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POSSIBILITIES OF CHEMICAL SEDATION IN SPECIAL PATIENTS

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SUMMARY
This study aims to conduct a literature review on the possibilities of chemical sedation in special patients, since sedation has been used as a complement to control pain and anxiety in patients who present these specific feelings. The methodology adopted is based on a literature review of articles available in PubMed; Scielo, Google Scholar, books and dental journals in Portuguese and English. Therefore, a study was carried out on chemical sedation techniques and their indications and contraindications specifically aimed at patients with special needs. Emphasizing the importance of sedation management to control and improve the treatment of these patients. **Keywords:**Chemical sedation; Patients with special needs; dental treatment anxiety

ABSTRACT
The present work aims to conduct a literature review on the possibilities of chemical sedation in special patients, considering that sedation has been used as a complement for managing pain and anxiety in patients experiencing these specific feelings. The methodology adopted is based on a literature review of articles available on PubMed, Scielo, Google Scholar, books, and dental journals in Portuguese and English. In this context, a study was conducted on the techniques of chemical sedation, their indications, and contraindications focused specifically on patients with special needs. The importance of sedation management for controlling and improving the treatment of these patients is emphasized.
Keywords: Chemical sedation; Patients with special needs; anxiety in dental treatment.

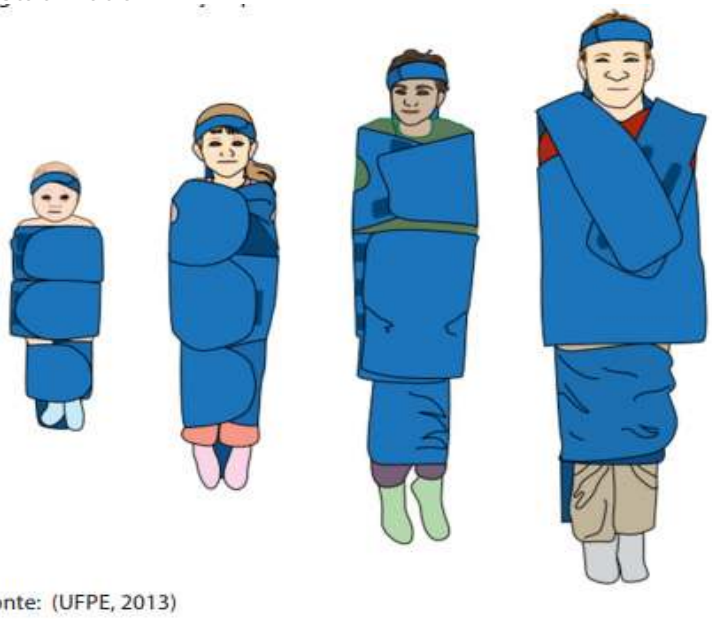
INTRODUCTION

Patients with special needs (PNE) are defined as a certain group of people with some long-term impairment that may affect their cognitive, motor or sensory states (Law No. 13,146, 2015, p. 2-11). According to the latest survey carried out in 2010 by the Brazilian Institute of Geography and Statistics, at least 45 million Brazilians have some kind of disability, where these data approximately 25% of the general population. Such individuals are more likely to develop diseases children due to objections to specialized care and treatment (MELO et al, 2019)

The approach to patients with special needs (PPNE) in dentistry requires greater care with techniques that facilitate the performance of procedures, avoiding stress, anxiety or any type of discomfort that may interfere with the success of the treatment (PIOVESANA; AMSG, 2002). The methods used to control PNE in cases of poor collaboration in the procedure are divided into non-pharmacological or pharmacological management (AAPD, 2015). The non-pharmacological technique used is protective stabilization, which consists of physical restriction through equipment, but the psychological damage that may be generated after this type of treatment must be taken into account (AAPD, 2015). This technique

prevents the patient from being subjected to sedation and can be used as conditioning to receive comprehensive care (LYONS, 2009).

Figure 1: Protective stabilization



Fonte: (UFPE, 2013)

Source: (UFPE,2013)

The pharmacological method for PNE is done through sedation, which allows the treatment to be done avoiding discomfort; anxiety; pain; involuntary movements; intraoral secretions and minimizing psychological stress (CALDAS JR.; MACHIAVELLI, 2013). The indications for sedation are for patients with intellectual disability; intellectual disability with severe physical disability with good general health; physical or motor disability without loss of mental function; psychiatric disorders; behavioral disorders in which there is no understanding or collaboration of the patient (CALDAS; MACHIAVELLI, 2013).

The levels of sedation and analgesia are closely related to the dose being administered: (ASA, 2019)

the) Level 1 = minimal drug-induced sedation, where the patient responds normally to verbal commands, their cognitive function may be affected and their cardiorespiratory functions are not affected.

b) Level 2 = moderate drug-induced sedation, where the patient intentionally responds to verbal stimuli with moderate depression of consciousness without affecting the patient's airway and cardiovascular function.

c) Level 3 = deep drug-induced sedation, where the patient does not respond easily only to repeated and painful action, where he loses the ability to independently maintain respiratory function and may require a ventilation system, cardiovascular signs must be monitored and remain stable.

d) Level 4 = Drug-induced general anesthesia, where the patient does not respond to stimuli, even if painful, the patient often loses independent respiratory function, thus requiring maintenance of the previous airway, cardiovascular function may be impaired. This level is restricted to anesthesiologists.

In an attempt to understand the scenario of care for patients with special needs, sedation is one of the most widely used methods to facilitate the performance of dental procedures. (LOPES et al., 2018). Professionals trained to perform this type of treatment must be duly qualified in accordance with paragraph VI of Art. 6 of Law No. 5,081/66 (Brazil, 1966).

1.1 OBJECTIVES

1.1.1 General Objective

To conduct a literature review on the possibilities of chemical sedation in special patients, focused on the dental field. To highlight the importance of managing these patients to achieve success in the

treatment. Highlight the role of the CD

1.1.2 Specific Objectives

Emphasize the types of sedation and their indications and contraindications for patients with special needs. Highlight the role of the dentist in the use of these sedative methods.

