Best Practice Approaches for State, Community and Territorial Oral Health Programs

A Best Practice Approach Report describes a public health strategy, assesses the strength of evidence for the effectiveness of the strategy, and uses practice examples to illustrate successful/innovative implementation.

Adopted: February 2011

Updated: October 2023

Best Practice Approach: Early Childhood Caries: Prevention and Management

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Executive Summary

Early childhood caries (ECC) is the clinical term for tooth decay that affects children younger than age six. It is the most common disease in young children, especially those from socially disadvantaged populations. ECC is the result of poor diet in combination with poor oral hygiene, leading to the transformation of colonizing bacteria into a pathogenic biofilm capable of destroying teeth. Common strategies to prevent and manage ECC include the use of fluorides, as well as early and regular access to oral health care. An additional strategy includes educational campaigns that promote oral health, which often focus on reducing sugar intake. While these efforts have had some success, a comprehensive approach to preventing and managing ECC requires a broad workforce, including oral health professionals, health professionals in primary care settings, early childhood providers in community-based programs, community health workers and caregivers.

This report asserts that prevention is more effective in addressing ECC than invasive treatment procedures. Improving oral hygiene and oral health literacy of caregivers can positively affect the oral health of children. Engaging public messaging campaigns can encourage caregivers to improve their own oral health before and during a child's early years, so the child learns healthy habits and the transfer of cariogenic bacteria is reduced. The current oral health care delivery and reimbursement systems should expand preventive and treatment services beyond dental offices and provide oral health care where children spend most of their time, such as early childhood programs and schools. Finally, public policy must be flexible to allow medical health professionals and others to use effective therapeutics to prevent, manage, and treat ECC.[1]

Introduction

A healthy mouth is essential to overall health and well-being. Strong, disease-free teeth are critical to a child's physical well-being, communication, and self-esteem during early childhood, a crucial developmental period. As fermentable carbohydrates such as sugars and overly processed starches have become a large part of the American diet, many children develop ECC. Recent data indicate 52 percent of children younger than age six are affected by ECC, with the highest prevalence found in children from families with low incomes that are socially disadvantaged, from minority groups, or a combination of both. If ECC is not prevented, it must be addressed with a variety of interventions before it leads to pain, infection, poor sleep, inability to eat, inattention in class, missed school days, and a probable lifetime of chronic oral and systemic disease. Prevention must be the focus of ECC management, as it lessens the need for invasive surgical procedures in the future. The positive experience often delivered through remineralization interventions offers tremendous potential for improving future outcomes.[2,3]

Despite the progress in diagnosis and treatment of dental caries via the Caries Management by Risk Assessment (CAMBRA) tool, ECC remains a significant public health burden on families and communities.[4] As preventive and minimally invasive therapies continue to evolve, these effective practices must be expanded and more widely adopted. A comprehensive approach to address ECC requires coordination among oral health professionals, primary care providers, early childhood educators in community-based programs, and caregivers. Expanding access to oral health care outside traditional practice settings, finding collaborators outside the traditional dental team, and seeking creative ways to reach families with effective communication strategies have demonstrated improved outcomes. This Best Practice Approach Report (BPAR) will review the strengths and weaknesses of current ECC management strategies and outline a vision for the future of oral health care that emphasizes innovative prevention and treatment, expanded outreach, and a value-based payment system.

Current Model

The current model of oral health care delivery depends mostly on oral health professionals reacting to

overt dental caries with invasive treatment in traditional dental offices or hospital operating rooms with the patient under general anesthesia. In some areas, preventive oral health care such as fluoride treatments, dental sealant application, and oral hygiene instruction, are provided in medical settings, in early childhood programs, and in school-based or school-linked oral health programs. These innovative, early touchpoints are critical for preventing ECC and expanding opportunities for improving oral health literacy.[5]

Fluoride

Fluoride is the most widely adopted preventive and therapeutic strategy used against dental caries. Fluoride strengthens the surface of the tooth to prevent the penetration of harmful acids. It also inhibits the growth of bacteria that metabolize sugar and the enzymes responsible for acid production.

Fluoride toothpaste, professional fluoride application, and community water fluoridation are the principal mechanisms for delivering fluoride to young children. Most over-the-counter (OTC) toothpastes contain fluoride. Almost all community water supplies contain some naturally occurring fluoride, but usually at levels too low to prevent tooth decay. Some communities adjust the fluoride concentration in the water supply to an optimal level to reduce tooth decay.[6]

Fluoride can be professionally applied in the form of varnish, gel, foam, or silver diamine fluoride (SDF). These products can slow, arrest, or reverse early carious lesions and strengthen developing teeth, making them resistant to future decay. The application of SDF can stop the progression of ECC if applied with appropriate frequency and in combination with proper nutrition and improved oral hygiene practices; this is done without the use of needles or drilling. While SDF does not change the color of healthy teeth, it does produce a dark stain on decayed tooth structure. This leads to the common misunderstanding that SDF turns teeth black, which limits its acceptance among parents and clinicians.[7,8] The belief that SDF stains teeth black should be corrected whenever possible. If aesthetics is a problem, a tooth treated with SDF can be further restored with tooth-colored material.

