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THE NEW CLASSICATION OF PERIODONTAL AND PERI-IMPLANT DISEASES AND CONDITIONS

Consensus from World Workshop in Chicago will have global impact on periodontology

The new classification of periodontal and peri-implant diseases from the recent World Workshop in Chicago, will have a profound and lasting impact on clinical practice in periodontology and implant dentistry.

There are big changes since the previous classification, in 1999, based on how the scientific understanding of periodontal and peri-implant diseases and conditions has evolved.

Among significant differences in the new classification are that peri-implant diseases and conditions are included for the first time, and the distinction between "chronic" and "aggressive" periodontitis has been replaced by a model with stages and grades.

The World Workshop on the Classification of Periodontal and Peri-Implant Diseases and Conditions, which took place in Chicago in November 2017, was organised by the American Academy of Periodontology (AAP) and the EFP. A total of 110 experts reviewed the scientific evidence, and developed the new classification, which the EFP and the AAP will promote as a globally accepted classification.

The workshop's evidence-based reviews and consensus reports, which are being published simultaneously in the EFP's *Journal of Clinical Periodontology* and the AAP's *Journal of Periodontology*, will be presented formally for the first time at the EuroPerio9 congress in Amsterdam on June 22.

This special issue of *Perio Insight* features articles by the EFP co-chairs of the workshop's four working groups.

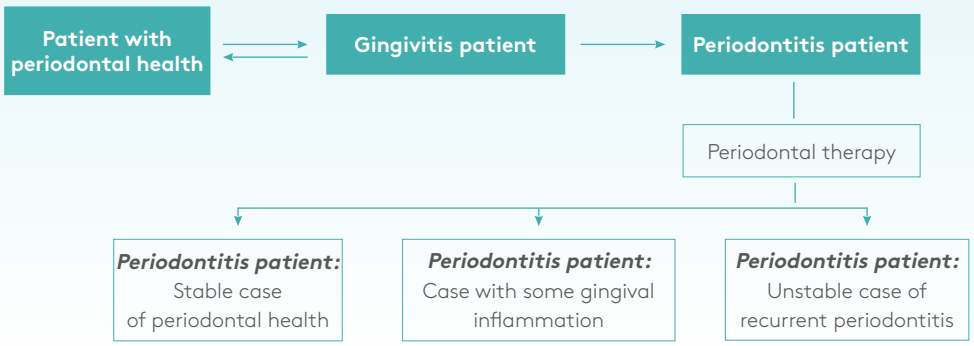
Participants in the World Workshop, Chicago, November 2017

- Iain Chapple, co-chair of working group 1, writes about defining periodontal health and defining gingival diseases and conditions.
- Mariano Sanz, co-chair of working group 2, discusses the new categorisation of periodontitis according to four stages and three grades.
- Søren Jepsen, co-chair of working group 3, explains the periodontal manifestations of systemic diseases and developmental and acquired conditions.
- Tord Berglundh, co-chair of working group 4, outlines the classification of peri-implant diseases and conditions.

The idea of the joint workshop on classification was proposed by EFP past presidents Phoebus Madianos and Søren Jepsen at a meeting with the AAP leadership in 2014.

"We are very happy with the outcome of this major joint effort together with our partners and friends of the AAP," said Prof Jepsen, one of the co-chairs of the World Workshop and the EuroPerio9 scientific chair. "EuroPerio9 offers a unique opportunity to present and share the new classification with our colleagues from all over the world. We are convinced that it will be globally accepted and will lead to even better patient care".

Figure 1: Health & gingivitis on an intact & reduced periodontium: Underpinning principles



Defining health, defining gingival diseases and conditions

By Iain Chapple, co-chair, working group 1

Iain Chapple

Human periodontal diseases encompass a wide spectrum of conditions: some relate to plaque biofilm build-up and others arise independently of biofilm accumulation and may either be modified by the biofilm or uninfluenced by it.

The 1999 classification system was the first to recognise a need to classify gingival diseases, but its classification of gingival conditions included oddities, such as "diabetes mellitus-associated gingivitis" and "ascorbic acid-deficiency gingivitis" (Armitage 1999). There was no attempt to define "health" – clearly a critical factor when establishing case definitions for disease – and the gingivitis classification was unnecessarily complex, embedding both predisposing factors and modifying factors in the diagnosis.

