

## HEALING HANDS



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# Pediatric Oral Health: What Every HCH Provider Should Know

*Although the oral health of most Americans has improved since the 1970s, people living in poverty remain at especially high risk for chronic dental disease, and the prevalence of dental caries among children aged 2–5 years has increased during the last decade. Financial barriers to dental care, poor nutrition, lack of awareness of serious health risks associated with untreated tooth decay, and ignorance of the mechanisms by which infectious pathogens responsible for dental caries are transmitted from adults to young children partially explain this increase. New models of care focus on earlier screening for dental caries during pregnancy, infancy, and childhood; anticipatory guidance to primary care clinicians and adults responsible for infant and child care; and increased access to preventive dental care for people of all ages. The following articles explain the reasons for higher dental morbidity in children and what clinicians working with homeless families can do to address this critical health disparity.*

**BACKGROUND** In 2000, the Surgeon General declared oral health to be “essential to the general health and well-being of all Americans.”<sup>1</sup> Over 35 years of research and clinical practice have substantiated the relationship between poor oral health and other systemic disease, as well as the impact of oral health on diet, nutrition, self-image, and community activities including school and work. In addition, poverty significantly exacerbates oral health problems.<sup>1–4</sup> Despite a decline in tooth decay and loss in adolescent and adult populations since the 1970s, dental caries have increased in children and remain the most prevalent chronic disease of childhood, disproportionately affecting poor children.<sup>5–9</sup> Tooth decay in children is five times more common than asthma and seven times more common than hay fever.<sup>10</sup>

A combination of factors contribute to the increased incidence of dental caries in youngsters from 1 to 11 years, including early exposure to *Streptococcus mutans* (the bacterium that is primarily responsible for dental caries) by primary caregivers with untreated tooth decay, transmission of bacteria via pacifiers and utensils, use of bottle feeding to pacify infants (thereby exposing early dentition to excess sugar), poor nutrition exacerbated by an international shift to high-sugar diets, and limited access to dental care. Untreated caries can destroy early dentition and primary teeth and impede the development of healthy permanent teeth.<sup>2,5,11,12</sup>

**EPIDEMIOLOGY** Understanding the bacterial causes of tooth decay and poor oral health has played an important role in establishing the time frame, dietary risk factors, and socioeconomic roles related to widespread early childhood caries (ECC).<sup>11,13</sup> Armed with new knowledge that early colonization by *S. mutans* is a major risk factor for ECC and future dental caries and that it can begin before dentition in the furrows of the tongue, the American Academy of Pediatric Dentistry (AAPD) and the American Association of

Pediatrics (AAP) have tightened the dental evaluation timetable and recommend initial assessment during a child’s first year between six and twelve months of age and establishment of a dental home (i.e., an ongoing relationship with a dentist).<sup>13–15</sup>

Mothers with poor dental health—a risk factor associated with poverty—act as a vertical vector transferring the *S. mutans* in their saliva directly to the infant by tasting food before feeding, sharing utensils, or cleaning dropped pacifiers or toys in their mouths. Indeed, a mother’s poor oral health may be related to adverse pregnancy outcomes such as risk of preterm labor and low birth weights.<sup>10</sup> In addition, horizontal transmission of *S. mutans* in nursery school children from 12 to 30 months of age has been reported based on bacteriocin typing.<sup>13</sup> Established oral bacteria produce acid by fermenting carbohydrate food sources; the acid, in turn, dissolves tooth enamel when dentition begins.<sup>16</sup>

**DIETARY RISK FACTORS** ECC is fueled by prolonged sucking of liquids that contain sugars—sucrose, glucose, fructose—in soda, fruit juices, and infant formulas.<sup>13,16</sup> The continual use of bottles and sipping cups to pacify the infant during the day and in bed adds high levels of sugar to the oral cavity that cannot be cleared by normal salivary flow rate. Increased use of juice and soda instead of milk as infant food sources also decreases the amount of dietary calcium important to normal development of teeth and bones.<sup>16</sup> In addition, nutritional deficiencies in the mother’s prenatal diet may have impaired the infant’s tooth development.<sup>17</sup>

**ACCESS TO CARE** Research shows that children in low-income families are more likely than other children to have unmet dental health needs. Disparities in access to dental care reflect parental education, race and ethnicity, rural versus urban residence, as well as family income and access to health insurance with dental coverage.

