Rehabilitation of a fearful dental patient with oral sedation: Utilizing the incremental oral administration technique

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[Editor's note: The AGD acknowledges that the procedure described in this article is not legal in every state. Many states require dental practitioners to have an IV/conscious sedation license before they are allowed to titrate (dose) oral medication; in addition, certain states require IV training to counteract medications. The AGD's Enteral Sedation Task Force has studied this issue on behalf of general dentistry; results of this study are available in the January 2005 issue of AGD Impact. *To read the transcript of the AGD's January 25 Web chat concerning oral sedation, visit www.agd.org. The AGD encourages continuing education in sedation modalities for general dentists.]*

The treatment of fearful or anxious patients presents a myriad of problems for the dentist. In-office sedation using oral (enteral) medications is an effective means of increasing patient tolerance of invasive dental procedures. The incremental oral administration technique is a protocol that can be utilized to treat fearful or anxious patients. A case is presented in which this technique was used as an adjunct to the rehabilitation of a debilitated mouth.

Received: July 28, 2004 **Accepted: October 14, 2004**

Table 1. Pre-sedation checklist.

Review medical history (including anesthesia history)
Complete airway evaluation
Research all potential drug interactions
Note all drug allergies or intolerances
Collect baseline vitals
Review preoperative instructions with the patient
Review dietary, habit, or medicine restrictions with the patient
Present informed consent and have the patient sign it
Identify a responsible companion for travel to/from the office

Providing dental care to anxious and fearful patients is one of the challenges facing practicing dentists. Despite advances in local anesthesia and dental equipment, anxiety and fear remain pervasive in the dental patient population.[1]

Dental fear is a learned response. Family, friends, and popular media can influence patients' attitudes toward dentistry; this attitude manifests in a cycle of fear that is characterized by avoidance of care and dental pathology.[2]

Dentists have used numerous techniques to improve patient comfort during treatment, employing distraction techniques, calming dialogue, and positive reinforcement to manage anxious patients who otherwise would use the "white-knuckle" technique. Administering oral sedative medications (with or without nitrous oxide) to anxious dental patients is popular; oral benzodiazepines are a commonly prescribed, low-cost, low-risk treatment adjunct for the reduction of dental anxiety.[3]

This article describes a protocol for enteral/oral conscious sedation and its clinical utility. This incremental oral administration protocol should serve as a guide for dentists faced with clinical decisions. Any dentist who performs enteral conscious sedation must apply good judgment as to how the protocol is utilized. Dentists should seek the appropriate training, acquire the proper equipment, and satisfy state laws on the use of enteral sedation before implementing any of the techniques described in this article.

The protocol

Preoperative evaluation

Not all patients are good candidates for enteral conscious sedation. Recognizing the limitations of any sedation technique and the appropriateness of referral is the first step toward selecting acceptable patients. The preoperative evaluation of potential sedation patients begins with a thorough medical history. Dentists also should identify medical conditions or diseases that may affect the safety of the sedation procedure. A patient's previous bad experiences or adverse reactions to anesthetics should be recorded and factors that may compromise airway management should be recognized. Table 1 outlines a pre-sedation checklist that must be completed for every patient.

Incremental oral administration technique

The various types of sedation are listed in Table 2.[4] Indications for the use of oral conscious sedation with incremental dosing include the need for a long sedation appointment and/or a patient who suffers from moderate to severe dental fear or anxiety.

