

# Nitrous oxide versus midazolam for paediatrics

## Précis

This review shows little to separate midazolam and nitrous oxide as single-agent sedatives for conscious sedation for healthy children. This supports the careful use of nitrous oxide or midazolam as a means of giving options to children to receive appropriate dental care in Ireland, by suitably trained and skilled conscious sedation teams in certain circumstances.

## Abstract

**Statement of the problem:** There is often a need for pharmacological behaviour support among children requiring dental care. Midazolam sedation is rarely considered for the paediatric population in Ireland, in line with Dental Council guidelines. However, the evidence base for this guidance is unclear.

**Purpose of the review:** The aim of this systematic review is to summarise the strongest available evidence relating to comparison of the safety and effectiveness of nitrous oxide and midazolam in conscious sedation for healthy young dental patients.

**Materials and methods:** Using a systematic review methodology, according to a predefined protocol, searches of PubMed and Google Scholar were conducted. Citation chaining was undertaken and seven key journals were hand searched. Titles and abstracts were screened by two authors and full texts read. Included studies were randomised controlled trials comparing the use of nitrous oxide and midazolam, as single-sedative agents, in children  $\leq 16$  years of age. Information regarding methods, participants, interventions, outcome measures and results were extracted. Each trial was assessed for risk of bias. Grading of recommendations, assessment, development and evaluations (GRADE) standards were then applied to measure the strength of evidence.

**Results:** Six randomised controlled trials were included. All trials were at high risk of bias. Trials were grouped into those comparing nitrous oxide with oral midazolam, intravenous midazolam or transmucosal midazolam. There is weak evidence that both nitrous oxide and midazolam are safe and effective sedative agents for use in the healthy paediatric population.

**Conclusions:** This review considers the strongest level of evidence available regarding comparison of the safety and effectiveness of nitrous oxide and midazolam as single-drug sedatives. It shows little to separate both techniques, at least when compared as single-drug techniques. The evidence, limited as it is, supports nitrous oxide as a preferred sedative and the judicious use of midazolam as a means of giving options to children to receive appropriate dental care.

**KEY WORDS:** nitrous oxide; midazolam; dental; conscious sedation; systematic review; Ireland

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