CLINICAL RELEVANCE

Evidence-based clinical practice recommendations guide clinicians in their decision-making and give support for choosing relevant preventive and therapeutic interventions when treating patients with periodontitis stage I-III. Both EFP and Nordic guidelines underline the importance of patients' commitment and risk factor control, especially smoking, to improve their periodontal status, while subgingival instrumentation is a key part of periodontal therapy in reducing pocket depths and gingival inflammation, as well as achieving pocket closure. Limited evidence exists on the benefit of adjunctive methods. The use of adjunctive agents like systemic antibiotics should be limited to specific cases.

AUTHORS

Eija Könönen, professor, ph.d., Department of Periodontology, Institute of Dentistry, University of Turku, Turku, Finland. Chief dentist, Oral Healthcare, Welfare Division, City of Turku, Turku, Finland
Bjarne Klausen, retired dentist, dr.odont., Copenhagen, Denmark; email: bjarne.klausen@esenet.dk
Anders Verket, Associate professor, ph.d. Department of Periodontology, Institute of Clinical Dentistry, University of Oslo, Oslo, Norway
Jan Derks, Associate professor, ph.d. Department of Periodontology, Institute of Odontology, Sahlgrenska Academy at University of Gothenburg, Gothenburg, Sweden

Corresponding author: Professor Eija Könönen, DDS, PhD, Specialist in Periodontology, Institute of Dentistry, University of Turku, Lemminkäisenkatu 2, 20520 Turku, Finland. E-mail: eija.kononen@utu.fi

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Non-surgical periodontal therapy:

Recommendations by the European Federation of Periodontology and guidelines in Nordic countries

Eija Könönen, Bjarne Klausen, Anders Verket and Jan Derks

Abstract

The recent clinical practice guidelines by the European Federation of Periodontology (EFP) are based on the best available evidence to be used in decision-making when treating stage I-III periodontitis patients with the intention to improve the overall quality of periodontal treatment in European countries. In the present article, we highlight the most important preventive and therapeutic aspects of the non-surgical periodontal treatment (NSPT) protocol, including the first and second steps of therapy as well as supportive periodontal therapy. This step-wise approach covers different types of interventions. While subgingival instrumentation forms a basis in NSPT, it is less clear whether adjunctive methods and agents are of benefit in an attempt to enhance treatment response and to achieve the endpoint of therapy. The aim of the present article was to compare selected EFP guidelines to be used in the NSPT protocol to those available in Nordic countries. The comparison revealed a few differences of little clinical relevance and showed that EFP and Nordic guidelines are in agreement.

Introduction

For decades, non-surgical periodontal therapy (NSPT) has proven to be an effective method in removing soft and hard deposits from deepened periodontal pockets using either hand instruments or power-driven instruments in combination with oral hygiene instructions (1,2). This "golden standard" protocol, also known as cause-related therapy or anti-infective treatment, still remains the cornerstone of periodontal treatment. With or without adjunctive therapeutic means NSPT suppresses the burden and modifies the composition of dysbiotic biofilms, thus reducing the inflammatory reaction in tissues surrounding periodontitis-affected teeth.

Currently, several methods are available to be combined with NSPT. Among those, systemic antibiotics have been of interest since the 90's and, despite potential adverse effects, are sometimes used in the treatment of advanced periodontal disease (stages III and IV), while some newer adjunctive therapies still lack convincing evidence on their effectiveness or are not yet available in clinical practice.

Major clinical parameters relevant to NSPT include reduced pocket depths (ideally pocket closure) and absence of bleeding (3). To guarantee long-term treatment results, i.e., the stability of clinical attachment level and tooth survival, periodontitis patients' commitment to sufficient oral hygiene, smoking cessation, and attending maintenance visits based on an individual risk assessment is required (4,5).

In November 2019, the XVI European Workshop in Periodontology (EWP), organized by the European Federation of Periodontology (EFP), was dedicated to a structured consensus development, targeting to create evidence-based clinical guidelines for decision-making in the treatment of stage I-III periodontitis (6). The guidelines use the information from 15 systematic reviews that were prepared for this EWP where expert consensus-based recommendations were presented, discussed, voted on, and finally adopted by consensus (see the detailed description of the S3 level process (6)).

