

Pharmacological methods of behaviour management



Presented by

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Pharmacological methods

CONSCIOUS
SEDATION

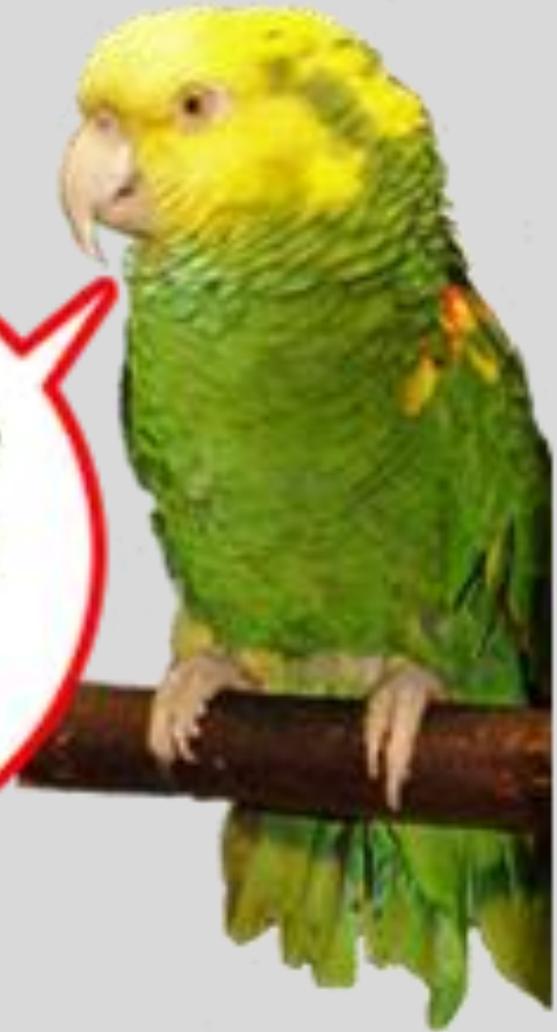


General Anesthesia

CONCIOUS SEDATION ??

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

Sedation is used to ease and comfort anxious patients.



