

White Paper

Sealant Placement Efficiency:

A Comparison of Isolite[®] to

Cotton Rolls

A study in sealant placement efficiency by Pediatric Dental Residents Dr. Maetal Henig, DMD and Dr. Erin McGrath, DMD, Capt, USAF at Temple University

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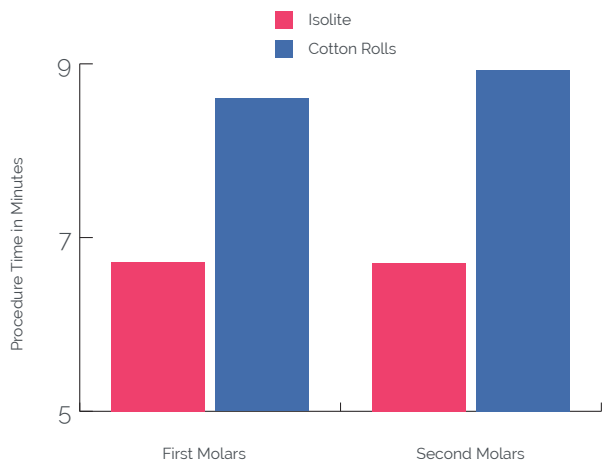
ABSTRACT

Purpose: To compare sealant placement time using Isolite® Illuminated Dental Isolation System with the traditional cotton roll isolation technique.

Methods: A total of 104 subjects between the ages of five and fifteen in a pediatric dentistry residency clinic were enrolled. Subjects were randomized into first molar (65 subjects) and second molar (39 subjects) groups undergoing sealant placement with one of the two sealant methods and the time to sealant completion was recorded.

Results: Isolite reduced procedure time by 22 percent ($P < .001$) for first molars and by 25 percent ($P < .001$) for second molars.

Conclusion: Isolite Illuminated Dental Isolation System significantly reduces sealant placement time when compared to traditional cotton roll isolation technique.



INTRODUCTION

Dental caries are a health concern that affect nearly one-fourth of children and over one-half of adolescents in the United States in permanent teeth¹. Occlusal surfaces in particular have deep pits and fissures that harbor bacteria and debris and therefore increase the risk of dental caries. Sealants are a protective coating placed on these pits and fissures to aid in the prevention of caries formation². Sealant success is dependent upon retention, which is achieved by proper isolation³.

Isolation for sealants is often accomplished with cotton rolls. The Isolite® Illuminated Dental Isolation System offers an alternative method by functioning as a bite block with isolation, suction, and lighting⁴. Dental professionals are challenged with meeting the high demand for sealant placement while needing to provide quality care efficiently. The purpose of this study is to compare sealant placement time using the Isolite® Illuminated Dental Isolation System with the cotton roll isolation technique.



METHODOLOGY

A randomized control study was performed with 104 subjects between the ages of 5 and 15 at Temple University Hospital's Pediatric Dentistry Residency Program. Sixty-five subjects received sealants on their first molars, of which 28 were randomized to be treated with Isolite® and 37 with cotton rolls. Thirty-nine subjects received sealants on their second molars, of which 25 were treated with Isolite® and 14 with cotton rolls. In total, 53 subjects were treated with Isolite® (test group) and 51 with cotton rolls (control group).

Sealants were placed on all four molars of each subject and time of procedure was recorded. All sealants were applied by one of the two co-authors without any other assistance. All subjects had a Frankl behavior rating of 3 to 4. For sealant application, each tooth was brushed with a toothbrush for 10 seconds⁵, etched with Etch-Rite™: Dental Etching Gel of 38% phosphoric acid for 15 seconds⁶, rinsed and dried for 10 seconds, sealed with Embrace™ WetBond™ Pit & Fissure Sealant material and light cured for 20 seconds⁷.

Isolation for the control group was achieved with a mouth prop, dry angles, several cotton rolls, and slow and high speed suctions. Time was measured from the placement of the mouth prop until its removal after completion of all sealants. Isolation for the test group was achieved solely with the Isolite® Illuminated Dental Isolation System. Time was measured from the placement of the Isolite® System into the mouth until its removal after completion of all sealants.

RESULTS

For subjects receiving sealants on their four first molars, the time needed to apply the sealants using the Isolite® System averaged 6.72 minutes compared to 8.60 minutes using cotton rolls.

