

SUPPORTIVE PERIODONTAL THERAPY- A REVIEW

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ABSTRACT Research has provided evidence that chronic inflammatory periodontal diseases are treatable. As a result of advances in knowledge and therapy, the great majority of patients retain their dentition over their lifetime with proper treatment, reasonable plaque control, and continuing maintenance care. However, there are some situations when traditional therapy is not effective in arresting the disease. In these instances the progression of the disease may be slowed, but eventually the teeth may be lost. Numerous studies have indicated that periodontal therapy in the absence of a carefully designed maintenance program invariably results in the relapse of the disease condition. Accordingly, periodontal care provided without a maintenance program deal with significant patient management and disease management issues. Hence supportive periodontal treatment forms an integral part of periodontal therapy, with all treatment accomplishments channeled into achieving a healthy periodontal status that can be effectively maintained. In this regard, supportive periodontal therapy becomes the most decisive aspect of dental treatment. This article gives an overview of the significance of supportive periodontal therapy in maintaining the integrity of the periodontium.

KEYWORDS: *periodontal disease, maintenance therapy, plaque control, supportive periodontal therapy, compliance*

INTRODUCTION

Periodontal diseases are among the most common diseases affecting humans. Dental biofilm is a contributor to the etiology of gingivitis which if not treated leads to periodontitis with a high potential for recurrence, progressive loss of attachment and eventually, tooth loss. Increased health awareness and improvements in dentistry have led to decreasing tooth loss for all age groups. This has led to changes in demand from individuals for periodontal treatment.^{1,2}

Studies^{3, 4, 5} have indicated patients who return for regular periodic visits of scaling, root planning, oral hygiene reinforcement, and disease reassessment demonstrate better periodontal health and a better prognosis in the long term than patients who do not return for these appointments. Treatments with long term maintenance programs following active therapy¹, once termed maintenance is called as Supportive Periodontal Therapy (SPT) according to 5th American Academy of Periodontology (AAP), 1986.⁶ In 1989 the World Workshop in Clinical Periodontics described by the term 'supportive

periodontal treatment' (SPT).⁷ In 2003 AAP, position paper termed as Periodontal Maintenance Therapy.⁸

In SPT periodontal diseases and conditions are monitored, etiological factors reduced or eliminated and continued at periodic intervals for the life of the dentition or its implant replacement.⁶ Patient should be informed and explained about the importance of this therapy for management of the disease.⁹ This makes the patient to maintain the teeth for their life time which suggests that the evaluation of the efficacy of SPT can be carried out over an extended period.²

Study conducted by Axelsson and Lindhe 1980¹⁰ in patients with periodontitis following SPT resulted in the establishment of clinically healthy gingiva and shallow pockets and also results in re-growth of alveolar bone (Ramfjord et al¹¹) and other study conducted by William Becker, Burton E Becker and Lawrence E. Berg 1984¹² on patients with periodontitis were treated and for various reasons not participated in the SPT and found that there was high incidence of tooth loss, worsening of the health

status of furcations, no reduction of probing depth and also a significant loss of alveolar bone was observed.¹² This shows the importance of SPT in patients.

Attempts are being made to individualize and tailor SPT according to the patient's profile and needs i.e. in various clinical aspects like patients with gingivitis, periodontitis, implants and also its role in other different clinical aspects of dentistry. Recent trends also show increased use of antimicrobials as adjuncts to mechanical procedures for controlling the etiologic agents.⁹

Supportive periodontal treatment has gone by many names, including recall and maintenance, but the name was changed at the 1989 World Workshop in clinical periodontics to the present name. This term expresses the essential need for therapeutic measures to support the patient's own efforts to control the periodontal infections and to avoid re-infection.

Biologic basis for periodontal maintenance

Tooth loss in some periodontal patients has been shown to be inversely proportional to the frequency of periodontal maintenance¹³. Other study by Axelsson p, Lindhe J¹⁰ have shown that patients who maintain regular periodontal maintenance intervals experience less attachment loss and lose fewer teeth than patients who receive less periodontal maintenance or none at all. Since patients rarely are completely effective in removing plaque, adherence to a periodontal maintenance program reduces the risk of future attachment loss.

Periodontal treatment without maintenance (Flow chart-I)

An inadequate control of bacterial plaque by the part of the patient and / or the professional predispose to the recurrence of the disease.^{14, 15} Few studies^{10,11,12} have shown that bone loss continues if the periodontal patient is treated but not maintained or receiving "Traditional Dental care".

