

# Maintenance care for treated periodontitis patients

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**Abstract.** This paper is a review of current literature combined with clinical observations. Well-controlled maintenance care is a key consideration in the long-term prognosis of treated periodontitis patients. Periodic professional tooth cleaning every 3 to 4 months often is recommended. Furthermore, recent studies indicate a potential need for selected retreatment in problem areas, since minute residual accretions may be left behind during active therapy – even with “open” surgery. While efficient plaque control is essential for optimal results during the healing phase of periodontal therapy, periodic prophylaxis may prevent loss of clinical attachment over long periods of time even for patients with less than perfect oral hygiene.

**Key words:** Maintenance therapy – scaling – plaque control – retreatment.

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If a person once has developed periodontitis, it has to be assumed that he/she is at risk for future loss of periodontal attachment if bacterial action is not contained in some way (Loe et al. 1978). There is at present no “definitive periodontal treatment” that will cure all periodontal infections in the same sense as an infection in a finger or a toe may be cured with antibiotics without residual predisposition to a recurrent infection. Periodontal disease is the result of opportunistic infection (Lang et al. 1985) by infective organisms which cannot be eliminated from the mouth over prolonged time, and so far we have no way to boost the patient's immunoresponses to the extent that these organisms would be innocuous. Complete periodontal health will exist only with perfect plaque control, which usually is an elusive goal over a long period of time for patients who have had periodontitis (Ramfjord et al. 1982). Obviously, the closer we come to maintenance of a plaque-free dentition, the lesser is the risk for return of any periodontal disease. However, the facts of life are that in spite of extensive attempts, we have not been able to maintain complete plaque control in periodontitis patients over years, even when unrealistic amounts of time and effort were spent towards that goal (Ramfjord et al. 1982). Fortunately, a great number of individuals may harbour some

plaque without even developing gingivitis, and a good % of adults have plaque and gingivitis without developing periodontitis. Thus, dentitions may function in comfort and without measurable loss of support for the teeth over many years, in spite of less than perfect plaque control. Gingivitis has to be characterized as a form of periodontal disease with a potential over time to develop into periodontitis. From a practical public health standpoint, it has been suggested that it would be very important to determine who can tolerate a certain amount of plaque and gingivitis over time without developing periodontitis, and only in susceptible individuals to intercept the infective process before periodontal attachment is lost (Polson & Goodson 1985).

To ignore gingivitis and treat only pockets which show indications of continuous breakdown would endorse a very questionable principle of only treating “fatal disease” (fatal to the teeth), and leave bleeding infected gums alone untreated. One may imagine how that principle could affect the practice of medicine if the physicians were to treat only diseases with fatal prognosis. Quality of life and elimination of disease are after all the main concerns in all health care, although by tradition length of life may be given the primary attention.

Both length of life and quality (com-

fort) of the human dentition is best served by the lowest possible attack rate of pathogenic organisms, and all our efforts should be directed toward a disease-free mouth. The fact that this goal may not be completely attained should not be used as an excuse to ignore some form of periodontal disease (gingivitis) and treat periodontitis only, especially since what is good for gingivitis (plaque control) also is good for control of periodontitis. Some confusion has crept into the discussion of effective maintenance programs for gingivitis and periodontitis, since it appears to take a longer time after treatment to re-establish destructive periodontitis than gingivitis with inadequate oral hygiene by the patient. Thus, periodic professional tooth cleaning every 3 months may serve predictably well for prevention of clinical loss of attachment, but it may not be adequate for prevention of gingivitis if the plaque control is poor (Ramfjord et al. 1982).

Although plaque control is the alpha and omega of prevention, healing, and maintenance of periodontal health, it should be understood that adequate (1) prevention programs, (2) treatment and healing programs, (3) maintenance programs may differ both in execution and time frames and still give similar results with regards to maintenance of attachment levels.

This paper is focused on the mainten-

ance care of treated periodontitis patients, and does not consider the need for supervision of regular dental patients without a history of periodontitis.

