PRE-DOCTORAL PEDIATRIC DENTISTRY SURVEY OF MINIMALLY INVASIVE CARIES MANAGEMENT TECHNIQUES

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Aims

- To assess the extent to which MID techniques are currently being incorporated in to pre-doctoral dental school didactic and clinical curriculums within the U.S.
- To evaluate the extent and indications for the usage of these techniques clinically, and if usage is anticipated to increase or decrease over the next year.

Introduction

Minimally invasive non-surgical pediatric caries management techniques offer alternative treatment approaches that are comparably efficacious in arresting primary decay and preventing the formation of new caries[1]. MID techniques include: Silver Diamine Fluoride (SDF), Hall-Style crowns, Silver Modified Atraumatic Restorative Treatment (SMART), and Interim Therapeutic Restoration (ITR).

These treatments have the potential to expand access to care for pediatric patients, especially those from lower socioeconomic populations and those with greater behavior management challenges[2]. With more timely and sustainable caries management techniques, efforts in intervention and prevention are more successful in combatting pediatric dental caries[3]. The impact of these techniques is substantial since they can be provided by well-trained general dentists. However, to realize this potential, pre-doctoral students must be equipped with this knowledge and these skillsets in their education.

Materials & Methods

An anonymous 26-question electronic survey was created using REDCap, based on current American Association of Pediatric Dentistry recommendations[4] and a previous survey of post-doctoral pediatric dentistry residency directors[5]. The survey is composed of various question and response types, with an estimated completion time of 10-15 minutes.

Using the AAPD contact list and emails from school websites, the survey was distributed via email to those in charge of pre-doctoral pediatric dentistry curriculum in 60 U.S. Dental Schools. Reminder emails were sent 4 and 8 weeks after the initial email. Newer dental schools that have not yet graduated a class and those where email addresses could not be found were excluded. The survey is still open with an anticipated closing end date in June 2022.

Descriptive statistics for the preliminary results were calculated using RedCAP and Microsoft Excel.

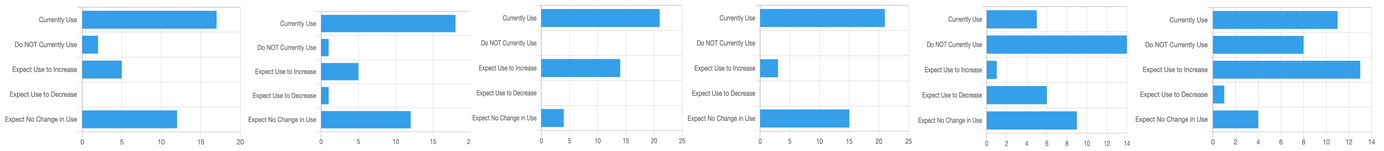
Results

SURVEY LINK: *https://redcap.link/MIDsurveybugsdm*

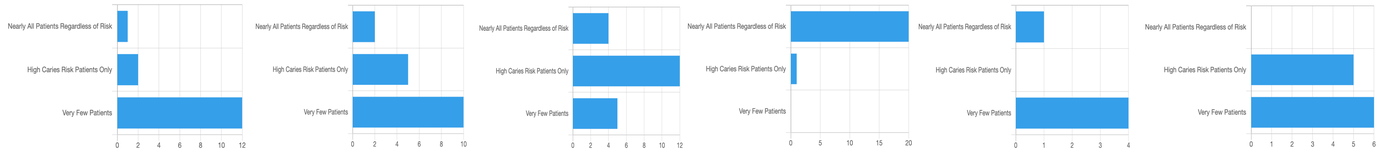
- Preliminary results shared are based on **21 survey responses** and a **35% response rate**, as of April 30, 2022.
- All respondents are Pre-Doctoral Pediatric Dentistry Program Directors, with an average of **5.8 years** in the role, and range of **1 to 20 years**.
- Geographic distribution of institutions represented: **28.6% U.S. Northeast** (CT, ME, MD, MA, NY, NJ, PA, VA, DC, WV), **23.8% U.S. Midwest** (IL, IN, IA, KY, MI, MN, MO, OH, WI), **19% U.S. Southeast and Puerto Rico** (AL, FL, GA, LA, MS, NC, PR, SC, TN), **14.3% U.S. Plains** (CO, NE, OK, TX), **14.3% Pacific West** (AZ, CA, NV, OR, UT, WA)

Q15: *Below is a table of newer caries control agents/alternative agents. For each one, we would like to know if you use it in your pre-doctoral program clinics AND whether, in your opinion, this use is likely to increase or decrease during the next year. If you are not sure, please provide your best guess.*

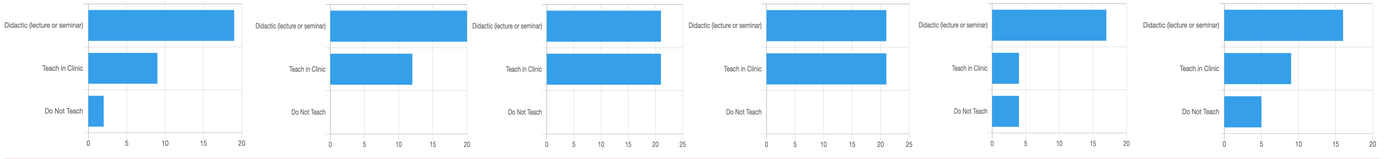
Atraumatic Restorative Treatment (ART) | **Interim Therapeutic Restoration (ITR)** | **Silver Diamine Fluoride (SDF)** | **Fluoride Varnish** | **Accidulated Phosphate Fluoride (APF) Foam** | **Hall Technique**



