**AAP Classification of Periodontal and Peri-Implant Diseases**

**Description:**  
  
The updated American Academy of Periodontology (AAP) classification system represents a multi-dimensional staging and grading framework for periodontitis and implant disease status. This course will examine the concepts of staging and grading to classify each patient by complexity of case management, likelihood of less predictable response to therapy and potential for periodontitis development. The systemic connection as it relates to the grading portion of the classification system will be examined with a synopsis of the COVID-19 virus and it’s relationship to oral health/periodontal disease. Diagnosing, treatment planning and executing appropriate and necessary periodontal therapies will be reviewed utilizing case presentations and examining the systemic conditions patients present with. A hallmark feature of the updated system will bring opportunities for more case specific patient care. The need for calibration and clinician alignment with the new classification system will be discussed along with narrative examples for documentation recommendations.

**Learning objectives:**

* + Discuss staging/grading for periodontal disease and how it will benefit patient care and management.
  + Create treatment modalities that are evidence-based protocols for specific types of periodontal diseases according to the new classification system.
  + Identify patients who may benefit from adjunctive strategies of disease management and overall reduction of bioburden through tele dentistry approach.
  + Develop individualized homecare regimens utilizing staging and grading to motivate and encourage patients to improve their oral health.

**Course Outline**

# Half of the US Adult population is experiencing some form of periodontal disease. Why?

* 1. Underdiagnosing
  2. Undertreating
  3. Clinical expertise is lacking
  4. Access to care
  5. Education (public)

1. **Applying evidence based decision making (EBDM) to** - The ADA defines the term “evidence-based dentistry (EBD),” as an approach to oral health care that requires the judicious integration of systematic assessments of clinically relevant scientific evidence, relating the patient's oral and medical condition and history, with the dentist's clinical expertise and the patient's treatment needs and preferences.

**In order to address the epidemic of periodontal disease, clinicians must apply evidence-based decision making which includes:**

* **Searching for relevant scientific evidence**
* **Incorporating the patient needs and preference**
* **Applying the dentists’/RDHs’ clinical expertise**

*Since the patient needs/preferences are subjective and clinical expertise can vary among various providers and population, relevant scientific evidence is of critical importance.*

*Developing clinical expertise involves staying current with research, incorporating new procedures and adopting new policy/procedures*

# In November 2017, the World Workshop on the Classification of Periodontal and Peri-implant Diseases and Conditions took place in Chicago sponsored by the AAP/EFP.

More than 100 experts from Europe, Asia, Australia, and the Americas conducted literature reviews, established case definitions, and deliberated diagnostic considerations for

the classification’s primary topic areas.

1. Since the 1999 workshop, substantial new information has emerged from population studies, basic science investigations, and the evidence from prospective studies evaluating environmental and systemic risk factors. The analysis of this evidence has prompted the 2017 workshop participants to develop a new classification framework for periodontitis.
2. The new system enhances how periodontal diseases are understood, communicated and treated. It strives for greater diagnostic precision and offers guidance for clinical application by introducing a multi-dimensional staging and grading system for periodontal disease, as well as ***the first classifications for peri-implant disease***. Intended to improve clinicians’ understanding of disease progression and risk factors. The new system highlights the ***complex nature of the disease and need for individualized treatment***.

# Periodontal Health, Gingival Diseases and Conditions

* 1. **Periodontal Health**
     1. Defining a state of ***periodontal health*** is essential to creating a common reference point for the assessment and evaluation of treatment in periodontal disease and gingivitis.
     2. Clinical periodontal health is clearly distinct from pristine clinical health Pristine clinical health is rare, but a realistic entity. It is defined by:
        + no attachment loss
* no bleeding upon probing
* no anatomical loss of periodontal structures

*(No signs of inflammation which include redness, clinical swelling, edema and pain***)**

# Gingival Diseases and Conditions –

1. **Gingival diseases** can be separated into and defined as:
   * dental biofilm-induced
   * non-dental biofilm-induced
2. **Biofilm-induced gingivitis** is a site-specific inflammatory condition initiated by dental biofilm accumulation and characterized by gingival redness, edema and the absence of periodontal attachment loss.

