Long-Term Management of the Fearful Adult Patient Using Behavior Modification and Other Modalities

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Abstract: This paper reviews reports on the treatment of fearful adult dental patients with special emphasis on behavioral and cognitive methods and long-term followup. A number of such treatment methods are available that can be used by dentists for the alleviation of fear and anxiety in their patients. At an “intuitive” level, many dentists probably use these methods frequently as a comprehensive part of everyday praxis. Considering the high number of fearful individuals visiting dentists regularly, a better knowledge of such methods would improve dental care for the majority of these patients. It would also help prevent aggravation of fears among individuals at risk. However, despite the success of treatment methods performed by specially trained dentists, it seems reasonable that there should be limits to what can be expected of a dentist in terms of psychological, diagnostic, and therapeutic competence. Dental phobia may constitute a complex psychological and odontological problem with far-reaching consequences for a relatively large proportion of fearful individuals. It therefore seems likely that optimal care of such patients can best be achieved by cross-disciplinary efforts involving both dentists and psychologists.

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Key words: literature review, dental anxiety, dentist-patient relations, adult, treatment outcome, long-term, behavior therapy, cognitive therapy, pharmacological therapy

Dental fear, in keeping with other specific phobias, involves intense fear of a specific object or situation. However, dental fear is in many respects atypical. In contrast to many other phobias, sufferers subject themselves to regular and repeated exposure to threatening stimuli, or may be expected to do so. In addition, compared to most other specific phobias, avoiding the feared situation in many cases leads to significant negative consequences. For the truly phobic individual, it is common for a vicious cycle to develop in which fear leads to avoidance of dentists, resulting in neglected dental care, increased awareness of these unmet needs, and feelings of shame. These factors give rise to negative social effects and hence to increased anxiety.1 Another important factor is that the dentist and auxiliaries are also affected by patients’ anxiety: the performance of dental care may be hampered, giving rise to occupational stress. When considering the importance of treating dental fear, all of these aspects should be taken into account.

However, it should be emphasized that a review of the research literature does not provide a complete picture. Although up to 40 percent of the adult population admit to being fearful of dental treatment, only 3 percent to 5 percent can be said to be truly phobic or to have a debilitating high level of fear. A limitation that should be borne in mind in light of this is that almost all clinical studies have been performed with selected samples of individuals seeking special care because of dental fear and avoidance. Our knowledge about the larger group of fearful individuals with regular dental care is limited. Thus, it is assumed (but not established) that there is a difference in degree and quality, but still a significant similarity between problems experienced by fearful individuals with regular and irregular dental care.

Scope of the Problem

From a patient’s point of view, the obvious effect of high dental fear is the inability to undergo ordinary dental treatment. However, as mentioned above, fairly large proportions of fearful individuals seek dental treatment on a regular basis, but with an increased incidence of canceled appointments. At the dentist’s office, fearful patients report experiences of pain and ineffective local anesthesia. Commonly, fear of specific treatments (drilling, extractions, and root-canal treatments) or instruments (syringe, explorer), and a feeling of lack of control or
distrust and fear of belittlement vis-à-vis dental personnel\textsuperscript{11,12} are reported.

The effect of dental fear on oral health has been reported in several studies.\textsuperscript{13-15} These effects are marked in phobic groups,\textsuperscript{13,16} but have also been established in Vassend’s large-scale epidemiological study in Norway.\textsuperscript{7} Hakeberg\textsuperscript{13} compared dental phobic individuals with a matched control group of ordinary dental patients and found that the number of missing teeth was four compared with one; decayed tooth surfaces, twenty compared with eight; filled surfaces, eight compared with thirteen; and periapical lesions, four compared with one. In addition, proximal bone loss was significantly greater among phobic individuals.

In 1996, Kent\textsuperscript{17} drew attention to individual cognition as well as social consequences in fearful patients compared with a group of emergency patients. Previously, Berggren\textsuperscript{16,18} reported that phobic patients listed an array of negative side effects in everyday life situations, including increased use of medication and increased sick-leave periods at work. Almost 50 percent of these phobic patients reported having problems with family relationships, meeting friends, eating out, and going on vacation.

