EluMed
YOUR MEDICO-DENTAL INFORMATION SUPPLEMENT
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Periodontology

Editorial

Dear colleagues,

Our role, in the French society's public health domain, is to preserve, care for and prolong our patients' periodontal health. This falls under the first duty of health professionals: keeping the French population in overall good health for a better quality of life in the long term.

EluMed has allowed us space in this supplement to bring you up to speed with the latest scientific progress made in periodontology and implantology, as well as the implications these disciplines have on general health.

We are very mindful in providing a continuous stream of the most up-to-date information on periodontology and implantology. We believe that this is key in enabling you, dear colleagues, to communicate this information and in establishing true awareness and therapeutic education for patients, and also for non-dentist health professionals.

Periodontally yours,

Prof. Virginie Monnet-Corti
President of the French Society of Periodontology and Oral Implantology

Dear Colleagues,

It is indeed a privilege for me to have the opportunity to address you through this editorial of the current issue of EluMed that is dedicated to the link between periodontal disease and general health.

It was only two years ago that the EFP (European Federation of Periodontology) and the AAP (American Academy of Periodontology) jointly gathered in an important workshop in Spain, to examine growing evidence observed over the last 3 decades of how periodontal diseases are linked to these systemic conditions. As it is apparent from the summary of the evidence greatly presented in the following pages by the leadership of SFPIO, that today there is a strong scientific basis underlying these associations, this compels us to further investigate & clarify how these links interact, when and why.

Dear colleagues, it is true that this knowledge creates more responsibility for us, and as dentists we have a bigger role to play in people's health, a role well beyond saving teeth. Our future in the EFP is putting oral health at the heart of patient's wellbeing and quality of life, or if you like, 'putting the mouth at the center of the body'.

It is with this in mind that I would like to ask for your help in relaying the importance of periodontal care to society by joining us in signing the EFP Manifesto, an international call to action in terms of prevention, early detection and treatment of periodontitis. The Manifesto emphasizes that the dental/periodontal practitioner brings benefits to individuals and society, not only at periodontal level but at a general health level as well. To achieve this goal, we need to bring relevant scientific knowledge forward and that is precisely what the role of a magazine, such as 'EluMed' will enable us to do.

Pro f. Phoebus Madianos
EFP immediate past President.

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SFPIO

Periodontitis and systemic diseases:
a record of discussions of working group 4 of the Joint EFP/AAP Workshop on Periodontitis and Systemic Diseases.

This working group included experts from the European Federation of Periodontology and the American Academy of Periodontology. It aims at analysing the data available on **any existing links between periodontal disease and various diseases / systemic manifestations,** such as chronic obstructive bronchopneumopathy (COBP), pneumonia, chronic renal insufficiency (CRI), rheumatoid polyarthritis (RP), cognitive deficit, obesity, metabolic syndrome and cancer. There is certainly increasing evidence of connections between these conditions and periodontal disease, but the conclusions of this report point towards more discussion and recommendations for future studies, to allow us to broaden our knowledge of this subject, as opposed to a standard consensus report.

PERIODONTAL DISEASE AND SYSTEMIC DISEASE

In the majority of cases, the studies conducted are transversal or case-control studies and rarely prospective cohort studies. The working group also noted the absence of interventional studies or randomized clinical trials on this subject.

1 WHICH BIOLOGICAL MECHANISMS ARE INVOLVED?

• Infections and pro-inflammatory events triggered by periodontal disease can develop into systemic diseases and disorders. **No cause-and-effect** relationship can yet be established, with the exception of the role of **oral microbiome organisms in pulmonary infections.**

• Like periodontal diseases, other infections can cause infectious and pro-inflammatory stimuli that can have a chronic systemic impact. As a consequence, the pathogenic load accumulated over time does not allow for the precise identification of the role periodontal infections play in systemic disorders.