Focusing on the positive experience of remineralization and minimally invasive treatment should be the predominant theme in managing ECC. The science of remineralization has expanded dramatically in the past decade. Advances in peptide therapy show promise in reversing carious lesions without discoloration. Recent comprehensive and systematic reviews found the application of self-assembling peptides work together with fluoride to prevent the need for future restorations. The evidence to support the use of peptides continues to grow; however, the success of topical remineralization requires adequate plaque control and healthy eating habits for long-term success.[9,10]

Peptide scaffolds offer a dramatically different mechanism and delivery of remineralization science. The volume of promising evidence continues to demonstrate optimistic outcomes, yet it should be noted that longer term outcomes will still need to be observed. However, it is exciting that a therapeutic has arrived that is safe, effective, and has no potential downside. [Ref. JADA October 2023]

Early access to oral health care

The American Academy of Pediatric Dentistry (AAPD) recommends children establish a dental home by 12 months of age. Prior to this first dental visit, most young children have frequent well-child visits with their primary care provider, who can educate parents about protecting, improving, and maintaining the child's health. Addressing the child's oral health is an essential part of these visits, which should include a caries risk assessment, anticipatory guidance, topical fluoride application as appropriate, and referral to establish a dental home, especially when any sign of early oral disease is evident. Educating parents and other caregivers about the benefits of good oral health and teaching preventive oral health techniques during the well-child visit are the most efficient use of time and resources.[11]

As children's posterior primary teeth erupt, sealants applied to the chewing surfaces can block the

penetration of plaque acids and prevent ECC on the sealed surfaces. Current American Dental Association (ADA) and Centers for Disease Control and Prevention (CDC) guidelines recommend the use of sealants on *both* primary and permanent teeth for the prevention of dental caries. However, most public, and private insurance plans do not currently reimburse for sealants on primary teeth, and many dentists do not routinely provide sealants.

Expanding access to care in school-based and school-linked dental sealant programs has reduced the rate of dental caries in permanent molars; nevertheless, the majority of children do not receive sealants. If sealant programs were expanded and funded to seal primary molars, the disease would be prevented even earlier. The existing dental workforce requires continuous re-education regarding the efficiency and effectiveness of this preventive measure.[12]

Messaging and communication

Promoting the importance of oral health for both children and caregivers has been a crucial strategy in preventing ECC. Despite the realization among clinicians that effective communication plays a role in disease prevention, dental public health campaigns often lack an interdisciplinary, coordinated approach, thus leaving health professionals to develop often disparate individual messages for children and their families. Poor communication skills lead to uninspired counseling by providers. Motivational interviewing is more effective or engaging. The concepts of Personal Health Literacy and Organizational Health Literacy offer supportive systems that strive to distribute the burden placed solely on the dental care team and are likely to assist in improving oral health communication .[13]

Lessons Learned

Increasing access to oral health care, use of fluorides, and other preventive strategies have shown promising results. Primary care providers and community-based oral health stakeholders conducting oral health screenings, identifying the first reversible signs of ECC, and applying therapeutics such as SDF and fluoride varnish have proven effective. These strategies could be enhanced with thoughtful communication focused on changing unhealthy behaviors to protective actions that address the underlying causes of the disease. These strategies will be influenced and improved though organizational and personal health literacy efforts.[14]

Ensuring early access to oral health care has been a key component in managing ECC, but when a young child is brought into the dental office with advanced stages of decay, the resulting treatment often makes the teeth more prone to future disease. Drilling weakens tooth structure and does not address the cause of the disease, which increases the cost of oral health care and discourages families from seeking further care. Early access to oral health care will not inherently mean children receive better care with healthy outcomes until a more comprehensive approach is adopted. Early interceptive prevention should be combined with empowering caregivers to realize the control they have and the role they play in changing behaviors that contribute to dental caries.[1]

Evidence suggests young children acquire caries-causing bacteria from their mothers and other caregivers.[2] If these individuals can model effective oral hygiene habits, not only will children's oral health improve, but the transfer of colonizing bacteria is also likely to decrease. Motivating pregnant women to reduce their disease burden will lead to improved oral health outcomes for their children. Some oral health counseling, however, can feel like a scolding or may cause shame, which can result in a lack of engagement, ultimately affecting quality of care and less than optimal health outcomes. There is a disconnect in some states that do not cover dental care for pregnant women. It is extremely difficult for pregnant women to reduce their disease burden if they do not have a viable mechanism to cover services.

Oral health professionals can collaborate with behavioral health professionals to apply more effective communication techniques that facilitate positive behavioral change. Engaging with the manufacturers of OTC fluoride products, dental hygiene aids, and organizations that can help

increase access to healthy foods would improve the dissemination of key oral health messaging. Fostering improved oral health literacy via improved communication is often overlooked, but research continues to demonstrate the value of effective communication in disease management.

Challenges

A principal challenge to fighting ECC is financial. The oral health care system needs a payment model that compensates for prevention and does not over-incentivize operative treatments that do not address the causes of the disease. Except for a few unique clinical environments, there is little financial incentive for dental offices to prioritize preventive care. Such care is often bundled with restorative treatment, and reimbursement is significantly less for preventive procedures.

Tracking patients over time with improved outcome measurement would allow providers and payers to better assess the efficacy of caries management. As disease progression and remineralization are not tracked through tooth-level diagnostic coding, lack of data limits the understanding of how well preventive modalities work. Better data from the tooth, patient, practice, and population levels will likely lead to faster adoption of better ECC management strategies.

An additional challenge is the reluctance of many general dentists to see young children in their practice. This sense of unease is largely based on unfamiliarity and inexperience. Not every young child needs to be seen by a pediatric dentist. Increasing the comfort level of general dentists to address the oral health needs of young patients can be addressed in dental school and enhanced with continuing education courses.