1 LITERATURE REVIEW

1.1 legality of the practice of sedation in a dental environment.

The Federal Council of Dentistry is the body responsible for delimiting and defining the area of activity of the dental surgeon (Brazil, 1964). Questions about the legality of the use of sedation in a dental environment are present among health professionals, but any disagreement must be resolved jointly by the councils of such professionals (BRASIL, 1964).

According to resolution CFO-51 of April 30, 2004, considering Law No. 5,081 of August 24, 1966, article 6, items VI, it is stated that dentists must use analgesia and hypnosis through sedation, provided they are duly qualified, with the aim of improving treatment efficacy. Conscious sedation may be performed by inhalation using nitrous oxide without completely compromising the patient's consciousness. It is not the dentist's responsibility to perform sedation through intravenous administration, only local and truncal anesthesia. The CFO resolves in Articles 1, 2 and 3, for this professional to be considered qualified by the federal and regional dentistry councils, they must present certification from a course recognized by the Federal Dentistry Council (CFO) registered with the Agency, with a minimum duration of 96 hours, where the program content must be included (CFO, 2004):

the) History of the use of conscious sedation with nitrous oxide: its origin and development of technique and equipment
b) Introduction to sedation: its concepts and definitions; classification of sedation methods; objective and subjective signs of sedation
w) Medical emergencies in the dental clinic and basic life support training
d) Pain and anxiety in dentistry
and) Anatomy and physiology of the central nervous, respiratory and cardiovascular systems
f) Physical and psychological evaluation of the patient
g) Monitoring during sedation
h) Pharmacology of nitrous oxide
i) Conscious sedation technique with a mixture of oxygen and nitrous oxide
j) Oxygen and nitrous oxide mixture dispensing equipment
k) Safety in handling equipment and gases
l) Advantages and disadvantages of the technique
m) Complications of the technique
n) Potential abuse, occupational hazards, and hallucinatory effects of nitrous oxide
the) Suitability of the work environment
p) Legal standards, bioethics and recommendations related to the use of biotechnology techniques conscious sedation with a mixture of oxygen and nitrous oxide
q) Medical record for recording data on conscious sedation techniques using a mixture of oxygen and nitrous oxide.

According to Anvisa ordinance 344/1998, drugs on lists B1 and B2, such as benzodiazepines, require special control with a type B prescription, which is characterized by the color blue (Brazil, 1998).

In relation to general anesthesia, the dental surgeon can perform procedures on patients under this type of anesthesia, as long as the anesthesia is administered by an anesthesiologist in a hospital setting (CFO, 2002)

1.2DRUGS APPLIED TO SEDATION

1.2.1 Benzodiazepines

Benzodiazepines have sedative, hypnotic, anxiety-reducing, muscle-relaxing, anticonvulsant and amnesiac effects, but they do not have analgesic effects. Their action on the central nervous system is done by reducing the spontaneous or provoked electrical activity of neurons in the brain and spinal cord (HOBBS et al., 1996). The drug binds to the ion/receptor channel, stimulating the gamma-aminobutyric acid (GABA) receptors, leading to increased chloride entry, inhibiting neuronal activity (*CHAPACAIS et. al, 2020*). The distribution of the drug is rapid in the brain and in

followed and redistributed to muscles and fat, due to its high lipid solubility it can cross the placenta and can be secreted in breast milk (HOBBS et. al., 1996). The effect of benzodiazepines on the respiratory system, in the case of sedation, can lead to a slight depression of ventilation and an increase in the presence of CO and a decrease in O_2, therefore, in the case of a patient with some alteration in the respiratory system, it must be carefully evaluated before performing this type of sedation (HOBBS et. al., 1996). The effect of these drugs on the cardiovascular system in sedative doses can lead to a reduction in blood pressure by 15% to 20% and can increase heart rate (MARSHALL et. al., 1996).

The drugs in the benzodiazepine class are: (HOBBS et. al., 1996)

the) Alprazolam: Half-life of 6 to 24h (intermediate duration), its commercial presentation can be found as: frontal, Alpraz, Tranquinal or Altrox.
b) Bromazepam: In higher doses it can lead to muscle relaxation in the patient. Commercial presentation that can be found as: Bromoxon, Brozepax, Neurilan, Novazepan, Relaxil, Uni Bromazepax, Lexotan or Lexfast Somalium
c) Diazepam: Half-life greater than 24h (long duration). Commercial presentation that can be found as: Valium, Dienpax, Compaz, Diazepan NQ, Kiatrium, Valix, Calmociteno, Noan, Relapax or Uni Diazepax.
d) Flumazenil: It is an antagonist of the effects of benzodiazepines, reducing or preventing their action. It has only one type of intravenous administration due to its metabolization characteristics. If administered orally, the dose required to take effect in the body would cause the patient to experience severe symptoms of headache and dizziness. Commercial presentation can be found as: Lanexat, Flumazil or Flumazen.
e) Lorazepam: Sedative used to induce anterographic amnesia in the patient. Commercial presentation can be found as: Lorax, Lorazefast, Max-pax or Mesmerin

f) Midazolam: The most widely used due to its diverse routes of administration and it is water-soluble. Its half-life is less than 6 hours. Commercial presentation can be found as: Dormonid and Dormire.
g) Triazolam: When administered in low doses, it can be used safely and effectiveness in dental sedation. Commercial presentation can be found as: Halcion.