The key clinical features of **biofilm-induced gingivitis** include erythema, edema, bleeding, tenderness, heat, loss of function and gingival enlargement.

## The diagnosis of dental biofilm-induced gingivitis is identified based on the extent and the severity of a patient’s BOP score (%).

* When only a few sites (<10%) are affected by gingival inflammation (mild redness and/or a broken line of bleeding rather than edema or an immediate unbroken line of BOP), this is defined as **incipient gingivitis.**
* ***Incipient* gingivitis** may rapidly progress to localized gingivitis (10-30% BOP) if left untreated. **Generalized gingivitis** involves BOP scores of greater than 30%.
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# Similarly, the severity of gingival inflammation can be categorized as mild, moderate or severe:

* + Mild gingival inflammation: area with a minor change in the color and little change in texture of the tissue.
  + Moderate gingival inflammation: area with glazing, redness, edema, enlargement and BOP.
    - Severe gingival inflammation: area of overt redness and edema with a tendency toward bleeding when touched rather than probed.

*Several local factors are known to exacerbate dental biofilm-induced gingivitis including prominent subgingival restorations and hyposalivation. Xerostomia, a symptom caused by perceived lack of salivation (not a diagnosis) may make plaque control difficult and gingival inflammation may be worsened. Similarly, medications which cause dry mouth such as antihistamines, decongestants, antidepressants, and antihypertensives (among others), can cause dental caries, taste disorders, halitosis, and inflammation of the oral mucosa, tongue and gingiva*

1. **Non-dental biofilm-induced gingival diseases** are less common but are often of major significance for patients. These are often manifestations of systemic conditions. They may represent pathologic changes limited to the gingiva and the classification is based on the etiology of the lesions.

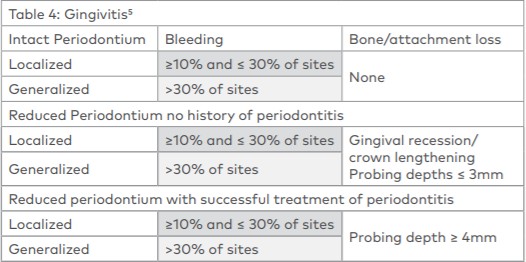
# These diseases and conditions can be classified into eight general categories:

* + genetic/developmental disorders
    - specific infections
* inflammatory or immune conditions and lesions
  + reactive processes
    - neoplasms
* endocrine/nutritional/metabolic disease
  + traumatic lesions
* gingival pigmentation

Non-plaque-induced gingival diseases and conditions are usually **not resolved by mechanical plaque removal.**

1. For the patient with a **reduced periodontium**, without a history of periodontitis, or with successfully treated periodontitis (stable patient), the same criteria may be applied to define periodontal health, provided that no BOP

positive sites show a probing depth≥4 mm



# Periodontitis

1. The experts concluded consistent with current knowledge on pathophysiology, three forms of periodontitis can be identified:

# Necrotizing periodontitis

* **Periodontitis as a manifestation of systemic disease**
* **Periodontitis –** (*the forms of the disease previously recognized as “chronic” or “aggressive”, now*

*grouped under the single category of “periodontitis” as the pathophysiology was considered to be too similar.)*

1. **Endodontic-periodontal lesions** are no longer classified according to the ***primary lesions***. There is no distinction between periodontal and gingival abscesses, as the diagnosis of periodontal abscesses includes both.
2. Updated from the 1999 classification system, **oral contraceptives and menstrual** cycle have been removed as a modifying risk factor in the new 2017 classification system. It was previously believed that oral contraceptives and hormonal changes associated with the menstrual cycle were associated with gingival inflammation, gingival enlargement, and increases in gingival crevicular fluid production.
   1. Important **changes in terminology** are also included in the new classification system.

-**Traumatic occlusal force** replaces excessive occlusal force.