From the dental profession’s perspective, patients’ dental anxiety has a negative effect on the performance of dental care and gives rise to occupational stress. In a study among Swedish dentists\textsuperscript{3} the most commonly mentioned stress-provoking patient behaviors were “non-compliance with oral hygiene instructions,” “missed and canceled appointments,” and “patients showing fear.” Although “patients showing fear” was ranked considerably lower (sixteenth) with regard to the level of stress it produces, the highest stress levels were reported in conjunction with patient behaviors that all may be related to extreme fear reactions (“not appreciating your work,” “interrupting treatment,” and, again, “missed or canceled appointments”). Thus, it seems that these dentists distinguished between dental fears, which are common among patients complying with regular dentistry, and noncomplying fearful patients who have dental care on a non-regular basis or not at all.

What Determines the Choice of Therapy

Patients come to their dentist to have dental treatment and should obviously be provided with sound dental care. Dental status, time, cost, and patients’ preferences all are taken into account when a specific therapy is planned. An evaluation of the patient’s personality and psychological resources is included, albeit seldom in a structured way. However, this process is by no means “objective,” but is influenced by the dentist’s skills, interests, and preferences, and his or her awareness and knowledge about each of the above-mentioned factors.

In addition, regulations may govern the choice of particular treatment methods. For example, I.V. sedation and general anesthesia are not available for use by dentists in their clinics, but in Scandinavia and some other parts of Europe they must be administered by an anesthesiologist in a hospital setting. Nitrous oxide sedation can be used in Sweden and Norway only by dentists who have completed postgraduate education. In the Netherlands, it is considered unethical to use general anesthesia and deep sedation without first trying to treat patients with behavioral methods.\textsuperscript{19} There may also be restrictions on psychological treatment modalities. Formal hypnosis, for example, cannot be used by dentists in Norway.

Thus, within the limits of regulations and ethical rules, a dentist should try to find strategies to explore each case and make decisions together with the patient in the patient’s best interest. For a fearful patient, after history taking and evaluation of information, one important question to put to oneself and the patient is “What is the primary problem?” The patient often has his or her focus on treating cavities, but frequently the primary problem is fear. These matters should be discussed and clarified before embarking on treatment. Regardless of the therapy chosen, an agreement with the patient about the primary objective of treatment makes it easier to keep the focus on just that. This is important since patients tend to be eager to have quick dental results, which often may be counterproductive in terms of emotional and behavioral change.

My experience is that it is most helpful to listen carefully to the patient and to take as one’s starting point his or her own assessment of the situation. The goal is always to strengthen the patient’s feelings of self-efficacy. In my dental phobia clinic, the goal is to enable the patient to leave the special fear-clinic as soon as possible and to receive regular, conventional dental care with a general practitioner. We look upon our treatment and staff as tools for the patient to use to enhance and build up his or her own competence. Coping strategies should be internal-
ized so that the patient should need neither premedication nor a specially trained “therapeutic” dentist in the future. Among our long-term avoiders, we too often meet patients who have already received such care and who have had various dental needs met without tackling the dental fear. From time to time they relapse into fear and avoidance, and some of them eventually come to our clinic.

Even though our basic approach relies on cognitive-behavioral techniques, we sometimes combine them with pharmacological treatments. However, we always try to end our therapy with conventional dental treatments without any adjuvant methods before referring patients to general practitioners. As I previously mentioned, we see neither method as a separate treatment technique, but rather as an aid to promote a psychological outcome. In fact, it is hard for me to believe that any medicine given to reduce anxiety acts on its own. My view is rather that medication sometimes is necessary to make it possible for a patient to gain new and positive experiences. If medication leads to a lasting coping ability and anxiety reduction, it is a beneficial approach. If the patient continues to need medication, we have not been successful.

However, we have found it useful to combine cognitive-behavioral therapies with pharmacological treatments in four situations:

a) *When the patient has an immediate need for dental treatment because of acute dental pain.* Painful conditions make it close to impossible to motivate the patient to work with his or her fear. In these cases we initially choose nitrous oxide sedation or oral or I.V. sedation with diazepam or midazolam, although we sometimes use general anesthesia.

b) *When the patient has an accumulated massive need for treatment with several risks for acute dental pain.* This is a situation that, for both practical and humane reasons, is often best solved by general anesthesia. Often these patients are so preoccupied by their need for dental treatment that they cannot deal with their underlying fear reactions.

c) *When the patient was referred to our clinic specifically for general anesthesia treatment and categorically demands it.* It may be impossible to change the patient’s opinion about this, but it is often possible to motivate the patient for fear treatment afterwards.

