

# SEDATION IN CHILDREN UNDERGOING THERAPEUTIC AND DIAGNOSIS PROCEDURES. SAFETY OR RISK?

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**Abstract:** The growing need for sedation and/or analgesia for the diagnosis and therapeutic procedures overburden the anaesthetist physicians. Guidelines for physicians from other specialties who wish to sedate the patients safely and at high quality are required. There is a wide variation in the selection criteria and in the techniques used for the preparation, monitoring and management of children requiring sedation for diagnostic and therapeutic procedures. A survey done in 268 Scottish hospital departments revealed that, although the sedation of children was undertaken by one in four departments, only three had a protocol for paediatric sedation. This suggests that despite the multiplicity of the published guidelines for sedation in both adult and paediatric specialties, these are not being applied consistently in clinical paediatric practice.(1)The problem is of real interest both internationally and in our country, because there is no overspecialization for Pediatric Intensive Care specialty. Also guidelines for safe sedation of paediatric patients of age are not well structured.

**Keywords:** sedation, analgesia, paediatric, guide

**Rezumat:** Nevoia crescândă de sedare și/sau analgezie în cazul procedurilor diagnostice și terapeutice suprasolicită medicii anesteziști. Ghiduri pentru medicii din alte specialități care vor să sedeze pacienți în siguranță și la un înalt nivel calitativ sunt obligatorii. În literatură sunt descrise variații largi în criteriile de selecție și în tehnicile utilizate pentru prepararea, monitorizarea și managementul copilului care are nevoie de sedare. Un studiu făcut în Scoția evidențiază că doar în 1 din 4 departamente se practică sedarea pacientului de vârstă pediatrică, doar 3 spitale din 268 luate în studiu având protocol de sedare, ceea ce sugerează că ghidurile publicate nu sunt pe deplin aplicate în serviciile pediatriche.(1)Problema este de real interes atât pe plan internațional cât și la noi în țară, deoarece nu există o supraspecializare din specialitatea Pediatrie în Terapie Intensivă Pediatrică. De asemenea ghidurile de sedare a pacientului de vârstă pediatrică nu sunt bine structurate.

**Cuvinte cheie:** sedare, analgezie, pediatric, ghid

development of diagnostic and therapeutic minimally invasive surgery, and also due to the short term drugs appearance. Given the apparent ease of management techniques of sedation, and also because of the reduce number of anaesthesiologist personnel in many countries, sedation and/ or analgesia is used by doctors in other specialties, or even paramedical staff, without an accurate estimation of the risk.(2,3) It is important to establish protocols for high quality of these services that can be applied by doctors in other specialties than the anaesthesia - intensive care. The essential conditions on the quality and safety of the sedation/analgesia performed by doctors from other specialties are: risk determination, the patient selection, staff training, use of a limited number of drugs with short duration of action, setting targets to be monitored, kept records, appropriate facilities for recovery after sedation.

We say “yes” to sedation for both diagnosis or therapeutic procedures, painless (echocardiography, electroencephalogram, computed tomography, **magnetic resonance imaging**), or painful (peripheral and central venous approach, lumbar puncture, bone puncture, cardiac catheterization, and others). “Yes”, because of the security and good cooperation of the child in hospital, “yes” because it offers relaxation and amnesia, “yes” because it facilitates the transport of patients, “yes” because of the comfort given to the practitioner.

There are risks when sedation is performed by other physicians than anaesthesiologist, since:

- there is here is no overspecialization from Pediatric speciality to Pediatric Intensive Care;
- there are no sedation protocols well defined for paediatric age patients.

## Definitions

Sedation is a technique of drug administration that induce a state of medically controlled state of depressed consciousness or unconsciousness, which allows the patient to tolerate the unpleasant procedures, meanwhile maintaining cardio-respiratory function and protective reflexes.

The Ramsay Sedation Scale (RSS, Table), was the first scale to be defined and was designed as a test of rousability.

