

Promotion of Oral Health and Prevention of Dental Caries Among Children in Primary Care

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Dental caries is the most common chronic disease of childhood in the US,¹ with approximately 23% of children aged 2 to 5 years experiencing caries in their primary teeth.² Dental caries disproportionately affects children of low socioeconomic status and minority race and ethnicity,² with a higher prevalence among Mexican American children (33%) and non-Hispanic Black children (28%) than among non-Hispanic White children (18%).³

Poor oral health adversely affects overall health, and dental caries is associated with pain, tooth loss, missed school days, poorer academic performance, and costly restorative care.^{4,5} Access to dental care remains limited in many communities,



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especially for young children, those insured through Medicaid, and patients with special health care needs.⁶ A dental visit by age 1 year is recommended by the American Academy of Pediatrics, American Academy of Pediatric Dentistry, and the American Dental Association,^{7,8} yet only 2% of US children will have seen a dentist by their first birthday, despite an estimated 10% already having dental caries.⁹ Conversely, 87% of children have at least 1 visit with a health care professional by age 1 year.⁹ Therefore, primary care clinicians are well-positioned to deliver preventive oral health services, which are proven to reduce caries in young children.¹⁰

Leveraging the numerous routine medical visits during the first year of life to initiate preventive measures (eg, application of fluoride varnish) and provide oral health guidance regarding nutrition and dental hygiene can help address the gap in dental care access.¹¹ However, few primary care clinicians nationwide report providing basic oral health services. In a 2012-2014 cross-sectional analysis of claims data for 6 275 456 children enrolled in Medicaid in 39 states, only 8% received fluoride varnish from their primary care clinician,¹² and in another study examining 328 661 billing claims, less than 5% of privately insured children aged 1 to 5 years received dental fluoride varnish application.¹³

In 2014, the US Preventive Services Task Force (USPSTF) recommended that pediatric primary care clinicians prescribe oral fluoride supplementation starting at age 6 months for children whose water supply is deficient in fluoride and also recommended application of fluoride varnish to the primary teeth of infants and children starting at tooth eruption through age 5 years (B recommendations).¹⁴

In this issue of *JAMA*, Chou and colleagues¹⁵ report findings from a comprehensive systematic literature review¹⁶ to inform the USPSTF 2021 update on the topic. The authors examined an additional 17 studies published since the prior USPSTF guideline and found that dietary fluoride supplementation and fluoride varnish were both associated with improved caries outcomes in higher-risk children younger than 5 years. Chou et al found limited or no new direct evidence regarding the benefits and harms of oral health screening, caregiver oral health education, or dental referral.^{15,16}

The Recommendation Statement from the USPSTF in this issue of *JAMA* on screening and interventions to prevent dental caries in children younger than 5 years presents the updated 2021 guidelines.¹⁷ The 2021 USPSTF guidelines conclude with moderate certainty that there is a moderate net benefit of preventing dental caries with oral fluoride supplementation at recommended doses in children 6 months or older whose water supply is deficient in fluoride and with fluoride varnish application in all children younger than 5 years.

Although the recommendations are largely unchanged from the prior USPSTF Recommendation Statement,¹² the evidence behind these recommendations is stronger, particularly for caries prevention with early application of fluoride varnish. However, the 2021 Recommendation Statement is applicable for children up to age 5 years,¹⁷ whereas the 2014 USPSTF recommendations included children through age 5 years.¹⁴ The modified upper age parameter limits direct comparison of the guidelines.

According to the 2021 Recommendation Statement, “The USPSTF recommends that primary care clinicians prescribe oral fluoride supplementation starting at age 6 months for children whose water supply is deficient in fluoride. (B recommendation).”¹⁷ The USPSTF also “recommends that primary care clinicians apply fluoride varnish to the primary teeth of all infants and children starting at the age of primary tooth eruption (B recommendation).”¹⁷

Clinicians can use “My Water’s Fluoride,” an online tool from the Centers for Disease Control and Prevention,¹⁸ to assist in determining community water fluoridation status and in making decisions about prescribing oral fluoride supplementation. Fluoride varnish (typically 5% sodium fluoride [2.26% fluoride]) is easily applied with a small brush. Medicaid in all 50 states reimburses primary care clinicians for fluoride varnish application. The American Academy of Pediatrics¹⁹ and Bright Futures publications support these fluoride recommendations.²⁰

In the current Recommendation Statement, “the USPSTF concludes that the current evidence is insufficient to assess

the balance of benefits and harms of routine screening examinations for dental caries performed by primary care clinicians in children younger than 5 years (I statement).¹⁷ The 2021 USPSTF statement,¹⁷ supported by the systemic review by Chou et al,^{15,16} cite insufficient evidence on the benefits or harms of primary care clinicians completing oral health screenings (including risk assessment), caregiver oral health education, and dental referrals. A validated and accurate caries risk assessment instrument and evidence regarding the benefits and harms of caries risk assessment are needed to guide practice and inform policy.

However, in the 2021 USPSTF Recommendation Statement, the patient population under consideration is limited to asymptomatic children younger than 5 years. Dental access remains a challenge in many communities, so the absence of formal guidelines addressing school-aged children should not imply that preventive primary care oral health interventions are not indicated for this population. Moreover,

recognizing that primary care health care professionals are not dental health professionals, referral of school-aged children for routine recommended dental care is appropriate, and lack of data on referrals preventing caries in this age group should not be interpreted as devaluing this important service to patients.