In a group of periodontal patients treated but not maintained, reported a tooth loss of 0.22 teeth by patients 1 year, which is similar to that found in periodontal patients without treatment.¹² Lack of maintenance call results in disease recurrence showing that surgical periodontal treatment "per se" cannot guarantee the maintenance of periodontal support.¹⁶

Factors affecting frequency (Table I)

For most patients with gingivitis but no previous attachment loss, supportive periodontal treatment twice a year will suffice, for patients with a previous history of Periodontitis studies suggest the frequency of SPT should be less than 6 months.¹¹ Patients with previous history of chronic periodontitis should be at least 4 times a year,

because that interval will result in a decreased likelihood of progressive disease.¹⁷

All this data goes to suggest that it is advantages if SPT visits are performed every 3 months. However, this interval should be individualized.⁶

Compliance and its role in periodontal therapy

In periodontitis, there is always a hindrance because most of the disease are chronic and most patients do not find them particularly threatening, but the fact that compliance and its effect can be measured in many situations is very helpful. When patients comply with suggested periodontal treatment schedules, the vast majority keep their teeth over long periods of time.¹⁹

Definition:

Compliance (also called adherence and therapeutic alliance) has been defined as "the extent to which a person's behavior coincides with medical or health advice".²⁰

The first study on the degree of compliance with supportive periodontal treatment was published in 1984 by Wilson et al.²² It reviewed all the patients whose progress could be followed after treatment for periodontitis in a private periodontal office of approximate 1000 patients followed for up to 8 years, only 16% complied with suggested SPT intervals, 34% never came back for maintenance, and the rest complied erratically.

Various studies²² done in compliance with suggested oral hygiene regime have shown that the average patient does not brush as instructed or as frequently. Only a very small minority of patients uses dental floss regularly and systematically. Part of the answer to the problem would be careful, detailed and continuing instruction in oral hygiene, followed by positive feedback and reinforcement. But patients must come in so that instructions can be reinforced, and there is some evidence that if they are present for supportive periodontal treatment, they may not need to be perfect cleaners anyway.

Why do patients fail to comply? ²³

- The behaviour of these non-compliant patients is characterized by denial and negligent attitude towards their illness.
- Fear of dental treatment is a major reason for non-compliance
- Perceived indifference or indifferent behavior on the dentist's part has also been cited as the reason for non-compliance.
- Economic problems are another factor that keeps patients from complying.
- Lack of satisfaction on the patient's part also contributes to non-compliance.

Table.1. Recall intervals for various classes of recall patients¹⁸

<i>Merin's Classification</i>	<i>Characteristics</i>	<i>Recall interval</i>
First year	First year patient – routine therapy and uneventful healing or	3 months
	First year patients – difficult case with complicated prosthesis, furcation involvement, poor crown to root ratio, or questionable patient co-operation	1 to 2 month
Class A	Excellent results well maintained for 1 year or more patients displays good oral hygiene, minimum calculus, no occlusal problems, no complicated prosthesis, no remaining pockets, and no teeth with less than 50% of alveolar bone remaining	6 months to 1 year
Class B	Generally good results maintained reasonably well for 1 year or more, but patient displays some of the following factors <ol style="list-style-type: none"> 1. In consistent or poor oral hygiene 2. Heavy calculus formation 3. Systemic disease that predisposes periodontal breakdown 4. Some remaining pockets. 5. Occlusal problems 6. Complicated prosthesis 7. Ongoing orthodontic treatment 8. Recurrent dental caries 9. Some teeth with less than 50% of alveolar bone support 10. Smoking 11. Positive genetic test. 	3 to 4 months
Class C	Generally poor results following periodontal therapy and / or several negative factors from the following list : <ol style="list-style-type: none"> 1. Inconsistent or poor oral hygiene 2. Heavy calculus formation 3. Systemic disease that pre disease to periodontal breakdown 4. Remaining pockets 5. Occlusal problems 6. Complicated prosthesis 7. Recurrent dental caries. 8. Many teeth with less than 50% of alveolar bone support 9. Smoking 10. Positive genetic test 11. Periodontal surgery indicated but not performed for medical, psychologic or financial reasons 12. Conditions too for advanced to be improved by periodontal surgery. 13. More than 20% of pockets bleed on probing 	1to 3 months

Possible methods of improving Compliance²³

- i. Simplify: the simpler the required behavior, the more likely it is to be carried out.
- ii. Accommodate more the suggestions fit the patients' needs, the more likely they are to comply.
- iii. Remind patient of appointments and keep records of compliance.
- iv. Provide positive reinforcement
- v. Ensure the dentists involvement: In some cases, dentists are more likely to encourage compliance than the dental hygienists.

