

# Retrospective Comparison of Oral Morphine versus Meperidine for Conscious Sedation in Pediatric Dental Patients

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## INTRODUCTION:

Behavior Management is essential in pediatric dentistry, especially for children with anxiety or limited cooperation. While non-pharmacologic techniques are first-line, oral conscious sedation is utilized often to safely complete treatment. Although oral sedation is easy to administer, patient response can be variable. Opioids such as morphine and meperidine have been used for sedation due to their analgesic and sedative effects, often alongside adjuncts like hydroxyzine and nitrous oxide. However, differences in pharmacologic profiles may impact behavior and treatment outcomes. Limited research directly compares oral morphine and meperidine in pediatric dental sedation, particularly regarding behavioral outcomes and treatment completion. This retrospective study compares oral morphine versus meperidine in children aged 4-11 years, using Frankl Behavior Scores and treatment completion as measures of effectiveness. Findings aim to guide pediatric dentists in selecting optimal sedation agents.

## MATERIALS AND METHODS:

A retrospective chart review was conducted of pediatric patients aged 4-11 years who underwent oral conscious sedation between January 2024 and September 2025 at UPMC Children's Hospital of Pittsburgh. Eligible patients were ASA I or ASA II with baseline Frankl Behavior Scores of 3 or 4 and no significant medical conditions; patients with incomplete records were excluded. Patients received either Oral Morphine (0.5mg/kg, max 15-20mg) or oral meperidine (2mg/kg, max 50mg) in combination with Hydroxyzine (25mg) and nitrous oxide as needed, with treatment initiated approximately 40-60 minutes after medication administration. A total of 200 patients (100 per group) were randomly selected. Outcomes included treatment completion (success vs. failure) and provider documented Frankl Behavior Scores during sedation. Data collected included demographics, sedation details, treatment timing and procedure outcomes. Statistical analysis was performed using a chi-square test to compare behavioral outcomes between groups with significance set at  $p < 0.05$ .

## FRANKL BEHAVIOR RATING SCALE

- 1 — Definitely negative: refusal of treatment, crying, fearfulness.
- 2 — Negative: reluctant, uncooperative, withdrawn.
- 3 — Positive: accepts treatment, follows directions with some hesitation.
- 4 — Definitely positive: good rapport, interest, enjoyment.

Table 1: Frankl Behavior Rating Scale. Adapted from AAPD Behavior Guidance for the Pediatric Dental Patient (2023)

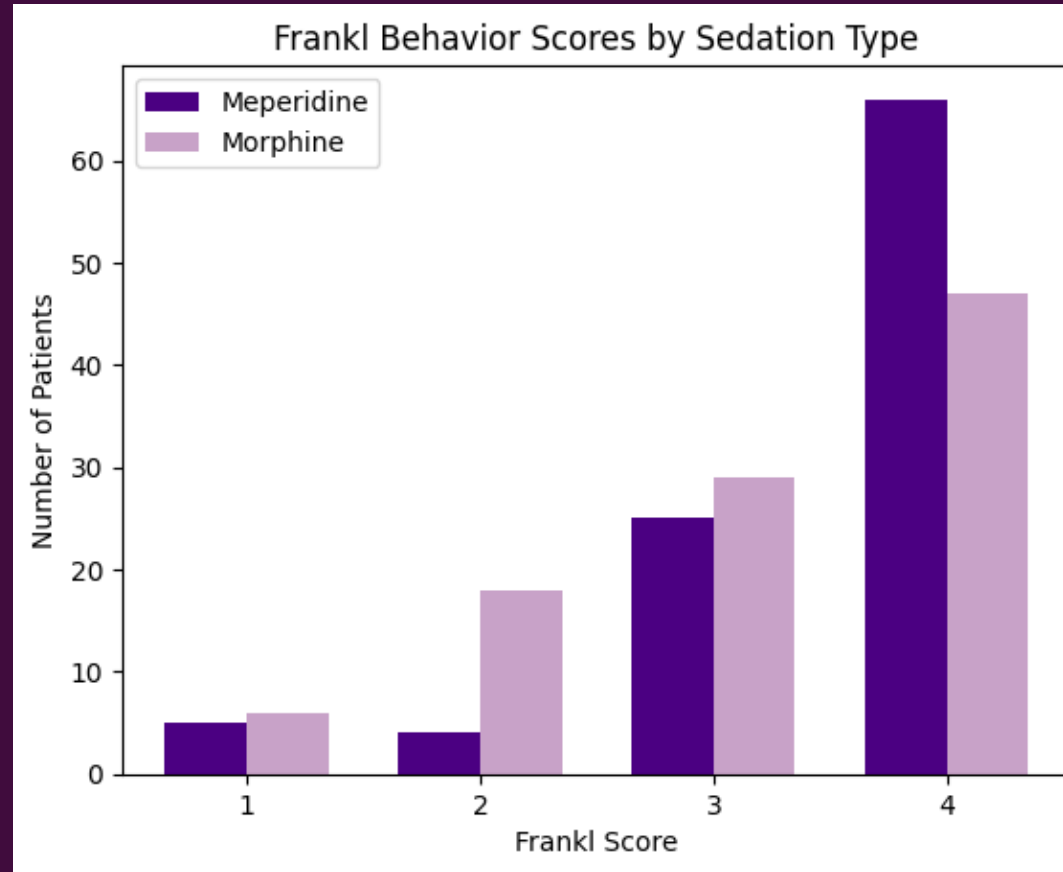


Figure 1: Patients receiving meperidine demonstrated more favorable behavioral outcomes, with 91% achieving positive or definitely positive behavior (Frankl 3-4) compared to 76% in the morphine group. Higher proportions of definitely positive (Frank 4) were observed with meperidine (66% vs 47%). Meperidine was also associated with higher treatment success rates (94% vs 82%)

## RESULTS:

A total of 200 pediatric patients were included, with 100 receiving oral morphine and 100 receiving oral meperidine. Patients in the meperidine group demonstrated more favorable behavioral outcomes, with 91% exhibiting positive or definitely positive behavior (Frankl 3-4) compared to 76% in the morphine group. Distribution of Frankl scores differed significantly between groups ( $\chi^2(3)=10.50, p=0.015$ ), with higher scores observed in the meperidine group. Treatment success was achieved in 94% of meperidine cases versus 82% of morphine cases, while failure rates were 6% and 18% respectively. No adverse medical events were reported, and all failed sedations were due to behavioral intolerance. Mean time to procedure start was similar between groups (41.6 minutes meperidine vs 43.2 minutes morphine), as was mean procedure duration was (47.1 vs 51.4 minutes), consistent with the expected onset of oral sedation.

## CONCLUSION:

Oral Meperidine, when used in combination with hydroxyzine and nitrous oxide, was associated with improved behavioral outcomes and higher rates of treatment completion compared to oral morphine in pediatric patients aged 4-11 years. Patients receiving meperidine were more likely to demonstrate positive behavior and less likely to require rescheduling under general anesthesia. Both medications were safe, with no adverse medical events observed. These findings highlight the importance of selecting sedation agents based on their ability to promote cooperation. Further prospective studies are needed to validate these results and optimize sedation protocols.

## LIMITATIONS:

As a retrospective, single-center study, there is potential for selection bias and limited control of confounding variables. Behavioral outcomes were based on subjective Frankl scale, and factors like patient anxiety, prior experiences, and operator technique may have influenced results.

## REFERENCES:

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- Wilson S. Pharmacological behavior management for pediatric dental treatment. Pediatr Clin North Am. 2000;47(5):1159-1175