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Psychological/Behavioral Techniques in Managing Pain and Anxiety in the Dental Patient

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The issues of pain, anxiety and fear have always been a major part of dentistry. It is the human makeup that potential aversiveness produces fear and in turn, anxiety. No one denies their importance. No one denies that a fearful person is a more problematic patient. No one denies that an anxious patient states that they feel more pain. And no one denies that the dentist can create an ambiance that can enhance or inhibit the anxiety or fear of the patient. These experiences of anxiety and fear and their contributory effect upon pain can be taken as givens, as facts, as part of the human existence. The more important questions pertain to whether our understanding of anxiety, fear, and pain and our understanding of the development of anxiety and fear within childhood and the adult[1] can provide us with practical recommendations to reduce these deleterious influences. And whether, once we understand that there are practical recommendations to utilize within the dental operatory—whether we can establish a means of enhancing the implementation of those recommendations. Put another way, do the behavioral sciences really have bona fide practical recommendations to give to the field of dentistry and if they do, does the field of dentistry know how to increase the utilization of those recommendations?

Let me address the above questions in the following manner. First of all, from the behavioral science perspective, what is our current understanding of pain, anxiety, and fear? Secondly is there a behavioral technology to provide recommendations to deal with the psychological aspects of pain, fear, and anxiety? And thirdly, what are some clinical techniques to assess and treat various levels of anxiety and fear?

DEFINITIONS OF PAIN

Less than 30 years ago, the medical and dental texts were explaining pain in one of two forms: the specificity theory or the pattern theory. Briefly put, the specificity theory proposed that pain was a specific modality like the other senses and projected through free nerve endings. The pattern theory was described as being produced by intense stimulation of nonspecific receptors.[2]

In 1965, Melzack and Wall presented the Gate Control Theory of Pain.[3] The Gate Control Theory does one strikingly different thing that the preceding theories did not do. It incorporates the role of emotions and cognitions. While there has been some controversy concerning the physiology of the Melzack and Wall theory, their conceptualization has been widely endorsed within the pain research community. Why? Because the explanatory discrepancies to patient's response to aversive stimuli have been substantially diminished. I refer to countless examples in which intensely aversive stimuli produce remarkably little reports of pain or pain behaviors. And conversely, a theoretical explanation is provided for the endless stream of instances where mild or nondiscernable aversive stimulation are followed by intense protestations of pain (eg, psychogenic pain).

The impact of the Melzack and Wall gate theory of pain has been revolutionary. In the 25 years plus since its publication, the definition of pain has changed from a primary focus on anatomy and physiology to an understanding that pain is influenced by our cognitions, our affective state, and our somatic state. A modern interpretation of pain recognizes that previous experiences, current expectations, distractions, current emotional states, and cognitions are all interactive causative factors in the experience of pain. Pain is no longer viewed as a sensation, it is understood as a perception.

ANXIETY AND FEAR

Anxiety consists of patterns of autonomic arousal appearing together with thoughts of fear and feelings of threat. There is a large body of literature[4] detailing the specifics of anxiety, but three characteristics appear particularly relevant to the promotion of dental anxiety. The first of these factors is novelty. New experiences are generally met with some apprehension. Humans are more likely to

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feel comfortable with the familiar and feel discomfort/anxiety with a novel experience. A second characteristic likely to be conducive to dental anxiety is uncertainty. Generally speaking, humans do not like to experience the unknown. Much of what happens in the dental operatory to a very young child, for example, is uncertain. This uncertainty contributes to the increased general arousal of a patient. Lastly, there is the problem of expectation. The information conveyed by parents, siblings, and friends obviously can lead to a heightened aroused and anxious state. These expectations often take the form of negative cognitions that encourage feelings of fear and anxiety to grow. Many patients anticipate dental interventions, believing, "I am going to be in a great deal of pain, and there is not much I can do about it." Even though these statements may be only partially realistic, the anxiety and fear that they generate are fully evident. Often, it is these cognitions and images that reverberate and maintain a sustained fearful state in spite of efforts to calm the patient.

THE INTERACTION OF ANXIETY, FEAR, AND PAIN

Anxiety, fear, and pain share many identical features. Historically, pain was seen as an emotional reaction prior to its perception as a predominantly physiological response and more recently as a combination of physiology and emotions. Similarly, anxiety was at one time viewed as a unitary as opposed to a multidimensional experience and more recently understood to share physiological and emotional components. Both pain and anxiety are now perceived to have considerable overlap in their physiological and emotional components.