Medicaid and the State Children's Health Insurance Program (SCHIP) are the most important sources of dental coverage for poor and near-poor children in the U.S.; yet access barriers remain, even for those who are eligible.<sup>18</sup> In many communities, dentists who accept Medicaid are rare.<sup>9</sup> Often homeless families with children do not enroll because of confusion about eligibility criteria, missing personal information, lack of required documentation, and failure to complete the enrollment process after application.<sup>19</sup> Moreover, dental benefits and outreach to underserved populations fluctuate in response to state budgetary pressures.<sup>6,7, 18</sup> Many state programs have become so fragmented that children they were originally intended to serve cannot find their way through the maze.

The following examples illustrate how poor access to dental care can result in grave health outcomes for children.

A homeless family in rural Maryland, the Drivers, had five sons and worked hard to make ends meet. The adults had no health insurance, but the boys were usually covered by Medicaid or the Maryland Children's Health Program. Their pediatrician was accessible and kept them up to date on physicals and immunizations. None of the family members had regular dental care. The older two boys had only limited tooth decay, but each successive child experienced increased and significant oral infection—a trait borne out by clinical observation linking later-order offspring to the mother's continually increasing *S. mutans* flora.<sup>20</sup>

In September 2006, Alyce Driver called Laurie Norris, a lawyer working with the Prince George's County Public Justice Center, for help. Norris had met the Driver family in July while interviewing homeless families about the public school system. The fourth Driver son, 10-year-old DaShawn, had developed several tooth abscesses and was in a lot of pain. During the summer, his mother had taken him to an oral surgeon who ultimately refused to treat the child because he was unable to hold still during the examination. She had made numerous calls to the child's Medicaid managed care plan but was unable to find another dentist who would see her child. As Ms. Norris testified in May 2007 at a Congressional subcommittee hearing, "it took the combined efforts of one mother, one lawyer [and her administrative assistant], one help-line supervisor, and three health care case management professionals [over the course of a week] to make a dental appointment for a single Medicaid-insured child."<sup>21</sup>

DaShawn was finally seen in October 2006 by a general dentist who determined that six teeth should be pulled by an oral surgeon. Again the case managers went to work to find an in-service provider; the earliest appointment available was scheduled for mid-November. However, the oral surgeon's office rescheduled the extractions and by January the dentist had canceled his contract with the child's carrier, necessitating yet another referral. All this time the boy continued to suffer pain, inflammation, and infection without even the relief of antibiotic therapy. Early bacterial colonization had led to DaShawn's poor dental health, which when combined with too few dentists willing to accept Medicaid patients and unreliable provider records and services resulted in a "Catch 22" scenario of grave proportions.

In mid-January, Mrs. Driver's 12-year-old son Deamonte developed severe headaches, which were first diagnosed as a sinus infection and later as a massive brain infection caused by an untreated infected tooth. In February 2007, during Deamonte's sixth week in the hospital, he appeared to be recovering from his two brain surgeries and one tooth extraction when he

died suddenly. During Deamonte's hospitalization, his mother learned about the University of Maryland dental school pediatric clinic where she would be able to have DaShawn's abscessed teeth pulled without further delay.<sup>21</sup>

The second case also involves the rampant oral disease that can develop from early ECC but earlier intervention prevented lifethreatening health consequences.



Young child with severe ECC



Photos, Judith Allen, DMD

In October 2003, **Judith Allen, DMD**, Clinical Director of the McMicken Dental Center Health Care for the Homeless Dental Project in Cincinnati, received a call from one of the shelter case workers about a youngster who was there with her grandmother. The little girl had recently been abandoned by her mother and would not eat, drink, talk, or open her mouth. "Would Dr. Judi please take a look at her?" When Dr. Allen was able to coax the child's mouth open, she found it full of tooth decay. The grandmother could only cry.

Dr. Allen was able to admit the child to the Cincinnati Children's Hospital Medical Center for oral surgery and all of her decayed teeth were extracted with coverage under SCHIP. While the removal of primary teeth is problematic to the development of permanent teeth and may cause malocclusions, there was no alternative in this case.