In the current paper, the following questions are addressed: 1) Which are the most important guidelines in NSPT? 2) What is the impact of adjunctive methods and when to use them? 3) In what cases is NSPT sufficient to reach the endpoint of active therapy? Then we compare selected EFP clinical practice guidelines in the first and second steps of periodontal therapy and supportive care to guidelines previously available in Nordic countries.

Treatment of stage I-III periodontitis: first and second steps of periodontal therapy

When periodontitis is diagnosed, including staging and grading (7), the patient is provided with thorough information on the disease, describing its etiology, major risk factors, and how to manage the condition. In addition, different therapeutic approaches and their expected benefits and potential risks are explained and, thereafter, an initial treatment plan is made and confirmed through patient consent (6).

Oral hygiene

For the first step of therapy, an essential goal is to achieve favorable conditions for oral hygiene practices and to commit the patient to regular homecare. At all levels of staging, a stepwise treatment should start with individually tailored oral hygiene instructions, including selected tooth brushing and interdental cleaning methods (8,9,10), which is followed by professional interventions to remove supragingival biofilms (plaque), calculus, and plaque-retentive factors to ensure effective plaque control by the patient at home (6). Sometimes additional tools, such as promoting behavioral changes to improve oral hygiene (11) and adjunctive therapies for reducing gingival inflammation (12), are needed to reach an adequate oral hygiene level. Psychological methods for motivation (motivational interviewing, cognitive behavioral therapy) are of interest. Five randomized clinical trials (RCTs), however, failed to identify any significant impact on patients' compliance with oral hygiene practices (11). Notably, it is important to enforce oral hygiene instructions throughout all steps of periodontal therapy (6).

Risk factor control: tobacco smoking

Tobacco smoking is strongly linked to periodontal disease, increasing the risk for periodontitis by 85% (13). It is also established that the outcomes of periodontal therapy are inferior in smokers compared to non-smoking patients. Tomasi et al. (3) reported that the likelihood to obtain pocket closure at 3 months after subgingival instrumentation was three times lower in smokers (Odds ratio 0.33). The pronounced negative impact on the periodontal status and on outcomes of therapeutic intervention makes smoking cessation a relevant target of risk factor control in conjunction with periodontitis-related interventions, and existing data do suggest that smoking cessation significantly reduces the risk to develop periodontitis (14). In the systematic review by Ramseier et al. (15), assessing six relevant studies on the effect of smoking cessation interventions, the proportion of patients actually quitting tobacco smoking ranged from 4% to 30% at 1 to 2 years, and quit rates were higher following more intensive behavioral interventions. On the basis of two included studies (16,17), the effect of periodontal therapy was found to be greater in the subgroup of quitters compared to oscillators (serial quitters) or those who continued smoking. Thus, it was concluded that interventions for smoking cessation are effective and should be included in periodontal care (15).

Approaches to subgingival instrumentation

Dental professionals can choose between different evidence-based delivery protocols when planning subgingival instrumentation. In addition, different categories of instruments are available. In the systematic review by Suvan et al. (18), the efficacy of full-mouth protocols was compared to more traditional quadrant/sextant-wise approaches. The authors also addressed the potential differences between the use of hand or ultrasonic instrumentation. The primary outcomes considered were the reduction of probing pocket depth (PPD) and the proportion of closed pocket (PPD ≤4 mm and absence of bleeding on probing (BOP)) at 3/4 and 6/8 months. A total of 19 studies with a minimum follow-up period of ≥6 months were identified. In all, NSPT resulted in an estimated PPD reduction of 1.4 mm at 6/8 months and 74% of all pockets were closed. Interestingly, the PPD reduction at initially deep sites (PPD ≥7 mm) amounted to 2.6 mm. No differences between the full-mouth protocol, where subgingival instrumentation is performed less time-intensively, and traditional quadrant/sextant-wise setups were observed in terms of PPD reduction or pocket closure. Likewise, no differences were noted between subgingival instrumentation carried out with either hand instruments or ultrasonic devices (18).