The protocol described below for incremental oral administration is designed for the drug triazolam (Halcion, Pfizer, Inc., New York, NY; 800.223.0182) and is based on its pharmacokinetics and pharmacodynamics (see Table 3). If the sedation patient is *nulla per os* (NPO) for six hours before the appointment, triazolam should be absorbed rapidly and produce discernable effects within 45–60 minutes. The dentist can assess patient susceptibility at that time, before the drug reaches its maximum plasma concentration. If no effect is noted, another small increment (usually one-half the amount of drug administered previously)

could be added. If the patient's level of sedation is acceptable, it is unnecessary to administer any additional drugs. An example of an incremental oral administration protocol is presented in Table 4.[5]

During dental treatment, patients are assessed continuously via monitoring equipment and every five minutes based on verbal responses. When additional patient cooperation is needed (for example, for bite adjustments, bathroom breaks, or radiographs), 2.0 ounces of a clear juice drink (not grapefruit) with a straw is provided, which should lighten sedation for approximately five minutes. This introduction of a small amount of carbohydrate is not intended as a pharmacologic reversal but as physiologic stimulation.

When dentistry is completed, the patient should consume approximately 6–8 ounces of a clear, carbohydrate-rich drink to speed the recovery process. Additional drinks may be given to the patient for consumption on the ride home to prevent hypoglycemia and to begin rehydration.

Assessing patients for additional medication

What separates the incremental oral administration protocol from the traditional technique of oral premedication is its provision for additional doses of medication during the procedure. Additional medication is dispensed when the patient and doctor agree it is needed to prolong adequate sedation. It is important to recognize that additional medication should not be given if the patient appears comfortable and responsive, regardless of how much time has elapsed. Administering the smallest effective dose necessary for the patient to receive treatment is the goal of the incremental oral administration technique.

The decision to administer additional medication should be based on verbal and visual assessment.

Verbal assessment

Dentists should sit at eye level with the patient and ask him or her to rate his or her sedation (for example, "How are you feeling? On a scale from 1 to 10, with 10 being totally relaxed, where do you think you fit?"). If the patient responds quickly and concisely, it is likely that his or her level of sedation is low. A deeper level of sedation is indicated if

Table 2. Definitions of sedation.[4]

Type of sedation	Definition
Anxiolysis	The diminution or elimination of anxiety
Conscious sedation	A minimally depressed level of consciousness that retains the patient's ability to independently and continuously maintain an airway and respond appropriately to physical stimulation or verbal command and that is produced by a pharmacological or nonpharmacological method or a combination thereof; the drugs and/or techniques should carry a margin of safety wide enough to reduce the possibility of unintended loss of consciousness
Combination inhalation	Enteral conscious sedation using inhalation and enteral agents
Deep sedation	An induced state of depressed consciousness, produced by a pharmacological or nonpharmacological method or a combination thereof and accompanied by a partial loss of protective reflexes, including the inability to continually maintain an airway independently and/or to respond purposefully to physical stimulation or verbal command
Titration	The administration of a drug in small incremental doses until the desired clinical effect is observed

Table 3. Characteristics of triazolam.[8-11]

Time to maximum concentration (in hours)	0.75–2.5 (mean = 1.25)
Half-life (in hours)	1.8–3.9 (mean = 2.6)
Duration of action (in hours)	4.0–6.0
Anxiolytic	Dose-dependent
Amnesia	Anterograde; dose-dependent
Pharmacologic antagonist	Flumazenil

Table 4. Protocol for incremental oral administration.[5,12]

This example is for an 8 a.m. appointment when dentistry is planned to begin at 9 a.m.

Prior to appointment: The patient (Adult ASA 1 or 2) has been evaluated by the dentist preoperatively and accepted for oral sedation dentistry; prior to appointment, the patient has received a single dose of triazolam (0.25 mg; for elderly, debilitated, or patients with potential drug interactions, 0.125 mg should be dispensed).

7:00 a.m.: The patient, having gone six hours without eating, takes 0.25 mg triazolam; a responsible companion escorts the patient to the office

8:00 a.m.: The patient arrives at the office with the companion and compliance with preoperative instructions is verified

8:03 a.m.: The patient is seated in the operatory for the beginning of continuous physiologic monitoring; at that time, the patient's wristwatch and glasses are removed and given to a companion

8:06 a.m.: The patient is assessed for susceptibility to the sedative medication; additional medication may be provided sublingually

8:35 a.m.: The patient's sedation state is reassessed; if additional medication is necessary, the dentist should deliver it sublingually

8:54 a.m.: Oxygen is introduced with the appropriate protocol

8:57 a.m.: Nitrous oxide is introduced with the appropriate protocol

9:00 a.m.: Local anesthesia is administered; at this point, nitrous oxide administration is terminated and dentistry begins

Table 5. Required monitoring for oral conscious sedation.

