

Episode 128 – Overview of Periodontal Therapy March 7, 2025

Introduction

Periodontal diseases are a major global health problem. In 2021, severe periodontal diseases were estimated to affect approximately 19% of the global adult population, representing more than one billion cases worldwide. It is projected that by 2050, more than 1.5 billion people will have severe periodontitis. [1] [2]

Periodontitis is characterized by progressive destruction of the periodontium, with the primary features of clinical attachment loss (CAL), radiographically assessed alveolar bone loss, periodontal pockets, and gingival bleeding. [3]

Periodontitis is a complex multifactorial disease, sharing many risk factors with other systemic noncommunicable diseases, such as age, dietary habits, tobacco use,[1] and alcohol consumption. Over 50 systemic conditions have been associated with periodontal disease, including atherosclerotic disease,[2] adverse pregnancy outcomes, diabetes,[3] metabolic syndrome, and inflammatory bowel diseases. [4] [5]

Despite its largely preventable nature, periodontitis is highly prevalent and imposes a substantial health and economic burden on individuals, families, and society. [4]

Oral diseases, including periodontitis, dental caries, and tooth loss, cost $710 billion USD worldwide in 2019. This total cost consists of direct treatment costs of $387 billion USD and indirect costs (i.e., productivity losses) of $323 billion USD. [6]

The global direct treatment costs for periodontitis were estimated at $104 billion USD, while productivity losses were estimated at $82 billion USD. When periodontitis-related tooth loss was considered, direct treatment costs amounted to $186 billion USD and productivity losses to $142 billion USD. [4]

The rising prevalence rates of periodontal diseases, coupled with the strong link between periodontitis and systemic conditions, further contribute to the economic burden of these diseases. [4]

[1] Refer to Episode 101 for discussion on tobacco use and cessation.
[2] Refer to Episodes 37, 79, 80, and 81 for discussion on cardiovascular disease and oral health.
[3] Refer to Episodes 91, 93, and 94 for additional information on diabetes and oral health.

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The human cost of periodontitis has traditionally been underappreciated, with the disease regarded as being a “silent disease,” since it is seldom associated with obvious signs and symptoms unless the disease has progressed to an advanced stage. [4]

Pierce et al. (2025) showed individuals generally have a limited understanding of their periodontitis diagnosis and treatment. Nearly 20% reported they did not know whether they had received a diagnosis of periodontitis, and approximately 14% did not know if they had undergone periodontal treatment. However, those who reported having periodontitis had a better understanding of what a periodontal pocket was, agreed smoking tobacco products could worsen the condition, and were more concerned about their teeth (e.g., esthetics, tooth loss, function, discomfort) than healthy participants. The findings suggest clinicians need to spend more time discussing periodontal diseases with their clients. [7]

Increasing attention to client-reported outcomes has demonstrated periodontitis negatively impacts quality of life, speech, nutrition, self-confidence, and overall well-being. [4]

Prevention and management of periodontal disease is critical. Several strategies to prevent and control periodontitis have been recognized, such as:

- Public health approach to improve health behaviours (e.g. public campaigns to reduce tobacco use and raise oral health awareness)
- Chairside advice and counselling to promote oral health
- Home-based oral self-care
- Clinical nonsurgical and surgical periodontal therapy [4]

In addition to improving periodontal health, preventing and managing periodontitis can also control and improve several chronic systemic diseases. [4]

Treatment guidelines

In 2018, the American Academy of Periodontology (AAP) published a new classification system for periodontal health, diseases, and conditions. The classification system was the outcome of a joint workshop held by the European Federation of Periodontology (EFP) and AAP in 2017. [8]

This classification system defines the stage and grade of the disease:

- Stage captures the severity, extent, and distribution of the disease, and the anticipated complexity of its management;
- Grade captures additional biological dimensions of the disease, including the observed and anticipated progression rate, predicted treatment outcomes, and the risk that the disease will adversely affect the client’s general health. [3]

In 2020, EFP published the first formal evidence-based guideline for periodontitis treatment to assist oral health practitioners in providing the best possible treatment. This

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guideline provides clinical recommendations to treat stage I-III periodontitis using four sequential steps.[4] [9] [10]

Step one:

- Reduce inflammation by motivating clients to adopt behavioural change, including good oral hygiene practices and a healthy lifestyle (e.g., smoking cessation, diabetes control).
- Provide professional removal of supragingival deposits:
    - Professional mechanical plaque removal can be completed by via toothbrushing, hand and/or power instrumentation, traditional polishing, and air polishing.[5]
    - Calculus removal via hand and/or ultrasonic or sonic instrumentation.
- Eliminate local biofilm retentive factors that impair oral hygiene practices.
- Client behavioural change should be implemented for all clients with periodontitis, irrespective of the stage of their disease.
- It is not known if increasing physical activity or reducing weight through dietary and lifestyle changes will have a positive impact on periodontal therapy. [10] [11] [12]

Step two:

- Provide professional subgingival debridement (hand and/or powered instrumentation) performed in traditional quadrant or full mouth delivery within 24 hours, typically with local anesthetic.
- Professional subgingival debridement can be provided with adjunctive therapies as required, such as the use of:
    - Physical or chemical agents (e.g., chlorhexidine mouthrinse for a limited period)
    - Local or systemic host-modulating agents;
    - Locally delivered subgingival antimicrobials (e.g., locally administered sustained-release chlorhexidine or antibiotics)
    - Systemic antimicrobials (may be considered for specific clients, e.g. generalized stage III periodontitis in young adults, but routine use of systemic antibiotics is not recommended as an adjunct to subgingival instrumentation).
- Step two requires successful implementation of the first step and should be re-evaluated after an adequate healing period of approximately 4-8 weeks.[6]
- First and second steps can be delivered simultaneously, especially if deep probing depths are present to prevent periodontal abscess development.

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[4] Refer to Episodes 49 and 50 for further discussion on this evidence-based guideline.

[5] Refer to Episode 35 for discussion on air polishing.

[6] Rational for periodontal reassessment 4-8 weeks after initial therapy includes:

- Takes 1-2 weeks for junctional epithelium to re-establish to the root surface. Reassessing prior is too early.
- Connective tissue repair occurs for 4-8 weeks following initial therapy.
- Subgingival microbial repopulation can occur 4-8 weeks after initial therapy if plaque control is inadequate. Waiting longer risks disease progression.
- 4-8 weeks allows adequate time to assess client's long-term plaque control.
- Bleeding on probing, gingival erythema, and edema decrease during the initial 4-8 weeks post-therapy. [13] [19]

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- During re-evaluation after step two, if there are no periodontal pockets ≥5 mm with bleeding on probing and no deep pockets ≥6 mm, the client can move to step four: supportive periodontal care.
- Lasers, photodynamic therapy, probiotics, and systemic administration of sub-antimicrobial dose doxycycline are not suggested as an adjunct to subgingival instrumentation.
- Administration of statin gels, systemic or local bisphosphonates, systemic or local nonsteroidal anti-inflammatory drug, omega-3 fatty acids, and metformin gel are not recommended to be added to subgingival instrumentation. [10] [12] [13]

Step three:

- Involves retreating areas unresponsive to step two therapy (i.e., pockets ≥4 mm with bleeding on probing or deep periodontal pockets ≥6 mm). This may involve:
    - Repeated subgingival instrumentation with or without adjunctive therapies
    - Flap periodontal surgery to gain access to deep pocket sites for subgingival instrumentation
    - Resective periodontal surgery
    - Regenerative periodontal surgery
- Surgery should be performed by dentists with additional specific training or by specialists. Surgery should not be performed for clients not able to achieve adequate oral self-care.
- During re-evaluation after step three, if there are no periodontal pockets ≥5 mm with bleeding on probing and no deep pockets ≥6 mm, the client moves to step four. [10] [12]

