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# Instituting an Oral Health Preventive Service Program, Including Fluoride Varnish, for Preschool Children Birth to Five Years in a Rural Health Clinic: A clinical Scholarship Project

Carol Ann Berger

University of Missouri-St. Louis, [hardboundinc@yahoo.com](mailto:hardboundinc@yahoo.com)

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Instituting an Oral Health Preventive Service Program, Including Fluoride Varnish, for  
Preschool Children Birth to Five Years in a Rural Health Clinic:

A clinical Scholarship Project

By

Carol Berger,

B.S.N., Nursing, University of Missouri – St. Louis, 2007

M.S.N., Nursing, University of Missouri – St. Louis, 2009

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Advisory Committee

Jean Bachman, DSN  
Chairperson

Susan Farberman, Med, CPNP, DNP

Anne Fish, PhD, RN, FAHA

Gregory G. Casalone, D.D.S

### **Abstract**

This project was designed to institute an oral health preventive program in a rural health clinic, in a dental provider shortage area, promoting oral health in preschool children birth to five years by: (a) instituting a program that supports the Missouri preventive service program in oral health, (b) promoting oral screenings and fluoride varnish twice yearly, (c) assessing the risk of caries, (d) referring to appropriate dental services and (e) educating parents or guardian about the importance of oral health and how to maintain oral health at home with children birth to five years. This project sought to answer the following questions: (1) Will children birth to five years in a rural health clinic have low, moderate, or high risk for caries? (2) Are there specific risk factors in children birth to five years in a rural health clinic that are more common in the high risk category for caries? (3) Is there a specific ethnic group in children birth to five years in rural health clinics that are at a higher risk for caries? (4) Are oral health educational materials an effective tool for the parents? Key findings were: The majority of the children 35 (97.2%) had never been seen by a dentist; 27 (75%) were in the High Risk category for early childhood cavities, 3 (8.3%) were found to have white spot lesions, the first sign of decay, 8 (22%) had evidence of rampant decay (seven or more cavities), 9 (25%) had untreated decay, 10 (27.8%) had evidence of early childhood cavities; urgent referral for extensive cavities was needed by 9 (25%) of the children, 6 (67%) were African American and Hispanic. There was insufficient time to evaluate if educational materials were an effective tool. Findings from this study clearly demonstrate that an oral

health preventive service program, which includes the application of fluoride varnish, be a part of the well child exam and should begin earlier than school age children.

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**Table of Contents**

Abstract ..... 2

Acknowledgement ..... 3

Purpose of Project ..... 7

    Issue and rationale for project ..... 7

    Baseline data ..... 9

    Significance of oral health preventive services to health care and nursing practice.  
 ..... 11

    Epidemiologic relevance to population health outcomes ..... 13

Literature Review ..... 14

    Etiology of dental caries ..... 14

    Bacterial Transmission ..... 15

    Nutritional Causes ..... 16

    Oral Hygiene ..... 18

Oral Health Prevention Strategies Including Fluoride Varnish Application by PCP ..... 18

    Parental education of oral hygiene ..... 19

    Nutritional education ..... 19

    Primary care provider education ..... 20

    Health Care Provider Based Risk Assessment Oral Preventive Program ..... 23

    Fluoride Varnish ..... 24

Summary ..... 26

Final Evidence of Project Completion ..... 26

Project Design.....	27
Training.....	27
Setting and Sample .....	27
Protection of Human Subjects .....	28
Instruments for Data Collection.....	29
Educational Materials .....	29
Recruitment of Subjects.....	30
Procedure for Data Collection .....	31
Results.....	32
Research Questions.....	32
Discussion of Results.....	34
1. Painful Rampant Decay .....	35
2. “Baby Bottle Tooth Decay” .....	35
3. Upper First Molar .....	35
4. Disfigurement from Fracture .....	35
5. First and Second Bottom Primary Molar .....	36
6. Missing Teeth from Previous Surgical Extraction, Rampant Decay .....	36
7. Upper First Molar .....	36
8. Lower Right Second Molar.....	36
Implications for Practice.....	39
Children and Families.....	40
Advanced Practice Nursing.....	40
Plans for Dissemination .....	42

Influence on Doctoral of Nursing Practice .....	43
References.....	45
Appendices.....	51
A. Modified Informed Consent in English and Spanish.....	51
B. The American Academy of Pediatric Dentistry CAT Tool .....	51
C. Missouri Department of Health and Senior Services Survey Tool.....	51
D. Children’s Oral Health fact sheet in English/Spanish.....	51
E. Brush Up on Healthy Teeth, Simple Steps for Kids’ Smiles in English/Spanish.....	51
F. A Quiz for Parents about Simple Steps for Kids’ Smiles in English/Spanish.....	51

## **Introduction**

This project piloted an oral health program for children birth to five years in a rural health clinic where there are limited dental services. An oral exam is considered standard of care during a well-child visit; however, it is not standard of care for primary care providers (PCPs) including nurse practitioners, to apply fluoride varnish to children's teeth during this exam. This project sought to determine if including an oral health program which included fluoride varnish by nurse practitioners could help meet the need for oral health services and improve access to oral health care in children birth to five years.

### **Purpose of Project**

The purpose of this project was to promote oral health in preschool children birth to five years in a rural health clinic by: (a) instituting a program that supports the Missouri preventive service program in oral health, (b) promoting oral screenings and fluoride varnish twice yearly, (c) assessing the risk of caries, (d) referring to appropriate dental services, and (e) educating parents or guardian about the importance of oral health and how to maintain oral health at home with their children birth to five years.

**Issue and rationale for project.** Children are our most valuable resource. Health care professionals should do everything in their power to ensure children grow up in a healthy way. Early childhood cavities (ECC) are the most infectious chronic disease of childhood in the United States, five times more prevalent than asthma (Barber, & Wilkins, 2002; Kressin et al., 2009; Ramos-Gomez, Jue, & Bonta, 2002; Ramos-Gomez, Crystal, Ng, Tinanoff, & Featherstone, 2010; Marrs, Trumbley, & Malik, 2011; Parisotto,



Steiner-Oliveira, Silva, Rodrigues, & Santos, 2010; Yost & Li, 2008). ECC is defined as “the presence of one or more decayed (noncavitated or cavitated lesions), missing (due to caries, or filled tooth surfaces) in any primary tooth in a child 71 months of age or younger” (American Academy of Pediatric Dentistry [AAPD], 2008) ECC is a multifactorial disease involving bacteria, diet, feeding habits, and socioeconomic factors (Barber, & Wilkins; Kressin et al.; Ramos-Gomez et al., 2002; Ramos-Gomez et al., 2010; Marrs et al.; Parisotto et al.; Yost & Li). According to the CDC caries are the most prevalent infectious disease for our children with more than 40% having caries by the time they reach kindergarten. Although there is a declining prevalence of caries in older children, poor US children under the age of 5 have an increasing prevalence (AAPD, 2011). Ramos-Gomez et al. (2002) point out that the intervention of oral disease needs to start before cavities are detected, claiming that the infection is present before cavities develop.

In 2001, the Surgeon General released a report detailing the condition of oral health in the United States (U.S.). This report stated that oral health does not just mean healthy teeth: oral health is a reflection of general health; safe and effective treatments for oral diseases are grossly under-utilized; and this under-utilization in communities that are socio-economically challenged has resulted in an epidemic of oral disease which affects the most vulnerable (poor children, elderly, and ethnic and racial minorities) (U.S. Department of Health and Human Services, [HHS], 2001). This report challenged policy-makers, PCPs, states, and communities to develop oral health programs and policies to address this national concern (HHS, 2001). In 2003 “*A National Call to Action to Promote Oral Health*”, was released by the Surgeon General which provided a

framework for oral health agendas to be developed at both the state and local levels (HHS, 2003). Other studies supported the Surgeon General's assessment that ECC disproportionately affects the poor and under-privileged children of our county (Kressin et al., 2009; Marrs et al., 2011).

Oral disease in children is progressive and can lead to problems with pain, abscess, weight loss, low self-esteem, learning difficulties, speech problems, and affect quality of life (Marrs et al., 2011; Yost & Li, 2008). According to the AAPD (2009), children from low socio-economic status, who consume a diet high in sugar, and who come from a family with a low-educational level, are 32 times more likely to experience ECC. Oral disease is highly preventable. With appropriate education of parents about dental care for their children and early screening techniques, the risk of ECC can be greatly reduced (AAPD, 2010a; Ramos-Gomez et al., 2002; Ramos-Gomez et al., 2010; Yost & Li, 2008). ECC, if unchecked, leads to a more progressive oral health disease and increased expense. Kressin et al. (2009) points out that often, untreated ECC leads to serious illness and repair requiring surgical intervention under general anesthetic (Kressin et al.; Marrs et al.).

**Baseline data.** There is a growing body of evidence that early intervention in the form of education and screening, especially in the high-risk populations, will decrease the incidence of ECC (Carvalho, Salazar, deOliveira, & Coutinho, 2010; Ferreira, Aragao, Rosa, Sampaio, & deMenezes, 2009; Kowash, Toumba, & Curzon, 2006; Macintosh, Schroth, Edwards, Harris, Mellon, & 2010; Marrs et al., 2011). However, access to dental care especially in high-risk groups can prove to be challenging (Kressin et al., 2009). One of the barriers in accessing dental care is lack of dental providers. The Missouri

Department of Health Senior Services (2009) report that 50 of 114 Missouri counties qualify as dental health professional shortage areas and many dentists in Missouri do not accept Medicaid as payment; of the 2595 registered dentists in Missouri, only 518 or 20 % of dentists billed Medicaid for services in Missouri in 2009; and as a result, of the 635,000 children enrolled in Missouri Health Net (Medicaid), 80 %, 508,000 will not have access to care. Even with dental insurance, only 62.6 % of children saw a dentist annually, which is under the national average of 71.3% (Missouri Dept of Health and Senior Services, 2009). Another barrier is parents' lack of education and understanding of the importance and methods of oral care at home with their children that include proper cleaning technique, frequency of feeding, and use of fluoride (Academy of General Dentistry, 2010; Feldens, Vitolo, & Drachler, 2007; Marrs et al.).