Pulse oximetry (SpO_2 and pulse)
Blood pressure
Ventilation (either by precordial or pretracheal stethoscope)

Table 6. Discharge criteria for a sedation patient.

Awake and alert (will patient fall asleep if left alone?)
Ambulatory
Oriented to time, place, and location
Responds appropriately and purposefully to verbal commands
Postoperative instructions given in writing to the companion
Prescriptions given, if needed
Emergency contact numbers given

the patient hesitates, does not answer, or becomes confused. Based on each patient's individual need for sedation and level of fear or anxiety, additional medication may be administered if needed.

Before administering additional medication to a patient, it is very important to ask if he or she would like to be more sedated. If the patient replies "no," the dentist should not deliver additional medication; the patient may be sufficiently relaxed to receive care at this lower level. Dentists should always administer the smallest effective dose.

Visual assessment

This assessment also involves sitting at eye level with the patient and observing his or her overall appearance. Is the patient capable of maintaining eye contact? Are the patient's eyes open or do they appear partially closed? The patient's physical posture also should be assessed. Is the patient sitting upright or is he or she slumping or leaning back in the chair? Maintaining direct eye contact and normal posture are signs of inadequate sedation. Patients will display signs of somnolence as drug effectiveness becomes observable. Postural changes to a slumped or slouched position also indicates a patient who is properly sedated.

Discharge

When the procedure is complete, the patient must satisfy discharge criteria before being released. This will give you a psychological assessment of the patient's orientation to time, place, and person (orientation X3). All appropriate information should be recorded in the chart, including the procedures performed, medications given, and contents of the discharge note (for example, "Patient tolerated treatment well and was ambulatory and oriented X3 when he or she left"). The patient and his or her companion should be given written postoperative instructions; the companion must sign a copy of these instructions, drive the patient home directly, and call the office to confirm a safe arrival.

The sedation appointment does not end with the completion of dental work. The patient should be monitored physiologically and remain under the care of the dental team until deemed ready for dismissal. Recovery typically is qualified by a return to normal cognitive function; however, because oral medications can cause sedation for several hours, the dentist is responsible for assessing the level of sedation in each patient before releasing him or her to a responsible companion. Factors that will determine the timing of discharge include the patient's abilities to ambulate, verbalize appropriately, and remain alert without stimulation. Dental offices that provide sedation should develop a list of discharge criteria to determine when patients are ready to be released. A list of discharge criteria is included in Table 6.

Postoperative calls to all sedation patients should be made the night of the appointment; at that time, should be reminded to resume normal eating/drinking and medication dosing.

Case report

A 29-year-old woman whose chief complaint was embarrassment about her smile sought dental care. She was not experiencing any acute discomfort but reported episodic pain from a mandibular molar. Due to her extreme fear and anxiety, she was interested in sedation dentistry. During the initial interview, she acknowledged sedation was an important factor in her decision to seek treatment.

A review of the patient's past medical history revealed that she had undergone a cervical biopsy and subsequent corrective laser cervical surgery several years earlier. No current medical conditions existed to contraindicate the delivery of oral sedation dentistry. At the time of her visit, the patient was taking oral contraceptives as well as naproxen (as needed) for pain. She reported smoking 10 cigarettes every day for five years and consuming two to three alcoholic drinks per week. A medical consultation was obtained and a presedation workup was completed; this workup included cross-referencing the patient's medications with the sedative drugs, preoperative blood pressure, heart rate, and oxyhemoglobin saturation (as measured with a pulse oximeter). Preoperative and postoperative instructions were reviewed with the patient and written consent was obtained.