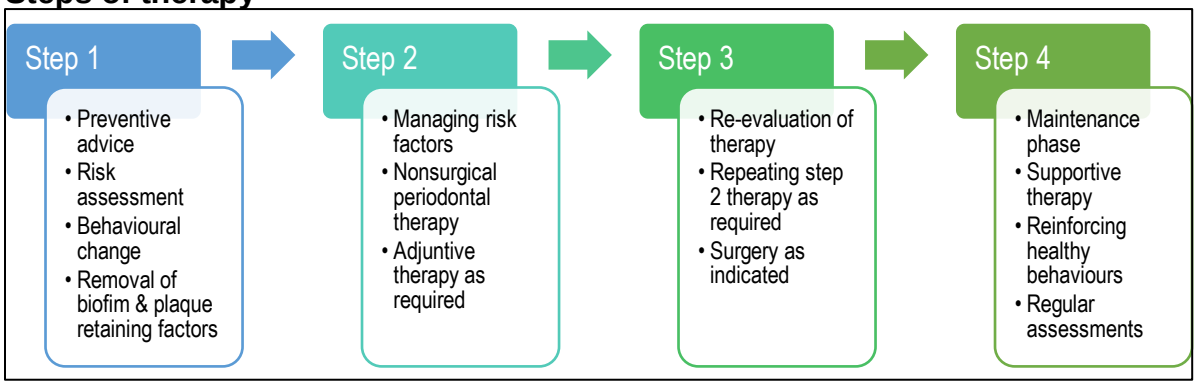
Step four:

- Provides long-term supportive periodontal care (also referred to as periodontal maintenance or supportive periodontal therapy) to maintain periodontal stability and prevent relapse since risk for periodontitis recurrence and progression is high.
- Step four combines preventive and therapeutic interventions outlined in step one and two, based on the client's periodontal status. Interventions include advice on healthy lifestyles and good oral hygiene, regular assessments, and professional debridement.
- Supportive periodontal care visits should be scheduled every 3 months to a maximum of 12 months, and should be tailored to the client's risk profile and periodontal conditions after active therapy.
- Client adherence to supportive periodontal care is vital for long-term periodontal stability and potential further improvements in periodontal status.[7] [10] [12]

[7] The EFP guideline to treat stage I-III periodontitis does not address the treatment of gingivitis (although gingivitis management is an indirect goal in some of the interventions), it also does not address stage IV periodontitis, necrotizing periodontitis, periodontitis as manifestation of systemic diseases, or mucogingival conditions. The EFP published its second evidence-based guideline, on the multidisciplinary treatment of stage IV periodontitis in 2022. Treating stage IV periodontitis poses significant challenges including addressing tooth loss and problems with mastication, and requires collaboration between periodontists and other dental specialists such as orthodontists and prosthodontists to restore the lost function and manage periodontitis sequelae. [10] [3]

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Steps of therapy



Biofilm control

The EFP guideline also offers recommendations for client oral-self care, such as:

- Tooth brushing should be supplemented with the use of interdental brushes.
- Flossing is not recommended as a first choice for clients in periodontal maintenance.
- Other interdental cleaning devices are suggested if interdental areas are not reachable by interdental brushes (e.g., water flossers).
- A power toothbrush may be considered as an alternative to manual tooth brushing.
- Client preferences and needs should be considered when recommending type of toothbrush and interdental brush. [12]

Classifying periodontal disease

Periodontal disease classification is essential for determining the risks, prognosis, and treatment options. Tokede et al. (2024) used electronic health records to estimate the rate of diagnostic misclassification of periodontal cases. The findings suggest approximately a third of periodontal diagnoses were misclassified.

Accurate classification of periodontal disease is critical for its effective treatment and management. Clinicians should be aware of the potential for misclassification when seeing clients with periodontal disease. Staying informed about the latest developments and engaging in professional development on diagnosing and classifying periodontal disease is essential. [14]

Hand and power scaling

Historically, periodontal therapy to remove supra- and subgingival deposits was primarily accomplished with handheld instruments (e.g. sickles, curettes, chisels, files, and hoes) until ultrasonic scalers were developed in the 1950s for ‘gross scaling’ and the removal of supragingival calculus and extrinsic stains. [15]

In the 1980s, manufacturers introduced thinner, probe-like ultrasonic tips designed to remove deposits below the gingival margin. Curved tips were also developed, enabling clinicians to reach deeper periodontal pockets and furcation areas. Increased research into the effectiveness of ultrasonic scaling, combined with advancements in technology, resulted in a shift towards ultrasonic scaling becoming a primary treatment method for nonsurgical periodontal therapy. [16] [17]

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The concept of root planing was established in the 1970s when it was discovered endotoxin could penetrate the cementum and influence the attachment of fibroblasts. Root planing was intended to smooth root surfaces using hand instruments to remove infected cementum, eliminate endotoxins, and create a smooth, hard, and clean biocompatible root surface that promotes the attachment and healing of periodontal tissue. [18]