Missouri responded to this call to action from the Surgeon General to decrease disparities in oral health care by conducting a survey in 2004 to evaluate the state of oral health in Missouri children. One-hundred thirteen Missouri schools participated in the "*Show Me Your Smile*" survey. This was a representative sample study of Missouri children in the third grade. The results found of the 7266 children who were enrolled in school in the third grade, 3525 of them were successfully screened for oral decay. Other results include: (a) 55% of third graders and 46% of special needs children had cavities or fillings; (b) 27% of third graders and special needs children needed fillings; (c) 5% of third graders needed urgent dental care; and (d) 29% of the children had dental sealants (Missouri Department of Health Senior Services, 2005). These figures were worse for African-American children and for children in low income school settings where greater than 75% were eligible for free or reduced meals. These results supported the need for

earlier intervention and education of parents (Missouri Department of Health Senior Services, 2005).

In 2009 in Missouri, an access to care initiative was planned to bring together both dental providers and non-dental providers in a way that increased screening and referral services (Missouri Department of Health Senior Services, 2009). According to the National Center for Health Statistics (2006), 88 % of American children see a pediatrician or primary care provider annually. Expanding dental screening by PCPs at well-child visits is an attractive approach to increase oral health care screenings and referrals to a dentist, emphasizing the need for a dental home by the age of one, which follows the recommendation of the AAPD (2009).

**Significance of oral health preventive services to health care and nursing practice.** The growing body of evidence in the literature of the deleterious effects of ECC on children has prompted an increased interest and commitment by PCPs to provide the necessary oral health screening and education to parents (AAPD, 2008; Kressin et al., 2009). This project is important because nursing plays a unique role since often nurses are the first health care provider a parent or child encounters. Nurses are advocates for health promotion and are educators. Although the PCP, to include nurse practitioners, will conduct the oral screening in an office environment, the nurse may be responsible for the reinforcement of education and may also serve in a case-management role to help find resources for children who need referrals for urgent or follow up care (AAPD, 2009; Marrs et al., 2011). Nurses may also find themselves in the community or in the public health arena where they are the oral health screener as well as the educator. Finally nurses may also need the skills to become involved in the legislative process by educating

their representative of the need for funding oral health preventive services, a national health problem.

Educating non-dental health care providers, which would include the pediatrician, nurse practitioners, physician assistants, and nurses about the importance of oral health screening of children and the education of their parents will help meet the goals of Healthy People 2020 (HHS 2011): (a) OH-1.1 -Reduce the proportion of young children three to five years with dental caries experience in their primary teeth; (b) OH 2.1- Reduce the proportion of young children aged three to five years with untreated dental decay in their primary teeth; (c) OH-7- Increase the proportion of children, adolescents, and adults who used the oral health care system in the past year (d) OH-8- Increase the proportion of low-income children and adolescents who received any preventive dental service during the past year; (e) OH 10.1- Increase the proportion of Federally Qualified Health Centers that have an oral health care program; (f) OH-11- Increase the proportion of patients who receive oral health services at Federally Qualified Health Centers each year.

Educating non-dental health care providers, which would include the pediatricians and nurse practitioners, about the importance of oral health screening of children and the education of their parents will also meet the Missouri goal number three, “promoting and working with pediatricians and family practitioners to include an oral health focus during well-baby visits and annual exams” (Missouri Department of Health Senior Services, 2009, p. 47). Several studies have reported the effectiveness of educating non-dental health care providers (including PCPs) to provide oral health preventive services as an

effective means of reaching more children (Kressin et al., 2009; Okuneri, Szabo, Jackson, Pajewski, & Garcia, 2009; Ramoz-Gomez et al., 2010).

**Epidemiologic relevance to population health outcomes.** Advocating for fluoridated water is another area of concern. Since the 1970s there has been a decrease in dental caries with the introduction of fluoridated water. However, there are still one hundred million U.S. citizens who live in areas where fluoridated water is not available and 58% percent of U.S. citizens do not receive adequate levels of fluoride (Marr et al., 2011; Yost & Li, 2008). A survey by the National Health and Nutrition Examination (NHANES) which is an on-going representative survey of civilian U.S. citizens ages two months and older who are not institutionalized, conducted between 1988-1994 and again in 1999-2002, showed that although there was no change in the prevalence of caries in children ages two to eleven in primary teeth, there was with a reduction in caries in permanent teeth in children ages six to nineteen (CDC, 2005).

According to several studies, fluoride acts as a way to stabilize the tooth and enhance re-mineralization of the tooth surface (Barber & Wilkins, 2002; Ferreira et al., 2009; Gold, 2005). Fluoride is available in drinking water, toothpaste, rinses, and as a varnish. It has also been shown that a combination of fluoride sources is recommended to high risk individuals including children birth to five years of age (AAPD, 2008; 2009).

In response to the *Healthy Smiles* survey conducted by Missouri for Children, (Missouri Department of Health Senior Services, 2005), the Preventive Service Program (PSP) was developed in an effort to help communities take control and responsibility for their oral health. The PSP program is being implemented at various sites throughout the state of Missouri including Women, Infants, and Children (WIC) centers, Head-Start

programs, area schools. Some of the goals of the PSP in Missouri include: (a) increasing access to care, (b) educating the community about oral health, and (c) increasing the workforce through volunteers, non-dental providers, and health care providers that include oral health screening and fluoride varnish as a part of the well child visit.

Combating ECC will take a multidisciplinary effort involving dental providers, primary health care providers, nurses, volunteers, and communities to raise awareness of preventative methods. Advocating for congressional action to provide the necessary funding for preventive oral health services to impact what the Surgeon General report (2000) calls an “epidemic of oral disease” will also take a group effort (p. vii).

### **Literature Review**

This section includes a comprehensive review of the literature related to dental health in children. Key words for this literature review include dental caries, early childhood caries, children, baby bottle decay, and fluoride varnish.

#### **Etiology of dental caries**

One of the most significant trends in oral care and treatment is the recognition that dental caries are an infectious process that is multifactorial and of bacterial origin that can be transmitted vertically from mother to child even before the first tooth erupts (Barber & Wilkins, 2002; Parisotto et al., 2010; Ramos-Gomez et al., 2010). To understand how to prevent and treat cavities, an understanding of how cavities develop must be achieved.

Dental caries develop when the interaction of cariogenic bacteria (mainly streptococcus mutans) combine with fermentable carbohydrates such as juice or milk to form acidic byproducts that will soften the tooth enamel and start the demineralization process (Barber & Wilkins, 2002; Marrs et al., 2011; Yost & Li, 2008). Some factors

such as race or socio-economic factors cannot be changed; however factors that can be changed to help reduce or eliminate dental caries include bacterial transmission, nutritional practices, oral hygiene, and oral health preventative measures including oral screening and fluoride varnish applied by health care professionals.

### **Bacterial Transmission**

A systematic review, conducted by Parisotto et al. (2010) consisting of sixteen original research articles, along with other research, supports the fact that the colonization of the oral cavity by streptococci mutans provide a strong risk factor for the development of ECC (Barber & Wilkins, 2002; Marrs et al., 2011; Parisotto et al.; & Ramos-Gomez et al., 2010). According to Ramos-Gomez et al., streptococci mutans are one of the most important pathogens in the development of caries because of their ability to stick to the tooth. When the bacteria mix with carbohydrates in food; acetic, lactic, propionic, and formic acids form and begin the demineralization process of the tooth enamel (Marrs et al.). These early lesions will appear as white spots on a solid unbroken tooth surface, as this process continues the color will change from yellow to brown (Marrs et al.). With adequate levels of calcium, phosphate and fluoride at the tooth-plaque junction the integrity of the tooth can be better protected (Barber & Wilkins, 2002).

Decreasing the bacterial transmission from mother to child is the first step in preventing ECC (Marr et al., 2011; Ramos-Gomez et al., 2010). Studies report that prevention of ECC should start with prenatal care (Marrs et al.; Ramos-Gomez et al.). By educating mothers during prenatal visits of the importance of oral health during pregnancy, the pathogenic bacterial levels in the mother teeth may decrease (Ramos-Gomez et al.). There is a positive correlation between decreasing pathogenic bacterial



levels in the mother and delaying or preventing the development of ECC in children (Marrs et al.; Ramos-Gomez et al.). Transmission occurs through the exchange of saliva between the mother and the child (Ramos-Gomez et al.). Current research suggests this transmission from mother to child occurs between seven and eight months up through 36 months (Marrs et al.), however other research indicates that children as young as three months may be affected (Parisotto et al., 2010).

### **Nutritional Causes**

Dietary habits are another factor in ECC. Infants are at greatest risk because newly formed teeth are exposed for long periods of time to sugary foods such as milk and juice (Parisotto et al., 2010; Yost & Li, 2008). In a study conducted by Palmer et al. (2010), nutritional factors were related to the development of severe ECC and results showed an interaction between the susceptible host, cariogenic bacteria, and a cariogenic diet. Two studies reported that a cariogenic diet consists of sugars that are contained in fermentable carbohydrates such as milk, juice, and starches (Marrs et al., 2011; Palmer et al.). The guideline for a cariogenic diet in the study conducted by Palmer et al., indicated foods that have a protective effect against cavity formation (a) cheese, nuts, and xylitol; (b) non- cariogenic food (cario zero) meat, fish, chicken, butter, oil, eggs, beans, or raw vegetables; and foods that do not have a protective effect (c) low cariogenic foods (cario one) rice, pasta, milk, fresh fruit, yogurt, cooked vegetables; (d) medium cariogenic foods (cario two), juice, ice cream, sweetened yogurt, soda; and (e) high cariogenic foods (cario three) bread, chips, crackers, cookies, bananas, jelly and jam (Palmer et al). Children in the study were between the ages of two to six years. Seventy-two children had severe early childhood cavities and thirty-eight were without cavities (Palmer et al.). Palmer et

al. also reported that children who: (a) developed severe early childhood cavities had a higher incidence of between meal juices, whereas eating and drinking during a meal was not a major risk factor, (b) children who drank more milk between meals showed fewer cavities than children who did not, (c) children who ate just before going to bed or during the night showed a strong association with cavities, and (d) children who ate food that were high in retentive sugars and starch/sugar combinations (cario three) were positively correlated with an increase in ECC.

