

Pharmacologic Desensitization for Dental Phobias: Clinical Observations

Paul A. Moore, DMD, PhD,* Robert M. Peskin, DDS,† Calvin J. Pierce, DMD, PhD*

*University of Pittsburgh, School of Dental Medicine, Pittsburgh, Pennsylvania; †Long Island Jewish Medical Center, New Hyde Park, New York

The elimination of the extreme fear reported by dental phobic patients traditionally involves psychological interventions such as systematic desensitization. Observations resulting from a conscious sedation approach, as outlined in two case histories, suggest that a desensitization phenomena is occurring. This pharmacologic desensitization appears to mimic elements of systematic desensitization. Optimal management of fearful patients may sometimes require conjunctive support from both dental behavioral scientists and dental anesthesiologists.

Sedative and anxiolytic drugs can effectively relax anxious dental patients during stressful procedures. However, the elimination of extreme dental anxieties, avoidance behaviors, and phobias is usually thought to require behavior modification strategies.¹ Behavioral methods used to treat simple dental phobias initially involve identifying and controlling the specific dental stimuli that are feared.² The overall strategy, regardless of the specific behavioral method employed, requires that fearful patients develop trusting relationships with their dentists, be given some control of the dental situation, and have a means for coping with inevitable stressful stimuli. Successful treatment requires that patients be presented with a series of positive experiences, permitting fearful patients to develop more realistic expectations for future dental therapies.³

The primary use of pharmacologic sedation and general anesthesia is to modify or eliminate patients' perceptions of the extreme external stresses associated with such highly traumatic procedures as oral or periodontal surgery. Pharmacologic conscious sedation, although usually

considered a symptomatic therapy, has also been advocated for extremely fearful patients who cannot tolerate even routine dental procedures.⁴ Its use has generally been considered a means for permitting a patient to comfortably receive treatment and not a method for overcoming dental phobic behavior.

It is not uncommon, when multiple sedation appointments are planned, for extremely fearful patients to require less pharmacologic management during subsequent treatments. Many patients who required conscious intravenous sedations during the initial appointments will require minimal or no sedation at the completion of a multiple appointment treatment plan. Sedation therapy becomes unnecessary as patients develop greater trust in their dentist and undergo a series of dental appointments that have not been perceived as extremely aversive.

We present two case studies of this weaning phenomena that might be appropriately termed pharmacologic desensitization. Through careful drug titration, the presentation of perceived aversive stimuli is controlled and decreasing depths of sedation are needed during subsequent appointments.

Case 1

A 28 year old healthy female was referred to a university dental school-based fears clinic by a hospital oral surgeon. She had seen the oral surgeon for an emergency extraction and had requested to have all her teeth removed. Her chief complaint was that she "hated her teeth and hated dentists." Recently employed as a sales clerk, she was concerned about her smile and had obtained partial dental insurance coverage.

Her first appointment involved a 40 minute interview and a cursory exam where multiple carious teeth were noted. She permitted bitewings and a panoramic radiograph to be taken during the initial visit. A treatment plan that required seven appointments was prepared and accepted. Although intravenous sedation was scheduled for each appointment, it was explained that, as the work progressed, she might not find further sedation necessary. The seven visits required the following sedation and dental procedures:

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Address correspondence to Paul A. Moore DMD, PhD, Professor, Department of Pharmacology/Physiology, University of Pittsburgh, School of Dental Medicine, 560 Salk Hall, Pittsburgh, PA 15261.

visit 1:	diazepam meperidine methohexital local anesthesia	15 mg i.v. 40 mg i.v. 40 mg i.v.	endodontics/ caries control
visit 2:	diazepam meperidine local anesthesia	10 mg i.v. 40 mg i.v.	scaling/endodontics restorative
visit 3:	diazepam meperidine nitrous oxide/oxygen local anesthesia	7.5 mg i.v. 10 mg i.v.	endodontics/restorative
visit 4:	diazepam nitrous oxide/oxygen local anesthesia	10 mg i.v.	crown and bridge/ endodontics/extractions
visit 5:	oxazepam nitrous oxide/oxygen local anesthesia	10 mg p.o.	restorative/impressions
visit 6:	nitrous oxide/oxygen local anesthesia		restorative/ crown and bridge
visit 7:	nitrous oxide/oxygen local anesthesia		restorative/ crown and bridge

Case 2

An 18 year old, well developed, well nourished white female, with a non-contributory past medical history, came to the office requesting to be “put asleep” to have dental treatment performed. She had previously had teeth extracted by an oral surgeon with “general anesthesia.” At the initial consultation, she indicated that she disliked local anesthesia, having had that for dentistry several months prior and having discontinued treatment because of her apprehension about it. Further discussion revealed

that the use of nitrous oxide/oxygen had never been attempted for her dental work.