Results of the 2005 National Survey of Children's Health (NSCH) demonstrate the impact of dental insurance on access to preventive pediatric dental care. According to the NSCH, 28% of U.S. children in 2003 had no preventive dental care visit during the previous year. Variables associated with significantly lower likelihood of a preventive dental visit included being young, non-white race and ethnicity, lower income, lacking dental insurance, and lacking a personal doctor. Near-poor children in states with SCHIP dental coverage and broadest income eligibility standards had a 24% greater likelihood of receiving a preventive dental visit than children in states with limited or no dental coverage.<sup>7,8,22</sup>

Pediatric dental services are a mandatory benefit under Medicaid but an optional benefit under separate SCHIP plans. Currently, 39 states with a non-Medicaid Children's Health Insurance Program offer some level of dental services, although benefit caps in some states could make it difficult for children with poor oral health to get comprehensive care.<sup>18</sup> In 2006, 21.4% of HCH clients had Medicaid (Title XIX) coverage and only 0.7% were SCHIP (Title XXI) beneficiaries.<sup>23</sup>

# Promoting the Oral Health of Underserved Children

Today, we understand that good oral health care for children is important to ensure their general health and readiness to learn. To address limited access to dental care for poor, underserved, and homeless populations, clinicians are encouraged to advocate for community interventions and design creative solutions to meet their clients' needs.<sup>10</sup> While rural, urban and suburban communities face different challenges, interdisciplinary teams and public-private partnerships are making headway in a number of jurisdictions.

## PARENT & CLINICIAN EDUCATION

In 2003, the Association of Clinicians for the Underserved (ACU) developed a transdisciplinary training program with support from the Robert Wood Johnson and webMethods Foundations—the Early Childhood Caries Project. **Lois Wessel, RN, MS, CFNP**, Instructor of Community Health Nursing at Catholic University in Washington, DC, describes this project as bridging a gap in health care education:

“We saw a need to educate clinicians and parents. Many folks think tooth decay is a genetic problem and don't realize that it's caused by bacteria, which can be transmitted from caregiver to infant.” So the ACU found grant money, designed the program, and gathered educational materials.

Sharing the knowledge that the infectious organisms that cause tooth decay are contagious and that infants contract them from caregivers through shared food and utensils is a vital step that encourages parents to think about the importance of their own oral health.

A second program objective was to increase the comfort level of primary care providers and all members of the clinical team with basic dental

screening. Physicians regularly saw infants and toddlers for routine well child visits and knew there were dental problems but had little training in oral care, whereas dentists seldom saw young children.

“We used community presentations and CME trainings” to cross-train these clinicians, explains Ms. Wessel. “Each participant received a tool kit with pertinent articles, an educational poster, and patient education materials that included laminated preventive health care cards about infant oral health care. All printed information was available in English and Spanish.” A pretest, posttest, and six-month follow-up questionnaire assessed how well the participants incorporated their new knowledge into clinical practice. Physicians, RNs, nurse practitioners, dentists, allied health workers, and medical students were part of the CME trainings.

Parents, outreach workers, and social workers learned to do assessments from the presentations as well. Educational sessions were presented by a dentist and nurse practitioner team that:<sup>24</sup>

- Specified the role of primary teeth and the benefits of oral health for both pregnant women and children;
- Explained the etiology of tooth decay, risks factors, and costs associated with early childhood caries (ECC);
- Taught clinicians to perform an oral examination and recognize early signs of ECC;
- Provided materials to use for appropriate anticipatory guidance of parents and children;
- Described treatment strategies; and
- Discussed the infectious cycle of bacterial transmission from parent to child and how to stop the spread of infection.

In addition, participants watched the video “Lift the Lip,” produced by the University of Washington's Department of Dentistry, which demonstrates how parents can assess their infant for early signs of ECC. Hands-on training was provided using the knee-to-knee oral evaluation model in which the infant is cradled between parent and clinician in a comfortable and secure position.