Baby bottle tooth decay is another established cause for ECC. According to Kanellis, Logan, and Jakobsen (1997), even with knowledge and education, many parents continue the practice of putting their babies to bed with baby bottles that contain sugary substances or milk. According to Marrs et al. (2011), sucrose is the carbohydrate most associated with dental caries. In a study conducted by Hallett and O'Rourke (2002), 3,375 Australian children between the ages of two to six were studied and a significant positive correlation was found between children who developed ECC and children who sipped from a cup during the day or went to bed with a bottle. Smith and Moffatt (1998) examined the literature as it pertained to baby bottle tooth decay and countered that teeth are formed in utero; and noted children born to mothers from low socio-economic status were at the highest risk for ECC, because their mother's diets were low in calcium and Vitamin D, making the teeth of these babies weaker and more susceptible to the cariogenic properties of milk, and sugary food. Smith and Moffatt suggested a shift from a focus of baby bottle tooth decay to teaching prenatal mothers how to take care of their own teeth thus supporting the fact that if you reduce the pathogenic bacteria of the mother you will protect the offspring.

**Oral Hygiene**

Many times parents are faced with fussy or uncooperative children who do not want someone else putting fingers inside their mouths. Teaching parents how to properly brush and floss their children's teeth according to Marrs et al. (2011) has had some of the most positive effects on decreasing ECC. Yost et al. (2008) points out that lack of adequate oral hygiene plays a key role in the development of caries in young children, and that these poor oral hygiene habits are passed from one generation to the other. Kanellis et al. (1997) point out that education alone is not enough to change parental behavior, an attitude change must also occur. According to the Academy of General Dentistry (AGD) (2008), providers who used motivational interviewing techniques with education of oral care were more successful at changing parental behavior at home than when providers used traditional educational methods, motivational interviewing involves individualizing a plan of care with the parents actively participating in developing the plan that will best benefit their child (AGD). The AAPD (2009) also supports the use of motivational interviewing as a method to help improve home health habits.

**Oral Health Prevention Strategies Including Fluoride Varnish Application by PCP**

According to Ramos-Gomez et al. (2010), health care providers are in an excellent position to educate parents about oral health care, and noted that PCPs see infants frequently during the first few years of their life. This gives PCPs multiple opportunities to reinforce anticipatory guidance as it pertains to oral health preventive strategies, and reinforce the need for parents to find a dental home before their child's first birthday (Ramos-Gomez et al.). Education can be divided into two categories; (a) parental education as it pertains to general oral hygiene practices and diet, and (b)

provider education as it pertains to oral caries as a disease process, anticipatory guidance and recommendations, as well as oral screening and fluoride varnish application.

**Parental education of oral hygiene.** The AAPD (2009) recommends that all parents be taught dental hygiene for their children. The AGD (2010) points out parents are responsible for the oral hygiene of their children. The AGD recommends that parents should start cleaning the gums of their children before teeth erupt. According to the AAPD gentle cleansing with a washcloth or soft toothbrush will help decrease bacterial colonization. Children should have their teeth brushed with fluorinated toothpaste twice a day; a smear size (less than a pea) amount of toothpaste should be used for children two years and under, and a pea-sized amount of toothpaste for children between the ages of two to five years (AAPD). Flossing should begin as soon as there is an adjacent tooth surface (AAPD). If dental hygiene is begun early, children will establish good dental hygiene and be less likely to fight having their teeth brushed and cared for. Early intervention programs involving education of the parents about oral health for their children have been successful (AGD). Health teaching and promotion that involved effective tooth brushing have been one of the most effective programs in preventing ECC (Marrs et al., 2011).

**Nutritional education.** Nutritional education programs have shown a positive risk reduction in ECC in children. A randomized clinical trial by Feldens, Giugliani, Duncan, Drachler, and Vitola (2010) evaluated the effectiveness of a home visit education program with mothers during the first year of life on healthy feeding practices. The “Ten steps for Healthy Feeding” program was introduced at six, ten, and 12 months by nutrition students; five-hundred mother and child pairs participated in the study (200

interventions, 300 controls); and the results showed a decrease in caries incidence and severity up to four years of age in a low socio-economic community Feldens et al.

According to the AGD (2010) mothers should be encouraged to breast feed their infants as the preferred source of nutrition; if bottles are used, they should be held not propped up; sweetened liquids should be avoided; and bottle feeding should be discontinued at twelve months of age (AGD, 2010). Another study by Felden et al. (2007) showed the effectiveness of counseling mothers of infants up to one year of age on breast-feeding and weaning techniques and reported the development of fewer ECC. The intervention included ten visits promoting a healthy diet, discussing proper hygiene techniques, and providing fluorinated water; 350 mother-child pairs showed a difference of 60% percent in odds of developing ECC by the age one between the control group and the group that received the intervention (Felden et al.).

#### **Primary care provider education.**

Ramos-Gomez et al. (2010) point out that pediatricians, family practitioners, and other non-dental providers such as nurse practitioners are ideally suited to provide oral screening, fluoride varnish, anticipatory guidance, and referrals to appropriate dental services. Increasing evidence in the literature indicates that primary care providers, including nurse practitioners, are in a unique position to help eliminate oral health care disparities by instituting an oral health program into their practice (Douglass, A., Douglass, J., & Krol, D., 2009; Carroll, C., Fong, T., & Nickman, J., 2010; Krol, D., 2010; Webster, R., Ware, J., Wai Ng, M., Noon, J., & Risko, W. , 2011). Krol's work (2010), in a survey conducted by the Fellows of American Academy of Pediatrics, 90% of pediatricians agreed that they should be conducting oral health examinations on their

pediatric patients; however, only 54% of respondents indicated they did conduct oral examinations on children birth to three years, and only four percent applied fluoride varnish in their pediatric patients.

The biggest barrier to instituting an oral health program into primary care practice according to primary care providers, including nurse practitioners, is the lack of education or training in oral health examinations or the application of fluoride varnish (Douglass et al, 2009; Krol, 2010, Carroll et. al, 2010, Webster et al, 2011). In response to mounting evidence that the introduction of an oral health program into primary care practice would benefit children, primary care providers voiced a desire for more training. This request was met by the federal government providing grants and instituting more training programs across the United States beginning in 2001. Eight Health Resources and Services Administration (HRSA) physician education grants were given to eight medical centers across the country, followed in 2003, with the funding of the development of an on-line education program for non-dental providers by the Maternal and Child Health Bureau (Douglass et al.). Funding for the Missouri Oral Health Preventive Services Program is provided through HRSA's Title V Maternal and Child Health Services Block Grant.

Several studies have demonstrated positive effects of educating providers and providing reimbursement in effectively changing practice. Kressin et al. (2009) showed how a one-hour educational intervention could help change provider behavior by increasing provider knowledge about ECC and by reducing the risk of ECC in children. This was a comparison study between two groups. The intervention group received education about oral health as a transmissible bacterial disease with risk factors that could

be managed; how to do caries risk assessment; and how to provide anticipatory guidance, oral screening, and fluoride varnish application; and a control group that did not receive education (Kressin et al.). Kressin et al. showed how education of PCPs helped increase their knowledge about ECC. Prior to educational intervention scores from PCPs averaged 66%, at the conclusion of the intervention scores were increased to 79% (Kressin et al.).

The two practices were studied over time. At the intervention site there were 635 eligible children and at the control site there were 452 eligible children (Kressin et al., 2009). At baseline there was no significant difference between the two clinics in regards to risk of development of ECC in children within both practices. At the last follow up visit the intervention site showed a 77% reduction in the likelihood of developing ECC over time. (Kressin et al.) This change was attributed to more active involvement by the PCPs in the intervention group in educating, screening, and providing fluoride varnish to children.

Okunseri, Szabom, Jackson, Pajewski, and Garcia (2009) studied a program introduced in Wisconsin designed to get PCPs more actively involved in oral health care by offering Medicaid reimbursement to medical providers for fluoride varnish services. Education was given to PCP's about oral disease, bacterial transmission, anticipatory guidance, and training on how to conduct an oral screening examination and apply fluoride varnish on young children (Okunseri et al.). Children in this study were one to six years; results of this study show that reimbursement to medical providers by Medicaid provided a significant increase in claims for fluoride varnish treatment (FVT) to children, prior to Medicaid reimbursement for medical providers FVT claims totaled 3,631. After

the policy change Medicaid claims for FVT totaled 28,303 with 38% of these claims coming from medical providers. This study reinforced that state level policy changes with reimbursement directed at medical providers will increase provider involvement and overall increase access to care for children (Okunseri et al.).

Modifying the standard of care in a practice is a challenging endeavor, but studies have shown with the proper education and tools this change in standard of care can be successful. Primary care providers including, nurse practitioners, have a unique opportunity to impact change and improve oral health care for pre-school children. However, all models studied showed that in order to be effective in changing the standard of care for oral health in a clinical practice setting an effective clinical, administrative, and business model with reimbursement were necessary (Douglass et al. ,2009).