## Ramsay Sedation Scale:

1. Patient is anxious and agitated or restless, or both;

Sedation and / or analgesia techniques are needed to assist a growing number of patients undergoing diagnostic and therapeutic procedures, due to the

## CLINICAL ASPECTS

2. Patient is co-operative, oriented, and tranquil;
3. Patient responds to commands only;
4. Patient exhibits brisk response to light glabellar tap or loud auditory stimulus;
5. Patient exhibits a sluggish response to light glabellar tap or loud auditory stimulus;
6. Patient exhibits no response.

### *Objectives*

It is indicated that sedation and / or analgesia performed by a physician of another specialty than anaesthesia-intensive care should not reach such a level in which vital protective reflexes are abolished.

It is enough, for a good sedation, reaching level 2 or level 3 on Ramsay Sedation Scale. The transition from level 3 of sedation to other higher levels is more rapid in children than in adults, that is why the non-anaesthesiologist doctor must have skills and concepts of maintaining airway patency and assisting the spontaneous respiration, he must also know CPR protocols and have appropriate resuscitation equipment.

Maintaining permanent contact with the patient during surgery is mandatory.

### *Personnel*

Sedation must be administered by personnel capable of rapidly identifying and treating cardiorespiratory complications, including respiratory depression, apnoea, partial airway obstruction, emesis, and hypersalivation. They must understand the pharmacology of the sedatives they use and be proficient at maintaining airway patency and assisting ventilation if needed. At least two experienced persons are required, usually a physician and an assistant, such as a nurse or respiratory therapist. The physician typically oversees drug administration and then performs the procedure, while the assistant continuously monitors the patient for complications and documents the medications administered, the response to sedation, and periodic vital signs. The assistant may perform minor, interruptible tasks, but the assistant's ability to remain focused on the patient's cardiopulmonary status must not be impaired. It is strongly recommended that a person trained in advanced life support be available when primary sedation is administered; it is mandatory that such a person be available when deeper sedation is likely or possible.

### *Facilities*

Undertaking paediatric sedation should possess:

- oxygen (a reliable source to deliver face-mask or nasal oxygen and a self-inflating positive pressure oxygen delivery system)
- suction equipment
- tipping trolley or bed, or chair in dentistry
- resuscitation bags and masks of appropriate sizes
- oral, nasopharyngeal and laryngeal mask, airways and endotracheal tubes of appropriate sizes
- pulse oximeter (with size appropriate pulse oximeter probes)
- ECG machine
- non-invasive blood pressure (NIBP) monitor with appropriate range of cuff sizes

- fully stocked emergency trolley including resuscitation drugs and specific reversal agents for benzodiazepines (ie flumazenil) and opioids (ie naloxone)
- defibrillator with appropriate paediatric equipment and paddles
- temperature monitoring for younger children undergoing long procedures
- capnograph to monitor expired CO<sub>2</sub> levels is useful but not compulsory.

### *Patient selection*

Important elements are the age, the weight, past medical history, recent illnesses, allergies and adverse reactions, medication or drug used, ASA classification, last solid and liquid PO intake. All these should be noted, as they are medical documents.

It is essential that written, informed consent is obtained and documented prior to the procedure and this should include an explanation of the procedure and sedation technique proposed.

### *Monitoring*

Every patient should be monitored every patient should have a venous approach.

A minimal monitoring includes: non-invasive blood pressure measurement, ECG, pulse oximetry, as well as continuous monitoring of breath and frequency.(1)

### *Recordings*

All the drugs given should be noted, as well as the vital sign, at regular intervals, especially after the drug administration, but also after the procedure, in the absence of external stimuli.

The registration procedure sedation may be used to assess the quality of the sedation, and also for medico-legal requirements.

### *Recovery*

Post-procedure patients should be observed carefully, in a properly equipped environment for recovery, using the same monitoring as well as during the procedure.

Patients should be monitored continuously in the first 30 minutes after the administration of agonist or antagonist drugs.

### *Criteria for discharge*

One can discharge the patient that:

- is conscious and responds appropriately to commands
- can rise and walk without support;
- vital functions returned to normal and maintained for at least 30 minutes;
- pain, discomfort and nausea are controlled within acceptable limits.

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## CLINICAL ASPECTS

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