2 WHICH SYSTEMIC DISEASES / MANIFESTATIONS WERE STUDIED?

A. CHRONIC OBSTRUCTIVE BRONCHOPNEUMOPATHY (COBP)

• **Smoking**, combined with underlying inflammation, is the main etiological factor. However, it is linked to periodontitis, in the form of a **dose-effect relationship** (the more severe the periodontal disease, the more aggravated the deterioration in pulmonary function).

Inflammatory status is modified:

- by inhalation of the micro-organisms found in dental plaque of patients with periodontitis

- and/or by dissemination from the periodontal pockets, via the bloodstream, of inflammation mediators and dental plaque micro-organisms.

B. PNEUMONIA

• The link between dental plaque and pneumonia appears faint.

According to several meta-analyses, **better oral hygiene would reduce the risk of pneumonia** associated with health risks, even if the link with periodontitis has not been established.

C. CHRONIC RENAL INSUFFICIENCY (CRI)

• Even if hypertension and diabetes form its primary etiological factors, **periodontitis aggravates**, clinical signs by acting on these two factors. Several studies highlight, using statistically significant evidence, a link between periodontal diseases and CRI. Studies evaluating the effect of periodontal treatments on the evolution of CRI are needed.

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D. RHEUMATOID POLYARTHRITIS (RP)

• It has been proven in animals that the **Porphyromonas gingivalis** can trigger and aggravate rheumatoid polyarthritis.

In humans with RP, antibodies targeting citrullinated proteins are frequently found in the blood. This marks the enzyme conversion of citrullinated arginine in some proteins.

The plausibility of the biological link between RP and periodontitis involves detecting the citrullinated proteins in the inflamed gum, which could be linked to an elevated level of antibodies targeting self-antigens.

E. COGNITIVE DEFICIT

• Data in literature reveal the heterogeneity of the definitions used to classify periodontitis and cases of cognitive deficit. Few studies establish the plausibility of the underlying biological link.

F. OBESITY

• Numerous clinical studies have been conducted on obesity and periodontitis, and some of them show a link between the two conditions.

More precisely, **although obesity poses a threat to periodontitis, there is little data to support the theory that periodontal disease can affect obesity.**

G. METABOLIC SYNDROME

• This syndrome is the combination of five clinical signs: abdominal obesity, hypertriglyceridemia, drop in HDL cholesterol level, hypertension and hyperglycemia. The combination of obesity and at least two other signs of metabolic syndrome means that the patient meets the diagnosis criteria. Links between periodontitis and one or two of these clinical signs have been reported, with no connection made to metabolic syndrome.

H. CANCER

• Some studies seem to indicate a link between **periodontitis and oropharyngeal cancer.** Although some micro-organisms in the oral cavity can alter cells and tissues, calling to mind the specificities of malignant transformations, these links must be confirmed by epidemiologically reliable clinical studies.

Points to remember...

- Systemic diseases/manifestations such as chronic obstructive bronchopneumopathy, pneumonia, chronic renal insufficiency, rheumatoid polyarthritis, cognitive deficit, obesity, metabolic syndrome and cancer have been studied in association with periodontitis.
- However, to date, **the causality of the link has not been established** and depends on a minimum of data, with the exception of the role of oral micro-organisms in the appearance of pulmonary infections.
- **The oral/periodontal biofilm acts as a reservoir for respiratory pathogens** in patients with mediocre oral hygiene and periodontitis. These respiratory pathogens can cause pulmonary infections.
- New studies must be conducted in order to identify any causal link between periodontal diseases and these conditions.

