Conscious sedation with nitrous oxide and oxygen in patients with special needs





Introduction

Conscious sedation with nitrous oxide and oxygen is an anesthetic technique in which the patient breathes a mixture of oxygen and nitrous oxide through a mask.

The patient is always conscious, he does not lose reflexes or decision-making abilities; feels a feeling of well-being, extreme relaxation and tranquility, with a consequent reduction in pain sensitivity; this sensation may be accompanied by a slight euphoria or, on the contrary, by amnesia or drowsiness.

The effect of this technique is almost immediate (about 3 minutes) and wears off just as quickly at the end of the session.







Introduction

The use of conscious sedation allows the clinician to perform dental care treatments (avoiding the use of general anesthesia) in:

patients with special needs

Very young patients

Low collaborative patients

A more serene approach to the dental treatments and the absence of pain perception: will leave a positive memory of the dental treatment increase motivation and trust for the patient in the next sessions





The patient with special needs, like other individuals, has the right to take advantage, without any discrimination, of an adequate preventive, diagnostic and dental treatment that provides for adequate times and methods.





Patients with special needs are:

- collaborating and autonomous patients who present conditions of fragility and / or health vulnerability;

- poorly cooperative and autonomous patients: they have pathologies that may require special management and relationship skills;

-patients who are not autonomous, but collaborating or poorly collaborating;

- uncooperative patients





Overview on nitrous oxide (Mechanism of action)

Nitrous oxide is a colorless gas with a faintly sweet odor; it is non-toxic and non-irritating.

It is administered by inhalation with a nasal or nasal-oral mask, it spreads very quickly in the blood where it is transported in dissolved form (It does not combine with hemoglobin).

It accumulates little in fat and tissues, is not metabolized by the body and is eliminated through exhalation from the lungs.





Overview on nitrous oxide (Mechanism of action)

Nitrous oxide acts directly on:

- Opiate receptors (undergroups OP2 e OP3)
- GABA receptors (undergroup A)
- Glutamate receptors (undergroup NMDA)



Analgesic and anesthetic effect





Indications

The inhalation conscious sedation is indicated in:

- Disabled patients and patients with systemic diseases
- Non collaborative patients > 4 years
- Anxiophobic patients









Examples of patients on which we can use the sedation with nitrous oxide

Pazienti ASA 2 :

- Patients with autism
- Cardiovascular disease
- Williams syndrome
- Patients with mild to moderate asthma
- Epileptic patients



Avoids the onset of asthma and epilepsy



Examples of patients on which we can use the sedation with nitrous oxide

ASA 2 patients

- Cerebral palsy
- Diabetes
- Fetal alcohol syndrome
- X fragile syndrome
- Down syndrome











Contraindication



Conscious inhaled sedation should not be used in patients:

- ✤ Flu or cooling state
- ✤ Inability to breathe through the nose due to obstruction
- Recent ear surgery (<3 weeks)
- Otitis and acute sinusitis
- Changes in consciousness (sudden fainting)
- Pneumothorax / emphysema
- Intracranial hypertension (intense headaches due to increased cerebral liquor)





Contraindication

- ★ Head trauma
- ★ Biermer's disease / vitamin B 12 deficiency
- \star Abdominal gas distension
- ★ Patient needing pure oxygen
- ★ Recent episode of semi-drowning
- ★ Detachment of the retina or operations that required the use of gas
- ★ Gas embolism
- ★ Pregnancy status (first and last trimester)







Equipment needed

- SEDATION MACHINE (for example Master Flux Plus by Tecno-Gaz)
- Oxygen delivery system
- ➡ Suction system
 - Arterial saturation and heart rate monitoring system.

Emergency equipment and drugs





Oral Team

DOCTOR: responsible for carrying out sedation, with valid PALS and training on the use of drugs for sedation, patient monitoring, management of complications and the use of antagonists. For ASA patients> 3, it is recommended to perform the session in a protected structure.

NURSE: responsible for patient monitoring and assistance in case of resuscitation or support maneuvers.







Monitoring of vital signs

When? Pre Sedation - During the procedure (every 10 minutes) - After the procedure;





SO2 heart rate - respiratory rate





Operational protocol

- Instrumentation control and preparation of the same (cylinder pressure and opening, suction, etc.)
- Pre-sedation clinical evaluation (near and distant medical history, compliance with sedation prescriptions NO interruptions of basic therapies for systemic diseases,
 FASTING from solids and liquids for two hours, NO fever, NO cold, NO otitis in the last 3 weeks (see list against -indications)
- Contact with the patient and psychological approach (assessment of the level of collaboration, choice of the appropriate mask).
- Pre-sedation vital signs monitoring



Acquisition of informed consent to the procedure and sedation



Operational protocol

Nitrous oxide dosage : - 50% in patients from 4 to 8 years - Gradual titration from 9-10 years

- Administration of the mixture for 4/10 minutes of N_2O and O_2 at a variable flow between 4.0 l / m and 12 l / m based on the respiratory demand
- Procedure: 40/60 minutes duration of the session with continuous monitoring of vital parameters
- Post-procedure 1 minute of pure oxygen
- Monitoring of post-procedure vital signs
- Discharge of the patient upon reaching the initial clinical conditions
- 7 days of waiting between sessions of conscious sedation with nitrous oxide / oxygen





Side effects

There is a low risk of side effetcs
Adequate attention to the patient's medical history and monitoring help to minimize the risk of complications as well as to recognize the early signs of suffering, so that the administration of NO / O is interrupted.

Vomiting / nausea / aspiration in the bronchial tree of regurgitation

Hypertension /headache

Hallucinations





Effects expected

Achieving a good level of conscious sedation with the administration of nitrous oxide and oxygen is characterized by the following clinical signs and symptoms.

Reduction of lingual movements and muscle contractions

Basal heart rate

Look into the void

Tingling in the extremities



Collaboration in the execution of simple commands or questions even if delayed



Conclusion and Advices

Why choose conscious sedation with nitrous oxide for a patient with special needs?

PATIENT

- Give the patient the opportunity to overcome their fears and anxieties
- Reduce procedural pain
- Positive memory
- Return the patient to a conventional path
- Overcoming the fear of the dentist
 - Reduction of anxiety in hyper-hospitalized patients
 - Have less impact on the child's emotional sphere

OPERATOR



- Improve the quality of care
- Simplify the work of the professionals involved







Sedation alone is not enough...

Tips and Tricks, for success:



early recognition and knowledge of patients in need of sedation (avoid traumatic experiences)

association of behavioral techniques: knowledge view and "tell show do"

calm environment and induction of a state of hypnotic suggestion





Questions & Answers

• Does an epileptic patient have to suspend drug therapy to perform sedated dental treatment? NO, basic therapies for the control of epileptic seizures or other systemic pathologies, eg. ASMA, should not be discontinued.

• Can sedation with nitrous oxide / oxygen be combined with sedation with midazolam? The combination of nitrous oxide / oxygen and midazolam is to be used only in a hospital setting where complications can be managed (combination of the sedative effect with deep sedation).

• Can you be allergic to nitrous oxide?

Nitrous oxide is a gas composed of oxygen and nitrogen, normally present in the air we breathe, it cannot cause allergic reactions.

• Does the patient fall asleep when sedated with nitrous oxide / oxygen? NO, the patient must remain awake and cooperating with simple commands, such as opening the mouth, or opening the eyes.

• Can all dentists perform treatments in conscious sedation with nitrous oxide / oxygen? Yes, if properly trained and after taking a PALS course.

