

## Sports Pediatric Dentistry: for Grassroots Athletes

Márcia Moreira<sup>1\*</sup>, Giuseppe Umberto Pastore<sup>2</sup>, Mário Cappellette Jr<sup>3</sup>, Marcelo Galotti<sup>4</sup>

<sup>1</sup>Dentist, Paediatric Dentist, FOUSP, Faculty of Dentistry, University of São Paulo - São Paulo –SP- Brasil- Director of the Brazilian Society of Sport and Exercise, Dentist in the area of Pediatric Dentistry for Sports Bases- S.B.O.E.E. -São Paulo, Brasil.

<sup>2</sup>Dentist, Periodontist, FOUSP-Faculty of Dentistry, University of São Paulo-São Paulo –SP- Brasil.

<sup>3</sup>Dentist, Orthodontist, São Francisco University-Bragança Paulista, SP-Brasil. Master in Orthodontics and facial Orthopedics; Post doctor and Professor by the Department of Otorhinolaryngology and Head and Neck Surgery at São Paulo Federal University

<sup>4</sup>Dentist, Sports Dentist, UNG- Guarulhos University -Guarulhos-SP-Brasil. Specialist in Sports Dentistry by Federal Council of Dentistry; Director of the Brazilian Society of Sports And Exercise Dentistry.

**\*Corresponding Author:** Márcia Moreira, Dentist, Paediatric Dentist, FOUSP, Faculty of Dentistry, University of São Paulo - São Paulo –SP- Brasil- Director of the Brazilian Society of Sport and Exercise, SBOEE, Dentistry in the area of Pediatric Dentistry for Sports Bases-São Paulo, Brasil. Avenida Brigadeiro Faria Lima, 1616, conjunto 701, Jardim Paulistano, São Paulo, Brasil., 01451-001. 55-11-3032-1914.

### Abstract

All sports categories invest in growing athletes, who begin their careers in childhood or adolescence. Our goal is to provide for these athletes the maximum protection in dental care so that their oral health in adult life does not trigger any impact on performance in functional activities related to the face: full nasal breathing and normal occlusion, protection of the temporomandibular joints and prevention of dental trauma, using mouth and facial protectors; systemic health protected by zero caries and absence of any pathology in the coating or support periodontium, result of self-care learning. For the achievement of these goals, the pediatric dentist, working within protocols of the Sport Dentistry, is the most suitable professional. Health Promotion and Protection Begin in Childhood, at the same time as the athlete's sports training began!

**Abstract:** physical exercise, childhood, adolescence, oral health, Preventive Dentistry, Health Education.

### INTRODUCTION

In recent years, in Brazil, the approval of Sport Dentistry, as a specialty (ANEQ, National Association of Dental Specialties / CFO, Federal Dental Council, 2015)<sup>1</sup>, has created a movement around the promotion of the athlete's integral health, facial and oral-dental trauma, use of facial and mouth protectors, care in relation to doping, the role of salivary markers in indicating the systemic health of the athlete and others. The objective of this work is to launch a new, opportune discussion, as we are at the beginning of the implementation of this specialty in our country! All sports categories, clubs and federations, invest in training athletes, who in the vast majority start their careers in childhood or adolescence. These young athletes are in different stages of development, which should not only be seen

from the physical point of view, but also intellectual, moral, cultural, social and emotional. Clubs and confederations must search through the medical fields for the identity of their young athlete: general health, school performance, family and social belonging, their interrelationships with the world, their psychological and social stability, their beliefs and expectations of life. A young athlete with promising potential in a particular sporting area is of interest to any base club team, but if we do not identify whether this athlete has conditions for the basic food basket in the family, or for the purchase of basic hygiene products, we cannot regret his lack of systemic health or even gum problems or caries, in the absence of tooth brushes!! Let's talk about how to promote oral health for athletes in the development phase, from oral care to basic categories, from childhood and adolescence

to adulthood, the general and specific needs of these stages in oral health. However, firstly, the diagnosis of the athlete's needs is in the hands of those responsible for the athletic teams of the clubs and confederations! Health and Education are a binomial of first need for the success of an athlete! Who will do this? Is it the medical team? Is it an administrative department? Is there an overview of these needs or do they appear only in emergencies and eventualities? Are we going to build a dental department integrated with the medical department? Or are we going to restructure the way of conducting the grassroots categories until their promotion to professional teams? This is our proposal in the Oral Health Area: to make you think about today and tomorrow!

### **About the need for dental care for sports practitioners in childhood and adolescence. BASES**

In Brazil, we do not have an organized system in which sport and school life go hand in hand, from cradle to college, revealing potential athletes and providing environments for them to develop, as in the U.S.<sup>2</sup>. In Brazil there are four main sources of athletes: social, football and corporate clubs, training centers, confederations, and social projects. For example, in April 2019, in the city of São Paulo, the Favelas Cup<sup>3</sup> was organized with many sponsors to reveal new names, with 64 teams for men's soccer and 32 teams for women's.

