

# PERIO FOCUS GREEN PAPER

## FOR STAKEHOLDER CONSULTATION

### Impact of the Global Burden of Periodontal Disease on Oral Health, Wellbeing and Nutrition of Mankind

A Global Call for Action in the Context of the Milan World Exhibition 2015:  
Feeding the Planet, Energy for Life

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#### Introduction

1 Periodontal (gum) disease including gingivitis and periodontitis is probably the most  
common disease of mankind (Guinness World Records, 2001). This complex disease  
is attributed to a plaque-induced, destructive host response linked to genetic,  
5 environmental and host risk factors (Kornman 2008). Severe periodontitis affects  
5-20% of adult populations and remains a major global oral health burden (Jin et al  
2011; Petersen & Ogawa 2012). In the United States, periodontal disease impacts  
nearly half of adults age thirty and older (Eke et al 2015). Additionally, research  
points to an increase in periodontitis prevalence and severity in other  
industrialized countries such as Germany and the UK.

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10 Recent reports from the WHO oral health databank indicate that severe  
periodontitis is the 6<sup>th</sup> most prevalent disease worldwide (Marcenes et al 2013;  
Kassebaum et al 2014), with 750 million people affected. These individuals are at  
risk of tooth loss, edentulism and masticatory dysfunction, thereby affecting their  
nutrition, quality of life, and self-esteem; as well as imposing huge socio-economic  
15 and healthcare costs (Chapple 2014; Chapple et al 2015).

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Periodontitis incidence is highest in older adults (age 30 and older), and current  
research in industrialized countries indicates that lack of access to oral care  
services in early adulthood is as a key element in disease development. Access to

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professional preventive and diagnostic services and proper care during these key years contributes to better outcomes and healthy aging.

Heart disease, diabetes, cancer and chronic respiratory disease cause around 60% of human deaths (Ezzati & Riboli 2012). Oral diseases including periodontitis share social determinants and common risk factors with these life-threatening diseases (Sheiham & Watt 2000; United Nations 2011; Jin 2013; FDI 2013a,b), such as tobacco consumption, poor nutrition (both in terms of caloric intake and quality of the nutritional components), obesity and physical inactivity.

While it is well recognized that genetic susceptibility is associated with periodontitis severity, microbial biofilms that accumulate on teeth are the key. As such, inadequate self-performed oral hygiene procedures, such as tooth brushing and use of interdental cleaning aids, significantly account for the disease initiation and progression. These biofilms, if not well controlled, interact with the unique susceptibility profile of each individual and may become dysbiotic, initiating and sustaining the disease process characterized by the inflammatory destruction of the tooth-supporting apparatus and alveolar bone. The key clinical signs of periodontal disease at the early stages are gingival bleeding, recession of the gingival margin, and halitosis. Measurable changes in oral health-related quality of life are present.

Once a considerable amount of the periodontal attachment has been destroyed by periodontitis, the disease is complicated by an array of sign and symptoms that further impact on the quality of life of the affected individuals. These include tooth migration and drifting, tooth hyper-mobility, tooth loss, and ultimately increasing levels of masticatory dysfunction. Masticatory dysfunction, as the terminal stage of periodontitis, compromises nutrition and general health. However, the early stages of periodontal disease are often symptomless, and a number of periodontal patients do not seek for professional care. The 'silent' nature of the disease, combined with low awareness of periodontal health, lead to many patients seeking 'symptom-driven' care for advanced disease through periodontal therapy when available and affordable (Jin 2015).

Considerable evidence also points to the fact that the effects of periodontitis go beyond the oral cavity and that the body is affected by the haematogenous dissemination of both bacteria and/or bacterial products originating in the oral biofilm and inflammatory mediators originating in the inflamed periodontium.

Through these mechanisms periodontitis interacts with various systemic diseases, notably diabetes, atherosclerosis, rheumatoid arthritis and pulmonary infections (Tonetti & Kornman 2013).

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Periodontitis can be prevented, easily diagnosed, and successfully treated and controlled following appropriate professional care and long-term maintenance. Currently, various cultural and socio-economic barriers to professional care prevent some patients from applying correct preventive approaches, receiving early diagnosis and seeking treatment, resulting in limited progress in improving periodontal health. This document aims at drawing the global attention of oral healthcare professionals, medical practitioners, educators, health officials, payers and the public to opportunities to improve periodontal care. In this document, it is recognized that different countries are at different levels with respect to periodontal health literacy. However, even in the most advanced countries, considerable segments of the population continue to present high burdens of disease and have difficulty in accessing health information and professional services.

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### Opportunity 1 - Prevention

Prevention is the key for oral health (Editorial. *Lancet* 2009)! Periodontitis is preventable through effective management of gingivitis and promotion of healthy lifestyles at both population and individual levels. This can be accomplished through instruction of self-performed oral hygiene such as tooth brushing and interdental cleaning, and in health education. A critical element is that prevention needs to be tailored to the individual needs through diagnosis and risk-profiling.