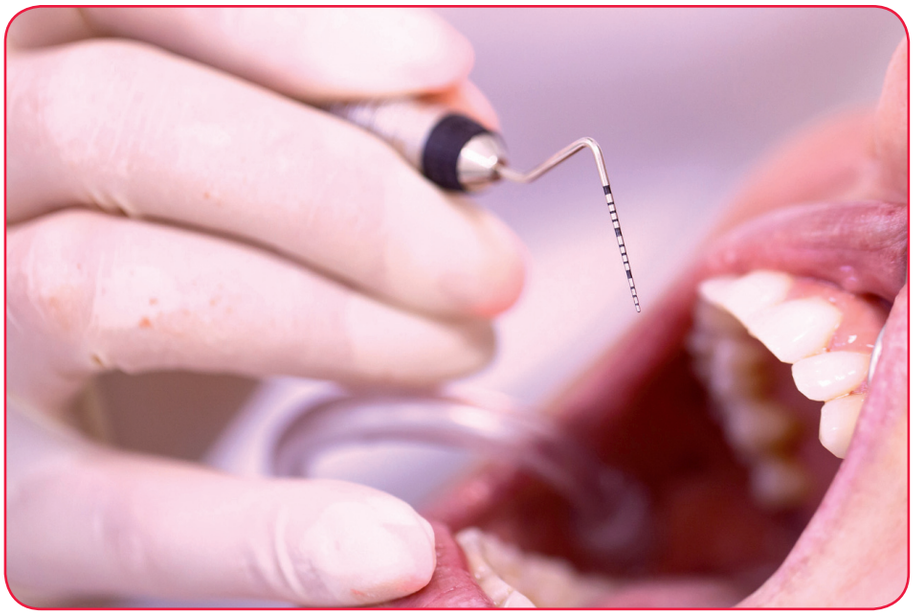
Periodontitis and adverse pregnancy outcomes: consensus report of the Joint EFP/AAP Workshop on Periodontitis and Systemic Diseases.

This consensus report includes a group of experts from the European Federation of Periodontology and the American Academy of Periodontology. It aims to:

- Define, using epidemiological and scientific data, **the role of periodontal disease in the onset of pregnancy complications**.
- Identify the underlying mechanisms that could explain this link.
- Provide you with recommendations for treating pregnant women:
  - with periodontal conditions (gingivitis or periodontitis)
  - with no periodontal issues (providing preventive care, information and motivation for oral hygiene).
- Build awareness among our physician colleagues about the diagnostic attitude to adopt with pregnant patients (patient history, endo-oral exam) and about the information to provide them with concerning the risks caused by periodontitis.

MATERNAL PERIODONTITIS AND PREGNANCY COMPLICATIONS

As health professionals, we must be aware of the potential impact of mediocre periodontal health on the overall health of the mother and developing fetus.



1 WHAT ARE THE UNDESIRABLE EFFECTS DURING PREGNANCY?

When numerous risk factors are taken into account (socio-economic situation, ethnicity, addictive habits, mother's age and weight, stress level, physical activity), clinical studies have shed light on a link between a diagnosis of **periodontitis in the mother** and:

- **Low birth weight of infant** (<2,500 g)
- **Preterm delivery** (<37 weeks)
- **Pre-eclampsia** (maternal hypertension and **proteinuria** beginning in the 20th week of gestation).

Nonetheless, the strength of the periodontitis-pregnancy complication relationship varies according to the population studied and the methods used to evaluate and classify periodontal diseases.

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2 WHAT ARE THE BIOLOGICAL MECHANISMS INVOLVED?

Two pathways, infectious and inflammatory, are involved in the link between periodontal diseases and pregnancy complications.

A. DIRECT PATHWAY

- **Maternal periodontitis is a source of micro-organisms** that pass from the mouth to the fetal-placental unit, via dissemination in the blood or by ascending pathway through the genital-urinary apparatus.

B. INDIRECT PATHWAY

- The **inflammation mediators** produced locally in the periodontal tissues (e.g.: PGE2 and TNF) are released in the bloodstream and reach the fetal-placental unit.
- Some oral micro-organisms and their sub-products flow towards the liver, where inflammatory agents are produced such as cytokines (e.g.: IL-6) or acute-phase proteins (e.g.: CRP). These agents travel towards the growing fetus.