In investments made to the grassroots categories, the youngest of clubs and confederations, as the primary value of the Club, should be placed on the health of athletes! This investment, in the short and long term, is one of the most promising in saving future costs in the athlete's total physical health, because the investment in health promotion saves real expenses on injuries of any kind. Individual Health Education is of utmost importance to learn about self-care and the information incorporated during childhood and adolescence about hygiene, nutrition and protection routine will influence the athlete's performance, the quality and duration of his career.

In 1998, the Brazilian Society of Sports Medicine, in official position<sup>4</sup>, highlights the importance of the relationship between physical activity and health for childhood and adolescence. At these ages, increased physical activity contributes to improving the lipid and metabolic profile and reducing the prevalence of obesity. They consider that physical activity is any

movement resulting from skeletal muscle contraction, which increases energy expenditure above rest and not necessarily sports. These habits of physical activity in childhood are reflected in the promotion of physical activity in adulthood and regardless of continuity yet reflect a decrease in obesity and cardiovascular disease in adulthood. Impact physical exercise in adolescence decreases osteoporosis, especially for postmenopausal women. The Society emphasizes that physical activity in childhood and adolescence should be encouraged as a matter of public health, that the practice mainly of physical activities in teams, should be conducted by professionals who work in these activities, with these age groups, prioritizing playful activities, more than the competitive ones. The objective of physical activity should be to train three important factors: aerobic, muscular strength and flexibility and should accompany the education of children and adolescents, such as training of competition, socialization, teamwork and experience of wins and losses, reduction of prevalence of sedentary lifestyle in adulthood, thus contributing to a better quality of life.<sup>6</sup> There are few clinical conditions that require the adoption of special recommendations for sports practice in children and adolescents and should be identified and quantified.

According to the Brazilian Society of Sports Medicine, 1998, they are: bronchial asthma, obesity and diabetes mellitus.<sup>4</sup> These systemic conditions deserve special attention, also in the dental office, because associated with focal infections, can lead to severe symptoms of severe repercussions, which can even result in death of the patient.

Concern about the growing rates of childhood obesity in Brazil also impacts the prevalence of obesity in adulthood and the severity of other associated diseases<sup>5</sup>. Overweight and obesity control in the first years of life act as health promotion, prevention of diabetes and hypertension in other age groups. Over the past four decades, the obesity rate among boys has jumped from 0.93% to 12.7%. Among girls, growth was lower but high: from 1.01% in 1975 to 9.37% last year, according to data compiled by the network of health scientists NCD Risk Factor Collaboration,<sup>6</sup> used in the survey. Currently, in Brazil, 712% of children between 5 and 9 years old are obese and 7% of adolescents between 12 and 18 years old.

Studying the hormonal and metabolic responses to exercise in children and adolescents, Boisseau &

Delamarche,<sup>8</sup> concluded that there is little literature on the subject, but there are studies showing that there are variations by age, linked to the practice of moderate to intense exercise. These responses in children and adolescents are also different from those in adults, and in children there is an immaturity of the prepubertal glycolytic response. Children are better adapted to aerobic exercise because their energy use seems to be more related to oxidative metabolism than in adults. Glycolytic activity increases with age and the relative proportion of fat use during prolonged exercise seems to be higher in children than in adults.

Therefore, children and adolescents who practice sports and athletes of sports bases should undergo initial screening consultations with health professionals, including an oral health professional. Because they are young individuals with deciduous or mixed permanent dentition, teeth erupting or erupted a few years ago, the recommended professional is the Pediatric Dentist. Pediatric Dentistry for athletes in training, or for grassroots teams, has a general view of oral health needs, from health promotion to interceptive and corrective treatments, functional facial and dental occlusion.

As protocol, at the initial consultation, for Base Athletes, the data of interest should be evaluated and recorded in a specific clinical form. For each sport that is provided, the anamnesis questions should be directed and noted in respect to the daily life lived by the athlete. A swimmer is not exposed to the risks of oral-trauma that may be at higher risk for a martial arts fighter such as boxing. Although within a club or any other sporting environment, dental consultation of underage athletes should always involve not only the presence of parents and / or guardians, but also the signing of the informed consent form, by law in Brazil, required and mandatory. The dentist should inform his patient in simple and popular language so that it is easy to understand which treatment is recommended; whether there are viable treatment alternatives; the benefits, risks and limitations that could be associated with these treatment choices and the consequences of nontreatment. The informed consent form (ICF) aims to strengthen and clarify the position of the patient, establishing the rights and duties of both parties-patient and professional. The writing of individual ICF, for each clinical case performed in the office, or health care clinics is mandatory by law, for the proper exercise of the profession. This contract between professional

and patient or guardian eliminates ethical and legal negligence between parts.

Currently, especially the virtual, technical-scientific dissemination, or not, requires the authorization of the minor's family to be presented in digital media, and not to characterize commercial advertising of the Dentist.

