

Call To Review How Staging Periodontitis using the 2017 Classification of Periodontal and Peri-Implant Diseases and Conditions: Suggestions for Modifications and Improvements to Help Clinicians in the Decision-Making Diagnosis

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The new Classification of Periodontal and Peri-implant Diseases and Conditions was published in 2018, bringing many changes and challenges when compared to the previous of 1999.¹ It was produced from the efforts of the American Academy of Periodontology and the European Federation of Periodontology at the 2017 World Workshop and can be considered one of the most complete classifications.²

Focusing on periodontitis, the new classification system introduced staging and grading parts, which brought multiple levels of assessment.³ Specifically, staging evaluates:¹ Severity, observing the interdental clinical attachment loss (CAL) at the site of greatest loss, radiographic bone loss (RBL), tooth loss due to periodontitis.² Complexity, analyzing probing depth (PD), bone loss pattern (horizontal/vertical), furcation involvement, ridge defects, and the need for complex rehabilitation due to masticatory dysfunction, secondary occlusal trauma, bite collapse, drifting, or flaring, and³ extent and distribution, localized (< 30% teeth), generalized (≥ 30% teeth), or molar-incisor distribution.⁴ Thus, the staging process can be summarized as:

Stage I

- Severity: CAL ≤1–2 mm, RBL at the coronal third of the root (<15%), and no tooth loss due to periodontitis.
- Complexity: PD ≤4 mm, mostly horizontal bone loss.

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Stage II

- **Severity:** CAL between 3–4 mm, RBL at the coronal third of the root (between 15-33%), and no tooth loss due to periodontitis.
- **Complexity:** PD $\leq$ 5 mm, mostly horizontal bone loss.

Stage III

- **Severity:** CAL $\geq$ 5 mm, RBL extending to the middle third of root and beyond, and loss of $\leq$ 4 teeth due to periodontitis.
- **Complexity:** PD $\geq$ 6 mm, horizontal bone loss, and may have vertical bone loss; may have furcation involvement of class II or III.

Stage IV

- **Severity:** CAL $\geq$ 5 mm, RBL extending to the middle third of root and beyond, there is the potential for loss of $\geq$ 5 teeth due to periodontitis.
- **Complexity:** PD $\geq$ 6 mm, horizontal bone loss and may have vertical bone loss, may have furcation involvement of class II or III, need for complex rehabilitation (masticatory dysfunction, secondary occlusal trauma, bite collapse, drifting, flaring, severe ridge defects, $<$ 20 teeth may be present or less than 10 opposing pairs).

Therefore, the professionals are still digesting and undergoing the process of adaptation to this new system; some “gray zone” cases have been detected for Periodontitis, which may produce uncertain clinical scenarios.⁵ The complaints raised involve difficulties in determining the stage of periodontitis due to the existence of many clinical and radiographic parameters.⁶ Then, some strategies have been studied and published to simplify the diagnosis process and minimize confusion and inconsistent diagnoses.⁶⁻⁸ However, the flowcharts developed brought questions and concerns regarding some points, e.g., considering “tooth loss” as the primary criterion for the severity of periodontitis⁷ or mixing classifications.⁸

Nevertheless, the correct assessment for staging periodontitis has still raised a high level of concern. Thereby, this editorial intends to propose/suggest adjustments in the stage step to the diagnosis of periodontitis, bringing reflection, better organization, and facilitating the clinical application.

Suggestions for Modification and Improvements

1. The new classification for periodontitis recommends shifting the stage found by analyzing SEVERITY whether a stage-shifting COMPLEXITY factor(s) was detected. Indeed, applying this methodology can reflect in a non-real scenario of the periodontitis case. Then, the first recommendation for observation and change is that: no one of the COMPLEXITY factors should shift the stage in periodontitis and surpass the SEVERITY primarily found (CAL [1st], RBL [2nd], and TLP [3rd]); the only exception is for complexity factors found in Stages III and IV that can permit interchangeability for those Stages (III or IV) initially obtained through the severity factors.

Shifting Upwards or Downwards

Currently, it is considered (a) if any complexity factor is eliminated after periodontal treatment, the stage initially detected should not retrogress to a lower stage; this fact is due to the original complexity factor previously found.⁴ Therefore, once again, this fact can permit a non-real scenario. Then, we suggest that if the severity parameters were kept stable for 12 months, a new diagnosis must be obtained, even if it is shifting downwards. Otherwise, (b) if a patient had a significant disease progression after treatment, increasing the severity and/or more complex treatment needs, the stage must be shifted upwards at the time of the subsequent examination. We agree with this posture and support keeping this upward decision.

Severity in Staging Periodontitis

Three parameters are observed in severity: CAL, RBL (%), and tooth loss due to periodontitis (TLP). Analyzing the literature, there is confusion in defining the severity. Some authors support analyzing TLP first,⁷ contradicting the new classification system, which recommended CAL and RBL for the initial assessment. TLP, as the first parameter, may generate a non-precise result because of the possible unknown or non-precise reason for the cause of tooth loss. CAL is a more firmly established parameter to identify periodontitis with greater accuracy.⁴ According to some authors,⁹ TLP was totally correlated to stages III and IV. This fact shows this parameter is highly important only to decide the severity between those stages (III or IV). In addition, if the patient is qualified for Stage III or IV (CAL ≥ 5 mm and RBL extending to the middle third of the root and beyond) but without any TLP or tooth due to another reason, the patient must be diagnosed as Stage III (following the classification).

