



# Insurance Claim Data Trends in Pulp Therapy for Pediatric Patients

L White\*, J Yepes\*, A Scully\*, G Maupome\*\*, M Milano\*\*\*, Q Tang\*\*, JA Dean\*

\*Riley Hospital for Children/Indiana University School of Dentistry \*\* Richard M. Fairbanks School of Public Health, Indiana University\*\*\* Augusta University

## BACKGROUND

- A pulpotomy has been a traditional vital pulp therapy for the treatment of advanced caries, while a pulpectomy has been the preferred nonvital pulp therapy<sup>1</sup>
- While pulpotomies and pulpectomies have well documented success rates, they are both technique sensitive, require good patient behavior and require extensive removal of tooth structure for proper pulpal access<sup>1</sup>
- Recent research into less invasive vital pulp therapies, direct and indirect pulp therapy and non vital pulp therapy, lesion sterilization tissue repair (LSTR) has shown moderate to high quality evidence to support the use of these alternative pulpal therapies<sup>2,3</sup>
- The objectives of the present study included: assessing dental professionals use of pulpotomy and pulpectomy for children aged 2-12; evaluating if differences in procedure trends exist between PDs and GDs; and outlining current geographic and age-based trends in pulpal therapy in a large sample of pediatric patients in the United States.

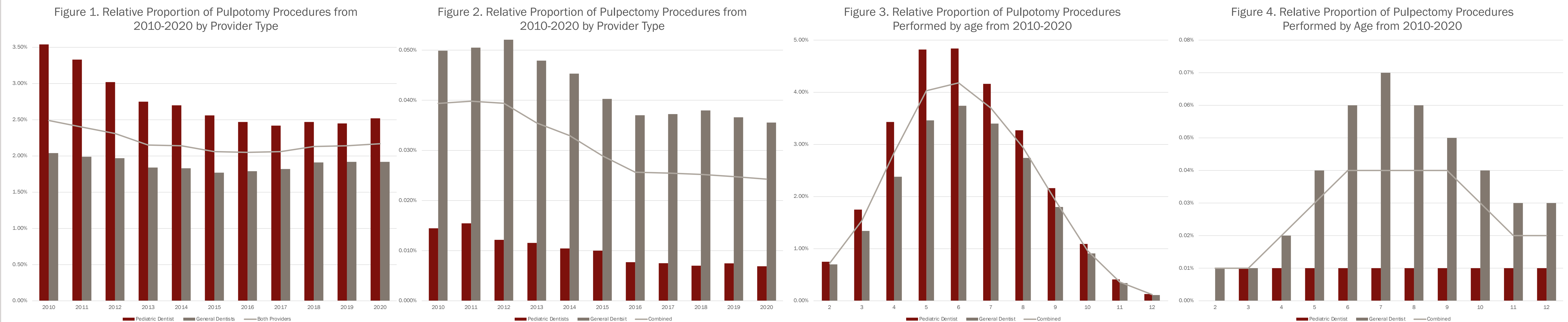
## METHODS

- Deidentified nationwide data were retrieved from P&R Dental Strategies, LLC, Hamilton, NJ from January 1, 2010 to December 31, 2020
- The Current Dental Terminology (CDT) codes for pulpotomy (D3220) and pulpectomy (D3221) were examined for children aged 2-12. D0120 (periodic oral evaluation – established patient), D0140 (limited oral evaluation – problem focused), and D0150 (comprehensive oral evaluation – new or established patient) were included as a reference point for trends relative to the number of children being treated
- Pulpotomy and pulpectomy counts were summarized and relative proportions were plotted both by year and by patient age
- Mixed effect logistic regression models estimated: the association between receiving pulpotomy/pulpectomy procedure, year, and provider specialty effects; and the association between receiving pulpotomy/pulpectomy procedure and patient's age separately by provider specialty
- Random effects were included for potential correlations among the same patients associations were analyzed both over and across AAPD region
- A 5 % significance level was used for all statistical tests