The patient's dental history has consisted of sporadic, episodic care. Her first memory of dental care (as a young child) was traumatic and involved incomplete anesthesia during the restoration of several cavities. Since then, the patient's fear and anxiety toward dentistry has increased to the point that the idea of receiving dental treatment led to sweating, crying, a rapid heartbeat, and insomnia the night before an appointment. Fear and anxiety has led to avoidance of treatment despite obvious dental problems. This avoidance has led to a severely debilitated appearance, causing pain and embarrassment (Fig. 1).

The patient eventually was coaxed into the dental chair an hour after entering the operatory. After further calming and application of a gentle technique, the patient allowed a comprehensive examination, including full-mouth periodontal charting, radiographs, soft tissue examination, muscle and joint evaluation, and a dental examination. Impressions and accompanying data for mounted study models were obtained. A treatment plan was devised to address both the patient's oral disease and her cosmetic concerns. Due to the patient's high level of fear and anxiety, all treatment was scheduled to occur while she was under oral sedation. The patient consented to the treatment plan, although the prognosis was guarded because of advanced oral deterioration and the patient's emotional lability.

The first appointment lasted approximately six hours and involved root debridement therapy throughout the entire

mouth. The patient was NPO for six hours before her appointment. One hour before her scheduled appointment time, she took the first dose of triazolam (0.25 mg) at home and was driven to the office by a predetermined companion. The patient was reassessed upon her arrival at the office and an additional dose of 0.25 mg triazolam was administered 30 minutes later. Treatment was scheduled to begin at 9:00 a.m. but adequate sedation was not accomplished until 9:30 a.m.; treatment began uneventfully at that time. Visual and verbal assessment satisfied the definition of light conscious sedation and the patient was monitored continuously with a pulse oximeter.

At approximately 12:00 p.m., or 3.5 hours after the previous dose, the patient received another 0.25 mg of triazolam to prolong sedation and complete treatment; a total of 0.75 mg of triazolam was administered. The patient was cooperative and anxiety-free while under sedation; in addition, all physiological parameters were within normal limits during the appointment. After discharge criteria were met, the patient was released into the care of her companion for transportation home. Subsequent appointments to complete the remainder of the treatment plan were as uneventful and successful as the initial treatment appointment.

The final treatment rendered consisted of nonsurgical (laser-assisted) periodontal treatment, root canal therapy for 6 teeth, all-porcelain crowns (including selected post-core build-ups) for 8 teeth, porcelain veneers for 14 teeth, one extraction, and various resins for 7 teeth.

As a result of the dental care she received, the patient is asymptomatic, free from dental and periodontal disease, and ecstatic with her cosmetic result (Fig. 2). While she still is nervous about dental care, she is continuing maintenance therapy with a greater sense of appreciation. Sedation dentistry has broken the cycle of fear and avoidance that led to the patient's dental pathology.

Fig. 1. *Left*: A preoperative photo of the patient. *Right*: A close-up of the patient's preoperative smile.

Fig. 2. *Left*: A postoperative photo of the patient. *Right*: A close-up of the patient's postoperative smile.

Summary

Oral sedation dentistry is a treatment adjunct available to dentists to diminish patient fear and anxiety. It has been estimated that 30% of the population is fearful or anxious about receiving dental care and that eight million people nationwide will not seek care despite acute pain or infection.[6,7] Dentists can treat this patient population by using oral conscious sedation. The incremental oral administration protocol should be considered a guideline for dentists when performing sedation dentistry. Like all guidelines, it is not static but is subject to change when demanded by the evolution of anesthesia knowledge.

Disclaimer

Dr. Feck is a lecturer and vice-president for the Dental Organization for Conscious Sedation in Norristown, Pennsylvania, where Dr. Goodchild is a consultant and lecturer.

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