Table 1 – Sedative doses of Benzodiazepines and contraindications

Drug	Sedative dose oral	Contraindication
Alprazolam	Adults: 1.0 to 2.0 mg/dose 1 hour before the procedure	Elderly patient/obesity/cirrhosis: difficulty in eliminating drug from the body (reduced clearance) Pregnant patients: category D medications (high risk)
Bromazepam	Adults: 3.0 at 6.0mg/dose before the procedure	Elderly patient: increased half-life (longer duration of effect of medication, risk of falling) Pregnant patients: category D medications (high risk)
Diazepam	Child: 0.2 years 0.3 mg/kg/dose (maximum is 10mg) 1 hour before the procedure Adult: 2.5 years 10mg (maximum 20mg)	Elderly patient: increased half-life (longer duration of drug effect, risk of falls) and reduced plasma binding Patient with liver disease: difficulty in eliminating the drug from the liver organism (reduced clearance) Neonatal patients: reduced plasma binding Patient with cirrhosis: difficulty in eliminating the drug from the body (reduced clearance) and reduced plasma binding Patients with nephropathy: reduced plastic connection Patients with hypoalbuminemia: reduced plasma binding (low albumin) and increased elimination of the drug from the body Pregnant patients: category D medications (high risk)

Lorazepam	Child: 0.02 to 0.09mg/kg/dose 1 to 2 hours before the procedure Adult: 1 tablet the night before	Patient with cirrhosis or renal failure: plasma binding reduced Pregnant patients: category D medications (high risk)
Midazolam	Children aged 6 months to 5 years: 1.0mg/kg/ dose (maximum 20mg) 30min before Child from 6 to 15 years: 0.25 to 0.5 mg/kg/ dose (maximum 20mg) 30min before Adults: 1 tablet 30 minutes before	Neonatal patients: difficulty in eliminating the drug from the organism (reduced clearance) Elderly patient: increased half-life (longer duration of drug effect, risk of falls) and reduced plasma binding Patient with renal failure: reduced plasma binding and increased elimination of the drug from the body Patient with cirrhosis: difficulty in eliminating the drug from the organism (reduced clearance) Pregnant patients: category D medications (high risk)
Triazolam	Adults: 0.125mg 0.25mg at bedtime	Elderly and/or obese patient: difficulty eliminating drug from the body (reduced clearance) and reduced half-life. Pregnant patients: category D medications (high risk)
Flumazenil	0.01 mg/kg per 15 seconds later 0.01mg/kg/ minute. Total of 0.05 mg/kg or 1mg. (maximum dose is 0.2mg)	Patient with liver disease: difficulty in eliminating the drug from the liver organism (reduced clearance) Pregnant patients: category D medications (high risk)

Source: Adapted (HOBBS et. al., 1996 andPASSARELLI, 2006.)

Benzodiazepines have some adverse effects that can occur after the administration of these drugs, such as nausea, headache, blurred vision, syncope, involuntary muscle contractions, difficulty with motor coordination, difficulty in verbalization, aggressiveness, vomiting, salivation (need for aspiration to avoid suffocation), diarrhea, increased appetite, tachycardia and nasal congestion (HOBBS et.al., 1996).

Because it has a muscle relaxation action without compromising locomotion, this type of sedation is indicated for patients with muscle rigidity, which can be noted in the case of patients with cerebral palsy (HOBBS et. al., 1996).

1.2.2THE**nitrous oxide**

Nitrous oxide (NO_2) is derived from the heating of ammonium nitrate, forming a colorless gas with a slightly sweet or tasteless odor and low solubility in the blood (MARSHALL et. al., 1996). The effects of nitrous oxide at a concentration of 20% lead to analgesia similar to that of morphine; at concentrations of 80% it can lead to loss of consciousness (LADEWIG et. al., 2016). N_2O is marketed in cylinders in the standardized blue color, composed of liquid and gaseous form. As the gaseous form is used, the liquid begins to evaporate for use, thus maintaining its constant pressure in the cylinder (MARSHALL et. al., 1996).

The sedative action of nitrous oxide in the body is achieved through the administration of the substance via inhalation, where it is absorbed by the lungs, participating in hematosis in the alveoli. As N_2O has low solubility in the blood, it does not bind to any element, thus being transported by the circulation. blood throughout the body (MALAMED et. al, 2003), the elimination of the gas leads to a decrease in lung tension and blood to low levels, thus being exhaled by the lungs for 3 to 5 minutes, with only 1% of the substance remaining in tissues with low perfusion (muscle and fat) eliminated after 24 hours (KENNDY et. al., 1996). The air spaces present in the body are filled with large amounts of NO, increasing local pressure, so care must be taken when administering it to patients with sinusitis and/or otitis (LAVINAS, B. et al., 2014). In the central nervous system, NO acts on the cerebral cortex, reducing the sensations of proprioception, thermal and analgesia. In the cardiovascular system, at concentrations of 80%, it slightly reduces myocardial systole and promotes cutaneous vasodilation, which can lead the patient to

sweating and flushing. In the respiratory system, the substance is not irritating to the pulmonary epithelium and can be administered to patients with asthma. ONO inhibits the action of methionine synthetase (B12); when administered for periods of more than 24 hours, nitrous oxide alters DNA synthesis, compromising the production of leukocytes and red blood cells (MARSHALL et. al., 1996).

It is worth noting that currently no evidence has been found that contraindicates the use of the substance in certain patients, therefore it may present adverse effects that can occur when administering nitrous oxide (LADWINGet. al., 2016):

the) Excessive use of the substance over a long period of time can lead to neuropathies and loss of touch of the patient (MALAMED et. al, 2003)
b) Diffusion hypoxia = occurs after the discontinuation of NO, where the combination of nitrous oxide/oxygen is abruptly replaced in the tissues and blood, reducing tension with NO and consequently reducing the body's oxygen, leading to diffusion hypoxia, where the patient will report headache and nausea (APARECIDA et. al.,2000)
c) Sexual hallucinations = to avoid this, NO administration must be done in minimum doses necessary to sedate the patient and all care must be monitored, to protect the patient and the professional (MALAMED et. al., 2003).

1.2.3 Chloral hydrate

Chloral hydrate is a hypnotic that is currently not the first choice for sedative procedures, because an overdose can lead to lethal damage such as coma and death due to depression of the cardiorespiratory system. It also has other negative points: unpleasant taste; does not reduce anxiety; has no analgesic effect and does not have a reversal drug (ROBERTSON et. al., 2005).

The mechanism of action is through its active ingredient, which induces GABA to increase the chloride current, prolonging the opening of the ion channels (HOBBS et.al., 1996). The drug causes sedation through sleep and has its effect half an hour after oral administration. This drug has no defined half-life; it will be proportional to the amount administered (SILEGY et al., 2003).