Various upstream factors influence one's ability to maintain good oral health. Social determinants such as access to healthy foods, misconceptions about oral health, and government policy shape the public's ability to understand and prevent oral disease. Communities with low-income families are more frequently affected by compromised public water systems, creating mistrust, and inadvertently resulting in populations at high risk of not receiving the benefits of community water fluoridation. Recent immigrants may be hesitant to drink tap water due to misconceptions about water quality based on experiences in their own countries.[15,16]

Diet is ultimately the strongest determinant of oral health and overall health. When healthy foods are unavailable and/or unaffordable, ECC is likely to affect the family. The typical American diet includes unhealthy levels of processed foods containing carbohydrates (in particular, sugar). Although most caregivers understand consuming sweets leads to ECC, they are often unaware of the types of foods that promote oral health.

Although frequent consumption of foods and beverages containing sugar increases the risk for tooth decay, snacking is important for children. Due to their small stomachs, they need to eat small amounts of food more frequently (such as three meals and two or three snacks) to meet their daily nutritional needs. Consequently, it is important to limit beverages and snacks that contain sugar and offer healthy alternatives at regular times between meals.

Messaging campaigns must address inaccurate popular beliefs about diet and tooth decay. For example, most caregivers associate tooth decay with eating sweets, such as cookies, candy, and soda; however, any food containing simple carbohydrates that tends to stick to the teeth, including crispy snacks, can cause tooth decay. It is important to share that chips, goldfish crackers, graham crackers, pretzels, and cereals contain sugar, while emphasizing that natural (unprocessed) foods and foods containing protein (such as cheeses, nut butter, fruits, and vegetables) may prevent the disease.

Lastly, public policy shapes what oral health care is, who administers it, and where it can take place. State dental boards dictate who can provide what care and in which settings with various levels of supervision. States should expand the capacity and capability of diverse dental team members, such

as dental hygienists, dental therapists, and dental assistants, who can provide care in the community and provide education and preventive care at a lower cost. This would enable dentists to focus on those patients with complex oral health needs.

States regulate the use and composition of preventive products and can ensure system flexibility that allows providers to treat children based on the best available evidence and sound clinical judgment. Outdated policies that do not reflect the latest evidence, inhibit the most effective procedures and dental materials from being utilized. Such policies affect the types of sealants used and preclude children at risk for oral disease from receiving the benefits of modern materials. For instance, it is often easier and more effective to use glass ionomer sealants with young children, but clinicians are unable to do so in states where Medicaid reimbursement policy mandates the use of only composite resin sealants.

The Future of ECC Management

Value-based care

There are benefits to a family-centered oral health care delivery system that incentivizes through value-based reimbursement. The current delivery system is volume-based, which means dentists are financially rewarded by performing a plethora of invasive procedures that require the surgical skill of highly trained clinicians. Under a value-based paradigm, oral health care providers would be compensated based on the continued positive health outcomes of their patients. Compensation would be generated from preventive services that reduce the burden of disease and minimize the cost of future care. This model would include strategies deployed by the entire oral health team supporting patients at risk for oral disease with telehealth dental visits and community outreach. Ultimately, such an incentive structure would provide returns on the investments made in prevention.

Care beyond the dental office

A crucial strategy to reduce the cost of care and improve the management of ECC is moving oral health care beyond the walls of traditional dental offices. Although less than half of children covered by Medicaid benefits visit a dentist regularly, they do attend community-based programs such as Head Start; Early Head Start; and the Special Supplemental Nutrition Program for Women, Infants, and Children (WIC). These programs are potential points of contact for expanding oral health care interventions. Preventive services provided in these settings have demonstrated reductions in rates of decay.

Telehealth, which is currently used to connect healthcare professionals to patients remotely, should be expanded to its fullest potential. Telehealth and disease management complement each other well, allowing for follow-up and support for behavior changes essential to personal oral health literacy. The concept of a virtual dental home could easily expand access to oral health care, especially in rural areas and the inner city. Not only would our understanding of the disease burden in these communities improve, but oral health allies could provide simple and effective treatments to arrest ECC in non-dental settings. In an integrated system, the oral health team performs reciprocal medical screenings and preventive services (in the clinical dental setting), and patients benefit from comprehensive, rather than segmented care.

Taking care beyond the dental chair involves developing a wide-ranging, embedded network of trained allied healthcare professionals, who can provide prevention and remineralization treatments, while advocating for oral health promotion in their communities. *Promotoras de salud* have proven effective in Spanish-speaking communities. All communities at high risk for oral disease need ambassadors who can educate families and influence oral hygiene practices within the home and the greater community. Achieving integrated care will require educational opportunities for everyone who has an interest in children's health. In the future, the traditional dental office should be one component of the overall oral health system of care. The oral health community can work more

closely with families and family advocacy groups to ensure the future model of oral health care will be value-based, person-centered, and community-driven.[17]

Updated, positive health education and messaging

Educating caregivers is a foundational element of ECC management. Improved oral health is not solely the result of clinical services; it is also the result of a family's healthy habits at home, which are the foundation of prevention. Crucial advice needs to be imparted to individuals and the public in general. For instance, it is important to share with families that leaving some toothpaste foam residue in the mouth after brushing increases contact time with the teeth, which greatly improves the effectiveness of fluoride toothpaste.[18]

Messaging should prioritize building rapport and come from a person-centered perspective. Companies that understand consumer habits and how to influence them are well-positioned allies to craft creative, novel marketing campaigns that focus on what is most important to families. Previous messaging campaigns have tended to shy away from mentioning pain; yet the overwhelming response from consumer focus groups has been that avoiding pain is their primary interest. Families are trying to tell us that future messaging should emphasize the relationship between at-home methods of fighting tooth decay and pain reduction.

All oral health messaging should be tailored to its unique audience. Native Americans living on tribal land are likely to have a different relationship with oral health than recent immigrants in an urban setting; someone who grew up in the 1950s likely has a different notion of oral hygiene than someone who grew up in the 2000s. The best way to raise oral health awareness is to tailor the message to the audience.

