

Conscious Sedation: An Integral Part of Dentistry

Anika Mittal*, Shilpa Khullar**, Jai Hans Aggarwal***, Bhupesh Gupta****

Abstract

Conscious sedation has become an increasingly important subject in recent years. Its use in dentistry for reconstructive surgery, some cosmetic surgeries, removal of wisdom teeth, or for high anxiety patients has been documented but not widely accepted in day to day practice. It helps establish communication between dentist and patient which is important for establishing trust, easing a patient's pain, and allowing them to feel they are in control of procedure. The aim is to provide a safe and comfortable anaesthesia while maintaining the patient's ability to follow commands..The introduction of new anaesthetic applications enables patients to undergo lengthy and complex procedures as outpatients and then promptly and safely be discharged home. The choice and route of anaesthesia administration is paramount to the patient's overall surgical experience. If, upon discharge, the patient is alert, has minimal pain, and has no nausea or vomiting, then the surgical experience was a positive one. This level of sedation is used for medical procedures in which it is necessary for the patient to be responsive, and also for minor procedures which do not merit the use of general anaesthesia, and for procedures involving patients who cannot cooperate with care providers. Like any form of anaesthesia and sedation, there are some risks to conscious sedation, but it is significantly less dangerous than general anaesthesia.

Keywords: Anxiety; Conscious sedation; Dentistry, Pain.

Introduction

The effective control of dental anxiety and pain has been an integral part of dentistry. Conscious Sedation is a fundamental part of the management of patients in operative dentistry. Properly provided Conscious Sedation is safe, valuable and effective for dental patients. Training and experience though are essential. Being conscious during the treatment allows the patient to fully understand each step of the procedure, making the experience less stressful for them. Conscious sedation therapies are intended to make visit to the dentist a more enjoyable and pleasant

experience.

It is of key importance to maintain a wide margin of safety between Conscious Sedation and the unconscious state of general anaesthesia where verbal communications with the patient or protective reflexes are lost. **Every** practitioner providing Conscious Sedation should gain the **theoretical** and **practical hands on**, supervised, clinical training necessary to practise the individual techniques for the safe management of the dental patient.

Definition

A technique in which the use of a drug or drugs produces a state of depression of the central nervous system enabling treatment to be carried out, but during which verbal contact with the patient is maintained throughout the period of sedation. The drugs and techniques used to provide conscious sedation for dental treatment should carry a margin of safety wide enough to render loss of consciousness unlikely.[1]

Author's Affiliation: *Professor, Department of Conservative Dentistry, **Designation is not provided, Department of Prosthodontics, ***Professor Department of Conservative Dentistry, ****Reader, Department of Conservative Dentistry, I.P Dental College & Hospital, Sahibabad (U.P), India.

Reprints Requests: Dr. (Prof) Anika Mittal, M.D.S, Department of Conservative Dentistry, I.P Dental College, Sahibabad, U.P.

E-mail: dr.anikamittal7@gmail.com

The level of sedation must be such that

- The patient remains conscious,
- Retains protective reflexes, and
- Is able to understand and respond to verbal commands.

The American Society of Anaesthesiologists² defines the continuum of sedation as follows:

- Minimal Sedation - Normal response to verbal stimuli.
- Moderate Sedation - Purposeful response to verbal/tactile stimulation. (This is usually referred to as “conscious sedation”)
- Deep Sedation - Purposeful response to repeated or painful stimulation.
- General Anaesthesia - Unarousable even with painful stimulus.

Local anaesthesia is used to control regional pain. Sedative drugs and techniques may control fear and anxieties, but do not by themselves fully control pain and thus, are commonly used in conjunction with local anaesthesia. General anaesthesia provides complete relief from both anxiety and pain.

Background

During the last decade there have been a number of reports relating to the provision of general anaesthesia and Conscious Sedation. In 1990 the report (“General Anaesthesia, Sedation and Resuscitation in Dentistry” prepared by the Standing Dental Advisory Committee”) heralded considerable changes in the provision of these services for dentistry. [3] A report by the Clinical Standards Advisory Group entitled “Dental General Anaesthesia” in 1995 recommended standards for patient care, safety facilities and training for dentists and anaesthetists. During this time the Society for the Advancement of Anaesthesia in Dentistry and the Association of Dental Anaesthetists issued specific guidelines in relation to contemporary clinical practice both in relation to General Anaesthesia and Conscious Sedation.[4,5] More recently The Dental Sedation Teachers Group have

published curriculum guidance for undergraduates and the competent graduate. [6,7]

In 1998 the General Dental Council recognised the views of the specialist societies and the Royal Colleges. It endorsed the need for Conscious Sedation provision rather than the continuing provision of General Anaesthesia as a demand led service. This has reduced the use of General Anaesthesia in primary dental care.[8]

In July 2000 the publication of “A Conscious Decision”, a report by a group chaired by the Chief Medical Officer and Chief Dental Officer of England, finally heralded the removal of General Anaesthesia associated with dentistry from non hospital settings.[9] This report made a number of recommendations concerning Conscious Sedation. The government has accepted the report.

