Pharmacological methods of behaviour management

Presented by

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Pharmacological methods

CONSCIOUS SEDATION

General Anesthesia
Sedation is the use of a mild sedative (calming drug) to manage special needs or anxiety while a child receives dental care.
Definition of Conscious Sedation

- A technique in which the use of a drug or drugs produces a state of depression of the 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.
### Objectives of sedation in Pediatric Dentistry

**For the child**
- Reduce fear and perception of pain during the treatment
- Facilitate coping with the treatment
- Prevent development of dental fear and anxiety

**For the dentist**
- Facilitate accomplishment of dental procedures
- Reduce stress and unpleasant emotions
- Prevent “burn-out” syndrome
Patient selection and assessment

Full medical & dental history

Each patient classified according to the ASA Physical Status Classification System

ASA Class I or Class II
(considered candidates for CS as outpatients)

ASA Class III and Class IV
(treated in a hospital environment, involving the assistance of medical doctors when appropriate)
ASA Physical Status Classification System

ASA Physical Status 1 - A normal healthy patient
ASA Physical Status 2 - A patient with mild systemic disease
ASA Physical Status 3 - A patient with severe systemic disease
ASA Physical Status 4 - A patient with severe systemic disease that is a constant threat to life
ASA Physical Status 5 - A moribund patient who is not expected to survive without the operation
ASA Physical Status 6 - A declared brain-dead patient whose organs are being removed for donor purposes
Indications

**Children with low coping ability**

- Behaviour management problems
- Dental fear and anxiety

**Treatment need**

- Emergency treatment
- Moderate to large and complicated treatment needs
Contraindications

- Very young children
- Intellectually challenged children
- Hyper motive/obstinate children
- Systemic diseases like respiratory distress, Neuromuscular disorders etc.
Routes

- Oral
- Intramuscular
- Intravenous
- Inhalational
Drugs used

- Inhalational agents
- Benzodiazepines
- Other agents with sedative properties
Nitrous oxide/oxygen has been shown to be an effective anxiolytic and sedative inhalation agent for conscious sedation.

Nitrous oxide is a weak analgesic, most often insufficient to ensure painless dental treatment.

Nitrous oxide/oxygen sedation and local anesthesia is an alternative to general anesthesia.
• **Horace Wells** was an American dentist who pioneered the use of anesthesia in dentistry, specifically nitrous oxide (laughing gas).
Nitrous oxide / oxygen should be the first choice for paediatric dental patients who are unable to tolerate treatment with local anesthesia alone and who have a sufficient level of understanding to accept the procedure.

- It may be offered to children with mild to moderate anxiety to enable them to better accept treatment which may require a series of visits.

- It can also facilitate the provision of more complex time consuming procedures and dental extractions particularly for young children or anxious patients undergoing elective orthodontic extractions.
Typically delivered through a mask over the nose, nitrous oxide is mixed directly with oxygen and delivered as the patient breathes in and out regularly.

The patient is usually asked to breath normally through the nose, and as the gas begins to take effect, the child will become more relaxed and less nervous.
The gas mixture shall contain a maximum 50% nitrous oxide.

Nitrous oxide/oxygen is reliable in terms of onset and recovery as long as the patient accepts the nasal hood and breathes through the nose.

Nitrous oxide has minimal effect on cardiovascular and respiratory function, as well as on the laryngeal reflex.
Indications

- A fearful or anxious patient.
- Certain patients with special health care needs.
- A patient whose gag reflex interferes with dental care.
- A patient for whom profound local anesthesia cannot be obtained.
- A cooperative child undergoing a lengthy dental procedure.
Contraindications

- Pre-co-operative children
- Patients with upper airway problems as common cold, tonsillitis or nasal blockage
- Patients with sinusitis or recent ENT operations (within 14 days)
- Patients in bleomycin chemotherapy
- Psychotic patients
- Patients with porphyria
Selection of an appropriately sized nasal hood should be made.

A flow rate of 5-6 L/min generally is acceptable to most patients.

Introduction of 100 % oxygen for 1-2 minutes followed by titration of nitrous oxide in 10 % intervals is recommended.

During nitrous oxide/oxygen analgesia/anxiolysis, the concentration of nitrous oxide should not routinely exceed 50 %.

Nitrous oxide concentration may be decreased during easier procedures (eg, restorations) and increased during more stimulating ones (eg, extraction, injection of local anesthetic).
During treatment, it is important to continue the visual monitoring of the patient’s respiratory rate and level of consciousness.

The effects of nitrous oxide largely are dependent on psychological reassurance. Therefore, it is important to continue traditional behavior guidance techniques during treatment.

Once the nitrous oxide flow is terminated, 100 % oxygen should be delivered for five minutes due to risk of diffusion hypoxia.