Certainly they should be noted in the clinical record, since the initial consultation,<sup>10</sup> in addition to the previous personal medical history in the anamnesis, the comparative evaluations of height and weight with the average of the tables for the age group should be searched; facial development, buccal-nasal functions, occlusion, condition of jaw-temporal joints, presence of facial or oral stomatological lesions, caries, presence of gingivitis or periodontal disease, quality of dental occlusion, changes in growth of nasomaxillary and jaw complex, presence of continuous mouth breathing or effort compensation, functional performance of lip-sealing, occlusion, swallowing and phonation, presence of oral habits, history of facial and / or oral-dental trauma and other isolated complications of oral health history, sleep quality, daily sleep hours and hours of Training.

Having performed this initial basic clinical examination, we will order, if necessary, complementary imaging exams, where panoramic radiographs are the most comprehensive and least expensive oral cavity exams. In the presence of caries lesions diagnosed and especially if the need for endodontic treatment is suspected, periapical radiographic images are required to know the extent of damage to the tooth structure of the affected tooth and the supporting bone structures of the element. This type of caries lesion, with intracanal involvement, is always the primary focus of systemic infection and should be controlled before the athlete enters more routine and intense training. Other examinations or indications for consultations with the medical area, more often, otolaryngologists or other perceived specialists may be indicated, or with speech therapists to correct functional deviations. Dental treatment should follow the conventional needs of primary foci elimination. Especially because they are athletes in training should be warned and also their guardians, that these primary oral injuries can feed systemic injuries. Rôças&colab., 2019,<sup>11</sup> addressing the concept of focal infection, described that bacterial cells, bacterial products and fragments, high

plasma concentrations of chemical mediators from chronic inflammation sustained by endodontic and periodontal infections in the mouth, can interfere with the evolution of other systemic diseases, their onset and / or progression, mainly cardio-vascular diseases. Therefore, teeth with an indication for extraction and teeth in need of endodontic treatment are considered to be the focus of infectious bone lesions, as they are the basis for the focus of systemic infections and are a priority for treatment, in any age group.

Freires&colab, 2017,<sup>12</sup> studying a *S. mutans* glycoprotein that promotes tissue adhesion, concluded that without doubt, this common microorganism of the oral cavity, has the ability to invade the intracellular space and to adhere to high-capacity human heart tissues. pathogenic, which alerts us about this care, especially for athletes.

For athletes from the Bases, it is indicated to operate the treatment of extractions and endodontics of deciduous teeth or of young permanent damaged teeth, always with antibiotic coverage to prevent systemic injuries.

At this beginning of treatment, the dental surgeon should teach and correct the ways in which plaque is eliminated from the mouth by demonstrating tooth brushing and flossing for each age group and needs as part of an educational phase within the dental plan. treatment. The indication of the brushing technique, the type of toothbrush, the fluoridated toothpaste, the need or not, the fluoridated mouthwash or the antibacterial, are prescriptions that must be made individually,<sup>13</sup> case by case, evaluated all the needs. Athlete's. The disclosure of bacterial plaque is necessary for the child or adolescent to be able to understand and visualize the bacterial plaque and to be able to rationally realize what we talk about bacterial plaque control when we talk periodically<sup>14</sup>.

Periodontal treatments such as coronary and dental root scraping should be done at this stage and the control of gingivitis and the maintenance of this plaque control established, following pre-established protocols for risk of developing periodontal problems, or periodontal risk (every 15 months, 15 days, once a month). Clinical research is still needed in this area to define risk protocol periods. Pasttore&colab, 2017,<sup>15</sup> elucidate that the role of the sports dentist in the multiprofessional team of a sports entity is mainly to provide athletes with any health promotion,

preventive or therapeutic intervention, where the transit of microorganisms can be minimized. other compartments of the body. They establish that the Athlete Bases Athlete Treatment Plan differs from other children and adolescents, as the perception of the Pediatric Dentist, at the bases and the Sport Dentist, in the professional teams, must be very objective regarding the control of focal infection. and the different characteristics of their daily lives: need for water balance, different dietary pattern, the continuous use of isotonic and energetic, the risk of immunosuppression, behavioral and emotional pressure for excellent sports performance, among others, as characteristics of the athlete's life. may have important consequences on the oral cavity. In this phase of infection control or, if necessary, surgical procedures, the administration of topical and systemic medications should be controlled and evaluated the phases of athlete's competition, so that there is no influence of the necessary treatments with evidence of positive dopping.<sup>15</sup> Within the most common substances in Dentistry, care should be taken to use local anesthetics, based on felipressin which, although considered in the anti-doping test, as an exception, has a half-life of 90 minutes and is contraindicated in association with paracetamol and the condition of the pregnancy.<sup>16</sup>

