

## Introduction

Dental caries is one of the most common chronic conditions affecting the pediatric population. In fact, studies have shown approximately 50% of preschool aged children experience caries. Untreated dental caries can lead to pain, malnourishment, and can affect physical development. [1] Two major considerations when treating caries are dental anxiety and a fear of the dentist. These have been cited as the fifth most common reason for avoiding dental care and are frequently the main cause of behavior management concerns. [2, 3] Such challenges must be considered daily for dental care of pediatric patients.

Oral conscious sedation (OCS) is a pharmacological technique used to help children with anxiety tolerate dental treatment. [4] OCS can have a profound effect not only on the treatment for the day of the procedure but can also set up the patient successfully for care needed in the future. Additionally, studies have shown no statistical difference between longevity of restoration success completed with OCS as compared to general anesthesia, another advanced behavior technique. [8] Children who receive invasive dental care under OCS have been shown to behave more positively for future dental visits in the dental chair. [5] When considering patient selection for dental treatment under OCS, dental anxiety is just one of many considerations. Due to associated risks of sedation, proper case selection of patients is very important. [6]

With recognition of associated risks with dental treatment under OCS, minimizing the need for retreatment is essential when considering a treatment plan. Studies have shown that up to 74% of patients who have undergone dental treatment with OCS required further dental care in the future. [7] Studies further show that treatment modality also impacts success. For example, treatment of posterior caries with Resin Modified Glass Ionomer showed a 92.6% success rate when used in the primary dentition, while stainless steel crowns had success rates near 96%. [9, 10, 11] With these considerations, the aim of this study is to determine the effectiveness of dental treatment for the pediatric dental patient undergoing OCS and to note how restorative treatment modalities can impact success.

## Objectives

The objective of this study is to retrospectively evaluate the clinical and radiographic success of restorative procedures for posterior interproximal caries of primary teeth under OCS.

## Study Design and Methods

This is a retrospective chart review with the following inclusion criteria:

- Age: Patients 3- 6 years old
- Procedure: Treatment of interproximal carious lesions under Oral Conscious Sedation
- Study Period: July 1, 2022 – June 30, 2024
- Follow-up: Clinical and radiographic follow-ups completed within 1 year of the initial OCS visit
- Health Status: ASA Class I (healthy, no systemic disease)
- Demographics: No exclusions based on gender, race, or ethnicity
- Tooth with interproximal decay into dentin of posterior primary tooth/teeth not involving the pulp

A single reviewer collected data from the electronic dental records of patients treated in at Montefiore Medical Center (Bronx, NY). Follow-up visits were completed at one of the four Montefiore pediatric dentistry clinics. The following information was collected: (1) age, (3) ADA dental codes, and (4) radiographic analysis.

Clinical and Radiographic Criteria for Success of a treated tooth

1. The tooth is asymptomatic
2. The tooth has an absence of periapical or furcation pathology
3. The tooth being studied does not require retreatment within 1 year of OCS

Clinical and Radiographic Criteria indicating Failure (any of the following):

1. The tooth is symptomatic
2. The tooth has a periapical and/or furcation radiolucency present
3. The tooth requires retreatment (i.e. due to recurrent decay, failed restoration)

## Results

A descriptive summary of patient characteristics is presented. A logistic regression model was employed in assessing the association between a priori selected patient characteristics and treatment success. Result is summarized as point estimate of effect of patient characteristics and associated 95% confidence interval (CI). Statistical significance

is claimed at  $\alpha=0.05$  level.

### Treatment Success Rates

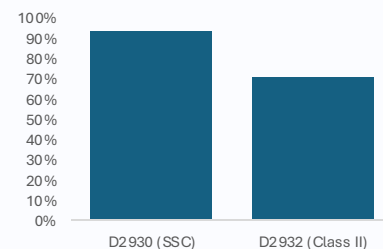


Table 1. Overall characteristics of study participants

Variable	N = 362 <sup>1</sup>	95% CI <sup>2</sup>
<b>Age</b>		
Median (Q1, Q3)	4.00 (4.00, 5.00)	
<b>Outcome</b>		
Success	320 (88%)	(85%, 91%)
Failure	42 (12%)	(8.6%, 15%)
<b>Treatment</b>		
D2930	295 (81%)	(77%, 85%)
D2932	67 (19%)	(15%, 23%)

<sup>1</sup>n (%)

<sup>2</sup>CI = Confidence Interval

Figure 1.

Table 2. Assessment of treatment effect

Characteristic	OR <sup>1</sup>	95% CI <sup>1</sup>	p-value
Age (above median Age)			
FALSE	—	—	
TRUE	1.63	0.83, 3.27	0.2
<b>Treatment</b>			
D2930	—	—	
D2932	0.18	0.09, 0.37	<0.001

<sup>1</sup>OR = Odds Ratio, CI = Confidence Interval

## Discussion and Conclusion

This exploratory analysis demonstrates a high overall treatment success rate (88.4%), suggesting that the interventions evaluated are generally effective in this population. A key finding is the significant difference in outcomes between treatment groups. Patients treated with D2930 achieved notably higher success rates (92.5%) compared to those treated with D2932 (70.1%). This difference was supported by logistic regression analysis, where D2932 was associated with substantially lower odds of success (OR= 0.18, 95%CI: 0.09-0.37, p < 0.001). These findings indicate that D2930 may be the more effective treatment option. Age showed a positive but non-statistically significant association with treatment success (OR = 1.63, p = 0.20). Although older children appeared to have higher odds of success, the wide confidence interval suggests uncertainty in this effect, and it should not be overinterpreted. An important limitation of this study is the relatively low follow-up rate (47%), which introduces the potential for selection bias. Patients who returned for follow-up may differ systematically from those who did not, possibly leading to an overestimation of treatment success. Among cases classified as failures, the most commonly reported reasons included:

- Loss of restoration
- Recurrent caries
- Furcation radiolucencies
- Iatrogenic damage

These failure modes highlight both biological factors (e.g., caries progression) and technical/operator-related factors, suggesting that treatment success may depend not only on material choice but also on clinical technique and case selection. Given the exploratory nature of this analysis, along with limitations such as incomplete follow-up and potential confounding, the findings should be interpreted with caution. Further prospective studies with higher follow-up rates are needed to confirm these results and better understand the determinants of treatment success.

## References

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