New therapies and technology

The extreme prevalence of dental caries is unmatched by the lack of therapeutics available to treat the disease. A vaccine to prevent caries is unlikely in the near future, and the desire to practice evidence-based care should be balanced with the need to create the data that will support more effective agents and better outcomes in the future. Combination therapies are likely more effective; yet a lack of high-level evidence supporting their use hinders the adoption of these improved modalities. As the focus of treating dental caries continues to transition toward disease management, patients will benefit from forward thinking health care professionals who combine evidence-based recommendations and emerging research to create a more favorable ecologic balance within patients' mouths.

Historically, dentistry has focused on making teeth stronger with fluorides. CAMBRA advocates for identifying and balancing risk factors with pH neutralization, along with calcium and phosphate supplementation, while discouraging caries-causing bacteria from thriving on the tooth surface. Antibacterial agents can decrease the number of cariogenic bacteria in a patient's mouth, but modern disease management expands our understanding of the role of *good* bacteria in oral health. The addition of OTC prebiotic and/or probiotic agents encourage the growth of healthy bacteria in the mouth.[19,20]

Iodine has been used in clinical practice for decades. Most often, dentists working on children using general anesthesia will use povidone iodine for a full-mouth disinfection. It is assumed that decreasing the viable bacteria with such an antimicrobial will delay the development of recurrent ECC, although the long-term effects of a single professional iodine treatment would certainly be improved if it were coupled with the reduction of other risk factors. Use of povidone iodine by patients at home as a preventive strategy is often overlooked because of the taste, potential to stain, or allergies. The utility of any agent that should not be swallowed (like iodine) limits its use in treating ECC because young children cannot reliably "rinse and spit," but caregivers and older children could easily use this cost-effective strategy.[21]

Xylitol has a long history as a sugar substitute with anti-caries properties and is used to reduce the transmission of caries-causing bacteria from caregivers to children. The cost, availability of products with effective concentrations of xylitol, and the potential for adverse gastrointestinal effects with high doses restrict its widespread usage. Gum chewing is often not recommended for very young children, but xylitol wipes are useful for cleaning the mouths of infants and could be a useful strategy for allied health professionals. Erythritol is a similar sugar substitute that is gaining popularity as an alternative to xylitol with fewer side effects.[22]

Arginine is an amino acid found in various foods, which is linked to caries resistance when found in elevated concentrations in saliva. For this reason, toothpaste with arginine is emerging in the US market. Recent research shows the combination of arginine and fluoride reduces dental caries better than fluoride toothpaste alone. Consuming foods high in arginine (e.g., turkey, pork, chicken, soybeans, peanuts, dairy products, chickpeas, or legumes) has not been extensively researched, but may be an effective way to raise arginine levels in the saliva and is consistent with healthier dietary habits.[23]

Peptide scaffold technology, which claims superior caries prevention and arrest, has recently become available in the United States. The technology is reported to improve upon the remineralization potential of calcium and protein. It can be applied to teeth as a gel or liquid and stimulates remineralization by creating more binding sites for the minerals the tooth has lost. Its functionality and ease of use make it an exciting addition to caries prevention and treatment options. More research is needed to understand how it can best be leveraged, but the array of delivery methods available make novel peptides incredibly flexible.[24]

Tracking oral health outcomes

Measurement systems need to be developed to evaluate disease management activities and clinical procedures or to account for caries lesions that go untreated or are reversed through remineralization. At present, the ability to measure ECC in the general population is limited. Current ECC data are largely based on exams, fluoride treatments, sealants on permanent molars, and number and type of restorations. These are procedure counts, not actual disease metrics. The absence of outcome analysis leads to inaccurate assumptions, such as a child without pain does not need to see a dentist.

Better methods for tracking ECC in populations both inside and outside dental offices need to be created and implemented. Within the dental office, diagnostic coding, which tracks the disease at the tooth level for caries progression or remineralization, would allow for better understanding of how interventions achieve better results. Most of the electronic dental record software in use by practices today is tailored to the current volume-based system of care, which focuses on identifying opportunities for increased revenue. New measurement software to evaluate the health of the population and patients would shift the practice of dentistry toward a value-based system. With such technology, crucial data can drive continued improvement resulting from tracking diagnoses, interventions, and positive outcomes.[25]

The future system must anticipate issues surrounding patients at high risk for oral disease so that providers can address these issues early. Given the relationship between a family's oral health and a child's potential risk for ECC, reducing the family's overall disease burden must be prioritized. Effective tracking tools and measurable health outcomes will be crucial in developing a value-based oral health care system based on prevention.

Conclusion

The oral health care system is well-positioned for success but will require the adoption of strategies as described in this report. Tailoring care and messaging to specific patient groups will be best

supported by improved measurement within practices, for each patient, and with tooth-specific data that will improve outcomes for the entire population.

The further adoption of creative strategies carried out by programs and practices achieving success can improve the oral health of the population. The oral health of a child depends upon the oral health of the family. ECC is not just a disease that affects children; this preventable chronic disease represents the outcome of mismanaged oral health in adults that becomes the beginning of a lifelong struggle with poor oral health. Increasing access to care has become a central strategy for long-term success, but we must reconceptualize who provides that care and of what that care consists.

This BPAR is a call to identify and change the practices that are not demonstrating success and adopt those that are. Emphasizing prevention, effective communication, taking care beyond the dental office, improving health outcome tracking, and implementing a family-centered and value-based system of care are crucial strategies that aim to lighten the burden of ECC on the population.