### **Health Care Provider Based Risk Assessment Oral Preventive Program**

The AAPD (2002) recommends that risk assessment for caries be an essential element in the clinical care of infants, children, and adolescents and that oral health preventive strategies are implemented. Unique oral health risk factors that pertain to preschoolers include: (a) inappropriate bottle feeding and weaning techniques with breast feeding, (b) medications that are high in sucrose, (c) family history of cavities, (d) inappropriate fluoride intake, and (e) unsealed deep pits and fissure (Barber & Wilkins, 2002).

The AAPD Caries-Risk Assessment Tool (CAT) provides a way for PCPs to reliably predict the risk of cavities by identifying reliable predictors (AAPD, 2002). A risk factor assessment along with an oral exam allows the PCP to categorize the child as high risk (cavities found within last 12 months, along with other factors), moderate risk



(cavities found within last 24 months, along with other factors), and low risk (no cavities found for last 24 months, along with other factors) for ECC (AAPD, 2002). High risk infants and children should be referred to appropriate dental services (AAPD, 2002). According to Ramos-Gomez et al. (2010), appropriate screening should be done early because caries that occur in primary dentition are a strong predictor of future decay in permanent dentition and fluoride varnish can then be applied.

### **Fluoride Varnish**

Several studies have shown the effectiveness of fluoride varnish in reducing ECC (Association of State and Territorial Dental Directors Fluorides committee, 2007; Seppa, 2004; Okunseir et al., 2009). A systematic review of the literature conducted by Carvalho, et al. (2010) showed that there is published research that suggests that fluoride varnish is capable of reducing ECC in preschool children, but no conclusive scientific evidence was provided.

In a randomized clinical trial conducted by Ferreira et al. (2009) fluoride varnish was shown to be a factor that may help tooth re-mineralization when WSL occur. White spot lesions (WSL) are the first indication of tooth demineralization and subsequent decay (Ferreira et al). In this randomized clinical trial fifteen children seven to 12 years with 45 active WSLs had fluoride varnish applied and reported that active WSLs were reduced or eliminated over a four week period of time (Ferreira et al.).

Fluoride varnish is easy to apply, between one and four minutes per child; the varnish hardens almost immediately and children can eat soon afterwards ; children are encouraged not to brush their teeth for the remainder of the day; and because the varnish hardens quickly, it is safer than other preparation because less fluoride is swallowed

(Gold, 2005). Seppa (1999), conducted studies to see how effective fluoride varnish was on strengthening tooth enamel, reported that after the first application of fluoride varnish, the content of the fluoride in the tooth enamel was markedly increased and remained that way for several years. Seppa also found that twice yearly application of fluoride varnish showed a reduced prevalence in ECC in countries that used it regularly (Seppa, 1999). Investigators have tried to increase the frequency of fluoride varnish but no greater benefit has been shown (Seppa, 2004).

There are very few risks associated with the application of fluoride varnish which is reported to be safe in this age group (AAPD, 2009; ASTDD, 2007; Gold, 2005; Ramos-Gomez, 2010). There have been two confirmed cases of allergic reaction to the product Duraphat (fluoride varnish) since its inception in the 1990s in the United States; one involved a technician's hand, contact dermatitis, and the other involved the oral cavity, stomatitis (ASTDD). Fluoride varnish is contraindicated when gingivitis or stomatitis is present, or when evidence of fluorosis is present (ASTDD).

Fluoride varnish applied infrequently (twice yearly) is unlikely to contribute to fluorosis in the age group of birth to five years (ASTDD). Fluorosis occurs when the tooth enamel is exposed to too much fluoride during the development stage of the tooth. Too much fluoride can cause the tooth enamel to become rough or pitted and discolored. (AAPD, 2011). Infants and toddlers absorb fluoride differently than older children (ASTDD, 2007). Care should be taken to apply fluoride sparingly and to avoid excessive swallowing of the product.

## **Summary**

A comprehensive review of the literature found that a variety of programs for oral health care for children have been instituted around the country to include programs in schools, WIC offices, and in community health centers, and in primary health care practices. Eighty-eight percent of American children see their health care provider's annually (Kressin et al., 2009). This gives primary health care providers (PCPs), including nurse practitioners, the opportunity to become involved in an oral health preventive program in their practices. Because oral health impacts children's overall health, it is important for primary health care providers to include preventive overall health in their practices and learn how to assess for oral disease, apply fluoride varnish, educate parents, and refer children to dental care professionals. Legislation has been enacted by Medicaid to reimburse health care providers for this service in an attempt to encourage primary health care providers to put forth this oral health effort. This project is important because instituting an oral health preventive service program, including fluoride varnish for preschool children birth to five years in a rural health clinic, may prevent cavities and may improve the overall health of preschool children. The results of this project, if successful, may lay the groundwork and serve as a model for other public rural health clinics and private practice clinics to adopt, thus having the potential to improve the overall health of children throughout the state of Missouri.

## **Final Evidence of Project Completion**

Implementation of the project was completed in December, 2011. The following section presents the project design and the results of the project.

## **Project Design**

This project was designed to institute an oral health preventive program in a rural health clinic to promote oral health in preschool children birth to five years by: (a) instituting a program that supports the Missouri preventive service program in oral health, (b) promoting oral screenings and fluoride varnish twice yearly, (c) assessing the risk of caries, (d) referring to appropriate dental services and (e) educating parents or guardian about the importance of oral health and how to maintain oral health at home with children birth to five years.

## **Training**

Training for oral screening and the application of fluoride varnish for preschool children birth to five years was accomplished by direct on-site training between the local dentist, Dr. Gregory Casalone and the principal investigator, Carol Berger, FNP-C. Demonstration and return demonstration procedure were used to assess competency of principal investigator in these techniques. Additionally, on-line training was completed by the principal investigator on the Missouri preventive service program web-site, (<http://www.mohealthysmiles.com/web-training.html>) registering the principal investigator as trained in oral health screening and fluoride application procedures. Completion of this program satisfied the Missouri program requirements for participation in the preventive service program in oral health. Fluoride varnish was provided by Missouri Department of Health and Senior Services.

## **Setting and Sample**

The setting for this project was a rural health clinic that serves the community of Elsberry, Missouri. Families across the lifespan receive health care services which

include well-care, acute illness care, and chronic disease management. Participants were a (a) convenient sample of children birth to five years who are brought to rural clinic for well care and (b) their parents or guardian. Participants included a parent (mother, father or both parents) or a guardian and their child or children birth to five years. Children were excluded if they were ill, had evidence of gingivitis, stomatitis, open lesions in the mouth were present, or evidence of fluorosis was found.

### **Protection of Human Subjects**

Permission to initiate the project was obtained from the Chief Executive Officer of Lincoln County Memorial Center. Approval to implement this project was obtained from the University of Missouri at St. Louis Institutional Review Board (IRB). Informed consent for parents was in both English and Spanish. Each parent was given an informed consent form describing the oral health screening for their child, and application of fluoride varnish which was adapted from the standard school-based permission form. The informed consent described the purpose of the project to do oral screening on their child and apply fluoride varnish, parent's rights, the costs and benefits of allowing their child to participate in the project, and how to contact the PCP for questions.

After several oral health examinations, it became apparent that oral decay was present in a large number of children and that pictures of the children's teeth would add evidence of oral decay in children. A modification that allowed for parental consent for pictures to be taken of the children's teeth was approved by IRB. These pictures were only of the child's mouth and teeth to protect the identity of each child. Informed consent forms were modified and printed in English and Spanish (see Appendix A).

### **Instruments for Data Collection**

The American Academy of Pediatric Dentistry Caries-Risk Assessment Tool (CAT) was used to assess the risk for caries (see Appendix B). The CAT is a tool which divides caries risk into clinical conditions present, environmental characteristics, and general health conditions that are present in the child. Once completed, it stratifies the child into the low risk, moderate risk, and high risk categories. A study conducted by Nainar and Straffon (2006) evaluated the CAT assessment tool with pre-doctoral dental students to determine how easy it was for them to use and how likely it would be that they would continue to use it in practice. After introducing the tool in class, students were exposed to two-years of using the tool in practice. At the end of the study most students scored it as easy to use (86%), and simply to apply (76%), stating they found it easy to use to develop an oral health plan (84%). It was felt that the instrument was extremely sensitive and may over identify high risk children in some cases, but it was also felt that in non-dental providers it would be a good learning tool to introduce carie risk assessment. Oral health care plans were then developed and given to the parent based on the risk category.

A survey tool was provided by Missouri Department of Health and Senior Services and was used to collect demographic variables (age, sex, gender, nationality). Findings were registered with the state (see Appendix C).

### **Educational Materials**

An oral health screening packet was developed to use when screening the children. Educational materials included, (a) Children's Oral Health fact sheet (Centers for Disease Control [CDC], 2000) , (b) Brush Up on Healthy Teeth, Simple Steps for

Kids' Smiles (CDC, 2009), and (c) A Quiz for Parents about Simple Steps for Kids' Smiles (CDC, 2009). These materials were supplied in both English and Spanish (see Appendix D, E, F). The CDC *Children's Oral Health fact sheet* provided information about when children's teeth come in, why baby teeth are important, why children's oral health is important, how to prevent dental decay, brushing and flossing. The CDC *Brush Up on Healthy Teeth, and Simple Steps for Kids' Smiles* provided educational information about cleaning teeth early, amount of fluoride toothpaste, how to supervise the child, and how to talk to the child's doctor or dentist about care of children's teeth. The CDC *A Quiz for Parents about Simple Steps for Kids' Smiles* includes a six question true false quiz about how parents can keep the child's teeth healthy and was used to assess if oral health educational materials needed to be reinforced.

