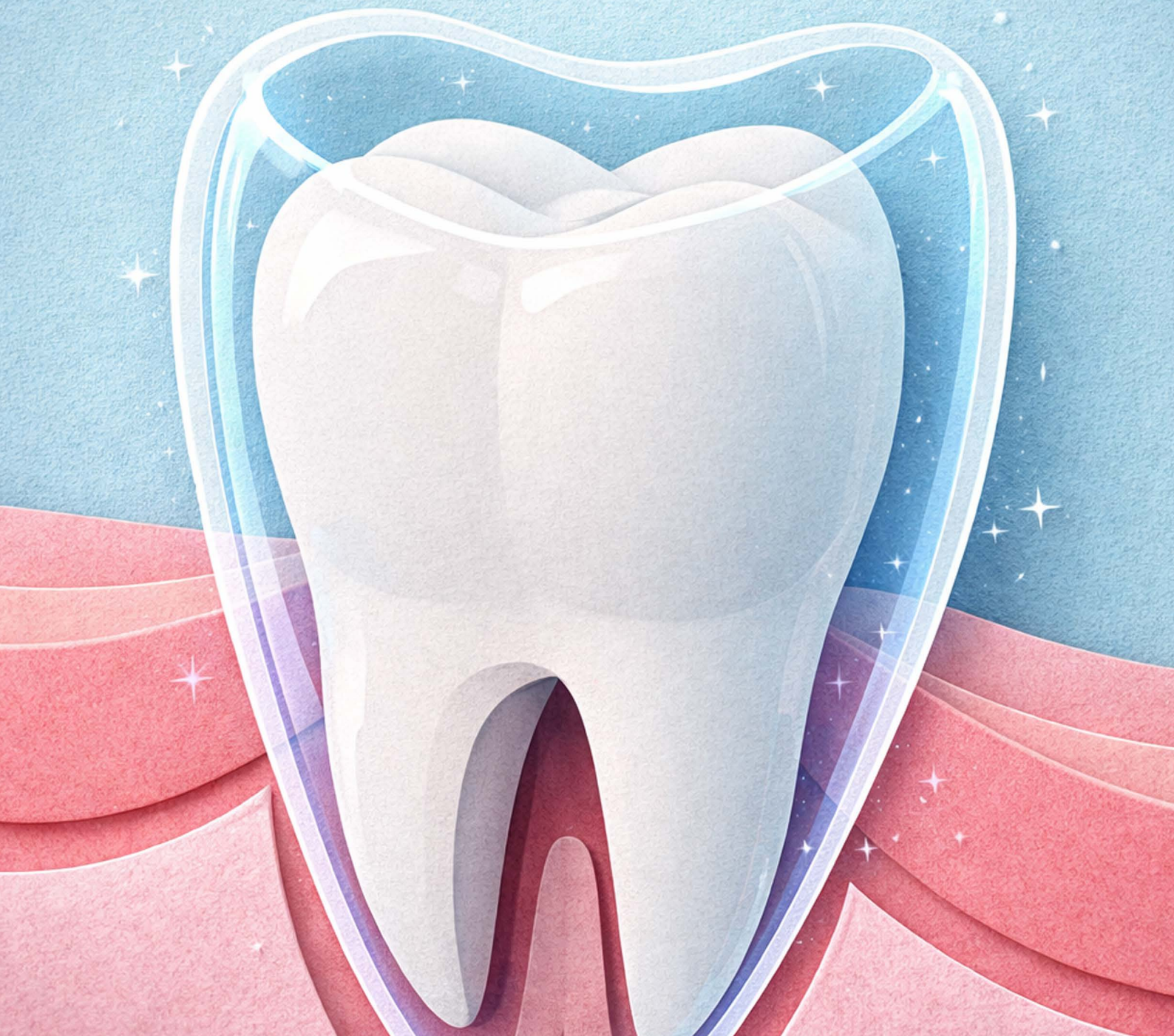
|EN

TILMAN FRITSCH, STAVROS AVGERINOS

SYSTEMATIZATION OF SPORTS DENTISTRY

FROM A SIDELINE DISCIPLINE TO A PERFORMANCE-MEDICAL FRAMEWORK — A 13-CLASS SYSTEM FOR PERFORMANCE OPTIMIZATION, INJURY PREVENTION, AND POST-CAREER ACCOMPANIMENT