In 1962, Schacter and Singer conducted an experiment which has significantly affected how psychologists view emotions.[5] This study has important implications for how we view the experience of pain and anxiety as well. These investigators administered epinephrine injections to subjects who were told that the injection was Suproxin, a new vitamin compound. After being injected, each subject was placed individually in a waiting room for 15 or 20 min. A cohort of the investigators supposedly also injected with Suproxin was then brought in to pass the waiting time with the subject. A short time after the subject had been injected with the epinephrine, the typical response of the nervous system took place: hand tremors, heart pounding, and rapid breathing. During the time that the subject's nervous system arousal occurred, the cohort acted in one of two ways: becoming progressively more angry or increasingly euphoric and playful. During these proceedings, the subject was being monitored through a one-way mirror where his behavior was systematically observed and recorded.

The experimenters found that those subjects who had waited with the angry cohort became angry and those who had waited with the euphoric cohort became euphoric. Control group subjects who were injected with a saline placebo evidenced no change in their behavior regardless of the cohort's actions. Similarly, control group subjects who were warned in advance that Suproxin sometimes had side effects of trembling and heart pounding had no emotional reactions, once again, regardless of the cohort's behavior.

Amongst the conclusions drawn by the researchers was the following observation[6]: "A state of physiological arousal for which you have no immediate explanation makes you want to evaluate and understand it. This causes you to actively search your environment for an appropriate explanation or 'label' for the arousal. Choice of the labels will determine the emotional response."

The Schacter study tells us that mislabeling and inappropriate anticipation can lead to an inaccurate perception. Remembering that pain is a perception, we are led back to the understanding that anxiety and fear (experiences in the central nervous system) can magnify the experience of pain. Thus, there is a direct relationship between anxiety and acute pain. Increases in anxiety increase the sensitivity of pain.[7,8] And conversely, reductions in anxiety reduce the perception of pain.[9–11] It is appropriate, therefore, for the dentist to be exquisitely sensitive to the patient's state of anxiety and the patient's expectation of pain.

OVERUSE OF PHARMACOLOGIC AGENTS

Given that patients coming to a dental office often have anxiety and fear and that these emotions (as well as pain) have cognitive, affective, and somatic elements, it appears logical that pharmacological interventions be used. After all, medications are quick, easily available, and effective. It is arguable, however, that pharmacological interventions are overutilized and for the following reasons:

1) A lack of education in the dental curriculum of the behavioral sciences and, in particular, behavioral psychology. Behavioral sciences are often considered of lesser importance. Consequently, the dental professional frequently has neither the knowledge nor the confidence to implement behavioral/psychological techniques of patient management.
2) A perception that behavioral/psychological techniques are not cost effective. A strong argument can be made, however, that the use of good behavioral management techniques increases patient comfort

and loyalty as well as preventing expensive anxiety-laden extended sessions.

3) Lastly and probably the most important reason for the overutilization of pharmacologic agents is the limited interpretation of pain to the somatic dimension. A fuller understanding that pain also includes cognitive and affective dimensions provides a rationale for a greater use of nonpharmacologic techniques.

BEHAVIORAL STRATEGIES FOR DENTISTRY

Given the interactive nature of pain and anxiety, and given the occurrence of anxiety in the dental operatory, it is evident that behavioral management is needed. It is obvious that anxiety and fear play a significant role in the dental operatory. Are there strategies available within the behavioral sciences to help manage the child's and adult's pain, anxiety, or fear? Behaviorists expert in communication and specialists dealing with fear and anxiety within behavioral medicine would say yes. This is illustrated by outlining some of the basic ideas that emanate from the behavioral sciences (Table 1).

Limiting the first session to a nondental operatory is a recommendation often stated.[12] For obvious reasons of building confidence, rapport, and nonpainful associations between the patient and the dentist, the first contact with the dentist should never be in the operatory.

Setting goals with clearly defined objectives and criteria of measurement is an absolute requirement of any behavioral program to modify behavior.[13] Do patients and particularly young patients, entering a dental operatory know exactly what is expected of them? Do they know what the standards of misbehavior are, and are they aware of what the consequence (positive and negative) will be?