d) *When it may be strategic for highly motivated patients to start exposure therapy aided by mild sedation.*

### Evidence-Based Treatment Methods

Many research studies have shown the positive effects of a variety of psychological treatment approaches for dental fear. However, only a limited number of reports have included evaluations of followups. An even smaller number have included followup studies of general dentistry outside the specialized university or fear clinic. From a clinical point of view, however, the results of studies with a “real-life” followup are of special interest. Although most studies are performed by psychologists and dentists together, special attention should be drawn to some recent studies that evaluated behavioral treatments performed by dentists alone.19,20

I have mentioned that fear treatment usually involves a combination of several different techniques. However, for this paper I have chosen to discuss eclectic approaches, behaviorally oriented approaches, and cognitively oriented approaches separately. I have also treated clinical comparative and long-term (at least one year) followup studies separately.

### Eclectic Approaches

A fundamental prerequisite for most reported treatments for dental fear is a good patient-dentist relationship. Although this fact is clinically well established, it is seldom specified as a clinical component and is rarely considered in the analysis of treatment success or failure. Interpersonal processes are far from well explored in dentistry and are mainly seen as cognitive processes. Other aspects were elaborated on in a recent doctoral thesis by Willumsen in Oslo, Norway,20 in which it was emphasized that behavioral aspects of dentists’ communication with patients are just as important as cognitive ones. Another doctoral thesis, which used qualitative in-depth interviews with dentists experienced in working with phobic dental patients, pictured the core category of these dentists’ view of successful interaction as “relatedness, based on affective resonance and concordant roles.” An ability to adjust to the patient’s needs by shifting between a professional and a personal role vis-à-vis the patient was seen as particularly important.21

Friedman and colleagues22,23 described what they labeled an “iatrosedative technique” as a sys-
Behaviorally Oriented Approaches

Behavior modification tries to modify symptoms in patients’ behavior that interfere with their adaptive functioning.25 Behavior modification is based on principles of learning, both in terms of classical conditioning26,27 or operant conditioning28 and of social learning.29 It should be emphasized that cognitive processes have a significant influence on behavior.29,31 In clinical practice, the treatment of dental fear often includes concurrent components to modify both behavior and cognitions.32 Melamed33 pointed out that in studies of behavior modification such as systematic desensitization, what was described was seldom pure systematic desensitization, but rather a variety or mixture of different techniques. However, for the reader’s convenience, this and the following sections will distinguish between these aspects. Hence, treatments based on gradual exposure and systematic desensitization will be described briefly first.

Systematic desensitization (SD) first came to widespread attention when Wolpe26 presented his theory of reciprocal inhibition. SD uses relaxation (in Wolpe’s case, deep muscle relaxation) to counteract and weaken the connection between the anxiety-provoking stimulus and its response (arousal, tension, and fear) during gradual exposure. Thus, SD involves: a) constructing an individual anxiety “scale” for the patient to use to report anxiety at each stage of treatment, which encourages better communication between patient and therapist and makes it possible to register changes in tension and anxiety; b) constructing a hierarchy of situations progressively more threatening and anxiety-provoking; c) training the patient in a relaxation technique as an antagonist to anxiety and tension; and d) gradually exposing the patient during relaxation to the hierarchy starting with the least threatening situations and progressing to successively more taxing situations. These four steps constitute a basic model of SD. However, they have sometimes been modified in the dental setting. For example, sometimes the hierarchy has been visualized,34,35 and sometimes video presentations32,36 or “clinical rehearsals”11,36,37 have been used. The latter technique, in-vivo desensitization, is based on the same principles of working through a hierarchy of situations and maximizing patient control, but may or may not be combined with relaxation or sedatives.38 Relaxation can be achieved in a number of ways; this has also been established in reports of dental anxiety treatments.20,39-42 Moreover, biofeedback procedures have sometimes been used to facilitate the change of physiological autonomic responses.32,43

These studies have demonstrated a substantial reduction in self-reported dental anxiety, and there also have been indications that treatment has a positive influence on general states of fear, anxiety, and mood.22,26,34,44 The rate of successful outcomes (patients continuing dental care) has been reported at more than 90 percent in a clinical sample of dental phobic patients.45,46 but generally there is a reported success rate of from 70 percent to 80 percent. Thus, across many studies approximately every fourth to fifth patient does not benefit from the treatment or cannot follow through with treatment. A poorer outcome of behavioral therapies has been shown to be
unrelated to the level of specific dental fear, but predicted by general psychological distress or psychopathology and by low levels of motivation. The strength of studies in this area is that they have repeatedly shown positive side effects, and that long-term followups of performed treatments have been documented (see below).