SPT IN DAILY PRACTICE.⁵

The recall hour should be planned to meet the patients' individual needs. It consists of 4 different sections.

- 1. Examinations, re-evaluation and diagnosis (ERD).
- 2. Motivation, reinstruction and instrumentation (MRI)
- 3. Treatment of reinfected sites (TRS).
- 4. Polishing of the entire dentition, application of fluorides and determination of future SPT (PFD)

SPT FOR PATIENTS WITH IMPLANTS²⁶

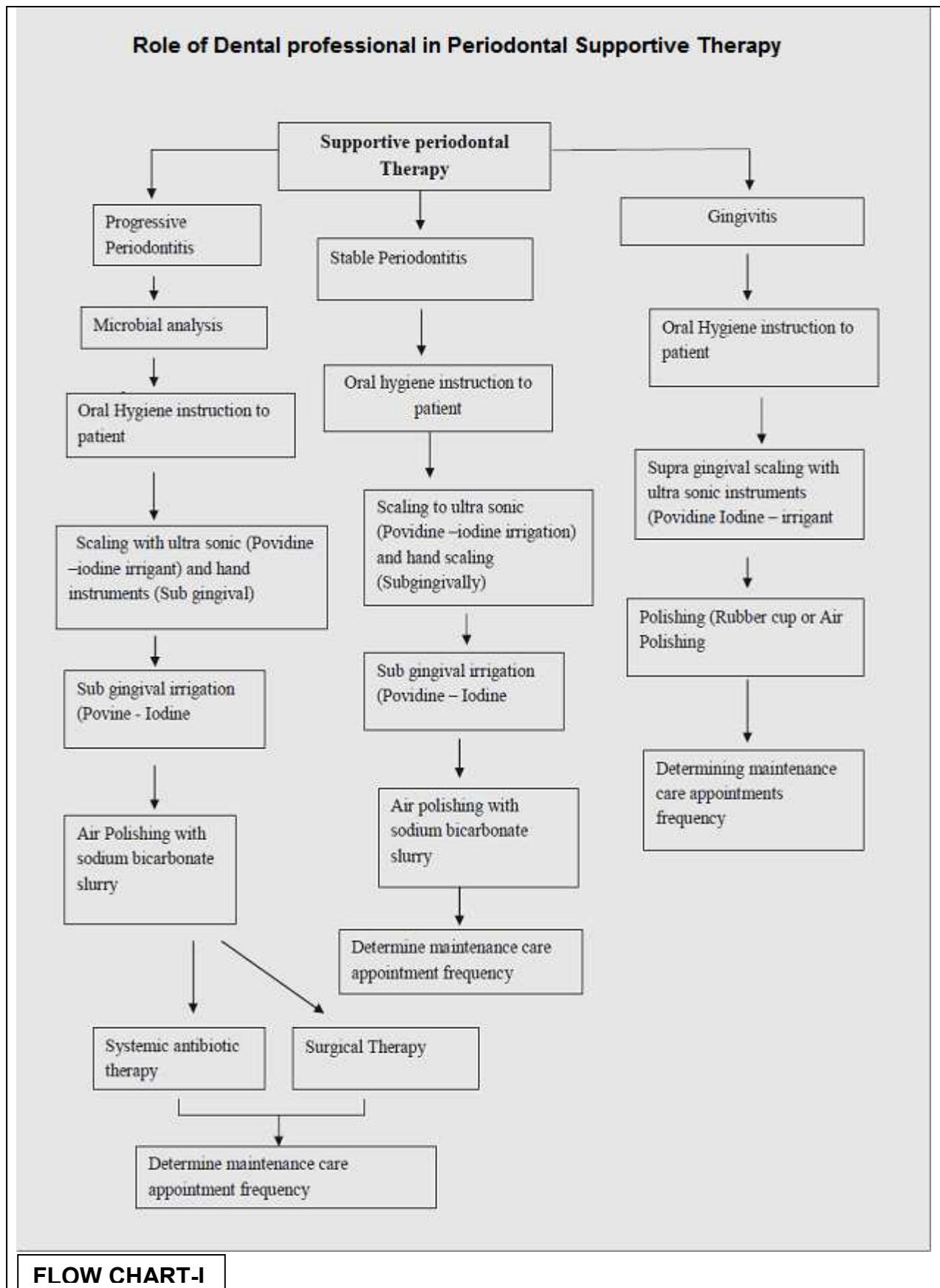
Known as the *cumulative interceptive supportive therapy (CIST)*. Depending on the clinical and eventually the radiographic diagnosis, protocols for preventive and therapeutic measures designed to intercept the development of peri-implant lesions. This system of supportive therapy is cumulative in nature and includes four steps. (**Flow chart-3**)