Notably, the patient populations in these studies demonstrated high levels of self-performed biofilm control. This is particularly relevant when considering the lack of differences between the full-mouth and quadrant/sextant-wise protocols. In the former, behavioral change (step 1 therapy) had been addressed prior to the limited, e.g. 1-hour subgingival instrumentation (19). It is also noteworthy that patient preference was only rarely considered and could not be evaluated in the systematic review by Suvan et al. (18).

Residual problems following non-surgical periodontal therapy

While NSPT in combination with self-performed biofilm control (steps 1 and 2) is widely effective in the management of periodontitis, residual pockets and BOP may be expected in patients with stage III or IV periodontitis. The systematic review by Suvan et al. (18) found that 74% of periodontal pockets were resolved at 6 to 8 months after initial treatment. In addition to the patient-related factor smoking, the strongest indicator for treatment outcomes is the initial probing depth (19,20), typically associated with the presence of intra-bony defects. While the mean PPD reduction may be greater, the likelihood of pocket closure was still reduced. Also, sites with deep furcation involvement (class II or III) responded less favorably to NSPT. Tomasi & Wennström (21) observed that as little as 25% of sites with initial furcation involvement class II were reduced to class I or resolved at 3 months, and 94% of sites still demonstrated BOP. In the effort to personalize treatment approaches, patients should be informed on expected treatment outcomes prior to NSPT.

Additional approaches

Laser or antimicrobial photodynamic treatment

The systematic review by Salvi et al. (22) examined the adjunctive use of laser (10 RCTs) and antimicrobial photodynamic therapy (aPDT; eight RCTs) in connection to NSPT. The studies tested five different lasers (diode, Er:YAG, Er.Cr:YAG, Nd:YAG, and KTP) and four different photosensitizers (methylene blue, toluidine blue, phenothiazine chloride, and indocyanine green). Due to this heterogeneity, no meta-analyses could be performed on laser treatment, while a meta-analysis on aPDT based on two studies failed to identify any benefit (mean PPD changes) for adjunctive aPDT with a wavelength range of 650–700 nm. In general, the differences in PPD after subgingival instrumentation with or without adjunctive laser or aPDT were small and hardly clinically relevant.

The efficacy of laser monotherapy (Er:YAG-laser) as an alternative to conventional subgingival instrumentation was examined in patients with untreated periodontitis and reported in a systematic review with a meta-analysis based on eight RCTs (23). No significant differences in reduction of PPD, clinical attachment level (CAL), and BOP were found between these treatments.

Local antimicrobials

In the systematic review by Herrera et al. (24), including a meta-analysis based on 50 RCTs, the adjunctive effect of locally administered antibiotics (doxycycline, tetracycline, and minocycline) and other antimicrobial agents (chlorhexidine) was evaluated. The short-term (6-9 months) results indicated significant additional PPD reductions and CAL gain compared to placebo. However, the effects were small (<0.4 mm for PPD and <0.3 mm for CAL), and probably of little clinical relevance. Few adverse effects were reported with no difference between the test and placebo groups.

Systemic antibiotics

The systematic review by Teughels et al. (25) with a meta-analysis based on 28 RCTs evaluated the adjunctive effect of systemic antibiotics in NSPT. The results indicated that systemic antibiotics in addition to subgingival instrumentation yielded better clinical results than instrumentation alone. Significant improvements were seen in reduction of PPD, CAL, and BOP values, and the effects were evident both at 6 and 12 months after treatment. In initially deep pockets, the additional PPD reduction was larger (around 1 mm) than in moderately deep pockets (around 0.5 mm). Also note-

worthy is that an additional percentage of pockets were closed (i.e., PPD changed from ≥4 mm to ≤3 mm) at 6 and 12 months after antibiotic treatment. Consequently, the number of residual pockets decreased. The additional reduction in pockets was approximately 37% for sites with initial PPD ≥4 mm and 64% for sites with initial PPD ≥7 mm. Side effects were registered in 25 studies. Adverse effects like nausea, diarrhea, and general unwellness were more frequent in patients receiving antibiotics, and one case of anaphylactic shock occurred in this group as well. On the other hand, fever and periodontal abscess were more common in placebo groups. Although the clinical effects of adjunctive systemic antibiotics were significant and relevant, the authors warned against their unrestricted use, since drug resistance is a serious health and socio-economic problem (25).