A number of studies have been performed to compare the benefits of different behavioral treatment methods. Some early studies evaluated the importance of using relaxation in conjunction with exposure. Thus, Corah et al. showed that for ordinary patients relaxation resulted in a significantly greater reduction of anxiety than distraction or a control contingency. McAmmond et al. reported that deep progressive muscle relaxation and hypnotic relaxation had an equally large physiological effect. It has also been shown that patients who were treated with symbolic modeling combined with deep muscle relaxation reduced their avoidance behavior.

Although it has been argued that hypnosis can be viewed as more of a cognitive approach than a behavioral one, most reports tend to present it as a behavioral modality. The similarities with behavioral techniques lie in the use of exposure to visualized or in-vivo hierarchies under hypnosis or suggestive relaxation. The clinical benefits of hypnotherapies for dental fear have been documented repeatedly, but very few controlled studies have been performed. Hammarstrand et al. conducted a study of twenty-two women with long-standing avoidance behaviors (average 9.5 years). This study compared hypnotherapy (suggestions of progressive relaxation while imagining dental scenes and procedures in hierarchical order) with SD in combination with EMG biofeedback. After therapy, significantly more patients who received SD treatment were able to carry out conventional dental treatment, compared with patients who received hypnotherapy (73 percent as compared with 45 percent). Subjective dental fear and mood improvements were seen in both groups, but these changes reached significant levels only among SD patients. Similar results were reported in a study by Moore et al., who compared the effects of hypnotherapy, including training in self-hypnosis, with SD administered in groups or individually. No significant differences were detected between the groups with regard to outcome in the number of patients completing therapy or reduction in dental anxiety. However, significantly fewer patients continued dentistry with a private dentist after therapy at the specialist clinic among the hypnotherapy and SD group therapy patients compared with individually treated SD patients (48 percent and 50 percent as compared with 80 percent). Therapist dependence was indicated by 60 percent of the hypnotherapy dropout individuals, who said they were not able to practice self-hypnosis with another dentist, but needed the induction of hypnotic trance by the dentist-hypnotist participating in the treatment experiment.

The results of the comparison between group therapy and individual SD treatment was reported by Moore et al. in an attempt to find more a cost-effective approach. The results were disappointing for phobic avoiders, but it was argued that group treatment may be useful in selected cases and that a combination of group and individual therapy may provide patients with the advantages of both modalities. In 1990, Ning and Liddell used group therapy based on relaxation training and cognitive restructuring in conjunction with imaginal exposure to produce habituation to the dental situation among high-fear individuals. A third of the subjects dropped out during group therapy, but the remaining group reported a significant drop in dental anxiety and made appointments with a dentist. Later, Liddell et al. carried out a followup of fearful dental subjects who had been successfully treated with the same group therapy program. The followup period varied between one and four years after group therapy for dental fear. It was found that 70 percent of these individuals were paying regular visits to a dentist.

In a clinical study, Moore compared desensitization by clinical rehearsal with video training for phobic avoiders. He showed that both methods were able to bring down subjective dental anxiety to the level of ordinary dental patients and to produce a significant improvement in dental beliefs. This was accomplished more efficiently using clinical rehearsals as indicated by a higher proportion of successful cases (91 percent vs. 78 percent), and a significantly shorter time spent on preparing the patient for conventional dental treatments. The methods were equally successful in creating positive side effects in terms of reducing general fears and anxiety and having a beneficial effect on mood.

Cognitively Oriented Approaches

As mentioned previously, the influence of cognitions on human behavior has been emphasized by a number of researchers. Attention or aware-
ness, mediation (cognitive coding), individual response repertoires, and motivational or incentive components are important processes that influence behavior.\textsuperscript{29,31} Ellis\textsuperscript{30} claimed that a person’s thoughts and emotions are not separate processes, but rather overlap each other. Thus, fearful dental patients most often have inappropriate expectations and beliefs about dental treatment and their ability to cope with the situation. According to Ellis, the modification of such negative cognitions is a means of reducing anxiety. Thus, the goals for cognitive treatment strategies and cognitive aspects of behavioral therapies are two-fold: they aim to alter and restructure the content of negative cognitions, and they aim to enhance control over these thoughts.

