



The Most Neglected Phase of Periodontal Therapy: Patient Motivation & Education

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Abstract

One of the most important steps for any periodontal treatment to be a successful procedure is patient's self-awareness about maintaining their own oral hygiene. Even after giving maximum potential of a periodontist, the treatment outcome might be negligible if the patient doesn't follow the plaque control measures properly. So, to ensure highest probable outcome of any periodontic treatment, patient education and motivation should be provided in a very skilful manner since the first meeting & also should be reinforced in every succeeding appointment

Keywords: Patient's Self-care, Biofilm Accumulation, Motivation, Long-term Compliance, TIPPS tool

Introduction

Oral hygiene is the practice of keeping one's oral cavity clean, to reduce the plaque scores and other plaque associated problems by regular brushing as well as flossing. It is important that oral hygiene should be carried out on a regular basis to enable prevention of oral diseases and to maintain a healthy gingiva. The most common types of gum diseases which are caused due to the negligence for maintaining oral hygiene are basically gingivitis and obviously its penultimate stage: periodontitis.

No doubt, maintaining oral hygiene is of utmost importance for all the individuals to maintain a healthy state, but when it comes to an ongoing treatment of a periodontitis affected patient, higher standard of plaque control measures which will reduce bacterial load, becomes a necessity. Even surgical periodontal therapy shows its full potential when oral hygiene has been adequately maintained by the patient as well as by the professionals. A decisive influence is drawn by the patient's self-care¹

maintenance of the oral cavity for the long term success of any periodontal treatment². It has been seen that the patients, who were under consistent monitoring since 5-year of period, had a higher frequency of plaque-free tooth surfaces and showed very little evidence of recurrent periodontal disease.³ Whereas the patients who had a lower load of plaque on their tooth surfaces, had a higher frequency of sites which were showing additional loss of attachment. In 1965, Loe and colleagues⁴ conducted the classical study demonstrating the relationship between microbial plaque biofilm accumulation and the development of gingivitis in humans. Socransky et al (1994)⁵ introduced a method to hybridize a lot of DNA samples against large numbers of DNA probes on a single support membrane. The method permits the simultaneous determination of the presence of multiple bacterial species in single or multiple dental plaque samples, thus suggesting its usefulness for a range of clinical or environmental samples.

Therefore, if a periodontist wishes to achieve the full-fledged outcome from the dental office therapies, bacterial load within the plaque must have to be lowered by the self-care regime of the patient. Supra-gingival as well as subgingival plaque control

Treatment Plan

measures are to be done in professional manner,^{6,1} reduction and elimination of the local and systemic risk factors should be made sure and at last but not least motivation as well as adhering to the long-term compliance by the patient has to be reinforced.

