ECONOMIST ENTERPRISE

Winning margins

The impact of oral health on athlete performance

Commissioned by EFP European Federation of Periodontology

Supported by CURASEPT

Contents

3 **About this report**
4 **Executive summary**
7 **The opportunity: An overlooked path to stronger athletic performance**
7 Why oral health matters more than people think
10 Oral health implications for athlete performance
17 **The goal: Harnessing oral health for athletic success**
18 The role of athlete self-care
21 The role of coaches, teams and oral health experts
24 The role of international and regional sports bodies
29 **Conclusion: The first steps toward victory**
30 **References**

About this report

Winning margins: The impact of oral health on athlete performance is a report produced by Economist Enterprise, commissioned by the European Federation of Periodontology (EFP), and supported by Curasept. This report addresses how improved oral health can contribute to athlete performance and success by looking at the potential mechanisms involved and athlete outcomes. It looks at the role of a wider network of people and organisations that can support athletes to see oral health as an important optimisation tool in performance science. This network includes coaches, teams, medical and oral health professionals, and sports bodies. In addition, it shows how sports dentistry and oral health are being better recognised as an important player in the multidisciplinary field of sports medicine as the science in this field emerges.

Economist Enterprise would like to thank the following experts who provided insights via interview and the provision of information (in alphabetical order):

- **Nadia Battocletti**, an Italian Olympic and European Championship medallist in distance running, Italy
- **Sergio Lara-Bercial**, vice-president for strategy and development, International Council for Coaching Excellence; former Team GB coach, UK
- **Fabian Marc Hürzeler**, head coach, Brighton & Hove Albion F.C. in the Premier League, UK
- **Markus B Hürzeler**, professor for implantology and former president, European Academy of Esthetic Dentistry, Germany
- **Michael Salyzyn**, president, Academy for Sports Dentistry, US
- **Kate Shortman**, medallist (artistic swimming), Team GB Olympic, World and European Championships, UK
- **Thanos Stamos**, co-founder and vice-president, European Association for Sports Dentistry, Greece
- **Maher Zahar**, expert dentist, the International Olympic Committee's Medical Expert Group, Tunisia; vice president, International Federation of Sports Medicine

We would like to thank experts from the EFP for providing data sources (in alphabetical order):

- **Moritz Kebschull**, head, division of periodontology and oral rehabilitation, University of Birmingham, UK; former president, EFP
- **Sharon Legendre**, head of operations, EFP
- **Anton Sculean**, professor and chairman, department of periodontology, University of Bern, Switzerland; secretary-general, EFP
- **Nicola West**, professor of restorative dentistry (periodontology) and head of periodontology, University of Bristol, UK; president-elect, EFP

This research was led by Elizabeth Sukkar, senior research manager in policy and insights at Economist Enterprise. It comprised targeted desk research and in-depth interviews, undertaken by Alcir Santos Neto and Elizabeth Sukkar. Fact-checking support was provided by Adiya Koitlyub and copy editing by Amanda Simms. The report was written by Paul Kielstra and edited by Elizabeth Sukkar. The findings and views expressed do not necessarily reflect the views of the sponsor. Photos of Nadia Battocletti, Fabian Marc Hürzeler and Kate Shortman were provided by the individuals. The report was finalised in June 2026.

Executive summary

Athletic performance depends on a complex mix of physical, psychological, environmental and lifestyle factors. These include genetics, training load, recovery, sleep, nutrition, hydration, injury, illness, stress and access to good medical care. One often overlooked factor, however, is oral health. This is despite growing evidence that deficits here can drive inflammation and fatigue throughout the body as well as undermining everything from sleep and nutrition to levels of power and endurance.

While the quality of the relevant studies varies, the overall message is consistent: oral health and athletic success interact in too many ways to be ignored. Instead, by prioritising oral health, athletes can protect both their physical wellbeing and their mental edge, creating a stronger foundation for success in sport.

This report examines what we now know about the link between oral health and athletic performance, so that the vital importance of more robust oral health becomes better recognised in performance science. It will interest not only medical and oral health professionals, but also athletes (elite, professional and amateur), coaches and support teams searching for the marginal gains that can decide medals and championships.

The key findings include:

1. The opportunity

Oral health can affect an athlete's performance in many, complex ways, the specifics of which are just beginning to be understood. Oral health is not separate from overall body health. Instead, the two interact in many ways. Our study divides this area into the oral health issues that have one or more effects on athletic performance and their potential outcomes.

The main initiating factors are:

- the spread of oral inflammation into body-wide systemic inflammation. Common oral conditions among athletes, such as gingivitis (bleeding gums) and periodontitis (gum disease) can contribute to this phenomenon, undermining an athlete's overall health;
- the complex relationship of oral health, the effects of impaired nutrition on athletes and the body as a whole. This takes two directions: high-sugar energy drinks, commonly consumed by athletes, are implicated in erosive tooth wear; on the other hand, dental pain can lead to avoidance of certain healthy but difficult to chew fruits, vegetables and nuts;
- pain from dental caries (tooth decay) can harm athlete's physical and psychological states, as well as their quality of life;
- the interaction of the sensorimotor/neuromuscular system with other parts of the body, with implications for athlete strength and balance;
- heightened risk of orofacial injuries, with the time away from training they frequently bring; and
- physical conditions and demands that can pose risks to oral health, such as acidic environments in some swimming pools.

These oral health issues can, either alone or in combination, have a range of performance outcomes particularly relevant to athletes. These fall into three categories:

- **Ability to recover from exercise and overcome fatigue**. Poor oral health can make it harder to engage in athletic activity and impede the recovery process. The latter involves everything from systemic infection tiring out the body to painful teeth making sleep harder to come by.
- **Competition and training readiness.** At an extreme, oral health problems can make it impossible for athletes to do their jobs. A 2018 survey of UK elite athletes found that 9% of the overall sample had experienced problems with taking part in training or competition due to such issues.
- **Physical strength, endurance and balance.** Good oral health can help athletes to exert more power, especially from their arms and legs, as well as to enjoy better balance and improved reaction times.

2. Strategies to enhance oral health for improved athlete performance

Athletes are the central players in their own oral health. Athletes themselves ultimately control their mouths and teeth. But not everyone is likely to pay attention to oral health unless they understand why it is so important in the context of being an athlete. Accordingly, athlete development needs to include oral health awareness, providing an understanding of the performance benefits of good oral hygiene as well as best practices. Once athletes have been won over, some simple steps are easy, such as cleaning teeth after using high-sugar energy drinks and remaining hydrated. Others are more sport-specific, such as working with oral health professionals on appropriate dental protection. Finally, increasing interest in the cosmetic benefits of good teeth should be a pathway for athletes to improve their oral care regimes.