Sedative dose of chloral hydrate (HOBBS et. al., 1996):

the) Children: 25-100 mg/kg/dose 30 to 60 minutes before, maximum dose 1g/dose for under 1 year old and for children over 1 year old up to 2g/
dose b) Adults: 250 mg/dose 3 times a day

The adverse effects of this drug are: irritation of the stomach lining, which leads to gastritis with vomiting (in 4% of cases), jaundice, hypotension and depression of the cardiorespiratory system. Research has shown it to be a carcinogenic agent (HOBBS et.al., 1996).

Chloral hydrate is not indicated for children with any neurological impairment, leading to failure of the sedation procedure, and is therefore indicated for children without alteration under 3 years of age (SPONSORSHIP et. al,2001)

1.2.4 H receptor inverse agonists

H receptor inverse agonists are antihistamines that can be used for mild sedation procedures. Their action is done by blocking serotonin receptors (neurotransmitter) in the central nervous system, leading to effects similar to sedation, such as drowsiness, but they do not have anxiolytic or analgesic effects. Therefore, they are more indicated to assist other medications in the sedation process (ROBERTSON et.al., 2005) or for patients with mild to moderate apprehension during dental care (LU et. al., 2006).

The H antihistamines used are (OLIVEIRA et. al., 2005;BABE et. al., 1996 andRosengarten,2009):

a) Hydroxyzine = The dose for sedation in children is 1 to 2 mg/kg 30 minutes before the procedure. In adults, 50 – 100 mg 30 minutes before the procedure. In elderly patients/ cirrhosis, the half-life of the drug is increased and it should be avoided in pregnant patients because it is category C. This drug may have side effects such as nausea, mental confusion, headache, hypotension, xerostomia and urinary retention.
b) Dimenhydrate = Dose for sedation in children is 1.0 to 1.5 mg/kg/dose 4 times (maximum dose for children under 6 years of age is 75 mg/day, for 6 to 12 years of age the maximum is 150 mg/day and for those over 12 years of age it is 300 mg/day). For elderly patients they have difficulty in excretion (reduced clearance) and increased half-life and for pregnant women it should be administered with caution (category B).
c) Fenergan = Sedative dose is fernergan 25 mg 1 tablet before the procedure, its effects are noticed 20 minutes after its administration lasting 4 to 6 hours. It is

contraindicated for children under 2 years of age, the medicine is excreted in breast milk, posing risks to the baby. Some adverse effects that may be reported are: muscle spasms, dry mouth, constipation, decreased appetite and blurred vision. (Rosengarten,2009)

1.2.5 Zolpidem

Zolpidem is a sedative-hypnotic, its mechanism of action begins when the drug selectively binds to the GABA receptor, increasing its activity of inhibiting the central nervous system, leading to the sedative effect (AZEVEDO et. al., 2022).

Prolonged use of zolpidem, even within the therapeutic range, causes adverse effects such as: hallucinations and distortion of reality (AZEVEDO et. al., 2022)

The usual dose for sedation is Zolpidem 10mg, 1 tablet at bedtime or before the procedure. In elderly patients, this dosage should be reduced to avoid increased half-life (risk of falling).(MORSCH et. al., 2023).

1.2.6 Zopiclone

Zopiclone belongs to the pharmacological class of cyclopyrrolones and has effects similar to benzodiazepines. Its sedative effect is rapid, inducing sleep, and it is rapidly excreted via urine, breast milk and saliva due to its short half-life (FERNANDEZ et. al., 1995).

The sedative dose in adults: zopiclone 7.5 mg 1 tablet before bedtime or before the procedure. Users of the medication do not become dependent on the drug. The reported adverse effects are: residual drowsiness, bitter taste in the mouth, xerostomia, feeling of drunkenness, dreamlike confusion and headache (FERNANDEZ et. al., 1995)

1.2.7 Propofol

Propofol is a general anesthetic administered intravenously, and is therefore outside the scope of the dentist's area of expertise. (FILHO et. al., 2019; BRASIL, 1966).

The drug works by stimulating GABA, increasing the presence of chloride in postsynaptic neurons, inhibiting electrical impulses, leading to a sedative effect at various levels. As it is highly fat-soluble, it has the ability to cross the blood-brain barrier. Its effect can be prolonged in the case of deposit in adipose tissue and in patients with liver and/or kidney dysfunction. (FILHO et. al., 2019)

1.3 patient assessment for sedation with emphasis on patients with special needs.

1.3.1 ANAMNESIS

Anamnesis should be performed together with the patient, enabling the assessment of the need for sedatives in procedures. Pre-sedation assessment is important to detect conditions that prevent use, avoiding adverse effects. It should be verified whether the patient has already undergone any type of sedation and whether there was any complication during the administration of the drug. In cases where the patient reports an allergy or adverse effect in relation to the use of a certain drug, it should be avoided during the procedure (COSTA et. al., 2007).

The identification of a patient with special needs is based on the National Assembly of Dental Specialties, which defines that patients with special needs are those with diseases and/or physical and mental conditions that require individualized treatment. Therefore, it is important for the dentist to detect these conditions, for good planning of his/her work and to verify the need for sedation and/or general anesthesia (COSTA et. al., 2007).

Duailibi and Duailibi classified PNE (DUAILIBI et. al., 1998):

the) Congenital malformation: genetic (Example: Down syndrome) and non-genetic (Example: cleft palate) b)

Behavioral changes: psychotic, neurotic (phobias), autism and dependent chemical

w) Acquired physical alteration: pregnant women, patients with some post-traumatic alteration trauma, heart disease, diabetes, kidney failure, immunodeficiency, gastrointestinal problems, respiratory or nervous problems.