It is well known that anxiety and fear increase when a child or adult feels out of control.[9] Allowing patients to signal to temporarily interrupt a procedure when their anxiety, fear, or pain has increased provides them with a mechanism to control the perceived threat and thereby lessens their loss of control of the situation.

The patient's cognitions are almost always a major component magnifying the dental fears and pain.[14,15] When a patient is known to be fearful and anxious, knowledge of the patient's cognitions is a major first step in reducing fears and anxieties. Assessing the patient's level of anxiety and fear is an easily attained feat.[16] And yet, remarkably large numbers of dentists rely upon their perceptions of overt behavior, which has been empirically shown to be unreliable.[17] There are a variety of means by which these cognitions can be assessed, including interviews by hygienists or simple paper and pencil questionnaires. Brief, simple to understand scales are available for adults,[18] for children,[19] and for the parent to interpret for the very young child.[20,21]

Table 1. Behavioral Strategies for the Management of Pain and Anxiety in the Dental Environment.

1. Conduct the first session in a non-dental setting.
2. Set treatment goals with defined objectives and criteria for success.
3. Establish a signal which permits the patient to temporarily interrupt the procedure when their anxiety or pain has increased.
4. Assess the patient's dental fears and pain by an interview and paper and pencil tests.
5. Clearly state the consequences for disruptive behavior.
6. In treating children, assess the parent's level of anxiety concerning dental procedures and recommend that they not reveal fears through their verbalizations and behaviors around the child.
7. In treating children, provide taped examples of children going through dental procedures with positive outcomes so they can learn healthy behaviors.

Providing clearly stated and defined consequences for disruptive behavior has been shown to be very effective in decreasing such problems in children. Very simple procedures such as demonstrated in the work of Melamed[22] and Ingersoll[23] provide extremely effective tools in the management of the disruptive child. Time-out procedures have long been effective in classroom settings and can be easily adapted to the dental operatory.

It is well known that dental fear is often modeled through the attitudes of the parents.[24] To assess the parent's level of anxiety concerning dental procedures is a step in dealing with the child's fears and anxieties. Measuring parental attitudes and providing specific educational material to the parents regarding their verbalizations and behaviors around their children can help ameliorate the child's anxieties and fears.

Lastly, children learn many of their fears and anxieties through modeling. They can also learn healthy behaviors in the same way, especially when provided with models from the same age peers and particularly when those models are shown to result in a positive outcome.[25] In this age of VCRs, video tapes showing children cooperatively going through dental procedures with positive outcomes should be readily available in every dental operatory. The VCR is every bit as important as much of the current technologic equipment now being purchased by the dentist. Providing these demonstrations to every new (and return) child coming to the dentist would be recommended by the behavioral scientist.

The above recommendations coming from the behavioral sciences are not exhaustive and could easily be expanded to include such areas as distraction, coping strategies,[26] rates of reinforcement, charting, compliance,

providing information concerning sensoring experiences,[27] etc. No doubt, many dentists practice some of the above recommendations, but one cannot be so optimistic regarding the field as a whole. The surprising fact is that the above recommendations are easily implemented and appreciated by the patient.

The above techniques are not meant to replace anesthetics, but general anesthesia is often not the treatment of choice.[28] Behavioral management techniques are meant to supplement the utilization of anesthetics. They are meant to reduce the need for excessive and potentially unsafe use of medication. They are meant to help medication not be the first resort. They are meant to integrate knowledge of the behavioral sciences with dentistry.[29] There is evidence to indicate that an integration of good behavioral management techniques leads to better results, lessened drug requirements, greater patient safety, and reduced side effects.[12] Good integration of behavioral science knowledge is also likely to maximize the placebo response, an extremely important factor in the amelioration of pain.[30–32]

CLINICAL TECHNIQUES: SPECIFICS IN TREATING THE ANXIOUS DENTAL PATIENT

The intent of the remainder of this article is to provide practical, specific information: assessment techniques with a particular emphasis upon pretreatment questions to ask, areas to emphasize for the modestly or moderately anxious patient, and how to contact an appropriately trained psychologist.