Taking Action to Best Prevent and Manage ECC

	Easy	Moderate	Challenging
Dentists, dental hygienists, dental therapists, dental assistants, community dental health coordinators, and clinical educators	Learn more about cariology, CAMBRA*, disease management, or motivational interviewing. Review the ADA Caries Classification System and/or latest systematic reviews pertaining to ECC management.	Implement motivational interviewing in practice. Expand the use of glass ionomer sealants, SDF, peptide scaffolds, prebiotics, and nutritional counseling within your practice. Create caries risk assessment calibration cases to discuss at lunch with your clinical team.	Publish or present case studies or outcomes of successful disease management. Network and interact with local community health partners and programs.
Non-clinical team members (office support staff)	Attend or watch an online dental continuing education course pertaining to disease management. Reinforce goal setting with patients (i.e., ask children/caregivers what goals they set during their dental appointment).	Establish your role within the clinical team using motivational interviewing to help patients and caregivers set self-management goals.	Explore the use of oral health apps such as MySmileBuddy† or search for patient engagement items that can help with self- management goal setting in your environment.
Policymakers and payers	Learn more about your state oral health program and maternal and child health (MCH) program. Support teledentistry opportunities.	Engage with clinicians fighting ECC outside the dental office (i.e., observe a school-based dental sealant program site). Identify hurdles affecting ECC management locally and help eliminate them.	Create quality Improvement programs fostering disease management techniques. Introduce legislation to expand scope of practice and incentivize value-based dental care.
Non-dental health care professionals	Complete the *Smiles for Life* oral health curriculum.‡ Take a dental or medical colleague to lunch and discuss referral opportunities. Encourage caries protective foods instead of instructing individuals to avoid sugar.	Incorporate a caries risk assessment during exams and begin “lifting the lip” and observing the maxillary central incisors at well baby visits. Promote ECC management training to colleagues through relationships with professional associations (e.g., dental, dental hygiene).	Include dental hygienists in well-child visits. Begin applying fluoride varnish or SDF when you identify children at high risk for caries. Incorporate ECC management and oral health in medical and nursing education.
State oral health programs	Engage with ASTDD or state level maternal and child health (MCH) organizations to strengthen integration of oral health into programs at state and community	Ensure an effective childhood surveillance system that includes oral health needs assessment, Medicaid, and PRAMS data; contribute to or use the ASTDD National Oral Health Data Portal §	Create an Early Childhood Network (ECN) of oral health advocates**.

* https://dentistry.ucsf.edu/research/cambra
† https://ccnmtl.columbia.edu/triangle/projects/mysmilebuddy.html
‡ https://www.smilesforlifeoralhealth.org/
§ https://www.nationaloralhealthdataportal.net/
** An ECN should include dental and medical professionals, Federally Qualified Health Centers, Rural Health Centers, community health coordinators, child health advocacy organizations, Medicaid, and non-traditional partners like children’s museums (any organization that shares a vision for improved oral health for all young children in your state)

	levels.		
Oral health coalitions	Invite your state dental director to a coalition meeting to discuss cariology, CAMBRA[††], disease management, and motivational interviewing.	Share information about ECC prevention with the communities served by coalition members. Identify ECC champions within the communities served by coalition members.	Advocate for legislation to expand scope of practice and payment for prevention.
New oral health champions/allies	Join the Oral Health Progress and Equity Network (OPEN)[‡‡]. Partner with dietitians and Head Start or WIC staff to educate the public about preventive interventions for ECC and impacts of diet on oral health.	Spread the key concepts for caregivers highlighted in this BPAR through health and wellness fairs or similar events within the community.	Give statewide presentations highlighting the evidence for school-based dental sealant programs, successes, challenges, and stories that illustrate impact.
Anyone who cares for children	Notice how chips, cookies, bread, and crackers stick to your teeth, and how difficult they are to remove. Increase consumption of spinach, soy, seafood, and nuts (foods rich in arginine).	Avoid rinsing your mouth after tooth brushing before bed, thus increasing the contact time for toothpaste with your teeth. Advocate for more protein in school meals and less cariogenic and/or acidic foods for meals and snacks.	Reduce or eliminate fermentable carbohydrates (sugar, starch) from your own diet.

Evidence for Best and Promising Practices and Criteria

The evidence for preventing dental caries with fluoride and sealants is some of the strongest clinical evidence in the oral health literature; yet widespread adoption of this science for the benefit of children's health has not been achieved. Some leading-edge innovative programs continue to challenge and improve traditional clinical models. Those that achieve success do so by ensuring children have access to proven preventive and evidence-based care. Practices that meet the following criteria are well positioned for future success:

Impact and effectiveness

- Clinical strategies are sound, and evidence based. While this BPAR describes newer preventives and therapeutics, children at high risk are most likely to benefit from the application of evidence-based therapies first or in combination with other methodologies and sound clinical judgment.
- Process and outcome measures are used to assess and refine strategies. Data collected at the practice/program level are disseminated to relevant audiences to drive continuous improvement and stimulate further impact.
- Clinical care is risk-based, family-centered and child-focused. While a child may be affected by ECC, their disease is likely shared by other family members. The most effective strategies address the underlying cause of the disease within the family unit while providing definitive care to the child with ECC.

Efficiency

- Programs demonstrate cost savings or no increase in cost. Despite the increased time required for patient engagement, the overall cost of providing care can be reduced by delegation and expansion of duties.
- Clinical resources/programs are expanded through improved prevention. As care is delivered by an expanded workforce, dentists are able to provide more complex care for children at high-risk. The wait time for an appointment with an oral health care professional is reduced.
- Patient volume increases as clinical care improves. Children who are healthy due to strong prevention programs place less demand on clinical services, thus increasing access to clinical services for additional patients waiting for care.