Occlusal forces are described as traumatic if they cause trauma in the periodontal tissues and/or occlusal wear of the teeth

-**Periodontal phenotype** (associated with clinical characteristics) replaces periodontal biotype (associated with genetic characteristics).

-In addition, **biologic width** is now replaced by ***supracrestal tissue attachment***

(and still refers to the junctional epithelium and connective tissue attachment).

*The periodontal biotype/****phenotype*** *and its classification as thin scalloped, thick scalloped, or thick flat were added in this category. It was acknowledged that the phenotype,* ***biological width*** *etc. could affect the therapeutic outcome.*

*The negative effect of the restoration margins when placed within the* ***supracrestal tissue attachment*** *(formerly known as biologic width), and the increase of mobility of teeth used as abutments in distal extension removable dental partials are highlighted.*

# Categories of peri-implant diseases and conditions

* **Peri-implant health**—the absence of erythema (inflammation), bleeding on probing (BOP), swelling, and suppuration with no bone loss (BL) < 2.0 mm
* **Peri-implant mucositis**—inflammation, presence of BOP, swelling, no BL < 2.0 mm, and strong evidence that plaque (biofilm) is the etiologic factor
* **Peri-implantitis**—inflammation, plaque-associated pathological condition in tissue, probing

depth (PD) ≥ 4–8 mm, and subsequent progressive BL ≥ 2–3 mm

*Peri-implantitis in absence of previous examination—patient records should include previous radiographs, PD at one-year post-load. In the absence of a previous exam, refer to the guidelines for peri-implantitis, PD ≥ 6 mm, BOP, and BL ≥ 3 mm with concurrent peri-implantitis diagnosis*

* **Peri-implant soft- and hard-tissue deficiencies**—conditions following the normal healing process of tooth loss that leads to diminished dimensions of the alveolar process/ridge, resulting in both hard- and soft-tissue deficiencies

**A Multi-dimensional staging and grading system** for periodontal disease provides a paradigm similar to what is used in some fields of medicine, from which clinicians can develop a well-rounded treatment strategy based on a patient’s specific needs.”

1. **Staging** is largely dependent upon the severity of disease at presentation as well as on the complexity of disease management, while **grading** provides supplemental information about biological features of the disease, including a history based analysis of the rate of disease progression, assessment of the risk for further progression, anticipated poor outcomes of treatment, and assessment of the risk that the disease or its treatment may negatively affect the general health of the patient.
2. This distinction was made to ***emphasize the need for a more comprehensive maintenance and surveillance*** of the successfully treated patient with periodontitis.

# Compare the previous 1999 classifications and the rationale for the new multi-dimensional categorization.

1999 Classifications – Based almost entirely on **SEVERITY** of past destruction 2017 Classifications –

* + **SEVERITY** pf past destruction
  + Missing teeth
  + Complexity of managing the case
  + Estimate **future risk progression** and likelihood of responding to standard therapy 

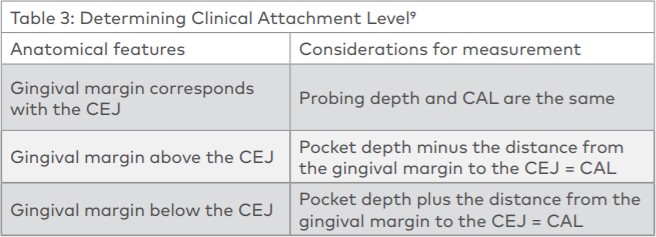
New Classification System helps to ***stratify*** periodontally involved patients to explore influence of treatment on systemic diseases

# How to stage/grade and what are the critical components

**Step 1:** Initial Case Overview to Assess Disease - recommendation is to conduct a screening consisting of radiographs, probing depths and missing teeth.

Based on the findings from step 1, proceed to step 2 to determine the patient’s stage.

**Step 2:** Establish Stage is divided into two sections. For mild to moderate periodontitis, the focus will be on clinical attachment loss (CAL).



For a determination of mild-moderate periodontitis can be made, which is considered Stage I or Stage II. Severe or very severe periodontitis will be considered Stage III or Stage IV.