Tilman Fritsch, Stavros Avgerinos

NAM Institute / DHGS · ÖGSZM · DGSZM · EA4SD · SBMC

ABSTRACT

For decades, sports dentistry remained a reactive sideline discipline confined to trauma prevention and emergency care. Building on the initial systematization [21], the present paper describes the systematization of sports dentistry on the basis of NAM-Dentistry (Neurobiology, Anatomy, and Metabolism) [8]. The resulting three-pillar model (Toxification, Silent Inflammation, Dynamic Function), resting on the foundation of Nutrition, provides the organizing structure. The extension of the established "Mouth-Body Connection" to a "Mouth-Brain-Body Connection" (MBBC) supplies the neurobiological rationale for understanding the oral cavity as a performance-relevant organ. The guiding principle is: performance enhancement through the identification and elimination of performance-diminishing oral factors. The framework extends beyond the acute competitive phase: it aims at minimizing injury risk, improving regenerative capacity, and providing salutogenetic accompaniment of the elite athlete beyond the end of their active career. Only the incorporation of Toxification as a hitherto missing third pillar enabled the step from an enumeration of action fields to a genuine systematic framework. By crossing the three pillars with three performance dimensions (Prevention, Performance Optimization, Regeneration), a 13-class system emerges (9 cell classes + 4 interaction-axis classes) that classifies sports dentistry comprehensively for the first time. Contextual embedding in Salutogenesis, Planetary Health, and Sustainable Dentistry ensures connectivity to the global health sciences.

Keywords: Sports dentistry, NAM-Dentistry, toxification, Mouth-Brain-Body Connection, silent inflammation, performance optimization, injury prevention, 13-class system, salutogenesis, planetary health post-career accompaniment, nutrition

HERAUSGEBER:
NAM RESEARCH INSTITUTE
ROCHUSGASSE 13
A-5020 SALZBURG

TEL: +43(0)662-822788
MOBIL: +43(0)664 1250 239
SALZBURG@NAM-INSTITUT.COM

1. INTRODUCTION: HISTORY OF SPORTS DENTISTRY

1.1 Origins: Trauma and Emergency Care (1890s–1990s)

Sports dentistry originated as a reactive discipline whose scope was limited to the management of sport-related dental trauma and its prevention through mouthguards. The earliest documented mouthguards date to boxing in the 1890s. The year 1958 is generally regarded as the founding date of institutional sports dentistry, when dental care was first integrated into the sports-medical setting at the FIFA World Cup in Brazil [1]. Subsequent developments followed this reactive pattern: in 1960, the American Dental Association (ADA) recommended mouthguards for American football; in 1983, the Academy for Sports Dentistry (ASD) was founded; Japan established its own society in 1990. The paradigm remained stable for decades: sports dentistry equated trauma prevention, emergency care, and mouthguard fabrication. The dentist in the sporting context acted as a repairman on the sideline, not as a performance partner.

1.2 The Clinical Reality: Oral Inflammation in Elite Sport

While sports dentistry focused on trauma, a clinically far more relevant problem remained largely unaddressed. Merle et al. reported in a 2022 narrative review that up to 97% of the elite athletes examined presented with oral inflammatory findings, and up to 80% were unaware of their condition [2]. Additional studies — including investigations of participants at the 2012 London Olympic Games [11] and of elite athletes across various disciplines [12] — confirmed this substantial burden. These data reveal a striking discrepancy between what classical sports dentistry addressed (trauma) and what clinically prevailed (chronic oral inflammation).

Kolb and Mandrup-Poulsen (2010) coined the term "low-grade inflammation" for this phenomenon — a silent, subclinical inflammation that exerts systemic effects without producing acute clinical symptoms [3]. The oral cavity ranks among the primary sources of this chronic inflammatory burden.

HERAUSGEBER:
NAM RESEARCH INSTITUTE
ROCHUSGASSE 13
A-5020 SALZBURG

TEL: +43(0)662-822788
MOBIL: +43(0)664 1250 239
SALZBURG@NAM-INSTITUT.COM

As early as 1994, Nieman described the J-curve of infection risk: moderate physical activity lowers the risk of upper respiratory tract infections (URTI), whereas high-intensity exertion raises it [4]. In the same year, Pedersen and Ullum formulated the "open-window" hypothesis: following intense exercise, an immunological window opens during which NK-cell function is suppressed and pathogens gain facilitated entry [5]. The sports-dental consequences of these findings were not drawn at the time.

