sports.

I know firsthand what it means to prepare for competition, manage pressure, live with pain, and seek maximum performance when every detail matters.

Today, I am a sports dentist working with real athletes: advanced amateurs and high-level athletes such as Kilian Jornet, Remco Evenepoel, Pau Capell, and teams like Red Bull–BORA, who understand that performance does not depend solely on training, recovery, or physiotherapy, but on an integrated view of health.

My work focuses on identifying, preventing, and treating oral health problems that can affect performance, recovery, and athlete availability not from an isolated dental perspective, but as part of a complex system where inflammation, immune function, sleep, and training load interact.

This PDF is born from theory, but above all from clinical and sporting experience, supported by the most up-to-date scientific evidence.

Why oral health remains the great forgotten factor in sport

In modern sport, variables such as training load, nutrition, sleep, lactate, heart rate variability, and fatigue markers are closely monitored. However, oral health is still excluded from many routine assessments, even in high-level athletes.

This happens partly because the mouth continues to be seen as an independent system, limited to cavities or acute pain. Yet scientific evidence from recent years shows that this view is incomplete and potentially harmful to performance.

Chronic oral inflammation, subclinical dental infections, trauma, bruxism, or poor periodontal health can influence recovery, sleep quality, perceived effort, and an athlete's availability to train and compete.

The aim of this mini-guide is to build bridges between disciplines. To clearly and evidence-based show how sport affects oral health and how oral health, in turn, can condition athletic performance.

It is not intended to be an exhaustive treatise, but rather a tool for reflection and awareness for healthcare professionals working with athletes who want to better understand a variable that has gone unnoticed for far too long.

When training and competition also have an oral cost

Sport, especially when practiced intensely and consistently, is not neutral for oral health. Although physical exercise has clearly beneficial effects at cardiovascular, metabolic, and immunological levels, in certain contexts it can become a risk factor for the oral cavity if its secondary effects are not taken into account.

In high-level athletes and advanced amateurs, a series of circumstances converge that alter oral balance and increase the likelihood of dental and periodontal pathology. The problem is not sport itself, but the combination of physical load, physiological stress, and habits associated with training and competition.

Dehydration and reduced salivary flow

During exercise especially prolonged sessions or training in hot environments there is a significant loss of fluids. Dehydration not only affects muscular performance but also saliva production.

Saliva plays a fundamental role in oral health:

- Lubricates oral tissues
- Neutralizes acids
- Provides minerals for remineralization
- Controls bacterial growth

When salivary flow decreases, the risk of caries, dental erosion, and gingival inflammation increases. Many athletes train and compete repeatedly in a state of functional hyposalivation without being aware of it.

Physical stress, inflammation, and the immune system

Intense training generates a controlled inflammatory response that is part of the adaptive process. However, when training load is poorly managed or fatigue accumulates, the body enters a state of systemic stress that can affect immune function.

In this context, mild oral infections or subclinical inflammatory processes can become chronic or worsen. Gums that “bleed a little,” intermittent discomfort, or dental sensitivity often go unnoticed, yet they maintain a constant inflammatory stimulus that is not harmless.

The oral cavity can thus become an inflammatory reservoir, particularly in the presence of gingivitis or early-stage periodontitis.

Sports nutrition and cariogenic risk

Athletic nutrition is designed to optimize performance and recovery, but it is not always compatible with oral health. Frequent consumption of:

- Isotonic drinks
- Energy gels
- Bars
- Carbohydrate-rich supplements

results in repeated exposure to sugars and acids, often without adequate oral hygiene afterward.

Unlike the general population, athletes may consume these products several times a day, during both training and competition. Today, cyclists and Ironman triathletes commonly ingest between **120 and 200 grams of carbohydrates per hour**, which can amount to **over one kilogram of sugar (maltodextrin and fructose) per competition**.

This pattern significantly increases the risk of caries and dental erosion, especially when combined with dehydration and reduced salivary flow.