Patients make interpretations of their emotional (and bodily) states based on the perception of “cues” in a situation. According to pre-existing schemata\textsuperscript{43} arising from direct and indirect experience in similar situations, a subject appraises how dangerous a situation is and how able he or she is to cope with it. Cognitive restructuring aims at altering the content of the patient’s internal dialogue by changing underlying beliefs. Providing information that helps patients to restructure their image of the dental situation and to reattribute the use of particular instruments and the experience of pain or unpleasantness can bring about such restructuring. Preferably, such explanatory information should be given beforehand and as a running commentary on the procedures and the possible associated sensations.\textsuperscript{24} There are probably two beneficial effects from this procedure, the first relating to the content of the information (retribution) and the second giving the patient control. When this is done repeatedly in the treatment situation and is combined with components such as relaxation or distraction, it resembles the “cafeteria-style” approach used in Stress Inoculation Training (SIT), which has on occasion been used with phobic dental patients.\textsuperscript{56}

The SIT has several similarities with a treatment approach reported on by Berggren and Carlsson.\textsuperscript{52} They made a post hoc analysis of this broadbased therapy for phobic dental patients with long-standing avoidance behavior. The method combines a partly automated video desensitization procedure with EMG biofeedback and cognitive retribution. After therapy with a psychologist (six or seven one-hour sessions), the patients had two dental “test-treatments” to allow them to use their new competence in a real-life situation. In this particular qualitative study, this treatment package was successful in twenty-one out of twenty-four cases. Patients were able to complete regular dental care and often extensive oral rehabilitation followed by a one-year recall with general dentists.

Observations during the treatment seemed not to favor any simple hypothesis of how therapy worked. Cognitive, emotional, and physiological elements seemed to be important to a different degree for different subjects. While some patients obviously seemed able to benefit from relaxation training, others changed their attitude to dental treatment without a concomitant change in physiological response. This was achieved by watching the dental video scenes and discussing them with the psychologist. However, such patients said that the most important factors in this cognitive process were the two “in vivo” dental treatments. The concepts of appraisal and coping, according to Lazarus,\textsuperscript{57} may be of additional help in understanding the change from avoidance, incapability, and hopelessness to the patients’ report of feelings of increased competence and coping skills. It was not possible to judge the relative importance of these factors, and the authors suggest that future research should aim at finding predictors of the usefulness of different treatment strategies for different patients.

An attempt to evaluate the influences of cognitive therapy on a behaviorally oriented therapy was made by Harrison et al.\textsuperscript{58} They found, contrary to their clinical experience, that separating the cognitive components from behavioral components so that their individual significance could be identified led to a more or less negative influence from the cognitive therapy components. Because of this contradiction, a new study was conducted of 112 dental phobic patients.\textsuperscript{49} Two treatment modalities were tested, both using the same video-based hierarchy of dental scenes. One involved a behavioral (physiologic stress-related) approach aiming to improve relaxation, and the other a cognitive aiming at the modification of maladaptive thinking. It was shown that both treatment modalities were effective in reducing dental anxiety, but the number of successful cases was greater in the cognitive treatment group. However, relaxation-oriented therapy generally resulted in a more significant reduction in dental fear as well as in general anxiety. It was also found that motivation for treatment was the one factor that predicted successful treatment outcome.
Based on the work by Beck, de Jongh and colleagues created a short-term one-session cognitive treatment of dental phobia. It was used to prepare fearful dental patients one week before a dental examination by trying to restructure their negative cognitions. The therapy was introduced by explaining how negative or catastrophic thoughts interact with anxiety. Examples were given of how different ways of interpreting a situation give rise to completely different reactions. The cognitive intervention focused on the modification of negative cognitions. Evidence for the negative cognitions was challenged, and alternative ways of looking at the situation were discussed. When cognitions seemed to be based on false assumptions, the patient was provided with corrective information. In addition, the patients were given an audiotape of their cognitive therapy session, which could be listened to at home during the following week. It was shown that, compared with sessions when dental treatment information only was provided, the frequency of negative cognitions and the believability of these cognitions dropped markedly. A one-month follow-up revealed continued improvement in the cognitive therapy group, especially with regard to believability of cognitions. These changes were paralleled by a decrease in dental anxiety in both groups, which was also shown to continue over a one-year followup period.