They establish that a of the fundamentals of Dentistry for Sport, should be in the Promotion of Oral Health, especially for the basic categories. The younger the individual, in the process of education and learning of mechanical control of plaque by tooth brushing and correct oral cavity hygiene, the fewer bacteria and microorganisms present in the oral microbiota. With this permanent educational action, we will be able to zero dental caries, periodontal disease and significantly minimize the number of muscle, joint, ligament and tendonitis injuries throughout the athlete's sports life. They consider that for the basic categories, the follow-up of a dentist, specialist in Pediatric Dentistry, would be essential.<sup>15</sup>

Unfortunately, many individuals have not learned to take care of themselves with personal hygiene and as a result, the mouth of the individual without proper, daily and careful cleaning becomes a storehouse of bacteria progressively in number and pathogenicity. Spolidorio&colab, 2010,<sup>17</sup> showed that these periodontal and / or periapical oral infections act as the primary source for the



development of many systemic diseases, including atherosclerosis. The authors cite three theories that would support this process: Studies suggest that chronic inflammation (cells and their biologically active byproducts) resulting from periodontal and periapical infection may alter circulatory homeostasis and result in a systemic chronic inflammatory state. This hypothesis is supported by several studies showing fibrinogen elevation (byproduct of triggering the coagulation system during the inflammatory process), inflammation and C-reactive protein (CRP) production, presence of amyloid type A protein, and von Willebrand factor in the circulation of patients with periodontal disease. The second biological mechanism suggested raises the hypothesis that in addition to all inflammatory cells originating at the site of injury, due to the presence of dental biofilm, platelets also play an important role. Initial platelet attraction to the vascular injury site is mediated by a membrane receptor expressed exclusively by megakaryocytes and platelets formed by a glycoprotein complex Ib / V / IX and also by glycoproteins expressed on its reactive surface. The third mechanism suggests that even being intermittent, systemic bacteremia could induce an increase in circulating leukocytes and consequently increase the production of biologically active products in addition to activating platelets and consequent platelet aggregation. Thus, bacteremia can occur in invasive and noninvasive dental procedures and also occur in daily actions such as chewing and tooth brushing.

The child's food menu should be learned to be healthy, with guidelines for pregnant women about the importance of exclusive breastfeeding until 6 months of life and continued until 2 years. Breastfeeding and playing during childhood are two pillars advised for the prevention of obesity and overweight in childhood. Studies suggest that by the age of 18, a young person today may have spent 3 years in front of a television screen, a mobile phone, or a tablet.<sup>18</sup> Currently the prevalence of childhood obesity is 15% from 5 to 9. years old, and 33% overweight in this age group! According to the Ministry of Health, this condition is associated with 26 chronic diseases, such as hypertension and type 2 diabetes.

The dental protocol established for athletes from Sports Bases, starts with self-care educational actions in oral hygiene, with technical actions for the elimination of primary sources of infection (recommended

extractions, endodontic treatments, sealing of open dental cavities and periodontal treatment for control of gingivitis). Once mouth infections are controlled, the restorative stage can and should be associated with orthodontic and / or orthopedic needs, especially the needs of maxillary disjunction, so that the required space rehabilitation and increased respiratory capacity are gained. The maintenance phase for any athlete, whether from sports bases or professional teams, must be continued! Individually, two to four times a year and every 15 days, in teams. This ongoing work to control oral bacterial plaque must be supervised by a dental surgeon and supported by oral health technicians throughout each year.

If the athlete is in good oral health condition from the beginning, the occlusion exam should be the objective, after the educational and health promotion steps. Whenever you notice deviations from the maxillomandibular facial structures, normal occlusion, or oral functions, orthodontic documentation should be requested for the diagnosis of malocclusion and the indication of orthopedists and / or orthodontists and medical specialists for early solution of associated dysfunctions. The Brazilian team of the 2000s had great players with severe malocclusions: Ronaldinho Gaúcho and Ronaldo, the Phenomenon!! If these Brazilian football idols had received in the grassroots categories, the necessary treatment for their severe malocclusions, which were evident on television for the world, perhaps their performance would have been more remarkable than what was registered! Certainly, facial structures, when early corrected for facial growth deviations, would result in better respiratory performance, increasing nasal permeability, with functional restoration that is not only restricted to chewing, swallowing and speech, but also benefiting the quality of sleep. Could it be that the number of injuries suffered by the Phenomenon would not have been minimized, if in the Basic categories, they had minimized the severe malocclusions they presented?! Imagine! .... Perceived in the clinical examination, mouth breathing interferes with the individual's general health, development, immunity and for the athlete is a factor that negatively interferes with their performance. Moreira & Lino, 1989,<sup>19</sup> researched in a group of children with asthma and who practiced sports for respiratory problems, that the dysfunction of the respiratory pattern altered the morphology of the dental arches, still in the deciduous dentition phase,

causing palatal deepening and atresia of the upper arch, in the intercanine region. Studying adolescents with chronic mouth breathing problems resulting from asthma in the mixed dentition phase, the same authors, in 1990,<sup>20</sup> conclude that maxillary expansion not only corrects the deepening of the palate, but also increases the transverse dimensions of the arches teeth, molars and canines, significantly improving nasal breathing capacity. The correlation between increased inter-canine distance was statistically correlated with improved respiratory flow. This flow showed significant improvements towards the standard, with statistical significance.

