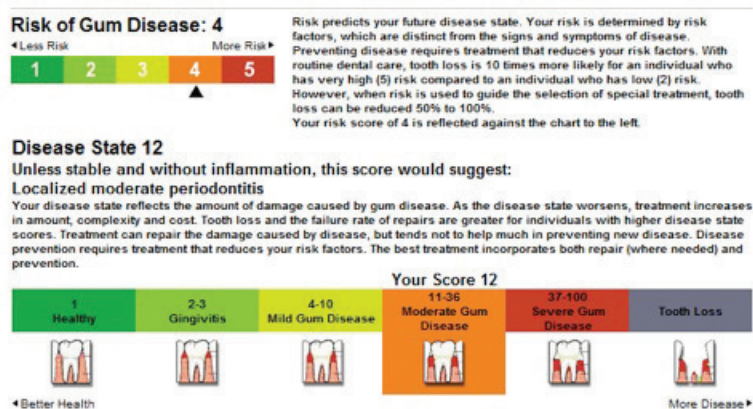


## Avoiding periodontitis complications—and contributing to the development of a diagnostic tool

*John A Martin explains why orthodontists need to screen patients for periodontal disease and address any problems immediately, and invites orthodontists to participate in testing a new tool*



Periodontitis may develop or progress at a faster rate than usual during orthodontic treatment, especially for a patient 30 years of age or older. If discovered during or at the conclusion of orthodontic treatment, periodontitis may require therapeutic interventions not planned for or discussed at the initial orthodontic consult. This can result in an alarmed patient inclined to blame the orthodontist and general dentist, which may damage professional reputations and relationships or worse. For the patient, straightened teeth that are affected by disease are not a satisfactory result.

It might seem natural to assume that periodontitis is unlikely to occur or be exacerbated during orthodontic treatment. After all, a national health survey reported that only 35% of adults 30 years of age or older had periodontitis in the United States during the sample period that began in 1988 and ended in 1994.<sup>1</sup> Furthermore, periodontitis typically progresses very slowly<sup>2</sup> so that during an orthodontic treatment period of 2 to 3 years, the orthodontist might assume that periodontal status is unlikely to noticeably worsen, especially since irreversible periodontal lesions rarely affect the more commonly treated adolescent patient. While this may appear to be comforting information, the data from the US national survey indicates that 60% of the adult population is at risk for periodontitis,<sup>3</sup> and a sampling in 2009 of 36 general dental practices distributed throughout the United States by PreViser Corporation revealed that 52% of more than 18,000 adult patients presented with mild-to-severe periodontitis. This information is indicative that the odds are at least 50-50 that an adult orthodontic patient has periodontitis, with even higher

odds that some patients not currently presenting with the disease will develop the disease. The higher odds that periodontitis will affect an adult orthodontic patient is because poor oral hygiene, abnormal occlusal forces, tooth malposition and crowding,<sup>4</sup> which are common for orthodontic patients, are also risk factors for periodontitis. These factors may be amplified by orthodontic appliances and the movement of teeth resulting in the very rapid development of periodontal pockets that will later require therapeutic treatment.

The situation where an adult orthodontic patient is surprised to learn after orthodontic treatment begins that periodontal treatment is suddenly needed can be avoided. To reduce the possibility of these surprises, the periodontal status of an adult patient should be evaluated before treatment begins and periodically during orthodontic treatment. If periodontitis is diagnosed, then periodontal therapy should be considered before beginning or continuing orthodontic treatment. The periodontal diagnosis should include a summary of disease risk and severity, and their change over time. If periodontal treatment is indicated, essential information includes the periodontal prognosis, the effect of periodontal treatment on orthodontic treatment, and how orthodontic treatment can continue without the recurrence of periodontitis.

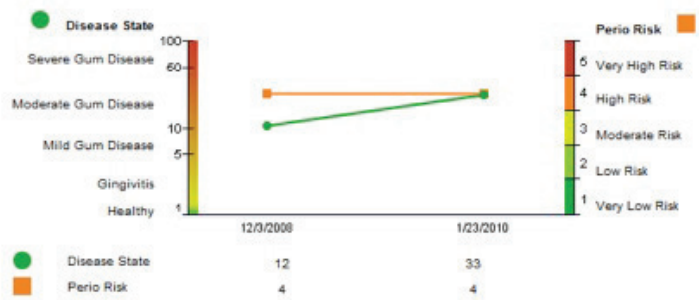
While an orthodontist is trained in dental school to diagnose periodontal disease, it may be impractical for an orthodontist to assume the responsibility for this task since his or her experience in the current diagnostic methods and treatment related to periodontitis is typically not part of orthodontic care. Delegating the entire responsibility to the general dentist may be prudent, but impractical. For instance, it has been reported that a general dentist may underestimate the risk for periodontal disease<sup>5</sup> and defer referring to a periodontist until the disease has progressed to the severe stage.<sup>6</sup> Another choice is to refer to a periodontist. This may frequently be appropriate, as a periodontist has specialized training and the daily practical experience to provide care that creates excellent results.<sup>7</sup> In many cases, however, this choice may be impractical because the severity for most patients with periodontitis is low<sup>1</sup> and the treatment needs are not complex. These patients may not need the services of a periodontist as adequate periodontal care could be expected to be provided by the general dentist.