Coaches and team officials are essential in providing a supportive environment for athletes. Many well-resourced sports organisations have begun to understand the competitive, and economic, benefits of good athlete oral health. They should take a long-term, strategic approach to pursuing this goal. Oral health care needs to be integrated into their sports general medicine

provision at every level, from youth development programmes to top competitions. This includes both personnel matters—such as including sports dentists in medical teams—and focus—such as giving athletes regular dental checks and appropriate oral health behaviour change messages. Coaching staff, where appropriate, should also work with medical staff to encourage good oral health, especially prevention. Those organisations with fewer resources, meanwhile, should focus on issues where they might be able to help, such as dental care access, with coaches likely to take the main role.

More sports federations need to step up to support oral health promotion. Governing bodies in athletics and sports have a profound impact on how competitions are conducted and on the standard of care required for athletes. Already most have advice and guidance on general athlete health matters. However, based on an analysis of nine sporting bodies, only two—the International Olympic Committee (IOC) and the World Rugby Federation—pay more than limited attention to oral health. The influence of these bodies is such that they should do more. Meanwhile, the increasing profile of sports dentistry, and its growing acceptance within sports medicine, provides an opportunity to apply its growing expertise in shaping policy for their athletes.

Teams and sports bodies need to tap into the growing expertise of sports dentistry as it comes of age. Sports medicine is multidisciplinary and needs to ensure that oral health experts have a place at the table. Some sports like football have been using them, based on expert insights, but others could do more. The development of consensus statements is helping to sow a new field as these specialists work to diagnose and treat athletes' health problems, aiming to prevent injury and improve outcomes. Adding oral health experts to the sports team would help prevent, detect and treat tooth decay, erosive tooth wear, gum disease, malocclusion, temporomandibular disorders and other injuries. In turn, athletes would enjoy better oral and overall health and performance.

The opportunity: An overlooked path to stronger athletic performance

Why oral health matters more than people think

Athletic performance is influenced by a complex interaction of physical, psychological, environmental and lifestyle factors. These include genetics, training load, recovery, sleep, nutrition, hydration, injury status, illness, stress and access to high-quality medical support.[1] Most people could name many of the items on this list. One under-recognised component, however, is oral health.

Oral health refers to the condition of the teeth, mouth and surrounding facial structures, or the orofacial area. Health here allows us to eat, breathe, speak and smile. It also shapes our self-confidence and wellbeing, as well as our ability to socialise, work and play without pain, discomfort or embarrassment.[2]

On one level it is obvious that oral health is part of our body's systemic health. However, it has too often been viewed in isolation.

Professor Dr Markus Hürzeler—a global expert on periodontology with professorships in Houston, Texas, and Freiburg, Germany—explains that, in his 30 years of practice, "the part that has changed most is how seriously we now take what the mouth does to the rest of the body. We used to treat the tooth and its surroundings as a local problem." The reason is as simple as the implications are far-reaching. As Dr Maher Zahar—a dentist and member of the International Olympic Committee's Medical Expert Group, notes: "The tooth is not outside the body's systems but highly connected to all parts."

Given these diverse links between the orofacial area and the rest of the body, it is no surprise that, in recent decades, "strong evidence that oral health affects general health" has appeared, to use Prof Dr Markus Hürzeler's words. He cites as an example the burden on the whole body's health of periodontal inflammation. More generally, various academic review articles point to a growing number of studies that describe the interaction between the health of the oral cavity and a range of chronic conditions.[3] Dr Zahar sums it up simply: "Without good oral health, overall health is harder to sustain."

While oral health has extensive general health implications for everyone, this study will look at one group in particular: elite athletes. For them the importance of oral care goes beyond the personal to include the professional. As Kate Shortman,

"One thing that needs to change is awareness—oral health isn't always seen as a priority in elite sport, even though it can have an important impact on performance and overall health."

Kate Shortman, medallist (artistic swimming), Team GB Olympic, World and European Championships, UK

UK Olympic, World and European Championships medallist in artistic swimming, points out: “One thing that needs to change is awareness—oral health isn’t always seen as a priority in elite sport, even though it can have an important impact on performance and overall health.”

Lack of attention here exacts a high, unnecessary toll. In Prof Dr Hürzeler’s clinical experience “you see the late bill, not the early one. By the time footballers or triathletes walk into our chair, the problem has usually already cost them training days, sometimes a season. None of it had to happen.”

Oral health implications for athlete performance

Athletes and members of their support networks therefore need to understand this link in more detail.

It may not always be clear where oral health issues and other concerns begin and end among the important and more commonly cited levers affecting an athlete. Poor nutrition[4] and disturbed sleep[5] can increase the level of proteins in the body in a way that promotes greater inflammation. Certain oral diseases, such as periodontitis, do the same thing.[6] Thus, in this one instance at least, they appear to share a biological gateway towards a similar impact: an increase in feelings of tiredness.[7] Indeed, these factors are far from distinct. Sergio Lara-Bercial, professor of sports coaching at Leeds Beckett University and vice president for strategy and development at the International Council for Coaching Excellence, notes that something as basic as a painful cavity "is going to affect athletes' sleep; their nutrition because they won't be able to eat everything they want to eat; and their recovery because they're not sleeping well and they're not hydrating well."

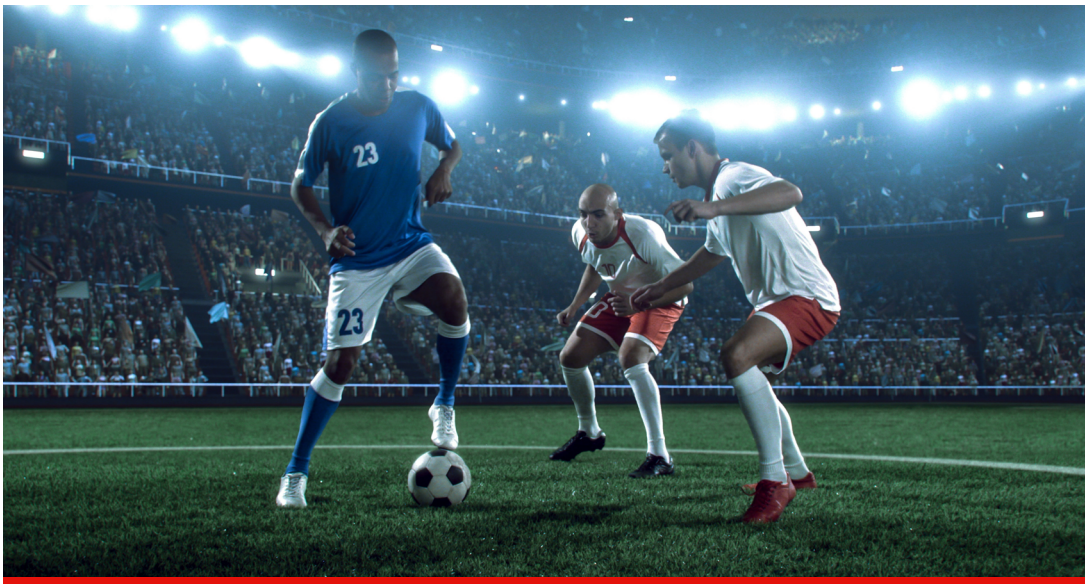
Fabian Hürzeler, head coach of English Premier League football club Brighton & Hove Albion, adds that these problems have serious knock-on effects. Lost sleep due to dental pain, for example, means that "you can't train properly. We've seen football players who didn't take care of their teeth develop problems, miss games and in some cases even miss international tournaments. That's when you really see the consequences."