Therefore, should be part of the protocol of dental treatment for children who practice sports, especially the indication of orthopedic and / or orthodontic resources that increase breathing capacity, whenever indicated, improving sleep quality, physical and sports performance. The mouth breather loses the lip seal and with the mouth open, the tongue no longer naturally compresses the palate. This upper dental arch, resulting from chronic mouth breathing, presents maxillary narrowing and palatal deepening, resulting in a decrease in the length of the dental arch, often presenting crowding of medium to severe severity. Also, the maxillary deepening, presents a clinical aspect of "V" palatine arch, which consequently may cause narrowing of the nasal passages and narrows the airways impairing the nasal permeability. With mouth breathing, chewing, swallowing, phonation functions are compromised. For young individuals with normal functions promoting integral growth and development, the mouth breathing should be considered as a major detriment to the health of the child or adolescent. Mouth breathing must be diagnosed and should be treated promptly!<sup>19</sup> It affects quality of life, achievement, sleep quality, and cognitive, emotional, and physical development, and for the athlete it makes all the difference in performance! As we have seen, energy use in young individuals is directly related to oxidative metabolism<sup>6</sup>. Whenever functional changes are diagnosed, medical referral should be performed.

Li ZG & colab, 2011,<sup>21</sup> studying the effects of obstructive sleep syndrome that cause apnea and hypoapnea on the immune system, observed that sleep quality influences cytokine production, altering the inflammatory response pattern and increasing the residence time of these cells at the injured site. Cytokines are molecules,

polypeptides or glycoproteins produced by cells regulating cellular activities. Thus, the quality of sleep and night respiration may influence the time of cell repair of injured muscles.

Milewski & colab, 2014,<sup>22</sup> concluded that lack of sleep is associated with increased sports injuries in young athletes. The number of hours slept per night and school progression were the independent predictors that most pointed to injuries caused by sports practice. Athletes who slept less than 8 hours a day were 1.7 times more likely to be injured than those who slept more than 8 hours a day. For each additional year in grade school, athletes had the risk of 1.4 more injuries. According to Couter & colab, 2000,<sup>23</sup> resting or sleeping time, or hours slept, profoundly influences growth hormone production in young individuals. There is a 24-hour circadian rhythm regulated by the cerebral hypothalamus, which forms the biological cycle of living beings. Maintaining this circadian cycle influences sleep, sleep maintenance, sleep consolidation, and rapid eye movement (REM) sleep distribution, which is low-amplitude sleep of brain activity, maximum muscle relaxation, and occurrences of dreams. Sleep regulates proper endocrine function. This decreased development of central and peripheral disorders associated with glucocorticoid excess rest period may cause increased cortisol levels. Increased cortisol facilitates the such as memory deficit, insulin resistance, sleep fragmentation and progressively insomnia. In the long run, lack of adequate rest and sleep leads to changes in the HPA (hypothalamus-pituitary-axonal axis) system. The HPA axis effectively regulates the integration of physical and psycho-social systems, allowing for adaptation to the environment. Research justifies that training athletes, children and adolescents should be educated on the need for rest and daily sleep hours as well as training hours.<sup>24</sup> Children and adolescents should sleep an average of 10-13 hours / day, according to the US National Sleep Foundation, 2019.<sup>25</sup>

Not work in isolation the health of athletes! We should always be supported by working together with partners from other areas of health who work in the same sports and age groups that we work with. Murphy & colab., 2013,<sup>26</sup> report that clinical observations demonstrate that numerous factors may contribute to the progression of temporomandibular disorder (TMD) disorders and associated degenerative changes. These factors include independently or

interconnected: Trauma, Parafunctions, Occlusal Imbalances, Functional Overload, and Increased Joint Friction.

Weiler & colab, 2010,<sup>27</sup> however, did not observe a relationship between TMJ dysfunction in the various pubertal stages when evaluating adolescent athletes and non-athletes, despite the known influence of sex hormones acting on TMJ physiology. In sports that require strength and balance, (Athletics, Boxing, Taekondo), Occlusion in Centric is overloaded to achieve balance of body musculature, with maximum strength or even overload. Early correction of malocclusion in athletes, especially for those who perform occlusal force in sports, should reach a maximum number of centric occlusal balance points. The burden placed on occlusion in demanding Maximum Strength muscle exercises, as during many Athletics exercises, is an example of how the facial, cervical and occlusion muscles are required and that the years of training and competition involved in such a sport, Without proper protection provided by mouth guards, which relieve the occlusal load of the condyle head against the temporal bone articular fossa, they can bring chronic and even irreversible sequelae throughout the athlete's life. Weiler & colab, 2010,<sup>27</sup> also conclude that three important conditions that make adolescents disqualified for competitive sports practice are sickle cell anemia, high risk for cardiovascular manifestations in individuals with Marfan Syndrome, (hereditary disorder affecting connective tissue) and dysplasia. ventricle arrhythmia. As athletes generally begin their careers in childhood and adolescence, guardians, parents and coaches should be alerted!