By the 1980s, research clarified endotoxins were only loosely attached to the cementum surface, with most of the endotoxin being associated with the bacterial biofilm. Accordingly, it was deemed unreasonable to engage in excessive root planing for endotoxin removal. [18]

In 1994, the first European Working Conference on periodontology reached a consensus on the term "subgingival debridement," which refers to a gentle method to remove subgingival plaque and calculus while preserving the cementum as much as possible. [18]

Many studies have demonstrated the effectiveness of hand and power scaling in reducing probing depths, increasing clinical attachment levels, and reducing inflammation by removing plaque bacteria, calculus, and endotoxin.

Hand instruments

Hand instruments provide good tactile sensation but may be more time-consuming and cause fatigue than other methods. A probe is used to explore the root surface to determine the pocket probing depth, the root surface anatomy (e.g., irregularities, root furrows, furcations), and the location of calcified deposits. Mini-curettes are available with thin blades and longer shanks to improve access and maximize contact with the root surface in narrow and deep defects. [19]

Their effectiveness and efficiency depend on the correct use and frequent sharpening. Periodontal instruments can dull after 15 to 45 strokes, leading to a round cutting edge. Dull cutting edges can result in:

- Burnished calculus
- Increased lateral pressure and pinch force by the clinician
- Musculoskeletal issues for the clinician
- Client discomfort
- Increased time to remove deposits [11] [19]

Instrument sharpness is determined by both visual and manual assessment. Visually, a dull cutting edge will reflect the light due to the rounded edge, whereas a sharp cutting edge will not reflect light. A sharp cutting edge will “bite” the surface of a plastic sharpening test stick, while an instrument that does not engage with the test stick needs sharpening.

Some instruments have a coating so they require less sharpening than standard stainless-steel instruments, and others do not require sharpening. Sharpen-free instruments are replaced when they become dull. When sharpening instruments, it is

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vital to preserve the original angle of the cutting edges and replace instruments with thinned blades. [11]

Power instruments

Sonic and ultrasonic instruments are available for nonsurgical periodontal therapy. Sonic scalers use air pressure to create mechanical vibrations at the tip. Ultrasonic scalers convert electrical current into mechanical energy to produce high-frequency vibrations at the instrument tip. The wear of the tip impacts the performance of ultrasonic instruments. Thus, the dimensions and shape of the tip should be regularly checked. Periodontal probe-type sonic and ultrasonic scaler tips are available for deep and narrow pockets. [19]

Advantages and disadvantages of ultrasonic scaling

Advantages of ultrasonic scaling include:

- Less operator hand and wrist fatigue
- Efficient removal of dental plaque biofilm, calculus, and extrinsic stain
- May provide better access in deep pockets and furcations
- Decreased treatment time
- Less tissue trauma due to no sharp cutting edges
- Continuous lavage reduces the need for rinsing
- Antiseptic solution can be substituted for the water to provide simultaneous irrigation and disinfection of the area being treated
- Tips do not need sharpening
- Less chance of operator injury because there are no cutting edges [15] [17] [19]

Disadvantages of ultrasonic scaling include:

- May increase root surface roughness
- Incorrect application of the tip to the tooth surface or unintentional over instrumentation of calculus-free subgingival root areas may cause surface alterations, including scratches, gouges, and nicks
- May chip or scratch restorations, e.g. ultrasonic scalers will alter the topography of amalgam restorations and can significantly damage porcelain and composite restorations
- Conventional ultrasonic scalers with metal tips cause considerable changes to implant surfaces
- May cause cavitations when applied to demineralized surfaces, such as initial carious lesions or hypoplastic enamel
- May contribute to clinician hearing loss
- Transmission of pathogenic microorganisms via aerosols is of concern. Studies show bacteria and blood are routinely present in aerosols produced by ultrasonic scalers, increasing potential for spread of infection between clients and between client and clinician [15] [20]

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Hand versus power scaling

A systematic review by Suvan et al. (2020) evaluated the efficacy of subgingival instrumentation using sonic, ultrasonic, and hand instruments and different subgingival instrumentation delivery protocols in nonsurgical periodontal therapy.

