

## Review Article

# Defying Pediatric Fasting Guidelines

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**Abstract**

Doctors and nurses provide procedural sedation to children in a variety of settings-emergency, outpatients, and inpatient units. Procedure guidelines exist in both North American and Canadian Association of Anesthesiologists. Not all providers of procedural sedation adhere to these guidelines. A systematic review of the literature was conducted with the aim of finding evidence supporting pre-operative fasting. Studies were evaluated from electronic databases. No evidence existed to support pulmonary aspiration from vomiting; however, children at risk may be more prone to aspiration. Best practice for nurses providing safe care for children receiving procedural sedation involves: head-to-toe assessment, airway management skills, monitoring vital signs, pulmonary auscultation, and knowledge about resuscitative medications, intravenous equipment, and pharmacologic antagonists.

**Keywords**

- Pediatrics
- NPO
- Fasting
- Procedural sedation
- Emergency

**INTRODUCTION****Defying pediatric fasting guidelines**

Normally, children undergo a fasting period prior to procedural sedation. At the time of fast the child abstains from both food and fluids [1]. The American Society of Anesthesiologists recommends a two hour fast of clear fluids prior to sedation [2]. According to the Department of Anesthesiology, School of Medicine Queen's University (2015) the minimum duration of the fast includes: clear fluids two-hours, breast milk four-hours, infant formula six-hours, light meal six-hours and other solid foods eight-hours prior to elective procedures. Found that the aspiration risk is low for food intake; however, it should be considered when choosing the level of sedation and timing of the procedure [3].

Fasting guidelines are not always held fast to in Canadian emergency departments administrating care to children [4]. A study by [5] suggested a nationwide culture of "don't ask, don't tell" (p. 1) exists in American emergency in which administering conscious or moderate sedation happens outside of practice guidelines. Also found from their practice of nursing (cardiac catheterization laboratory) that current guidelines were not always practiced; however, they supported the idea that nurses' need advanced skills and knowledge when monitoring children for adverse effects from sedation [6]. The objective of this study is to review the administration of procedural sedation in children undergoing diagnostic, therapeutic, and minor procedures and determine what impact, if any does violate traditional two-hour fasting guidelines have on children's outcomes.

Clinical relevance's to pediatric nursing is time, cost, and safety [7]. The challenge for nurses is the missing detriment of

safety aimed at improving the quality of care given to children receiving procedural sedation outside of traditional fasting guidelines [8]. This article presents a systematic review of the literature and available evidence supporting fasting.

A review of the literature revealed that [9] found high aspiration rates among maternity patients receiving general anesthesia. During labor and delivery the women might vomit copious amounts of fluids, and as a result Dr. Mendelson recommended withholding all-oral feeding during labor. These findings were well supported by other investigators who named the aspiration (chemical pneumonitis) Mendelson Syndrome. Mendelson contributed the rise of the syndrome to increase the incidence of cesarean sections. Found that to avoid pulmonary pneumonitis from aspiration of stomach contents during surgery the standard in elective surgery was to fast from midnight; however, many anesthesia societies recommend fasting two hours for clear fluids and six hours for solids [10].

As a result of this discovery, fasting practice guidelines are well established for both physicians and nurses. The Canadian Anesthesiologist's Society (CAS) practice guidelines require the physician to monitor the patient with an electrocardiogram or for minor procedures continuous pulse oximetry [11]. Good practice requires that the patient receive an assessment from a physician who completes appropriate documentation, assesses for suitable medication route, and makes certain the availability of supplies and equipment for managing an overdose or resuscitation. The physician must also ensure adequate intravenous access, availability of appropriately trained and accredited assistances, obtain a written consent and review fasting status.

According to [12], procedural sedation is growing rapidly as a cost effective means of sedating children, and at the same time

decreasing the child's anxiety and pain. Best practice for nurses require that the nurse complete a physical assessment, baseline vital signs, weight, drug history, prior illnesses, conditions, and pathology, and informs family of what to expect following post sedation care highlighting safety and injury precautions [13]. The nurse must ensure that appropriate equipment is available; for example, resuscitation trolley, functional suction, blood pressure/saturation monitors, in addition to minimizing the child's procedural anxiety by consider lighting and noise levels. Nurses will also review consent, allergies, and fasting times to curtail prolonged preoperative fast that manifests in thirst, irritability, hunger, and distress leading to dehydration.

### Search for the best evidence

To assess the effect of the two-hour fast on children receiving sedation the author performed an electronic seek of EBSO Host, Pro Quest, and Cochrane Central Register of Controlled Trials using

- (1) Nothing by mouth (as a MeSH term or text word) OR
- (2) Procedural sedation (as a MeSH term or text word)
- (3) AND (pediatric surgical sedation, pediatric emergency).