The elite athlete operates under a metabolic regime characterized by high catabolic phases, adapted substrate utilization, and altered endocrine regulation. Sport-specific nutritional strategies — carbohydrate-rich gels, isotonic beverages, high meal frequency — alter the oral milieu directly. Frequent travel across time zones induces chronobiological disruption; psychosocial stress levels feed back on inflammatory processes via immunomodulatory axes (HPA axis, sympathetic nervous system) [6, 7]. The elite athlete is not a "healthy patient who exercises a lot" but an immunologically, metabolically, and chronobiologically distinct organism.

1.3 From Action Fields to a Systematic Framework: DGSZM, EA4SD, ÖGSZM

A first step beyond pure trauma care was taken by the German Society for Sports Dentistry (DGSZM), which identified three action fields: mouthguards, silent inflammation, and function (craniomandibular dysfunction, CMD). This placed silent inflammation and the functional dimension alongside classical trauma prevention as independent domains for the first time.

At the European level, the European Association for Sports Dentistry (EA4SD) advanced the professionalization of the discipline through three consensus publications: the Consensus Statement on Sports Dentistry Integration in Sports Medicine (Stamos et al. 2020) defined the role of dentistry within multidisciplinary sports medicine [18]; the Universal Screening Protocol for Dental Examinations in Sports (Stamos, Fritsch et al. 2023) created a standardized instrument for the sports-dental assessment of athletes [19]; the Position Statement and Recommendations for Custom-Made Sport Mouthguards (Avgerinos, Fritsch et al. 2025) standardized the oldest component of sports dentistry on the basis of international consensus criteria [20].

What was missing was a systematic framework — an organizing principle capable of transforming an

HERAUSGEBER:
NAM RESEARCH INSTITUTE
ROCHUSGASSE 13
A-5020 SALZBURG

TEL: +43(0)662-822788
MOBIL: +43(0)664 1250 239
SALZBURG@NAM-INSTITUT.COM

enumeration of action fields into a coherent diagnostic-therapeutic system. This step was accomplished by the Austrian Society for Sports Dentistry (ÖGSZM), drawing on NAM-Dentistry (Neurobiology, Anatomy, and Metabolism) [8, 21]. The pivotal element was Toxification. It was absent from the DGSZM proclamation. Mouthguards, inflammation, and function were acknowledged — but the question of what dental materials and oral care products in the athlete's mouth actually do was not asked. Anthropogenic artifacts — metal alloys, composites, monomers, galvanic couples — remain permanently in the oral cavity, while oral care products (toothpastes, mouthwashes, fluoride applications) introduce additional chemical agents on a daily basis. Together, they impose a continuous burden on the organism. Without their systematic assessment, an entire spectrum of performance-diminishing oral factors remains invisible.

Only by incorporating toxification as an independent pillar did the enumeration become a system. The diagnostic logic: inflammatory findings and functional disorders can be assessed clinically — periodontal probing, salivary diagnostics, functional analysis. But only toxification diagnostics — galvanic measurement, material analysis, biocompatibility testing — complete the picture and render the entire chain systematizable: finding → diagnosis → causal attribution → targeted therapy → performance optimization.
The ÖGSZM accordingly structured sports dentistry into the three pillars known from NAM-Dentistry [8] — Toxification, Silent Inflammation, and Dynamic Function — on the foundation of Nutrition, which permeates all pillars as a basal modulator [6, 10] (cf. Section 3.1).

With toxification established as a pillar, a new conceptual vocabulary became integrable: Ergoprivativa (Gr. érgon, performance; Lat. privare, to deprive: performance-diminishing oral material burdens) and the concept of Loping (performance reduction through oral interference factors; antonym of doping) [8]. The decisive shift in perspective: not "What can I add to the athlete?" but "What must I eliminate so that the organism can realize its full performance capacity?"

HERAUSGEBER:
NAM RESEARCH INSTITUTE
ROCHUSGASSE 13
A-5020 SALZBURG

TEL: +43(0)662-822788
MOBIL: +43(0)664 1250 239
SALZBURG@NAM-INSTITUT.COM

2. NEUROBIOLOGICAL BASIS: FROM ORAL FINDINGS TO SYSTEMIC EFFECTS

2.1 Pillar Interactions as a Systemic Principle

The three pillars introduced in Section 1.3 — Toxification, Silent Inflammation, Dynamic Function — do not describe isolated disease entities but interacting pathogenic principles [8]. Toxification can trigger inflammation; inflammation alters neuromuscular function via nociception and muscle hypertonicity; functional imbalances in turn modulate inflammatory patterns through mechanical overload. This network of interactions is systematically mapped in the four interaction axes of the 13-class system (Section 3.5). The question arises through which routes the three pillars reach the organism as a whole.