Working group 1 of the 2017 World Workshop decided to give a clear definition of periodontal health – both histologically and clinically – and it reduced definitions of gingivitis to two categories: plaque-biofilm-induced gingivitis and non-plaque-biofilm-induced gingival diseases.

World Workshop consensus

A critical factor in defining health is the recognition that periodontal health can exist at both site and whole-mouth levels, and on an intact or a reduced periodontium. An intact periodontium is one without clinical attachment loss or bone loss, whereas a reduced periodontium may arise either in a non-periodontitis patient (e.g. patients with some forms of gingival recession or following crown-lengthening surgery) or in a patient with a history of periodontitis. Case definitions of health and gingivitis were therefore established for all three scenarios.

The next fundamental decision surrounded the concept of "pristine" versus "clinical" health, as in medicine "normality" is defined as 95% of the population fitting the definition of "clinical health".

It was evident from the literature that histological changes in the gingival microvasculature arise almost immediately following tooth eruption and that an inflammatory infiltrate is evident as part of normal immune surveillance, as indeed are subtle clinical signs of inflammation at isolated sites as part of "clinical health". Thus, pristine health is exceptional and largely seen only in textbooks.

A case of clinical gingival health was therefore established on an intact and a reduced periodontium in a non-periodontitis patient as <10% sites of bleeding on probing (BoP) and probing depths of ≤3mm. The intact periodontium had no attachment loss, whereas the reduced periodontium did have evident attachment loss. In the reduced periodontium in a successfully treated periodontitis patient, health allowed probing depths up to 4mm, embracing the concept of the "closed pocket", but there must be no BoP at any 4mm site, as this would represent the likelihood of recurrent periodontitis and indicate a need for remedial intervention.

Gingivitis: Defining plaque-induced gingivitis on a reduced periodontium was the most challenging concept for achieving consensus. This was because of the recognition that the consequences of periodontitis are irreversible and that a patient who develops periodontitis remains at high risk of recurrent periodontitis, regardless of whether they are currently healthy because of successful treatment, have individual sites of gingival inflammation defined by BoP at shallow sites ≤3mm, or have 4mm non-bleeding "closed pockets".

It was therefore agreed that, once periodontitis is diagnosed, a patient remains a periodontitis patient for life, but may represent a case of "health" or of "gingival inflammation" at any particular time following successful therapy (see Figure 1, page 1). In this context, the term "gingival inflammation" was employed rather than "gingivitis". Although technically they mean the same thing, it was felt that one could not have a periodontitis patient who also has a diagnosis of gingivitis. However, a periodontitis patient may have sites of gingival inflammation at probing depths of ≤3mm following treatment, but such patients may not require root-surface debridement for recurrent periodontitis, but rather need oral-hygiene reinforcement and plaque removal to manage localised gingival inflammation.

A further complication arose from the need for both epidemiological studies to capture periodontitis prevalence and for clinical-management protocols to avoid over-treatment in successfully managed periodontitis patients. The threshold for defining health on a reduced periodontium in a treated periodontitis patient for epidemiological surveys was therefore set at ≤3mm, whereas for clinical care it was set at ≤4mm (but no BoP). Gingivitis was categorised simply as gingivitis on an intact or a reduced periodontium and definitions were made of predisposing factors (local risk factors) that lead to increased plaque accumulation and of modifying factors (systemic risk factors) that alter the nature of the immune-inflammatory response to plaque.

The non-plaque-induced gingival conditions and lesions were stratified into eight groups, differentiating them from non-plaque-induced periodontal conditions: a) genetic/developmental; b) specific infections; c) inflammatory/immune; d) reactive; e) neoplasms; f) endocrine, nutritional and metabolic; g) traumatic; h) pigmentation.

Finally, it was recognised that there was a need to develop an ISO-standard, constant-force periodontal probe, otherwise case definitions based on 1mm probing differences are futile.

Periodontitis: From 'chronic' and 'aggressive' to stages and degrees

By Mariano Sanz, co-chair, working group 2

Periodontitis is a chronic multifactorial inflammatory disease associated with dysbiotic plaque biofilms and characterised by progressive destruction of the tooth-supporting apparatus. Its primary features include the loss of periodontal tissue support, manifested through clinical attachment loss (CAL) and radiographically assessed alveolar bone loss, the presence of periodontal pocketing, and gingival bleeding.