These sorts of problems may seem obvious, but they are just the beginning. Dr Michael Salyzyn, president of the Academy for Sports Dentistry (ASD), explains that "oral health is not just about disease in the teeth. It includes musculoskeletal conditions, musculature, breathing and posture." This means that oral health can affect athletes in multiple ways, he adds. A gum infection, for example, may spread to other parts of the body, forcing it "to address the deficiency caused by that disease instead of optimising performance." Similarly, dental malocclusions (usually an overbite or underbite), can reduce speed, strength in certain muscles, or balance.[8]

The links between oral health and athletic performance may seem logical and intuitively obvious, but the field has been under-researched. However, over the last decade, and particularly the last five years, evidence on how oral health interacts with athletic performance has grown. The quality of this research varies, ranging from self-reported observations to clinical trials. As a result, it is not fully conclusive. Nevertheless, explains Prof Dr Hürzeler, "while the direct link [of oral health] to athletic performance is still emerging, the signals we have are consistent and increasingly compelling. The direction of travel is clear."

For this report, Economist Enterprise undertook targeted desk research to understand what those involved in sports should know about oral health. In the **first part of our analysis**, we looked at the potential mechanisms that can lead to any number of athletic outcomes (see Figure 1). The most studied ones that we found are:

- The spread of inflammation beginning within the oral cavity—such as from periodontal diseases, caries (or tooth decay) or tooth abscess—**to systemic inflammation** across the body. Such transmission is a general health risk for everyone.[9] The dangers appear to be a particular issue for athletes, among whom gingivitis and periodontitis are common.[10] As Dr Zahar puts the now widespread consensus: "In medicine and in sports medicine, one of our key aims is to reduce any source of inflammation, including those originating from the mouth. The periodontium protects the tooth but if its care is not optimised, it can mean infection and inflammation in the body [which in turn] can affect athletes'



A survey of 187 British football players found that the existence of dental caries and mouth pain correlated with lower quality of life and perceived performance.

performance." European and international medical and dental bodies recognise periodontal diseases as a meaningful contributor to systemic, low-grade inflammation in all otherwise healthy adults, including athletes.[11] At an extreme, this inflammation can contribute to, or complicate, cardiovascular disease, type 2 diabetes and lung conditions.[12]

- There is a complex relationship between oral health, **impaired nutrition** and the body as a whole. Two such interactions illustrate the range of challenges where there is a need to balance the nutritional needs of athletes for performance goals with their oral biological resilience. First, the use of energy drinks is widespread among elite athletes, with several surveys showing that over 80% consume them regularly.[13] The reason is simple: they provide rapidly absorbable energy that athletes need in practice and competition. On the other hand, frequent use is associated with dental erosion. Second, the pain arising from poor dental health can affect food choices, with people more likely to avoid nutritious but difficult to chew fruits, vegetables and nuts.[14]
- Beyond nutritional choices, the impact of **pain on an athlete's wider physical and psychological state**. To give one example, a survey of 187 British football players found that the existence of dental caries and mouth pain correlated with lower quality of life and perceived performance.[15] Meanwhile, another review found a link between levels of acute pain from oral conditions and poorer performance efficiency.[16]
- The interaction of the **sensorimotor/ neuromuscular system** with other parts of the body. This is a field that has been debated in the past,[17] but researchers are still exploring potential mechanistic links as recently as in a paper by Hollander *et al* in 2026.[18] "Pain is a strong input into our sensory system and dental pain may influence sensorimotor control and ... power in consideration of the role of periodontal mechanoreceptors. Furthermore, jaw

mechanics and temporomandibular disorders have been shown to affect postural stability and performance," the paper found. A randomised control study in 2025 of 30 soccer players demonstrated that the temporomandibular joint plays a part in an athlete's balance and that a malocclusion also has implications for strength and balance. "The results show a functional relationship between dental occlusion and the lower extremities, which reflects an underlying anatomical connection in which the central nervous system may play a major role", the researchers said.[19] A very small recent study provides a possible explanation for the sometimes inconsistent findings in this field. Its data suggested that specific kinds of temporomandibular disorder—including myofascial ones, the most common—had more of an effect on balance than others.[20]

- **Heightened risk of orofacial injuries.** The often intense physical nature of sport leaves athletes prone to dental and facial injuries, although the risks vary widely depending on the nature of the competition. A recent review found that about one in five rugby players had suffered a dental injury[21] while a study of boxers found dentofacial trauma so common (present in 92%) that the athletes did not even report sub-clinical injuries, as these were "part of the norm."[22] Even sports seen as less dangerous carry notable risks. A study of maxillofacial injuries among America's National Collegiate Athletic Association Division I athletes found the highest rate among male basketball players, with 8.3 injuries per 1,000 hours of play.[23]
- **Physical environment and demands** that can be hostile to oral health. In certain sports, the conditions can pose issues. Dr Zahar explains that swimmers need to pay close attention to oral health care. "They face varying acid levels in the water, and their sport—done in weightlessness—demands extra strain on muscles and balance." One review for professional dentists found that exposure to chlorinated water was implicated in tooth staining and erosive tooth wear, dental pain, and calculus build-up.[24]

Much of the research used in that review predated the increasing use of less damaging forms of chlorine in pools. Nevertheless, the problem persists. A recent Australian study found that among children, competitive swimmers saw an almost twofold chance of dental staining compared with the general public. The presence of the problem correlated positively with lifetime swimming hours, and negatively with oral health-related quality of life.[25] Similarly, a 2023 Egyptian study found erosive tooth wear (using Basic Erosive Wear Examination scores) more common among competitive swimmers than competitive rowers. The former had average scores more than twice as high as the latter.[26]

The very physical act of exercise also has oral health implications. Nadia Battocletti, an Italian Olympic and European Championship medallist in distance running, who has also worked with Curasept, says that "from running, I've learnt that lower saliva flow can raise the risk of dental erosion, which can affect both my teeth and my performance." Her experience is not unique. Dry mouth syndrome, or xerostomia, is common among athletes. as it results from intense exercise. Xerostomia brings with it a higher risk of cavities and periodontal diseases, among other results.[27] In addition, saliva produced during exercise has a different composition from that produced when the body is resting. The one created during exercise is likely to be less protective of tooth enamel.[28]

Each of these potential mechanisms can, in turn, affect athletes in various ways. In the **second part of our analysis,** three broad kinds of links between oral health and athletic performance emerged. They show that oral health is not just about preventing dental disease in athletes. Optimising it could help improve and sustain performance, aid recovery and keep athletes competition-ready.