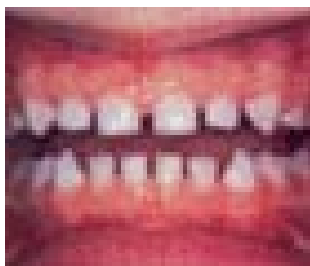


Photo, Judith Allen, DMD

### Knee-to-knee examination

Participants learned that the child's mouth will open automatically or with slight downward finger pressure inside the lower lip. Then they looked for signs of obvious plaque on the teeth, developmental abnormalities, and tooth color ranging from opaque white spots along the gum (decalcifications) to brown spots and cavities.

**Scott Wolpin, DMD**, Chief Dental Officer of the Choptank Community Health System, Inc., on Maryland's Eastern Shore, was also a trainer in the ACU project. He collaborates with non-dental clinicians who will be seeing infants and toddlers multiple times during the first years of life and provides training in risk assessment, sharing anticipatory guidance, and delivery of preventive dental services.



Photo, Judith Allen, DMD

### Healthy infant mouth



Courtesy, Scott Wolpin, DMD

### Signs of early ECC with white spots at gum



Photo, Judith Allen, DMD

### Medium ECC with brown spots and decay

Dr. Wolpin offers five tips for clinicians to promote good oral health for children:

1. **Ensure early intervention** by establishing a dental home for all children before age one.
2. **Reduce dental disease in caregivers' mouths**, if possible by directly linking them with restorative care.
3. **Provide age-specific and relevant anticipatory guidance** to prevent ECC and injuries.
4. **Appreciate and mitigate cultural issues that present obstacle to prevention** (e.g., multiple families living together where the mom tries to keep the baby quiet for others by improper feeding or using the bottle as a pacifier).
5. **Apply evidence-based clinical preventive interventions** (e.g., fluoride varnish, sealants).

Dr. Wolpin says, "The Choptank System targets delivery of care to children on free or reduced lunch programs, provides schoolbased services to these children because access is an issue for high risk populations, partners with community agencies (e.g., WIC, HeadStart), and builds advocacy through their medical providers who now have a heightened awareness of oral health and well-being (e.g., the relationship between low birth weight babies and women with periodontal disease)."

**MOBILE DENTAL CARE VANS** At the 2007 National HCH Conference in Washington, DC, **Lawrence F. Hill, DDS, MPH**, Dental Director of the Cincinnati Health Department, talked about the challenges of bringing dental care to poor and underserved people in a large city. "Fixed-site clinics have many pluses in terms of capital outlay, work space, staffing, and upkeep, but access can be a big problem," he said.

The Cincinnati community, school nurses, and HeadStart staff wanted a mobile van to increase the number of children linked to a dental home. The van has had a major impact

on youngsters. "It is bright and lively and a constant advertisement for personal oral hygiene and the smiles that good oral health care can provide," explains Dr. Hill. "People love to give money for them—vans almost sell themselves."

The Health Department designed the two-chair dental van to accommodate one dentist, two assistants, and a driver-receptionist-manager. "Though start-up costs for a van exceed those of a school-based clinic, its ability to visit multiple schools each year make capital expense fairly equivalent," Dr. Hill adds.

To maximize its effectiveness, the mobile dental program needs: (1) a strong staff liaison with schools, (2) cooperative school personnel to coordinate students' dental visits, (3) linkages to pediatric specialists and safety net providers, (4) a solid plan of care and revenue stream when schools aren't in session, and (5) MORE vans. Most important, Dr. Hill advises: "Know whom you want to serve; have a business plan;<sup>24</sup> design the facility (van or fixed-site) that you want; and then raise the money. Whatever you do, include an experienced dental public health professional in the planning process to get the best return on investment."

In 2003, **Frances White, DDS**, was instrumental in getting the mobile dental program started for the Grace Hill Neighborhood Health Centers HCH project in St. Louis. The first single-chair van was so successful that they purchased a second van for pediatric services, but soon found that it was redundant—they could easily transport light-weight pediatric equipment for checkups, fluoride varnishes, and sealants from site to site in a car. That freed the second van for adults too.