In July 2000, an expert group representative of all branches of dentistry was convened by the Society for the Advancement of Anaesthesia in Dentistry charged to consider standards for Conscious Sedation in dentistry.

Preparation of patients for conscious sedation

Patients who are scheduled to receive Conscious Sedation must receive careful verbal and written instructions as to the effects of the sedation and their responsibilities prior to the sedation appointment. Specific written consent must be obtained from all patients who are to receive treatment under sedation. Consent is a communication process. *It is the voluntary and continuing permission of a patient to receive a particular treatment. It must be based upon adequate knowledge of the purpose, nature and likely effects and risks of that treatment, including the likelihood of its success and any alternative to it.*

In order to provide valid consent a patient must be able to comprehend the information provided, retain it and assimilate the same information so as to be able to make a decision. Caution must be applied where children under 17 provide consent when they are competent

to do so. Patients who are already sedated are unlikely to be competent to take decisions regarding consent for treatment. It is therefore inappropriate to try to seek consent for dental treatment from a patient who is sedated.

A responsible adult escort must accompany the patient home from the dental surgery and assume responsibility for the patient's post-sedation care. Both patients and escort must understand and accept that this responsibility is delegated to the escort and both must agree to comply with this. It is therefore essential that both patient and escort clearly understand the effects of sedative agents and the consequences of failing to follow all post-sedation instruction.

Patient assessment and Selection

Careful and thorough assessment of the patient ensures that correct decisions are made regarding the planning of subsequent treatment. Important history includes personal or family history of malignant hyperthermia, cardiac arrest, congestive heart failure, recent MI, stroke or TIA, heart rhythm disturbance, smoking, diabetes, COPD, or recent change in respiratory status. A listing of current medications is important. It is recommended that patients be NPO for six to eight hours before drug administration

An objective assessment and discussion with the patient enable decisions to be made such that the patient receives the most appropriate type of Conscious Sedation, administered in the correct environment.

Equipment and Supplies

1. Monitoring equipment: BP cuff, pulse oximeter, cardiac monitor
2. IV access
3. Oxygen delivery by nasal prongs or mask
4. Resuscitation equipment: Endotracheal tubes, Ambu bag and mask, defibrillator, emergency cardiac drugs, naloxone, flumazenil
5. Personnel trained in airway

management, and recovery of sedated patients

6. Informed consent as appropriate

Techniques

The three standard sedative techniques used in dentistry,

- Inhalation,
- Oral and
- Intravenous

All work for the vast majority of patients. The technique that is chosen must be tailored to provide the most appropriate anxiety relief for the individual patient. No one technique will be successful for all patients whether it be the use of a single drug, or the use of multiple agents. All drugs must be carefully labelled even when only one drug is drawn up. All syringes in use in the surgery must be labelled, whether containing dental medicaments (e.g. root canal medicaments) or drugs (e.g. intravenous sedatives). Drugs should be given according to accepted administration/titration protocols.

Monitoring

Every patient needs a free flowing intravenous line and supplemental oxygen administered via nasal cannula or face mask. The provider monitoring the patient should be aware of known allergies, medical history, NPO status, and whether the patient may be difficult to intubate. Large men with bull necks and small mouths can be very difficult to ventilate and intubate. Such a person, or those with morbid obesity or other significant airway issues should be evaluated by an anaesthesia provider.

The suction capability and resuscitation equipment should be immediately available. All providers should have ACLS certification. A health care provider other than the person performing the procedure should monitor the patient at all times. That person should record in the medical record at minimum every five (5) minutes:

- Level of consciousness (0 = unconscious, 1 = sedate but responsive, 2 = alert)
- Peripheral oxygenation via pulse oximeter and respiratory rate.
- Heart rate, Heart rhythm, Blood Pressure.
- Pain score (0= none, 1= tolerable, 2= not tolerated)

This level of monitoring meets JCAHO guidelines.