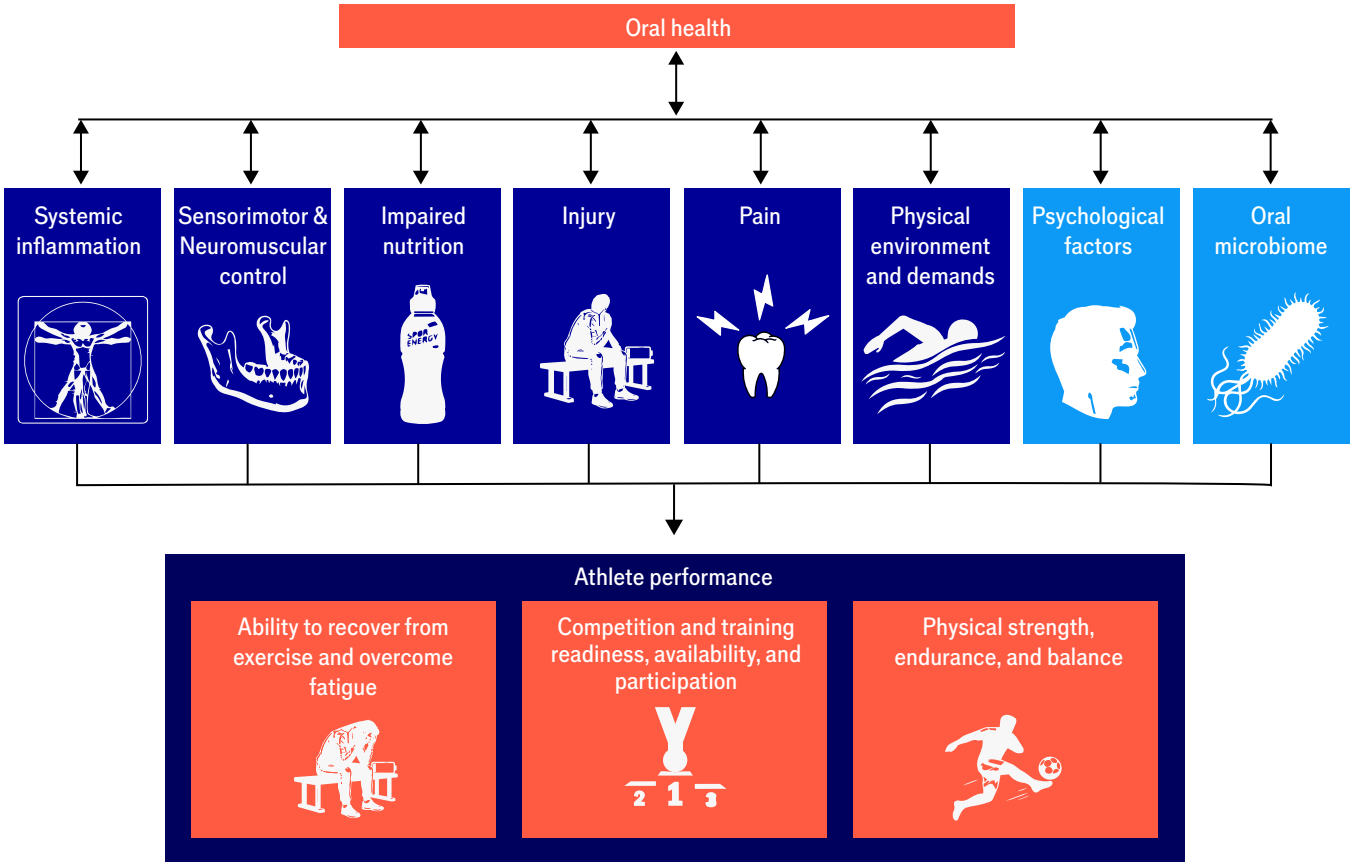
The categories are:

The ability to recover from exercise and overcome fatigue. Being an elite athlete is, by its nature, a repetitive process. Practice, training and competition involve using muscles and skills. Tiredness and some measure of pain typically ensue, but after rest, the body is, ideally, stronger and the athlete's skills more developed. Unfortunately, poor oral health can add to the athlete's physical burden during exercise. A 2026 Japanese survey of people involved in basketball, volleyball and athletics, for example, found that those at greater risk of

periodontal diseases were more likely to report pain linked to their sporting activities.[29] More importantly, poor oral health can impede recovery, slowing an athlete's development. One way this occurs is through the systematic inflammation described earlier. A 2024 review reported that several studies found that oral diseases increase the body's levels of inflammatory cytokines. These proteins cause muscle fatigue, which can contribute to a higher risk of sports injuries.[30] Similarly, simply getting enough relaxation to recover can become a problem. A 2018 UK survey of elite athletes from 11 sports found that 15% of the overall sample had reported that oral health issues impeded their ability to rest, including sleeping. The problem was particularly pronounced among those with PUFA (Pulp, Ulcer, Fistula, Abscess) index scores, which indicated untreated, potentially severe, dental caries.[31]

Competition and training readiness, availability and participation. At an extreme, oral health problems that impede recovery from exercise can prevent athletes from doing their jobs: training for and taking part in competitions. Among those definitely affected by dental issues, the problem is more widespread. In a survey of Olympians who went to the dental clinic at the 2012 games, 18% said that oral health problems had affected training or performance.[32] Meanwhile, among US National Collegiate Athletic Association Division I basketball players who reported an orofacial injury from competition, the average time it kept them from competing was 24 days.[33] These findings are for those definitely affected by training issues. For the athlete population as a whole, the 2018 survey of UK elite athletes mentioned above also found that

Figure 1. Potential mechanisms linking oral health to athlete performance



Source: "Oral microbiome" and "psychological factors" are in the acqua colour as the evidence is still early. Economist Enterprise analysis, including concepts from Hollander *et al*.[37]

9% of the overall sample had experienced problems with taking part in training or competition due to oral health issues, with 4% saying that it had affected training volume.[34] Such absences not only disrupt performance, but they can also have a knock-on effect on fitness, team selection and, therefore, the ultimate career success of athletes.

Physical strength, endurance and balance. Good oral health plays a role in how well an athlete can perform. One example of this kind of connection is the impact of Bruxism, the involuntary clenching and grinding of teeth. A 2025 meta-analysis in the *International Journal of Sports Medicine* found that the condition is statistically correlated with lower strength and endurance, as well as slower reaction times.[35] The other is the link, discussed in detail above, between the temporomandibular joint, jaw position, and various aspects of an athletes' power and balance. Despite the controversy on this point, an important finding for athletes is that, since the 1970s, a body of studies has found that jaw repositioning can enhance muscular strength in the arms and legs.[36]

"Oral health problems can affect your personal confidence, which can impact your athletic performance. You could stop believing in yourself."