The search produced eight articles from 2013 to 2015. All abstracts were read, and relevant articles pertaining to pediatric sedation identified. Exclusion criteria included adults 19 years and older. Table 1 provides a summary the pediatric procedural sedation studies.

### EVALUATION OF STUDIES

No fasting criteria appeared in 50% of the [16,18,20,21]. Study the fasting criteria included: no clear fluids for 3 hours, no infant formula or non-human milk for 6 hours, and no solids for 8 hours prior to sedation [15]. Suggested using spray or atomized intranasal medication for delivery facilitating the child's comfort [17]. Adverse effects ranged from vomiting, hypotension, laryngospasm, bronchospasm, bradycardia, apnea, de-saturation, seizure, hypoxia, to agitation and hallucination. Treatments of adverse effects included bag-masks ventilation, oxygen, intravenous normal saline, and anti-emetics. The children underwent the administration of procedural sedation for MRI, voiding cystourethrogram, fractures, lacerations, plus incision and drainage.

### Implication for practice

Although the pediatric population is likely to have, an increased incidence of vomiting no evidence exists to support fasting as a means of preventing aspiration in patients' sedation in the emergency room. (Griffiths et al (2013) suggested that prolonged use of sedation; for example, propofol should be monitored by one nurse trained in procedural sedation. In addition, nurses need familiarity with skills requiring airway management, use of pulse oximetry, monitoring vital signs (pulse, blood pressure, and respirations), suction, resuscitative medications, pulmonary auscultation, intravenous equipment, and pharmacologic antagonists. Post procedure the child needs monitoring for airway

References	Subjects	Drugs and procedures	Study Design	Primary outcome variables	Comments
[14]	213	Propofol MRI	Respective chart review	No evidence of vomiting	American Academy of Pediatrics fasting guidelines
[15]	36,516	Propofol Multiple procedures	Respective study	Hypotension requiring saline solution (0.05%) O <sub>2</sub> by face mask (0.4%) Laryngospasm (0.2%) Bronchospasm (0.04%)	No clear fluids for 3 h, No infant formula or non-human milk for 6 h No solids for 8 h
[16]	58	DXM Ketamine MRI	Prospective Study	No evidence of adverse effects	No fasting
[17]	200	DXM Ketamine MRI	Double-blind placebo-controlled trail	Two cases of bradycardia 1 cases of nausea	Standard pediatric fasting guidelines
[18]	1	DXM VC	Case Report	One case of bradycardia	No fasting
[19]	179	Ketamine (90%) cases Fractures	Retrospective cross-sectional study	Six cases of vomiting One case apnea de-saturation One seizure Two cases agitation /hallucination	American College of ER physician guidelines (Two cases with adverse events did not meet fasting guidelines)
[20]	600	Ketamine (95%) I&D	Retrospective and prospective study	1.8% cases had hypoxia 0.9% cases bag mask ventilation	No fasting
[21]	154	Ketamine Midazolam Fractures laceration I&D	Randomized controlled trial	One case of hypoventilation	No fasting

Note. DXM: Dexmedetomidine; ED: Emergency Room; MRI: Magnetic Resonance Imaging; I&D: Incision and Drainage; VC: Voiding Cystourethrogram.

patency, level of consciousness, sit unassisted and tolerating oral fluids. Parents should receive discharge instructions; avoiding activities that require coordination such as swimming and biking because of weakness or dizziness, and gradually increase diet from liquids to solids to prevent nausea.

## LIMITATIONS OF THIS REVIEW

The reviews were large enough to demonstrate of effectiveness the procedural sedation with or without fasting; however, limited evidence exists to omit safely fasting prior to sedation. Another limitation of the studies was a lack of consistency for fasting, monitoring, treating adverse events, and medication used in the different settings.

## CONCLUSION

Strict guidelines exist for fasting children undergoing general anesthesia for elective surgery. Finding from this review suggest a large degree of variability exists for fasting children prior to procedural sedation. Most children require, moderate and dissociative sedation for the relief of pain, anxiety, or compliance with the procedure. Because the use of procedural sedation has increased significantly outside the operating room, a need exists to standardize fasting guidelines times and patient monitoring intended for sedating children. Outside the operating room procedural sedation are occurring in ICU, emergency, outpatient departments, and hospital units; for example, sedating children for diagnostic, therapeutic, and minor procedures. The safety of the child is dominant when giving the procedural sedation as well as, providing information and support to all family members.

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