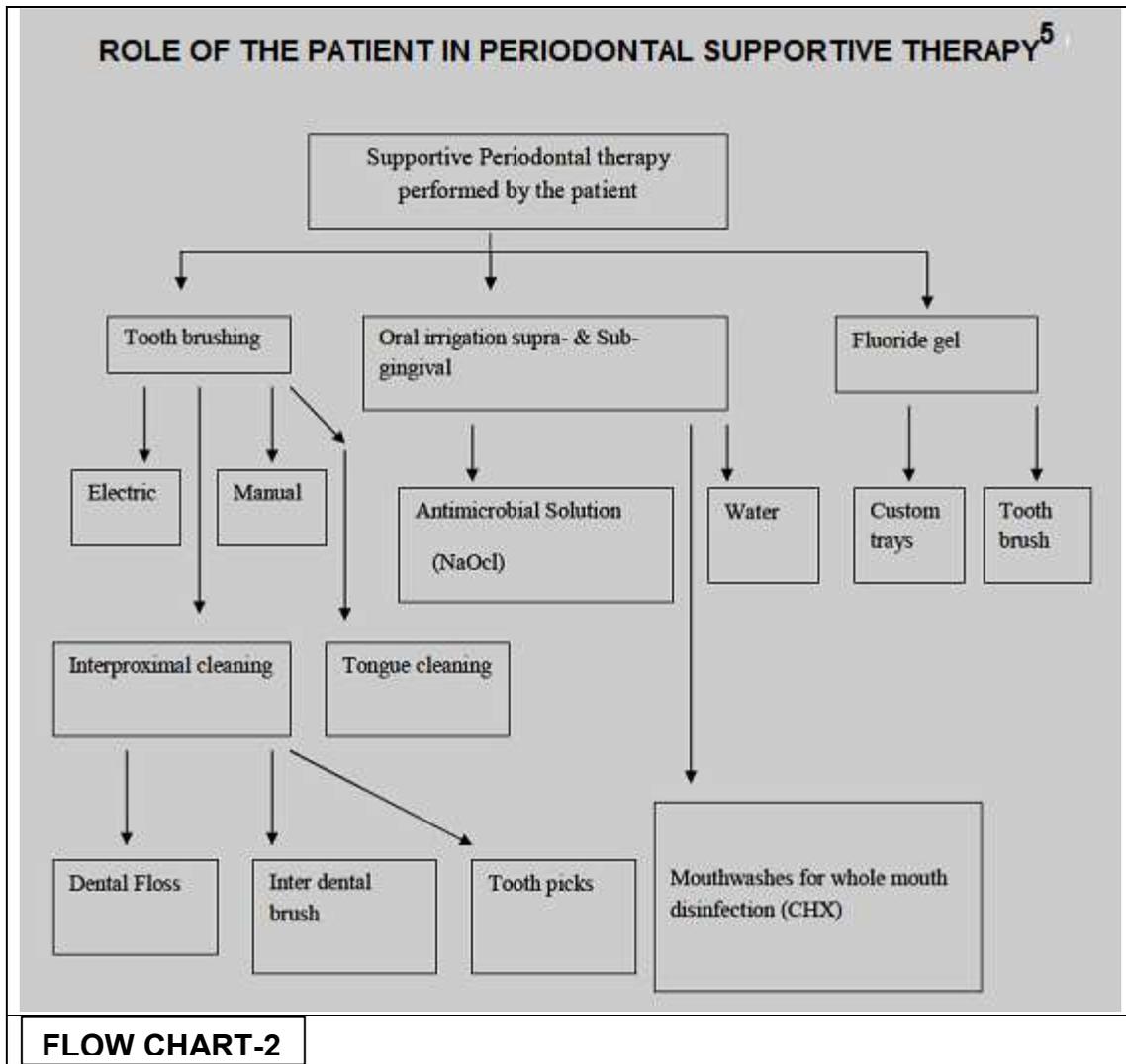
The 4 steps are Mechanical debridement, CIST protocol A