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Conclusions of the recent European Workshop of Periodontology on primary and secondary prevention of periodontal and peri-implant diseases have helped to identify potential large-scale preventive programs and highlighted specific actions that may reduce the worldwide prevalence of periodontal disease (Tonetti et al. 2015a).

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- Gingival bleeding is a leading risk factor for the onset and progression of periodontitis and the first sign of disease. Public health campaigns, professional information and oral health care products labeling should highlight this and encourage the care of a professional whenever gingival bleeding is present and persists.

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| 85          | <ul style="list-style-type: none"> <li>• Patient motivation paired with detailed instruction on the use of mechanical plaque control aids, such a tooth brushing, inderdental cleaning and oral rinses, are key in management of gingivitis and prevention of periodontitis.</li> </ul>  | 12               |
| 90          | <ul style="list-style-type: none"> <li>• An appropriate periodontal diagnosis including an assessment of patient-level factors (risk factors and attitudes) should determine the most appropriate professional preventive care and the need for treatment.</li> </ul>  | 13               |
|             | <ul style="list-style-type: none"> <li>• There is still a need for universal implementation of periodontal screening by the oral health care team.</li> </ul>  | 14               |
| 95          | <ul style="list-style-type: none"> <li>• Professional mechanical plaque removal is important, but cannot serve as the sole element of professional preventive care. Education and behavior change are fundamental to sustained improvements in periodontal health status.</li> </ul>   | 15               |
| 100         | <ul style="list-style-type: none"> <li>• Professional preventive care alone is inappropriate in subjects with a clinical diagnosis of periodontitis or peri-implantitis, as they require treatment for their condition first.</li> </ul>   | 16               |
|             | <ul style="list-style-type: none"> <li>• The public should be aware that self-medication with effective chemical plaque control agents may mask more serious underlying periodontal disease and should seek professional advice following periodontal examination.</li> </ul>  | 17               |
| 105         | <ul style="list-style-type: none"> <li>• Long-term success of periodontal therapy requires participation in a secondary prevention program specifically designed to meet the needs of these individuals at higher risk of disease recurrence.</li> </ul>   | 18               |
|             | <ul style="list-style-type: none"> <li>• For optimal long-term tooth retention, patients participating in secondary prevention programs require completion of an active phase of periodontal therapy that achieves individually set treatment goals.</li> </ul>  | 19               |
| 110         | <p>More information is reported in the consensus statements of the four workshop working groups (Chapple et al. 2015; Jepsen et al. 2015; Sanz et al. 2015; Tonetti et al. 2015b).</p>   | 20               |
| 115         | <p>As risk factors for common oral diseases like periodontitis are shared with those of other major chronic inflammatory diseases such as heart disease and diabetes, the WHO Common Risk Factor Approach (CRFA) to improving human health should incorporate self-performed oral hygiene as one of the positive lifestyles.</p> | 21               |

## Opportunity 2 - Diagnosis

Periodontitis is easily diagnosed via a full-mouth comprehensive periodontal evaluation. Periodontal probing should be a key component of every dental visit. Professional periodontal screening approaches that are both sensitive and inexpensive have been introduced in several countries more than a quarter of a century ago. Their routine adoption by all oral healthcare professionals has been an elusive objective and the burden of undiagnosed disease remains high. Furthermore, diagnosis is frequently delayed until symptoms of advance periodontal breakdown emerge. Missed or delayed diagnosis results in very significant increases in both the burden and the cost of disease management, and in many industrialized countries it represents the leading cause of professional litigation. Professional organizations around the world recognize the value of a three-step approach to diagnosis:

1. Patient self-detection of symptoms and signs of disease to promote awareness and seek professional examination.
2. Professional periodontal screening to segment the population into periodontal health, gingivitis (and plan preventive care for these conditions) and periodontitis.
3. Comprehensive periodontal examination and diagnosis to plan appropriate treatment of periodontitis.

Early diagnosis followed by appropriate treatment and secondary prevention has the potential to improve quality of life, preserve masticatory function, and decrease the lifelong financial burden associated with caring for periodontitis.

Periodontal diagnosis should include an assessment of risk factors for periodontitis. As several systemic conditions interact with periodontitis or its treatment, their screening is part of a standard periodontal examination. Since the adult population of advanced countries is more likely to see an oral healthcare professional than a medical practitioner, screening for and monitoring of the conditions like obesity, diabetes and hypertension in the dental setting may contribute to detection of undiagnosed medical conditions (Lalla et al. 2011). This reshaped and expanded role of oral healthcare professionals would contribute to improve patients' oral and general health while enhancing their roles in the health workforce team (Glick et al 2012).