### **Recruitment of Subjects**

From September 15, 2011 through December 4, 2011, all parents of children aged five and younger, receiving well care services at the Elsberry Health Clinic, were approached and asked if they would like to participate in an oral health study which included a caries risk assessment, oral health screening, and fluoride varnish for their children and educational materials for the parents. If they indicated they were interested informed consent was obtained. There were 40 parents who agreed to participate in the study and allow their children to have oral screening. Thirty six children participated, 21 (58.3%) males and 15 (41.7) females. Of the children who participated there were, 28 (77.8%) white, 4 (11.1 %) African America, and 4 (11.1 %) Hispanic. Children's ages ranged from birth to 5 years: 2 (5.6%) under >1 year, 5 (13.9%) 1 year, 10 (27.8) 2 years,

6 (16.7) 3 years, 8 (13.9) 4 years, and 5 (13.9%) were 5 years. There were no guardians who brought children to the clinic during the study time.

### **Procedure for Data Collection**

Following informed consent by the parent, children birth to five years received a caries risk assessment. Following risk assessment, oral screening took place. Specifically, the procedure for oral screening and the application of fluoride varnish for the child birth to five years included:

- Explanation of procedure to parent
- Explanation of what will happen at an age appropriate level to the child
- We used the knee-to knee technique. Cradling the child between the PCP, examiner at the head of the child and, the parent cradling the child on their lap with their legs straddling them. This allows the examiner maximum viewing of the child's oral cavity, and parental support to comfort the child. A flashlight will be used to examine the upper and lower surfaces of the teeth. No instrumentation will be used.
- Application of fluoride varnish to the child's teeth using the disposable brush that was provided by the Missouri Dept of Health and Senior Services.
- Comfort measures were given if necessary.
- The procedure was stopped if the child became overly resistive.

Care was taken to apply fluoride sparingly and to avoid excessive swallowing of the product. Applicators containing fluoride varnish were kept out of the reach of children.

Parents received the educational materials and education about the importance of oral health and how to maintain oral health at home with their children. The educational



materials and preventive recommendations were explained. They then completed the six question true false quiz on the CDC Brush Up on Healthy Teeth to determine if they needed any additional oral health education. Once the procedure for oral screening and application of fluoride varnish was completed, an oral action plan was developed to show the parents the risk of their child, high, medium, or low for caries. If oral disease was found, this was recorded on the Missouri survey form provided by the state. A list of referral information was given to the parent for dental services in the St. Louis area and included providers who care for children under the age of five and accept Medicaid.

### **Results**

There are minimal risks to the children to screen for oral health primarily, the child may become upset. In this investigation, no child became overly upset and no procedure had to be stopped. None of the children had sealants present. Twenty-one males and 15 females received oral health screenings and fluoride varnish. No child had gingivitis or stomatitis present at the time of the examination. No child had evidence of fluorosis at the time of the examination.

### **Research Questions**

Descriptive statistics were used in this investigation. This project sought to answer the following questions:

**Research Question 1.** Will children birth to five years in a rural health clinic have low, moderate, or high risk for caries? High risk was the predominant category found. Caries risk assessment was done on all participants and 27 (75%) were in the High Risk category for early childhood cavities. Only 1 (2.8%) was in the Low Risk category and 8 (22.2%) were in the Medium Risk category.

**Research Question 2.** Are there specific risk factors in children birth to five years in a rural health clinic that are more common in the high risk category for caries? Access to care became a specific risk factor. The majority of the children 35 (97.2%) had never been seen by a dentist. Only 1 (2.8%) child had been seen by a dentist and had been treated for decay. Of the children, 3 (8.3%) were found to have white spot lesions, the first sign of decay; and 8 (22%) had evidence of rampant decay (seven or more cavities). Nine (25%) of the children had untreated decay and 10 (27.8%) had evidence of early childhood cavities. Urgent referral for rampant cavities was needed by 9 (25%) of the children.

**Research Question 3.** Is there a specific ethnic group in children birth to five years in a rural health clinic that is at a higher risk for caries? Yes there were specific ethnic groups that showed higher risk for caries. Of the nine children who needed urgent referral for extensive cavities, the majority 6 (67%) were African American and Hispanic and 3 (33%) were White. There were four African American children and four Hispanic children sample; 3 (75%) African American and 3 (75%) Hispanic children needed urgent referral for extensive cavities. One child had significant tooth pain when her teeth were touched. This child was referred for same day services to the local dentist and subsequent to the caries will need surgical extraction of her front teeth under general anesthesia.

**Research Question 4.** Are oral health educational materials an effective tool for the parents? Because normal well child exams takes 15 minutes, and the total time with the parents is just 30 minutes, there was insufficient time to evaluate if the educational materials were an effective tool for parents in just one visit.

### **Discussion of Results**

After informed consent, pictures of the children teeth with ECC were taken.

Figure 1 shows painful severe rampant decay. This child had pain when any tooth with decay was touched. This child will need surgical intervention to remove the teeth that are decayed. Figure 2 shows the effects of baby bottle tooth erosion, notice that the teeth have completely worn away to the gum line, the roots of the teeth will need to be surgically extracted. Figure 3 shows a deep cavity found in the upper left first molar. Restorative work will require a pulpotomy, which is equivalent to an adult root canal, and possible crown. Figure 4 shows disfigurement/ fracture of a tooth that has been affected by decay. This will require a plastic filling. Figure 5 shows first and second lower left primary molars requiring pulpotomy and crown. Figure 6 shows missing teeth from previous extractions and rampant decay. Restorative work will require pulpotomy and crown. Figure 7 shows deep cavities in upper left first molars, requiring pulpotomy and possible crown, and Figure 8 again shows deep cavities in the lower right second molars, which requires pulpotomy and possible crown. All the children in these pictures require extensive restorative work and parents were given information for urgent referrals and in some cases the dentists were called personally by the investigator to help facilitate an earlier appointment. All of these children have suffered from some type of oral pain, may be subject to ridicule from their peers for years because of missing teeth or steel crowns that will have to be placed, some have problems with chewing food, and all of these conditions were fully preventable with proper dental care at home, fluoride varnish, and earlier visits to the dentist. However there are limited dentists available to see them.

**Figure 1. Painful Rampant Decay**



**Figure 2. "Baby Bottle Tooth Erosion"**



**Figure 3. Upper Left First Molar**



**Figure 4. Disfigurement/Fracture**



**Figure 5. First and Second Lower Left Primary Molars**



**Figure 6. Missing Teeth from Previous Surgical Extraction, Rampant Decay**



**Figure 7. Upper Left First Molar**



**Figure 8. Lower Right Second Molar**



In this study 97.2 percent of children who had an oral examination in this rural health clinic were found to be at high risk or medium risk for caries while only one child (2.8%) was at low risk. This finding is consistent with other investigators who reported that early childhood caries was the most infectious chronic disease of childhood in the United States, five times more prevalent than asthma (Barber, & Wilkins, 2002; Kressin et al., 2009; Ramos-Gomez, Jue, & Bonta, 2002; Ramos-Gomez, Crystal, Ng, Tinanoff, & Featherstone, 2010; Marrs, Trumbley, & Malik, 2011; Parisotto, Steiner-Oliveira, Silva, Rodrigues, & Santos, 2010; Yost & Li, 2008). Additionally, the majority of children in this study were from poor families. The median income in Elsberry is \$35,000 per year, which is below the national average. The majority of children had Medicaid as their insurance. Very few had private insurance. These findings are similar to the Surgeon General's report (2000) which found that oral disease affects poor children and ethnic and racial minorities (HHS, 2001), as well as other studies which supported these findings (Kressin et al., 2009; Marrs et al., 2011).

The majority of the children 35 (97.2%) had never been seen by a dentist, a major risk factor for these young children in this rural community. The Missouri Department of Health and Senior Services (2009) reported that 50 of 114 Missouri counties qualify as dental health professional shortage areas and many dentists in Missouri do not accept Medicaid patients. Kressin et al. (2009) pointed out, that access to dental care is especially challenging in high-risk groups. This rural health clinic in Elsberry qualifies as a dental health professional shortage area and only one dentist within a 50 mile radius will take children with Medicaid as their insurance. Additionally, this dentist only accepts appointments from families with Medicaid insurance one day per week. Further away in

St. Louis dental clinics, wait times to be seen can vary from weeks to months.

Transportation is an added barrier for these parents because many depend on public transportation. In this study the child with pain when her teeth are touched and difficulty eating (an urgent referral, see Figure 1) had difficulty scheduling needed surgery because of lack of transportation. After a concerted effort, the parents have been able to arrange for Medicaid transportation for the child to be seen by an oral surgeon in March in Jefferson City, over 100 miles away.

There were four African American children and four Hispanic children with rampant cavities; 3 (75%) African American and 3 (75%) Hispanic children needed urgent referral for extensive cavities. These findings were consistent with the Missouri “*Show Me Your Smile*” survey that reported African-American children and children in low income school settings where greater than 75% were eligible for free or reduced meals had higher rates of cavities and urgent dental care needs (Missouri Department of Health Senior Services, 2005). Results were higher (75%) in this sample compared to findings by the National Health and Nutrition Examination Survey who reported the prevalence of decay in primary teeth in children ages two to 11 were 55 percent among Hispanics and 43 percent among African Americans (NHANES1999-2002).

Time was the greatest challenge. There was insufficient time to evaluate if the educational materials were an effective tool for parents who participated in the study. A normal well-child examination takes 15 minutes of the 30 minutes allotted for a well-child visit. Developing a smooth transition into the oral exam and providing the education in a timely manner took multiple approaches. A manila envelope was preassembled to include a consent form; the educational materials: Children’s Oral Health fact sheet

(Centers for Disease Control [CDC], 2000), Brush Up on Healthy Teeth, Simple Steps for Kids' Smiles (CDC, 2009), and A Quiz for Parents about Simple Steps for Kids' Smiles (CDC, 2009); and data collection instruments, American Academy of Pediatric Dentistry Caries-Risk Assessment Tool (CAT), and the *Missouri Preventive services survey* tool. The most effective approach was to have the office nurse collect the demographic information from the parent on the *Missouri Preventive Services Survey* tool and circle the parent's answers to the questions on the *caries risk assessment form*. The prepackaged oral screening kit was taken into the room by the nurse practitioner. This kit included a dental mirror for exam, the dental varnish package, a tooth brush and toothpaste for the child, along with the educational materials. The nurse practitioner was able to go over the consent form again with the parents, provide education on oral health care for their child, conduct an oral exam, and apply the fluoride varnish in a timely manner. This time constraint presented a barrier to evaluate if the educational materials were an effective tool for parents in just one visit.