**Step 3:** Establish Grade focuses on assessing risk factors, systemic considerations, and outcomes of non-surgical periodontal therapy.

1. **Staging** - Stages represent severity **based on historical destructions**

Evaluate from the standpoint of Stage 1 & 2 vs. 3 & 4 [(refer to chart)](http://perio.org/sites/default/files/files/Staging%20and%20Grading%20Periodontitis.pdf) - determine where the patient lands; start there.

First two stages represent how we expect the cases will respond; **Stage 1 and 2** are predictable - early to moderate perio respectively **3 & 4 are stages** that may not respond as we would expect; unpredictable - moderate with missing teeth from perio to severe (IV) respectively

## Entirely about disease PATTERNS and not mm. – mm’s adds to complexity, but the CAL is the determining staged definer.

1. **Grading** - Classification of periodontitis based on [**grades**](http://perio.org/sites/default/files/files/Staging%20and%20Grading%20Periodontitis.pdf) that reflect biologic features of the disease including evidence of, or risk for, rapid progression, anticipated treatment response, and

effects on systemic health – THIS AIDS IN THE PROGNOSTIC OUTCOMES OR THE FUTURE PROGNOSIS FOR PATIENT

Grading is more fluid where staging is static, or patient can get worse.

- **DO NOT CHANGE THE STAGING AFTER TREATMENT because we then lose the future predictive**

**value of the system**

# A closer look at risk assessment for perio/implant health and how it applies to the updates.

* + Risk assessment is an accepted component of the American Academy of Periodontology guidelines for patient management.
  + “Risk assessment goes beyond the identification of the existence of disease and severity and considers factors that may influence future disease progression”.
  + Goal of risk assessment is to identify individuals who are likely, or at least more likely than others, to have periodontitis

**Risk** is the probability that an individual will get a specific disease in a given period. **Risk factors** may be environmental, behavioral, or biologic factors that, when present, increase the likelihood that an individual will get the disease.

**Risk determinant / background characteristic** are the risk factors that cannot be modified.

**Risk indicators** are probable risk factors that have been identified in cross-sectional studies but not confirmed through longitudinal studies.

**Risk predictors/markers** - although associated with increased risk for disease, do not cause the disease

# The Periodontal Exam – Moving towards identifying patients in the subclinical phase

A. Existing clinical diagnostic methods for periodontitis can reflect its severity and previous periodontal destruction, but they fail to reflect its present state or allow monitoring and predict its progress.

By contrast, **periodontitis-related biomarkers** can indicate current disease conditions and evaluate treatment effects and future risk. Regarding periodontitis, peri-implantitis and cardiovascular diseases oral fluid and serum MMP-8 analysis has proved to an objective biomarker that has been evaluated and confirmed as an indicator of health, pathologic processes and pharmacologic response to therapeutic intervention.

C=reactive Protein levels and Interleukin factors are all considered biomarkers for inflammatory predisposition and response gradients however as of August 2018, there are

no [FDA-approved salivary diagnostic tests for evaluating risk of periodontal disease](https://www.ada.org/en/member-center/oral-health-topics/salivary-diagnostics), dental caries, or head and neck cancer approved.

Assessments should include however the patients risk factors, noting whether they are modifiable or not

Ie genetics, history of perio.

Keep in mind patients should not be stratified according to one or two risk factors but the whole picture must be incorporated.

# Treatment planning/strategies incorporating the patient’s classification – Questions to consider

1. We now have a classification – what does that mean?
2. How will we approach differently? Will we approach differently?
3. How does this new classification system change our thought process and why?