The authors concluded nonsurgical periodontal therapy by mechanical subgingival instrumentation is efficacious to achieve infection control in clients with periodontitis irrespective of whether performed by sonic, ultrasonic, or hand instruments or delivered full mouth within 24 hours or in segments over multiple visits. Clinicians can choose instrument type and mode of delivery on an individual client basis. [21]

A systematic review and meta-analysis by Zhang et al. (2020) compared the effectiveness of ultrasonic and manual subgingival scaling in periodontal therapy, focusing on different initial probing pocket depths (PPD). The authors concluded ultrasonic subgingival scaling is an efficient nonsurgical treatment for periodontitis. However, when initial PPD was 4 to 6 mm, PPD reduction proved manual subgingival scaling was superior, but clinical attachment loss (CAL)[8] results demonstrated no statistical differences between the two methods. When initial PPD was ≥6 mm, PPD and CAL reductions suggested manual subgingival scaling was superior. Therefore, manual subgingival scaling is important and cannot be completely replaced by ultrasonic subgingival scaling. The authors suggested using a combination of ultrasonic and manual subgingival instruments when initial PPD is ≥4 mm. The research highlights the importance of hand scaling for clients with advanced periodontal tissue destruction and deep pockets to ensure adequate disease management. [22]

A randomized control trial by Johnston et al. (2020) investigated the systemic inflammatory response following hand and ultrasonic instrumentation. Thirty-nine participants with periodontitis were randomized to treatment with full-mouth debridement using either hand or ultrasonic instrumentation completed within 24 hours. At baseline and day 90, clinical parameters (e.g. full-mouth plaque, bleeding scores, and periodontal pockets) were recorded. Serum, whole blood, saliva, subgingival plaque, and gingival crevicular fluid samples were collected at baseline, and at day one, day seven, and day 90 post-treatment.

For all participants, serum C-reactive protein (CRP) increased at day one, with no differences between the hand and ultrasonic groups. There was no difference between groups in interleukin-6 (IL-6) or tumour necrosis factor alpha (TNFα) at day one.[9] Inflammatory markers returned to baseline levels by day seven. Treatment resulted in equal and marked improvements in clinical parameters in both groups. However, total treatment time was on average shorter for ultrasonic instrumentation. The authors concluded ultrasonic instrumentation resulted in shorter treatment time with comparable clinical outcomes. Serum CRP levels at day one were similar following debridement with hand or ultrasonic instruments. [23]

[8] Refer to Episode 20 and corresponding Keynotes and Resources for information on clinical attachment loss (CAL) and its calculation.

[9] CRP, IL-6, TNFα are systemic markers of inflammation. Refer to Episodes 44 and 45 for additional information on inflammation and the immune system.

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Paterson et al. (2023) compared nonsurgical periodontal therapy using exclusively hand instruments, ultrasonic instruments, or a combined approach. A total of 55 participants were treated across two studies (randomized controlled trial and cohort study). All participants were re-evaluated 90 days after treatment. Clinical parameters, time taken, and financial implications of nonsurgical periodontal therapy were explored.

The researchers found no clinically relevant differences in clinical outcomes across all groups at day 90. Ultrasonic instruments required less time on average to complete treatment compared to hand instruments.

Ultrasonic full mouth debridement within 24 hours yielded similar clinical outcomes to quadrant treatment with a combination of instruments. Full mouth debridement with ultrasonic instruments may reduce clinic time and the costs of instrument sterilization, reprocessing, and maintenance. However, this treatment modality may not be suitable for all clients and clinicians. [24]

The EFP clinical practice guideline for treating stage I–III periodontitis recommends performing subgingival periodontal instrumentation using either hand or powered (sonic/ultrasonic) instruments or a combination of both. This recommendation is based on evidence indicating treatment outcomes do not depend on the type of instrument used. The guidelines also acknowledge that a client's preference may differ from the clinician's preferred instrument, emphasizing the importance of respecting client autonomy. Accordingly, the choice of instrument should consider the clinician's experience, preference, and skills alongside the client's preferences. [10]

Full mouth debridement versus quadrant scaling

A 2022 Cochrane review evaluated the clinical effects of full-mouth scaling or full-mouth disinfection to treat periodontitis compared to traditional quadrant subgingival instrumentation (the control).