Assessment Techniques

An important element in the assessment process is the one-to-one interview with the patient. This interview should not take place in the dental chair, but hopefully in a quiet, comfortable, and confidence-building room. Certainly no psychologist would establish rapport with patients by meeting them at the source of their stress, at least not during the first session. In some ways, being at the site of the difficulty may give more observable signs of anxiety and fear, but at a significant cost for subsequent treatment. The interview needs to take place in a relaxed setting and is needed to acquire information, particularly the history of oral care that is an important measure of dental avoidance and fear. The relaxed first meeting should also be the critical first step in reducing the psychological state of anxiety. Questions (eg, "How may we help you?") that appear in the interview provide the foundation for the bonding that reduces the anxiety of the patient. Confidence provides the basis for trust, and the information the dentist gives provides the security for the procedures to come.

How does one affect changes in anxiety and fearfulness? The first step is measurement. Anxious and fearful patients present a serious problem for the dentist. They are three times more likely than nonfearful patients to miss their appointments and require as much as 20% more time in the dental chair than less anxious patients. The means by which these patients are assessed for anxiety and fearfulness, however, may be different than your expectation. Kleinknecht and Bernstein[17] cast doubt on the veracity of observations of trembling, moaning, sweating, and flushing as accurate measurements. These researchers recommend a combination of patient's self-report and records of dental care (dental fear is a major factor in the neglect of oral hygiene) as the most sensitive and meaningful measure of dental fear. A self-report measure commonly used and suitable for office use is the Dental Anxiety Scale (Appendix 1).[18] It is recommended that all patients be given a paper and pencil measure of their fear and/or anxiety at the beginning of their evaluation. This should be a standard procedure for adults, children, and parents of very young children.

Management Techniques

Touching. Reach out and touch the patient's hand or shoulder on his/her very first visit. Touching is a means of establishing warmth, security, and competence, but most importantly, caring. McCoy studied the use of nurses' touch in the emergency room and found that those patients touched by the nurse perceived a sense of caring, whereas those patients not touched viewed the nurse as only wanting to get their job done.[33] Caring and touching are antagonistic to fear. Remember, the patient is not a sophisticated consumer of technical knowledge and, within limits, "people don't care how much you know, they only know how much you care."

Identify Fearful Patients During the Initial Telephone Contact. The best time to identify fearful patients is during the initial telephone contact. Milgrom et al[34] suggest that a few questions be asked by the receptionist prior to the patient's first appointment:

—How long has it been since your last dental visit?
—What kind of treatment did you have? How was it? How did it feel?
—Do you have any concerns about receiving dental treatment that would be helpful for us to know?

When the receptionist notes patient's replies indicating anxiety and fear, he/she can indicate that you, as a dentist, have a special interest in working with people who are apprehensive of dental treatment.[34] Furthermore,

Milgrom and his colleagues suggest that identifying such patients prior to their first appointment allows you to structure the fearful patient's first appointment differently than your regular patients.

Modify the Dental Operatory. Examples of modifying the dental atmosphere include scheduling easier procedures early in the treatment plan, taking time to ensure adequate anesthesia, being warm and supportive, and providing prophylaxis in two short appointments rather than in one long visit. Milgrom and colleagues also suggest modifying the dental atmosphere by asking and responding to specific questions regarding the patient's perception of the dental experience. For example, one might ask, "In general, what are the most difficult or fearful things about dentistry?" In this question particular attention should be paid to those patients who can indicate specific concerns and, if possible, for the dentist to make appropriate modification. For example: if a patient states, "I hate the sound of the drill," that makes the patient a better candidate for the use of earphones. A patient stating, "I'm afraid of losing control," could result in giving that patient more choices.

Ask the Patient What Can the Dentist Say or Do That Makes Things Easier? What Can the Dentist Avoid That Makes Things More Difficult? The patient in answering these questions can often provide simple strategies for reducing their own fear. Once again, this question may produce some useful specific recommendations. However, even the procedure of asking the patient the questions provides a sense of concern and works towards increasing the patient's belief that they may enact some personal control over the stressful situation.

Enhancing the Patient's Coping Skills. This is accomplished by first assessing how the patient normally copes with stressful experiences. Explain to the patient that the arousal the patient experiences at the dentist's office or anticipating an appointment is normal. A discussion then ensues in which an analogy to other scary situations such as being at a frightening movie is made. Specific mention is made of the variety of feelings, thoughts, and behaviors available and simultaneously to evaluate how the patient reacts in stressful situations. What is particularly important is for the interviewer to look for existing skills in managing stress. It is useful to note to the patient that they will continue to experience some anxiety even though they may learn to cope effectively with regular dental treatment procedures in the future. The importance of relating this message is highlighted when it is realized that many patients have unrealistic expectations around the removal of all anxiety. Smith et al[35] demonstrated a reduction on the Dental Fear Survey occurred from a mean of 73 to a mean of 49 following treatment (n=56). Typical general practice patients have scores from 35 to 45 on this scale. Questions to help reach the goal of enhancing the patient's coping skills include, "When you find yourself in a stressful situation, how do you deal with it?" Patients tend to answer this question along three lines:

—Behaviorally: for example, fleeing a stressful situation (a crowded mall) or waiting for a less crowded elevator.
—Cognitively: a fearful flyer may remind himself of the impressive safety records that airlines have or that his wife flies regularly.
—Physiologically: a patient fearful of driving in traffic may utilize relaxation techniques to calm down.

More often than not, the patient will utilize a combination of strategies to be more effective. For example, the fearful driver will choose to drive during less heavily traveled times and simultaneously purposely relax his muscles while driving. No matter what the strategies presented, the question concerning strategies will likely reveal valuable insights on how the patient copes with stress and gain useful ideas on how to enhance those skills.

A second question which extends the information from the above inquiry is as follows: "Did you ever have a fear of something that you got over? What did you do?" Once again, obtaining information on how the individual has coped with previous stress provides valuable clues on procedures to reduce dental anxiety in the present situation.

DEALING WITH THE MILDLY OR MODERATELY ANXIOUS PATIENT

For patients exhibiting modest or moderate amounts of anxiety, the watchwords are caring, telegraphing of actions, and feedback. These less anxious patients do not bring the same level of previously embedded fear as the very anxious patient but nevertheless will benefit from a focus upon care and structure. Although a structured anxiety reduction program is not necessary for these patients, elements or characteristics of the program are still appropriate. For example, paying attention to how you transmit a sense of caring is certainly essential. Do you take time to listen? Do you look directly at your patient and touch him on the shoulder or hand? Do you give him

feedback and praise for handling the dental procedure well? Good clinical care suggest all of the above. In addition, remember that anxiety is built on novelty, uncertainty, and inappropriate projections of what is going to happen. When the dentist acts in a calm, confident manner, and then telegraphs his actions, patients will come to understand that most of their fears and anxieties are unfounded. Furthermore, even when the procedure may provide much noxious stimulation (eg, intense noise or multiple injections), providing the patient with an agreed upon hand signal to temporarily interrupt treatment and thereby supply a degree of control can greatly diminish the level of anxiety. Lastly, always end your session with a specific compliment of what the patient did well. You are then assisting in the reduction of anxiety for future sessions by building the patient's confidence.

The wording that the dentist uses in the dental operatory is of extreme importance. This is illustrated by an example taken from Milgrom and his colleagues.

> A dentist after the initial examination might say the following: "The primary problem is this tooth that hurts. It looks like you will need a root canal, which is a procedure where we take out the nerve and replace it with an inert plug. You have two new cavities that need to be filled, and a few old fillings that should be replaced. You also have moderate periodontal disease which will require treatment. This may sound like a lot of work, but it is all pretty routine dentistry, and everything should turn out 'O.K.' by the time we finish."[34]

Can you see yourself using a similar explanation? Is there anything wrong with the above approach? The *difficulty* is that it focuses exclusively on what is *wrong*. It begins with a discussion of a root canal, one of the most feared procedures in dentistry. Once the patient hears this term, anxiety is likely to be substantially increased and he/she is unlikely to clearly hear subsequent information. Examine the following material in contrast to the proceeding information[34]:

> "Let me begin by saying that most of your teeth are in good shape. You have two kinds of problems—both of which can be successfully treated. I'm glad you came in now, rather than waiting longer. We can make you healthy again. The problem I am most concerned with is the infection in your gums. It is the infection which makes your teeth so sensitive, and the problem which can eventually cause more problems than anything else."
>
> "The second problem involves your teeth. There are two new cavities and two to three old fillings that need to be repaired. All of them involve routine patch work and they will be 'good as new' after we're done. The last tooth I want to discuss is the one that you pointed out as bothering you. Although I need to do some more tests, it looks as though that tooth will need more complicated treatment, which I will explain in detail later. It too should turn out fine. I want to give you some antibiotics to reduce the infection in that tooth (which also will help the gums). Also, I'd like to start with some simpler procedures so that I can get to know how you react to treatment, and you have a chance to get to know me. Do you have any questions?"