- 1. Antiseptic therapy, CIST protocol A and B
- 2. Antibiotic therapy, CIST protocol A + B
- 3. Antibiotic therapy, CIST protocol A + B + C
- 4. Regenerative or resective therapy, CIST protocol A+B+C+D

Table.2. Radiographic examination of SPT recall patients.²⁵

Patient condition	Type of examination
<ul style="list-style-type: none"> • Patient with clinical caries or high risk factors for caries 	Posterior bitewing examination at 12 to 18 month intervals.
<ul style="list-style-type: none"> • Patient with no clinical caries as high risk factors for caries. 	Peri apical and / or vertical bitewings of problem areas every 12 to 24 months full mouth series every 3 to 5 years.
<ul style="list-style-type: none"> • Patients with periodontal disease not under good control 	Bitewing examination every 24 to 36 months; full mouth series every 5 years.
<ul style="list-style-type: none"> • Patients will history of periodontal treatment with disease under good control. • Patients with root form dental implants 	Peri apical or vertical bitewing at 6, 12 and 36 months after prosthetic placements, then every 36 months unless clinical problems arise
<ul style="list-style-type: none"> • Transfer periodontal or important maintenance patients. 	Full mouth series if a current set is not available. If a full mouth series has been taken within 24 months, then radiographs of implants and periodontal problems areas should be taken





Recurrence of Periodontal Disease²⁴

Lesions may recur occasionally. This may be due to inadequate plaque control, or failure to comply with recommended supportive periodontal treatment schedules on the part of the patient. However, it is the dentist's responsibility to teach, motivate and control the patient's oral hygiene technique and the patient's failure is the dentist's failure. Surgery should not be undertaken unless the patient has shown proficiency and willingness to cooperate by performing his or her part of therapy.

Discussion

Supportive periodontal treatment appears to be an integral part of periodontal therapy and its goal is to maintain the natural dentition in functional health and comfort throughout the lifetime. This ideal, lofty goal often is not completely met in clinical practice, because it requires perfect plaque control, which is seldom achieved.

Lindhe and Nyman 1975²⁸ demonstrated long term success of SPT depends on combined efforts of the patient and the professional, contrary to this (Rosling et al., 1976²⁹, Nyman et al., 1977³⁰, Knowles et al., 1979³¹, Ramfjord et al., 1982¹⁹, Westfelt et al., 1985³²), the long term success of supportive periodontal therapy depends less on the manner in which the case was treated than on vigorous follow-up and on how well the case is maintained in subsequent recall.

According to Loe et al., 1965³³, Seymour et al., 1983³⁴ as the time needed for gingival inflammation to develop into a clinical entity takes two- three weeks supporting this, a regimen given by Ramfjord 1987³⁵ and a review by Ramfjord SP 1993³⁶ suggested oral prophylaxis for every two-three weeks has shown very effective in clinical trials in prevention of gingivitis.

Contrary to the above observations, (Jenkins et al., 2002³⁷) questioned the value of performing repeated

subgingival scaling at 3-month intervals for patients with persistent disease. Whereas, (Heasman et al., 2002³⁸) indicated SPC regimens of supragingival prophylaxis and subgingival debridement are comparable with respect to the clinical outcomes of probing depth and attachment levels at 12 months post non-surgical treatment.

Axelsson and Lindhe 1978³⁹ observed good oral hygiene depends on repeated professional reinforcement and motivation, although most individuals do not seem to comply adequately with maintenance visits (Mendoza et al., 1991⁴⁰). Contrary to these Echeverría et al., 1996⁴¹ in a review on growing evidence of the fundamental role in supportive periodontal care stated personal oral hygiene

becomes a key factor in the long-term preservation of periodontal support in cases with rapid and severe periodontal destruction.

Novaes, Novaes and Bustamanti 1999⁴² demonstrated compliance is a very complex matter and findings from individual studies cannot be generalized. According to Checchi et al., 1994⁴³, Novaes Jr et al., 1996⁴⁴ and no correlation was observed between degree of compliance and gender or between short-distance and long-distance groups. However age is the most important factor of compliance of patients (Ojima et al 2001⁴⁵). Contrary to the above observation female patients of age < or = 30 years and > or = 51 years were found to be higher risk for non-compliance (Novaes 2001⁴⁶).