It is important to assess whether the patient presents considerable systemic changes such as (COSTA et. al., 2007):

a) Cardiovascular problems: dental care can lead to stress on the

patient, being harmful, leading to high blood pressure, with light to moderate sedation being indicated after a specific medical evaluation.
b) Respiratory problems: asthmatic patients who present wheezing or have had a recent asthma attack cannot undergo general anesthesia, as intubation is a potent stimulant of intraoperative bronchospasms.
c) Digestive problems: patients with gastric problems cannot eat before the procedure, as they run the risk of aspirating gastric contents. Choose sedatives that are not gastrointestinal irritants. Be careful with drug interactions with the patient's medications.
d) Hormonal problems: uncontrolled diabetic patients may be harmed by the food pause before sedation. Obese patients may have more adipose tissue where the sedative agents are stored, prolonging the duration and damaging the cardiorespiratory system.
e) Neurological problems: evaluate the medications the patient is taking to avoid possible drug interactions. Situations that make the patient anxious, leading to hyperventilation, can cause seizures, so sedation is highly recommended to avoid this situation.
f) Problems in the hematological system: anemic patient due to difficulties in transporting oxygen, in the sedative procedure it will be necessary to supplement O_2.
g) Kidney problems: patients with renal insufficiency may need to adjust the dose of sedatives.
h) Patient with tuberculosis: it is not recommended for the patient to undergo sedation via inhalation, due to the risk of contamination in the device hoses, making decontamination difficult.
i) Patients with hepatitis: many sedative medications are biotransformed in the liver, so in patients with liver problems, this can lead to drug inactivation, longer duration of action and possible overdose.

1.3.2 PHYSICAL EXAMINATION

During the physical examination, the professional should measure blood pressure, listen to the heart and lungs to assess the airways. If the patient presents changes, it will be necessary to request additional laboratory tests. Additional tests are not usually requested routinely before sedation, only in the cases mentioned above. Therefore, it is important for the dentist to obtain an opinion from the doctor responsible for the patient about the health conditions before sedation (ASA, 2018)

1.3.3 SEDATION PLANNING

After gathering the information obtained from the anamnesis, physical examination and complementary tests, it is possible to detect whether this patient is indicated for sedation. Before sedation, the patient must be aware of the risks and complications and some specific care, such as diet and appointment time. The patient must sign a free and informed consent form regarding the procedure being performed under sedation (COSTA et. al., 2007).

The ASA (American Society of Anesthesiologists) PS (psychological status) classification allows the professional to plan the treatment taking the necessary care to avoid complications during the procedure (ASA, 2018)

I. Normal patient, without physiological or psychiatric disorders
II. Patient with controlled systemic alterations
III. Patient with controlled or uncontrolled systemic alteration, but with functional impairment significant.

Prior to the inhalation sedation or general anesthesia procedure, the proper functioning of the equipment must be checked (COSTA et. al., 2007)

1.4PATIENT MONITORING DURING SEDATION

Central nervous system monitoring in mild to moderate sedation: the patient's nervous state is monitored visually and by the professional's hearing. When the sedative effect has its effect on the body, the patient becomes drowsy. Depending on the degree of sedation, the patient may have difficulty verbalizing and moving. In cases of general anesthesia, the patient is unable to respond to any stimulus (COSTA et. al., 2007).

Monitoring of the respiratory system is done visually with the expansion of the chest and the respiratory rate, which may be reduced due to sedation, in cases of hyperventilation it indicates that the

Anxiety control is not being controlled. Also observe the color of the patient's oral mucosa, where if the patient presents cyanosis indicating hypoxia. Sounds such as snoring may indicate hypopharyngeal obstruction and wheezing indicating bronchospasms. The patient's saturation can be monitored by pulse oximeter, in the range of 95 to 100% the patient does not need supplementation, in 95% to 90% requires O supplementation, below 90% the procedure should be interrupted in the dental setting and oxygen should be administered and medical attention sought (COSTA et. al., 2007).

Cardiovascular system monitoring is done by measuring blood pressure with a sphygmomanometer and stethoscope. During the sedative procedure, monitoring is done every 15 minutes, except in deep sedation, when monitoring is done every 5 minutes. In light sedation, blood pressure is measured before or after the procedure. Significant hypotension in blood pressure will indicate shock, in which case the professional must perform basic life support maneuvers. The following are significant hypotension values (COSTA et. al., 2007):

a) Neonates (0 to 28 days old) = less than 60 mmHg
b) Lactating women (1 month to 12 months) = less than 70 mmHg
c) Children (1 to 10 years) = less than 70 mmHg
d) Over 10 years old = 90 mmHg

Monitoring the patient's temperature in light to moderate sedation does not require monitoring. In cases of deep sedation or general anesthesia, the temperature of very young or elderly patients may be altered during the procedure, leading to hypothermia due to the temperature of the environment, muscle relaxation, exposure of cavities, use of cold solutions in the cavities or heat loss through the airway (COSTA et. al., 2007).

1.5 sedation and general anesthesia IN PATIENTS WITH SPECIAL NEEDS

1.5.1 SEDATION

The selection of the drug for mild to moderate sedation will depend on the desired level of sedation, duration of the procedure, general health of the patient and route of administration. In the dental office, only mild to moderate sedation should be performed. In the case of PNE, there are limitations in verbal communication in some patients, which makes it difficult to assess the quality of sedation. Monitoring of patients with special needs should continue after the procedure by qualified professionals (COSTA et. al., 2007).

In mild to moderate oral sedation procedures, the following drugs may be used: Benzodiazepines, H receptor inverse agonists, zolpidem and zopiclone. In inhalation procedures, nitrous oxide is used, which in some cases may present difficulties in adapting to the mask, and midazolam may be administered later to aid in acceptance of the mask. In these cases of association, the patient's oxygenation must be evaluated, due to the expected complication of respiratory depression (COSTA et al., 2007).

It is recommended that the procedures are not too extensive, lasting a maximum of 1 hour. In more complex cases, it is recommended to perform them under general anesthesia in a hospital setting (COSTA et al., 2007).

1.5.2 GENERAL ANESTHESIA

The administration of the drug, such as propofol, is restricted to anesthesiologists in the hospital, to promote general anesthesia/deep sedation. The indications for PNE are: trauma, uncooperative patient, multiple dental needs and severe or profound mental retardation (COSTA et al., 2007).

Patients with genetic disorders must be monitored by the medical team, as they are more likely to develop adverse effects: arrhythmia; hypothermia or hyperthermia; respiratory depression; muscle and joint stiffness and renal failure (COSTA et al., 2007).