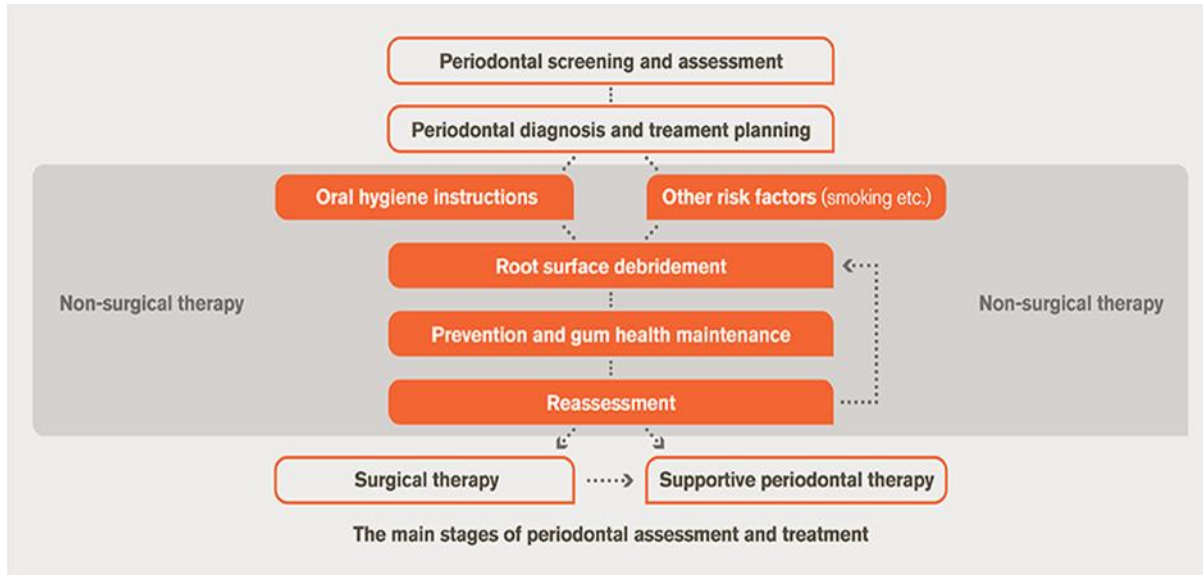


Fig 1- The main stages of periodontal assessment & treatment protocol

Armitage's contribution⁷ at periodontal maintenance phase:

The periodontal maintenance (PM) appointment requires varying amounts of time and is absolutely essential for long-term successful periodontal therapy. The interval between visits are initially set at 3 months, but this schedule can be changed according to the patient's need. The time required for a recall visit for patients with multiple teeth in both arches is approximately:

Part I: Examination for 14 minutes,

Part II: Treatment for 36 minutes,

Part III: Report, Clean-up and scheduling for 10 minutes.

At the 3rd and final stage, patient should be given adequate information and knowledge about how the oral-hygiene regimen is the most necessary for achieving highest prognosis of any treatment. At this stage, TIPPS oral hygiene tool is a saviour for ensuring efficient plaque control measures by the patient in between two appointments to the periodontists.

Oral hygiene tool (TIPPS):

Oral Hygiene tool/ TIPPS is a behaviour change strategy which aims to make patients feel more confident in their ability to perform effective plaque removal and help them plan how and when they will look after their teeth and gums.



Fig 2: TIPPS Tool

Oral hygiene TIPPS is a tool based on behavioural theory that aims to make patients feel more confident in their ability to perform effective plaque removal. Developed by the Scottish Dental Clinical Effectiveness Programme, the intervention is as follows:

1. Talk with the patient about the causes of periodontal disease and discuss any barriers to effective plaque removal,
2. Instruct the patient on the best ways to perform effective plaque removal,
3. Ask the patient to practise cleaning his/her teeth and to use the interdental cleaning aids whilst in the dental surgery,
4. Put in place a plan which specifies how the patient will incorporate oral hygiene into daily life,
5. Provide support to the patient by following up at subsequent visits.

Non-surgical therapy:

Non-surgical periodontal therapy is an integral part of periodontal treatment which includes plaque removal, plaque control, supra- and subgingival scaling, root surface debridement and the adjunctive use of chemical agents. The primary goal of nonsurgical periodontal therapy is to control microbial periodontal infection by removing bacterial biofilm, calculus and toxins from periodontally involved root surfaces. This therapy comprises of 3 components; these are: Patient motivation and education, oral hygiene instructions and oral prophylaxis (mechanical & chemical).

Patient motivation and education: After thorough evaluation of taken case history, scrutinizing all the diagnostic aids as well as consulting with other medical or dental professionals (if necessary),⁸ a probable outcome of the periodontal therapy may be postulated. And at this stage of perio-consultation, the patient should be educated properly on the problems in his or her mouth and the aetiologies and prevention of these problems. For better understanding of the periodontal status of a patient, clinical photographs, X-rays as well as study models can be incorporated. A preventive approach to oral health care demands behaviour modification, which requires time, effort, and repetition. So, every opportunity should be seized to educate patients and to alter their behaviour. Patients should be given personalized oral hygiene instructions to control biofilm and to improve their oral health and the conditions of the periodontium. It is not uncommon for patients to report brushing and flossing multiple times daily, while having poorly controlled periodontal disease in their mouths. The patients are to be asked to show the oral hygiene practices in front of a mirror (whatever he/ she does regularly to maintain oral hygiene on a daily basis).⁹ The patient should then be taught proper biofilm control techniques with a demonstration in his or her own mouth in front of a mirror. After explaining all the minute details of oral self-care techniques to the patients, they should be given minimum 10-14 days to improve their oral hygiene, to control biofilm by themselves and to reduce periodontal inflammation, and to appreciate how they can impact their oral health with meticulous biofilm control before any periodontal treatment is rendered.