Currently, Dr. White works mostly in men's shelters, but over the years, she has worked with many shelter kids and their moms. "We always try to have pregnant women get a

cleaning at about five months, when the gums really get inflamed," she says. "That's when I discuss infant tooth care:

- Babies are born with germ free mouths, so if you have cavities, they're going to catch 'em from you.
- Clean the teeth as they erupt; the corner of a clean wash cloth works fine, but no toothpaste until the child is old enough to spit.
- Take children to the dentist when they're young. Several non-traumatic visits make for a good patient—and even more important, people who won't fear dentists all their lives.
- Don't send babies to bed with a bottle unless it contains water, and stop bottle feeding at one year of age."

**EARLY INTERVENTION** Because tooth decay should be a preventable disease, the AAPD and the AAP have jointly endorsed a program of early intervention to identify infants who may develop ECC and ensuing dental disease. Ideally, preventive measures will begin during gestation with the pregnant woman and continue with mother and infant at approximately six months of age.

The first oral health risk assessments can be completed at the six-month check-up by a pediatrician or qualified pediatric healthcare professional using the Caries Risk Assessment Tool.<sup>20,26</sup> Referral to a dentist after the first tooth erupts or by 12 months will establish the child's dental home, where parent and infant should receive:

- An accurate assessment for dental diseases and risk;
- Anticipatory guidance about growth and development including feeding practices, teething, finger sucking and pacifier use;
- Information about proper care of the child's teeth, nutrition, and dietary practices;
- Regular comprehensive and emergency dental care; and
- Referrals to other dental specialists as necessary.



Photos, Ansell Horn, PhD, FNP



Cincinnati Mobile Dental Health Care Van



**ANTICIPATORY GUIDANCE** In order to delay infant bacterial colonization, mothers and other intimate caregivers should be encouraged to add these steps to their own oral hygiene:<sup>20</sup>

- Brush morning and evening with an ADA-approved fluoridated toothpaste, flossing at least once a day, and rinse nightly with an over-the-counter alcohol-free 0.5% sodium fluoride mouth rinse.
- Consume fruit juices only at meals and avoid carbonated beverages during the infant's first 30 months of life.
- Have teeth examined and all decay restored as soon as possible.
- Avoid infecting the infant with dental flora from shared spoons or by cleaning pacifiers in own mouth or with saliva.
- Chew xylitol gums (4 pieces per day by the mother has been reported to have a significant decrease in the child's caries rates).

As soon as the child's teeth begin to erupt, parents should begin to brush them twice a day while continuing to clean the child's mouth with a damp cloth after meals. Fruit juices should be restricted to one cup a day during meals, and carbonated beverages should NOT be part of the baby's diet. If a bottle is placed in bed with the infant, it should only contain water.

## Q&A: ORAL HEALTH PRACTICES FOR CLINICIANS

**What's the first step in establishing good pediatric oral health practices?** Make sure that all shelter and clinical staff understand the infectious cycle of bacterial (*S. mutans*) tooth decay and the ongoing pain and suffering, systemic illness, malocclusions, and cost of care for children who develop untreated early childhood caries (ECC).

**How can clinicians break the cycle of infection?** Start with community and school education programs. Ensure that thorough dental assessments, teeth cleanings, and restorations for any decay are integrated into prenatal care. Continually provide expectant parents and other caregivers with anticipatory guidance about the development of babies' teeth and the impact of good oral health on a child's overall and ongoing well-being. Excellent resources are available through the AAPD, APP, ASTDD, and NMCOHRC websites.<sup>26-28</sup>

**What information is most important for practitioners to share with patients who are parents or parents-to-be?**

- ECC is an infectious disease.
- Oral health care for children begins even before gestation and requires that the mother and other caregivers understand and practice good oral hygiene for themselves and the newborn.
- Babies should have an oral health assessment at every well child checkup during the first year and be referred to a dentist skilled in early childhood care at the eruption of the first tooth or by the first year of age.<sup>29</sup>
- Parents and caregivers should be taught how high sugar diets feed and multiply the *S. mutans* bacteria responsible for tooth decay.
- Health care providers should explain the availability of dental care through Medicaid and SCHIP and help their clients navigate application and enrollment procedures.
- Municipal fluoridated water is a better choice than bottled water because fluoride is one of the best preventives of tooth decay.

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