Q16: *Now, using the same list of caries control agents/alternative treatments, please indicate approximately what proportion of patients in your pre-doctoral program clinics are administered these agents? If you are not sure, please provide your best guess.*



Q17: *Now, please indicate what training methods you use to teach these caries control agents/alternative treatments in your pre-doctoral program. You may mark more than one option per agent.*



Summary of Preliminary Survey Results:

- **Q15**: SDF and Fluoride Varnish are both currently being used in 100% of pre-doctoral pediatric dentistry clinics of responding schools.
- **Q15:** The majority of dental schools have incorporated ITR (94.74%), ART (89.47%), and Hall Crowns (57.89%) into their pre-doctoral clinic.
- **Q15**: APF Foam was the only technique expected to decrease in the next year, the utilization of other techniques were generally expected to increase, with the greatest increase expected for Hall crowns.
- **Q16**: 95.24% of schools provided Fluoride Varnish for most of their patients. ART was used least often, with most schools (80.00%) using it on very few patients. High risk patients, were most likely to receive SDF by 57.14% of schools.
- **Q16:** ART and APF Foam usage are primarily limited to very few patients; Clinical ITR administration is as follows: very few patients > high caries risk patients > nearly all patients; SDF application is primarily used for high caries risk patients; Clinical usage of the Hall Technique is approximately 45:55 between high caries risk patients and very few patients.
- **Q17**: When assessing training methods, programs appear to have much greater teaching of these agents didactically while clinical experiences lag behind.
- **Q17**: The Hall Technique is currently being taught least (76.19%), with ART (90.48%) and APF Foam (80.95%) also being taught at few programs.

Conclusions

❖Studies have shown that teaching these minimally invasive non-surgical caries management techniques in post-doctoral pediatric residencies leads to greater adoption of these treatments in practice[6,7].

❖It is well documented that pre-doctoral students' exposure to procedures in both the pre-clinical and clinic setting results in significantly greater incorporation of that procedure into their professional practice[8].

❖Thus, it is likely that incorporating minimally invasive non-surgical caries management techniques in the pre-doctoral didactic and clinical curriculum would lead to general dentists who have greater confidence, skills, and are more likely to utilize these procedures when treating pediatric patients.

❖All schools now incorporated some aspects of minimally invasive dentistry in their curriculum, thereby increasing the number of general dentists who are trained to address the dental needs of young children. This will increase access to care especially for more vulnerable, younger patients and populations[1]. It is well documented that an expansion in caries management options encourages better tailoring of treatment based on individual needs and offers more alternatives, leading to a higher quality of care for young children[9].

References

1. Crystal YO, Niederman R. Evidence-Based Dentistry Update on Silver Diamine Fluoride. Dent Clin North Am. 2019 Jan;63(1):45-68. doi: 10.1016/j.cden.2018.08.011. PMID: 30447792; PMCID: PMC6500430.
2. Slayton RL, Urquhart O, Araujo MWB, et al. Evidence-based clinical practice guideline on non- restorative treatments for carious lesions: a report from the American Dental Association. JADA. 2018; 149(10):837-849.e19.
3. Capurro, DA, Iafolla, T, Kingman, A, Chattopadhyay, A, Garcia, I. Trends in income-related inequality in untreated caries among children in the United States: findings from NHANES I, NHANES III, and NHANES 1999–2004. *Community Dent Oral Epidemiol* 2015; 43: 500– 510. © 2015 John Wiley & Sons A/S. Published by John Wiley & Sons Ltd.
4. The American Academy of Pediatric Dentistry. (2022). *Oral Health Policies and Recommendations (The Reference Manual of Pediatric Dentistry)*. Oral Health Policies and Recommendations. Retrieved April 27, 2022, from https://www.aapd.org/research/oral-health-policies--recommendations/
5. Crystal, Y. O., Janal, M. N., Yim, S., & Nelson, T. (2020). Teaching and utilization of silver diamine fluoride and hall-style crowns in US Pediatric Dentistry Residency Programs. *The Journal of the American Dental Association*, *151*(10), 755–763. https://doi.org/10.1016/j.adaj.2020.06.022
6. Ngoc, C. N., Mehta, R., Donovan, T. E., & Ferreira Zandona, A. G. (2018). Teaching silver diamine fluoride in U.S. dental schools' predoctoral curricula. *Journal of Dental Education*, *82*(12), 1305–1309. https://doi.org/10.21815/jde.018.141
7. Halcomb, M. J., Inglehart, M. R., & Karl, E. (2020). Pediatric dentists' educational experiences, attitudes, and professional behavior concerning resin infiltration: Implications for dental education. *Journal of Dental Education*, *84*(3), 290–300. https://doi.org/10.21815/jde.019.174
8. Huebner, Gene. (2002). Evaluation of a Predoctoral Implant Curriculum: Does Such a Program Influence Graduates' Practice Patterns?. The International journal of oral & maxillofacial implants. 17. 543-9.
9. Seale, N. S., & Casamassimo, P. S. (2003). U.S. Predoctoral Education in Pediatric Dentistry: Its Impact on Access to Dental Care. *Journal of Dental Education*, *67*(1), 23–30. https://doi.org/10.1002/j.0022-0337.2003.67.1.tb03615.x