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

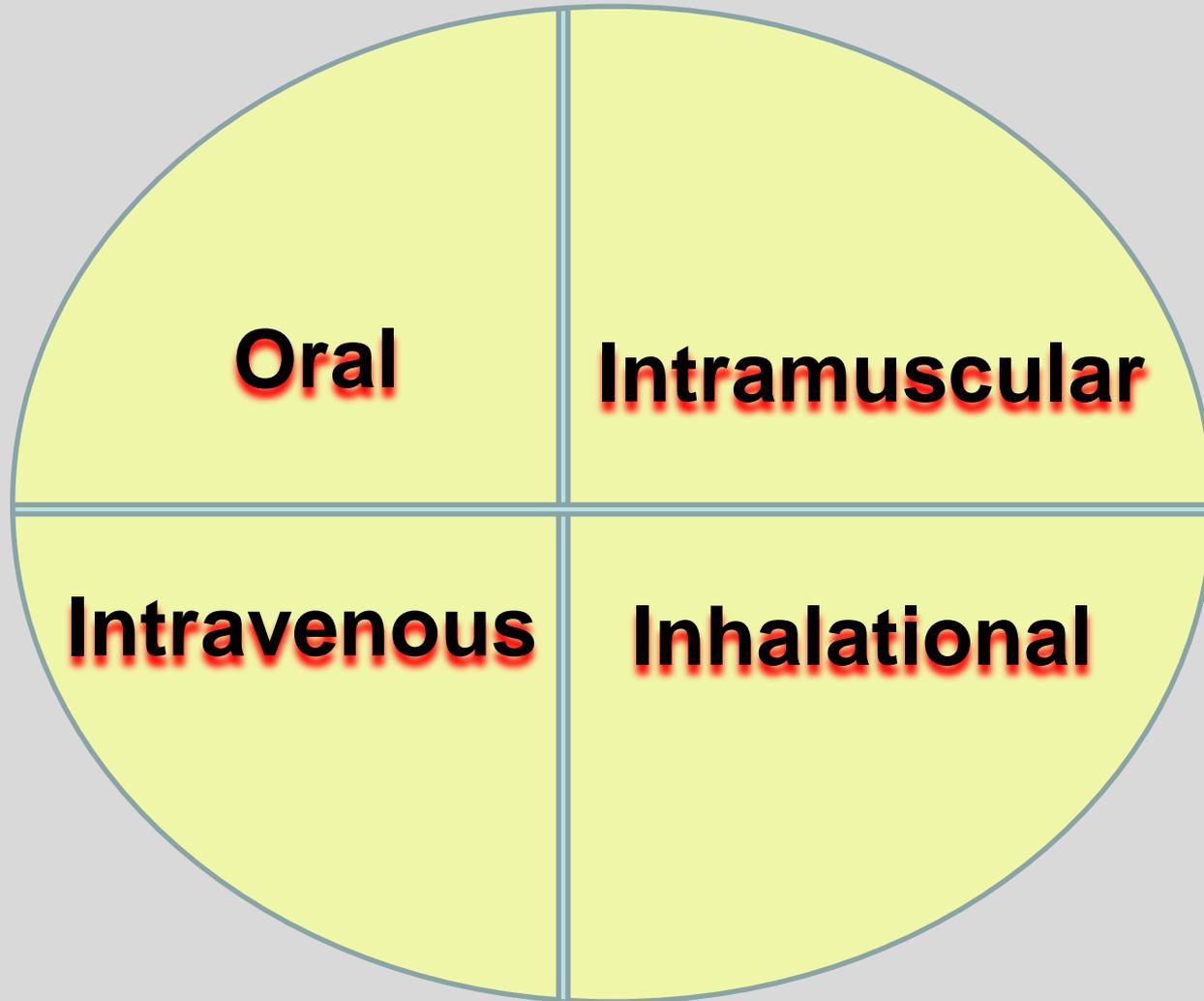
Treatment need

- 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



Drugs used

**Inhalational
agents**

NO

**Benzodia-
zepines**

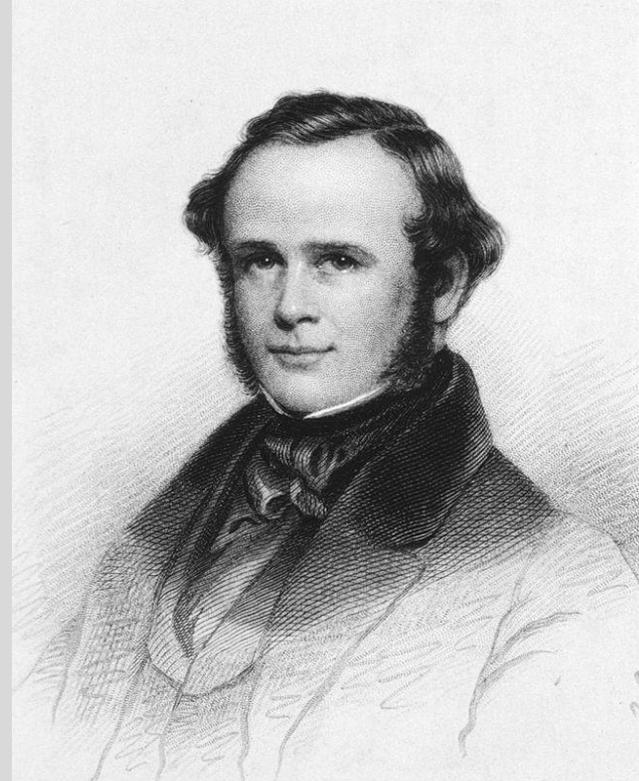
**Other
agents with
sedative
properties**

N₂O sedation

- 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

N₂O sedation

- **Horace Wells** was an American dentist who pioneered the use of anesthesia in dentistry, specifically nitrous oxide (laughing gas).



N₂O sedation

- 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

N₂O sedation

- 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



N₂O sedation

- 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

Procedure

- 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).

Procedure Cont.

- 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

Side effects

The following side effects should be considered:

- Interactions with other medication
- Paradoxical reaction
- Over sedation
- Hallucinations

Midazolam

Routes

- 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.

Midazolam

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

Diazepam

Routes

- 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.

Other drugs with sedative properties

- 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

(a) ??

(b) ??

MCQs

(c) ??

(d) ??

MCQ 1

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 N_2O in children:

- (a) 30 %
- (b) 40%
- (c) 50%
- (d) 80 %

MCQ 3

Who pioneered the use of Nitrous oxide anesthesia in dentistry:

- (a) William Morton
- (b) John Riggs
- (c) Horace Wells
- (d) Gardner Colton

MCQ 4

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.

MCQ 5

N_2O is also known as :

- (a) Sleeping gas
- (b) Laughing gas
- (c) Smiling gas
- (d) Tear gas

MCQ 6

Diffusion hypoxia is seen in :

- (a) Ether
- (b) Midazolam
- (c) Diazepam
- (d) Nitrous oxide

MCQ 7

Which of the following is an indication of Midazolam 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

MCQ 9

Diazepam has all of the following effects **except:**

- (a) Skeletal muscular relaxation
- (b) Dissociative anesthesia
- (c) Respiratory depression
- (d) Anticonvulsive 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