## REFERENCES

1. McDonald RE, Avery DR, Dean JA. McDonald and Avery's Dentistry for the Child and Adolescent. 2016.
2. Coll JA, Seale NS, Vargas K, Marghalani AA, Al-Shamali S, Graham L. Primary Tooth Vital Pulp Therapy: A Systematic Review and Meta-analysis. *Pediatr Dent.* 2017;39(1):16-123.
3. Coll JA, Vargas K, Marghalani AA, Chen CY, Al-Shamali S, Dhar V, et al. A Systematic Review and Meta-Analysis of Nonvital Pulp Therapy for Primary Teeth. *Pediatr Dent.* 2020;42(4):256-461.
4. Seale NS, Glickman GN. Contemporary perspectives on vital pulp therapy: views from the endodontists and pediatric dentists. *Pediatr Dent.* 2006;30(3):261-7.
5. Koozeai MW, Ingberhart MR, McDonald N, Fontana M. General dentists', pediatric dentists', and endodontists' diagnostic assessment and treatment strategies for deep carious lesions: A comparative analysis. *J Am Dent Assoc.* 2017;148(2):64-74.
6. Dunston B, Coll JA. A survey of primary tooth pulp therapy as taught in US dental schools and practiced by diplomates of the American Board Of Pediatric Dentistry. *Pediatr Dent.* 2006;30(1):42-8.
7. Barker AM, Mathu-Muju KR, Nash DA, Li HF, Bush HM. Practice patterns of general dentists treating children in Kentucky: implications for access to care. *Pediatr Dent.* 2012;34(3):220-5.

## FIGURES



## RESULTS

- An average of 6,087,900 children ages 2-12 were seen each year from 2010-2020 by both GDs and PDs
- The overall downward trend of each procedure group is shown in the Figures 1-2
- The probability of receiving either a pulpotomy or pulpectomy trended downward from 2010 to 2020
- With each increasing year, the odds of a child receiving a pulpotomy or pulpectomy decreased by 2.2 % and 5.4%, respectively (p<.001).
- A PD was more likely to perform a pulpotomy procedure than a GD (OR= 1.39, p<.001)
- PD are less likely to perform a pulpectomy than a GD (OR= 0.23, p<.001)
- Figures 4-5 demonstrate procedure trends by age
- Younger age was a significant predictor for pulpotomy treatment for both GDs and PDs.
- With each one-year increase in age, the odds of receiving a pulpotomy decreased by 15% and 10.9% for PDs and GDs respectively (p<.001)
- PD had an increase in odds of performing a pulpectomy with each one-year increase in age (OR= 1.03, p<.001), while GDs had decreased odds of performing a pulpectomy with increasing age (OR=0.9995, p= 0.04)
- When analyzed by AAPD national membership regions there are similar effects for year, provider type, and age

## DISCUSSION

- The overall decrease in pulpotomy and pulpectomy use may reflect a trend consistent with attitudes of pediatric dentists favoring more conservative pulpal therapy techniques<sup>4,5</sup>
- This a departure from past surveys which indicated dental pediatric programs taught and used pulpotomies in a similar manner from 1997 to 2005<sup>6</sup>

## DISCUSSION CONT.

- Pediatric dentists are performing more pulpotomies than general dentists perhaps due to pediatric dentists' increased training in pulpotomies, behavior management, and access to sedation dentistry<sup>7</sup>
- Overall use of pulpectomy by both pediatric and general dentists has also decreased which is consistent with a previous trend among board certified pediatric dentists and dental schools<sup>6</sup>
- General dentists are performing slightly more pulpectomies and in a younger population. One possible reason for this discrepancy could be that general dentists are not following or are not as familiar with the indicated clinical guidelines for pulpectomies as pediatric dentists.<sup>5</sup>

## CONCLUSIONS

- The probability of a child receiving a pulpotomy or pulpectomy in the United States has been trending down for the 11-year period from 2010 to 2020.
- PDs are more likely to perform pulpotomy procedures than GDs, but GDs are more likely to perform a pulpectomy procedure.
- With increasing child age, PDs and GDs have decreased odds of performing a pulpotomy.
- With increasing child age, PDs have increased odds of performing a pulpectomy while GDs have decreased odds.
- When examining effects by AAPD national membership districts, these pulp therapy trends remain consistent between districts.