According to the previous internationally accepted classification scheme (Armitage 1999), periodontitis was further subdivided into: *chronic periodontitis* (forms of destructive periodontal disease that are generally characterised by slow to moderate progression) and *aggressive periodontitis* (a diverse group of highly destructive forms of periodontitis affecting mainly young people, including conditions formerly classified as *early-onset periodontitis* and *rapidly progressing periodontitis*.

World Workshop consensus

Working group 2 agreed by consensus that the current evidence does not support the distinction between chronic and aggressive periodontitis as two separate diseases. However, a substantial variation in clinical presentation does exist in terms of the extent and severity of periodontitis throughout the age spectrum, suggesting that there are population subsets with distinct disease trajectories caused by differences in exposure and/or susceptibility.

Based on this evidence, a new periodontitis classification scheme was adopted, in which forms of the disease previously recognised as "chronic" or "aggressive" are now grouped under the single category of "periodontitis" and further characterised based on a multi-dimensional staging and grading system.

The current evidence does not support the distinction between chronic and aggressive periodontitis as two separate diseases

Within this new classification system, patients should first be identified as having periodontitis by the presence of interdental clinical attachment loss. This individual case of periodontitis should be further characterised using a simple matrix that describes the stage and grade of the disease.

"Stage" is largely dependent on the severity of disease at presentation and on the anticipated complexity of disease management, and it includes a description of the extent and distribution of the disease in the dentition. "Grade" provides supplemental information about biological features of the disease including: a history-based analysis of the rate of periodontitis progression; assessment of the risk for further progression; analysis of possible poor outcomes of treatment; and assessment of the risk that the disease or its treatment may negatively affect the patient's general health.

- **Stage I**: a very incipient periodontitis with clinical attachment loss and bone loss limited to the most coronal portion of the root. In this stage, patients do not present periodontal pockets and they have not suffered tooth loss caused by periodontitis.
- **Stage II**: periodontal destruction affects the coronal third of the root and is characterised by the presence of moderate periodontal pockets (≤5mm) and the patient has not yet lost teeth because of periodontitis.

  These first two stages can be managed straightforwardly, mainly by means of non-surgical approaches, and their long-term prognosis is very good, provided that the patient complies with oral-hygiene practices and professional preventive measures.
- **Stage III**: advanced periodontitis with destruction of periodontal tissues beyond half of the tooth length.
  A limited amount of tooth loss has usually already occurred and the presence of furcation and intrabony lesions is common. All these aspects make the treatment of this stage complex and surgical interventions are usually needed.
- **Stage IV**: increases the severity and complexity of the previous stage by an increased tooth loss (>5 teeth) and the presence of masticatory dysfunction, which usually requires a complex multidisciplinary treatment beyond the periodontal therapy.

Mariano Sanz

The new grading system defines the rate of disease progression and the presence of risk factors that may influence this progression and the patient's response to therapy:

- **Grade A:** the rate of progression is low and the patient does not have risk factors.
- **Grade B:** the expected progression.
- **Grade C:** the patient has evident risk factors and there is a high risk of periodontal progression.

By combining these defined stages and grades, we can individualise the modalities and sequences of existing therapies, which will allow us to better assess their results.

Reference: Armitage, G.C. (1999) Development of a Classification System for Periodontal Diseases and Conditions. *Annals of Periodontology 4, 1-6.*

Periodontal manifestations of systemic diseases and developmental and acquired conditions

By Søren Jepsen, co-chair, working group 3

Søren Jepsen

Numerous systemic disorders can affect the initiation and progression of periodontitis or can negatively impact the periodontal structures. There is a high prevalence of mucogingival deformities and, in particular, gingival recessions. These are often associated with hypersensitivity, caries, and non-carious cervical lesions on the exposed root surface and can be of aesthetic concern. Occlusal forces can damage teeth and the periodontal attachment apparatus. Developmental or acquired conditions associated with teeth or prostheses may predispose to diseases of the periodontium. Working group 3 reviewed and updated the 1999 classification regarding these diseases and conditions, developing case definitions and diagnostic considerations.