#### **When should maintenance phase start?**

Maintenance care should secure over time the results obtained by periodontal therapy, and if possible encourage regeneration of lost periodontal support (soft tissue and bone). It should preserve oral and dental health and intercept any upcoming threats to the health status. The duration of initial and delayed healing responses to periodontal therapy depends on the nature of the lesions, the modality of therapy and type of care during the healing stage. The initial gross clinical results of the therapeutic procedures are established 4–6 weeks after completion of the therapy (Caton et al. 1982). However, there are noticeable changes in gingival form and collagen content for at least 6 months (or in one study for 9 months) (Badersten et al. 1984) after completion of the therapy. Observing patients who have had each half of the mouth treated by different techniques, has made it apparent that adaptive changes in gingival form, crevice depth, bone contour and tooth mobility may take place over several years even in successfully treated cases. However, these adaptive changes cannot be characterized as healing. When healing ends, and the changes should be considered as adaptive, cannot be stated in terms of numbers of weeks or months. The results of therapy are fairly stable with respect to clinical attachment levels after 6 months (Westfelt et al. 1983). Suggestions have been made (Westfelt et al. 1983) to consider as a healing phase the first 6 months after completion of the treatment of periodontal pockets, while following mucogingival surgery, the results are essentially stable after 4–6 weeks (Guinard et al. 1978).

Longitudinal results following treatment of periodontitis are often documented from a baseline of 6 (Westfelt et al. 1983) to 12 months (Knowles et al. 1979) after the therapy, while the changes that occurred before that time usually have been credited to healing as a direct result of the therapeutic procedures. It also appears that the position of the attachment levels become stable in a much shorter time than the pocket depth and the position of the free gingival margin. However, a definite separ-

ation between the healing phase and the maintenance phase is not practical, and of minor clinical importance since the treatment procedures used during the 2 phases are in both instances concentrated on plaque control. Thus, a main question is the frequency of professional tooth cleaning needed after active treatment and how this need relates to the patient's own plaque control level.

It has been established that the results of treatment of periodontitis may be improved by professional tooth cleaning every 2 weeks for the first 6 months postoperatively compared with prophylaxis once a month or every 3 months during this period (Westfelt et al. 1983), and that mechanical tooth cleaning provided slightly better results than chemical plaque control during the healing period (Westfelt et al. 1983). Later during the maintenance phase with prophylaxis for all patients every 3 months, these initial differences in results continued. The unquestionable benefit from periodic professional tooth cleaning after periodontal surgery was established convincingly by the Gothenburg group about 10 years ago (Nyman et al. 1975). During the last 10 years of the Michigan studies, we have removed supra and subgingival plaque professionally once a week for the 1st 4 weeks after periodontal surgery and then placed the patients on a maintenance program with visits every 3 months. What is the best during healing, either professional cleaning every 2 weeks for 6 months or weekly cleaning for 4 weeks and then maintenance care every 3 months, has not been tested, but the similarity of the results from the Gothenburg and the Michigan studies might indicate that small differences in time schedules during the initial healing are insignificant for the clinical results.

The disastrous results from inadequate oral hygiene both during the healing phase and later have been documented convincingly by Nyman et al. (1977).

#### **Objectives of maintenance care**

The prime objective of maintenance care is to secure optimal supra and subgingival plaque control. First by encouraging optimal oral hygiene by the patient, and secondly by professional removal of all supra and subgingival plaque and calculus. professional tooth cleaning should include removal of all supra and subgingival accretions with

small curettes, polishing with soft rubber cups and fluoride toothpaste or fine fluorcontaining pumice, the use of the EVA polishing contrangle interproximally, and followed by topical application of fluoride. Since we have not been able to implement a perfect and uniform plaque control in periodontitis patients (Ramfjord et al. 1982), we rely heavily on the meticulous periodic supra and subgingival professional tooth cleaning and the application of fluorides. The patient's own plaque control is more critical for establishment of optimal pocket depth and attachment level during the healing stage than for maintaining these levels during the maintenance phase (Ramfjord et al. 1982). The patients with the best oral hygiene in our studies also had the most favorable healing results during the 1st year (Ramfjord et al. 1982). However, later, the maintenance results were similar over time for the groups with below or above average oral hygiene performance. Thus, after the 1st year, the average rate of loss or gain of attachment over 7 years did not seem to be affected by the oral hygiene performance for these patients who received professional tooth cleaning every 3 months.