Clinical Comparative and Long-Term Followup Studies

As previously mentioned, several studies have compared therapies or separate treatment elements. However, a number of limitations are apparent in many studies in that they have often been conducted under experimental “laboratory” conditions, used selected special-clinic samples, or lack a long-term followup. Virtually no study fulfills all these requirements, but some studies that included a comparison and followup of clinical treatments should be reported on.

In Sweden, Berggren during a three-year period compared the effects of a “psychophysiological” dental fear treatment with treatment under general anesthesia. These therapies were conducted to prepare phobic patients for in-vivo exposure, which constituted a second phase of treatment and tested the patients’ ability to go through with ordinary dental treatment. Patients were randomly assigned to the two treatment modalities. The behavioral therapy (BT) was performed by a psychologist and consisted of video-based desensitization in combination with relaxation and an EMG biofeedback training, but included no dental treatment. Dental treatment under general anesthesia (GA) was performed during one session and included the performance of all necessary extractions, root treatments, and major fillings, which dramatically reduced these patients’ need for dental care. The following exposure treatment phase included two standardized dental treatments using local anesthesia.

In a first evaluation after pretreatment and the two exposures, it was shown that the BT group was significantly better in several respects. There were more successful cases (92 percent vs. 69 percent), fewer cancellations during exposure sessions (10 percent vs. 35 percent), and a lower level of dental anxiety. The successfully treated patients then left the fear clinic and were scheduled for treatment with general practitioners. A followup was performed using a questionnaire, which the new dentists filled in after the patients had completed dental treatments. It was shown that although some patients dropped out, significantly more BT patients remained in dental care and were scheduled for recall (78 percent vs. 53 percent of the original samples). There were no differences in dentist ratings of patient behavior between the two groups.

These patients were further evaluated after two years, when they were recalled for their second examination/treatment with their general dentist. Again, significantly more BT patients kept up regular dental care (82 percent vs. 57 percent of the original sample; increased numbers resulted because some patients, who broke off previously, took the initiative to make new appointments). In addition, dental anxiety measurements remained significantly better in the BT group, although a non-significant increase in scores had taken place in both groups. In an additional qualitative analysis, a major difference in treatment capability during completion of dental care two years earlier was traced. While BT patients had received an average of seven fillings, two extractions, two crowns or abutments, and one root canal filling during ten appointments, the corresponding figures for GA patients who also needed ten appointments were three fillings and mostly removable prosthetics. Thus, the BT patients had completed much more fear-provoking treatment than the GA group. A significant improvement in self-reported mood was reported, while concomitant factors such as general
tension problems (headache, stomach problems), use of tranquilizing medication, abuse of alcohol, and time spent on sick leave were significantly reduced. Both groups reported these significant general improvements, but BT patients reported significantly larger improvements in tension problems.

Hakeberg and Berggren62 were able to validate the reported positive change in sick leave in a subsample from the two groups. They matched controls by using official register data from the National Health Insurance Board. Their study showed that the number of sick-leave days was significantly reduced after the period of dental fear treatment among treated patients. The effect was confirmed by a significant posttreatment difference between treated patients and those who dropped out of the program. Compared to the matched control group, a significant pretreatment difference and a nonsignificant posttreatment difference were shown. It was concluded that, for patients suffering from severe dental fear and phobic avoidance as in this group, the benefits of a successful phobia treatment have effects that reach far beyond its specific goals.

Hakeberg also conducted two long-term followup investigations of patients treated at our clinic in small-group studies comparing behavioral and pharmacological treatments. In the first study, fourteen patients (out of twenty-four) who had received either systematic desensitization (SD) or oral premedication (P) with diazepam were followed up after ten years.63 This study had had a major dropout of patients from both groups, but after ten years all SD patients had regular dental care compared to five out of eight P-patients. Significant improvements in psychometric measures of dental anxiety and mood were reported after ten years in both groups. These assessments were (nonsignificantly) in favor of the SD group, especially with regard to the change in mood.