Nadia Battocletti, an Italian Olympic and European Championship medallist in distance running, Italy

The above description has been simplified to make it clearer. Actually, feedback loops abound. Dr Thanos Stamos, co-founder and executive vice-president of the European Association for Sports Dentistry, describes "a two-way interaction, where oral health impacts overall health and performance in sports, but sport itself also affects oral health. Factors such as diet, psychological condition, stress and orofacial injuries negatively influence the oral cavity, which in turn affects not only cardiovascular health but also musculoskeletal function."

This list is also unlikely to be exhaustive, but merely reflects current evidence. "Overall," says Dr Salazyn, "we still have a lot more research to do."

Two areas, in particular, are likely to yield useful insights. First, the potential benefits for athletes of better oral health could include giving a **psychological edge**. Ms Battocletti says: "Oral health problems can affect your personal confidence, which can impact your athletic performance. You could stop believing in yourself." Dr Stamos agrees. "For athletes, having confidence in their oral health and overall wellbeing is very important," he says. On the positive side, he adds, "restoring oral health can change an athlete's mood, enthusiasm and behaviour." Studies have looked little at this specific connection, but existing literature has suggested that compromised oral health may negatively affect athlete's confidence and it can impact their quality of life, although these relationships require additional research.[38,39]

Another area that holds out promise for research, but little current usable insight, is the **oral microbiome**—the collective term for the tens of billions of microorganisms present in every person's mouth. Recent research has found that the microbiota of physically fit people, not just elite athletes, usually include higher levels of the genera *Rothia, Stenotrophomonas* and *Veillonella*, and lower concentrations of the genus Gemella.[40,41] A 2024 study, meanwhile, found that athletes in strength-focused sports (as opposed to those specialising in endurance ones or members of the general public) had higher levels of *Bifidobacterium longum* and *Bifidobacterium adolescentis*.[42] These last two appear to be probiotic, or helpful to the body, in some way. On the other hand, forms of *Stenotrophomonas* cause tooth cavities. Overall, though, evidence is still lacking on whether the higher concentrations of these organisms result from levels and types of physical activity or from some confounding factor, let alone whether these microbes can help or hurt performance. Again, more research is needed.

Whatever the gaps in today's knowledge, though, says Prof Dr Hürzeler, "the practical message for athletes is simple: maintaining good oral health is part of giving yourself the best chance to perform at your highest level."

Even if the benefits that they can bring might sometimes seem marginal, such gains matter greatly in elite sports. For example, at the Paris Olympics, the difference between first and eighth place in the women's 100 metre freestyle swimming was less than 0.9 seconds, or about 1.6% of the winner's time.[43] Similarly, at the Cortina Olympics, only half a second separated the gold and bronze medal winners in the downhill men's skiing, under 0.5% of the leader's time.[44] At this level, explains Ms Shortman "small issues can have a big impact, so having a proactive, preventative approach helps athletes stay healthy, train consistently and perform at their best." In numbers, one study found that the bones, teeth and muscles in and around the mouth contribute up to 2% of a person's balance.[45] The authors describe this gain as, for high precision sports such as gymnastics or skiing, "the difference between winners and losers."

Despite the possible benefits, researchers have found that athletes tend to experience a range of oral health problems more often than the average population.[46] Rather than a single, simple explanation, the range of factors described above is at play.

Nevertheless, athletes too often fail to consider oral health when seeking to improve their performance. Ms Battocletti observes that "generally athletes do not realise the importance of oral health on performance." Coach Hürzeler agrees, "players often say, 'I don't care about oral health, I've never heard about it,' and that shows how low awareness still is." He adds that this has a negative impact. Too many athletes "continue to underestimate the importance of oral health in sport, especially compared to

areas like nutrition, even though both can impact performance. There's a clear imbalance in how we prioritize these factors."

Fortunately, with greater awareness of how oral health can support athlete performance, the above challenges can be reduced or even eliminated. The following section looks at how this can be achieved.

Too many athletes "continue to underestimate the importance of oral health in sport, especially compared to areas like nutrition, even though both can impact performance. There's a clear imbalance in how we prioritize these factors."

Fabian Marc Hürzeler (centre), head coach, Brighton & Hove Albion F.C. in the Premier League, UK

The goal: Harnessing oral health for athletic success

Success in raising levels of oral health among elite athletes depends on recognising that the competitors themselves must be at the heart of all efforts. But behaviour change relies on a supporting network around athletes to motivate them and create opportunities for change. Key stakeholders include coaches, sports medical teams, including sports dentists, team management, and sporting bodies and federations (see Figure 2).

Success in raising levels of oral health among elite athletes depends on recognising that the competitors themselves must be at the heart of all efforts. But behaviour change relies on a supporting network around athletes to motivate them and create opportunities for change

The role of athlete self-care

"Oral health is something so personal that we have to get the athletes themselves on side," says Dr Lara-Bercial. "Coaches can't force them to brush their teeth or to floss."

Oral health promotion and education are a first step in winning them over to take care of their own oral health.[47] As Coach Hürzeler puts it, simply telling a player to take care of their teeth will not help. "You need to explain why it matters. Without that, nothing changes. When players understand the 'why', they change their behaviour." Ms Shortman agrees. "Education is key," she says, including "helping athletes understand the link between oral health, recovery and inflammation, and giving them simple, practical habits they can apply day to day."

This teaching should start as early as possible, says Dr Salyzyn: "We need to improve communication at the grassroots level, especially with young athletes and their families." Obviously, better basic advice on preventing tooth decay matters, but education should go further, including information on the importance of mouthguards and the maintenance of oral health to control bacterial levels and infections. In that sense, Dr Salyzyn adds, "every dentist is effectively a sports dentist."

Those athletes involved in early development programmes need this kind of support as well. A focus on oral health at youth and pathway levels, "would make a big difference in building long-term habits," Ms Shortman adds. Dr Lara-Bercial agrees. Football academies, he explains, can have children as young as eight years old. He suggests that these schools should introduce the idea of oral health along with other healthcare that supports early player development. Research supports his assessment of the need. A study of British football academies found that their students also, too often, show very high levels of oral disease. Its authors concluded that "urgent action is needed to embed oral health promotion in development and youth football."[48]