From an animal experiment (Morrisson et al. 1979), it appeared that with perfect oral hygiene, periodic professional tooth cleaning was not needed to maintain attachment levels and reduced pocket depth. Furthermore, reports by Lindhe et al. (1984) also showed that with perfect plaque control, frequent recall was not as important as with inadequate plaque control. However, the same group of investigators have shown convincingly that with inadequate oral hygiene and 6 months periodic recall, deepening of pockets and loss of attachment occurred (Nyman et al. 1977). Since in the Michigan studies, we have not been able to secure on a predictable basis perfect plaque control, we have implemented professional tooth cleaning every 3 months, and with that program, it has been possible to maintain the clinical attachment level for the treated teeth with only few exceptions (Knowles et al. 1979, Ramfjord et al. 1986).

However, in spite of a well-controlled 3-month recall program, a few teeth have gradually lost attachment and some teeth had to be extracted (Ramfjord et al. 1986). All of these extracted teeth had specks of residual subgingival calculus which had not been

eliminated before or during the recall. Some pockets with pus secretion and bleeding on probing also lost attachment related to ineffective root planing associated with furcations and other anatomical restrictions to access. In such instances, both professional and personal oral hygiene proved inadequate to stop the progress of the periodontitis.

### Retreatment

One very important aspect of maintenance care is to diagnose the pockets where the initial treatment was inadequate so another attempt can be made to remove irritants on the root surface, as well as to prevent significant repopulation of pathogenic bacteria in the treated pockets.

It has been suggested that need for retreatment can be tested by bacterial counts (Keyes et al. 1978, Listgarten et al. 1981), but no specific organisms, or groups of organisms have yet been selectively implicated as causal agents for chronic periodontal disease, and the significance of the bacterial counts is very controversial when used for diagnosis of individual disease sites.

Although it has been claimed on the basis of short-term studies that clinical signs of redness, bleeding on probing and suppuration are poor predictors of periodontal disease activity as measured by attachment loss (Haffajee et al. 1983), this claim should be re-evaluated over a longer period of time and with more cases. When patients are examined at the time of recall every 3 months, gingival bleeding to probing is very common and may have nothing to do with the status at the deeper parts of the pockets. However, bleeding to gently probing 2–3 weeks after the recall prophylaxis and instruction indicates root surface irritants. Retreatment in cases of bleeding and/or pus may halt the progressive periodontitis (Ramfjord et al. 1986), while in other instances with inaccessible furcas or residual calculus the bleeding tendency and the breakdown may continue in spite of frequent recalls and good oral hygiene.

Incomplete removal of subgingival plaque and calculus during periodontal therapy, with (Caffesse et al. 1985) or without (Rabbani et al. 1981) flap surgery apparently is more common than generally assumed (Hunter et al. 1984, Eaton et al. 1985), and clinically acceptable results may (Knowles et al. 1979,

Caffesse et al. 1986) be attained in spite of the fact that microscopic remains of plaque and calculus inadvertently may be left on the roots, especially when deep pockets are treated. According to recent findings (Hunter et al. 1984, Eaton et al. 1985), it appears likely that microscopic specks of calculus and/or plaque may be present on root surfaces even if they appear clean to the naked eye during surgical exposure. Such remaining accretions may potentially be more-or-less harmful, dependent on total mass and type of bacteria and toxins. The root surface in a pocket that bleeds during gentle probing should be re-scaled, and if the bleeding continues, it should be exposed surgically and planed even if no calculus is visible. Bleeding on gentle probing indicates inflammation and less than ideal result of the treatment, although the pocket depth may not increase to a measurable extent. Magnifying glasses should be used during periodontal surgery.