The patient must return to pretreatment responsiveness before discharge.
N₂O sedation

Side effects

Over sedation
Nausea
Vomiting
Panics
Sweating
Headache
Restlessness
Dysphoria
Tinnitus
Benzodiazepines

Benzodiazepines (BZD) are a group of drugs, which have the following effects:

- Anxiolysis
- Sedation/hypnosis
- Skeletal muscular relaxation
- Anterograde amnesia
- Respiratory depression
- Anticonvulsive effect

Among the different benzodiazepines available, **Midazolam** and **Diazepam** are the most suitable for use in paediatric dentistry.
Midazolam sedation

- Midazolam is now the standard BZD agent for conscious sedation during dental treatment in children.
- After oral administration the peak plasma concentration is reached within 20 minutes.
- After 45 minutes the sedative effect wears off.
- The elimination half time is 2 hours, which facilitates a fast recovery.
Indications & Contraindications

Indications:
General indications for sedation

Contraindications:
Midazolam must not be given to the following groups of children

- Children under the age of one year
- Children with any form of acute disease
- Children with neuromuscular diseases as myasthenia gravis
- Children with allergy to BZD
- Children with sleep apnoea
- Children with liver dysfunction
The following side effects should be considered:

- Interactions with other medication
- Paradoxical reaction
- Over sedation
- Hallucinations
- Oral Midazolam can be administered in tablet form (available in some countries) or as a sweetened mixture for delivery either via a drinking cup or drawn into a needleless syringe and deposited in the retromolar area.

- Transmucosal administration of Midazolam has the advantage of depositing the drug directly into the systemic circulation.

- Midazolam should administered at the clinic.
Doses

- Oral: Children under 25 kilogram of weight shall have 0.3-0.5 mg Midazolam per kilogram. Maximum dose 12 mg.
- Children over 25 kilogram of weight shall have 12 mg Midazolam.
- Tablets are given 60 min before dental treatment, and oral mixtures given approximately 20-30 minutes before.
Diazepam sedation

- Diazepam is highly effective in reducing preoperative anxiety.

- The clinical action develops within an hour after oral tablet administration.

- Because of a pronounced distribution, the time of clinical effect is rather short. Diazepam has a long elimination half-life, 24-48 hours.
Oral administration of tablets can be given either as a single dose 1 hour before treatment, or fractionated, with half the dose taken on the night before, and the remaining half 1 hour prior to treatment.

Tablets can be crushed and mixed in sweetened drink to facilitate administration.
Diazepam

**Doses**

- Children 4-8 years of age: 0.5-0.8 mg diazepam per kilogram. Maximum dose 15 mg.

- Children over 8 years of age: 0.2-0.5 mg diazepam per kilogram. Maximum dose 15 mg.
Sedation scale according to Wilton

- **Agitated**: Clinging to parent and/or crying
- **Alert**: Awake but not clinging to parent, may whimper but not cry
- **Calm**: Sitting or lying comfortable with eyes spontaneous open
- **Drowsy**: Sitting or lying comfortable with eyes spontaneous closing but responds to minor stimulation
- **Asleep**: Eyes closed, arousable but does not respond to minor stimulation
Intravenous sedation for children

- Intravenous sedation for children is only appropriate in a minority of cases and should only be provided by those who are trained and experienced in sedation for children and in the administration of intravenous drugs.

- Its use may be indicated in older children for whom inhalational sedation has been unsuccessful.
The efficacy of fentanyl and pethidine is questionable and the associated risks may outweigh their benefit and some are only recommended in some countries for use in hospital settings and by qualified anaesthetists.

The use of propofol and ketamine in paediatric dentistry is still experimental and requires the assistance of or has to be administered by a qualified anaesthesiologist.
Thank You
MCQs
Which of the following is the most preferred route of conscious sedation in Pediatric Dentistry:

(a) Intramuscular
(b) Inhalational
(c) Intravenous
(d) Rectal
MCQ 2

What is the maximum recommended conc. of N₂O in children:
(a) 30 %
(b) 40%
(c) 50%
(d) 80 %
Who pioneered the use of Nitrous oxide anesthesia in dentistry:

(a) William Morton
(b) John Riggs
(c) Horace Wells
(d) Gardner Colton
Which of the following is true regarding N₂O:
(a) It is a weak analgesic
(b) 100% N₂O is recommended for long procedures
(c) Children become unconscious during sedation
(d) It is contraindicated in highly anxious patients.
N₂O is also known as:
(a) Sleeping gas
(b) Laughing gas
(c) Smiling gas
(d) Tear gas
Diffusion hypoxia is seen in:

(a) Ether
(b) Midozolam
(c) Diazepam
(d) Nitrous oxide
MCQ 7

Which of the following is an indication of Midozolam sedation:

(a) Patients with behaviour management problems
(b) Children with neuromuscular diseases as myasthenia gravis
(c) Children with allergy to BZD
(d) Children with sleep apnoea
MCQ 8

Which of the following is an indication of Conscious sedation as per ASA guidelines:

(a) ASA 1
(b) ASA 2
(c) ASA 3
(d) All of the above
Diazepam has all of the following effects except:
(a) Skeletal muscular relaxation
(b) Dissociative anesthesia
(c) Respiratory depression
(d) Anticonvulsivse effect
MCQ 10

Which of the following is a side effect of Midazolam:

(a) Paradoxical reaction
(b) Over sedation
(c) Hallucinations
(d) All of the above