2.2 From the Mouth-Body Connection to the Mouth-Brain-Body Connection

The concept of a link between oral health and general health — the "Mouth-Body Connection" — had been familiar since the 1990s through periodontal medicine, yet it was largely confined to the axis of oral inflammation and cardiovascular or metabolic endpoints. The extension to the "Mouth-Brain-Body Connection" (MBBC) [13] rests on the recognition that the oral cavity is the most densely innervated region of the human body and communicates directly with the brainstem via the trigeminal nerve, the facial nerve, and the autonomic nervous system. The MBBC describes a bidirectional communication space in which every dental intervention — intended or not — intervenes in a neuroimmunological network of systemic reach. A morphological basis for this systemic connection is provided by the Matrix Information System (MI System), which rests on the histologically confirmed Primo Vascular System [14].

2.3 Connection Axes: Mouth-Gut, Mouth-Lung, Mouth-Cardiovascular

The MBBC is embedded in a growing network of scientifically characterized connection axes of direct relevance to sports dentistry:

HERAUSGEBER:
NAM RESEARCH INSTITUTE
ROCHUSGASSE 13
A-5020 SALZBURG

TEL: +43(0)662-822788
MOBIL: +43(0)664 1250 239
SALZBURG@NAM-INSTITUT.COM

The Mouth-Gut Axis describes the daily transit of up to 1.5 liters of saliva with its full microbial cargo into the gastrointestinal tract. Periodontal pathogens such as Porphyromonas gingivalis and Fusobacterium nucleatum have been detected in the intestinal mucosa, where they compromise intestinal barrier function [15]. For elite athletes whose gastrointestinal integrity may already be compromised by exercise-induced intestinal permeability, this axis acquires particular relevance.

The Mouth-Lung Axis concerns the aspiration of oral microorganisms into the lower airways. In athletes exercising at high intensity with predominantly oral breathing and elevated minute ventilation, aspiration risk increases. Oral inflammatory foci can contribute to bacterial colonization of the lower respiratory tract [16].

The Mouth-Cardiovascular Axis is the longest-studied connection. Periodontal pathogens and their endotoxins enter the bloodstream via the sulcular epithelium and contribute to endothelial dysfunction and elevated systemic inflammatory markers [17]. For elite athletes in whom even minor reductions in cardiovascular efficiency become performance-relevant, this axis carries immediate practical significance.

2.4 Consequence: Performance Enhancement, Injury Prevention, and Lifelong Accompaniment

If the oral condition influences the entire organism through toxification, inflammation, and functional dysregulation, it also influences athletic performance — across all performance-relevant levels: energy metabolism, immune regulation, neuromuscular coordination, regenerative capacity, and cognitive function. The central consequence for a systematized sports dentistry reads: Performance enhancement through the identification and elimination of performance-diminishing oral factors.

The scope of the framework extends beyond the acute competitive phase. The elimination of oral interference factors operates along three temporal axes: first, it provides immediate relief during sport — via the connection axes described in Section 2.3, reduced inflammatory load, optimized occlusion, and diminished toxification burden act on systemic performance capacity. Second, it minimizes injury risk: craniomandibular dysfunctions generate compensatory movement patterns via the descending muscle chain that

HERAUSGEBER:
NAM RESEARCH INSTITUTE
ROCHUSGASSE 13
A-5020 SALZBURG

TEL: +43(0)662-822788
MOBIL: +43(0)664 1250 239
SALZBURG@NAM-INSTITUT.COM

promote malalignment and thus injuries; chronic inflammation impairs tissue regeneration and prolongs recovery after microtrauma; toxification-related impairments of neuromuscular coordination increase the risk of musculoskeletal damage. Third, the framework enables salutogenetic accompaniment of the elite athlete beyond the end of their active career. The cumulative burden of years of high-performance sport — toxification through dental restorations, chronic oral inflammation, functional overload from bruxism and clenching — persists beyond the career. A systematized sports dentistry accompanies the athlete through the transition to the post-career phase: the pillars retain their validity while the performance dimensions shift from competitive optimization to health maintenance — prevention becomes long-term prophylaxis, performance optimization becomes functional preservation, regeneration becomes resilience promotion. Notably, toxification — the very pillar that enabled the systemic leap — is the one whose effects remained invisible the longest: materials in the mouth generate no acute symptoms yet burden the organism continuously — during and after the career.