Using a similar treatment study design, Hakeberg64 was able to locate twenty-nine out of thirty-two eligible patients and conducted a second ten-year followup of previously treated patients. They had been treated with SD (twelve patients) or P (eight patients) therapy, and were compared with patients treated under general anesthesia (G; nine patients). Among these patients, eleven (92 percent) SD patients, five (63 percent) P patients, but only three (33 percent) G patients attended regular dental care. As can be expected, the dental anxiety scores of SD and P patients, but not G patients, were significantly reduced at followup. This study also investigated oral health variables and showed that SD and P patients had lost an average of one tooth during ten years, while G patients had lost seven teeth (presumably most of them during the general anesthesia treatment). While there was a significant difference in the number of decayed tooth surfaces at the ten-year followup between the combined groups of regular and irregular attenders (two compared with five surfaces), none of these differences was evident for the separate treatment groups. However, all groups had far fewer decayed surfaces than ten years before (three as opposed to eleven surfaces).

Only a few studies have attempted to investigate the outcome of different treatment modalities in a routine clinic. Kroeger and Smith65 reported the three-year outcome of a “behavioral fear control program” used in the general dentist’s office. This program consisted of a two-session condensed behavioral therapy that combined relaxation training, a video modeling tape, desensitization during session one with home practice, and a repetition at session two. The second session used the same combination of therapy components, but focused more specifically on the dental situations that happened to be a particular obstacle for the patient by means of guided imagery relaxation training performed by the dental assistant. Although the fear status of the eighty-six treated patients was unclear from this report, it showed that among those who were followed up (54 percent), most patients were able to continue conventional dental treatment. More than 90 percent said that it was helpful in reducing their fear and in helping them trust the dentist and the staff. However, 30 percent of the patients claimed that it was likely that they would have continued dental treatment anyway.

The outcome of treatment for different patients at our dental fear clinic at the University of Göteborg, Sweden, has been followed up continuously. A ten-year investigation between 1975 and 1985 was reported in Swedish.66 The clinic accepts self-referred patients (20 percent), but mainly treats patients who have been referred either by dentists (30 percent) or medical professionals (50 percent), mainly working in psychiatry and social medicine. Thus, different expressions of psychosocial strain were common in addition to dental fear. Among this clientele of more than 1,500 patients, it was reported that 17 percent never showed up after a period on the waiting list, 16 percent broke off their therapy program, 55 percent completed treatments, and 12 percent were able to
leave the clinic after only a consultation. These individuals and those who completed therapy were taken over by general dentists, who completed the plan for full oral rehabilitation. The patients were investigated according to treatment performed. A separate group of 110 individuals categorically demanded to have general anesthesia and nothing else. Only sixty-one (55 percent) of these returned for a checkup after general anesthesia and were possible to refer to general dentist, and thirty-six (33 percent) completed the treatments needed after general anesthesia.

Another subsample consisted of 685 individuals living in the city of Göteborg who did not have any dentist of their own. These patients had been treated according to three different models, namely a) exposure therapy with a dentist by clinical rehearsals in combination with enhanced control and simple relaxation instructions, b) video-based systematic desensitization in combination with relaxation training and biofeedback performed by a psychologist according to Berggren and Carlsson,32 and c) initial general anesthesia dentistry to reduce the amount of dental treatment needed in general dentistry. The latter group of patients also received clinical rehearsals with a dentist, including dental treatment adapted to the patients’ needs. The average number of therapy sessions was seven rehearsals with the dentist, seven sessions of desensitization plus two dental treatments to confirm the new ability, and three condensed rehearsals, including adapted dental treatments after general anesthesia. It was shown that the success rate (completed general dentistry) was more than 70 percent for exposure therapy and general anesthesia plus rehearsals, while 83 percent of the treatments with the psychologist were successful. These differences were not statistically significant, and it should be remembered that this was not a randomized study. Treatments were selected according to patients’ preferences and the dentists’ evaluation of clinical usefulness.

A similar line of research was followed recently in a Dutch doctoral thesis by Aartman19 that reported the followup of patients treated in a Dutch dental fear clinic. Dentists who were familiar with the use of behavioral treatment modalities performed all treatments. It was reported that patients were not randomly assigned to the treatment modes, but after assessment “allocated to the most appropriate form of treatment.” When, in the evaluation, combinations of behavioral and pharmacological treatments were used, patients were grouped according to the treatment modality that used the highest level of sedation (intravenous sedation with propofol [IVS] vs. nitrous oxide sedation [NOS] vs. behavioral management [BM]). It was indicated that some patients saw a psychologist for additional counseling, but no specification was made as to which group(s) these patients belonged.