### **Implications for Practice**

This was the first time an oral health program that supports the Missouri preventive service program in oral health was instituted in a rural health clinic by an advanced practice nurse in Missouri. Findings from this study clearly demonstrate that an oral health preventive service program, which includes the application of fluoride varnish, be a part of the well child exam and should begin earlier than school age children. Implications for practice include children and their families as well as advanced practice nurses.



**Children and Families**

Children particularly in rural areas are a vulnerable population. Rural families have a high percentage of children enrolled in Medicaid, have limited dental services available for their children, and thus are unable to have oral health be a priority in the health care of their children. Changing attitudes of rural parents toward oral health presents the biggest challenge. The key to success is to help parents understand the importance of oral health for their children and the benefits and risks of this oral health screening and fluoride varnish program for children birth to five. The benefit to the child should be made clear to the parents, a decrease in early childhood cavities. An additional benefit parents should be told is that screening for oral disease allows their child to be referred for immediate care and prevention of other health problems. Early oral screenings provide the opportunity to educate the parents about oral health. Education alone is not enough. Repeated exposure to information geared to the level of the parents from multiple sources over time may create a climate of change in the community and encourage parents to take their children for bi-yearly oral health screening and fluoride varnish application.

**Advanced Practice Nursing**

Advanced practice nurses practicing in not only rural but in any family practice setting are in a unique position to be advocates for oral health preventive programs in their practice. The results of this study as well as the supporting literature show how important instituting an oral health program including fluoride varnish is for young children birth to age five years, with even greater results for socio-economically challenged families and minority children. During well child visits oral health education

should be stressed by advanced practice nurses so that parents understand the importance of incorporating oral hygiene each day for their children, feeding techniques, nutrition, and preventative services to include fluoride varnish. This education will help to increase awareness by the parents and the community about oral health as a disease process and explain how this applies to the general health and well-being of their children and children in the community. By instituting an oral health program into their practice, recommended by the American Pediatric Association (APA), American Pediatric Dental Association (APDA), American State and Territorial Dental Director Fluoride Committee (ASTDD), as well as the Centers of Disease Control (CDC), advanced practice nurses will help meet national and state goals by reducing health care disparities and decreasing oral disease in children birth to five years. By instituting this program advanced practice nurses must also network with local dental providers in their region to help create a multi-disciplinary approach to a national health care problem. By bringing disciplines together advanced practice nurses can lead the way in creating a climate of change in provider practice by making early oral health screenings and fluoride varnish the standard of practice for children birth to five years in their clinics. Not only will this benefit the children, parents, and communities, there is also a modest financial benefit to the rural health clinic. The cost of supplies to include fluoride varnish is about \$2.75. Time for the provider would also have to be calculated. Missouri Medicaid reimburses on a bi-annual basis fluoride varnish at \$13.48 an application, and for the oral health exam when it is not a part of the well child visits at a rate of \$24.00 a visit.

### **Plans for Dissemination**

The Chief Executive Officer of Lincoln County Memorial Center approved the implementation of this project in the Elsberry Family Health Clinic with the expectation that results would be shared with other clinics in the system. These clinics include Troy Surgical, Troy Family, and Doctors professional. These clinics employ five physicians and four nurse practitioners who serve the Troy area in Lincoln County. Plans are in place to prepare a power point presentation highlighting results. Carol Berger, principal investigator and nurse practitioner and Dr. Casalone, the dentist instrumental in the success of this project, will demonstrate how to conduct oral health screening and apply fluoride varnish to children birth to five years. Helene Ruddy, RDH and Oral Health Consultant for the Missouri Dept. of Health and Senior Services will also be in attendance to answer any questions in regards to their program. Lincoln County providers will be provided with an initial oral health screening kit including fluoride varnish, toothbrush, toothpaste, and educational materials, to include the Caries Risk Assessment tool and the Missouri survey form. Information will be provided on how providers can order future supplies as well as billing codes for reimbursement from Medicaid.

Publications are in progress to disseminate the results to nurse practitioners and to Dentists. Disseminated at appropriate nurse practitioner conferences is planned. Based on the results of this project, a five thousand dollar grant application is in progress to fund the implementation of a dental varnish program in the three other clinics in the Troy area. A legislative brief to present to Missouri legislatures will be prepared in an effort to

demonstrate the need for more oral health providers in rural areas specifically calling attention to Missouri's rural children birth to five years.

Results from the project at Elsberry clinic will be shared with the Missouri Department of Health and Senior Services. Plans for a short article are planned to be placed on the Preventive Service Program website (<http://health.mo.gov/living/families/oral/health/psp>)

### **Influence on Doctoral of Nursing Practice**

The culmination of this doctor of nursing practice education provides the basis for a solid clinical foundation for delivery of advanced practice activities to improve care. The experience of the clinical scholarship project allowed this doctoral student to institute an oral health preventive service program, including fluoride varnish, for preschool children birth to five years in a rural health clinic. Best practice protocols in oral health programs, including fluoride varnish, were analyzed from the literature; a multi-disciplinary approach was used, between this doctoral student, the local dentist, and the Missouri Department of Health and Senior Services. A program was designed that would meet the specific needs of this community. The results of this study will pave the way for more rural health clinics in Missouri and other family practices to follow. Opportunity to work with the legislature was presented and reimbursement to rural health clinics from Medicaid was clarified so that rural health clinics will be compensated for this service. Opportunity was also presented to develop an integrated system in the electronic medical record for the clinics of Lincoln County Memorial Center incorporating a monitoring system for children birth to five years so that oral screening and fluoride varnish services

will be flagged at six month intervals in the chart as a reminder for primary health care providers.

This study was limited by a small sample size, further studies with larger populations would be beneficial, as well as further studies on the effectiveness of caregivers providing educational materials for parents, motivational interviewing techniques, and developing effective oral health care plans in a timely manner that is compatible with the time constraints of a well-child visit.

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## **Appendices**

- A. Modified Informed Consent in English and Spanish
- B. The American Academy of Pediatric Dentistry Caries-Risk Assessment Tool
- C. Missouri Department of Health and Senior Services Survey Tool
- D. Children's Oral Health fact sheet- in English and Spanish
- E. Brush Up on Healthy Teeth, Simple Steps for Kids' Smiles- in English and Spanish
- F. A Quiz for Parents about Simple Steps for Kids' Smiles- in English and Spanish



**College of Nursing**

One University Blvd.  
St. Louis, Missouri 63121-4499  
Telephone: 314-516-6075  
Fax: 314-516-7082  
E-mail: bachmanj@umsl.edu

**Informed Consent for Parent and Child Participation in Research Activities**  
Instituting A Oral Health Preventive Service Program, Including Fluoride Varnish,  
for Preschool Children Birth to Five Years in a Rural Health Clinic

Participant \_\_\_\_\_ HSC Approval Number \_\_\_\_\_

Principal Investigator \_\_\_\_\_ PI's Phone Number \_\_\_\_\_

1. You and your child are invited to participate in a research project conducted by Ms. Carol Berger, a doctoral student and Dr. Jean Bachman, Faculty Advisor in the College of Nursing at the University of Missouri – St. Louis. The purpose of this research project is to promote oral health in preschool children birth to five years in a rural health clinic.

2. a) Your child's participation will involve oral screening and the application of fluoride varnish.

- First, we will determine if your child is at risk for tooth decay using a risk assessment form. We will ask you about the fluoride in your water or tooth paste, the kinds of food your child eats, if family members have tooth decay, and if you have a dentist you see regularly. We also will want to know if your child is in programs such as the Head Start program.
- We will need to look in your child's mouth and examine any teeth. We will talk to your child and to you and explain how we will look at your child's teeth.
- We will show parents pictures of the procedure to include the oral screening, positioning, and application of fluoride varnish.
- **We may take a picture of your child's mouth and teeth**
- We will place your child in the knee-to-knee position with examiner at the head of the child and you, the parent, at the feet to gently cradle your child. This allows us to look carefully at your child's mouth and teeth and you can support and comfort your child. We will use a flashlight to examine the upper and lower surfaces of the teeth. No instruments will be used.
- We will apply fluoride varnish using the tooth applicator provided by the Missouri Department of Health and Social Services, which comes pre-coated with the fluoride varnish in the correct amount for your child, fluoride varnish dries immediately when it comes into contact with the saliva in your child's mouth so excess fluoride can not be swallowed. .
- We will ask that your child does not brush their teeth for the remainder of the day
- If your child becomes overly scared or resistant, we will stop.

b) Your participation as a parent or guardian will involve:

- We will ask you to complete the Missouri Show Me your Smile Survey that asks a few questions about your child such as age and a few questions about your child's oral health and any tooth decay.
- We will provide educational materials about your child's oral health that will help you care for your child's teeth. You may take these with you and share with your family.
- We will ask you to complete a six question true false quiz on the Missouri Brush Up on Healthy Teeth program to determine if you need any additional oral health education.
- After your child has had their mouth and teeth examined, we will prepare an oral health action plan. This plan will tell you about the risks your child has for cavities, give you activities you can do at home to minimize the risk of oral disease, and gives you guidelines for recommended follow-up care. If your child has tooth decay, we will provide a list of dentists in your area that will accept children in this age range and who accept Medicaid as a payment source.