Pereira & colab, 2006,<sup>28</sup> describe that bruxism is a parafunction characterized by non-functional teeth contact, which can occur consciously or unconsciously, manifesting by grinding or clenching. Bruxism is seen as a parasomnia, as are the habits of talking, walking, screaming and crying during sleep, nightmares and nocturnal enuresis. Patients should be instructed to perform "sleep hygiene", which consists of: respecting the right time to sleep and wake up (having a regular sleep schedule); have a sleep in which physical and mental rest occurs upon waking (quality is often more important than quantity); opting for no light and no noise environments (these CNS stimuli respond to involuntary muscle contraction throughout the body, making deep sleep difficult - stages 3 and 4 of non-REM sleep); avoid alcohol or stimulants before bed

(such substances may increase the electromyographic activity of the masticatory muscles); exercise every day and have an active life (this leads to a higher quality of deep sleep).

The development of occlusion of athletes in training should be monitored by the end of the establishment of permanent dentition: dental exchanges, first permanent molar bite braces, overbite and overjet, and exercise protection with mouthguards specifically designed for the athlete at different stages of development. The sport needs protection, especially for children and adolescents! For Mc Nutt & colab, 1989,<sup>29</sup> the increase in the occlusal bite plane with the mouthguard increases the space between the condyle and the glenoid cavity, located at the base of the skull, reducing the risk of concussion and cerebral hemorrhage. The American Association of Pediatric Dentistry<sup>30</sup>, 2013, recommends, in view of the high prevalence of oral-facial trauma related to sports practice in children and adolescents, a new educational policy for dentistry teachers and coaches and educators of young athletes, regarding the prevention of these accidents. They indicate the use of mouth guards and relate that the biggest difficulties are the lack of legal requirements, the cost of mouth guards, especially for younger athletes, where orthodontic treatments and frequent tooth changes occur and the resistance of young athletes to use these properly. individual protection features.

The new generations have new attitudes towards sports practices. Playing sports is an important part of the quality of life and an important time to live! Many young people have the goal of sports in their sporting life and to become outstanding athletes in their sports. Health practices aimed at these new generations must be in tune with these changes and their constant social adaptations. Families should be provided with information on how to conduct their children's sports practices and the choices they can make in this universe for each physical activity. Clubs and confederations must be clear that new therapies for muscle, joint and bone treatment will be available in the very near future, based on cell regeneration therapies and that for this reason, they should invest more and more in collecting for their athletes. most promising of the bases of the different sports modalities, cellular reserves derived from the pulp of the milk teeth, or even, of young third molars that remained included, for necessary therapies, in the

## Sports Pediatric Dentistry: for Grassroots Athletes

future professional career of these athletes. Dentistry for Sport, and more specifically, Pediatric Dentistry, should compose this universe of health promotion of young athletes. Even on the page of the Federal Council of Dentistry, at the launch of the new specialty, there was no comment on the performance of the dental surgeon focused on sports bases, within the scope of the Dentist for Sport!

Follow the development and eruption of the teeth until the definition of caries-free dentitions, with periodontal health and maximum functionality; To assess whether maxillomandibular development has built the foundation for facial development, which allows the skeletal and muscular bases for the fronto-nasal process and, consequently, provides full nasal breathing, with maxillary transverse dimensions, which favors respiratory function and other oral functions. -snaps with functional fullness in the transition to permanent dentition. This maintenance of oral and facial health, in the first years of life, will contribute to the full physical, functional and aesthetic development. For promising athlete the cellular reserve of milk tooth dental pulp should be practiced, since there are no doubt future research-certified advantages for the health promotion of the adult athlete in cases of muscle or other injuries.<sup>31</sup> Dental Pediatrics, such as Medical Pediatrics should be regularly attended by children and adolescents of sports bases.

### CONCLUSIONS

- 1-Pediatric Dentistry for children and adolescents who practice physical activities should be included as a primary health care need, with Health Promotion, Health Education, maintenance and necessary treatments within clubs and confederations, and sports entities. Specific public policies for this area of Sports Dentistry must be urgently established and pediatric dentists should be the professionals responsible for this activity!
- 2-The Pediatric Dentistry focused on Sport Dentistry, for children and adolescents practicing physical activities and especially athletes of sports bases, in the proposed treatment protocol, aims to: Caries Zero, maximum periodontal health and functional occlusion minimizing treatment costs of future professional generations!
- 3-During childhood and adolescence, orthopedic and orthodontic needs that promote the highest quality

of facial functions, such as full nasal breathing, effective chewing and swallowing, lip sealing, phonation, should participate in the treatment priorities for athletes of sports bases.