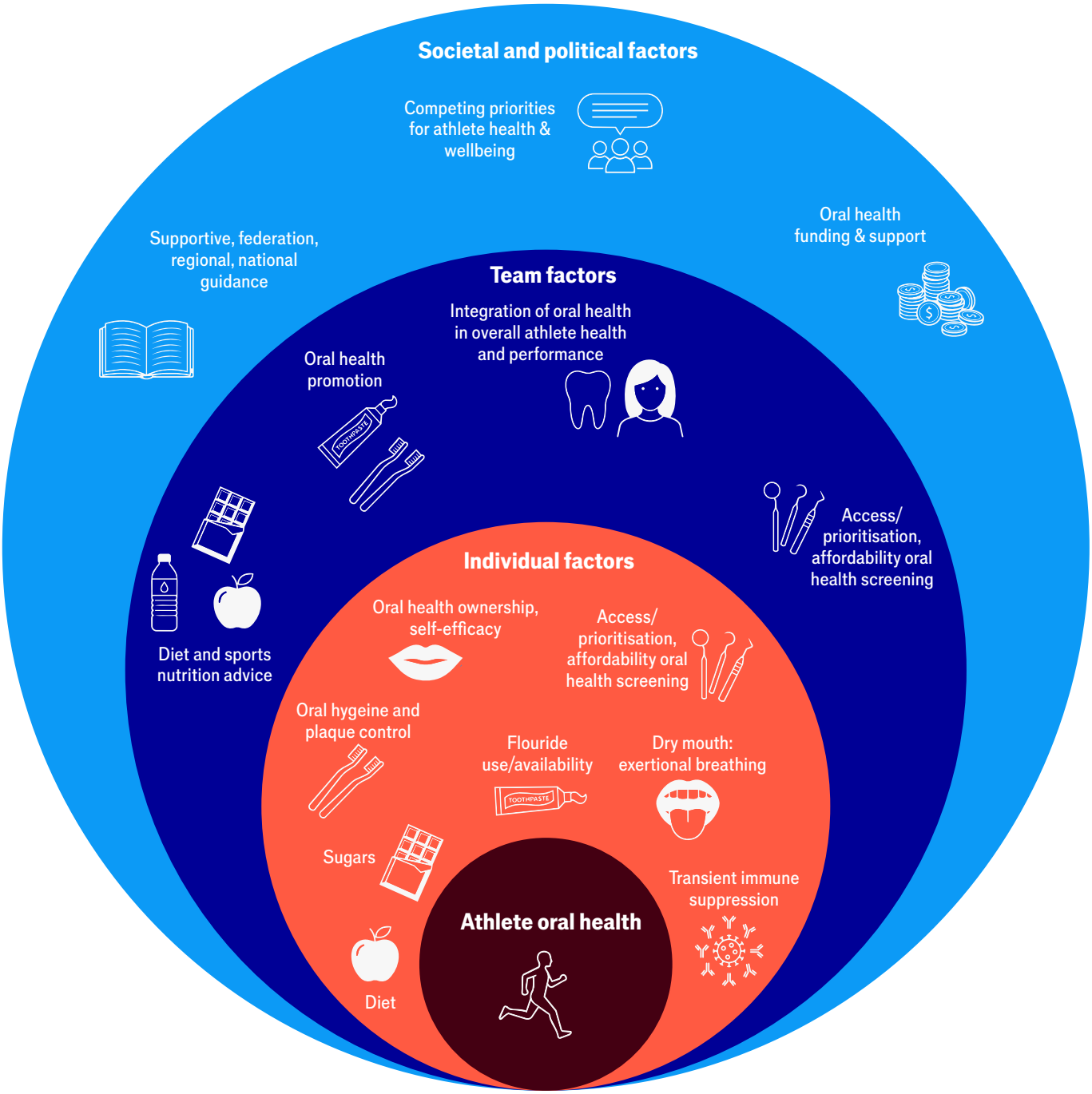
This is only the beginning for Dr Lara-Bercial. As players mature, he advises teams to integrate advice on oral health into general health counselling that goes along with regular physicals for professional athletes. Such education can help athletes address the specific oral health challenges of their sport. Some are unavoidable and so, says Dr Stamos, athletes must use "counter mechanisms to balance these effects."

A few of these can be straightforward. When Ms Battocletti has an energy drink a couple of hours before a competition, she brushes her teeth after an appropriate interval. She also drinks water on the track to clean her teeth. Similarly, Ms Shortman engages in the regular brushing and flossing that everyone should and, as an athlete, pays attention to "hydration and nutrition, especially around sports drinks or snacks during training, to make sure I'm not constantly exposing my teeth to sugar."

These simple expedients and education about them can do a lot very quickly. A study from University College London describes a programme that involved a presentation educating elite athletes about the performance benefits of good oral health and about good dental care (such as regularly using fluoridated toothpaste and interdental sticks). Participants also received an oral health kit. The results are striking. A follow-up after 12 weeks found that knowledge improved among the group has risen significantly, with 93% now motivated to take care of their teeth and gums to reduce the chance of inflammation in the body. Moreover, by the end, 80% were using fluoridated toothpaste, up from 13% at the start of the study. Finally, those saying that oral health had no negative impact on sports performance from their oral health nearly doubled, from 52% to 98%.[49]

Other mechanisms to protect oral health can require more work. For example, athletes also need to know how to use appropriate safety equipment—in

Figure 2. Elite athletes and oral health: a suggested model of the multi-level determinants



Source: Based on Needleman I, Gallagher J, Ashley P. What do we know about elite athlete oral health?. British Dental Journal. 2026, 240, 217–222. Available from: https://www.nature.com/articles/s41415-025-8909-7

particular, for oral health, mouthguards. These are more complex than they might appear. Dr Salazyn warns that "most commercially available mouthguards are poorly designed, uncomfortable and discourage young athletes from using them." Instead, he says that dentists and patients should work together to make effective, personalised, comfortable mouthguards that athletes will keep on wearing. In fact, one review found that personalised mouthguards not only reduce injury, but they can also improve balance performance, jump height and posture control while engaged in sport. Over-the-counter mouthguards brought no such performance gains.[50]

Another avenue for encouraging athletes to take greater care of their oral health is to connect such activity to an increasing interest in the cosmetic appeal of healthy teeth. Compared with the past, for example, Dr Lara-Bercial has been struck by the higher proportion of athletes, including some older ones, who wear or have worn corrective braces.

This is not just a question of looking good. As discussed above, the psychological benefits of having good teeth may, on their own, lead to better athletic performance.

Dr Lara-Bercial adds that the experience of having braces provides an opportunity for dental and medical professionals to teach athletes more about the importance of oral health in general—a phenomenon he has observed anecdotally among the young people whom he coaches.

So, athletes need to pay attention to their own oral health, the benefits it provides to their performance and the particular challenges that they face in this area. Success in doing all this, though, requires a supportive environment. Otherwise, they are unlikely to see oral health as a necessary priority.

The role of coaches, teams and oral health experts

A crucial element of this supportive environment consists of the athletes' coaches and team management.[51] In Ms Battocletti's experience, coaches and wider sports medicine teams must be "aware of the role of oral health on performance and give advice to athletes on this," including screening. The coach, in particular, "has a huge role in guiding athletes" in this area.

Dr Lara-Bercial explains that the need for such help is widely understood: "Most professional sport organizations are aware of the importance of oral health." He adds, though, that "how much they do about it is a different question."