The interventions consisted of:

- Full-mouth scaling (FMS), comprising subgingival instrumentation of all quadrants within 24 hours.
- Full-mouth disinfection (FMD), comprising subgingival instrumentation of all quadrants within 24 hours along with adjunctive antiseptic treatments (such as chlorhexidine), which could include rinsing, pocket irrigation, spraying the tonsils, and tongue brushing, and
- Traditional quadrant subgingival instrumentation, comprising scaling and root planing of each quadrant at a separate session, each session separated by at least one week.

The authors concluded that the treatment effects of FMS and FMD were modest. Neither treatment was superior to the usual treatment of quadrant subgingival instrumentation. In practice, the decision to select one approach over another should be based on preference and convenience of the client and clinician. [25]

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Supra- and subgingival debridement
Periodontitis results from a dysregulated immune response to bacteria in subgingival biofilms within susceptible hosts. Thus, reducing microbial load by disrupting and removing subgingival biofilms is essential. [19]

Supra- and subgingival debridement mechanically disrupts the plaque biofilm. Removing subgingival plaque and calculus exposes the cementum, root dentin, and pocket epithelium allowing for new colonization. Species that thrived in the subgingival environment of the diseased pocket may find the new habitat less hospitable. [19]

Calculus itself is not the main cause of inflammation but creates an ideal surface for microbial colonization. Thus, the reason for removing calculus is to eliminate, as much as possible, the irregularities on the root surface that harbour pathogenic bacteria. [19]

A reduction in the concentration of microbial and tissue breakdown products, along with the resolution of inflammatory tissue infiltrate and a decrease in the flow of gingival crevicular fluid, contributes to a more neutral subgingival biofilm pH. These changes result in shifts toward less pathogenic bacterial biofilms. Also, the reduction in pocket depth due to inflammation resolution, decreased edema, and the readaptation of the apical junctional epithelium encourages the recolonization of more aerobic species. [19]

Thus, the main goal of subgingival instrumentation is not to eradicate specific pathogens but to establish a healthy ecosystem by altering the microbial community in numbers and composition.

After instrumentation, the subgingival area may repopulate with microorganisms from supragingival and oral niches or subgingival pathogens. Therefore, clinical re-evaluation is necessary to determine if retreatment is needed. Additionally, a high level of oral self-care is important during periodontal therapy. Without proper oral hygiene, even with thorough professional pocket debridement, the subgingival microbiota can return to a state similar to an untreated periodontitis site within 4 to 8 weeks, rendering the active periodontal therapy ineffective. [13] [19]

Factors affecting periodontal therapy and healing
There are many known risk factors for periodontal disease, but there is limited data on the factors influencing periodontal healing following nonsurgical periodontal therapy. The healing process after subgingival debridement relies on the resolution of inflammation, which can lead to reductions in probing depth and bleeding on probing due to the repair and regeneration of damaged tissues.

Active therapy followed by supportive periodontal maintenance is crucial to prevent disease progression and tooth loss. Tooth loss can adversely affect speech, food intake, self-esteem, and overall quality of life. Therefore, it is essential to understand the factors that may impact periodontal healing after nonsurgical therapy. [26]

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Smoking
Smoking is considered a significant risk factor for periodontal diseases. Smokers have a higher risk for severe periodontitis, including more periodontal tissue destruction, gingival recession, and susceptibility for tooth loss.

Smokers also have a higher risk for periodontal disease recurrence, and their response to nonsurgical and surgical periodontal therapy is not as good as nonsmokers. Furthermore, there is a dose-response effect in the adverse effects of smoking on periodontal health. Smokers with periodontitis tend to respond less favourably to nonsurgical and surgical periodontal therapies and exhibit recurrence more frequently during supportive periodontal treatment. [27]

Previous research has not verified whether the amount of tobacco smoking influences long-term periodontal outcomes. Leite et al. (2022) investigated the influence of different levels of smoking on periodontal healing for 12 months after nonsurgical periodontal therapy and supportive periodontal care every third month. Eighty smokers with periodontitis who were willing to quit smoking were included. Participants were offered individualized voluntary smoking cessation programs.

The study revealed heavy smokers with severe periodontitis obtained no benefit from periodontal therapy, while heavy smokers with moderate periodontitis only had a 50% effect from treatment, compared to smokers who consumed less tobacco. Also, heavy smokers experienced a progressive clinical attachment loss (CAL) of 0.5 mm, despite this group receiving the most extensive, individually-designed periodontal therapy.