- 4-Risk groups should be monitored for sports by pediatric dentists from childhood: asthmatic, obese, diabetic and other systemic complications.
- 5-The use of mouth guards in sports needs to be widespread and practiced by sports organizations, as a health requirement for their athletes, especially for the sports age groups, in any sport practice.
- 6-Regenerative dentistry in sports teams should be conducted and evaluated within established protocols.
- 7- Research on protocols and performances in the area of Sport Dentistry, for children and adolescents should be built!

### BIBLIOGRAPHIC REFERENCES

- [1] Available in: [www.normaslegais.com.br/legislacao/Resolucao-cfo-160-2015.htm](http://www.normaslegais.com.br/legislacao/Resolucao-cfo-160-2015.htm)
- [2] Available at: <http://temas.folha.uol.com.br/bercos-olimpicos/introducao/quais-sao-os-cheiros-que-developos-atletas-olimpicos-dobras.shtml>; 03/03/2016.
- [3] Available at: <https://www.lance.com.br/futebol-nacional/taca-das-favelas-sao-paulo-2019-comeca-neste-sabado-com-oito-games.html>).
- [4] Lazzoli, J.K .; Nobrega, A.C.L .; Carvalho, T .; Oliveira, M.A.B .; Teixeira, J.A.C .; Piglet, M.B. Milk, N .; Meyer, F .; Drummond, F.A .; Pessoa, M.S.V .; Rezende, L .; De Rose, E.H.; Barbosa, S.T .; Magni, J.R.T .; Nahas, R.M .; Michels, G .; Matsudo, V .; Physical Activity and Health in Childhood and Adolescence - Brazilian Society of Sports Medicine-Official Positioning; Vol. 4, No. 4, 107-9; Jul / Aug, 1998.
- [5] Available at: <https://www.terra.com.br/noticias/dino/se-nada-mudar-o-brasil-tera-113-milhoes-de-children-obesas-ate-025,d1672884ce4d7e8a6f2dc66066065ff263cgj4dm.html> 08/06/2018.
- [6] Available at: <https://www.diabetes.org.br/profissional/noticia/noticias-em-destaque/6017-sbd-participa-do-ii-encontro-regional-para-enfrentamento-da-obesidade-infantil> .



- [7] Available at: <http://www.saude.gov.br/noticias/agencia-saude/45612-brasileiros-atingem-maior-indice-de-obesidade-nos-ultimos-treze-anos>.
- [8] Boisseau, N .; Delamarche, P .; Metabolic and Hormonal Responses to Exercise in Children and Adolescents; *Sports medicine*; 30 (6): 405-22; December 2000.
- [9] Sales-Peres, S.H.C .; Sales-Peres, A.; Eleutério, A.S.L.; Oliveira, J.L.G .; Gigliotti, M.P .. Free and informed consent to users of Brazilian dental clinics: ethical and legal aspects. *Public Health Science* [online]. 2011, vol.16, suppl.1, pp.805-812. ISSN 1413-8123. <http://dx.doi.org/10.1590/S1413-81232011000700011>.
- [10] Braga, M.B .; Mattos-Silveira, J .; Ferreira, F.R; Almeida, M.C.J.; Correa, F.N.P .; Correa, M.S.N.P.; Diagnosis and Treatment Plan in Pediatric Dentistry, in Côrrea, M.S.N.P, *Pediatric Dentistry in Early Childhood: A Multidisciplinary View*, 379 - 413 p., 4 ed., São Paulo, Quintessence Publishing, Brazil, 2017.
- [11] Rôças,I.N.; Campello,A.F.; Loyola,S.C.; Siqueira Jr;J.F.;Endodontic infections and cardiovascular diseases. *Rev Assoc.Paul.Cir. Dent.*;73 ( 4) : 294-301; 2019.
- [12] Freires, A.A., Reyes, A.A .; Todd Kitten, P. J .; Haidaris, S .; Swartz, M .; Knight, P.A .; Rosalen,, P.L .; Lemos, JA; Abranches, J.; Heterologous expression of *Streptococcus mutans*Cnm in *Lactococcus lactis* promotes intracellular invasion, adhesion to human cardiac tissues and virulence, *Virulence*, 8: 1, 18-29, DOI: 0.1080 / 21505594.2016.1195538., 2017 .
- [13] Vilhena, R.S .; Cury, J.A .; Correa, M.S.N.P; Rational use of fluorides in pediatric dentistry in early childhood: a multi-disciplinary view, 447-482.4 ed., São Paulo, Quintessence Publishing, Brazil, 2017.
- [14] Ardenghi, TM; Ortiz, FR; Lenzi, TL; Braga, MM; Correa, MSNP; Mechanical Control of Dental Biofilm; in Correa, MSNP, *Early Childhood Dentistry: A Multidisciplinary View*, 253-71p., 4 ed., Sao Paulo, Quintessence Publishing, Brazil, 2017.
- [15] Pastore, G.U .; Moreira, M .; Bastos, R; Galotti, M; Leonardi, M.F.P .; Sport Dentistry-aninnovativeproposal; *RevBrasMed Esporte* - Vol. 23, No 2 - Mar / Apr, 2017.
- [16] *International Journal of Sport Policy and Politics*; Volume 11, 2019 - Issue 2: The World Anti-Doping Agency at 20: Progress and Challenges.
- [17] Spolidorio, D.M.P.; Estrela, C.; Bedran, T.B.L .; Nogueira, M.N.M., Coimbra, Spolidorio, L.S.L; Microbial Invasion: Focal Infection and the Relationship with Atherosclerosis, *Rev Odontol Bras Central*; 18 (48): 10-14; 2010
- [18] Available at <https://saude.abril.com.br/alimentacao/o-perigo-da-obesidade-infantil/18/07/2019>.
- [19] Moreira M, by Paiva Lino A. Evaluation of palatal depth and width in mouth breathers with primary dentition. *Int J Orofacial Myology*. 1989; 15 (1): 19-24.
- [20] Moreira M, Lino AP. Spirometric and dimensional evaluation of the upper dental arch, of the changes caused by maxillary expansion, in the mouth breathing individuals, in the mixed dentition phase [thesis]. Sao Paulo: Faculty of Dentistry, University of Sao Paulo; 1993
- [21] Li ZG, Li TP, Ye H, Feng Y, Li DQ. Immune function changes in patients with obstructive sleep apnea hypopnea syndrome. *J Southern Med Uni*. 2011; 31 (6): 1003-1005.
- [22] Milewski MD, Skaggs DL, Bishop GA, Pace JL, Ibrahim DA, Wren TA., Barzdukas A. Chronic lack of sleep is associated with increased sports injuries in adolescent athletes. *J. Pediatr. Orthop*. 2014; 34 (2): 129-33.
- [23] Cauter, EV; Leproult, R .; Plat; L .; Age-related changes in slow wave sleep and REM sleep and relationship with growth hormone and cortisol levels in healthy men. *JAMA*; 2000; 284 (7): 861-8.
- [24] Available at: <https://www.sleepfoundation.org/sleep-topics/children-teens-sleep>; 2019.
- [25] Available at: <https://extraglobo.com/noticias/saude-ciencia/saiba-quantas-horas-voce-deveria-dormir-por-dia-de-ordo-com-ua-22495155.html>; 2019.
- [26] Murphy, M.K.; MacBarb, R.F; M. E. Wong; M.; Athanasiou, K.A .; Temporomandibular