The repercussions on pregnancy vary depending on time and on the severity of exposure to the bacterial agent.

3 WHAT ARE THE RECOMMENDATIONS FOR DENTAL SURGEONS?

A. FOR PREGNANT PATIENTS WITH A HEALTHY PERIODONTIUM

- **Inform them of the physiological periodontal changes** that can occur during pregnancy (increase in blood flow to the **gums** that can cause in bleeding and/or swelling).
- Perform a **complete oral exam**.
- Assess their overall health condition by asking questions about **any history** of hypertension, diabetes, cardiovascular disease and smoking habits.
- **Optimize their plaque control**, especially insisting on brushing interdental spaces.
- Invite them to **schedule another visit** after giving birth.

B. FOR PREGNANT PATIENTS WITH GINGIVITIS

- Implement the same **preventive measures** (paragraph A).
- **Reduce bacterial load and signs of inflammation**, by tartar-removal / polishing.
- **Schedule frequent visits** during patient's pregnancy to prevent any recurrence.

C. FOR PREGNANT PATIENTS WITH PERIODONTITIS

- Implement the same **preventive measures** (paragraph A).
- **Reduce sub-gingival biofilm** and **inflammation** through scaling / root planing / polishing.
- In the case of localized gingival hyperplasia, **surgical excision** excision will only be performed, if possible, after control of gingival inflammation.

Exam of a 27-year-old patient during the 5th month of pregnancy

Points to remember...

- **Low birth weight, pre-eclampsia or preterm** delivery can be associated with periodontal disease in pregnant women.
- The fetal-placental unit is affected thus:
  - either directly, through dissemination of oral micro-organisms and/or their components in the blood from the oral cavity,
  - either indirectly, through the release of inflammation mediators produced in periodontal sites.
- However, **this correlation is weak** and varies from study to study depending on several parameters (study population, periodontal endpoints).
- **Preventive measures, early diagnosis and suitable treatment** are recommendations for reducing pregnancy complications.

Periodontitis and atherosclerotic cardiovascular disease: consensus report of the Joint EFP/AAP Workshop on Periodontitis and Systemic Diseases

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Periodontitis is a chronic multi-factorial inflammatory disease caused by infection leading to edentulism, which poses a major problem in public health. The bacteria spreading in the bloodstream from the affected periodontium trigger an inflammatory response in the host via several mechanisms, **which contributes to the formation, development and aggravation of atheroma.** Thus, numerous highly coherent epidemiological data reveal that periodontitis is linked to a heightened risk of cardiovascular disease.

1 PERIODONTITIS AND CARDIOVASCULAR DISEASE

Periodontitis is a major public health issue, for the following reasons: high incidence, social inequality, lower quality of life, mastication difficulty and negative esthetic impact, loss of teeth and infirmity, major cause of edentulism and mastication disorders, higher dental costs and its chronic nature combined with potential impact on overall health. Periodontitis is particularly a threat to certain groups of patients: **more frequent and more severe cases affect socially-deprived persons** and persons belonging to certain ethnic groups. Smokers, diabetics and obese individuals are also more harshly affected.

Atherosclerotic cardiovascular disease (ACVD) includes **fatal** and non-fatal **coronary heart disease** (angina, myocardial infarction)**, ischemic cerebrovascular disease** (CVA/TIA) and peripheral vascular diseases. These are **multi-factor diseases with risk factors in common with periodontitis.**

2 BIOLOGICAL PLAUSIBILITY

Chronic periodontitis encourages the passage of bacteria (or their products) in the blood. These bacteria **trigger the host's inflammatory response** based on several mechanisms. The host's immune response then **encourages the formation, development and aggravation of atheroma**.