The 2021 USPSTF Recommendation Statement¹⁷ reinforces the value of early preventive oral health services for children younger than 5 years, specifically fluoride supplementation when indicated and fluoride varnish application. By adhering to the USPSTF recommended preventive oral health services and enacting evidence-based solutions, primary care clinicians could ensure the delivery of more effective whole-person care; help ameliorate oral health inequities that may be related to socioeconomic status, race and ethnicity, and insurance status; and potentially assist the dental profession in meeting the overwhelming demand for preventive dental care and improving oral health for children.

ARTICLE INFORMATION

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Additional Information: Dr Clark reported serving as editor of Smiles for Life, a national oral health educational curriculum. Dr Braun reported being an oral health equity researcher and director of the Rocky Mountain Network for Oral Health.

REFERENCES

- US Department of Health and Human Services. *Oral Health in America: A Report of the Surgeon General—Executive Summary*. US Department of Health and Human Services, National Institute of Dental and Craniofacial Research, National Institutes of Health; 2000.
- Dye BA, Mitnik GL, Iafolla TJ, Vargas CM. Trends in dental caries in children and adolescents according to poverty status in the United States from 1999 through 2004 and from 2011 through 2014. *J Am Dent Assoc*. 2017;148(8):550-565. doi:10.1016/j.adaj.2017.04.013
- US Department of Health and Human Services. *Oral Health Surveillance Report: Trends in Dental Caries and Sealants, Tooth Retention, and Edentulism, United States, 1999–2004 to 2011–2016*. US Dept of Health and Human Services, Centers for Disease Control and Prevention; 2019.
- Guarnizo-Herreño CC, Lyu W, Wehby GL. Children's oral health and academic performance: evidence of a persisting relationship over the last decade in the United States. *J Pediatr*. 2019;209:183-189. doi:10.1016/j.jpeds.2019.01.045
- Ruff RR, Senthil S, Susser SR, Tsutsui A. Oral health, academic performance, and school absenteeism in children and adolescents: a systematic review and meta-analysis. *J Am Dent Assoc*. 2019;150(2):111-121. doi:10.1016/j.adaj.2018.09.023
- Frank M, Keels MA, Quiñonez R, Roberts M, Divaris K. Dental caries risk varies among subgroups of children with special health care needs. *Pediatr Dent*. 2019;41(5):378-384.
- American Academy of Pediatric Dentistry. *Policy on the Dental Home: The Reference Manual of Pediatric Dentistry*. American Academy of Pediatric Dentistry; 2020:43-44.
- Section on Oral Health. Maintaining and improving the oral health of young children. *Pediatrics*. 2014;134(6):1224-1229. doi:10.1542/peds.2014-2984
- Northridge ME, Kumar A, Kaur R. Disparities in access to oral health care. *Annu Rev Public Health*. 2020;41(1):513-535. doi:10.1146/annurev-publhealth-040119-094318
- Kranz AM, Preisser JS, Rozier RG. Effects of physician-based preventive oral health services on dental caries. *Pediatrics*. 2015;136(1):107-114. doi:10.1542/peds.2014-2775
- Child and Adolescent Health Measurement Initiative. National Survey of Children's Health Data Query: 2019. Data Resource Center for Child & Adolescent Health. Accessed November 9, 2021. <https://www.childhealthdata.org/>
- Geiger CK, Kranz AM, Dick AW, Duffy E, Sorbero M, Stein BD. Delivery of preventive oral health services by rurality: a cross-sectional analysis. *J Rural Health*. 2019;35(1):3-11.
- Geissler KH, Dick AW, Goff SL, Whaley C, Kranz AM. Dental fluoride varnish application during medical visits among children who are privately insured. *JAMA Netw Open*. 2021;4(8):e2122953. doi:10.1001/jamanetworkopen.2021.22953
- Moyer VA. Prevention of dental caries from birth through age 5: US Preventive Services Task Force recommendation statement. *Pediatrics*. 2012;133(5):1102-1111. doi:10.1542/peds.2014-0483
- Chou R, Pappas M, Dana T, et al. Screening and interventions to prevent dental caries in children younger than 5 years: updated evidence report and systematic review for the US Preventive Services Task Force. *JAMA*. Published December 7, 2021. doi:10.1001/jama.2021.15658
- Chou R, Pappas M, Dana T, Selph S, Hart E, Schwarz E. *Screening and Prevention of Dental Caries in Children Younger Than Five Years of Age: A Systematic Review for the US Preventive Services Task Force*. Evidence Synthesis No. 210. Agency for Healthcare Research and Quality; 2021. AHRQ publication 21-05279-EF-1.
- US Preventive Services Task Force. Screening and interventions to prevent dental caries in children younger than 5 years: US Preventive Services Task Force recommendation statement. *JAMA*. Published December 7, 2021. doi:10.1001/jama.2021.20007
- My Water's Fluoride. Centers for Disease Control and Prevention. Last Reviewed July 20, 2021. Accessed November 9, 2021. https://nccd.cdc.gov/DOH_MWF/Default/Default.aspx
- Clark MB, Keels MA, Slayton RL; Section on Oral Health. Fluoride use in caries prevention in the primary care setting. *Pediatrics*. 2020;146(6):e2020034637. doi:10.1542/peds.2020-034637
- Hagan JF, Shaw JS, Duncan PM, eds. *Bright Futures: Guidelines for Health Supervision of Infants, Children, and Adolescents*. 4th ed. American Academy of Pediatrics; 2017.