For subjects receiving sealants on their second molars, procedure time for the Isolite® group averaged 6.71 minutes compared to 8.93 minutes for the cotton roll group.

When analyzed via independent samples t tests, the data demonstrate a 22% (P<.001) reduction in procedure time for first molars and a 25% (P<.001) reduction for second molars when Isolite® is used.

CONCLUSION

In conclusion, Isolite® significantly reduces sealant placement time when compared to the cotton roll isolation method. The reduced chair time can translate to a more efficiently run practice as well as increased patient satisfaction. In addition, the study investigators found the Isolite® system to be well-suited for two-handed dentistry.

The combination of light, suction and bite block into one system provided an efficient setup that eliminated the challenge of holding cotton rolls, suctioning, and placing the sealants at the same time. More effective airway protection further made the procedure safer and simpler with Isolite®. With these procedural benefits of Isolite® identified and quantified, further research is needed to assess the postoperative effectiveness and longevity of the sealants placed with these techniques.

ACKNOWLEDGMENTS

We thank Temple University Hospital's Pediatric Dentistry Residency Program directors, Dr. Michael Rosenbaum, DMD, and Dr. Paul Bahn III, DMD, for all their help and guidance. We also express our gratitude to Dr. Andrea Crivelli-Kovach, Ph.D., MA, MCHES for her help in analyzing the data. Thank you to Zyris, Inc. for sponsoring our research by supplying us with Isolite® Systems materials and resources to run the study.

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**TABLE 1:
CHARACTERISTICS OF THE STUDY POPULATION**

Category	Frequency (%) N (%) (N = 104)
Age of Child (years)	
Mean (SD)	9.73 (3.01)
Mean (First Molars)	8.09 (2.37)
Mean (Second Molars)	12.46 (1.68)
Molar	
First Molar (6)	65 (62.5)
Second Molar (7)	39 (37.5)
Technique	
Isolite	53 (51.0)
Standard	51 (49.0)
Time (Minutes, SD)	
Overall	7.68 (1.38)
First Molars	
Isolite (n = 28)	6.72 (0.88)
Standard Control (n = 37)	8.60 (1.04)
Second Molars	
Isolite (n = 25)	6.71 (0.74)
Standard Control (n = 14)	8.93 (1.25)

“ The combination of light, suction and bite block into one system provided an efficient setup that eliminated the challenge of holding cotton rolls, suctioning and placing the sealants at the same time.

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Sealant Retention: A Comparison of Isolite[®] to Cotton Rolls

In 2017, the Sealant Placement Efficiency Study confirmed that Zyris Isolite significantly reduces sealant placement time when compared to the cotton roll isolation method. To assess the postoperative effectiveness and longevity of the sealants placed, a randomized control study was conducted on these patients at 6 months and 12 months intervals. All patients were high caries risk, ages 6-16 years old and had Frankl behavior scores of 3-4.

At the patient's recall visit, the examiner commented on whether the sealants were visually and tactically intact. The examiners were dentists at Temple's Pediatric Dental Program who noted if the sealants were fully intact, partially intact, or completely missing. All examiners were calibrated and were unaware of which method was used.

At 6 months, results showed both methods to have a high success rate. 80% of the sealants were fully intact using the cotton roll technique, and 90% of the sealants were fully intact with the Zyris Isolite system. There was not a huge difference in the two isolation techniques.

However in terms of longevity, 12 months later, only 78% of the sealants were fully intact using the cotton roll method and 95% of the sealants were fully intact using the Zyris Isolite system. The Zyris Isolite system produces longer lasting sealants making it more successful than the cotton roll isolation technique. According to the previous sealant efficiency study, Zyris Isolite significantly reduces sealant placement time. Therefore, sealants placed with the Zyris Isolite system are more efficient AND retentive than those placed using the cotton roll technique.

6 Month Recall	Cotton Rolls	Zyris Isolite
Full	74	101
Partial	9	6
Missing	9	5
Total Sealants	92	112

12 Month Recall	Cotton Rolls	Zyris Isolite
Full	28	42
Partial	7	1
Missing	1	1
Total Sealants	36	44

	6 Months		12 Months	
	Control	Isolite	Control	Isolite
Full	80%	90%	78%	95%
Partial	10%	5.3%	19%	2.5%
Missing	10%	4.7%	3%	2.5%