## Diagnostic tools

A practical way for an orthodontist to identify periodontal disease risk and severity, as well as monitor on-going periodontal status during orthodontic treatment, has been developed by PreViser Corporation (available at [www.previser.com](http://www.previser.com)). This software technology provides an accurate and valid description of periodontitis risk and severity using easy-to-understand 1-to-5 and 1-to-100 scores, respectively. The periodontal risk and disease scores are presented and explained as part of a report prepared specifically for the patient (Figure 1). Furthermore, the report for a subsequent assessment includes a graph that clearly shows score changes over time (Figure 2). The report describes relevant information and provides a document to inform a patient about his or her periodontal status. Using PreViser before orthodontic treatment begins, every 2 to 6 months during treatment, and 1 year after active orthodontic treatment, provides a reliable means for the orthodontist and patient to be apprised of periodontal status during the entire course of orthodontic treatment and hence prevent any surprises related to worsening periodontal status associated with orthodontic treatment. This approach may be expected to have a beneficial effect on avoiding legal claims related to charges of periodontal deterioration due to orthodontic treatment.<sup>8</sup>

Oversight of a periodontal diagnosis and treatment by the orthodontist can be done using the PreViser risk and disease scores. For example, the risk score is predictive of future periodontal status and is used to determine a recommended frequency and intensity of preventive interventions. A high-risk patient should receive preventive treatment and an evaluation more often (e.g., every 2 to 3 months) than a low-risk patient (e.g., every 6 months). The disease score describes the severity of periodontal disease and the extent to which the dentition is affected (Table 1).<sup>3</sup> A disease score that on a subsequent assessment is higher indicates that periodontal status has worsened, which may be indicative that periodontal treatment needs to be instituted or the course of orthodontic treatment changed.

The PreViser software requires input of clinical information about pocket depth and radiographic bone loss that may or may not be practical for the orthodontist to acquire because measuring periodontal pockets can be challenging and time consuming. Additionally, the radiographs needed to measure bone loss may not be available from the general dentist or part of the orthodontic diagnostic records. Two additional methods that reduce and simplify the requisite clinical observations of the periodontium are in development by PreViser. These methods provide a quick and easy way for the orthodontist to estimate a patient's risk for periodontal disease and determine the need for a comprehensive periodontal examination. These tools are currently in testing, and PreViser is soliciting the involvement of orthodontists in evaluating the utility



**Table 1: Periodontal severity score description**

| Periodontal Disease Severity | Periodontal Disease Score Range | Description   |
|------------------------------|---------------------------------|---|
| Healthy                      | 1                               | No sextant has gingivitis or periodontitis  |
| Gingivitis                   | 2 to 3                          | At least 1 sextant has gingivitis, no sextant has periodontitis, but a sextant may be healthy   |
| Mild periodontitis           | 4 to 10                         | At least 1 sextant has mild periodontitis, no sextant has moderate or severe periodontitis, but a sextant may be healthy or have gingivitis                 |
| Moderate periodontitis       | 11 to 36                        | At least 1 sextant has moderate periodontitis and no sextant has severe periodontitis, but a sextant may have mild periodontitis, gingivitis, or be healthy |
| Severe periodontitis         | 37 to 100                       | At least 1 sextant has severe periodontitis and a sextant may have mild periodontitis, moderate periodontitis, gingivitis, or be healthy                    |

of these simplified tools. Orthodontists interested in participating in the evaluation and testing of these new tools are encouraged to contact PreViser Corporation at [ortho@previser.com](mailto:ortho@previser.com).

With advances in orthodontic techniques, many adults are now seeking the benefits of a more attractive smile. These patients need not be disappointed in their results with improved and more rigorous methods of measuring their periodontal status during their course of orthodontic treatment.

**John A. Martin, DDS**, received his dental degree from Temple University (1973) and specialty certificate in Periodontics from Boston University (1975). He has been in private practice limited to periodontics in State College, Pa, since 1975. He is a founder of PreViser Corporation, Mt. Vernon, Wa, and its Chief Science Officer. Dr Martin has authored (or co-authored) 9 peer-reviewed publications. He is also a practitioner-investigator with the PEARL (Practitioners Engaged in Applied Research and Learning) network, a practice-based research network (PBRN) sponsored by National Institute for Dental and Cranofacial Research (NIDCR) and hosted by New York University. He can be reached at [johnm@previser.com](mailto:johnm@previser.com) or 814-574-7607.