Bruxism and muscular overload

Competitive stress, performance pressure, and sympathetic nervous system activation favor the appearance of bruxism, both nocturnal and diurnal. In many athletes, tooth clenching becomes an automatic response during effort.

The consequences may include:

- Tooth wear
- Orofacial pain
- Temporomandibular joint overload
- Headaches

- Sleep disturbances

All of these have a direct impact on recovery and performance.

Oral trauma in sport

In certain disciplines, the risk of dental trauma is high. Direct impacts, falls, or collisions can cause dental fractures, luxations, or soft tissue injuries.

Beyond the clinical urgency, these injuries can affect training planning, recovery, and athlete availability if they are not managed appropriately and in coordination with the rest of the medical team.

ORAL HEALTH AND ATHLETIC PERFORMANCE

Scientific evidence of a clinically relevant relationship

For many years, the relationship between oral health and athletic performance was considered marginal. However, over the last decade, multiple studies have shown that oral health problems are common in elite athletes and can negatively impact training, recovery, and competitive performance.

Prevalence of oral disease in athletes

Scientific literature consistently shows a high prevalence of oral pathology in elite athletes, even in populations with access to top-level healthcare.

In a cross-sectional study conducted during the London 2012 Olympic Games, Ashley et al. observed that:

- More than **55%** of athletes had dental caries
- Approximately **45%** showed dental erosion
- A significant proportion had signs of gingivitis or periodontal disease

These findings have been confirmed in different sports and competitive contexts, suggesting that poor oral health is not an isolated issue but a systemic one within high-performance sport.

Perceived impact on performance and training

Beyond prevalence, several studies have evaluated whether these oral problems have functional consequences for athletes.

In the same Olympic study, nearly **18%** of athletes reported that their oral health had negatively affected their sports performance, and an even higher percentage reported an impact on training and general well-being.

Subsequently, Needleman et al., in a review published in the *British Journal of Sports Medicine*, concluded:

“There is consistent evidence that poor oral health is common in elite athletes and is associated with pain, negative impact on well-being, and perceived reduction in performance.”

Although many studies rely on subjective performance measures, the consistency of findings suggests that the relationship is clinically relevant rather than anecdotal.

Oral inflammation and systemic mechanisms

One of the most plausible mechanisms explaining this relationship is low-grade systemic inflammation induced by oral infectious or inflammatory processes.

Periodontal disease is associated with the systemic release of inflammatory mediators such as:

- Interleukin-1 β (IL-1 β)
- Interleukin-6 (IL-6)
- Tumor necrosis factor alpha (TNF- α)
- C-reactive protein (CRP)

These mediators can interfere with:

- Post-training recovery
- Muscle function
- Immune response

- Perception of fatigue

Several authors have pointed out that, in athletes, the coexistence of **intense training + chronic oral inflammation** may increase the risk of overload, infections, and performance decline.

Pain, sleep, and athlete availability

While acute dental pain is easily identifiable, many oral conditions cause mild but persistent discomfort. These can:

- Alter sleep quality
- Increase perceived stress
- Reduce concentration
- Decrease training adherence

From a performance perspective, this translates into reduced functional availability of the athlete, even in the absence of an evident musculoskeletal injury.

Practical implications for modern sport

From a clinical and scientific standpoint, current evidence allows us to state that:

- Oral health should be considered a component of medical–sport monitoring
- Untreated oral problems can act as limiting factors for performance
- Prevention and early diagnosis are more efficient than reactive treatment during the season

This approach reinforces the need to integrate the sports dentist into the multidisciplinary team surrounding the athlete.

PERIODONTITIS AND INFLAMMATION

Direct implications for recovery and athlete fatigue

Periodontitis is a chronic inflammatory disease of infectious origin that affects the supporting tissues of the teeth. Unlike other more obvious oral problems, it can progress silently, without acute pain, which explains why it often goes unnoticed in many athletes.

From a performance perspective, periodontitis should not be understood as a local problem, but as a **chronic inflammatory focus with systemic repercussions**, particularly relevant in contexts of high physical load.