3 SYSTEMATIZATION: THE 13-CLASS SYSTEM

3.1 Structural Principle: Pillars × Performance Dimensions

The systematization arises from crossing the three pillars with three performance dimensions [21]. Each of the nine resulting cells describes a defined action field. Four additional classes — the interaction axes — capture cross-pillar interactions: three pairwise axes (Pillar × Pillar) and one cascade class (Pillar × Pillar × Pillar). The result is a 13-class system. Nutrition does not occupy its own field in the matrix but forms the basal layer on which the entire classification rests: as a modulator permeating every cell, it belongs beneath the matrix as its foundation.

HERAUSGEBER:
NAM RESEARCH INSTITUTE
ROCHUSGASSE 13
A-5020 SALZBURG

TEL: +43(0)662-822788
MOBIL: +43(0)664 1250 239
SALZBURG@NAM-INSTITUT.COM

	PREVENTION	PERFORMANCE	REGENERATION
PILLAR 1 TOXIFICATION	SZM-1P Material selection	SZM-1L Material revision	SZM-1R Detoxification
PILLAR 2 Silent Inflammation	SZM-2P Salivary diagnostics	SZM-2L Focus elimination	SZM-2R Inflammation management
PILLAR 3 DYNAMIC FUNCTION	SZM-3P Mouthguard, functional analysis	SZM-3L Occlusal-optimization	SZM-3R Night splint / airway

SZM-W12 Toxification × Inflammation	SZM-W23 Inflammation × Function	SZM-W13 Toxification × Function

Table 1: The 13-class system of sports dentistry. 3×3 matrix + 4 interaction axes. Foundation: Nutrition. Contextual embedding: Salutogenesis, Planetary Health, Sustainable Dentistry.

3.2 Pillar 1: Toxification in Sport

SDM-1P (Prevention): Preventive material selection with consideration of individual total exposure. Galvanically active combinations are avoided; NiTi archwires are critically evaluated in elite athletes with immunological predisposition. Every restoration requires biocompatibility testing. The assessment extends to oral care products — toothpastes, mouthwashes, and topical fluoride agents — whose chemical composition (surfactants, preservatives, antimicrobial agents) contributes to the cumulative toxification load. The regulatory background is provided by the Minamata Convention (COP-6) with the global amalgam phase-out by 2034.

SDM-1L (Performance Optimization): Identification and elimination of existing toxification sources as a performance-enhancing measure. Galvanic relief, material revision, and reduction of the immunological baseline burden with measurable consequences for energy metabolism and regenerative capacity. Biomonitoring (saliva, blood).

HERAUSGEBER:
NAM RESEARCH INSTITUTE
ROCHUSGASSE 13
A-5020 SALZBURG

TEL: +43(0)662-822788
MOBIL: +43(0)664 1250 239
SALZBURG@NAM-INSTITUT.COM

SDM-1R (Regeneration): Chronic toxification as a regeneration inhibitor — heavy-metal burdens impair mitochondrial efficiency and decelerate the rate of recovery. Targeted detoxification protocols are integrated as adjunctive measures in sports-medical regeneration planning.

3.3 Pillar 2: Silent Inflammation in Sport

SDM-2P (Prevention): Systematic screening for oral inflammatory foci by means of non-invasive salivary diagnostics (cf. Section 4). Periodontal health as a preventive target — not only against tooth loss but as systemic relief. The high prevalence of periodontal disease in elite athletes [2, 11] makes this the priority action field.

SDM-2L (Performance Optimization): Elimination of chronic inflammatory foci as a performance reserve. The cytokine burden from periodontitis, periapical lesions, and devitalized teeth reduces cardiovascular capacity, impairs muscle regeneration, and strains the immune system [2, 11, 12]. Remediation of oral inflammation as a performance-medical intervention.

SDM-2R (Regeneration): Chronic oral inflammation delays recovery after exertion and injury. The systemic cytokine load prolongs the recovery phase. Active inflammation management — oral microbiome control, targeted anti-inflammatory interventions, serial salivary diagnostics — becomes a building block of sports-medical regeneration planning.

3.4 Pillar 3: Dynamic Function in Sport

SDM-3P (Prevention): Custom-made sport mouthguards [20] protecting the structural integrity of the stomatognathic system; instrumental functional analysis as a screening tool for craniomandibular dysfunctions; prophylaxis of functional overload — bruxism and clenching under competitive stress — and systematic airway analysis. SDM-3P thereby connects the oldest component of sports dentistry (mouthguard) with systematic functional diagnostics.