## SIDEBAR TO AVOIDING PERIODITIS COMPLICATIONS

Validating the periodontal challenge in orthodontic patients

Laurance Jerrold DDS, JD, ABO

Dr Martin presents the orthodontic community with a novel approach to dealing with a longstanding problem. From a risk management perspective, periodontal complications have been continuously ranked as one of the top three reasons for orthodontic malpractice actions. They usually present themselves in one of the following scenarios. First, is the situation where the adult patient presents with underlying periodontal disease that was not initially diagnosed prior to initiating orthodontic treatment and, therefore, was not treated or followed appropriately, and worsens throughout treatment until the patient suffers either an irreversible injury or one requiring extensive corrective treatment.

The second scenario occurs in situations involving impacted canines that are removed surgically, resulting in significant damage to adjacent teeth often involving the supporting hard and soft tissue structures. Again, tooth loss and or significant corrective surgical therapy is required.

The third most common periodontal complication associated with orthodontic treatment is the situation wherein the orthodontist is engaging in non-extraction therapy, often at the behest of the patient, and through various forms of arch development interventions, winds up sacrificing the labial supporting hard and/or soft tissues. Once again, periodontal surgical correction, sometimes with accompanying tooth loss, is the clinical sequela.

Finally, the last scenario, similar to our first, involves supervised neglect of the periodontal status of a patient during his or her treatment. In this case the periodontal status may have been adequate at the initiation of treatment but over time, with plaque accumulation around the orthodontic hardware, and the microtrauma induced from orthodontic tooth movement, the periodontal tissues go south; and, over time there is a periodontal “horrendenoma” in the making. Very often, the orthodontist expects the general dentist to be monitoring the patient’s periodontal status, the general dentist expects the orthodontist to be doing it, the patient doesn’t care as long as someone is doing it, and the reality is that no one is doing it.

PreViser appears to have a rational approach toward helping the practitioner diagnose and monitor their patients’ periodontal status during orthodontic treatment. Whether what is being proposed is reasonable in the clinical setting remains to be seen. Questions regarding what will be required in terms of armamentarium, records acquisition, chair time, expertise, cost, etc., are the issues that need to be explored before anything amounting to the development of a standard of care can be established. I for one, as a practitioner and educator for more than 30 years, welcome the exploration and development of every potential product or service that has the potential to provide our patients with better care. Dr Martin has indicated that for orthodontics, “two additional methods that reduce and simplify the requisite observations of the periodontum are in development.” He also notes that PreViser “is soliciting the involvement of orthodontists in evaluating the utility of these simplified tools.”

To me, this seems to be a no-brainer. I can’t wait for the Clinical Research Fellows at Jacksonville University School of Orthodontics to take a crack at this, see what’s involved, and do whatever we can to aid in the development of any product that can ultimately aid our profession in rendering better care to the public we serve. How about you? Anybody else ready to step up to the plate? From what I’ve read, it seems that this is a perfect practice-based research opportunity.

*Dr Jerrold is the Dean and Program Director of the Jacksonville University School of Orthodontics. He can be reached at (904) 256-7852 or at [ljerrold@ju.edu](mailto:ljerrold@ju.edu). *

### References

1. Albandar JM, Brunelle JA, Kingman A. (1999) Destructive periodontal disease in adults 30 years of age and older in the United States, 1988-1994. *J Periodontol* **70(1)**:13-29.
2. Goodson JM, Tanner AC, Haffajee AD, Sornberger GC, Socransky SS. (1982) Patterns of progression and regression of advanced destructive periodontal disease. *J Clin Periodontol* **9(6)**: 472-481.
3. Page RC, Martin JA. (2007) Quantification of periodontal risk and disease severity and extent using the oral health information suite (OHIS). *Periodontol Pract Today* **4(3)**:163-180.
4. Nunn ME. (2003) Understanding the etiology of periodontitis: an overview of periodontal risk factors. *Periodontol 2000* **32**: 11-23.
5. Persson GR, Mancl LA, Martin J, Page RC. (2003) Assessing periodontal disease risk: a comparison of clinicians’ assessment versus a computerized tool. *J Am Dent Assoc* **134(5)**: 575-582.
6. Cobb CM, Carrara A, El-Annan E, Youngblood LA, Becker BE, Becker W, Oxford GE, Williams KB. (2003) Periodontal referral patterns, 1980 versus 2000: a preliminary study. *J Periodontol* **74(10)**: 1470-1474.
7. Martin JA, Page RC, Loeb CF, Levi PA Jr. Tooth loss in 776 treated periodontal patients. *J Periodontol* 2010; in press.
8. American Association of Orthodontists. The Bulletin 2001; 19.