Periodontitis as a source of systemic inflammation

It is well established that periodontitis is associated with increased systemic levels of inflammatory mediators, including:

- Interleukin-1 β (IL-1 β)
- Interleukin-6 (IL-6)
- Tumor necrosis factor alpha (TNF- α)
- C-reactive protein (CRP)

These mediators, continuously released into the bloodstream, contribute to a state of **chronic low-grade inflammation**.

In athletes, this inflammatory state adds to the inflammation induced by intense training, potentially disrupting the delicate balance between stress and recovery.

Inflammation, muscle recovery, and training adaptation

Training adaptation depends on a proper sequence of:

1. Mechanical stimulus
2. Controlled inflammatory response
3. Tissue repair
4. Supercompensation

When a chronic inflammatory source such as periodontitis is present, this sequence may be altered. Experimental and clinical studies suggest that persistent systemic inflammation can:

- Delay muscle repair processes
- Increase perceived fatigue
- Interfere with training adaptation

In animal models with induced periodontitis, a significant increase in systemic inflammatory markers and greater tissue degradation has been observed, while regular physical exercise was able to partially modulate this inflammatory response.

These findings support the hypothesis that **untreated periodontitis can compromise recovery efficiency**, especially during periods of high load or competition.

Fatigue, immune system, and risk of overtraining

Fatigue is not solely a muscular phenomenon. It has a strong immunological and neuroendocrine component. The presence of chronic inflammation has been associated with:

- Increased subjective fatigue
- Alterations in the hypothalamic–pituitary–adrenal axis
- Changes in stress response

In athletes, this may translate into reduced load tolerance, greater susceptibility to infections, and difficulty maintaining training intensity over time.

From this perspective, periodontitis may act as a **silent risk factor for overtraining**, especially when combined with demanding competitive calendars and insufficient recovery.

Clinical evidence in athletic populations

Although sport-specific studies are still limited, available evidence points in a clear direction. Recent reviews indicate that athletes with periodontal disease:

- Show higher levels of systemic inflammation
- Report poorer overall well-being
- Describe a greater negative impact on perceived performance

These data, together with current knowledge of periodontal pathophysiology, reinforce the need to identify and treat oral inflammation as part of comprehensive athlete care.

Practical implications for healthcare professionals

From a clinically applied sports perspective, this section leaves us with several key messages:

- Periodontitis should be considered a **performance-related issue**, not merely a dental one

- Absence of pain does not imply absence of physiological impact
- Periodontal treatment may contribute to improved recovery and reduced chronic fatigue
- Periodontal evaluation should be part of pre-season medical assessments

The prevention and control of oral inflammation aim not only to preserve teeth, but to **optimize the athlete's ability to train, recover, and perform.**

OCCLUSION

A complex relationship that should not be oversimplified

The relationship between dental occlusion, body posture, and athletic performance has been of interest for decades. However, it has also been fertile ground for oversimplifications and claims lacking scientific support. For this reason, it is essential to address this topic with rigor, caution, and physiological understanding.

Occlusion does not directly and linearly determine posture, but it may influence the neuromuscular system through sensorimotor integration mechanisms, particularly in athletes exposed to high physical demands.

Occlusion and the neuromuscular system

The stomatognathic system is closely connected to the central nervous system through multiple afferent pathways, including:

- Periodontal receptors
- Muscle spindles of the masticatory muscles
- Temporomandibular joint

Occlusal alterations or imbalances can modify the activity of orofacial and cervical musculature, with potential effects on muscle tone, postural stability, and fine motor control.

In athletes, where neuromuscular efficiency is critical, small dysfunctions may acquire greater functional relevance.

Scientific evidence: what we know and what we don't

Some studies have explored the influence of occlusion on parameters such as:

- Postural stability

- Muscle activation
- Balance control

Changes in muscle activity and postural control have been described under certain occlusal conditions or after mandibular position modification.