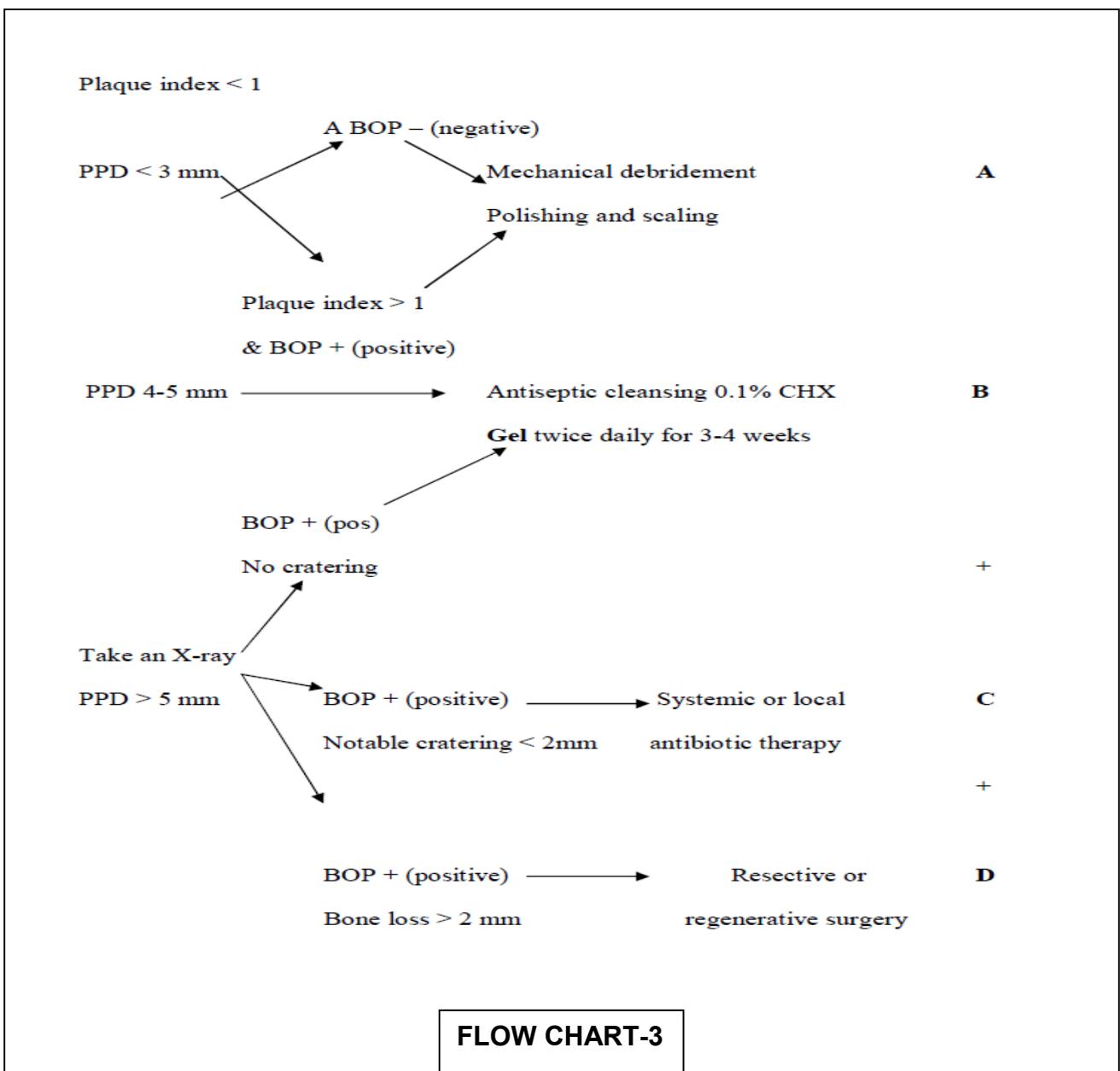


Table 3. SPT IN ORTHODONTIC PATIENTS²³

Time Period	Oral hygiene	Inflammatory periodontal disease	Trauma from occlusion	Muco-gingival problems
Before Treatment	OHI are given	Scaling, root planning or flaps can be raised if condition is present	eliminated	when oral hygiene is optimal and orthodontics is not to be done, grafts are seldom needed
During Treatment	keeping bands as far away from the base of the sulcus leaves more room for effective cleaning	Patient is seen for periodontal prophylaxis	Fremitus monitored and eliminated	Monitored for and treated
After Treatment	monitored as with other patients	patient is kept on appropriate maintenance then reevaluated 6 months after tooth movement ends	Monitory of fremitus and tooth mobility continued and evaluated 6 months after cessation of active orthodontics	Closely monitored.