- Joint Disorders: A Review of Etiology, Clinical Management, and Tissue Engineering Strategies; *Int J Oral Maxillofac Implants*. 2013; 28 (6): e393 – e414.
- [27] Weiler, R.M.E., Freire, Vitale, M.S.S., SchoenFerreira, T.H., S.C. Rodrigues, A.M., Vertematti, S.; Marcia Lika Yamamura, M.L.; Isa de Padua Cintra Sampaio, I.P.C.; The Adolescent Medicine Sector (Adolescent Care and Support Center - CAAA) of the Federal University of São Paulo: a multiprofessional and interdisciplinary experience - the commitment to adolescence. *Teens Health, Rio de Janeiro*, v. 7, no. 4, p. 13-20, Oct / Dec 2010.
- [28] Pereira, RPA; Negreiros, WA; Scarparo, HC; Pigozzo, MN; Consani, RLX; Mosque, MF; BRUSSELS AND QUALITY OF LIFE; *Odonto Ciência Magazine - Fac. Odonto / PUCRS*, v. 21, no. 52, apr./jun. 2006
- [29] McNutt T, Shannon SW Jr, Wright JT, Feinstein RA; Oral trauma in adolescent athletes: a study of mouth protectors. *Pediatr Dent.*, Sep; 11 (3): 209-13.1989.
- [30] American Academy of Pediatric Dentistry. Policy on prevention of sports-related orofacial injuries. Review Council; ORAL HEALTH POLICIES REFERENCE MANUAL; V 39 / NO 6 17/18; 2013. [http://www.aapd.org/media/Policies\\_Guidelines/P\\_Sports.pdf](http://www.aapd.org/media/Policies_Guidelines/P_Sports.pdf).
- [31] Available: <http://cfo.org.br/website/%E2%80%99Codontologia-do-esporte%E2%80%9D-agona-e-especialidade/>, 2019.

**Citation:** Márcia Moreira, Giuseppe Umberto Pastore, et al. *Sports Pediatric Dentistry: for Grassroots Athletes*. *Archives of Physical Health and Sports Medicine*. 2020; 3(2): 14-23.

**Copyright:** © 2020 Márcia Moreira, Giuseppe Umberto Pastore, et al. This is an open access article distributed under the Creative Commons Attribution License, which permits unrestricted use, distribution, and reproduction in any medium, provided the original work is properly cited.