Pockets that secrete pus or bleed from the bottom of the crevice during recall examination should be noted on the record and the teeth scaled as part of the professional tooth cleaning; such patients should then be called back in 2–3 weeks to be tested by the dentist or periodontist. If the pockets still bleed, it is up to the dentist to decide what may be done to eliminate the source of irritation – further root planing with or without surgical exposure. If the bleeding is from a furcation which previously has proven to be inaccessible, the tooth may be given up as an unavoidable loss or left as long as it is asymptomatic. Pockets with significant loss of attachment ( $\geq 2$  mm) during maintenance therapy should be routinely retreated, usually by a simple small mucoperiosteal flap, and the roots planed or by scaling and root planing only (Ramfjord et al. 1986).

If the professional tooth cleaning at recall visits is performed by persons who are good at scaling teeth, the chances are that calculus overlooked during the initial treatment or previous visits is found and removed, while if the recall is mainly a supragingival plaque removal and polishing session, minute subgingival irritants are often overlooked.

Much interest is currently focused on use of antibiotics both for treatment and maintenance care of periodontitis patients (Ciancio & Genco 1983). However, the results from bacteriological and clinical studies are confusing, and

these methods are as yet not ready for routine clinical application. It appears that antibiotic therapy alone for periodontal disease will not provide satisfactory long-term results. Antibiotics in addition to mechanical therapy may enhance at least the short-term responses to the treatment, but a combination of drugs and mechanical modalities of therapy has not been shown to have any long-term advantage over periodic mechanical recall therapy alone. However, a few patients with recalcitrant periodontitis may at least over the short-term get some benefit from antibiotics in addition to the mechanical therapy (Slots et al. 1979), and it may lead to temporary healing of a periodontal abscess, but this healing has to be augmented by mechanical therapy to assure long-term benefit.

Problems concerning development of resistant bacterial strains (Kornman & Karl 1982), following long-term use of antibiotics are always of concern. At the present, tetracycline is usually the drug of choice if antibiotics are to be used; however, there is a definite consensus that drug therapy, especially over prolonged time should be avoided if satisfactory results can be obtained by mechanical therapy. Even antimicrobial pocket irrigation is of limited value in maintenance care (Broatz et al. 1985). Professional supra and subgingival plaque removal once a month for 3–4 months and then every 2 months for another 3–4 months has been found to be more helpful than antibiotics in recalcitrant progressive periodontitis where recall every 3 months did not stop the progress of the disease. Drugs should definitely not be used as a substitute for inadequate removal of root surface irritants, and in spite of all glowing reports on the merits of scaling and root planing, these are situations where flap surgery will provide better access for removal of irritants than so-called "closed procedures".

The clinical results of mechanical periodontal therapy with regular maintenance care have been reported to be excellent over as long as 14 years, with very few teeth lost (Lindhe & Nyman 1984). Traditionally, it has been assumed that if probable pocket depth could be reduced to 3 mm or less following periodontal therapy, such "definitive" or "ideal" treatment would facilitate maintenance care and ensure against future periodontal loss in that area. It has also been suggested that treated pockets

with a long junctional epithelium could predispose to repocketing (Barrington 1981). Research has refuted such assumptions (Magnusson et al. 1983, Beaumont et al. 1984, Hunter et al. 1984), and it appears from a recent study (Ramfjord et al. 1986) that the resistance to progress of periodontal disease is about equal for a long epithelial attachment and connective tissue attachment, and that a higher % of shallow creviced ( $\leq 3$  mm) lost  $\geq 2$  mm of attachment over 5 years than for deeper crevices. Thus it appears to be no justification for a forceful penetration of the epithelial attachment during recall prophylaxis. Tightly adapted pocket walls without appreciable subgingival spread of plaque and inflammation during recall should be treated with light scaling or just polished if no calculus is present.