In one study, the immediate outcome of dental fear treatment for 144 patients was explored.67 The average avoidance time was about seven years, and women predominated. The mean age was thirty-four years, and it was shown that patients treated with IVS were younger than NOS and BM patients. The treatment groups did not differ with regard to pre-treatment psychological assessments. With regard to oral status, the only significant difference detected was a lower number of decayed tooth surfaces among BM patients as compared with IVS patients (three as opposed to nearly five surfaces). Significantly fewer but longer restorative dental sessions were shown among IVS patients. The number of filled teeth was significantly higher among IVS as compared with BM and NOS patients (seven vs. four and five), while the number of extracted and endodontically treated teeth did not differ.

In a second study, Aartman and colleagues68 had extended the group and were able to conduct a further followup with 192 patients. Assessments were made once before and twice after treatment, the latter being made at least two years after treatment. A discrete but statistically significant reduction in dental fear was reported. This reduction was mainly detected among the BM group. However, even in this more successful group only 40 percent and 52 percent, at the first and second follow-up, respectively, reduced their dental anxiety to a level under what has been proposed as a cut-off score for dental anxiety. The corresponding frequencies for NOS (28 percent and 39 percent) and IVS patients (15 percent and 12 percent) indicated a nonsignificant effect for these groups. However, 62 percent (>70 percent among BM and >50 percent among NOS and IVS patients) of all patients had visited a dentist outside the fear clinic, but no statistically significant differences were found with regard to treatment group. Aartman concludes in her thesis that behavioral treatments are beneficial and can successfully be performed by dentists in a regular clinic. She suggests that such training should be offered to dentists and included in the curricula of dental schools.
Further support for this notion was provided by a recent doctoral thesis from the University of Oslo, Norway. Although in most of the reviewed clinical studies, behavioral therapies were performed by clinical psychologists, Willumsen, in a comprehensive and well-controlled study, evaluated a behavioral and a cognitive therapy performed by a specially trained dentist. The dentist had received short (two weeks) training in cognitive therapy followed by supervised treatment of five pilot cases. This therapy was based on the principles from Beck et al. and Clark and had similarities with the one reported by de Jongh. However, the method adopted by Willumsen specifically emphasized a “Socratic dialogue and behavioral experiments” and homework assignments. This treatment modality was compared with treatment under nitrous oxide sedation or applied relaxation performed by the same dentist. Although all treatments were effective, posttreatment assessments showed that the two psychologically oriented therapies were superior to nitrous oxide sedation in mastering dental situations, in reduction of self-assessed dental anxiety, and in patients’ evaluation of the benefits of treatment. No differences between cognitive and relaxation therapies were noted except for a significantly longer time used to prepare patients for treatment in the cognitive therapy group.

This study also included a one-year followup of patients after referral to private dentists. Willumsen followed up fifty-eight out of the sixty-four patients treated in her study. The patients had then been taken care of by general dentists after fear therapies with Willumsen, and were investigated by means of questionnaires filled in by the patient and his or her private dentist. More than 90 percent of the patients who received cognitive or relaxation treatments were still attending, while 80 percent of the nitrous oxide patients attended. However, 45 percent of the N2O-group continued to use sedation in general dentistry, compared to less than 10 percent of the patients treated with behavioral methods. All groups were without significant differences able to master the treatment situation and carry out conventional dental treatments. The cognitively and relaxation oriented therapies were significantly more efficient in reducing dental anxiety, and, as also found by Berggren et al., this was consistently more pronounced among relaxation group patients.

**Conclusion**

There are a number of behavioral and cognitive treatment methods that can be used by dentists for the alleviation of fear and anxiety in the dental office. At an “intuitive” level, many dentists probably use them very frequently as a comprehensive part of the everyday praxis. Considering the high number of fearful individuals visiting dentists regularly, a better knowledge about such methods would improve the dental care for the majority of these patients. It would also help prevent aggravation of fears among individuals at risk. Thus, there are needs and benefits that speak for an improved education in behavioral dentistry. However, despite the success of treatment methods performed by specially trained dentists reported on by Aartman and Willumsen, it seems reasonable that there should be limits to what can be expected of a dentist in terms of psychological diagnostic and therapeutic competence. Dental phobia may constitute a complex psychological and odontological problem with far-reaching consequences for a relatively large proportion of fearful individuals. It therefore seems likely that optimal care of such patients can best be achieved by cross-disciplinary efforts involving both dentists and psychologists.

**REFERENCES**