Microbial biofilm growth occurs within hours, and it must be completely removed at least once every 48 hours in the experimental setting with periodontally healthy subjects to prevent inflammation.⁹ The American Dental Association (ADA) recommends that individuals should brush twice per day and use floss or other interdental cleaners once per day to effectively remove microbial plaque biofilms and prevent gingivitis.¹⁰ The ADA recommends twice-daily brushing because most individuals do not adequately remove microbial biofilms at one brushing, and doing it a second time improves the results.

Disclosing agent: It is a solution that selectively stains all soft debris, pellicle, and bacterial plaque on teeth which is used after rinsing with water and it can be utilized as an aid in patient education and motivation purpose as well. It is applied to the tooth surface to reveal the presence of dental plaque. These tiny chewable tablets contain a harmless vegetable dye that adheres to plaque – showing up bright pink or purple. It is used always after brushing. They demonstrate clearly the areas where removal of plaque has been missed or not properly cleaned away.

Ex: Two tone solution, Erythrosine dye, Bismark brown, Merbromin & different Iodine solutions.

Proper oral hygiene instructions: Periodontal lesions are predominantly found in interdental locations, so tooth brushing alone is not sufficient to control gingival and periodontal diseases.¹¹ Periodontal patients tend to have increased susceptibility to disease due to complex defects in gingival architecture and long exposed root surfaces to clean, which compounds the difficulty of practicing thorough hygiene.¹² There are different tooth brushing method which are asked to follow in different scenarios. These are: Horizontal Reciprocating Motion: horizontal scrub technique, vibratory motion:

Bass (Sulcular Technique) or Stillman's Brushing Technique, vertical weeping brushing technique and rotary brushing technique.

There are some general rules for recommending tooth brushes to the patients, these are:⁸

1. Soft nylon bristle toothbrushes clean effectively when used properly and tend not to traumatize the gingiva or root surfaces.

2. Toothbrushes become worn due to wear and should be replaced about every 3 to 4 months.
3. If patients perceive a benefit from a particular design of toothbrush, they should use it as long as it is not too stiff and hard.

Dentifrices (or commonly known as toothpastes) are used mostly in the form of pastes; although powders and gel forms are also available in the market. The contents of dentifrices are abrasives, water, humectants, soap or detergent, flavouring and sweetening agents, therapeutic agents (like fluoride, pyrophosphates), colouring agents, and preservatives.^{13, 14} Abrasives are insoluble inorganic salts that enhance the abrasive action of toothbrushing as much as 40 times and make up 20% to 40% of dentifrices.¹⁵ Tooth powders are much more abrasive than pastes and contain about 95% abrasive materials.¹⁴

“Calculus control” toothpastes (also referred to as “tartar control” toothpastes) contain pyrophosphates and have been shown to reduce the deposition of new calculus on teeth as it forms. These ingredients interfere with crystal formation in calculus but do not affect the fluoride ion in the paste or increase tooth sensitivity.¹⁶

Method Of Tooth Brushing:

1. Roll: Roll or modified Stillman's technique,
2. Vibratory: Stillman's, Charters and Bass techniques,
3. Circular: Fone's technique,
4. Vertical: Leonard technique,
5. Horizontal: Scrub technique.

Interdental Cleaning Aids: Tissue destruction associated with periodontal disease often leaves large, open spaces between teeth and exposed root surfaces with anatomic concavities and furcation bony areas. These defects may also occur after any resective periodontal surgeries. The best example of an anatomic root concavity is the mesial root surface of the maxillary first bicuspid. With attachment loss, the concavity located on this mesial surface is exposed where plaque biofilm will accumulate. This is where the need of interdental cleaning aids become prerequisite in nature.¹¹

Patients should understand that the purpose of interdental cleaning is to remove microbial plaque biofilm, not just food that has wedged between two

approximating teeth. Many instruments are available for interproximal cleaning, and they should be recommended based on the size of the interdental spaces, the presence of furcation, root surface concavities, tooth alignment, and the presence of orthodontic appliances or other fixed prostheses. Moreover, ease of use and patient cooperation are important considerations. Common aids for interdental hygiene are dental floss, interdental brushes, rubber tips, and wooden or plastic tips.