#### Monitoring of sensitivity, caries, pulp, old restorations and occlusion

With good plaque control during the healing phase and topical acidulated fluorophosphate application, root sensitivity is seldom any problem. This is partially true because root surfaces do not need to be denuded by resective surgery any more. Sodium fluoride mouthrinses or stannous fluoride are helpful against sensitivity. Maintenance prophylaxis should not include routine root planing. Only problem areas with pocket bleeding or pus should be planed at recall. Use of fluorides makes the surfaces of the roots harder by uptake of fluoride, and this hardened surface layer should not be removed. Polishing with fluoride-containing toothpaste is indicated rather than use of pumice which tends to remove too much tooth substance. If fluorides are not used, the exposed root surface often becomes soft, and will then have to be removed by repeated root planing, leading to progressive loss of tooth substance.

The use of topical fluoride is essential for prevention of caries, and acidulated fluorophosphate appears to be the best drug. However, if the patient has porcelain crowns, a non-acid preparation should be used.

A thorough check for caries at least twice a year and bitewing roentgenograms once a year both for caries and periodontal status should be carried out. Old restorations should be examined; they sometimes need to be re-

placed as cracks, erosions and fractures may occur or newer and better restorative materials and techniques become available. Pulp vitality and old root canal fillings should be observed with emphasis on questionable teeth according to previous records.

Occlusion, tooth mobility and masticatory comfort should also be checked. If mobile teeth are becoming increasingly mobile or feel uncomfortable during normal mastication, splinting may be indicated. Teeth with a tendency towards tipping and elongation also need monitoring to observe if the tipping is progressive and whether treatment is needed. Special attention should be given to removable prosthetic appliances and their periodontal relationships. Inspection of soft tissue lesions should always be included in maintenance care visits.

#### Summary

Maintenance care for treated periodontitis patients should include professional tooth cleaning of all teeth, oral hygiene instruction and fluoride application every 3 months.

Selective retreatment is often needed during the maintenance phase, both because of residual minute accretions and in relation to new active lesions. A careful monitoring of areas with bleeding and/or pus is important. Residual crevice depth after periodontal therapy is not critical for the prognosis.

#### Zusammenfassung

*Die Nachsorge bei behandelten Parodontitispatienten*

Die vorliegende Veröffentlichung vermittelt eine Übersicht über das laufende Schrifttum,

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verbunden mit klinischen Beobachtungen. Die gut kontrollierte Nachsorge nimmt bei der Langzeitprognose behandelter Parodontitispatienten eine Schlüsselstellung ein. Im allgemeinen wird eine, in 3 bis 4-monatlichen Abständen vorzunehmende, professionelle Zahnreinigung empfohlen. Weiterhin zeigen kürzlich veröffentlichte Studien den potentiellen Bedarf an selektiver Behandlung von Problemregionen, da nach der aktiven Therapie kleine Residualloci mit Krankheitszuwachspotential übrig geblieben sein können – auch nach "offener" Chirurgie. Während die erfolgreiche Plaquekontrolle die Voraussetzung für optimale Ergebnisse während der Heilungsphase der parodontalen Therapie ist, so kann die regelmässig vorgenommene Prophylaxe einen Verlust klinischen Attachments auch bei Patienten verhindern, deren orale Hygiene weniger perfekt ist.

### Résumé

#### *Soins de maintien chez les patients traités pour parodontite*

Cet article contient une revue de la littérature actuelle en même temps que des observations cliniques. La qualité du programme des soins de maintien est un élément fondamental pour le pronostic à long terme chez les patients qui ont subi un traitement parodontal. Il est souvent recommandé de faire des séances de nettoyage dentaire professionnel tous les 3–4 mois. Des études récentes ont en outre indiqué qu'il peut être nécessaire de faire une reprise sélective du traitement dans les zones problématiques, puisque des restes minimes de dépôts peuvent subsister après le traitement actif, même dans le cas d'une intervention chirurgicale à découvert. Le contrôle efficace de la plaque est essentiel pour obtenir un résultat optimal pendant la phase de guérison du traitement parodontal, mais les nettoyages dentaires périodiques peuvent prévenir la perte d'attache clinique sur de longues périodes, même si les soins d'hygiène pratiqués par les patients ne sont pas parfaits.

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