Observing this third point approached, our suggestions are: (a) it is mandatory to respect the sequence CAL (2 non-adjacent sites between 2 teeth; or buccal/oral/vestibular/facial CAL ≥ 3 mm with PD > 3 mm at ≥ 2 teeth), RBL, and TLP to diagnose the case, where RBL and TLP never can overcome CAL, and TLP never can overcome RBL; (b) must be included "May have no tooth loss" for Stage III; (c) must be removed "no tooth loss due to periodontitis" of Stages I and II, which may have or may not have TLP.

Furcation

it is known that the mean root trunk length is 4.31 mm (minimum of 3mm [short] and maximum of 8 mm [long]).¹⁰ This result helps clinicians to find better decision-making during the management of periodontal disease conditions. Currently, only furcation II and III are considered this parameter for Stages III and IV. Therefore, observing peculiarity in some cases due to the short root trunk, it is possible to have furcation involvement II in Stage II. Thus, we suggest modifications following: Stage I (no Furcation involvement, as previously defined); Stage II (may have Furcation class I or II involvement); and Stages III and IV (may have or not have any Furcation involvement).

Probing Depth (PD)

many clinicians use this parameter as a primary criterion to define periodontitis because it can be easily obtained.⁷ Therefore, it can be a primary factor of evaluation but not to define periodontitis diagnosis. We strongly recommend reaching out to CAL in order to work correctly. The PD recommended for Stages I and II, respectively, was ≤ 4 mm and ≤ 5 mm, which must be kept. However, Stages III and IV consider PD ≥ 6 mm; for these two worst stages, we suggest to consider the presence of any PD. It is based on the possibility of multiple CAL ≥ 5 mm with generalized recession and PD lower than 6 mm for all remnant teeth.

Mobility

it was not directly considered among the complexity factors. Therefore, we suggest including it in Stage II (mobility 1), Stage III (mobility 1 and 2), and Stage IV (any mobility). A tooth with mobility 3 is considered hopeless, and even though it was suggested to be included in Stage IV, it can be more adequately used as a hopeless tooth (TLP).

Bite Collapse, Drifting, and Flaring

There is confusion in the literature using these parameters. The initial idea of their presence was correlated to the absence of teeth (≥ 5 teeth), which caused a need for complex rehabilitation. If patients have no tooth loss or TLP of ≤ 4 teeth (without a need for complex rehabilitation) presenting any type of drifting or flaring, with CAL ≥ 5 mm and RBL extending to the middle third of the root and beyond, it cannot be a justification for changing the diagnosis from Stage III to Stage IV.

Summarization

Unquestionably, the new Classification system is one of the most interesting evolutions. Nevertheless, observing the difficulty around the world in staging periodontitis, this editorial letter intends to raise a

discussion and bring topics for debate to facilitate and improve its use in the clinic. It is resumed and a full-text explanation can be consulted for more clarifications.¹¹ Summarizing, we are presenting Figure 1, with all suggestions for modification and sequence to be followed in order to achieve an easy and rational application to diagnose periodontitis.

PERIODONTITIS: STAGING

Sequence of Assessment		Periodontitis	Checklist	Stage I	Stage II	Stage III	Stage IV
1 st	Severity	Interdental CAL (at site of greatest loss)	☐	1 – 2 mm	3 – 4 mm	≥5 mm	≥5 mm
2 nd		RBL	☐	Coronal third (<15%)	Coronal third (15% - 33%)	Extending to middle third of root and beyond	Extending to middle third of root and beyond
3 rd For decision between Stage III or IV		Tooth loss or planned to be extracted (due to periodontitis) Hopeless tooth (mobility class 3)	☐	May have tooth loss		May have no tooth loss or ≤4 teeth	≥5 teeth
4 th	Complexity	Local	☐	Maximum PD ≤ 4 mm (without recession) or PD-GM=1 or 2mm	Maximum PD ≤5 mm (without recession) or PD-GM=3 or 4mm	Any PD	Any PD
5 th			☐	Mostly horizontal bone loss	In addition to Stage II: - May have any class of Furcation involvement - May have vertical bone loss involvement - May have tooth mobility class 1 or 2 - Moderate ridge defects	In addition to Stage III: - May have any class of tooth mobility Need for complex rehabilitation due to: - Masticatory dysfunction - Secondary occlusal trauma (tooth mobility degree ≥2) - Bite collapse, drifting, flaring - May have < 20 remaining teeth (10 opposing pairs) - Severe ridge defects	
6 th	Extent and distribution	Add to stage as descriptor	☐	For each stage, describe extent as: • Localized (< 30% of teeth involved); or • Generalized (≥ 30% of teeth involved); or • Molar/incisor pattern			

Green background = new boxes included; Blue letters = modifications.

Only complexity factors from Stages III and IV can change the initial Stage obtained through severity factors (red lines and arrows).

Fig. 1: Summarization of the Staging proposed by the new classification with suggested modifications. It is important to highlight that the sequence recommended must be cumulatively followed. It is suggested the complexity factors should never overcome the severity factors in order to change the Stage. The exception must be considered only for complexity factors between Stages III and IV that can have interchangeability if the initial Stage III or IV was obtained through severity factors (red lines and arrows).

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