

Success of Restorations Placed for 3-8 Year Olds Using Oral Conscious Sedation

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BACKGROUND

Treating dental disease in children involves a range of procedures such as fillings, stainless steel crowns, pulpal therapies, and extractions. These techniques are highly sensitive and require a certain level of cooperation from the patient to ensure they are performed safely and effectively ¹.

However, many pediatric patients may be challenged to sit through multiple dental visits for successful completion of dental procedures due to age and emotional maturity. In such cases, advanced behavior management strategies including oral conscious sedation (OCS) or general anesthesia (GA) may be necessary to complete treatment successfully and in a safe manner ².

A variety of options exist for OCS including opioids, benzodiazepines, antihistamines, alpha-2 agonists, and are regulated via state agencies for use in dentistry. While current Commission on Dental Accreditation (CODA) standards require pediatric residency training in minimal and moderate sedation, individual state regulations limit the agent(s) that can be used ³.

Understanding outcomes of OCS is important for improving quality of care, minimizing repeat interventions, and refining clinical protocols in both educational and practice settings ⁴.

The aim of the study is to determine the clinical success and durability of restorations placed under OCS using a benzodiazepine with or without an antihistamine in a training institution which will contribute to treatment planning, case selection, and post-sedation follow up protocols in a pediatric dentistry residency.

METHODS

This retrospective chart review following IRB approval (2025-00706) utilized a report from electronic dental record in the axiUm™ software of Stony Brook University School of Dental Medicine (SBUSDM). Analysis of OCS procedures between the ages of 3 years and 8 years completed between 07.01.2022 to 07.01.2025 included age, sex, race, OCS date, restorative type (filling, SSC, sealant), and any follow-up treatment.

Data analysis included descriptive and non-comparative analyses including confidence levels determined by Wilson score intervals. For Chi square analyses, p-Value of 0.05 was considered significant.

RESULTS

TREATMENT	OUTCOMES	n
OCS-Only Success	Completed OCS 1 with no additional sedation or limited/emergency treatment recorded	85
Repeat OCS Required	Required at least one additional OCS (OCS 2-5) after OCS 1	24
Limited Exam w/ N ₂ O	Required limited or emergency restorative care under nitrous oxide following OCS 1	6
Emergency Extraction Post-OCS	Required emergency extraction after OCS 1	5

Table 1. Outcomes following OCS
 • 74% treatment w/ OCS successful
 • 21% required re-treatment with OCS

Figure 1. Sex Distribution between OCS
 There was no statistically significant difference in sex distribution between patients completing OCS 1 only and those requiring OCS 2 ($\chi^2 = 0.79, p = 0.37$).

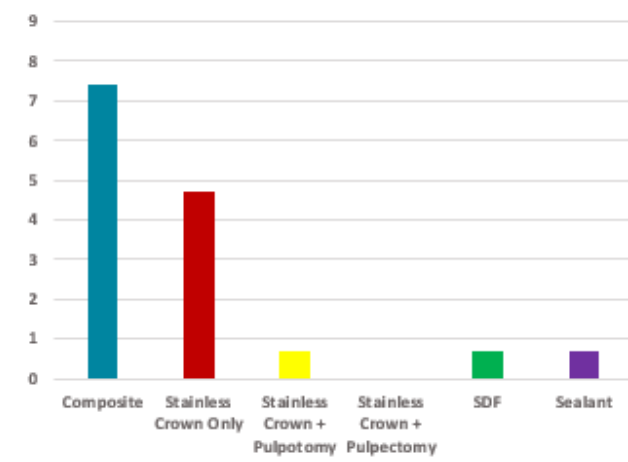
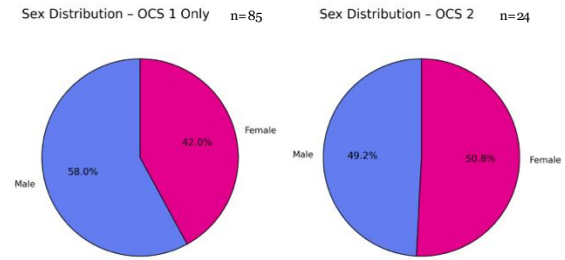


Figure 2. Percent Failure by Procedure
 Approximately 10% of treatments completed under OCS resulted in failure requiring further intervention.
 Of those failed treatments, 5% required emergency extraction.
 Composite restorations were associated with the greatest need for emergent extraction following OCS.

DISCUSSION AND CONCLUSIONS

OCS with a benzodiazepine demonstrated a high rate of treatment success, with nearly three-quarters of patients completing care without need for further sedation or emergency intervention. When additional treatment was required, it was most often planned repeat sedation rather than acute or emergency care, supporting OCS as an effective, longitudinal management strategy in high-risk pediatric dental patients. (Table 1).

Several primary teeth and one permanent molar treated during OCS 1 were subsequently addressed in later visits, including repeat OCS and limited restorative care. While the dataset does not allow definitive determination of failure at the individual tooth level, these findings are consistent with staged management of disease and ongoing caries risk in a high-need pediatric population.

Analysis of procedures requiring re-intervention following OCS confirmed composite restorations accounted for the highest number of failed treatments, followed by stainless steel crowns placed without pulp therapy. Full-coverage restorations combined with pulp therapy, silver diamine fluoride applications, and sealants showed minimal failure. This pattern suggests that failure may be more closely related to initial diagnosis and treatment planning rather than operative technique alone.

These findings suggest in this high-risk pediatric population treated under OCS, more durable and definitive treatments including full-coverage restorations may provide greater longevity than intracoronary restorations, reinforcing current pediatric dentistry recommendations favoring more definitive treatment planning for high-risk patients whose teeth manifest extensive caries or compromised structure ¹.

LIMITATIONS

This analysis is descriptive and non-comparative in nature. Findings are dependent on the accuracy and completeness of existing documentation and therefore may be subject to information bias. Frankl score or other behavior assessment was not addressed. Additionally, the dataset does not capture treatments completed outside the SBUSDM, which may limit the comprehensiveness of outcome assessment.

REFERENCES



The investigators thank Yang Zhou, Senior IT Analyst, for assistance with electronic dental record data.