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| It may be useful to stage the extent and severity of periodontitis and the presence of loss of masticatory function in a given subject, as treatment needs are likely to be different.   | 26               |
| 155 Stage 1: Mild to moderate Periodontitis. Refers to a condition characterized by gingival inflammation and a degree of destruction of the periodontal attachment compatible with function.  | 27               |
| 160 Stage 2: Severe Periodontitis. Refers to a condition characterized by gingival inflammation and advanced destruction of the periodontal attachment, presence of vertical defects and/or furcation involvement. Function may still be preserved but the risk of disease progression leading to tooth loss is high.  | 28               |
| 165 Stage 3: Severe periodontitis complicated by masticatory dysfunction. Refers to a condition characterized by gingival inflammation, advanced destruction of the periodontal attachment, presence of vertical defects and/or furcation involvement and loss of masticatory function consequent to tooth hypermobility and/or presence of tooth loss consequent to periodontitis.  | 29               |
| <b>Opportunity 3 - Treatment of Periodontitis</b>  |                  |
| Periodontal treatment aims to control periodontitis, avoid its progression leading to tooth loss, retain a functional dentition for a lifetime preserve self esteem and improve quality of life.   | 30               |
| 170 Overwhelming evidence indicates that periodontitis can be treated and effectively managed in the majority of subjects. Long-term studies report that, after periodontal therapy, tooth loss rates averaging 0.1 tooth/patient/year are observed in subjects participating in professional secondary prevention programs in specialist-type practice. These rates are generally compatible with the preservation of the dentition for a lifetime in the majority of subjects. A systematic review reporting tooth survival up to 22 years after periodontal therapy in a specialist type practice indicated that tooth loss due to periodontal reasons ranged 1.5% - 9.8% and that 36 to 89% of treated subjects did not experience tooth loss (Chambrone et al. 2010). Higher rates of tooth loss were observed among older individuals and smokers. | 31               |
| 180 Delivery of appropriate periodontal care to the individual patient requires a full diagnostic and prognostic assessment of the case and access to effective treatments able to control inflammation and avoid tooth loss. Most periodontal treatments require delivery by a highly skilled, and sometime highly specialized,   | 32               |

185 oral health care professional. Access to such professionals remains a challenge in  
most health systems.

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Scientific evidence indicates that periodontal treatment consisting of a series of sequential phases of care is effective and that effectiveness is related also to the skill level and experience of the oral health professional. These phases are:

190 Phase 1. Control of risk factors and promotion of healthy lifestyles including  
adequate self-performed oral hygiene combined with control of periodontal  
inflammation via professional biofilm removal in the supra- and sub-gingival  
environment. This is required for all subjects with a diagnosis of periodontitis. Its  
effectiveness for the individual patient needs to be assessed and lead to  
195 appropriate levels of residual dental plaque, gingival inflammation and residual  
periodontal pockets. It may be the only phase of treatment necessary for stage 1  
periodontitis.

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Phase 2. Subjects who respond well to the first phase of treatment but present  
with persistent periodontal pockets may benefit from surgical correction of the  
anatomical lesions caused by the disease process in order to regain periodontal  
200 health, enable adequate self-performed oral hygiene and minimize the risk of  
recurrence. It is frequently needed for the management of stage 2 and stage 3  
periodontitis.

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Phase 3. Once periodontal health has been achieved, rehabilitation of the chewing  
function and/or esthetics may be indicated in the more advanced cases that have  
experienced tooth loss, masticatory dysfunction, tooth migration or compromise of  
esthetics. It is frequently needed for the management of stage 3 periodontitis.

205 Phase 4. Participation in a professional secondary preventive care program tailored  
for the periodontitis patient who is at higher risk of recurrence and thus requires  
more stringent monitoring and a higher level of care. This is necessary for long-  
term preservation of the dentition after completion of active periodontal therapy  
210 (phase 1 - 3) of all periodontitis patients.

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Classical studies with 30-year follow-up indicate that optimal results are obtained  
with specialist care followed by participation in secondary prevention programs in  
specialist clinics. Failure to deliver structured secondary prevention care in a  
specialist clinic leads to higher rates of recurrence of periodontitis and tooth loss.  
215 (Axellson and Lindhe).

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Around the world periodontal care is being provided in a variety of health systems  
and, given the global burden of disease, it requires the active engagement of a

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highly skilled and motivated oral health professional team. As the complexity of treatment increases with disease progression (stage 1- 3 periodontitis), it is important to plan appropriate primary and secondary care.

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In countries with structured dental services, primary care is provided in general dental offices while secondary care is delivered in more specialized centers, usually under the guidance of a specialist. In some countries, tertiary care facilities at academic centers may provide support for the management of unusual and challenging forms of disease.