Periodontal manifestations of systemic diseases and conditions: There are rare systemic disorders, such as Papillon–Lefèvre syndrome, that result in the early presentation of severe periodontitis. Such conditions are grouped as *Periodontitis as a manifestation of systemic disease*. Their classification is based on the primary systemic disease. Other systemic conditions, such as neoplastic diseases, can affect the periodontal tissues independently of biofilm-induced inflammation. They are also classified based on the primary systemic disease and are now grouped as *Systemic diseases or conditions affecting the periodontal supporting tissues*.

On the other hand, there are more common systemic diseases – i.e. diabetes mellitus – that are important modifiers of the course of periodontitis. However, diabetes-associated periodontitis should not be regarded as a distinct diagnosis – diabetes is now included in the new clinical classification of periodontitis as a descriptor in the grading process. In a similar way, smoking – now regarded as nicotine dependence and as a chronic relapsing medical disorder with major negative effects on the periodontium – is now also included in the clinical diagnosis of periodontitis as a descriptor.

Mucogingival conditions: In the context of mucogingival conditions, the importance of the *gingival phenotype*, including gingival thickness and width, is now recognised and a new classification for gingival recessions has been introduced. This combines clinical parameters such as the gingival phenotype, the interproximal attachment loss, and the characteristics of the exposed root surface.

Occlusal trauma and traumatic occlusal forces: *Traumatic occlusal force*, which replaces the term "excessive occlusal force", is any occlusal force that results in injury to teeth (such as excessive wear or fracture) and/or to the periodontal attachment apparatus. *Occlusal trauma* is a histological term to describe the injury of the periodontal attachment apparatus. There is no evidence from human studies that traumatic occlusal forces lead to periodontal attachment loss, non-carious cervical lesions, or gingival recessions. Traumatic occlusal forces lead to adaptive mobility in teeth with normal support, and to progressive mobility in teeth with reduced support, usually requiring splinting.

Prosthesis and tooth-related factors: This section is expanded in the new classification. The term *biologic width* is replaced by *supracrestal tissue attachment*, consisting of junctional epithelium and supracrestal connective tissue. Evidence from human studies indicates that infringement of restorative margins within the supracrestal connective tissue attachment is associated with inflammation and/or loss of periodontal supporting tissue. However, it is not clear whether these negative effects are caused by dental biofilm, trauma, toxicity of dental materials, or a combination of these factors. On the other hand, certain tooth-related anatomical factors – such as enamel projections/pearls, root fractures, and proximity – are related to dental-biofilm-induced gingival inflammation and loss of periodontal supporting tissues.

It is hoped that the updated classification of periodontal manifestations and conditions that affect the course of periodontitis and the periodontal attachment apparatus – together with the updated classification of developmental and acquired conditions, and the updated case definitions – will facilitate clinical diagnosis and decision-making.

110 experts participated in the World Workshop in Chicago, November 2017

Peri-implant diseases and conditions – classified for first time

By Tord Berglundh, co-chair, working group 4

For the first time at a World Workshop on Periodontology, a classification of peri-implant diseases and conditions was presented. In addition to case definitions, working group 4 addressed questions about the characteristics of peri-implant health, peri-implant mucositis, peri-implantitis, and soft- and hard-tissue deficiencies.

Peri-implant health: It was agreed that peri-implant health is characterised by the absence of clinical signs of inflammation, including bleeding/suppuration on probing (BoP). It is not possible, however, to define a range of probing depths compatible with health. In addition, peri-implant health can exist around implants with reduced bone support. Hence, the case definition of peri-implant health includes:

- absence of clinical signs of inflammation, including BoP.
- no increase in probing depth compared to previous examinations.
- no bone loss beyond crestal bone-level changes resulting from initial bone remodelling.

Peri-implant mucositis

Peri-implant mucositis is an inflammatory lesion of the soft tissues surrounding an endosseous implant in the absence of loss of supporting bone. The lesion is located lateral to the junctional/pocket epithelium but does not extend into the supracrestal connective tissue zone, "apical" of the junctional/pocket epithelium. The main clinical characteristic of peri-implant mucositis is bleeding on gentle probing, while other clinical signs of inflammation may also occur.

There is strong evidence that plaque is the aetiological factor for peri-implant mucositis. The case definition of peri-implant mucositis includes:

- bleeding and/or suppuration on gentle probing.
- no bone loss beyond crestal-bone level changes resulting from initial bone remodelling.

