



## The Subtleties and Nuances of Pediatric Sedation: A Disappearing Art for Managing the Apprehensive Child Patient

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Pre-cooperative and severely apprehensive children have immature cognitive abilities, a restricted range of coping skills, brief or negligible attention spans, and virtually no experience coping with stress.

For these children conventional communication strategies may often prove inadequate or inappropriate to overcome the behavioral manifestations of childhood dental fear and anxiety. Well-chosen pharmacological approaches has potential to permit in-office treatment, avoid aversive measures, and be the difference between securing care at affordable rates versus prohibitive costs for general anesthesia in a hospital or surgical center [1]. Safe and effective use of agents and dosing which maintains consciousness and overcomes patient resistance is in essence more an art than science. Selection of optimal agents and therapeutic dosing for a given child's need, the duration of action required, the level of apprehension/resistance to be overcome, and the extensiveness/invasiveness of the procedure undertaken are key elements which separate the novice clinician from the expert. The "art" of pediatric sedation implies clinicians possess a degree of intangible insight and expertise based on extraordinary observational skills to most accurately assess the needs of a given patient. Critical analysis of contemporary research efforts find a paucity of well controlled data [2] and teaching curricula in advanced training programs suggest trends in the direction that sophisticated and successful applications of pediatric sedation are becoming a vanishing art [3].

Over the last three decades, few topics in pediatric dentistry generate greater diversity of opinion than the deployment of various forms of sedation to manage the behavioral manifestations of fear and disruptive behaviors of the pediatric patient. No general agreement seems to exist regarding what agents and dosages are efficacious. Some states and institutions have imposed significant constraints on what agents are acceptable despite decades of safe and effective use. In contrast to many health care fields where second thought is rarely granted for any modality other than general anesthesia for completion of invasive and unpleasant procedures, expectations in dental practice, be it for adults or children, are that most procedures are conducted with the patient in a conscious state in an office setting.

Use of sedative techniques is not without risk. Techniques which seek to overcome heightened levels of apprehension and patient resistance inherently carry potential to depress consciousness and

adversely suppress protective reflexes. Guided by limited science and an art which acknowledges nuances and subtleties of individual patient differences, agent and dosage must be carefully chosen and exercised with the utmost vigilance to insure patient safety.

If it can be stipulated that an optimal goal of pediatric sedation is to maintain patient consciousness throughout, obtund interfering movement, eliminate the need for persistent restraint, it begs the question of why approximately 60% of today's pediatric specialists consider sedation still successful when persistent restraints are necessary [4].

Since the drafting of safety guidelines by disciplines such as the American Academy of Pediatric Dentistry, American Academy of Pediatrics, American Association of Oral and Maxillofacial Surgery, and American Society of Anesthesiology in 1985, to name a few, contemporary use and effectiveness of sedation for management of the child patient appears diminished [3-5]. Intended to achieve the above goal, clinician compliance to follow safety guidelines appears to have fallen short of universal [4]. A paucity of well-controlled studies have been reported; no general consensus appears to exist within and between healthcare disciplines with respect to how clinical success is defined or expected; recommendations for dosage offering low, mid and upper range selection criteria have not been reported. Rarely are studies found which include sufficient sample sizes, valid behavioral selection criteria, objective assessment methodologies, or recordings of outcomes and recovery parameters.

Numerous mishaps with catastrophic outcomes have been reported over the last two decades for the pediatric dental patient [3-9]. A consistent finding reported has been lowered expectations for elimination of the need for patient immobilization (the use of physical restraints) to accomplish treatment and /or reduce need for general anesthesia. Consensus is lacking with respect to training curricula, agent and dosing selection. At the institutional and training level, experience, comfort levels, proficiency in recognition and management of potential adverse reactions and medical emergencies widely appear to vary among program directors of advanced training programs [3,4].