Approximately [30 children and 20 parents] may be involved in this research.

c) The amount of time involved in your child's participation will be approximately 2-5 minutes for the oral health screening and fluoride application, an additional 15 minutes will be needed to complete the Missouri Show Me your Smile Survey form, develop an oral action plan, provide education, complete the Missouri Brush Up Quiz, and review educational materials.

3. There may be certain risks or discomforts to your child associated with this research. They include your child being afraid when their mouth and teeth are examined. We will try to comfort your child. If they are still afraid, we will stop. There is very little risk using fluoride varnish. A minimal sore is the only known risk. If your child develops a sore in the mouth after treatment, they may return to the clinic and be seen at no charge. If your child is sick, have any sores in their mouth, or the teeth show signs of too much fluoride, we will not apply fluoride varnish.
4. The possible benefits to your child from participating in this research include better oral health and the possibility of fewer teeth that will get decayed.
5. You and your child's participation is voluntary and you may choose not to let your child participate in this research study or to withdraw your consent for you and your child's participation at any time. You may choose not to answer any questions you do not want to answer. You and your child will NOT be penalized in any way should you choose not to participate or to withdraw you and your child.
6. We will do everything we can to protect you and your child's privacy. By agreeing to let your child participate, you understand and agree that your child's data may be shared with other researchers and educators in the form of presentations and/or publications. In all cases, you and your child's identity will not be revealed. **If pictures are taken, they will only be of your child's mouth and teeth so that the pictures will not identify your child.** In rare instances, a researcher's study must undergo an audit or program evaluation by an oversight agency (such as the Office for Human Research Protection). That agency would be required to maintain the confidentiality of your child's data.
7. If you have any questions or concerns regarding this study, or if any problems arise, you may call the Investigator, (Carol Berger, MSN, FNP-C 573-898-9100) or the Faculty Advisor, (Dr. Jean Bachman 314 516-6075). You may also ask questions or state concerns regarding your child's rights as a research participant to the Office of Research Administration, at 314-516-5897.

**I have read this consent form and have been given the opportunity to ask questions. I will also be given a copy of this consent form for my records. I consent to my child's participation in the research described above.**

\_\_\_\_\_  
Parent's/Guardian's Signature

\_\_\_\_\_  
Date

\_\_\_\_\_  
Parent's/Guardian's Printed Name

\_\_\_\_\_  
Child's Printed Name

\_\_\_\_\_  
Signature of Investigator or Designee

\_\_\_\_\_  
Date

\_\_\_\_\_  
Investigator/Designee Printed Name



**College of Nursing**

One University Blvd.  
St. Louis, Missouri 63121-4499  
Telephone: 314-516-6075  
Fax: 314-516-7082  
E-mail: bachmanj@umsl.edu

Consentimiento informado para los padres y la participación infantil en actividades de investigación  
Instituir un Programa de Salud Bucal de servicios preventivos, incluidos los barnices de fluoruro,  
para niños de preescolar de cinco años en una clínica de salud rural

Participante \_\_\_\_\_ HSC Approval Number \_\_\_\_\_

Investigador Principal \_\_\_\_\_ PI's Phone Number \_\_\_\_\_

1. Usted y su hijo están invitados a participar en un proyecto de investigación dirigido por la Sra. Carol Berger, un estudiante de doctorado y el Dr. Jean Bachman, Facultad Asesor de la Escuela de Enfermería de la Universidad de Missouri - St. Louis. El objetivo de este proyecto de investigación es promover la salud oral en el nacimiento de niños en edad preescolar a cinco años en una clínica de salud rural.

2. a) La participación de su hijo incluirá detección oral y la aplicación de barniz de flúor.

→ En primer lugar, vamos a determinar si su hijo está en riesgo de caries en los dientes utilizando un formulario de evaluación de riesgos. Vamos a preguntarle sobre el fluoruro en el agua o la pasta de dientes, los tipos de alimentos que su hijo come, si los familiares tienen caries en los dientes, y si usted tiene un dentista que usted visita con frecuencia. También querrá saber si su hijo está en programas como el programa de Head Start.

→ Se tendrá que mirar en la boca del niño y examinar los dientes. Vamos a hablar con su hijo y para usted y para explicar cómo vamos a ver los dientes de su niño.

→ Vamos a mostrar imágenes de los padres el procedimiento para incluir el examen oral, el posicionamiento y la aplicación de barniz de flúor.

→ Se puede tomar una foto de la boca del niño y los dientes

→ Vamos a colocar a su hijo en la posición de la rodilla con rodilla con el examinador a la cabeza del niño y de usted, el padre, a los pies de la cuna suavemente a su hijo. Esto nos permite mirar con cuidado en la boca del niño y los dientes y que pueden apoyar y consolar a su hijo. Vamos a usar una linterna para examinar las superficies superior e inferior de los dientes. No hay instrumentos que se utilizarán.

→ Vamos a aplicar el barniz de flúor con el aplicador dental provisto por el Departamento de Salud de



Missouri y Servicios Sociales, que viene pre-revestido con el barniz de flúor en la cantidad correcta para su hijo, se seca el barniz de fluoruro de inmediato cuando entra en contacto con la saliva en boca de su hijo para el exceso de flúor no se puede tragar. .

- Vamos a pedir que su hijo no se cepillan los dientes durante el resto del día
- Si su hijo está muy asustado o resistentes, nos detendremos.

b) Su participación como padres o tutores serán las siguientes:

- Se le pedirá que complete el Missouri Muéstrame tu sonrisa encuesta que hace algunas preguntas acerca de su hijo como la edad y algunas preguntas acerca de la salud bucal de su hijo y cualquier deterioro de los dientes.
- Vamos a proporcionar materiales educativos sobre la salud bucal de su hijo que le ayude a cuidar los dientes de su hijo. Usted puede tomar esto con ustedes y compartir con su familia.
- Se le pedirá que complete un período de seis pregunta falsa prueba verdadera de la Missouri Refresque sus conocimientos sobre el programa de salud de los dientes para determinar si necesita algún tipo de educación adicionales para la salud oral.
- Después de que su hijo ha tenido la boca y los dientes examinados, vamos a preparar un plan de acción para la salud oral. Este plan le informará sobre los riesgos que su hijo ha de tener caries, te dan lo que puedes hacer en casa para minimizar el riesgo de enfermedad oral, y le da directrices para que le recomiende el cuidado de seguimiento. Si su hijo tiene caries en los dientes, le proporcionaremos una lista de dentistas en su área que aceptan a los niños en este rango de edad y que aceptan Medicaid como fuente de pago.

Aproximadamente [30 niños y 20 padres] pueden estar involucrados en esta investigación.

c) La cantidad de tiempo que supone la participación de su hijo será de aproximadamente 2-5 minutos para el examen de salud bucal y aplicación de flúor, 15 minutos adicionales serán necesarios para completar el Missouri Muéstrame tu Formulario de encuesta de sonrisas, un plan de acción por vía oral , proporcionar educación, completar el pincel Missouri hasta Quiz, y revisar los materiales educativos.

3. Puede haber ciertos riesgos o molestias a su hijo asociado con esta investigación. Que incluir a su hijo de tener miedo cuando su boca y los dientes son examinados. Vamos a tratar de consolar a su hijo. Si todavía tienen miedo, nos detendremos. Hay muy poco riesgo con barniz de flúor. Una úlcera es el mínimo de riesgo conocido. Si su niño presenta una úlcera en la boca después del tratamiento, pueden regresar a la clínica y ser atendidos en forma gratuita. Si su hijo está enfermo, tiene llagas en la boca o los dientes muestran signos de exceso de flúor, no vamos a aplicar el barniz de flúor.

4. Los posibles beneficios a su hijo de participar en esta investigación incluyen una mejor salud bucal y la posibilidad de menos dientes que se decaído.

5. Usted y la participación de su hijo es voluntaria y usted puede optar por no dejar que su hijo participe en este estudio de investigación o de retirar su consentimiento para que usted y la participación de su hijo en cualquier momento. Usted puede optar por no contestar a cualquier pregunta que usted no quiere contestar. Usted y su hijo no será penalizado de ninguna manera en caso de que decidan no participar o retirarse a usted y su hijo.

6. Vamos a hacer todo lo posible para protegerlo a usted y la privacidad de su hijo. Al aceptar que su hijo participe, usted entiende y acepta que los datos de su hijo puede ser compartida con otros investigadores y educadores en forma de presentaciones y publicaciones / o. En todos los casos, y la identidad de su hijo no será revelado. Si se toman imágenes, sólo será de la boca del niño y los dientes para que las imágenes no identificar a su hijo. En raros casos, el estudio de un investigador debe someterse a una auditoría o evaluación de programas de una agencia de supervisión (por ejemplo, la Oficina de Protección de la Investigación Humana). Que la agencia tendría que mantener la confidencialidad de los datos de su hijo.

7. Si usted tiene alguna pregunta o duda sobre este estudio, o si surge algún problema, puede llamar al Investigador, (Carol Berger, MSN, FNP-C 573-898-9100) o el asesor de la facultad, (Dr. Jean Bachman 314 516 -6075). Usted también puede hacer preguntas o preocupaciones con respecto a los derechos del estado de su hijo como un participante en la investigación de la Oficina de Administración de Investigación, en el 314-516-5897.

He leído este formulario de consentimiento y se les ha dado la oportunidad de hacer preguntas. También se le entregará una copia de este formulario de consentimiento para mis archivos. Doy mi consentimiento para la participación de mi hijo en la investigación descrita anteriormente.