A 66-year-old patient with a cardiovascular problem

3 EPIDEMIOLOGICAL DATA

In all studies, the appearance of new ACVD cases has revealed that **periodontitis precedes cardiovascular events**. The level of proof for this link is therefore strong, thus allowing for risk evaluation. Periodontitis, measured by loss of attachment, depth of periodontal probing and/or radiographic assessment of bone destruction, has been linked to a heightened risk of various ACVD measures, **independent of known cardiovascular risk factors**.

The statistically significant excess ACVD risk observed in patients with periodontitis is independent of known cardiovascular risks. However, the level of excess risk corrected from other ACVD risk factors varies according to the type of cardiovascular event and, among one population, according to age and sex.

The risk is particularly higher for cerebrovascular diseases than for coronaropathies, and higher in men and younger patients. No excess risk of coronaropathy has been linked to periodontitis in subjects over 65. This observation tallies with the results of several studies, according to which the various known ACVD risk factors are less significant in older adults. Available data do not allow for a connection between periodontitis and the incidence of secondary cardiovascular events (second ACVD event occurring after the first).

The link between periodontitis and ACVD risk is associated with numerous potentially significant confusing factors including **comorbidities such as diabetes, as well as lifestyle-related factors such as smoking**. However, known cardiovascular risk factors do not provide a complete explanation for excess risk in patients with periodontitis. All the studies analyzed took into account the patients' smoking habits, and several studies have proven an excess risk in non-smokers. In diabetes-related studies, an excess risk was also linked to periodontitis.

4 INTERVENTIONAL STUDIES

Atherosclerotic cardiovascular disease is a complex multifactor disease, and subjects may present one or several risk factors. It has been proven that **periodontitis increases ACVD risk, independently to other well-known risk factors.**

According to the group's conclusions, a moderate number of data related to periodontal treatment reveal a decline in systemic inflammation, confirmed by a decrease in CRP (C-reactive protein) through an improvement in clinical and secondary measures of endothelial function. CRP and endothelial function have been associated with a higher risk of cardiovascular disease. On the other hand, a moderate number of data reveals that periodontal treatment has no effect on lipid profile. Based on a limited number of data, **periodontal procedures cause a decrease in other inflammation, coagulation and endothelial activation biomarkers** linked to ACVD. Also based on limited data, periodontal treatment reduces blood pressure and infraclinical ACVD.

5 CLINICAL IMPLICATIONS AND PUBLIC HEALTH

Periodontal treatment requires a professional and personalized approach. **Primary prevention is thus essential** and the implementation of innovative preventive strategies for the population is strongly recommended. A periodontitis diagnosis can thus contribute to quantifying cardiovascular risk and therefore to its treatment.

Points to remember...

- **Practitioners must inform their patients that periodontitis is a major ACVD risk**.
- The aim of this periodontal prevention, diagnosis and treatment is to protect both oral health and general health. Thus, patients suffering from periodontitis combined with other ACVD risk factors such as hypertension, overweight/obesity, smoking, etc., and who have not consulted a physician over the past year should be encouraged to have a medical examination done.
- Modifiable periodontitis (and ACVD) risk factors must be taken into account within the context of a complete periodontal treatment, particularly via smoking cessation and advice towards changing lifestyle.

Diabetes and periodontal diseases: consensus report of the Joint EFP/AAP Workshop on Periodontitis and Systemic Diseases

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Diabetes and periodontitis are complex chronic diseases with a known bidirectional link.

Although the impact of hyperglycemia on periodontal manifestations has been long established, the objective here is to:
- Provide an overview of epidemiological data assessing the impact of periodontitis and its treatments on diabetes, its onset and complications.
- Identify the mechanisms involved in this bilateral link.

The aim is to be able to establish recommendations for health professionals (physicians, dentists) as well as patients. In this supplement we will focus on recommendations for periodontal care in diabetic patients.
The epidemiological data that serves as the basis for these conclusions are transversal and prospective studies.