Peri-implantitis:
Peri-implantitis is a plaque-associated pathological condition occurring in tissues around dental implants, characterised by inflammation in the peri-implant mucosa and loss of supporting bone. Peri-implantitis lesions extend apical of the junctional/pocket epithelium and are larger than those at peri-implant mucositis sites. Peri-implantitis sites exhibit clinical signs of inflammation including bleeding on probing and/or suppuration, increased probing depths in addition to radiographic bone loss.

The progression of peri-implantitis is faster than that observed in periodontitis and occurs in a non-linear and accelerating pattern. The association between plaque and peri-implantitis is underpinned by evidence demonstrating that patients with poor plaque control who do not attend regular maintenance therapy are at higher risk of developing peri-implantitis and that anti-infective treatment strategies are successful in arresting disease progression.
There is also strong evidence of an increased risk for peri-implantitis in patients who have a history of severe periodontitis.

The case definition of peri-implantitis includes:

- bleeding and/or suppuration on gentle probing.
- increased probing depth compared to previous examinations.
- bone loss beyond crestal bone-level changes resulting from initial bone remodelling.

In the absence of previous examination data, diagnosis of peri-implantitis can be based on the combination of bleeding and/or suppuration on gentle probing, probing depths of ≥6mm and bone levels ≥3mm apical of the most coronal portion of the intra-osseous part of the implant.

Hard- and soft-tissue deficiencies: Healing following tooth loss leads to diminished dimensions of the alveolar process/ridge that result in hard- and soft-tissue deficiencies. Ridge deficiencies can occur at sites associated with severe loss of periodontal support, extraction trauma, endodontic infections, root fractures, thin buccal bone plates, poor tooth position, injury, and pneumatisation of the maxillary sinuses.

Tord Berglundh

Final remarks: The working group pointed out that the proposed case definitions should be viewed within the context that there is no "generic" implant and that there are numerous implant designs with different surface characteristics and varying surgical and loading protocols. Recommendations to clinicians addressed the need to probe peri-implant tissues to assess bleeding on probing and probing-depth changes. It was also recommended that clinicians obtain baseline radiographic and probing measurements.

World Workshop consensus reports

>> Chapple I, Mealey B, et al.. Periodontal health and gingival diseases/conditions: Consensus report of workgroup 1 of the 2017 World Workshop on the Classification of Periodontal and Peri-implant Diseases and Conditions. *Journal of Periodontology/Journal of Clinical Periodontology 2018.*

>> Papapanou P, Sanz M, et al. Periodontitis: Consensus report of workgroup 2 of the 2017 World Workshop on the Classification of Periodontal and Peri-implant Diseases and Conditions. *Journal of Periodontology/Journal of Clinical Periodontology 2018.*

>> Jepsen S, Caton JG, et al. Consensus Report: Periodontal manifestations of systemic diseases and developmental and acquired conditions: Consensus report of workgroup 3 of the 2017 World Workshop on the Classification of Periodontal and Peri-implant Diseases and Conditions. *Journal of Periodontology/Journal of Clinical Periodontology 2018.*

>> Berglundh T, Armitage G, et al. Peri-implant diseases and conditions: Consensus report of workgroup 4 of the 2017 World Workshop on the Classification of Periodontal and Peri-implant Diseases and Conditions. *Journal of Periodontology/Journal of Clinical Periodontology 2018.*

Perio Insight: the EFP magazine that offers expert analysis and debate on key issues

Perio Insight is a quarterly publication from the EFP that focuses on science and clinical practice. Launched in 2016, it offers detailed coverage of key issues in periodontology today, providing opinion and debate articles featuring some of the world's leading experts.

Recent issues of *Perio Insight* have offered:

- **Tunnel versus flap**: A lively debate between Massimo de Sanctis and Ion Zabalegui on which technique to use to treat multiple adjacent gingival recessions. Massimo de Sanctis outlines the case for the flap technique ("a very effective approach to solving aesthetic problems when multiple recessions are present"), while Ion Zabalegui puts forward the argument for the tunnelling technique ("the treatment of choice in the absence of keratinised tissue, when low morbidity is expected, and when patients need public exposure soon after surgery").
- **Periodontal regenerative therapy**: an expert view by EFP president Anton Sculean, who explains why, when, and how to use regenerative techniques to improve tooth prognosis. Prof Sculean explores the use of bone grafts and bone substitutes, guided tissue regeneration (GTR), enamel matrix proteins, combination approaches, growth and differentiation (GDF) factors, and autologous blood concentrates such as platelet-rich plasma.
- **Role of genetics**: An in-depth analysis of the state of current knowledge about the role of genetics in the aetiology of periodontal disease, written by Bruno G. Loos and Deon P.M. Chin of the Academic Centre for Dentistry in Amsterdam. While these experts say that knowledge remains "disappointingly limited", they point to promising lines of inquiry for researchers.