However, current evidence does not allow us to establish a direct causal relationship between occlusion and overall athletic performance. Results are variable and depend on multiple factors:

- Type of sport
- Athlete level
- Presence of pain or dysfunction
- Baseline neuromuscular status

For this reason, any simplistic approach such as “correcting the bite improves performance” should be avoided.

Occlusion, bruxism, and overload in athletes

A particularly relevant aspect in sport is the high prevalence of bruxism and tooth clenching, both nocturnal and diurnal. In many athletes, clenching appears as a response to competitive stress or intense physical effort.

This pattern may be associated with:

- Overload of cervical and mandibular musculature
- Orofacial pain
- Headaches
- Sleep disturbances

All of which may indirectly affect recovery and training quality.

Clinical implications: when to pay attention

From an evidence-based clinical perspective, occlusion should be especially evaluated when:

- Recurrent orofacial or cervical pain is present
- Significant bruxism is detected
- Symptoms of temporomandibular dysfunction appear
- The athlete reports discomfort during or after exertion

In these cases, an individualized occlusal assessment may be part of an interdisciplinary approach, always avoiding unnecessary or disproportionate interventions.

A topic that requires specific training

The relationship between occlusion, posture, and performance is complex, multifactorial, and highly individual. Addressing it correctly requires specific knowledge, clinical experience, and coordination with other sports professionals.

For this reason, this guide presents only an introductory and cautious overview. In-depth analysis, treatment indications, and their real impact on athletic performance are addressed in greater detail in specialized training.

THE PRINCIPLE OF PROPORTIONALITY

Intervening without compromising athletic performance

In athletes, not all oral pathology should be treated in the same way or at the same time. Unlike conventional clinical practice, in the sporting context the decision to intervene must be guided by a fundamental principle: **proportionality**.

The principle of proportionality implies individually assessing the risk–benefit ratio of each intervention, considering not only oral health but also the potential impact on performance, recovery, and the athlete’s competitive calendar.

Not everything that can be treated should be treated immediately

In general dentistry, when facing a dental infection, the response is usually straightforward: treat and, if necessary, prescribe antibiotics. However, in high-level athletes, this decision requires nuance.

Treatment and especially the use of antibiotics may have relevant side effects:

- Alterations of the gut microbiota
- Increased fatigue
- Decreased physical performance
- Impaired recovery

Intervening without considering the sporting context can therefore be more harmful than beneficial.

A real case: deciding when to intervene

Just a few weeks ago, the athlete Carlos Sáez, a 2025 World Championship competitor in the 1500 meters and a member of the Spanish national team, contacted me due to a dental issue. Carlos had previously been treated and understood the importance of oral health for his performance.

He explained that he had an abscess in the area of tooth 14. He had visited a dentist, undergone radiographic examination, and the diagnosis was clear. As commonly happens, antibiotics were prescribed.

The context was critical: four or five days later, he was due to compete in the qualifying event for the World Championships in the 1500 meters.

The first question was not what the radiograph showed, but:

How severe is the pain?

His answer was clear: the pain was mild and manageable.

In this scenario, the decision was not to do what would be “ideal” from a purely dental standpoint, but what was most proportional from a performance perspective. I recommended postponing antibiotic treatment until after the competition, provided that pain and clinical signs remained stable and under control.

The result was that Carlos was able to compete under optimal conditions and achieved qualification for the **2026 World Championships**. Definitive treatment was addressed afterward, outside the critical competitive context.

What this case teaches us

This example clearly illustrates several fundamental principles:

- An athlete is not a conventional patient
- Clinical decisions must integrate diagnosis, symptoms, and the competitive calendar
- Antibiotic use should be prudent and strategically planned
- Treating too early can be just as harmful as treating too late
- The goal is not to avoid treatment, but to choose the right moment

Sports dentistry: deciding with judgment, not rigid protocols

Applying the principle of proportionality does not mean assuming unnecessary risks, but understanding the real impact of each clinical decision within a specific sporting context.