**Treat their disease early, aggressively and purposefully-**

* 1. **Focus on their individual stage and grade and what that means to them -**
  2. **Nonsurgical Periodontal Therapy – It’s the right thing to do**

*A 2015 evidence-based clinical practice guideline (CPG) from the American Dental Association found scaling and root planning (SRP) the treatment of choice for the initial nonsurgical treatment of chronic periodontal disease.*

*A review of more than 72 research*

*articles showed that* ***SRP improves clinical attachment levels.***

*SRP is both safe and effective and is still the*

*gold standard for the removal of subgingival biofilm and calculus.*

*Studies found that in pockets of 4mm- 6mm,*

*SRP resulted in 0.4 mm more clinical attachment gain than surgical therapy. In pockets greater than 6 mm, surgical treatment demonstrated 0.2 mm more attachment gain than SRP.*

*Finally, studies consistent demonstrate that nonsurgical therapy reduces inflammation and pocket depth and increases clinical attachment level.*

*Smiley, Christopher J. et al.*

*The Journal of the American Dental Association, Volume 146 , Issue 7 , 525 – 535*

# Home care strategies and the importance of maintenance and evaluation reflecting the stage/grade of the patient in response to therapy -

* Focus on Education
* Consider the patients classification Stage & Grade

1. Expressing what it means to be a stage one, stage two, three etc.

Discuss their history of perio and the maintenance that is needed to monitor judiciously so that the stage does not get worse – ***they must own that responsibility***

1. Expressing what the grade means and ways to *improve one’s grade*

Discuss modifying risk factors that will accelerate the progression of ***their*** disease

* Consider their susceptibility, saliva condition and their current homecare regimens -
  1. Could they benefit from a **power brush? Implant head?**
  2. Do they need ACP/xerostomia solutions? **Enamelon? Biotene?**
  3. What are they using interproximimally? Are there implants to consider?
  4. Do they understand their biofilm accumulation challenges? ***Plaque HD, Smart Power Brush***

# References –

**Useful Electronic links**

[**https://www.perio.org/2017wwdc**](#_bookmark0)

[https://](https://www.perio.org/sites/default/files/files/2017%20World%20Workshop%20on%20Disease%20Classification%20FAQs.pdf)[www.perio.org/sites/default/files/files/2017%20World%20Workshop%20on%20Disease%20Classificatio](http://www.perio.org/sites/default/files/files/2017%20World%20Workshop%20on%20Disease%20Classificatio) n%20FAQs.pdf

[https://www.waterpik.com/oral-health/pro/education/pdf/Waterpik\_Perio\_CE\_Course.pdf](http://www.waterpik.com/oral-health/pro/education/pdf/Waterpik_Perio_CE_Course.pdf)

[https://www.perioimplantadvisory.com/articles/2018/11/clinical-applications-for-the-2018-classification-](https://www.perioimplantadvisory.com/articles/2018/11/clinical-applications-for-the-2018-classification-of-peri-implant-diseases-and-conditions.html)of- [peri-implant-diseases-and-conditions.html](https://onlinelibrary.wiley.com/toc/19433670/2018/89/S1)

[https://onlinelibrary.wiley.com/toc/19433670/2018/89/S1](https://www.perio.org/sites/default/files/files/Staging%20and%20Grading%20Periodontitis.pdf) [https://www.perio.org/sites/default/files/files/Staging%20and%20Grading%20Periodontitis.pdf](https://www.cell.com/trends/biotechnology/fulltext/S0167-7799(18)30148-3) [https://www.cell.com/trends/biotechnology/fulltext/S0167-7799(18)30148-3](http://www.cell.com/trends/biotechnology/fulltext/S0167-7799(18)30148-3)

**ADA.** Policy on Evidence-Based Dentistry. [Last retrieved on 2016 Jun 23]. Available

from[: http://www.ada.org/en/about-the-ada/ada-positions-policies-and-statements/policy-on-evidencebased-dentistry .](http://www.ada.org/en/about-the-ada/ada-positions-policies-and-statements/policy-on-evidence-based-dentistry)

**Albandar JM, Susin C, Hughes FJ.** Manifestations of systemic diseases and conditions that affect the periodontal attachment apparatus: case definitions and diagnostic considerations. J Clin Periodontol.

2018;45(Suppl 20):S171–S189.

**Araujo MG, Lindhe J.** Peri-implant health. J Periodontol. 2018;89(Suppl 1):S249–S256.

**Armitage GC.** Development of a classification system for periodontal diseases and conditions. Ann Periodontol. 1999; 4(1): **Berglundh T, Armitage G, Araujo MG, 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. J Periodontol. 2018;89(Suppl 1):S313–S318.