Among the topics that will be addressed in forthcoming issues are the links between periodontitis and Alzheimer's Disease, the use of lasers in periodontal therapy, and the latest evidence on the association between periodontal disease and diabetes.

Perio Insight also includes summaries of recent research published in the *Journal of Clinical Periodontology*, the EFP's official scientific publication, which is edited by Maurizio Tonetti. The journal, which is published monthly, has an impact factor of 3.477.

The current and all previous issues of *Perio Insight* can be downloaded from the EFP website (www.efp.org/publications/perioinsight).

Perio Insight is edited by Joanna Kamma for the EFP communications committee. Phoebus Madianos and Lior Shapira, respectively chair and deputy chair of the federation's scientific affairs committee, act as scientific advisors.

Future issues will tackle the links between periodontitis and Alzheimer's Disease and the use of lasers in periodontal therapy

"As the title delineates, *Perio Insight* tackles 'hot' perio topics, analysing and casting light on controversies with the appropriate scientific justification," said Joanna Kamma. "The EFP is proud of this publication, and a large number of periodontologists and dentists are downloading and reading it."

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Latest research from the EFP's Journal of Clinical Periodontology

Journal of Clinical Periodontology

The *Journal of Clinical Periodontology (JCP)* is the official scientific publication of the European Federation of Periodontology.

Edited by Maurizio Tonetti, the *JCP* aims to convey scientific progress in periodontology to those concerned with applying this knowledge for the benefit of the dental health of the community.

The journal is aimed primarily at clinicians, general practitioners, periodontists, as well as teachers and administrators involved in the organisation of prevention and treatment of periodontal disease. The *JCP* is published monthly and has an impact factor of 3.477. The six articles summarised below were published in the *JCP* between April and June 2018.

PERIODONTAL DISEASES

Prevalence of diabetes mellitus in people clinically diagnosed with periodontitis: A systematic review and meta-analysis of epidemiologic studies

Diabetes mellitus and periodontitis are complex chronic diseases with an established bidirectional relationship. This systematic review evaluated the prevalence and odds of having diabetes in subjects with professionally diagnosed periodontitis.

A search of various databases (MEDLINE-PubMed, CENTRAL, and EMBASE) produced 803 titles and abstracts, out of which 27 papers met the initial criteria.

Prevalence of diabetes was 13.1% among subjects with periodontitis and 9.6% among subjects without periodontitis. Based on sub-analysis, the prevalence of diabetes for subjects with periodontitis was 6.2% when diabetes was self-reported, compared with 17.3% when diabetes was clinically assessed. The highest prevalence of diabetes (17.2%) was observed in studies originating from Asian countries and the lowest (4.3%) in studies describing Europe populations. The overall odds ratio for patients with diabetes to be among subjects with periodontitis as compared to those without periodontitis was 2.27 (95% CI [1.90;2.72]).

The research concluded that the overall prevalence and odds of having diabetes are higher within periodontitis populations compared to people without periodontitis. Self-reported diabetes underestimates prevalence when compared to clinical assessment, and geographical differences were observed.

Authors: *Laura Ziukaite, Dagmar E. Slot, and Fridus A. Van der Weijden*

Published in Journal of Clinical Periodontology Volume 45, Number 6 (June 2018).

Full article: https://www.onlinelibrary.wiley.com/doi/abs/10.1111/jcpe.12839

PERIODONTAL DISEASES

Ageing effects on humoral immune responses in chronic periodontitis

This report focused on host-adaptive immune responses in periodontitis, a dominant global bacterial infection that increases with ageing. While experimental models and humans diagnosed with periodontitis demonstrate an antigenic specificity for particular oral bacteria, there is a limited understanding of how ageing affects the adaptive immune responses to these bacteria (which chronically colonise the oral cavity for decades prior to disease expression), and of how the magnitude and specificity of the response interface with pathogens that emerge within the bacterial ecology during exacerbations of disease.