Anti-inflammatory agents

Modulation of host response through anti-inflammatory agents seems to be a promising approach as an adjunct to periodontal therapy. However, at this stage little evidence is available in the field. The systematic review by Donos et al. (26) with a meta-analysis based on five studies examined systemic administration of doxycycline in sub-antimicrobial doses (20 mg x1-2/day for 3-9 months). In deep pockets (≥7 mm), this medication gave an additional PPD reduction of 0.6 mm after 6 and 9 months compared to subgingival instrumentation alone. In the same review, 12 studies assessed the effect of adjunctive local treatment with statin gels (1.2% simvastatin, atorvastatin, and rosuvastatin). After 6 months, this treatment yielded an additional PPD reduction of 1.8 mm when compared to subgingival instrumentation alone. However, statin gels are not yet available for periodontal treatment, and systemic treatment with statins (as anti-cholesterol agents) has no effect on periodontal tissues (27). Only insufficient data are available on the role of other local modulators (aloe vera, green tea, and gingko biloba), while the benefit of essential oils mouth rinses/irrigation, systemic administration of omega-3 PUFA, certain micronutrients, bisphosphonates, and NSAIDs remains inconclusive (26).

Clinical outcomes

The ultimate goal of periodontal treatment, of which NSPT constitutes the second step of therapy, is the prevention of tooth loss. Since tooth loss can only be assessed in long-term studies, it is reasonable to consider clinical surrogate markers in the assessment of clinical periodontal treatment outcomes.

According to the 2017 World Workshop, the definition of a 'successfully treated and stable periodontitis case' is PPD ≤4 mm (no site ≥4 mm with BOP), in addition to BOP <10% of all sites (28). Hence, clinicians are required to obtain the surrogate markers PPD and BOP in order to assess the endpoint of therapy. This endpoint reflects absence of clinical signs of inflammation and increased resistance to probing, which in turn indicates sufficient removal of microbes and subsequent resolution of the inflammatory lesion. Hence, short-term treatment goals include reduced pocket depths, absence of gingival bleeding, and increased frequencies of closed pockets (18).

The rationale for the use of endpoint parameters has a solid foundation in clinical science. Following initial therapy, patients with residual probing depths of ≥5 mm are more likely to experience further loss of clinical attachment, ultimately resulting in tooth loss (29,30). Also BOP at site and tooth level, and a full-mouth BOP of ≥30% at patient level increases the risk for tooth loss (30), whereas absence of BOP indicates periodontal health (31). The highest chance of periodontal stability is connected to PPD <5 mm without bleeding. In addition to these clinical outcome measures, patient-related outcomes are important (32). The multicausal nature of periodontitis must always be considered.

NSPT is efficacious in treating periodontitis (18). After active periodontal treatment, the individual response must be re-evaluated. For patients with stage I and II periodontitis, NSPT is likely to be sufficient in achieving the endpoints of therapy. The treatment of stage III and IV periodontitis includes teeth with deep probing depths (≥ 6 mm) or complex anatomical surfaces. Although NSPT may in some patients with stage III or IV periodontitis suffice to reach successful treatment endpoints, further treatment is often required. If the endpoints are not met, the choice of treatment modality should be guided by the clinical features of the non-responding site. In shallow residual pockets (4-5 mm), repeating subgingival instrumentation is advocated, whereas access flap is more efficacious in deeper pockets (≥6 mm) (33).