**Caton JG**. A new classification scheme for periodontal and peri-implant diseases and conditions- introductions and key changes from the 1999 classification. J Periodontol. 2018; 89 (Suppl 1):S1–S8.

**Cortellini P, Bissada NF.** Mucogingival conditions in the natural dentition: narrative review, case definitions, and diagnostic considerations. J Periodontol. 2018;89(Suppl 1):S204–S213.

**Drisko CL.** Periodontal debridement: Still the treatment of choice. J Evid Base Dent Pract 2014; I 4S:33-41. <https://www.ncbi.nlm.nih.gov/pubmed/24929587>

**Fine DH, Patil AG, Loos BG.** Classification and diagnosis of aggressive periodontitis. J Periodontol. 2018;89(Suppl 1):S103–S119.

**Fan J, Caton JG.** Occlusal trauma and excessive occlusal forces: narrative review, case definitions, and diagnostic considerations. J Periodontol. 2018;89(Suppl 1):S214–S222.

**Heitz-Mayfield LJA, Lang NP.** Surgical and nonsurgical periodontal therapy. Learned and unlearned concepts. Periodontology 2000 2013; 62:218-231. https://onlinelibrary.wiley.com/ doi/abs/10.1111/prd.12008

**Jepsen S, Caton JG, Albandar JM, et al**. 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. J Periodontol. 2018;89(Suppl 1):S237–S248.

**Murakami S et al.** Dental plaque-induced gingival conditions. J Periodontol. 2018;89 (Suppl 1):S17–S27.

**Papapanou PN, Sanz M, Buduneli N, et al.** Periodontitis: consensus report of workgroup 2 of the 2017

World Workshop on the Classification of Periodontal and Peri-Implant Diseases and Conditions. J Periodontol. 2018;89(Suppl 1):S173–S182.

**Renvert S et al**. Peri-implant health, peri-implant mucositis, and peri-implantitis: case definitions and disgnostic considerations. J

Periodontol. 2018;89(Suppl 1):S304–S312.

**Stefan RG et al.** Perimplant health, perimplant mucositis, and periimplantitis: Case definitions and diagnostic considerations, J Periodontol 2018 ; 89, S1, (S304-S312).

**Schwarz F, Derks J, Monje A, Wang HL.** Peri-implantitis. J Periodontol. 2018;89(Suppl 1):S267–S290.

Sorsa et al. Oral Dis 2004, Sorsa et al. Ann Med 2006, Tuomainen et al. ATVB 2007, Reinhardt et al. J Periodontol 2010

**Tonetti MS, Greenwell H, Kornman KS**. Staging and grading of periodontitis: framework and proposal of a new classification and case definition. Periodontol. 2018;89(Suppl 1):S159–S172.

**Smiley CJ, Tracy SL, Abt E, Michalowicz BS et al**. Evidence-based clinical practice guideline on the nonsurgical treatment of chronic periodontitis by means of scaling and root planning with our without adjuncts. J Am Dent Assoc 2015; 146(&): 525-535. https:/[/w](http://www.ncbi.nlm.nih.gov/pubmed/26113100)w[w.ncbi.nlm.nih.gov/pubmed/26113100](http://www.ncbi.nlm.nih.gov/pubmed/26113100) References 10

**Suvan** JE. Effectiveness of mechanical nonsurgical pocket therapy. Periodontology 2000 2005; 37:48-71. https://onlinelibrary.wiley.com/doi/abs/10.1111/j.1600-0757.2004.03794.

**Websites:**

ADA - <https://ebd.ada.org/en>

Bonebox Lite Anatomy APP - <https://appadvice.com/app/bonebox-dental-pro/1186342618>

AAP - <https://perio.org/2017wwdc?_ga=2.30613754.474969781.1540905661-1560784162.1537446744>

Codeology - <https://dentalcodeology.com/>

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Premier Dental Products - [www.premierdentalco.com](http://www.premierdentalco.com)