Oral sedation

The Oral Medication used in dentistry is from a group of drugs known as Benzodiazapines. Midazolam is the benzodiazepine most commonly used, since it produces earlier sedation, more complete amnesia, less pain on injection, and improved awakening when compared with diazepam. The onset is 60-90 seconds and the duration of action for small doses is 10-15 minutes. Due to its amnesic effect patients remember little or nothing about their dental appointment. The patient will experience a state of very deep relaxation.

Advantages of dental oral sedation

- Easy to administer
- It is safe and easy to monitor
- Works well for most people
- Low cost

Disadvantages of dental oral sedation

- The level of Sedation is not easily changed
- Someone must drive to and from dental appointment
- There is no analgesic (pain relief from dental pain) effect

Inhalation conscious sedation

Nitrous Oxide and Oxygen ("laughing gas") has been used as the most frequent and primary

means of Sedation used in Dentistry for many years.

Equipment for inhalation sedation

Dedicated purpose-designed Relative Analgesia machines for dentistry should be used. Such machines should be maintained according to manufacturers' guidance with regular, documented servicing. Gas supply lines for Relative Analgesia machines must be connected by non interchangeable colour coded pipelines. On installed pipelines there must be a low pressure warning device and an audible alarm. Nitrous oxide and oxygen cylinders must be stored safely with regard to current regulations.

There should be adequate scavenging of waste gases where inhalation sedation is used since inadequate scavenging may result in unacceptable risks to health of the dental team. Adequate scavenging of gases should not rely on window opening or air conditioning alone. Breathing systems should have a separate inspiratory and expiratory limb to allow proper scavenging. Nasal masks should be close fitting providing a good seal without air entrainment valves.

Advantages of dental inhalation sedation

- Works well for mild to moderate anxiety
- Rapid Onset
- Flexible duration can be used for any appointment length
- Absolute Control. It is easy to quickly control the level of sedation which may be altered moment to moment.
- People recover quickly
- Very few side effects
- There is an analgesic effect
- Can drive self to and from dental appointment
- Can return to normal activities immediately

Disadvantages of dental inhalation sedation

- Severe anxiety may require a deeper level of sedation
- Not indicated for people who have respiratory problems (Asthma and Emphysema)
- Claustrophobic patients do not like anything covering their nose

The safety features of the machine insure a patient receives no less than 30% Oxygen mixed with Nitrous Oxide. Usually the patient receives 50 to 70% Oxygen.

*Intravenous sedation**Equipment for intravenous sedation*

All the appropriate equipment for the administration of intravenous sedation must be available in the surgery including syringes, needles, cannulae, surgical wipes/tapes/dressings, tourniquets and labels. Purpose-designed, calibrated and appropriately maintained equipment is required for all infusion techniques. It is mandatory to be able to administer supplemental oxygen or oxygen under intermittent positive pressure ventilation to the patient should the need arise. The standard technique used for intravenous sedation is a titrated dose of a single benzodiazepine or opioid. Fentanyl treats pain. Onset of action is 90-120 seconds. Effects of fentanyl are analgesia and respiratory depression. Evidence in the literature is emerging that also supports the use of other sedatives (e.g., etomidate, propofol).

1. Etomidate is gaining popularity because it elicits minimal hemodynamic effects and has a very reliable onset of action
2. Propofol has gained popularity in recent years. It provides potent, ultra-short-acting sedation and anaesthesia. Has no analgesic property. Provides rapid onset and recovery phase and brief duration of action; has anticonvulsant properties; can rapidly cause deepening sedation. Because of this, an anaesthesiologist or sedation team often administers it and monitors its use outside the operating

room.

In both Inhalation Sedation and Intravenous Conscious Sedation, success is due to titrating the dose given to the patient's needs. Fixed doses or bolus techniques are unacceptable. Attention must be given to risk awareness, risk control, risk containment and risk transfer.

Reversal of sedation

Rarely are reversal agents used in conscious sedation if the drugs are titrated appropriately.

Naloxone is a competitive antagonist of the opioid receptors; it is used for reversal of narcotic analgesics. Use 0.001 mg/kg IM/IV titrated to effect. The duration of naloxone is less than the duration of action for most opiates. Be prepared to re-bolus the naloxone, or use a naloxone drip at .01-.05 mg/min.

Flumazenil is a pure benzodiazepine antagonist, and can be used for reversal of benzodiazepine sedation. Like naloxone, it has a shorter duration of action than the benzodiazepine agents it reverses. Prepare to re-bolus with flumazenil, or run a flumazenil drip at 0.1 mg/min. Use 0.2 mg IV every 2-5 minutes titrated to effect, or up to 2-3 mg in total if needed.