He sees a clear difference between well-resourced organisations such as professional teams in major leagues or Olympics programmes in developed countries and others with fewer resources. For years, at least some of the better financially endowed ones have been integrating oral health into their sports medicine for athletes, to some extent. Real Madrid, a Spanish football club, for example, was already doing so in the 1990s, Dr Lara-Bercial says. Dr Salyzyn adds that the ASD now works with professional American football, ice hockey and basketball teams. Most, though still not all, have dentists on staff. The presence of these oral health experts "is starting to make a difference" for athletes.

Sports dentists should help to prevent, detect and treat: dental caries, erosive tooth wear, gum disease, malocclusion, temporomandibular disorders and other injuries, according to a 2020 consensus statement on sports dentistry integration in sports medicine from The European Association for Sports Dentistry, the ASD and the European College of Sports and Exercise Physicians.[52] Better integration would improve athletes' oral health and overall wellbeing. It could also lower the risk of systemic disease and musculoskeletal injury, while helping athletes perform at their best, the consensus statement adds.

Dr Zahar adds: "Sports medicine needs to be a team practice and effort. All colleagues on the team need to understand what the other specialities are talking about, such as the oral health work espoused by sports dentistry. For example, if cardiologists do not understand the sports dentists, then we are not a team, but a group of specialists." This may involve partnerships that allow athletes to minimise the oral health burden of training and competition. To give a simple example, athletes will continue to use high-profile energy drinks. Cooperation between nutritionists and dentists to maximise the benefits of their use and minimise the drawbacks therefore seems advisable.

Getting every large well-resourced team or organisation to include oral health in athlete care, though, requires winning over at least two crucial sets of actors. One consists of the people who care directly for the players. Dr Salazyn explains that, in particular, "athletic trainers are often the key drivers of medical programmes. Their buy-in is critical."

Gaining the support of more senior team officials is also essential, adds Dr Zahar. "Coaches and managers have a big role to play in encouraging the inclusion of oral health screening into athletes'

"Coaches and managers have a big role to play in encouraging the inclusion of oral health screening into athletes' global physical examination and protocol."

Maher Zahar, expert dentist, the International Olympic Committee's Medical Expert Group,Tunisia; vice president, International Federation of Sports Medicine

global physical examination and protocol." He believes that economic factors, if nothing else, should do much to convince such decision-makers. "Elite athletes can't afford to miss a day of training because their oral health is not optimised," he argues. "Compare the cost of the daily salary of a football player in [the English Premier League] with the cost of the annual salary of a sports dentist." Prof Dr Hürzeler agrees that the "maths are not complicated", when looking at screening, hygiene and early treatment programmes against lost competition time. He adds, however, that the obstacle is not a cost-benefit one, but that "nobody has yet been asked to count oral health as part of athlete availability, in the way sleep and nutrition are now counted."

Once committed, such well-resourced organisations should take a strategic view, considering a range of ways in which they can promote oral health. First,

says Dr Lara-Bercial, they have enough people in their sports medicine teams that they can make "oral health part of the complete package of personal wellbeing" that they provide to athletes. Screening, in particular, should take place at appropriate times in the sports calendar and be integrated with general risk-profiling of athletes.[53] Ms Shortman adds that this should include making oral health part of the "wider [health] support system, whether that's through routine dental screenings, education around how it links to performance and recovery, or simply making access to care easy for athletes."

Much of the groundwork to provide oral healthcare within these organisations is already in place, says Dr Stamos. "We have been very successful in integrating sports dentistry into sports medicine and today the sports medicine community already recognises the importance of oral health." The inclusion of dentists in medical teams at major sporting events has proved vital, improving care for athletes while raising awareness of oral health.[54]

Teamwork has to go beyond health teams. Where appropriate, other parts of the organisation should be involved. If, for example, several athletes are having oral health problems, the health experts can tell the coach. "Players and athletes listen to and trust coaches," explains Dr Lara-Bercial. This means that the latter are well placed to give athletes guidance and encouragement, which is more likely to be listened to more than if it simply comes from a dentist. As already noted, this strategy should include looking to the future by integrating oral health into the general care in sports academies.

Ideally, teams and coaches, in their efforts, should focus on prevention where possible, adds Coach Hürzeler. "When the pain is there, it's already too late," he warns. Then you have to manage the problem instead of preventing it. "That's the mistake many environments still make and that changes everything."

What about less well-off teams, or programmes in developing countries? Here, says Dr Lara-Bercial, support for oral health, like so many other aspects of player support and development, falls back largely on coaches. Many in this position already play an important role in encouraging healthy behaviour among their charges, such as having good nutrition, enough sleep and staying hydrated. A recent study from Senegal, for example, shows just how much medical care, including dental advice, a coach provides in these situations.[55]

But, says Dr Lara-Bercial, "oral health might not be on the top of the list" of things that leaders in these organisations know or talk with athletes about. So, he believes, "we will have to upskill or educate the coaches on oral health" so they can understand its importance and communicate its benefits.

Coaches in these less-endowed environments also may need to adopt a slightly different focus, says Coach Hürzeler. "In elite environments, the focus is on education and support, but in lower-resource settings, it's about access first. In grassroots environments, many players only see a dentist when they already have pain, so prevention is often missing entirely. The challenges are very different depending on the context."

The role of international and regional sports bodies

Sports governing organisations and federations also have a key role in creating an enabling environment for promoting oral health. They already shape safety rules for the competitions that they oversee, as well as the care that participating athletes get. Now, as Dr Lara-Barcial puts it, "organisations, like all the international sports federations and the International Olympic Committee, have a

"Organisations, like all the international sports federations and the International Olympic Committee, have a responsibility in the area of oral health because they dictate policy for the 200-plus countries that are members. That's probably where [progress] has to start."

Sergio Lara-Bercial, vice-president for strategy and development, International Council for Coaching Excellence; former Team GB coach, UK

responsibility in the area of oral health because they dictate policy for the 200-plus countries that are members. That's probably where [progress] has to start." Ms Shortman agrees. She says that the UK Sport Athlete Performance Award programme already mandates "regular health and fitness checks to make sure we're in the best condition to train and compete, which is really valuable. The next step is making sure oral health is consistently included in that wider support system, whether that's through routine dental screenings, education around how it links to performance and recovery, or simply making access to care easy for athletes."