This requires:

- Clinical knowledge
- Understanding of athletic performance
- Communication with the athlete and the support staff
- Experience in complex decision-making

For this reason, sports dentistry cannot be based on rigid protocols. It requires judgment, individualization, and a global view of the athlete.

This approach when to intervene, when to wait, and how to do so without compromising performance is one of the pillars developed in depth in specialized training.

WHAT SHOULD BE ASSESSED IN AN ATHLETE

A global perspective, not just a checklist of cavities

An athlete's oral health cannot be evaluated using the same criteria as the general population. It is not only about detecting cavities or acute pain, but about identifying factors that may interfere with performance, recovery, or availability to train and compete.

From a sports dentistry perspective, an evaluation should include at least the following axes:

1. Active or latent infectious foci

- Deep caries
- Periapical lesions
- Subclinical abscesses

Especially those that, even if minimally symptomatic, may flare up during periods of high load or competitive stress.

2. Periodontal status and gingival inflammation

- Bleeding
- Probing depths

- Signs of chronic inflammation

Early-stage periodontitis is common, silent, and potentially relevant for recovery and fatigue.

3. Risk of erosion and caries associated with sports nutrition

- Frequent intake of isotonic drinks and gels
- Post-training hygiene habits
- Salivary flow

Here, prevention is often more important than treatment.

4. Bruxism, clenching, and overload

- Signs of tooth wear
- Orofacial or cervical pain
- Headaches
- Sleep disturbances

Especially during phases of high competitive pressure.

5. Previous trauma or impact risk

- Teeth with previous treatments
- Poorly managed fractures
- Need for protection (splints, mouthguards)

6. Sporting context

- Competitive calendar
- Phase of the season
- Short- and medium-term objectives

This point is key: **clinical decisions cannot be separated from the sporting context.**

Much more than a dental check-up

This evaluation does not seek to treat everything immediately, but to prioritize, decide when to intervene, when to observe, and when to wait—without compromising performance.

This approach requires specific training, clinical experience, and constant communication with the athlete and the rest of the medical team. For this reason, it cannot be resolved with a simplified checklist or rigid protocols.

FOR THOSE WHO WANT TO GO ONE STEP FURTHER

Advanced training in oral health and athletic performance

Throughout this mini-guide, you have seen that the relationship between oral health and athletic performance is real, complex, and clinically relevant. You have also seen that it cannot be addressed through rigid protocols or an exclusively dental perspective.

This document does not aim to resolve every possible scenario. On the contrary, its objective is to present the full landscape, highlight critical points, and generate the right questions.

Real-world practice with athletes raises situations such as:

- When to intervene and when to wait
- How to manage oral infections during the competitive season
- The real impact of oral inflammation on recovery
- How to coordinate decisions with doctors, physiotherapists, and coaches
- How to avoid treatments that, although dentally correct, compromise performance

These decisions are not learned in undergraduate degrees or general courses.

The online course

For this reason, I have developed a specialized **online course in sports dentistry**, aimed at dentists, physicians, and other healthcare professionals who work—or want to work—with athletes.

In this course, I explore in depth:

- Clinical evaluation of the athlete from a performance perspective
- Oral health, inflammation, and fatigue
- Periodontitis and recovery
- Occlusion, bruxism, and overload
- Dental trauma in sport
- Rational use of antibiotics
- The principle of proportionality applied to real cases
- Clinical decision-making in competitive contexts

All of this is based on scientific evidence, clinical experience, and real cases involving high-level athletes.

Individual consultancy

In addition to the course, I offer **individual consultancy** for:

- Athletes
- Teams
- Healthcare professionals

Focused on resolving specific cases, planning interventions, and supporting complex situations where performance cannot be put at risk.

👉 If this PDF has made you rethink how you approach oral health in sport, the next step is clear.

- Access the online course: www.odontosport.net
- Request a personalized consultancy: www.odontosport.net

Because in high-performance sport, **every decision matters**.
And **oral health is part of the game**.