SDM-3L (Performance Optimization): Neurobiologically informed splint therapy that extends beyond empirical "performance splints." Targeted occlusal optimization acting on the postural chain, neuromuscular

HERAUSGEBER:
NAM RESEARCH INSTITUTE
ROCHUSGASSE 13
A-5020 SALZBURG

TEL: +43(0)662-822788
MOBIL: +43(0)664 1250 239
SALZBURG@NAM-INSTITUT.COM

coordination, and force transmission. Airway optimization to improve oxygen utilization. Dynamic Function is the pillar with the most direct performance relevance in competition.

SDM-3R (Regeneration): Functional relief of the craniomandibular unit during the regeneration phase. Night splints reduce bruxism-induced stress. Airway management to improve sleep quality — the craniomandibular unit as the key to nocturnal recovery.

3.5 The Four Interaction Axes

SDM-W12 — Toxification × Silent Inflammation: Toxification as an inflammation trigger; inflammation as an amplifier of toxification effects. Example: galvanically induced mucositis exacerbates periodontal inflammatory burden.

SDM-W23 — Silent Inflammation × Dynamic Function: Inflammatory mediators from the periodontium affect neuromuscular control; functional malalignment generates local inflammation (arthropathy, myalgia).

SDM-W13 — Toxification × Dynamic Function: Galvanic currents influence neuromuscular function directly; material-related volumes and surface qualities alter occlusal proprioception.

SDM-W123 — Cascade Class: The clinical norm in the complexly burdened athlete: galvanically active metal restorations (Pillar 1) sustain mucosal inflammation (Pillar 2), which in turn alters occlusal proprioception via nociception and muscle hypertonicity (Pillar 3). The triple interaction requires its own therapeutic sequencing: first eliminate the toxification source, then remediate inflammation, then recalibrate function.

The interaction axes are deliberately not crossed with the performance dimensions. They describe cross-pillar interaction patterns that are operative in all three dimensions. Their dimension-specific manifestation derives from the cell classes involved.

HERAUSGEBER:
NAM RESEARCH INSTITUTE
ROCHUSGASSE 13
A-5020 SALZBURG

TEL: +43(0)662-822788
MOBIL: +43(0)664 1250 239
SALZBURG@NAM-INSTITUT.COM

3.6 Overview: The Complete 13-Class System

Class	Designation	Type
SDM-1P	Toxification / Prevention	Pillar × Dimension
SDM-1L	Toxification / Performance	Optimization Pillar × Dimension
SDM-1R	Toxification / Regeneration	Pillar × Dimension
SDM-2P	Silent Inflammation / Prevention	Pillar × Dimension
SDM-2L	Silent Inflammation / Performance Optimization	Pillar × Dimension
SDM-2R	Silent Inflammation / Regeneration (Infl. Mgmt.)	Pillar × Dimension
SDM-3P	Dynamic Function / Prevention (Mouthguard, Fct. Analysis)	Pillar × Dimension
SDM-3L	Dynamic Function / Performance Optimization	Pillar × Dimension
SDM-3R	Dynamic Function / Regeneration	Pillar × Dimension
SDM-W12	Toxification × Silent Inflammation	Interaction Axis
SDM-W23	Silent Inflammation × Dynamic Function	Interaction Axis
SDM-W13	Toxification × Dynamic Function	Interaction Axis
SDM-W123	Toxification × Inflammation × Function	Cascade Class

Table 2: Overview of the 13-class system of sports dentistry.

4 BIOMARKERS AND DIAGNOSTICS

The 13-class system requires a diagnostic infrastructure. Salivary diagnostics constitute the central non-invasive instrument for Pillar 2: aMMP-8 (activated matrix metalloproteinase-8) as an indicator of collagenolytic tissue degradation, interleukins (IL-1β, IL-6, TNF-α) as inflammatory mediators, secretory IgA as a mucosal immune marker, cortisol as a stress indicator, and pH and buffer capacity as parameters of the oral milieu — quantitative, serially deployable, suitable for monitoring across the competitive season. Galvanic measurement quantifies intraoral current flows (Pillar 1). Functional analysis — instrumental and clinical assessment of craniomandibular function (Pillar 3): condylography, electromyography, airway diagnostics.