Ms Battocletti says that doing so would definitely be useful from the athlete's point of view. These bodies "send a lot of information already and want us to know many things. If they include guidance on oral

Table 1: Snapshot oral health policy analysis of selected sports bodies

Sports organisation	Guidance or statement on general sports medicine for athletes? Possible answers: Yes (Advanced/Moderate/Basic) No [Year published]	Guidance or statement on oral or dental health for athletes? Possible answers: Yes (Advanced/Moderate/Basic) No **Advanced (Blue):** it contains general guidance on the impacts of oral/dental health on athlete health, including athlete performance. Advanced could also mean an oral health standalone guidance that also covers athlete performance. **Moderate (Blue):** it contains general guidance on the impacts of oral/dental health on athlete health. **Basic (Yellow):** it contains very minimal mention of oral or dental health on athlete health. **No (Red):** no guidance or statement on dental or oral health exists. [Year published]
International Olympic Committee (IOC)	Yes (Advanced) [2024] [56]	Yes (Advanced)[2008] [57]
World Rugby	Yes (Advanced) [no date] [58,59]	Yes (Advanced) [2019] [60]
Fédération Internationale de Football Association (FIFA)	Yes (Advanced) [2022] [61]	Yes (Moderate) [2022] [62]
International Federation of American Football (IFAF)	Yes (Moderate)[2023][63]	Yes (Basic: focus on mouthguards) [2023][64]
International Boxing Association (IBA)	Yes (Advanced) [2020][65]	Yes (Basic: focus on mouthguards) [2020][66]
World Athletics	Yes (Advanced) [2020][67]	Yes (Basic: brief mention) [2020][68]
World Rowing (FISA)	Yes (Advanced) [2020][69]	No
World Aquatics	Yes (Advanced) [2024][70]	No
The International Tennis Federation (ITF)	Yes (Moderate)[2022][71]	No

Source: Economist Enterprise analysis.

health this could help support and guide [a] focus" on the topic.

In fact, because these bodies typically have policies addressing different aspects of athlete health, including guidance on oral health would be consistent with their mandates. Economist Enterprise examined nine international or regional federations across various sports (see **Table 1**). Seven had advanced guidance or statements on general sports medicine for athletes. The other two had moderately effective guidance.

Most, though, at best, pay limited attention to oral health specifically.

A couple of examples show that substantial progress on promoting athlete oral care is possible.

As Dr Zahar points out, the IOC, his organisation, "has done the most [of any international sports body] for the oral health of athletes." Its activity in this area goes back at least to 1999, when the Olympic Games' Medical Commission began to include a dentist.[72] Dr Zahar adds that the Olympics was also one of the first competitions to provide bespoke mouthguards for athletes. More generally, the IOC's guidelines on sports dentistry take a holistic view of dental health and sports performance that goes beyond a narrow focus on injury prevention: "From better chewing and digestion of food all the way to proper support of the upper body muscles, a healthy dental condition will bring out the best in an athlete."[73]

However, Dr Zahar notes, these guidelines were published well over a decade ago, in 2008, and focus specifically on sports dentistry. "They need to be updated," he says, to include "the latest evidence on oral health and its relationship with athletic performance, which is a new concept developed in the last five years."

The World Rugby Federation also has advanced athlete oral health guidance. Rather than creating its own, this body points people to resources from the World Dentistry Federation, published in 2019, that promote a greater understanding of how to encourage oral health among athletes and the positive effect this can have on their performance. Their publications also speak extensively about ways to prevent dental problems.[74]

Looking beyond these two organisations, other guidelines—if an organisation has them at all—fall into two camps. One includes very brief mentions of dental injuries, usually subsumed into general health guidelines. The other, such as those put out by the International Boxing Association and the International Federation of American Football, are restricted to discussions of mouthguard use. While these are important matters, they cover only a small part of the potential value of oral health to athletic performance and athletes' quality of life.

Worse still, the health policies of several global organisations mention nothing related to oral or dental health (**see Table 1**). Indeed, while interest in mouthguards shows that those overseeing boxing, American football and rugby are aware of the potential for mouth injuries in their fields, less obvious dangers may not get general attention. For example, despite the acid issues in pools for swimmers and other water athletes, World Aquatics, the governing body for water sports, lacks any guidance on oral health. Yet it does have advanced ones on general health. World Aquatics told Economist Enterprise that it is exploring the development of additional health-focused content for its athlete platform, which it plans to launch "soon". "Oral health could be considered as part of this broader work in due course, although we do not currently have specific materials or subject-matter experts in this field," it added.

A possible reason why sports organisations often have far more general than oral health guidelines is that sports dentistry, while advancing (as discussed above), is still a young field and has offered limited guidance. The first consensus statement on oral health and elite sports performance appeared only in 2014, led by Ian Needleman, professor of periodontology and evidence-informed healthcare at University College London.[75]

Now, however, the discipline is beginning to cut its teeth. Dr Stamos reports that a 2023 screening protocol for dental examinations in sport—a joint product of the European Association for Sports Dentistry and the ASD—has had good uptake.[76] Meanwhile, Dr Salyzyn says that the ASD has, in the last few years, been building partnerships with other bodies, including the American Dental Association

and the Academy of General Dentistry. That said, he adds, while momentum is finally growing for a better understanding of how oral health should be treated in organised sports, "improving alignment on this subject globally is challenging. This is a complex ecosystem with many moving parts across states and regions."

Despite this, Dr Stamos stresses the importance of making more progress, using the Olympics as a case example. "We need a more systematic and official involvement of sports dentistry at international competitions," he argues, "because having a presence at major events sends a clear message to the rest of the world."

"We are witnessing a new science forming and booming, driven by a clear need from the player's perspective for a more specialised approach to oral health, alongside an increasing demand from dentists to understand this emerging field. Sports dentistry is a new science with a strong future, and it is already expanding beyond elite athletes to everyday athletes."

"We are witnessing a new science forming and booming, driven by a clear need from the player's perspective for a more specialised approach to oral health, alongside an increasing demand from dentists to understand this emerging field."

Thanos Stamos, co-founder and vice-president, European Association for Sports Dentistry, Greece

Conclusion: The first steps toward victory

Oral health has a substantial effect on overall body health, which in turn makes it profoundly important for athletic performance. The benefits which good health of this kind provide may be sufficient, for elite athletes, to mean the difference between success and failure.

For many years, this link received little attention, and this report describes a range of implications for actors in various parts of the sporting world. A multi-faceted change is necessary to see the opportunities from optimised oral health. For those wishing to start, the following are essential first steps:

- **Athletes**: in order to gain improved performance, embrace oral health and dental care as part of keeping your body fit and ready for training and competition.
- **Coaches, team managers, and sports medical and oral health professionals**: understand the value of good oral health among athletes and integrate people with sports dentistry expertise into your general care provision. Do this while boosting awareness of oral health prevention measures and embedding screening within the cycle of athlete care.
- **Sports bodies and federations**: lead your sports by integrating oral health considerations into the advice you give to athletes and coaches to boost health and wellbeing. Ensure that sports dentistry and oral health experts are given the opportunity to increase awareness and spread best practices while the field gathers more data on performance outcomes.
- **Research and academic community**: prepare longitudinal and mechanistic research projects that include cross-sectional prevalence studies relevant to this topic. Such research should examine any link between oral health variables and performance. Meaningful metrics might include training days available and recovery metrics, not just dental diagnoses.

These shifts in perspective should lead to many of the changes needed at every level to improve athletes' oral health. While this, in turn, will support performance, it will also bring wider gains for athletes and the fans, young and old, who look to them as examples. As Ms Shortman points out, "building good habits around oral health will benefit you both in your career and beyond."

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