Contraindications

1. Recent (<2 hr) ingestion of large food or fluid volumes.
2. Physical class IV or greater.
3. Lack of support staff or monitoring equipment.
4. Lack of experience/credentialing on part of clinician

Complication, prevention, and management

1. Inadequate amnesia or analgesia:
 - a. Dosage of amnesic or analgesic agents are based upon patient weight. Make sure weights are accurate, and dosages are adequate. As a general rule, the elderly need less, muscular young men need more,

- and agitated children may also require slightly more medication.
- b. Allow sufficient time for the agents to work. It is tempting to start the procedure(s) immediately upon drug administration, but do allow time to titrate the effect of the sedation medications.
2. Decreasing oxygen saturation: apply nasal cannula or a non- rebreathing mask for increased oxygenation. Occasionally, a bag-valve-mask with positive pressure ventilation may be required transiently.
 3. Prolonged recovery: prolonged offset of sedation is dependent on several factors of which the most important are drug distribution in the patient, and the patient's own clearance of the sedation agents. Be prepared to recover the patient for a prolonged period, with adequate oxygenation and clearance of any airway secretions.

Aftercare

Recovery from sedation is a steady progression from completion of treatment through to discharge into the care of an escort. The first stage of recovery is normally in the dental chair. Once the patient is recovered sufficiently to move to a resting area, they should be carefully guided and supported. A member of the dental team should supervise the patient during this period. Equipment and drugs for dealing with medical emergencies must be available. The dentist must be available to see the patient urgently to deal with any problems that may arise.

Conclusion

Retrieved from "<http://www.articlesbase.com/dental-care-articles/conscious-sedation-in-dental-surgery-and-procedures-3383987.html>"

Sedation dentistry allows several dental visits

to be condensed into a single, more intense visit. A patient requiring multiple root canals, or extensive restructuring, is able to relax, and depending on the sedation method chosen, may feel time pass more quickly making the visit seem to last only minutes. It does not dull or numb pain, so it does not eliminate the need for numbing injections. Its purpose is to simply make the patient more at ease and less anxious about the dreaded dental chair.

The dental professions continued ability to control anxiety and pain effectively is dependent on maintaining a strong educational foundation in the discipline. The dental schools should urge to expand opportunities for predoctoral students to receive training and clinical experience in conscious sedation techniques. More Dental professionals should be BLS and ACLS registered. The Dental institutes in particular in subcontinent area should have facilities for airway management, crash trolley, defibrillators and a full time anaesthesiologist or an advanced airway management professional. This will enhance their ability to provide painless oral health care or any other emergencies pertaining to dental treatment.

Future

The use of conscious sedation, deep sedation and general anaesthesia in dentistry will be significantly affected by research findings and advances in these areas. Further research on the following should be done:

- 1) Epidemiological studies that provide data on the number of these procedures performed and on morbidity and mortality rates.
- 2) Clinical studies of drug safety and efficacy.
- 3) Basic research on the development of safer and more effective drugs and techniques.
- 4) Studies on improving patient monitoring, and
- 5) Research on behavioural and other non-

pharmacological approaches to anxiety and pain control.

References

1. Report of the Working Party on Training in Dental Anaesthesia. *Br Dent J*. 1981; 151: 385-388.
2. Continuum of depth of sedation: Definition of general anaesthesia and levels of sedation/analgesia. (Pdf). American Society of Anaesthesiologist. Approved Oct 27, 2004, amended Oct 21, 2009. Retrieved 2010-11-29.
3. General Anaesthesia, Sedation and Resuscitation in Dentistry. Report of an expert working party prepared for the Standing Dental Advisory Committee March 1990.
4. Guidelines for Physiological Monitoring of Patients During Dental Anaesthesia or Sedation. London: Society for the Advancement of Anaesthesia in Dentistry; 1990.
5. Monitoring of Patients during Dental Anaesthesia or Sedation. Association of Dental Anaesthetists; 1990.
6. Sedation in Dentistry. The Competent Graduate. Dental Sedation Teachers Group. 2000.
7. Sedation in Dentistry. Undergraduate Training. Dental Sedation Teachers Group; 1999.
8. Maintaining Standards, General Dental Council November 1997, Revised May 1999.
9. A Conscious Decision. Report of an expert group chaired by the Chief Medical and Dental Officer. Department of Health. July 2000.