HERAUSGEBER:
NAM RESEARCH INSTITUTE
ROCHUSGASSE 13
A-5020 SALZBURG

TEL: +43(0)662-822788
MOBIL: +43(0)664 1250 239
SALZBURG@NAM-INSTITUT.COM

5. CONTEXTUALIZATION: SALUTOGENESIS, PLANETARY HEALTH, SUSTAINABLE DENTISTRY

Systematized sports dentistry does not stand in isolation but is embedded in a contextual triad:

Salutogenesis. Antonovsky's salutogenesis model asks not "What causes disease?" but "What generates health?" Classical sports dentistry was pathogenetically oriented (prevent trauma, repair damage); systematized sports dentistry is salutogenetically oriented: which oral conditions promote performance capacity, regenerative potential, and systemic resilience? This paradigm is consonant with the hormesis principle, which defines the lifespan-relevant limits of biological adaptation [9]. The three pillars describe resources and burdens in the salutogenetic sense: reduction of the toxification load as strengthening of generalized resistance resources (GRR); control of silent inflammation as prevention of systemic resistance deficits; optimization of dynamic function as promotion of the physical performance resource. The salutogenetic perspective simultaneously underpins the post-career accompaniment described in Section 2.4: the pillar model retains its validity beyond the active career.

Planetary Health. Human health is inconceivable without the health of planetary systems. For sports dentistry, this yields: material ecology (the Minamata Convention as a Planetary Health instrument), the influence of environmental toxins on the oral milieu and oral inflammatory burden, and the nexus between athlete nutrition and planetary boundaries. Avgerinos et al. demonstrated how sports dentistry can serve as a pioneer for a sustainable transformation of oral healthcare [22].

Sustainable Dentistry. Sustainable dentistry integrates ecological, social, and economic sustainability with dental practice. Material reduction through prevention, longevity through biocompatibility, digitalization of diagnostics, and sport-specific prevention reduce the ecological footprint of sports dentistry.

The systematization describes the sports-dental action fields (13 classes), which derive their legitimation

HERAUSGEBER:
NAM RESEARCH INSTITUTE
ROCHUSGASSE 13
A-5020 SALZBURG

TEL: +43(0)662-822788
MOBIL: +43(0)664 1250 239
SALZBURG@NAM-INSTITUT.COM

from salutogenesis, their ecological responsibility from Planetary Health, and their practice criteria from Sustainable Dentistry.

6. CONCLUSION AND OUTLOOK

The systematization of sports dentistry on the basis of NAM-Dentistry [8] proceeds in three steps: first, the historical extension from a sideline discipline to a performance-medical discipline, with toxification accomplishing the key step from action-field enumeration to systematic framework; second, systematic structuring through the 13-class system (9 cell classes + 4 interaction-axis classes); third, contextual embedding in the triad of Salutogenesis — Planetary Health — Sustainable Dentistry. The framework addresses not only the acute competitive phase but aims at minimizing injury risk, improving regenerative capacity, and providing salutogenetic accompaniment of the athlete beyond the career's end.

The ÖGSZM and the DGSZM can employ this system as a basis for curricula, research programs, and clinical guidelines. The 13 classes provide a transparent structure for the assignment of research questions, diagnostic procedures, and therapeutic protocols. Operationalization into a clinical step protocol — from EA4SD screening through class assignment to pillar-specific therapy planning —, validation of class-specific biomarker panels, and the development of a post-career accompaniment program based on the three pillars are subjects of subsequent work.

HERAUSGEBER:
NAM RESEARCH INSTITUTE
ROCHUSGASSE 13
A-5020 SALZBURG

TEL: +43(0)662-822788
MOBIL: +43(0)664 1250 239
SALZBURG@NAM-INSTITUT.COM

REFERENCES

[1] Ramagoni NK, Singamaneni VK, Rao SR, Karthikeyan J. Sports dentistry: A review. J Int Soc Prev Community Dent. 2014;4(Suppl 3):S139–S146. doi:10.4103/2231-0762.149019.

[2] Merle CL, Wuestenfeld JC, Fenkse F, Wolfarth B, Haak R, Schmalz G, Ziebolz D. The Significance of Oral Inflammation in Elite Sports: A Narrative Review. Sports Med Int Open. 2022;6(2):E69–E79. doi:10.1055/a-1964-8538.

[3] Kolb H, Mandrup-Poulsen T. The global diabetes epidemic as a consequence of lifestyle-induced low-grade inflammation. Diabetologia. 2010;53(1):10–20. doi:10.1007/s00125-009-1573-7.

[4] Nieman DC. Exercise, infection, and immunity. Int J Sports Med. 1994;15 Suppl 3:S131–S141. doi:10.1055/s-2007-1021128.