The thorough removal of plaque biofilm from the interdental tooth surfaces is the most important hygiene step in the treatment of periodontal disease. Flossing tools work as well as flossing using one's fingers. The flossing habit is very difficult to establish and requires positive reinforcement during each dental visits.¹⁷

Oral Prophylaxis- Scaling root planing (SRP), also known as conventional periodontal therapy, non-surgical periodontal therapy or deep cleaning, is a procedure involving removal of dental plaque and calculus and then smoothing, or planing, of the (exposed) surfaces of the roots, removing cementum or dentine that is impregnated with calculus, toxins, or microorganisms, the etiologic agents that cause inflammation. It is a part of non-surgical periodontal therapy. This helps to establish a periodontium that is in remission of periodontal disease. Periodontal scalers and periodontal curettes are some of the tools involved.

Mechanical Technique; Tooth Brushing: During periodontal treatment as well as managing the deep pockets, it is advised to the patients for mechanically clean the subgingival area with the help of a toothbrush. But if we go through the studies, it has been found that brushing using two different techniques (Roll and Bass) was unable to introduce experimental particles into the crevicular epithelium or underlying connective tissue in patients with periodontal disease (1970s studies). But when irrigating devices had been introduced in those studies, carbon particles were detected from the GCF. Very limited penetration of the toothbrush (to as far as 0.9 mm below the gingival margin) had noticed even when the bass method had been applied.¹⁸

Chemical Rinses To Lower Bacteria: Using antimicrobial agents, as an adjunct to mechanical therapy, aided in the maintenance of the plaque free

environment inside the oral cavity.¹⁹ After 20 years of use of chlorhexidine by the dental profession, it is recognized as the gold standard against which other antiplaque and gingivitis agents are measured. Chlorhexidine's antiplaque effect is a result of the dicationic nature of the chlorhexidine molecule, which affords the agent the property of persistence of antimicrobial effect at the tooth surface, through both bactericidal and bacteriostatic effects. Although other antiplaque agents may show either purely immediate effect, or limited persistence, the degree of chlorhexidine's persistence of effect at the tooth surface is the basis of its clinical efficacy. The cationic nature of the chlorhexidine molecule also means that the activity of the agent is rapidly reduced in the presence of any anionic agents (specifically those found within certain types of toothpaste). Thus care is required when using normal tooth brushing alongside chlorhexidine.

By understanding how the chemical properties of the chlorhexidine molecule can explain the plethora of clinical efficacy and safety data, the use of chlorhexidine can be optimally aimed towards the patient groups who would be mostly benefitted from the superior therapeutic effect of the agent. Specifically, chlorhexidine would seem to be of most valuable to those patients, in whom the ability to perform adequate oral hygiene procedures has been compromised. In these individuals the delivery of the correct dose of chlorhexidine to the tooth surface can be optimized through the judicious use of the several different chlorhexidine formulations, which are now commonly available in the market.

Listerine: Listerine is an American brand of antiseptic mouthwash that is promoted with the slogan "Kills germs that cause bad breath", Named after Joseph Lister, who pioneered antiseptic surgery at the Glasgow Royal Infirmary in Scotland, Listerine was developed in 1879 by Joseph Lawrence, a chemist in St. Louis. The mouthwash fights germs that cause bad breath, plaque and gum related problems. This unique formula is having four different Essential Oils (Menthol, Thymol, Eucalyptol, Oil of Wintergreen), which deeply penetrate into the oral mucosa as well as lower the formation of plaque biofilm.

Chlorhexidine: Chlorhexidine gluconate is a powerful germicidal mouthwash that decreases the no of

intraoral bacteria. Dentists primarily prescribe it to treat inflammation, swelling as well as bleeding gums. Some of the available brand names are: Peridex (3M), PerioGard (Colgate). In the UK chlorhexidine mouthwashes are licensed for 30 days' use and are not recommended for routine use.

Patients are asked to measure 1/2 ounce (15 millilitres) of the solution using the supplied measuring cup and swish the solution in mouth for 30 seconds, then spit it out. Additionally, they are asked not to swallow the solution or mix it with any other substance. After using chlorhexidine, they are asked to wait at least for 30 minutes before rinsing mouth with water or mouthwash, brushing teeth, eating, or drinking any beverage.