The study highlights the importance for smokers to understand that working towards smoking cessation is a crucial step in effective treatment of periodontitis. The authors concluded smoking cessation should be part of periodontal therapy. Otherwise, the effect of treatment is hindered and limited benefits would be observed among heavy smokers. [28]

Alcohol consumption
A cohort study by Costa et al. (2022) found individuals with intense alcohol use undergoing periodontal maintenance therapy presented worse periodontal health, higher rates of periodontitis recurrence and tooth loss compared to those who either did not consume alcohol or consumed it only occasionally. Furthermore, the combination of heavy alcohol use and smoking significantly increased the risk of periodontitis recurrence. [29]

Sugar intake
Several observational and cross-sectional studies have highlighted links between free sugars and periodontitis. [30]

The World Health Organization (WHO) defines free sugars as all monosaccharides (e.g., glucose, fructose) and disaccharides (e.g., sucrose or table sugar) added to foods by the manufacturer, cook, or consumer, and sugars naturally present in honey, syrups, fruit juices, and fruit juice concentrates. Many sugars consumed today are “hidden” in

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processed foods. For example, one can of sugar-sweetened carbonated beverage contains up to 40 grams (~ten teaspoons) of free sugars. [31]

Research indicates consuming sugar-sweetened carbonated beverages is positively associated with a risk of periodontal disease. The intake of these beverages may heighten systemic inflammation, potentially contributing to the development of periodontal disease. [32]

A small randomized controlled clinical trial by Pappe et al. (2024) showed avoiding free sugar after periodontal therapy had beneficial effects on periodontal and metabolic parameters. The intervention group received a 45-minute dietary consultation and was instructed to avoid free sugars (e.g., sweets, white flour, juice, etc.) for 4 weeks after subgingival instrumentation. To avoid sugar, participants were allowed to replace it with whole fruit, which led to increased levels of micronutrients, such as vitamin C. The control group continued with their regular diet after subgingival instrumentation.

At the six-week follow-up, periodontal bleeding was significantly decreased in both groups (–40% intervention group, –34% control group). Additionally, body weight and visceral fat were significantly reduced only in the intervention group. The authors concluded free sugar avoidance may be of therapeutic benefit in addition to periodontal therapy. Further research is needed to investigate this effect in larger cohorts. [30]

Healthy lifestyle

The latest EFP guidelines recommend smoking cessation as part of step one. However, it is unclear whether other lifestyle interventions, such as dietary counselling and increase in physical activity, provide an added benefit to periodontal therapy.

A prospective cohort study by Marruganti et al. (2023) evaluated the association between lifestyle behaviours and clinical periodontal outcomes following steps one and two of nonsurgical periodontal therapy in participants with stage II or III periodontitis. At baseline, questionnaires assessed the following lifestyle behaviours: adherence to the Mediterranean diet, physical activity, stress levels, sleep quality, smoking, and alcohol use. Participants received steps one and two of periodontal therapy and were re-evaluated after three months.

The end point of therapy was no sites with probing pocket depth ≥4 mm with bleeding on probing and no sites with probing pocket depth ≥6 mm.

The results showed participants with poor sleep quality, smoking, and alcohol use above the suggested intake had significantly lower odds of achieving the endpoint of therapy at three months. Participants with a combination of unhealthy lifestyles (low adherence to the Mediterranean diet,[10] low physical activity, high levels of stress, and poor sleep quality) had a higher proportion of periodontal probing depths ≥6 mm. [33]

[10] A 2025 cohort study showed adherence to the Mediterranean diet helped to reduce obesity-related cancers (e.g., liver, esophageal, colorectal) regardless of BMI and fat distribution. Other mechanisms may be involved (e.g., reduced inflammation, improved metabolic health, or dietary interactions with the microbiome). https://jamanetwork.com/journals/jamanetworkopen/fullarticle/2830586#note-ZOI241697-1

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Protein intake
Protein is the most important macronutrient for supporting immune function and wound healing. The current recommended dietary allowance (RDA) for protein intake is 0.8 grams per kilogram of body weight per day for most adults. [26] [34]