Mombelli et al., 1997⁴⁷, Jones et al., 1994⁴⁸ and Tonetti 1998⁴⁹ demonstrated the importance of oral hygiene for the benefit of antibiotics during SPT. Beneficial effects of tetracycline fibers was observed at 3-months by (Tonetti 1998⁴⁹), 6 months by (Kornman et al., 1994⁵⁰ and Eickholz et al., 2002⁵¹) and 9-months by (Garrett et al., 2000⁵²). Contrary to these, antibiotics had limited effect (Anna Bogren et al., 2008⁵³) and its failure was observed by (McColl et al., 2006⁵⁴).

Hanes et al 2003⁵⁵ and Bonito et al 2005⁵⁶ in a review observed the use of locally applied antibiotics as an adjunctive therapy to SRP when compared to SRP alone. Taken together, this indicates anti microbials might have to be applied as often as every 3 months to maintain a long-term beneficial effect. An inadequate standard of supra gingival plaque control may account for the failure to maintain a long-term beneficial effect of the drug therapy.

Peri-implant lesions are a common clinical entity adjacent to titanium implants (Roos-Jansaker et al., 2006⁵⁷). According to Quirynen et al., 2007⁵⁸ supportive periodontal therapy can maintain moderately rough implants in periodontally compromised patients and minimal marginal bone loss around implants was observed (Aguirre-Zorzano et al., 2013⁵⁹). Momen and Atieh et al., 2013⁶⁰ reviewed a relatively high occurrence of peri-implant diseases that can manifest and persist for years if not in long-term maintenance care.

Kasaj et al., 2007⁶¹ demonstrated chlorhexidine chip (CHX chip) as an adjunctive therapy to scaling and root planing (SRP) with moderate-to-severe chronic periodontitis is beneficial. Supporting this Escribano et al.,

2010⁶² demonstrated chlorhexidine and cetyl-pyridinium mouth rinse had efficacy in reducing plaque and gingivitis.

Kaldahl et al, 1996⁶³ demonstrated past history of smoking was not deleterious to the response to therapy, heavy smokers (HS) and light smokers (LS) responded less favorably to SPT than past smokers (PS) and non-smokers (NS). But there was no difference between smokers and non-smokers with generalized aggressive periodontitis (G-AgP) during SPT (Guarnelli et al 2010⁶⁴). Bäumer et al., 2011⁶⁵ evaluated SPT and identified it as a protective factor in smoking patients with periodontitis.

According to Pihlstrom BL 2000⁶⁶ regardless of the type of treatment provided, periodontal therapy will fail or will be less effective in the absence of adequate supportive periodontal therapy. Trombelli et al 2014⁶⁷ reviewed and questioned as what extent the impact on long-term periodontal parameters still needs to be assessed during long-term, routine, professional mechanical plaque removal (PMPR) in the prevention of periodontitis progression during Supportive therapy.

Patient's compliance and personal oral hygiene has a greater role in SPT along with the dentist and there is a need for a randomized, controlled clinical trial to determine whether supragingival prophylaxis or subgingival debridement is the most appropriate strategy for SPC. Although short-term (3 months) beneficial effects on clinical parameters were demonstrated with the adjunctive use of locally delivered controlled-release doxycycline in periodontal maintenance patients, repeated application once annually had no long-term clinical and microbiologic effects above and beyond those observed with sub gingival mechanical debridement alone⁵³.

CONCLUSION

Compliance tends to be poor in patients who have chronic diseases that they perceive as nonthreatening. The nature and the rate of disease progression will affect supportive periodontal treatment. The converse is also true. In studies of the effect of therapy, it would be beneficial to record the results of treatment on all the patients, even those who drop out of therapy, to determine the part supportive periodontal treatment plays. Disappointing behavior of patients during the maintenance period should make professionals to conduct an intense program during the first year of maintenance, to educate and motivate patients on the importance of oral health.

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