Patient-related outcomes

Outcomes other than clinical changes in PPD or CAL, such as functional occlusion and satisfactory esthetics connected to tooth survival, are more relevant to patients' daily lives (32). Swollen, sore and/or receding gums, drifting and missing teeth, and oral malodor influence function, comfort, appearance and self-confidence, which have a significant impact on physical, social, and psychological aspects of a patient's quality of life (34). Oral health related quality of life (ORHQoL) domains affected positively by treatment are functional (improved eating/chewing), psychological (better appearance, less discomfort), and physical (less pain) (34,35). The ORHQoL improves significantly after NSPT, and the effects last at least one year.

Treatment of stage I-III periodontitis: supportive periodontal therapy

When active periodontal therapy is completed, there is a life-long challenge to maintain the treatment results, thus avoiding the risk of progression of the disease. Supportive periodontal therapy (SPT) visits should occur in 3- to a maximum of 12-month intervals depending on the risk profile (6). During the visits, periodontal status is examined, oral hygiene instructions are reinforced, and supra- and subgingival biofilms and hard deposits are removed by dental professionals (36,37). In this secondary prevention of periodontitis, the patient's role in adhering to recommended SPT visits and maintaining a high standard of oral hygiene is essential for long-term success (38). It has been shown that repeated oral prophylaxis with oral hygiene instructions even without subgingival instrumentation after NSPT of moderate/severe periodontitis is able to maintain the obtained treatment results at least for 2 years (36). On the other hand, the systematic review by Trombelli et al. (37) indicated that patients regularly complying with routine professional maintenance have in most cases stable periodontal parameters achieved by active periodontal therapy.

Oral hygiene

Although sufficient oral hygiene is important for optimal treatment response, only limited data are available on the effectiveness of mechanical oral hygiene devices used by the patient during SPT. The systematic review by Slot et al. (39) examined the effectiveness of plaque removal to reduce gingival inflammation by means of manual and powered toothbrushes and interdental cleaning devices in the secondary prevention of periodontitis, using the evidence from 16 publications with 17 comparisons. Based on a network meta-analysis, periodontal maintenance patients may use a powered or manual toothbrush, complemented with individually selected (size, shape) interdental brushes as the device of choice. Oral irrigators may be used as an alternative interdental cleaning method, whereas dental floss did not improve the effect of tooth brushing alone (10,39). However, due to the scarcity of studies on optimal oral hygiene devices during SPT, no definite recommendations can be given.

Alternative and adjunctive approaches

With the aim of evaluating alternative or adjunctive methods for conventional professional maintenance of treated periodontitis patients, a very limited number of RCTs was recognized for the recent systematic review by Trombelli et al. (40). This resulted in two negative suggestions, i.e., not to replace conventional SPT with laser (Er:YAG) treatment and not to use doxycycline in sub-antimicrobial doses, since they may not provide any additional benefit during periodontal maintenance.

Impact of compliance

There are several factors that contribute to clinical outcomes and the experience of tooth loss after active periodontal therapy. One important factor is the patient's compliance to long-term SPT. A meta-analysis based on eight studies, comparing a regular-compliance group to an erratic-compliance group followed for at least 5 years, showed that compliers had a significantly lower tooth loss rate during SPT than did erratic compliers (41). However, factors like stage of periodontitis, patient's susceptibility, and quality of maintenance were not analyzed due to the heterogeneity of estimates. Also the causes of extractions vary among dentists, affecting the comparative analysis. Smoking is a risk factor, which exposes smokers to tooth loss during long-term SPT (42,43). Notably, non-compliance to scheduled SPT visits tends to be more common among smokers than former smokers and non-smokers (44).

Assessing risk for progression of periodontitis

While NSPT followed by an adequate SPT program is able to maintain alveolar bone and periodontal attachment levels in most cases, patients with high susceptibility to periodontal disease may experience less favorable outcomes (5). In treated patients, several factors like smoking, diabetes, insufficient oral hygiene, residual pockets, and a high BOP score have an impact on prognosis. Using risk assessment tools, it is possible to predict the risk for periodontitis progression (45). In clinical practice, the risk assessment gives support in determination of an adequate interval between SPT visits for patients based on their risk profile. For example, the Periodontitis Risk Assessment (PRA) model, including six parameters, categorizes the patient at low, medium, or high risk of disease progression. Matuliene et al. (4) observed that high-risk patients, with a need of more frequent SPT visits, were less likely to be compliant, and thus, they may end up experiencing recurrent periodontitis and tooth loss during maintenance.