[††] https://dentistry.ucsf.edu/research/cambra
[‡‡] www.openoralhealth.org

Demonstrated sustainability

- Successful ECC management creates healthier patients who require less invasive treatment in the future.
- Availability of services to more patients is increased through improved ECC management.
- Success and lessons learned are documented and disseminated beyond local systems to relevant audiences for the benefit of all children.

Collaboration and integration

- Programs should reach beyond the walls of traditional dental offices via interprofessional collaboration and integration. Oral health care teams may be co-located with primary care teams or take *care beyond the dental chair* into schools or other community sites.
- All clinical providers should practice *at the top of their scope of practice w*ith appropriate regulations set by informed state licensing boards along with comprehensive measurement programs to ensure evaluation and continual improvement.
- Programs should recruit new oral health allies and champions, thus expanding the reach of preventive messaging and availability of therapeutic interventions.

Objectives and rationale

- Program objectives are clearly defined along with a rationale for how care is delivered and received.
- The rationale should reach beyond the needs of children to the population with an appreciation for increasing capacity of the entire oral health system.
- Outcomes are reported and disseminated in peer-reviewed journals or at conferences to further drive objectives.

The challenge in identifying best and promising practices is due to the diverse array of systems in existence. The abundance of evidence for ECC treatment and prevention is the foundation for improved care delivery. Decades of clinical experience have demonstrated how oral disease can be addressed, but not necessarily how to best deliver care. The following examples can be considered encouraging models to emulate and improve upon.

Practice Examples

Table 1. Practice Examples Illustrating Strategies and Interventions for ECC Prevention and Management.

#	Practice Name	State	Practice #
1	Improving Medicaid Rates of Fluoride Varnish Application and Oral Health Assessment by Medical Professionals at Well-Child Visits	CT	08007
2	Ready, Set, Smile PA	MN	26016
3	Pediatric Program within Apple Tree Dental	MN	26017
4	Preventive Services Program (PSP): Missouri's Preventive Oral Health Program for Head Start Children	MO	28011
5	Smiles Across Montana – Improving Access to Care	MT	29004
6	Montshire Pediatric Dentistry: Inspire Wellness	NH	32008
7	Jicarilla Service Unit Dental Outreach Prevention Program	NM	34009
8	Fluoride Varnish Program	NM	34010
9	Firstgrin	NY	35009
10	Leveraging Consumer Experience Data in Safety-Net Oral Health Care Clinics	NC	36015
11	Integrated Dental Hygiene – A Simple Innovation Yielding Big	OK	39004

	Results		
12	Motivational Interviewing	OR	40010
13	Partners for Prevention	SD	47004
14	802 Smiles Network of School Dental Health Programs	VT	51009
15	Brush, Book, Bed Program (American Academy of Pediatrics)	AAP (IL)	99007
16	Protect Tiny Teeth Toolkit (American Academy of Pediatrics)	AAP (IL)	99008

Highlights of Practice Examples

CT Improving Medicaid Rates of Fluoride Varnish Application and Oral Health Assessment by Medical Professionals at Well-Child Visits (Practice #08007)

The Connecticut Medicaid Program administers the Access to Baby Care Program through its third-party administrator CT Dental Health Partnership (CTDHP). The program trains and certifies medical providers to conduct oral health assessments and apply fluoride varnish to children enrolled in Medicaid up to age seven during medical well-child visits. The training enables the provider to bill and be reimbursed by CT Medicaid. CTDHP developed reporting and analytic capabilities to enhance its Access to Baby Care Program model by providing ongoing performance improvement interventions.

MN Ready, Set, Smile PA (Practice #26016)

Ready, Set, Smile (RSS) is a community school-based program that provides portable dental clinics and classroom oral health education onsite at early childhood education centers, elementary, and middle schools with a high percentage of low-income children. About 20% of the children served are five years or younger. RSS conducts a simplified caries risk assessment that identifies the child as high or low risk. If a child is identified as high-risk, they receive an additional fluoride varnish (FV) treatment provided by a community health worker between their six-month visits. Services provided every six months include routine preventive care: cleaning, sealants (glass ionomer), FV and oral hygiene instruction. Silver diamine fluoride (SDF) is placed on all carious lesions to arrest or delay the decay process. When clinically possible, Silver Modified Atraumatic Restorative Therapy is provided. If further restorative care is necessary, children are referred to partner community clinics, which are culturally competent, accept Medicaid, and have a sliding fee scale for services. RSS follows up with families to ensure care has been provided. By helping families establish a dental home, RSS encourages the child to continue to receive affordable dental care.

MN Pediatric Program within Apple Tree Dental (Practice #26017)

This pediatric program within Apple Tree Dental embeds specialty care for children within a non-profit critical access dental provider organization. The goal is to decrease care intensity and cost for those requiring advanced services and shift the emphasis from surgical treatment to minimally invasive care and disease prevention. Pandemic-related disruptions accelerated growth and innovation within the pediatric program and expansion of telehealth already in use at Apple Tree. Motivational interviewing, minimally invasive techniques and intentional skill-building of individual staff members accelerated, strengthening the pediatric team as a whole. Patients are referred from diverse practices across the state. Referrals are triaged, beginning with a virtual initial visit using the MouthWatch Teledent platform and a detailed questionnaire structured to understand family concerns and goals.