Serum antibody levels to a group of pathogenic and commensal oral bacteria were measured in individuals from 21 to 74 years of age, stratified based on clinical status of the periodontium, smoking, and sex. Clinical parameters were not significantly different within health, gingivitis, or periodontitis groups related to age. Antibody to oral pathogens and commensals was similar in the different age groups in each clinical category, with no age correlation noted in the periodontitis patients.

The report concluded that adaptive immune responses to oral bacteria that chronically colonise the oral cavity generally appear unaffected by age, but they are clearly linked to the extent of disease.

Authors: *Jeffrey L. Ebersole, Mohanad Al-Sabbagh, Octavio A. Gonzalez, and Dolph R. Dawson III.*

Published in Journal of Clinical Periodontology Volume 45, Number 6 (June 2018).

Full article: https://www.onlinelibrary.wiley.com/doi/abs/10.1111/jcpe.12881

PERIODONTAL THERAPY

Shift in the subgingival microbiome following scaling and root planing in generalised aggressive periodontitis

This longitudinal study investigated the shift in the subgingival microbiota under scaling and root planing (SRP) in patients with generalised aggressive periodontitis (GAgP). After undergoing supragingival scaling, 12 individuals with GAgP were enrolled in this study. Full-mouth SRP was accomplished in three weeks and re-evaluated six weeks later. Pooled subgingival samples were obtained from each patient before SRP (pre-treatment group) and at the time of re-evaluation (post-treatment group). A 16S ribosomal RNA sequence analysis for polymerase chain reaction (PCR) was carried out after DNA isolation.

The study found that, under SRP, the diversity of the subgingival community was consistent, whereas genus-level biomarkers transformed from *Porphyromonas*, *Treponema*, and *Fretibacterium* to *Actinomyces*, *Streptococcus*, and *Haemophilus*. In a network analysis, pathogen-related and non-pathogen-related components were identified in both the pre- and post-treatment groups. The pathogen component was dramatically augmented, while the non-pathogen component shrank after treatment.

The study concluded that scaling and root planing decreased periodontal pathogens in the subgingival microbiota of patients with GAgP. However, the shift in the microbiota composition was characterised by the expansion of pathogen-related components and the contraction of non-pathogen-related components six weeks after SRP.

Authors: *Guojing Liu, Qingxian Luan, Feng Chen, Zhibin Chen, Qian Zhang, and Xiaoqian Yu*

Published in Journal of Clinical Periodontology Volume 45, Number 4 (April 2018).

Full article: https://www.onlinelibrary.wiley.com/doi/abs/10.1111/jcpe.12862

Latest research | Journal of Clinical Periodontology

IMPLANT THERAPY

A five-year randomised clinical trial comparing minimally with moderately rough implants in patients with severe periodontitis

This randomised clinical trial compared the clinical and microbiological performance of minimally and moderately rough implants in patients with a history of severe periodontitis.

Forty-eight minimally (Turned surface [Tur]) and moderately (TiUnite surface [TiU]) rough implants were placed in 18 patients, according to a split-mouth protocol. Marginal bone loss, probing pocket depth (PPD), clinical attachment level (CAL), and bleeding on probing (BoP) were recorded, and microbial samples were analysed by means of quantitative polymerase chain reaction.

The amount of bone loss over the five-year period tended to be lower along Tur when compared with TiU surfaces. Although the clinical outcomes tended to be better for Tur surfaces, there were no significant differences between both surfaces in mean PPD. More bone loss and deeper pockets were recorded for partially than for fully edentulous patients. The trial concluded that, in patients with a history of severe periodontitis, minimally rough implants showed more favourable clinical parameters five years after loading, compared with moderately rough implants.

Authors: *Magalie Raes, Rutger D'hondt, Wim Teughels, Wim Coucke, and Marc Quirynen*

Published in Journal of Clinical Periodontology Volume 45, Number 6 (June 2018).

Full article: https://www.onlinelibrary.wiley.com/doi/abs/10.1111/jcpe.12901

IMPLANT THERAPY

A retrospective study of 30,959 implants: Risk factors associated with early and late implant loss

This retrospective study assessed the risk factors associated with early and late implant loss. A total of 18,199 patients received 30,959 dental implants between 2011 and 2015. Age, gender, jaw, location, implant brands, implant length and diameter, bone augmentation procedures, and the number of implants placed per patient were recorded. A multivariate generalised estimating equation (GEE) logistic regression was used to identify risk factors related to both early and late implant loss.