Discussion

The major aim of the EFP clinical practice guidelines was to produce solid scientific evidence to be used in decision-making when treating stage I-III periodontitis patients and improve the overall quality of periodontal treatment in European countries (6). In the context of the non-surgical periodontal treatment (NSPT) protocol, including here the first and second steps of therapy and supportive periodontal therapy, these EFP guidelines are well in line with guidelines used in Nordic countries (see Table).

TABLE. Selected clinical recommendations for treatment of stage I-III periodontitis: first and second steps of therapy and supportive periodontal therapy; adopted and modified from Sanz et al. (6). *(Strength of consensus: unanimous, agreement of 100%; strong, agreement of >95%; consensus, agreement of 75-95% of participants)*

Question	**European Federation of Periodontology recommendation** (*strength of consensus*)	Recommandations from Nordic guidelines*
FIRST STEP OF THERAPY		
What are the adequate oral hygiene practices in the different steps of periodontal therapy?	**We recommend** that the same guidance on oral hygiene practices to control gingival inflammation is enforced throughout all the steps of periodontal therapy (*strong consensus*).	FI: Agreement SE and DK: Agreement
Are additional strategies in motivation useful?	**We recommend** emphasizing the importance of oral hygiene and engaging the patient in behavioral change for oral hygiene improvement (*strong consensus*).	FI: Agreement SE and DK: Not mentioned
What is the efficacy of supragingival professional mechanical plaque removal (PMPR) and control of retentive factors?	**We recommend** PMPR and control of retentive factors as part of the first step of therapy (*unanimous consensus*).	FI: Agreement SE and DK: Not mentioned
What is the efficacy of risk factor control?	**We recommend** risk factor control interventions as part of the first step of therapy (*strong consensus*).	FI: Agreement SE and DK: Not mentioned
What is the efficacy of tobacco smoking cessation interventions?	**We recommend** tobacco smoking cessation interventions to be implemented in patients undergoing periodontal therapy (*unanimous consensus*).	FI: Agreement SE and DK: Agreement
What is the efficacy of promotion of diabetes control interventions?	**We recommend** diabetes control interventions in patients undergoing periodontal therapy (*consensus*).	FI: Not mentioned SE and DK: Not mentioned
SECOND STEP OF THERAPY		
Is subgingival instrumentation beneficial for the treatment of periodontitis?	**We recommend** that subgingival instrumentation be employed to treat periodontitis in order to reduce probing pocket depths, gingival inflammation and the number of diseased sites (*unanimous consensus*).	FI: Agreement SE and DK: Agreement
Are treatment outcomes of subgingival instrumentation better after use of hand, powered (sonic/ultrasonic) instruments or a combination thereof?	**We recommend** that subgingival periodontal instrumentation is performed with hand or powered (sonic/ultrasonic) instruments, either alone or in combination (*unanimous consensus*).	FI: Agreement SE and DK: Agreement
Are treatment outcomes of subgingival instrumentation better when delivered quadrant-wise over multiple visits or as a full mouth procedure (within 24 hours)?	**We suggest** that subgingival periodontal instrumentation can be performed with either traditional quadrant-wise or full mouth delivery within 24 hours (*strong consensus*).	FI: Agreement SE and DK: Agreement
Does the adjunctive use of systemic sub-antimicrobial dose doxycycline (SDD) to subgingival instrumentation improve clinical outcomes?	**We suggest not to use** systemic SDD as an adjunct to subgingival instrumentation (*consensus*).	FI: May be considered SE and DK: Low priority
Does the use of adjunctive chemotherapeutics (antiseptics) improve the clinical outcome of subgingival instrumentation?	Adjunctive antiseptics **may be considered,** specifically chlorhexidine mouth rinses for a limited period of time as adjuncts to mechanical debridement, in specific cases (*consensus*).	FI: Agreement SE and DK: Low priority
Do adjunctive systemically administered antibiotics improve the clinical outcome of subgingival instrumentation?	A) Due to concerns about patient's health and the impact of systemic antibiotic use to public health, its routine use as adjunct to subgingival debridement is **not recommended** (*consensus*). B) The adjunctive use of specific systemic antibiotics **may be considered** for specific patient categories (e.g. generalized periodontitis stage III in young adults) (*consensus*).	FI: Agreement Agreement SE: Agreement Not mentioned DK: Agreement Agreement