MO Preventive Services Program (PSP): Missouri's Preventive Oral Health Program for Head Start Children (Practice #28011)

The Preventive Services Program (PSP) is dedicated to promoting and improving healthy smiles for all Missouri children through education and preventive services. This free program uses community involvement to implement evidence-based prevention strategies to improve oral health outcomes for children ages infant to 18 years of age. The program is coordinated through the Office of Oral Health. The PSP has four components: surveillance/screening (using the ASTDD Basic Screening Survey), oral health education, prevention services, and referral to community dentists who can address unmet dental needs. Data from Early Head Start/Head Start and schools is shared with school nurses via a summary report. Another reporting mechanism is an annual one-page report and a Tableau Dashboard that gives findings for all children for that year and is available on the Missouri Oral Health Program data webpage.

MT Smiles Across Montana – Improving Access to Care (Practice #29004)

Smiles Across Montana's (SAM) team of experienced dental assistants, dental hygienists and dentists provide preventive, diagnostic and minimal restorative dental services using mobile and tele-dental equipment to bring care to many Montanans who are financially or otherwise unable to access dental care. SAM has ten portable clinics and one three-chair mobile clinic that are set up in schools, nursing homes, Head Start classrooms, WIC clinics, homeless shelters, and community centers. They form close connections with the communities they serve. SAM seeks to improve medical-dental integration by providing nursing students with knowledge on general oral health, the connections between dental health and overall health, and services they can implement to communicate better, refer and document oral health concerns.

NH Montshire Pediatric Dentistry: Inspire Wellness (Practice #32008)

Montshire Pediatric Dentistry is a dental practice with an ambitious mission to "Inspire wellness and empower people to create the best world." They adopted the minimally invasive treatment philosophy and feel they have "cracked the code" to the triple aim of health care: improving the patient experience, improving the health of populations, and reducing per capita costs of health care. Montshire used evidence-based caries management guidelines, educating and empowering patients and their families to play an active role in achieving good oral health, and training staff to practice at the top of their scope of practice to operate more efficiently. There were few Medicaid providers to care for children in New Hampshire. By adopting the minimally invasive dentistry (MID) philosophy using medical management, Montshire was able to increase access to care. Training dental auxiliaries allows delegation of many treatments to increase dental access. One important goal for Montshire is to reduce the number of children who undergo sedation for treatment. There has been an estimated 90+% reduction in sedation cases utilizing MID techniques including education, silver diamine fluoride, glass ionomer sealants, and povidone iodine.

NM Jicarilla Service Unit Dental Outreach Prevention Program (Practice #34009)

Two-to-five-year-old American Indian children in the Jicarilla Service Unit patient population experience a caries rate approximately four times the national average. The Indian Health Service (IHS) sponsored Dental Outreach Prevention Program provided services to Native American children enrolled in the community's Head Start Program and elementary school. Service unit data from the Resource and Patient Management System (RPMS) and Dentrix electronic dental record revealed a 45% decay rate in this user population. Placement of dental sealants on non-carious permanent and primary molars in this age cohort is a proactive caries prevention modality. The IHS Division of Oral Health, through its ECC Collaborative, has encouraged its dental programs to increase access to oral health care and evidence-based prevention efforts through collaboration with medical providers, Community Health Representatives, Head Start Programs, and WIC programs. This multi-faceted approach is designed to enhance knowledge about ECC prevention and early intervention not only among dental providers, but also healthcare providers and the community.

NM Fluoride Varnish Program (Practice #34010)

The New Mexico (NM) Office of Oral Health (OOH) has implemented best practices to reduce the incidence of dental caries and increase the application of fluoride varnish and dental sealants and the frequency and quality of oral health education (improving oral health literacy). The activities of the OOH are aimed to reduce oral health disparities and achieve oral health equity among underserved communities in NM. The OOH provides preventive care to Early Head Start (EHS), Head Start (HS), preschool and school-aged children in urban/rural areas throughout NM. The OOH conducts a fluoride varnish (FV) program in EHS and HS centers. The program provides dental screening, three FV applications per year, oral health education and dental case management. Dental case management includes securing a dental home and finding treatment for uninsured and low-income children.

NY Firstgrin (Practice #35009)

Firstgrin's approach to oral health is a pioneering initiative that encompasses the entire family's oral care needs, starting from the pivotal prenatal phase. Recognizing the profound influence of oral health on overall well-being and its effects on both pregnant individuals and their babies, Firstgrin emphasizes initiating oral care early and educating adults with actionable insights. The Firstgrin mobile app is central to this mission, acting as a digital bridge connecting users to dental care providers based on their location. This user-friendly platform offers age-specific tips, a digital trauma guide, and a hygiene guide. It is

designed to empower families with the knowledge they need to take care of their oral health, thereby minimizing unnecessary emergency room visits. Complementing the app, Firstgrin provides specialized oral care kits tailored to different life stages, including those specific to pregnancy. These are distributed through a widespread network of insurance companies, dentists, OBGYNs, and pediatricians ensuring that essential oral care products reach a diverse audience.

NC Leveraging Consumer Experience Data in Safety-Net Oral Health Care Clinics (Practice #36015)

North Carolina safety-net oral health clinics, as part of an initiative advancing principles of value-driven care, measured consumer experience data and applied it to correlate improvements in consumer experience with clinical, financial, and operational outcomes. Associated training and consultation in provider-patient communication, shared decision-making, and trust-building (e.g., motivational interviewing) enabled clinics to act upon the data. This descriptive report provides a foundational blueprint for oral health care clinics interested in measuring consumer experience and leveraging the data for continuous improvement. While the project described was funded by private philanthropy, the report makes a case for long-term sustainability by generating positive return-on-investment through practice modifications designed to improve consumer experience and, in turn, measures of clinical and operational performance.