It can be extremely helpful to carefully examine the specifics of your clinical language. Audio taping your exchange with the patient can help you obtain feedback and assist you in the process of becoming sensitive to the subtleties of good clinical language.

HOW TO CONTACT AN APPROPRIATELY TRAINED PSYCHOLOGIST

There is a plethora of different types of psychologists, and you should be alert to what specifically are your needs. If you are to follow the recommendations laid out in the present article, the following "code words" or areas would be most appropriate: cognitive behavioral therapist, behavior modification, therapist, or behavioral medicine specialist. Any of the preceding specialists would easily follow treatment plans recommended for the severely anxious patient.[36,37] If you do not have easy access to the psychological community, contact the local or state psychological organization. They will be acquainted with the labels cited above. Most importantly, choose a therapist who will be conscientious about feedback to you and with whom you feel comfortable.

TREATING THE EXTREMELY ANXIOUS PATIENT

The extremely anxious patient or the patient who is experiencing significant difficulty with the previously outlined anxiety reduction procedure should be referred to a clinical psychologist. One very clever means of arranging for such a referral has been suggested by Ingersoll and Geboy.[23] They recommend that the psychologist see the patient at the dental office during off hours. This provides a familiar setting for the patient, an opportunity for the psychologist to gradually decondition the patient to fearful stimuli, and, for the dentist, an opportunity to receive rental income for the utilization of the office.

CONCLUSION

Earlier I stated that a primary reason for the lack of utilization of behavioral techniques in the field of dentistry is the

lack of training and confidence. You have taken the first step in overcoming the above obstacles by reading this chapter. The next step is to lay out plans at your office for implementing your new behavior (eg, utilizing a measure of anxiety). Your patients will thank you for your effort.