TABLE. Selected clinical recommendations for treatment of stage I-III periodontitis: first and second steps of therapy and supportive periodontal therapy; adopted and modified from Sanz et al. (6). *(Strength of consensus: unanimous, agreement of 100%; strong, agreement of >95%; consensus, agreement of 75-95% of participants)*

Question	**European Federation of Periodontology recommendation** (*strength of consensus*)	Recommandations from Nordic guidelines*
SUPPORTIVE PERIODONTAL THERAPY		
At what intervals should supportive periodontal care visits be scheduled?	**We recommend** that supportive care visits should be scheduled at intervals of 3 to a maximum of 12 months and ought to be tailored according to patient's risk profile and periodontal conditions after active therapy (*strong consensus*).	FI: Agreement SE and DK: Partial agreement
Is adherence to supportive periodontal care important?	**We recommend** that adherence to supportive care should be strongly promoted, since it is crucial for long-term periodontal stability and potential further improvements in periodontal status (*unanimous consensus*).	FI: Agreement SE and DK: Not mentioned
Are oral hygiene instructions important? How should they be performed?	**We recommend** repeated individually tailored instructions in mechanical oral hygiene, including interdental cleaning, in order to control inflammation and avoid potential damage for patients (*unanimous consensus*).	FI: Agreement SE and DK: Agreement
How should interdental cleaning be performed?	If anatomically possible, **we recommend** that tooth brushing should be supplemented by the use of interdental brushes (*unanimous consensus*).	FI: Agreement SE and DK: Not mentioned
What is the value of adjunctive antiseptics/chemotherapeutic agents for the management of gingival inflammation?	The basis of the management of gingival inflammation is self-performed mechanical removal of biofilm. Adjunctive measures, including antiseptic, **may be considered** in specific cases, as part of a personalized treatment approach (*consensus*).	FI: Agreement SE and DK: Low priority
Which antiseptic is the most effective in mouth rinses?	If an antiseptic mouth rinse formulation is going to be adjunctively used, **we suggest** products containing chlorhexidine, essential oils and cetylpyridinium chloride for the control of gingival inflammation in supportive care (*consensus*).	FI: Agreement SE and DK: Not mentioned
What is the value of professional mechanical plaque removal (PMPR) as part of supportive care?	**We suggest** performing routine professional PMPR to limit the rate of tooth loss and provide periodontal stability/improvement, as part of supportive care (*strong consensus*).	FI: Agreement SE and DK: Not mentioned
What is the value of risk factor control in supportive care?	**We recommend** risk factor control interventions in supportive care (*strong consensus*).	FI: Agreement SE and DK: Not mentioned

*Nordic guidelines:

FI/Finnish Guidelines (Periodontitis. Current Care Guidelines. Working group set up by the Finnish Medical Society Duodecim and the Finnish Dental Society Apollonia. Helsinki: The Finnish Medical Society Duodecim, 2016/partial update (diagnosis) 2019. Available in Finnish online at: https://www.kaypahoito.fi/hoi50086)

SE/Swedish Guidelines (SOCIALSTYRELSEN. Nationella riktlinjer för vuxentandvård, 2012. Vetenskapligt underlag. Available in Swedish online at: https://www.socialstyrelsen.se/globalassets/sharepoint-dokument/artikelkatalog/nationella-riktlinjer/nr-vuxentandvard-vetenskapligtunderlag) New revised Swedish National Guidelines for Dentistry will be publishen in 2022.