OK Integrated Dental Hygiene – A Simple Innovation Yielding Big Results (Practice #39004)

Oklahoma City Indian Clinic (OKCIC) continues to lead the way with medical-dental integration. OKCIC has implemented an Integrated Dental Hygiene program (I-RDH) that has demonstrated results and is expanding across the nation. Initially, the pilot focused on embedding an I-RDH into the Pediatrics Department. The results were so successful the program expanded and OKCIC now has an I-RDH in Pediatrics, the Prenatal Clinic and the Metabolic Care Center addressing diabetic patients.

OR Motivational Interviewing (Practice #40010)

Neighborhood Health Center (NHC) is a not-for-profit healthcare organization established to provide services to low-income, uninsured, and underinsured residents of Washington and Clackamas counties in northwestern Oregon. It serves patients in five primary care clinics, three dental clinics (one co-located with one of the primary care clinics) and two school-based health centers. In recent years, NHC became acutely aware of motivational interviewing (MI) as an effective evidence-based communication tool to help individuals make behavior changes to improve their health. MI helps clinicians approach patients in a collaborative, accepting and compassionate way to help identify their motivations for change and to commit to goals toward bettering their health. MI was the perfect complement to a 2018 dental-medical integration project at NHC using occupational therapy. This project used occupational science and a patient activation approach to engage pregnant women and children in primary care into dental services and home oral care routines.

SD Partners for Prevention (Practice #47004)

To increase access to preventive dental services, the Delta Dental of South Dakota Foundation (DDSD Foundation) created a program called Partners for Prevention that trains primary care medical providers on oral health, including instruction on the application of fluoride varnish (FV) to prevent dental caries. As part of the program, DDSD Foundation offers a no cost, “lunch and learn” style training for medical offices that is taught by a dental hygienist, who conducts follow-up inquiries with the clinics to learn if there are any barriers to implementation they can help address. A sustainability aspect of the program involves training nursing students, medical students, and medical residents so they understand oral health and the part they can play in preventing dental caries.

VT 802 Smiles Network of School Dental Health Programs (Practice #51009)

The 802 Smiles Network is a partnership between the Vermont Office of Oral Health (OOH), students and their families, school nurses, communities, and health care providers to support access to care and the best possible oral health for all Vermont children. 802 Smiles is made up of five tiers that align with the range of dental services offered. The highest Tiers (4 and 5) offer the most services, although organizations in every tier play an important part in helping kids access dental care. See this link for a description of each tier. Network members receive startup supplies, technical assistance and local support implementing school-based dental programs at whatever tier works for them. Members commit to providing the OOH with data regarding their program. The Network includes programs in Head Starts, and elementary, middle, and high schools; most of the programs in the network are in elementary schools.

AAP Brush, Book, Bed Program (American Academy of Pediatrics) (Practice #99007)

The Brush, Book, Bed program was developed for providers to reinforce three important health messages to parents: brush their children's teeth, read together, and establish a regular bedtime. This program promotes good oral hygiene, literacy, and sleep health. The program offers a poster, parent handout, sticker, and bookmark templates for free. This program works in both medical and dental settings and is targeted for children ages six months to six years.

AAP Protect Tiny Teeth Toolkit (American Academy of Pediatrics) (Practice #99008)

To support pediatricians in the implementation of oral health services and establish routine preventive care in infancy, the American Academy of Pediatrics created the Protect Tiny Teeth Toolkit, which includes communication and practice tools that can be used to educate health care professionals and families about oral health and to support integration of preventive oral health for pregnant patients and infants in medical settings.

Acknowledgements

This report is the result of efforts by the ASTDD Best Practices Committee to identify and provide information on developing successful practices that address ECC. The Committee extends a special thank you to Brian B. Nový, DDS for his partnership in the preparation of this report.

This publication was supported by the Health Resources and Services Administration (HRSA) of the U.S. Department of Health and Human Services (HHS) as part of an annual award totaling $1,321,950 with no funding from nongovernmental sources. The contents are those of the author(s) and do not necessarily represent the official views of, or endorsement by HRSA, HHS, or the U.S. government. For more information, please visit HRSA.gov. Additional funding support was provided by the CareQuest Institute for Oral Health.

The following members of the ASTDD Best Practices Committee and subject matter experts assisted in the development of this report. We are grateful for their review and valuable contributions.

Lori Kepler Cofano, RDH, BSDH
Consultant
ASTDD Best Practices Committee

Steve Geiermann, DDS, FICD, FACD
Chair, ASTDD Best Practices Committee

Irene Hilton, DDS, MPH, FACD
San Francisco Department of Public Health
Dental Consultant
National Network for Oral Health Access

Katrina Holt, MPH, MS, RD, FAND
Director, National Maternal and Child Oral Health Resource Center
Georgetown University

Jeremy Horst, DDS, PhD
Director, CareQuest Innovation Partners

Mike Monopoli, DMD, MPH, MS
Oral Health Advocate
Formally, CareQuest Institute for Oral Health

Deborah Teixeira, DDS, MEd
Oral Health Systems Administrator
Vermont Department of Health
Program Coordinator
802 Smiles Network of School Dental Health Programs

Christine Veschusio, DrPH
Adjunct Associate Professor, Health Sciences
Utica University
Affiliate Associate Professor, Division of Population Health
Medical University of South Carolina College of Dental Medicine

Christine Wood, RDH, BS
Executive Director, ASTDD

Suggested citation: Association of State and Territorial Dental Directors (ASTDD) Best Practices Committee. Best Practice Approach: Early Childhood Caries Prevention and Management [monograph on the Internet]. Reno, NV: Association of State and Territorial Dental Directors; Washington, DC: National Maternal and Child Oral Health Resource Center; 2023. 16 pp. Available from: http://www.astdd.org.

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