The cumulative survival rates were 98.0% for patients and 98.7% for implants after observation time of between one and six years. A total of 183 patients with 194 implants were lost before or at the abutment connection, and 193 patients with 209 implants were lost after occlusal loading of the implant fixture. The multivariable GEE logistic regression showed that males, patients aged ≥41 years, and mandibular anterior location were risk factors for early implant loss. In the case of late implant loss, males, patients aged ≥41 years, bone augmentation, and short implants correlated with an increased failure rate.

Authors: *Guofen Lin, Shuhua Ye, Fengjia Liu, and Fuming He*

Published in Journal of Clinical Periodontology Volume 45, Number 6 (June 2018).

Full article: https://www.onlinelibrary.wiley.com/doi/abs/10.1111/jcpe.12898

IMPLANT THERAPY

Early and late implant failure of submerged versus non-submerged implant healing: A systematic review, meta-analysis, and trial sequential analysis

This systematic review analysed current evidence regarding differences in early and late implant failure as well as in marginal bone level (MBL) changes between submerged and non-submerged healed dental implants. The investigated outcomes were early and late implant failure (respectively defined as before or after six months from implant placement) together with MBL.

Eleven studies met the inclusion criteria and were included in this review, which revealed a small higher rate (2%) of early implant failure when a non-submerged healing approach is performed. Late implant failure appears not to be different in submerged or non-submerged healing, but the power of evidence is not high. If MBL changes at one year from implant loading are considered, it seems that non-submerged healing may better preserve marginal bone, although with a small effect size (0.13mm).

The review concluded that implants placed with a non-submerged technique have a higher risk (2%) of early failure. The power of the evidence about the effects on MBL is low, but present results seem to favour non-submerged healing.

Authors: *Giuseppe Troiano, Lucio Lo Russo, Luigi Canullo, Domenico Ciavarella, Lorenzo Lo Muzio, and Luigi Laino*

Published in Journal of Clinical Periodontology Volume 45, Number 5 (May 2018).

Full article: https://www.onlinelibrary.wiley.com/doi/abs/10.1111/jcpe.12890

EFP full-member societies

- **Austria** Österreichische Gesellschaft für Parodontologie
- **Belgium** Société Belge de Parodontologie / Belgische Vereniging voor Parodontologie
- **Croatia** Hrvatsko Parodontološko Društvo
- **Czech Republic** Ceská Parodontologická Spolecnost
- **Denmark** Dansk Parodontologisk Selskab
- **Finland** Suomen Hammaslääkäriseura Apollonia
- **France** Société Française de Parodontologie et d'Implantologie Orale
- **Germany** Deutsche Gesellschaft für Parodontologie
- **Greece** Ελληνική Περιοδοντολογική Εταιρεία
- **Hungary** Magyar Parodontológiai Társaság
- **Ireland** Irish Society of Periodontology
- **Israel** Israeli Society of Periodontology and Osseointegration
- **Italy** Società Italiana di Parodontologia e Implantologia
- **Lithuania** Lietuvos Periodontolog Draugija
- **Netherlands** Nederlandse Vereniging voor Parodontologie
- **Norway** Norsk periodontist forening
- **Poland** Polskie Towarzystwo Periodontologiczne
- **Portugal** Sociedade Portuguesa de Periodontologia e Implantes
- **Romania** Societatea de Parodontologie din Romania
- **Serbia** Udruzenje Parodontologa Srbije
- **Slovenia** Združenje za ustne bolezni, parodontologijo in stomatološko implantologijo
- **Spain** Sociedad Española de Periodoncia y Osteointegración
- **Sweden** Svenska Parodontolog föreningen
- **Switzerland** Société Suisse de Parodontologie / Schweizerisch Gesellschaft für Parodontologie / Società Svizzera di Parodontologia
- **Turkey** Türk Periodontoloji Dernegi
- **United Kingdom** British Society of Periodontology

EFP associate-member societies

- **Azerbaijan** Azərbaycan Parodontologiya Cəmiyyəti
- **Morocco** Société Marocaine de Parodontologie et d'Implantologie
- **Russia** Российской Пародонтологической Ассоциации
- **Ukraine** Асоціація лікарів-пародонтологів України