American Academy of Periodontology Statement on the Efficacy of Lasers in the Non-Surgical Treatment of Inflammatory Periodontal Disease*

The American Academy of Periodontology (AAP) periodically publishes reports, statements, and guidelines on a variety of topics relevant to periodontics. These papers are developed by an appointed committee of experts, and the documents are reviewed and approved by the AAP Board of Trustees.

linical application of lasers for the treatment of periodontal disease has continued to expand since their introduction for this purpose in the early 1990s¹⁻⁹ but remains controversial. The primary purpose of this statement is to provide an evidence-based perspective on three of the purported benefits of using lasers in the nonsurgical treatment of periodontal disease, i.e., sulcular and/or pocket debridement (a.k.a. laser curettage), reduction of subgingival bacterial loads (a.k.a. pocket sterilization), and scaling and root planing (SRP).

LASER-MEDIATED SULCULAR AND/OR POCKET DEBRIDEMENT

If one considers the clinical parameters of reductions in probing depth or gains in clinical attachment level, the dental literature indicates that when used as an adjunct to SRP, mechanical, chemical, or laser curettage has little to no benefit beyond SRP alone. 10-17 The available evidence consistently shows that therapies intended to arrest and control periodontitis depend primarily on effective debridement of the root surface and not removal of the lining of the pocket soft tissue wall, i.e., curettage. 18,19 Currently, there is minimal evidence to support use of a laser for the purpose of subgingival debridement, either as a monotherapy or adjunctive to SRP. 10-22

REDUCTION OF SUBGINGIVAL BACTERIAL LEVELS

Current evidence shows lasers, as a group, to be unpredictable and inconsistent in their ability to reduce subgingival microbial loads beyond that achieved by SRP alone. ¹⁰⁻¹⁷ Further, this conclusion also appears to apply to the use of photodynamic therapy (PDT), either as a monotherapy or adjunctive to SRP.²³ At

best, the evidence is lacking or conflicting. For example, of the 10 published clinical trials, only two showed PDT to be effective in reducing subgingival microbial loads, four reported no difference, and four did not measure reductions in microbes.¹⁷

SCALING AND ROOT PLANING

Erbium lasers show the greatest potential for effective root debridement (SRP). The Er:YAG laser has been shown, in vitro, to remove calculus ¹² and to negate endotoxin. ^{12,15,24,25} There is the potential for root surface damage during the process of in vivo calculus removal since the Er:YAG is a hard tissue laser and the operator would not be able to visualize what is being lased. Clinical data on attachment level changes when compared to SRP alone are conflicting, with some studies showing a slight benefit while others show no benefit. Further study is needed to determine if laser-assisted SRP has a beneficial effect.

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