

# Impact of Smoking Cessation on Periodontal Status and Treatment Outcomes

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## INTRODUCTION

The majority of studies investigating the effects of smoking cessation on periodontal disease acknowledge the benefits of giving patients smoking cessation advice and that smoking cessation may result in a long term benefit to the periodontal condition.<sup>1</sup>The implementation of population based smoking cessation program may also have a significant impact on the prevalence and progression of periodontal diseases.<sup>2</sup>The evidence to confirm unequivocally and scientifically the benefit of quitting smoking on patients with periodontal disease is however, sparse and several authors have expressed concern for this lack of evidence.<sup>3,4,5</sup>

Haber J et al (1992) found that current and former cigarette smoking is significantly more prevalent in a periodontal practice population of patients with moderate and advanced periodontitis.<sup>6</sup>The findings are consistent with the results of Ismail et al who reported that former smokers had poorer periodontal health than nonsmokers.<sup>6</sup>

- These findings support the hypothesis that the biological effects of cigarette smoking remain for a period of time after the cessation of smoking.
- Former smokers possess fewer deep sites than current smokers suggesting that smoking cessation is beneficial to periodontal health.

Bergstrom J et al (1991) found that loss of bone height was less pronounced in former smokers than current smokers suggesting that influence on bone loss ends when smoking is stopped.<sup>7</sup>

Bolin et al (1993) reported results from a 10-year radiographic follow-up study of alveolar bone loss and found that the progression of bone loss was significantly retarded in those who had quit smoking during the study compared with continual smokers.<sup>8</sup>

Kaldahl WB et al (1996) found that past smokers exhibit greater probing depth reduction and greater improvement of clinical attachment level than nonsmokers, although not statistically significant.<sup>9</sup>

It may be attributed to greater initial periodontal destruction in past smokers as compared to nonsmokers considering that cigarette smoke is a risk factor for periodontal destruction. Sites with deeper probing depths experience greater reductions of probing depth and greater gain of probing attachment following therapy.

Past smokers responded better to periodontal therapy than heavy or light smokers and much like nonsmokers indicating that smoking cessation allows wound healing to proceed unimpeded.

Grossi SG et al (1997) compared three study groups smokers, non smokers and quit smokers, with comparable level of attachment loss at baseline.<sup>10</sup> Over a period of three months four to six sessions of scaling and root planing were performed and it was concluded that:

- Current smokers showed less reduction in probing depth and gain in clinical attachment level compared to former smokers and non smokers after similar periodontal therapy. Preber and colleagues (1995) also reported less favorable clinical outcome for non surgical therapy in smokers compared to non smokers.<sup>11</sup>

- There was no association between number of years since cessation of smoking and changes in mean probing depth or clinical attachment level in former smokers suggesting that there is an early benefit of smoking cessation in terms of periodontal treatment outcome. Relevance of this finding in clinical practice is that:
- Smokers do not need to have stopped smoking for a long time to increase their chances of improved response to therapy. Rather merely ceasing to smoke before periodontal therapy increases the likelihood of better treatment outcome.

Reduced healing in current smokers was associated with the persistence of subgingival *P. gingivalis* and *B. forsythus* after mechanical debridement. Preber and colleagues (1995) found no difference in reduction of *P. gingivalis* between the groups as the size of their study population was less and only one subgingival site per patient was sampled for microbial analysis.<sup>11</sup>

Zambon J et al (1996) found that smokers are more likely than non smokers to be infected with *B. forsythus* and *P. gingivalis* and that there are quantitative and qualitative differences in the subgingival microflora of current smokers compared to former and non smokers. This is evidenced by the fact that a comparable proportion of former and non smokers patients became negative for *P. gingivalis* and *B. forsythus* after mechanical treatment.<sup>12</sup>

While smoking cessation does not reverse the past effects of smoking, there is abundant evidence that the rate of bone and attachment loss slows after patients quit smoking, and that their disease severity is intermediate to that of current and non-smokers. In the only longitudinal study to date, Preshaw et al (2005) have reported 12-month data from 10 subjects with periodontitis who had continuously quit smoking for the entire study period. The quitters demonstrated a significant reduction in probing depths compared with non-quitters as well as a higher incidence of probing depth reductions of  $\geq 2$  and  $\geq 3$  mm.<sup>13</sup>

Similarly, implant success rates for past smokers are similar to those for never smokers. The majority of implant failures occur prior to prosthesis delivery; therefore, smoking cessation during the healing phase should be beneficial. According to Bain, if patients quit smoking 1 week before and 8 weeks after implant placement, early implant failures were similar to non-smokers. Due to the highly addictive nature of nicotine, most patients will not be able to comply with a "cold-turkey" approach.<sup>14</sup>

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