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The remit of primary care facilities comprises periodontal health information, health promotion, instruction in self performed oral hygiene and preventive care for the general population (unaffected individuals), diagnosis and monitoring to ensure early detection of periodontitis, effective management of mild and moderate forms of disease (stage 1 periodontitis), early recognition of subjects responding poorly or incompletely to standard treatment in the primary care setting and consideration of referral to a secondary care facility. Access to secondary care is best performed by referral from a primary care facility but patient self-referral is a possibility.

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The remit of specialized centers includes the management of more advanced (stage 2 or 3 periodontitis) or non-responding forms of periodontitis as well as periodontitis in patients with complex co-morbidities. In many countries periodontitis management in secondary care facilities is provided under the guidance of a periodontist or periodontologist - a trained specialist.

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At these centers patients are given comprehensive advice on the full spectrum of treatment options available for the management of their periodontitis and should be able to receive the most appropriate form of treatment including control of advanced periodontitis (stage 2 periodontitis), access flap, osseous resective or regenerative periodontal surgery to manage deep residual pockets, management of ridge deformities consequent to tooth loss, rehabilitation of masticatory dysfunction with dental implants (stage 3 periodontitis), management of esthetic concerns with periodontal plastic surgery and, most importantly, the necessary highly specialized secondary preventive care tailored for high-risk individuals.

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Technological advances over the last decades have considerably improved the applicability and the predictability of these procedures and advanced periodontal

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| 250 | therapy is based on the largest body of scientific evidence in dentistry (EFP and AAP workshop references). Since the science supporting periodontal treatment is strong specific actions should address at the national level the following priorities to improve access to the available care:   | 42 |
| 255 | 1. Improve public awareness about the early signs of periodontitis and the need for professional diagnosis to differentiate gingivitis and periodontitis.  | 43 |
|     | 2. Improve access to care informing patients that periodontitis can be effectively managed and that management is more cost-effective in the early stages of the disease.  | 44 |
| 260 | 3. Improve public and professional awareness regarding the standard of care of periodontitis in its different stages of severity.  | 45 |
|     | 4. Improve access to evidence based treatment by addressing the wrong perception that periodontitis can be effectively managed by self-care or self-medication with mouthrinses, dentifrices, herbal or homeopathic remedies, or with professional tooth cleaning alone.   | 46 |
| 265 | 5. Improve public and professional awareness regarding the improvement in oral health related quality of life associated with treatment of periodontitis.  | 47 |
|     | 6. Improve public and professional awareness related to the possibility of individualized case prognosis based on the specific patient profile, stage of disease   | 48 |
| 270 | 7. Improve public and professional awareness of the consequences of incomplete periodontal treatment when it is indicated: higher risk of periodontitis progression and tooth loss in the presence of incomplete outcomes from phase 1 periodontal treatment as evidenced by persistence of periodontal inflammation (bleeding on problem), deep periodontal pockets, furcation involvement. | 49 |
| 275 | 8. Improve public and professional awareness of the inadequacy of limiting treatment of periodontitis to the delivery of preventive professional care alone.   | 50 |
| 280 | 9. Improve public and professional awareness of the role of dental implants as a part of the rehabilitation of masticatory dysfunction consequent to stage 3 periodontitis and not as a method for the treatment of periodontitis.   | 51 |
|     | 10. Improve public and professional awareness about the need to complete treatment of periodontitis before proceeding with tooth replacement with tooth or implant supported restorations.   |    |
| 285 | 11. Improve public and professional awareness of the advances that periodontal treatment has made in the last decades and that consequently  | 52 |

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| 290         | periodontal prognosis has changed and that teeth with advanced disease may be saved, e.g. with the application of regenerative periodontal therapy.  | 52               |
| 295         | 12. Improve public and professional awareness of the interdependence of periodontal health and general health and contribute to specific actions to address common risk factors - such as smoking, nutrition, sedentary lifestyles, overweight/obesity - for both periodontitis and other chronic diseases.  | 53               |
|             | 13. Improve public and professional awareness of the potential savings to dental care associated with the delivery of appropriate periodontal care.  | 54               |
| 300         | 14. Improve public and professional awareness of the potential savings to medical care associated with the delivery of appropriate periodontal care in specific groups like diabetics.   |                  |
|             | Clarifications of the above, along with the availability of the necessary resources, may improve access to care and contribute to the management of the current burden of disease.   | 55               |
| 305         | <b>Conclusions</b>   |                  |
| 310         | Periodontology is supported by a strong and coherent body of evidence that allows identification of appropriate preventive, diagnostic and therapeutic strategies to manage the enormous burden of disease represented by periodontitis, its health, wellbeing, social and economic consequences. This paper summarized reasonable actions whose implementation requires consideration of the specific national scenarios in terms of resources and health system model. | 56               |

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