In the preoperative evaluation for general anesthesia, the anamnesis should detect medication use, cardiorespiratory changes, whether there is a need for antibiotic prophylaxis, cyanosis of the lips and nails or cervical instability. All these signs indicate the need for additional tests and follow-up with the doctor. The desirable additional tests are (COSTA et al., 2007):

the) Complete blood count
b) Coagulogram
w) Chest X-ray

d) Electrocardiogram

To optimize the treatment of PNE, all doubts and concerns must be clarified for the patient's guardians by signing the free consent form, and a protocol of the procedure that will be performed must be created, carefully evaluating the instruments and equipment that will be used. The interaction between the dentist and the anesthesiologist is extremely important for the best progress of the treatment (COSTA et al., 2007).

The use of deep sedation in PNE has proven to be very effective and safe, through an adequate pre-evaluation and analysis of the patient's pathological condition (COSTA et al., 2007).

1.6 EMERGENCIES ASSOCIATED WITH THE USE OF SEDATIVES

Adverse events caused by sedatives are rare, but most of them, when they occur, are due to respiratory depression or drug interactions. Emergency signs and measures to be taken are (COSTA et. al., 2007):

the) alteration or loss of consciousness = sedation performed in the dental office is mild to moderate, so the patient responds to verbal commands. When moderate sedation progresses to deep sedation, the patient has a loss of consciousness leading to depression of the central nervous system and consequently a decrease in breathing and oxygenation, which is why in-office sedation must be performed with monitoring of the patient's oxygen. In these cases, oxygen supplementation will be necessary.
Loss of consciousness due to hypoglycemia may occur in diabetic patients. The signs that these patients will present are: nausea, sweating, tachycardia and may progress to convulsions. In this situation, the professional must immediately interrupt the treatment and remove all material that is in the patient's mouth, position the patient in the Trendelenburg position, administer 10 ml of 25% glucose IV and, if this is not possible, place a gauze soaked in dextrose solution diluted in water and place it in the sublingual region and wait for medical assistance to be called.
In situations of loss of consciousness due to seizures, where the patient will present muscle rigidity, temporary respiratory interruption, cyanosis and intense salivation, the professional should place the patient in a safe place, leaving the head protected and wait for the seizure to progress. At the end of the crisis, it is important to check the patient's vital signs and place him/her in a lateral position to avoid aspiration of secretions. Most sedatives have anticonvulsant action, however there may be a drug interaction with the patient's routine anticonvulsant drug, leading to potentiated depression of the central nervous system.
b) difficulty breathing = the cause of the patient's difficulty breathing may be due to a failure in the sedative technique generating over-sedation, previous respiratory alteration or some dental device obstructing an airway due to professional error. In case of aspiration of a foreign body in adults, the Heimlich maneuver must be performed, which consists of a series of subdiaphragmatic abdominal compressions. In babies or smaller children, they must be placed upside down and then performed blows on the back to clear the airway.

When there is depression due to sedative overdose, the antagonist of this drug can be administered together with oxygen supplementation.
Asthmatic patients in an asthma attack should be placed in a sitting position to facilitate breathing through a face mask and administered bronchodilators. If there is no improvement in the asthmatic condition, epinephrine should be administered intramuscularly to dilate the bronchi.

c) cardiovascular changes = patients with hypertensive crisis will present headaches, dizziness, mental confusion, agitation and may develop seizures. Hypertensive crisis episodes are rare with sedation due to the beneficial effects of controlling anxiety in these patients. Patients with uncontrolled hypertension are contraindicated in the use of sedation without adequate medical supervision.
d) allergic reactions = allergic reactions due to the use of sedatives are quite rare, but when they occur the patient will present red signs on the skin in milder cases and in more severe cases there will be laryngeal edema, bronchospasm and hypotension. The professional must immediately stop the use of the medication and start basic life support measures.

The measures established by basic life support are of utmost importance for the dentist to know, these measures being:

1. Call for emergency medical services = emergency services must be activated immediately after the event that threatens the patient's life. Calling 192, 193 or private service

2. Clear airways = any object in the patient's mouth must be removed. The patient's head should be positioned with the chin elevated to facilitate the passage of air or the jaw can be pulled with both hands, one on each side, in the jaw angle region, raising it forward and preventing the head from tilting back.

3. Assess breathing = the assessment is done by bringing the rescuer's face close to the patient's face to hear and feel the breathing movements. If the patient is not breathing, mechanical ventilation must be performed through the Ambu bag.
4. Assess the patient's pulse = in the case of adults and children, the pulse can be assessed by the carotid artery, while in babies, because they have a short neck, the best place to assess it is the brachial artery, located on the inner portion of the arm between the elbow and the shoulder.
5. CPR = in cases of patients without a pulse, cardiopulmonary resuscitation maneuvers should be performed. In adults and children aged 1 to 8 years, compressions are performed on the xiphoid process, performing 30 compressions and then 2 ventilations. In babies, contractions are performed with only the index, middle and ring fingers in the region below the inter-mammary line.
6. Defibrillator = in cases where the CPR technique is unsuccessful, the defibrillator is used for a maximum of 3 to 5 minutes.
7. Patient positioning = after recovery the patient should be positioned in lateral decubitus to avoid aspiration of secretions.

1.7 case report

Patient EG, male, 6 years old, autistic, level III of support, arrived at the Paulista University clinic as a patient with special needs. Intraoral examination detected large carious lesions with few remaining teeth on teeth 75 and 85, indicating extraction, since these teeth were a focus of infection with a risk of affecting the permanent successor germ, causing discomfort. The patient was uncooperative during the consultation, felt fearful and refused to sit in the dental chair, therefore, it was indicated for his case to perform the extraction in a hospital environment, under moderate sedation and general anesthesia. The patient was referred to the regional hospital of Ferraz de Vasconcelos.

Autism support levels (MARIA et al., 2023).

I. Requires support or not, there is social harm, difficulty in organization and planning, and a certain inflexibility of behavior
II. Support is essential, with apparent social impairments, difficulty in dealing with changes, inflexible behavior
III. Support is essential, with serious impairments in communication skills, many do not even verbalize, extreme difficulty in cases of change and severe inflexibility of behavior.