On a positive note, the A.D.A. Council on Dental Accreditation has recently begun to initiate efforts taking a pro-active role in identifying what constitutes appropriate sedation training and

experience seeking to standardize the experience of trainees in the safe and effective use of pharmacologic modalities to manage challenging child behaviors. However, until such materializes in formal policy, variability in faculty and clinician experience using a limited arsenal of agents, some being highly restrictive in agent selection and dosing can be expected to contribute to a diverse array of sedation outcomes in both academic and private settings. Surveys of pediatric dentists' use of sedation [3,4,6,7] have provided insights into the backgrounds of both program directors and residents on the basis of their training experiences and protocols their institutions permit. For program directors with a command of the literature and vast experience making use of a diverse arsenal of agents, resident training experiences are reported as optimal. Program directors and faculty less experienced using limited agents and minimal dosing regardless of the level of anxiety or childhood resistance encountered, report few if any successful sedation outcomes where need for persistent application of physical restraint was the norm. Faculty and clinicians reporting this end result from their training experiences expressed they were not likely to make use of sedation in their practices and would likely opt for general anesthesia when encountering patient resistance, or greater application of physical restraints. Alternatively, those with broad-based sedation experience indicated they anticipated making use of sedative techniques to a greater extent.

A recent study [2] reported the vast majority of training programs restrict agent selection to a single agent midazolam, (which has capacity for reversal) with restricted dosing limited to 0.2- 0.5 mg/kg. 94% of training programs report that the depth of sedations is "lightening" [3]. This target, while laudable, raises questions about efficacy for anything but ultrashort procedures for minimally to moderately apprehensive young subjects. Such use suggests a trend in the direction of vastly increased use of general anesthesia, (due to significant working time limitations of midazolam when longer duration of actions are required) simply to avoid even the most remote possibility of an adverse or over-sedation occurrence. Agitation and need for persistent application of physical restraint to combat resultant interfering movement from under-dosage or drug inadequacy, or expectations that this agent will provide sufficient working time poses ethical concerns to justify why agent selection is limited to this single agent [3]. At the very least, the need to resort to aversive measures to complete treatment under these conditions would seem to abandon the fundamental intent of sedation. Further conclusions declaring success despite need for these interventions seems illogical.

Pro-active involvement of disciplines directly involved in health care for the pediatric patient will ultimately determine, with parents, litigators, and state agencies, the direction taken for the use of sedation, either forwards, or backwards. Continued assessment of the standards, proficiency and experience provided in advanced training programs seems warranted. An often cited universal observation amongst health care disciplines providing pediatric care claim that no mishaps have occurred when guidelines have been followed and responsible agents and dosing are employed.

From a perspective of enforcement of compliance with established safety guidelines, efforts might be considered to establish national data banks requiring a recording of mishaps and appraisals of etiology. Lastly, imposition of more severe licensure sanctions might contribute incentive to lessening actions where guidelines are deliberately not followed.

The role and direction of pediatric conscious sedation appears to be reaching a crossroad. While science and innovative research often clear the pathway and roadblocks to progress, it appears numerous obstacles remain. Consensus is needed to define what constitutes success. Training programs must include exposure and experience to a diverse repertoire of agents using responsible yet therapeutic dosing, demand compliance with patient monitoring and facility requirements, and demonstrate proficiency in recognition/management of adverse patient responses and medical emergencies. For those lacking familiarity with the existing literature, experience

and history of success predicting optimal agents and dosing schedules, and those unwilling to be in compliance with safety guidelines, it should not be surprising that these latter clinicians find themselves more accepting of a need for physical restraints and/or more liberal selection of general anesthesia.

Disruptive behaviors, particularly from those lacking cooperative ability often are prompted by the need to protest an unpleasant situation and the impulse to protect oneself from perceived danger. Proficient use of pharmacologic adjuncts to help avoid unpleasant and unproductive confrontations from the outset, to create an environment to facilitate the child's ability to ultimately accept care, protect the child's self-esteem, foster a positive attitude toward care, and enhance the work quality of dental personnel can be frequently achieved with well selected sedation techniques.

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