Role Of Irrigation: Periodontal diseases are basically localized in nature, more specifically, it's a plaque-related infection. Often, clinical signs of inflammation are not eradicated by supra-gingival plaque control, dictating that subgingival microbial populations must be reduced.²⁰ Confirmation that it is possible to deliver medicaments to the base of deep pockets stimulated numerous investigations.^{20,21,22}

Dissimilar reports regarding rates of bacterial repopulation pose a problem for selecting appropriate irrigation frequencies. In general, subgingival irrigation improved clinical parameters. Lavage with Chlorhexidine (CHX) reduced the level of supra gingival plaque at treated sites, the probable reason may be due to spillage of the drug, but this was not noted after two Stannous fluoride (SnF2) irrigations.

Flushing as a monotherapy decreased pocket depths by approximately 1 mm, and if intermittent or daily lavage was preceded by root planing, pockets were diminished >2 mm. Similarly, it was found from various literatures that, the number of bleeding sites were decreased and it was suggested that, this corresponded to a reduction in the number of spirochetes.

Supra gingival irrigation reduces gingival inflammation¹⁹ and is easy to perform with water irrigation devices. Subgingival irrigation with specialized tips or blunt syringes for deep pockets and furcation areas is effective for maintaining residual pockets and furcation areas when it is used as part of the daily home care routine.²³ Most commonly used irrigating device is DWJ (Dental water jet).

Maintenance Phase & Its Importance:

The 'maintenance phase' is defined as the maintenance of periodontal health following active treatment of any periodontic issue as well as by ensuring patients' adequate knowledge for maintaining oral hygiene on a daily basis. Chronic periodontitis requires supervision and maintenance over a period of time after treatment in order to achieve long-term stability of results and to minimise recurrence.

The recalled appointment should be scheduled according to various factors. The well accepted Merin's classification has been described as follows:

Merin Classification	Characteristics	Recall interval
First year	1) Routine therapy & uneventful healing.	3 months
	2) Difficult case with complicated prosthesis, furcation involvement, or in questionable patient co-operations.	1-2 months

<p>Class A</p>	<p>Excellent results, well maintained for 1 year or more. Patient displays good oral hygiene, minimal calculus, no occlusal problem, no remaining pockets, no teeth with less than 50% of alveolar bone remaining</p>	<p>6 months- 1 year</p>
<p>Class B</p>	<p>Generally good results maintained reasonably well for 1 year or more, but patient displays some of the following factors:</p> <ul style="list-style-type: none"> a) Poor oral hygiene, b) Systemic diseases that predisposes to periodontal breakdown, c) Remaining pockets, d) Occlusal problems, 	<p>3-4 months (Decide on recall interval based on number and & severity of negative factors.</p>
	<p>e) Ongoing orthodontic therapy.</p>	
<p>Class C</p>	<p>Generally poor results after periodontal therapy and / or several negative factors from the list written below:</p> <ul style="list-style-type: none"> a) Poor oral hygiene, b) Many remaining pockets, c) Occlusal problems, d) Complicated prosthesis, e) Periodontal surgery indicated but not performed for medical, psychologic 	<p>1-3 months (Decide on recall interval based on number and severity of negative factors, consider re-treating some areas or extracting severely involved</p>

	<p>or financial reasons,</p> <p>f) Many teeth with less than 50% of alveolar bone support,</p> <p>g) Condition too far advanced to be improved by periodontal surgery,</p> <p>h) More than 20% of pockets bleed on probing.</p>	<p>teeth.</p>
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Conclusions:

Motivating patients to perform effective plaque biofilm control is one of the most critical and difficult elements in long-term success in periodontal therapy. It requires commitment by the patient to change poor daily habits and return for regular visits for maintenance therapy.

The scope of this compliance problem is immense. (It has been shown that patients will stop using interproximal cleaning aids after a very short time. Heasman and associates²⁴ followed 100 patients treated for moderate to severe periodontal disease who were taught to use one or more interdental cleaning aids. These investigators found that only 20% of the patients used the aids after 6 months.²⁵ Of the patients who had started using three devices, one-third had stopped all interdental cleaning at 6 months; the others used one or two of the aids).

The patient must understand the aetiology of the disease and its importance in treatment and maintenance; the patient must also be compliant and receptive and must understand the concepts of aetiology, pathogenesis, treatment and prevention of periodontal disease.

1. The patient must be willing to alter harmful habits such as smoking, tobacco chewing etc.
2. The patient must be able to adjust personal beliefs and values to eliminate risk factors.
3. Motivational interviewing and instruction techniques can assist for achieving these goals.²⁵ Although, manual skills must be developed to establish the strongest plaque biofilm control regimen

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