Dodington et al. (2021) investigated the relationship between higher protein intakes and periodontal healing after nonsurgical periodontal therapy. Their results showed a positive association between protein intakes of 1 gram or more per kilogram of body weight per day and improved periodontal healing following scaling and root planing in participants who do not smoke. However, this association was not observed in smokers, possibly due to the negative effects of smoking on oral health and healing. Further studies are needed to differentiate between animal and plant proteins. [26]

Cost effectiveness of periodontal therapy
A retrospective study by Saleh, et al. (2024) explored the effect of periodontitis stage and grade on the cost-effectiveness of periodontal therapy and concluded that more severe stage and grade may be associated with greater risk of relapse and repeat therapy. The risk of relapse in the maintenance population was correlated with increasing stage/grade, client compliance, the nature of the treatment provided during active periodontal therapy, smoking, and diabetes. Participants who underwent subgingival instrumentation during active periodontal therapy were less prone to doing an additional intervention through supportive periodontal maintenance (either surgical or nonsurgical) compared with those who received surgical therapy during active periodontal therapy.

The study also confirmed the costs for repeat therapy were less for those in stage III/IV and grade B/C who complied with supportive periodontal care compared to sporadic visits by individuals with the same severity and risk. [35]

A retrospective study by Ravidà et al. (2024) explored whether periodontal therapy consisting of surgical therapy (flap, resective, or regenerative) or nonsurgical treatment with long-term periodontal maintenance care is cost-effective in preventing periodontitis-attributable tooth extraction and replacement by implant-supported crowns. The impact of cigarette smoking on cost-effectiveness was also assessed. The results indicated periodontal therapy and maintenance are cost-effective, although smokers can expect poorer cost-effectiveness. [36]

Client adherence with supportive periodontal therapy
Supportive periodontal therapy (SPT) aims to maintain long-term periodontal health after active therapy, preventing disease recurrence and progression and minimizing tooth loss. [37]

Petsos et al. (2020) evaluated tooth loss during 10 years of SPT in clients who were periodontally compromised and identified factors for tooth loss. The study found tooth loss, on average, was rare, especially for periodontal reasons. Risk factors for tooth loss included smoking, baseline periodontitis severity, nonadherence to SPT, and older age, among others, with smoking having the greatest impact. Fewer SPT visits (two visits per

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year compared to four) were associated with an increased risk of tooth loss due to periodontal disease.

The results reinforce appropriate comprehensive periodontal therapy, encompassing nonsurgical, surgical, and supportive periodontal therapies, can help maintain natural teeth in clients with periodontitis. When properly maintained, clients lose teeth more often due to nonperiodontal reasons rather than periodontal disease. [38]

A systematic review and meta-analysis by Campos et al. (2021) found clients with periodontitis who did not adhere with SPT had a higher risk of tooth loss. The overall meta-analysis of data show nonadherence with SPT increased risk by 26%. These findings agree with a systematic review and meta-analysis by Lee et al. (2023), which showed individuals compliant with SPT have less risk of tooth loss. [37] [39]

When clients do not regularly attend SPT visits, their oral hygiene cannot be monitored, and they do not receive the necessary encouragement to maintain proper oral self-care. This can lead to increased plaque indices, bleeding on probing, probing depths, and subgingival periodontal pathogens. Furthermore, clients who do not have their periodontal risk reassessed miss the opportunity to retreat sites if periodontal disease recurs. These factors may help explain the higher rate of tooth loss among those not adherent with SPT. [37]

Take home messages

- Supra- and subgingival debridement remains the gold standard for periodontal therapy.
- Subgingival periodontal instrumentation can be completed using either hand or power instruments or a combination of both and depends on clinician and client preferences.
- Well-performed, nonsurgical periodontal treatment of periodontitis results in predictable improvements in clinical measures, regardless of instrumentation technique.
- It is important to recognize that the quality of the instrumentation is the essential element in subgingival debridement and the goal of the instrumentation is to reduce the bacterial load below the threshold level at which the individual's immune system can eliminate the remaining infection.
- Periodontal therapy and maintenance are cost-effective in the long term to maintain natural dentition and prevent tooth loss and tooth replacement.
- Clients should be informed that adherence to supportive periodontal maintenance, including regular visits, proper oral self-care, smoking cessation, diabetes control, is vital for long-term success of periodontal therapy.

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Client Resources

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