[5] Pedersen BK, Ullum H. NK cell response to physical activity: possible mechanisms of action. Med Sci Sports Exerc. 1994;26(2):140–146. doi:10.1249/00005768-199402000-00003.

[6] Agha-Alinejad H, Ahmadi Hekmatikar AH, Ruhee RT, et al. A Guide to Different Intensities of Exercise, Vaccination, and Sports Nutrition [...]. Int J Environ Res Public Health. 2022;19(3):1888. doi:10.3390/ijerph19031888.

[7] Walsh NP, Gleeson M, Shephard RJ, et al. Position statement. Part one: Immune function and exercise. Exerc Immunol Rev. 2011;17:6–63.

[8] Fritsch T, Avgerinos S, Jacob U, Muss C. 80 Jahre NAM-Zahnheilkunde. NAM-Journal 2025 Aug 25. doi:10.64447/2025nam0007.

[9] Calabrese EJ, Osakabe N, et al., Fritsch T, et al. Hormesis defines limits of lifespan. Ageing Res Rev. 2023;91:102074. doi:10.1016/j.arr.2023.102074.

[10] Maughan RJ, Burke LM, Dvorak J, et al. IOC consensus statement: dietary supplements and the high-performance athlete. Br J Sports Med. 2018;52(7):439–452. doi:10.1136/bjsports-2018-099027.

[11] Needleman I, Ashley P, Petrie A, et al. Oral health and impact on performance of athletes participating in the London 2012 Olympic Games. Br J Sports Med. 2013;47(16):1054–1058. doi:10.1136/bjsports-2013-092891.

[12] Gallagher J, Ashley P, Petrie A, Needleman I. Oral health and performance impacts in elite and professional athletes. Community Dent Oral Epidemiol. 2018;46(6):563–568. doi:10.1111/cdoe.12392.

[13] Fritsch T. Mouth-Brain-Body Connection — NAM-Dentistry. Presentation, International Biological Me-

HERAUSGEBER:
NAM RESEARCH INSTITUTE
ROCHUSGASSE 13
A-5020 SALZBURG

TEL: +43(0)662-822788
MOBIL: +43(0)664 1250 239
SALZBURG@NAM-INSTITUT.COM

dical Week, Chişinău, 2018.
[14] Soh KS. Bonghan circulatory system as an extension of acupuncture meridians. J Acupunct Meridian Stud. 2009;2(2):93–106. doi:10.1016/S2005-2901(09)60041-8.
[15] Atarashi K, Suda W, Luo C, et al. Ectopic colonization of oral bacteria in the intestine drives T_1 cell induction and inflammation. Science. 2017;358(6361):359–365. doi:10.1126/science.aan4526.
[16] Scannapieco FA. Role of oral bacteria in respiratory infection. J Periodontol. 1999;70(7):793–802. doi:10.1902/jop.1999.70.7.793.
[17] Sanz M, Marco del Castillo A, Jepsen S, et al. Periodontitis and cardiovascular diseases: Consensus report. J Clin Periodontol. 2020;47(3):268–288. doi:10.1111/jcpe.13189.
[18] Stamos A, Mills S, Malliaropoulos N, et al. The European Association for Sports Dentistry [...] consensus statement on sports dentistry integration in sports medicine. Dent Traumatol. 2020;36(6):680–684. doi:10.1111/edt.12593.
[19] Stamos A, Engels-Deutsch M, Cantamessa S, [...] Fritsch T, et al. A suggested universal protocol for dental examination in sports. Dent Traumatol. 2023;39(5):408–417. doi:10.1111/edt.12863.
[20] Avgerinos S, Stamos A, [...] Fritsch T, et al. Position statement and recommendations for custom-made sport mouthguards. Dent Traumatol. 2025. doi:10.1111/edt.13019.
[21] Fritsch T. Systematisierung der Sportzahnmedizin — über die NAM-ZahnHeilkunde. NAM-Journal 2026. doi:10.64447/2026nam0002.
[22] Avgerinos S, Fisher J, Krejci I, Saiyed A, Banerjee A. Achieving oral and planetary health; how sports dental medicine can pioneer and realize transformation in oral healthcare. Front Oral Health. 2025;6:1664261. doi:10.3389/froh.2025.1664261.

HERAUSGEBER:
NAM RESEARCH INSTITUTE
ROCHUSGASSE 13
A-5020 SALZBURG

TEL: +43(0)662-822788
MOBIL: +43(0)664 1250 239
SALZBURG@NAM-INSTITUT.COM