1 MECHANISMS INVOLVED BETWEEN DIABETES AND PERIODONTITIS

• Even though hyperglycemia encourages oxidative stress in periodontal tissues, studies have proven that **periodontitis, in return, contributes to a systemic increase in this oxidative stress.**

• **AGE (advanced glycation end product) and RAGE** (receptor of AGE) interactions in diabetic subjects cause an excessive inflammatory response (through disorganization of the pro-inflammatory cytokine network) and the destruction of periodontal tissues.

2 PERIODONTAL EFFECTS ON DIABETES

• **Periodontitis is linked to an increase in HbA1c and in insulin resistance.**
As a reminder, a decrease in HbA1c is an end-point that establishes diabetes treatment efficacy.

• A direct link has been established between **periodontal disease severity and the onset of diabetic complications** (particularly cardiovascular and renal), based on a dose-dependent relationship.

• A non-diabetic **patient with moderate to severe periodontal disease runs a greater risk of developing diabetes.**

3 EFFECT OF PERIODONTAL THERAPY ON DIABETES

• Randomized controlled trials (RCT) all agree on the fact that there is a reduction of approximately 0.4% in HbA1c to 3 months after mechanical periodontal treatment, which is tantamount to the clinical impact of adding a second medicine to the diabetic's pharmacological treatment.

• A long-term decrease in HbA1c could reduce the morbidity and mortality associated with diabetes.

• Current data does not allow proof of the benefit of antibiotic treatment concomitant to periodontal treatment in diabetic patients.

4 A DIABETIC PATIENT COMES TO YOUR OFFICE

Your patient tells you that they have diabetes. It is your duty to inform them that:

• they run a **higher risk of developing diabetes-related periodontal disease,**

• periodontal disease can **hinder glycemic balance**

• severe periodontitis cases are associated with a **greater risk of diabetic complications** (particularly cardiovascular and renal),

• there is an increased risk of developing other oral diseases: xerostomia, stomatodynia, and fungal infections, which all merit doctor-patient discussion.

We recommend the following for all diabetic patients:

• systematically conducting a **thorough oral exam** with a complete periodontal exam,

• **even in the absence of an initial periodontal disease diagnosis**, an annual periodontal exam is recommended,

• the patient must receive **advice** pertaining to oral health,

• for diabetic children, an annual **screening exam is recommended from the age of 6 or 7.**

A 67-year-old patient with diabetes

5 PERIODONTALLY CONSCIOUS PATIENTS

Your patient can carry out self-examination for earlier detection of any gingival infection. The observation of one of the following signs is reason for a dental consultation:

• red, swollen gums,
• bleeding or purulent oozing from the gums,
• fetid breath,
• longer, shaky teeth,
• progressively wider spaces between teeth,
• tartar on teeth.

Points to remember...

There is a bilateral link between diabetes and periodontitis.

Mechanical periodontal therapies have proven beneficial against diabetes, diabetic incidence and the onset of complications, hence the importance of periodontal treatment in your diabetic patients.

For all diabetic patients, you should systematically:

• **inform** them of the reciprocal risks that exist between diabetes and periodontitis
• give them **advice** pertaining to oral hygiene
• perform a thorough **oral exam with a periodontal assessment**.

Opinion

Esteemed colleagues,

This is the second issue of the innovative ELUMED magazine, which offers the latest news in periodontology.

Periodontal diseases, which are inflammatory conditions caused by bacteria, can influence the patient's overall health.

Known risk factors are smoking, age and conditions that depress the immune system. Pulmonary diseases can appear in the form of pneumonia, emphysema and chronic obstructive pulmonary disease.

Periodontitis can be another risk factor for a respiratory condition. We now know that periodontal disease is linked to an increase in the risk of pulmonary infection.

It is our duty to inform pneumologists and anesthesiologists of the inhalation risks of periodonto-pathogenic bacteria and of the obligation to treat periodontitis ahead of bronchopulmonary treatments or intubations.