REFERENCES

1. McGrath PJ, Unruh AM: Pain in Children and Adolescents. Amsterdam, Elsevier Science Publishers BV, 1987.
2. Korn E, Johnson K: Visualization: The Uses of Imagery in the Health Professions. Dow Jones-Irwin, Homeword, IL, 1983.
3. Melzack R, Wall PD: Pain mechanisms: A new theory. Science 1965;150:971–979.
4. Chapman R: The role of anxiety in acute pain. In: Bonica J, ed: Pain Overview, New York, HP Publishing Co, 1980.
5. Schachter S, Singer JE: Cognitive, social and physiological determinants of emotional states. Psych Rev 1962;69:379–399.
6. McKay M, Davis M, Fanning P: Thoughts and Feelings: The Art of Cognitive Stress Intervention. Richmond, CA, New Harbinger Press, 1981.
7. Melzack R, Dennis SG: Neurophysiological foundations of pain. In: Sternbach RA, ed: The Psychology of Pain, New York, Raven Press, 1971.
8. Sternbach RA: Clinical aspects of pain. In: Sternbach RA, ed: The Psychology of Pain, New York, Raven Press, 1971.
9. Hill HE, Kornetsky CH, Flanary HG, Wikler A: Studies on anxiety associated with anticipation of pain. I. Effects of morphine. Arch Neurol Psych 1952;67:612–619.
10. Egbert LD, Battit GE, Welch CE, Barlett MK: Reduction of post-operative pain by encouragement and instruction of patients. N Eng J Med 1964;270:825–827.
11. Beecher HK: The placebo effect as a nonspecific force surrounding disease and the treatment of disease. In: Janzen R, Keidel W, Herz A, Steichele C, Payne J, Burt R, eds: Pain: Basic Principles, Pharmacology, Therapy. Stuttgart, Thieme, 1972.
12. Foreman PA: Practical patient management: The integrated approach. Anesth Prog 1988;35:19–25.
13. William RL, Long JD: Toward a Self-Managed Life Style. Boston, Houghton Mifflin Co., 1975.
14. Turk D: Cognitive control of pain: A skills training approach. Unpublished doctoral dissertation, University of Waterloo, Ontario, 1975.
15. Gatchel RJ, Ingersoll B, Bowman L, Robertson C, Walker, C: The prevalence of dental fear and avoidance: a recent survey. J Am Dent Assoc 1983;107:609–610.
16. Luyk N, Beck F, Weaver J: A visual analogue scale in the assessment of dental anxiety. Anesth Prog 1988;35:121–123.
17. Kleinknecht RA, Bernstein DA: Assessment of dental fear. Behav Ther 1978;9:626–634.
18. Corah N: Development of a dental anxiety scale. J Dent Res 1969;48:596.
19. Venham L, Gaulin-Kremer E: A self-report measure of situational anxiety for young children. J Pediatr Dent 1979;1: 91–96.
20. Johnson R, Baldwin DC: Relationship of maternal anxiety to the behavior of young children undergoing dental extraction. J Dent Res 1968;47:801–805.
21. Wright GZ, Alpern GD: Variables influencing children's cooperative behavior at the first dental visit. J. Dent Child 1971;38:124–128.
22. Melamed BG: Preparing children for dental treatment: effects of film modeling. In: Ingersoll BD, Seime RJ, McCutcheon WR, eds: Behavioral Dentistry: Proceedings of the First National Conference. Morgantown, WV, West Virginia University, 1977.
23. Ingersoll B, Geboy MJ: Consultation with dentist: innovative roles for the clinician. In: Keller PA, Ritt LG, eds: Innovations in Clinical Practice: A Source Book, Vol 2. Saratoga, FL, Professional Resources Exchange, Inc., 1983:331–347.
24. Shoben EJ, Borland L: An empirical study of the etiology of dental fears. J Clin Psych 1954;10:171–174.
25. Bandura A: Influence of models' reinforcement contingencies on the acquisition of imitative responses. J Pers Soc Psychol 1965;1:589–595.
26. Brown JM, O'Keeffe J, Sanders SH, Baker B: Developmental changes in children's cognition to stressful and painful situations. J Pediatr Psychol 1986;11:343–357.
27. Siegel L, Peterson L: Stress reduction in young dental patients through coping skills and sensory information. J Consult Clin Psychol 1980;48:185–187.
28. Troutman K: Behavior of children in the dental office. Update Pediatr Dent 1988;1:1–7.
29. Dworkin SF: Integrating behavioral and pharmacological modalities. Anesth Prog 1988;33:55–59.
30. Beecher HK: The powerful placebo. JAMA 1955;159:1602–1606.
31. Wolf S: The pharmacology of placebos. Pharmacol Rev 1959;11:689–704.
32. Laskin DM, Greene CS: Influence of the doctor-patient relationship on placebo therapy for patients with myofascial pain-dysfunction syndrome: a comparative analysis. J Am Dent Assoc 1972;85:892–894.
33. McCoy P: Further proof that touch speaks louder than words. Reg Nurse 1977;40:43–46.
34. Milgrom P, Kleinknecht R, Weinstein P, Getz T: Treating Fearful Dental Patients: A Patient Management Handbook. Seattle, WA, Behavioral Dental Publications, 1985.
35. Smith T, Weinstein P, Milgrom P, Getz T: An initial evaluation of an institutionally-based dental fears clinic. J Dent Res 1984;63:272.
36. Klepac R: Stress inoculation to reduce fear of dental treatment. In: Moretti R, Ayer W, eds: The President's Conference on the Dentist-Patient Relationship and the Management of Fear, Anxiety and Pain. American Dental Association, 1983:58–61.
37. Pawlicki R: Psychologic interventions for the anxious dental patient. Anesth Prog 1987;34:220–227.

APPENDIX 1

Dental Anxiety Scale

1. If you had to go to the dentist tomorrow, how would you feel about it?
   a. I would look forward to it as a reasonably enjoyable experience.
   b. I wouldn't care one way or the other.
   c. I would be a little uneasy about it.
   d. I would be afraid that it would be unpleasant and painful.
   e. I would be very frightened of what the dentist might do.
2. When you are waiting in the dentist's office for your turn in the chair, how do you feel?
   a. Relaxed.
   b. A little uneasy.
   c. Tense.
   d. Anxious.
   e. So anxious that I sometimes break out in a sweat or almost feel physically sick.
3. When you are in the dentist's chair waiting while he gets his drill ready to begin working on your teeth, how do you feel?
   a. Relaxed.
   b. A little uneasy.
   c. Tense.
   d. Anxious.
   e. So anxious that I sometimes break out in a sweat or almost feel physically sick.
4. You are in the dentist's chair to have your teeth cleaned. While you are waiting and the dentist is getting out the instruments which he will use to scrape your teeth around the gums, how do you feel?
   a. Relaxed.
   b. A little uneasy.
   c. Tense.
   d. Anxious.
   e. So anxious that I sometimes break out in a sweat or almost feel physically sick.