Initial assessment of the patient’s chief complaint revealed that the patient exhibited greater than normal anxiety and apprehension concerning dentistry. However, management did not warrant sedation by an intravenous route. With the permission of the patient and her mother, the following treatments were performed:

visits 1–4	ethinimate diazepam nitrous oxide/oxygen local anesthesia	500 mg p.o. 5 mg p.o.	restorative dentistry
visit 5	nitrous oxide/oxygen local anesthesia		restorative dentistry
visit 6	nitrous oxide/oxygen local anesthesia		crown and bridge
visit 7	no local anesthesia		repair of incisal edge composite

At the beginning of each appointment the planned procedures and expected duration were explained. At no time did the sedations these patients received render them unconscious. After each appointment the patient was interviewed regarding their feelings and perceptions of the dental and sedation experience.

DISCUSSION

The reduction in dental fear and anxiety following multiple pharmacologic sedation appointments as described in these case studies illustrates the possible usefulness of integrating pharmacologic and behavioral strategies when managing fearful dental patients. However, the mechanism for its success and methods for maximizing its efficacy need further study.

It is interesting to note that when compared to a broad-based psychophysiologic therapy, the use of general anesthesia has not been found to be an effective means for reducing patient anxiety and fear-related avoidance behavior.⁵ Although this may be due to the brevity of the general anesthesia procedure, a more probable explanation for its inability to reduce phobic behavior is that unconscious patients receive little information (positive or negative) that might create more realistic perceptions of dental treatment. Additionally, there has been no opportunity to learn new coping skills. During conscious sedation, patients are aware, albeit limitedly, of the dental procedures that are occurring. Being aware of pertinent information and learning new coping skills often lead to desirable behavior changes.^{6,7}

Systematic desensitization is a behavioral strategy, supported through research and clinical evidence, that is effective in eliminating many kinds of simple phobias.^{8,9} The strategy first teaches the patient a relaxation technique, such as Jacobson's Progressive Muscle Relaxation.¹⁰ Using a patient's fear ratings, a hierarchy of increasingly aversive stimuli is then developed. Subsequently, the aversive stimuli are progressively presented to the patient from the least to the most aversive. The patient may first imagine the least fear-provoking stimulus while remaining relaxed. For example, if the feared situation is a local anesthesia injection, the hierarchy might start by asking a patient to picture in his mind a syringe on the dentist's instrument tray. If, as more feared stimuli are presented, the patient is unable to relax, a less feared stimulus is substituted until relaxation is attained. After the *in vitro* procedure, an *in vivo* (actual dental environment) hierarchical presentation of stimuli accompanied by relaxation is undertaken. The classical explanation for the success of systematic desensitization is that the patient learns a substitute response that opposes the unwanted response. The strategy is one of counterconditioning that makes it impossible to be simultaneously relaxed and anxious.

The pharmacologic desensitization phenomena that we have observed is in many aspects identical to systematic desensitization. Patients are relaxed not by Jacobson's relaxation method but by sedative drugs. If a patient demonstrates any anxiety and requests greater relaxation, the dental procedure is interrupted and additional anxiolytic or sedative agents are administered. Thus, as in systematic desensitization, a degree of patient control of aversive dental stimuli is maintained.

Pharmacologic desensitization does not expose the patient to anxiety-producing stimuli in an established hierarchical order of intensity, but rather it unmasks aversive stimuli in a graded manner. Initial pharmacologic sedation is designed to mask nearly all of a given stimulus (such as local anesthesia administration). It is likely that the decreasing depth of sedation used at subsequent appointments will present the patient with an increased awareness of reality. When the patient learns to cope with treatment at a particular level of sedation, he may request a decrease in the sedation level during subsequent appointments. Pharmacologic desensitization differs from systematic desensitization in that the behaviorally-induced relaxation is replaced initially with pharmacologically-induced relaxation. The pharmacologically-induced relaxation allows the most noxious (and frequently the most urgently needed) treatments to be accomplished immediately, while gradually providing patients with increasing self-control and trust in their dentist. Unlike systematic desensitization, pharmacologic conscious sedation is generally not used initially in an *in vitro* environment, although this has been suggested for nitrous oxide inhalation sedation.¹¹

We believe the observed pharmacologic desensitization phenomena that accompanies conscious sedation may be useful in treating many fearful patients, permitting them to overcome their anxiety. Procedures that combine behavioral and pharmacologic strategies may prove to be the optimal means for efficiently eliminating dental fear and avoidance behavior.¹²

Methods for including structured behavioral strategies within multiple conscious sedation appointments are likely to improve the efficacy and decrease the time necessary to overcome a patient's fears. Areas of investigation that are planned include evaluating state dependent learning (dissociated learning), identifying factors that predict treatment success, integrating the presentation of coping strategies, and formalizing patient participation by using verbal contracts.

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