Periodontal tissues in pregnant women are more sensitive to bacterial aggressions because of the hormonal fluctuations caused by pregnancy (gravidic gingivitis).

Pregnant women with severe periodontal disease have a higher risk of preterm delivery and a low-birth-weight baby with all the risks of sequela for the newborn. Prevention is essential.

Women planning a pregnancy must include a periodontal consultation in their list of medical exams in order to evaluate their health and begin treatment if necessary. It is preferable to begin a pregnancy with healthy gums, to avoid gingivitis and treat periodontal diseases harmful to the health of the fetus.

During pregnancy, rigorous periodontal hygiene is required.

Our duty is to pass on this information to OB/GYNs and midwives. Recent studies conducted in patients with periodontal disease suggest an increased risk of cardiac disease compared to patients without periodontopathy.

Additional research is underway to pinpoint the etio-pathogenic mechanism.

A first hypothesis is that the bacteria travel from the inflamed periodontal tissues into the bloodstream. The other hypothesis is linked to the inflammation triggered by the periodontal bacteria that contribute to the alteration of the inside of the arteries.

Periodontal prevention or treatment must begin as soon as a periodontal disease is diagnosed, particularly in patients with cardiac risk. Our duty is to communicate these results to cardiologists.

Where diabetes is concerned, it has been proven for several years that diabetics are more susceptible to periodontal diseases, which are now recognized as a complication of diabetes.

Moreover, if there is diabetic imbalance, there is a greater sensitivity to infections. The presence of periodontitis can cause difficulty in establishing balance and the presence of diabetes can reduce the efficacy of the periodontal treatment.

This bidirectional relationship was proven over the last decade since it has been observed that periodontal treatment could contribute to establish diabetic balance and to reduce necessary insulin dose.

Periodontal treatment can improve diabetes control.

Our duty is to communicate these results to endocrinologists.

Periodontally yours,

Prof. Virginie Monnet-Corti

President of the French Society of Periodontology and Oral Implantology

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6 sizes
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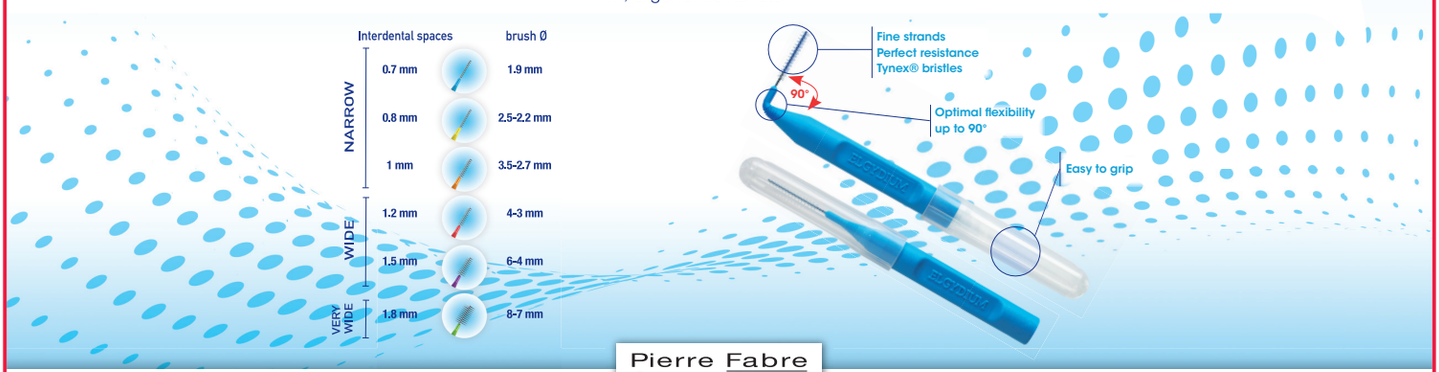
MONO Compact
Firm, ergonomic handle



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