The patient arrived at the hospital at 8 a.m. accompanied by his mother. Minutes before surgery, ketamine 20 mg and Precedex ® 20 mg were administered intramuscularly in the gluteal region. Ketamine was used to act as a pre-anesthetic, reducing mobility and facilitating the management of this uncooperative patient. Precedex ®, being a sedative, had the main function of inducing moderate sedation, since the patient was nervous and irritated. For his protection, it was necessary to administer these doses before entering the surgical center (SC). The entire procedure was authorized and monitored by the mother.

The patient was taken to the OR, and the anesthesiologist was responsible for administering general anesthesia. Initially, a mask with the anesthetic Sevoflurane was fitted, which induced the patient to lose consciousness, amnesia, analgesia and muscle relaxation. Then, in a combined manner, the following drugs were progressively administered intravenously:

1) Propofol 50mg = is an anesthetic used in general anesthesia. Fentanyl 50mg = an opioid, with
2) the aim of promoting analgesia. Dexamethasone 6mg = corticosteroid used to control the
3) patient's inflammatory condition. Dramim 1 ampoule = an antiemetic.
4)
5) Cefazolin 600mg = antibiotic.
6) Dipyrone 600mg = analgesic

Figure 2: Administration by inhalation

Figure 3: Control of sevoflurane gas release.

Figure 4: Intravenous access

During general anesthesia, the patient's cardiovascular and respiratory functions are impaired due to depression of the central nervous system. As a result, the anesthesiologist performs mechanical ventilation through intubation. Since the patient was a pediatric patient, ventilation was performed through an orotracheal tube, with the justification that compared to a nasotracheal tube, the orotracheal tube causes less postoperative discomfort, and since it was a minor surgery, the orotracheal tube would not interfere with the procedure. The tube will also prevent bronchoaspiration, since the patient's reflexes are lost during general anesthesia.

Figure 5: intubation with orotracheal tube, for mechanical ventilation

Throughout the surgery, the anesthesiologist monitored the patient's vital signs by measuring blood pressure, pulse oximetry and electrocardiogram. This monitoring was carried out until the moment ment the patient is taken to the post-anesthesia recovery room.

Figure 6: Anesthesiologist checking vital signs throughout the procedure.

Dentist Dr. Ana Paula Ricci performed the extraction of deciduous teeth 75 and 85. The suture thread used was the absorbable type, since it would not be possible to remove the stitches due to the patient's condition. At the end of the procedure, Dr. Ana cleaned the patient's navel and ear, because of being places that autistic people generally do not allow access to, level III support.

Figure 7: Tooth 85 for extraction

Figure 8: Fragments removed from teeth 85 and 75.

Figure 9: Suture with absorbable thread.

Figure 10: Cleaning the patient's ears.

Figure 11: cleaning the patient's navel area.

After the procedure was completed, the anesthesiologist washed the entire oropharynx to prevent bronchoaspiration, and then removed the orotracheal tube and moved the patient to the post-anesthesia recovery room.

In the post-anesthesia recovery room, the patient's vital signs continue to be monitored. The patient was discharged the same day after regaining consciousness and urinating. Urinating is very important because, due to the anesthesia, the detrusor muscles will be relaxed and need to contract so that the patient can urinate spontaneously.

2 MATERIALS AND METHODS

To achieve the proposed objectives, research was carried out on scientific articles on the websites: Scielo, Google Scholar and PudMed. Complementing this with readings of books related to the types of sedation and treatment of special patients in dentistry. To consolidate all this knowledge, a case was reported of a patient with special needs, who required treatment under moderate sedation and general anesthesia. The patient's guardian authorized the use of the case, through the signed free and informed consent form.

3 FINAL CONSIDERATIONS

Caring for patients with special needs presents obstacles that need to be overcome by the professionals themselves, and it is their duty to care for these patients, having knowledge of techniques that facilitate care. Hence the importance of performing both pharmacological and non-pharmacological control of uncooperative patients. According to the American Academy of Pediatric Dentistry, pharmacological control is more indicated than non-pharmacological control, due to the mental damage that may occur after stabilizing containment. However, other authors, such as Lyons, believe that stabilizing containment is an excellent conditioning for receiving comprehensive care. The best technique will depend on the patient's profile and financial condition, since the use of sedatives requires an investment.

larger and the place where this individual is being assisted has all the necessary equipment to carrying out the procedure.

After reviewing the literature, it was possible to observe the possibilities of sedation and general anesthesia that can be performed. The choice of the best technique will depend on the patient's condition, whether he or she has any contraindications to the use of this drug and whether he or she has the correct indication for its use.

REFERENCES

1. Presidency of the Republic. Law No. 13,146 of July 6, 2015.**Institutes the Brazilian Inclusion Law of Persons with Disabilities (Statute of Persons with Disabilities). Official Gazette [of the] Federative Republic of Brazil**, Brasília, DF, July 7, 2015. Section 1, p. 2-11. 2015b

2. Federal Council of Dentistry. Resolution CFO-51, April 30, 2004.**Lower standards for enabling the CD to apply relative analgesia or conscious sedation with nitrous oxide**. Rio de Janeiro, 2004.

3. MELO, LF; QUEIROZ, NL; NERO, NRDD**Use of restraint and sedation techniques in patients with special needs**. E-RAC., v.9, n.1, 2019.

4. PIOVESANA, AMSG.**Chronic encephalopathy (cerebral palsy) etiology, classification and clinical treatment**. In: FONSECA, LF. 2002; 3(1):18-48.

5. AMERICAN ACADEMY OF PEDIATRIC DENTISTRY (AAPD).**Policy on ethics responsibilities in the oral health care management of infants, children, adolescents, and individuals with special health care needs**. 2015a.

6. LYONS, R.A.**Understanding basic behavioral support techniques as an alternative to sedation and anesthesia. Special care in Dentistry**, Chicago, v. 29, n. 1, 2009.

7. CALDAS JR, AF; MACHIAVELLI, JL (Org.).**Attention and care for the person's oral health with disabilities: protocols, guidelines and procedures for dentists**. Recife: University Press of UFPE, 2013.