DK/Danish Guidelines (SUNDHEDSSTYRELSEN. National klinisk retningslinje for behandling af sygdomme i væv omkring tænder og tandimplantater, 2013. Available in Danish online at: https://www.sst.dk/da/Udgivelser/2013/NKR-Behandling-af-sygdomme-i-vaev-omkring-taender-og-tandimplantater and National klinisk retningslinje for brug af antibiotika ved tandlægebehandling, 2016. Available in Danish online at: https://www.sst.dk/da/Udgivelser/2016/NKR-Brug-af-antibiotika-ved-tandlaegebehandling)

This stepwise approach covers different types of interventions, which clinicians should consider in the management of periodontitis. For example, recommendations underline the importance of patients' commitment to good oral hygiene as well as the efforts to control existing risk factors, especially smoking. Nowadays clinicians are expected to have readiness to guide and support their patients to behavioral changes, whenever guidance is needed.

Subgingival instrumentation forms a basis in NSPT. According to the available evidence, there are no differences between the full-mouth protocol and traditional quadrant/sextant-wise set-ups or between hand instruments and ultrasonic devices in terms of reducing probing pocket depths. Therefore, clinicians are free to make their preferred treatment choice, but also taking into account patients' needs and preferences. Adjunctive applications available (lasers, antimicrobial photodynamic therapy) are not cost-effective and do not yield superior clinical benefits compared with non-surgical mechanical instrumentation alone (22,23). Also, adjunctive therapies, such as local antimicrobials and anti-inflammatory agents, have been used in an attempt to improve treatment response. According to the available evidence, the EFP guidelines recommend/suggest not to use them (26). Systemic administration of doxycycline in sub-antimicrobial doses offers some additional effect to subgingival instrumentation in deep pockets, but there are concerns related to the potential risk of adverse reactions and the issue of patient's compliance in taking a systemic medication for several months (26). Furthermore, systemic antibiotics seem to be a powerful adjunctive treatment to NSPT (25), but despite their clinical effect, the use should be restricted due to the global threat of increasing antimicrobial resistance (6). This is well in line with Nordic guidelines where adjunctive antibiotic treatment should only be considered in cases with sufficient oral hygiene and lack of response to properly executed periodontal treatment. However, the adjunctive use of certain systemic antibiotics may be considered for specific patient categories, such as generalized periodontitis stage III in young adults (6).

A fundamental goal of periodontal therapy is to maintain a healthy dentition for a lifetime. To assure long-term treatment results and avoid unwanted setbacks, supportive care is an essential part of periodontal therapy. In Nordic research reports (46,47) and Finnish guidelines, air-polishing devices may be considered an alternative method to conventional debridement in patients under supportive periodontal therapy. Results of a meta-analysis encouraged their use due to benefits of removing biofilms without damage to periodontal tissues as well as to patients' comfort and less time consumed (48). This issue was not included in EFP guidelines.

In clinical practice, risk assessment tools give support in determination of an adequate interval between maintenance visits. Depending on the risk profile, the intervals can vary from 3 to a maximum of 12 months (6). In oral health care, there is a tendency of having check-ups every two years. It is important to take into account periodontitis patients' specific need for these scheduled maintenance visits to avoid disease progression.

Take home messages

- The EFP clinical practice guidelines for decision-making in the treatment of stage I-III periodontitis are in line with guidelines used in Nordic countries.
- For periodontitis patients, a stepwise treatment starts with individually tailored oral hygiene instructions, which need to be reinforced throughout all steps of periodontal therapy.
- Non-surgical periodontal therapy is efficacious in treating periodontitis; for patients with stage I and II periodontitis, it is most likely sufficient in achieving the endpoints of therapy, while for patients with stage III periodontitis, further treatment is often warranted.
- The goal of periodontal therapy is to achieve reduced pocket depths, increased frequencies of closed pockets, and absence of gingival inflammation. At the patient level, retention of teeth and maintenance of a functional occlusion and satisfactory esthetics are relevant goals.
- When active periodontal therapy is completed, there is a life-long challenge to maintain the treatment results and to avoid the recurrence of the disease. The frequency of maintenance visits is based on patients' risk profile.

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