8. Brazil; Ministry of Health; Secretariat of Primary Health Care.**Healthcare Guide Oral Health of People with Disabilities / Ministry of Health, Secretariat of Specialized Health Care Department of Specialized and Thematic Care Secretariat of Primary Health Care Department of Family Health.**–Brasilia: Ministry of Health, 2019.

9. American Society of Anesthesiologists (ASA).**Continuum of depth of sedation: definition of general anesthesia and levels of sedation/analgesia**. 2019.

10. LOPES, RLS et al.**Oral health prevention in patients with special needs. Archives Of Health Investigation**. v. 6, 17 Jan. 2018.

11. Brazil. Law No. 5,081 of August 24, 1966.**Regulates the practice of the dental profession**. Daily Official of the Union, Executive Branch – Brasília, DF, 1966.

12. HOBBS, W. R; RALL, T. W; VERDOORN, TA**Hypnotics and sedatives; ethanol, In: Hardman JG, Limbird LE. Goodman and Gilman's The pharmacological basis of therapeutics.**9th ed – New York, 1996.

13. *CHAPACAIS, G. F; CHIKOSKI, PA; BECKER, S.Z; AGATTI, SW***Benzodiazepines: powerful, popular and dangerous – pharmacoLOGY**. 2020Available: <https://www.ufrgs.br/farmacologica/2020/11/11/benzodiazepines-powerful-popular-and-dangerous/>.

14.*MARSHALLB*. AND; LONGNECKER DE**General anesthetics. In: Hardman JG, Limbird LE. Goodman and Gilman's The pharmacological basis of therapeutics**. 9th ed. New York, 1996.

15. BRAZIL. Law 4,324 of April 14, 1964:**establishes the CFO and CROs and makes other provisions.**1964

16. BRAZIL. Law 5,081 of August 24, 1966:**Regulates the practice of dentistry.**Official Gazette of the Union. 1966

17. FEDERAL COUNCIL OF DENTISTRY.**CFO Ordinance – 149/99 of May 11, 1999.**

18. LADWING VM, LADEWING SFAM, SILVA MG, BOSCO G.**Conscious sedation with nitrous oxide in the pediatric dentistry clinic**. Dentistry. Clin. Cient., 2016

19. MALAMED SF, CLARK MS**Nitrous oxide-oxygen: a new look at a very old technique**. J Calif Dent Assoc, 2003.
20. Ministry of Health. Ordinance No. 344 of May 12, 1998.**Approves the technical regulation on substances and medicines subject to special control.**1998
21. PASSARELLI MCG**INAPPROPRIATE MEDICINES FOR THE ELDERLY: A SERIOUS PUBLIC HEALTH PROBLEM**. [sl: sn]. Available at: <https://cvs.saude.sp.gov.br/zip/bfarmaco_2.pdf>. 2006

22. LAVINAS, B. et al.**Inhalational sedation with nitrous oxide/oxygen: an effective option for odontophobic patients.**Brazilian Journal of Dentistry, v. 71, n. 1, p. 72–75, 2014.
23. KENNEDY SK, LONGNECKER DE**History and principles of anesthesiology. In: Hardman JG, limbird LE Goodman and Gilman's The pharmacological basis of therapeutics.**9.ed. New York, 1996. pg. 295-306
24. APARECIDA, E. et al.**Hypoxemia and Preoperative Hypoxia: Concept, Diagnosis, Mechanisms, Causes and Care Flowchart**.Brazilian Journal of Anesthesiology 319 Vol. 50, No. 4, 2000
25. SILEGY T; JACKS ST**Pediatric oral conscious sedation.**J. Calif Dent Assoc. 2003.
26. SPONSORSHIP, JA et al.**Evaluation of the efficacy of chloral hydrate in sedating children for nasofibroscopic examination**. Brazilian Journal of Otorhinolaryngology, v. 67, n. 5, p. 672–675, September 1, 2001 27. OLIVEIRA RG**Blackbook pediatrics.**3rd ed. Belo Horizonte, 2005.
28. BABE KS; SERAFIN WE**Histamine, bradykinin, and their antagonists. In: Hardman JG, Limbird LE Goodman and Gilman's the pharmacological basis of therapeutics.**9thed. New York, 1996. p.581-600.

29. LU DP, LU WI**Practical oral sedation in dentistry. Part II: Clinical application of various oral sedatives and discussion.**Educ Dent. 2006
30. SON IN, RIECHELMANN MB**Propofol use in newborns and children: is it safe? A systematic review.**Brazilian Society of Pediatrics. SP. 2019.
31. AZEVEDO BO; SANTOS EF; LIMA GS; PUJOL JT; ANTUNES AA; JESUS LOP**Pharmacotherapeutic profile of zolpidem.**Brazilian Journal of Biomedical Sciences. Vol. 3, SP, 2022. 32. ROBERTSON J; SHILKOFSKI N.**The Harriet Lane handbook. A manual for pediatric house officers.**17.ed. Philadelphia: Mosby, 2005.
33. MORSCH A.**Zolpidem: what it is for and how to take the medicine**. Available at: <https://telemedicinamorsch.com.br/blog/zolpidem>. Accessed on: May 4, 2024
34. Fernandez, C., Martin, C., Gimenez, F. et al.**Clinical Pharmacokinetics of Zopiclone. Clinic. Pharmacokinetics**. 29, 431–441 (1995). Available at:https://doi.org/10.2165/00003088-199529060-00004
35. COSTA LRRS; COSTA PSS; LIMA ARA; REZENDE GPSR**Sedation in dentistry: demystifying its practice.**1st ed. 2007.
36. American Society of anesthesiologists.**American society of anesthesiology practice guide for moderate sedation and procedural analgesia.**Arizona.2018.
37. Rosengarten OS, Lamed Y, Zisling T, Feigin A, Jacobs JM.**Palliative sedation at home. J Palliat Care**. 2009
38. FILGUEIRA, LM DE A. et al. Development of a participatory research strategy involving autistic people with different levels of support.**Science & Public Health**, v. 28, n. 5, p. 1501–1512, May 2023.