\_\_\_\_\_  
Padre / tutor Firma Fecha  
Parent's/Guardian's Signature Date

\_\_\_\_\_  
Parent's/Guardian's Printed Name

\_\_\_\_\_  
Nombre impreso del niño  
Child's Printed Name

\_\_\_\_\_  
Firma del investigador o la persona designada  
Signature of Investigator or Designee  
Date

\_\_\_\_\_  
Investigator/Designee Printed Name

**Caries Risk Assessment Form (Ages 0-6)**

Patient Name:

Score:

Birth Date:

Date:

Age:

Initials:

		Low Risk (0)	Moderate Risk (1)	High Risk (10)	Patient Risk
<b>Contributing Conditions</b>					
I.	<b>Fluoride Exposure</b> (through drinking water, supplements, professional applications, toothpaste)	Yes	No		
II.	<b>Sugary or Starchy Foods or Drinks</b> (including juice, carbonated or non-carbonated soft drinks, energy drinks, medicinal syrups)	Primarily at mealtimes	Frequent or prolonged between meal exposures/day	Bottle or sippy cup with anything other than water at bed time	
III.	<b>Eligible for Government Programs</b> (WIC, Head Start, Medicaid or SCHIP)	No		Yes	
IV.	<b>Caries Experience of Mother, Caregiver and/or Other Siblings</b>	No carious lesions in last 24 months	Carious lesions in last 7-23 months	Carious lesions in last 5 months	
V.	<b>Dental Home:</b> established patient of record in a dental office	Yes	No		
<b>General Health Conditions</b>					
I.	<b>Special Health Care Needs*</b>	No		Yes	
<b>Clinical Conditions</b>					
I.	Visual or Radiographically Evident <b>Restorations/Cavitated Carious Lesions</b>	No carious lesions or restorations in last 24 months		Carious lesions or restorations in last 24 months	
II.	<b>Non-cavitated (incipient) Carious Lesions</b>	No new lesions in last 24 months		New lesions in last 24 months	
III.	<b>Teeth Missing Due to Caries</b>	No		Yes	
IV.	<b>Visible Plaque</b>	No	Yes		
V.	<b>Dental /Orthodontic Appliances</b> Present (fixed or removable)	No	Yes		
VI.	<b>Salivary Flow</b>	Visually adequate		Visually inadequate	
<b>TOTAL:</b>					

Instructions for Caregiver:

\*Patients with developmental, physical, medical or mental disabilities that prevent or limit performance of adequate oral health care by themselves or caregivers.

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Indicate 0, 1 or 10 in the last column for each risk factor. If the risk factor was not determined or is not applicable, enter a 0 in the patient risk factor column. Total the factor values and record the score at the top of the page.

A score of 0 indicates a patient has a low risk for the development of caries. A single high risk factor, or score of 10, places the patient at high risk for development of caries. Scores between 1 and 10 place the patient at a moderate risk for the development of caries. Subsequent scores should decrease with reduction of risks and therapeutic intervention.

The clinical judgment of the dentist may justify a change of the patient's risk level (increased or decreased) based on review of this form and other pertinent information. For example, missing teeth may not be regarded as high risk for a follow up patient; or other risk factors not listed may be present.

The assessment cannot address every aspect of a patient's health, and should not be used as a replacement for the dentist's inquiry and judgment. Additional or more focused assessment may be appropriate for patients with specific health concerns. As with other forms, this assessment may be only a starting point for evaluating the patient's health status.

*This is a tool provided for the use of ADA members. It is based on the opinion of experts who utilized the most up-to-date scientific information available. The ADA plans to periodically update this tool based on: 1) member feedback regarding its usefulness, and; 2) advances in science. ADA member-users are encouraged to share their opinions regarding this tool with the Council on Dental Practice.*



**Missouri Department of Health and Senior Services**  
 P.O. Box 570, Jefferson City, MO 65102-0570 Phone: 800-891-7415 FAX: 573-522-8146

**Missouri Show Me Your Smile Survey**

rev.10-23-07

<b>Screen Date:</b>	<b>School Code:</b>	<b>Grade</b>	<b>Screener ID</b>	<b>ID Number:</b>
---------------------	---------------------	--------------	--------------------	-------------------

**1. Gender:**

- Male
- Female

**2. Age:**

- 0 to 11Mo.
- 1
- 2
- 3
- 4
- 5
- 6
- 7
- 8
- 9
- 10
- 11
- 12
- 13
- 14
- 15
- 16
- 17
- 18

**3. Height & Weight:**

\_\_\_ Ft. \_\_\_ In.  
 \_\_\_\_\_ Pounds

**4. Race**

- White
- African-American
- Hispanic
- Asian-Pacific Islander
- American Indian
- Multi- Racial
- Unknown (Non White)

**5. Oral Hygiene:**

- Satisfactory
- Not Satisfactory

**6. Treated Decay:**

- None
- Primary Only
- Primary and Permanent
- Permanent Only

**7. Untreated Decay:**

- None
- Primary Only
- Primary and Permanent
- Permanent Only

**8. Presence of Dental Sealants:**

- No Sealants
- Sealants

**9. Treatment Urgency:**

- No Obvious Problem
- Early Dental Care
- Urgent Care

**10. History of Rampant Caries? (Decay on 7 or more teeth)?**

- Yes
- No

**11. Early Childhood Caries? (Caries history on max anterior)**

- Yes
- No

**12 White Spot Lesions? (White spots on max anterior)**

- Yes
- No

**SAMPLE FORM-  
 FOR TRAINING  
 PURPOSES  
 ONLY**

Comments / Notes

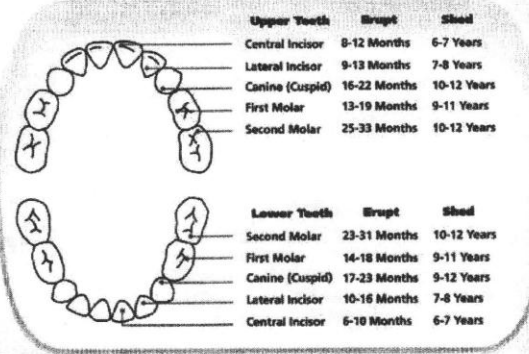


## Children's Oral Health fact sheet

### WHEN WILL MY CHILD'S TEETH COME IN?

Primary teeth start coming in around six months of age, and all 20 primary teeth are usually in by age 2 or 3 years. When babies are teething, let them chew on something cool like a clean, cold cloth or a teething ring. Signs of teething:

- Sore gums
- More drooling
- Fussy and irritable



### WHY ARE BABY TEETH IMPORTANT?

#### BABY TEETH:

- Guide permanent teeth into place
- Help your child speak clearly
- Aid in jaw and face formation
- Chew nutritious food
- Promote overall health
- Build self-esteem

### CHILDREN'S ORAL HEALTH IS IMPORTANT! DON'T BRUSH IT OFF!

- Tooth decay is the number one most common childhood disease, 5 times as common as asthma and 7 times as common as hay fever.
- More than half of children ages 5-9 have had at least one cavity or filling.
- 78% of 17 year olds have experienced tooth decay.
- Children from families without medical insurance are 2.5 times less likely than insured children to received dental care.
- Children from families without dental insurance are 3 times more likely than insured children to have unmet dental needs.
- For every child without medical insurance, there are 2.6 who lack dental insurance.
- Children with untreated oral disease often have persistent pain, have an inability to eat comfortably or to chew nutritious food well, embarrassed by discolored and damaged teeth and are distracted during play and learning.
- Nationally more than 51 million school hours are lost each year because of dental related illness.

## Back to the basics

### DENTAL DECAY IS PREVENTABLE! WHAT CAN YOU DO?

- Never let your child go to bed with a bottle.
- Brush your child's teeth 2 times a day, especially before bed.
- Use a pea-size amount of fluoride toothpaste, once your child can spit.
- Help children learn to brush their own teeth.
- Develop good brushing habits.
- Start gentle flossing when 2 of your child's teeth begin to touch.
- Check your child's teeth monthly for changes.
- Replace the toothbrush when your child has strep throat, recurring sore throats, or when bristles are worn.
- Set a good example by practicing good oral hygiene.
- Visit the dentist regularly beginning at age one.



## How to brush and floss your child's teeth

### BRUSHING

- Place your toothbrush at a 45-degree angle against the gums.
- Move the brush back and forth gently in short (tooth-wide) strokes.
- Brush the outer tooth surfaces, the inner tooth surfaces, and the chewing surfaces of the teeth.
- Use the "toe" of the brush to clean the inside surfaces of the front teeth, using a gentle up-and-down stroke.
- Brush your tongue to remove bacteria and freshen your breath.

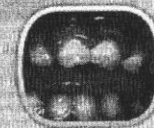
### FLOSSING

- Break off about 18 inches of floss and wind most of it around one of your middle fingers.
- Wind the remaining floss around the same finger of the opposite hand. This finger will take up the floss as it becomes dirty. Hold the floss tightly between your thumbs and forefingers.
- Guide the floss between your teeth using a gentle rubbing motion. Never snap the floss into the gums.
- When the floss reaches the gum line, curve it into a C shape against one tooth. Gently slide it into the space between the gum and the tooth.
- Hold the floss tightly against the tooth. Gently rub the side of the tooth, moving the floss away from the gum with up and down motions.
- Repeat this method on the rest of your teeth.
- Don't forget the backside of your last tooth.

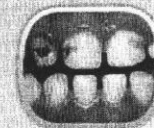
## Stages of tooth Decay:



**▲ HEALTHY MOUTH**  
No obvious dental problems. Uniform white tooth surfaces. Pink, firm gums.



**▲ EARLY DECAY**  
Early signs of cavities appear as lesions. Lesions can appear as white spots, opaque, or cloudy. Lesions appear as bands along the gum line.



**▲ MODERATE DECAY**  
Brown or black discolorations on teeth. Broken teeth and/or teeth that are wearing down. Child's teeth may sensitive to hot or cold.



**▲ SEVERE DECAY**  
Multiple, large cavities. Cavities often accompanied by gum abscesses. Pain not be present if nerve is already damaged.





## ¡Muéstrame tu sonrisa! Información sobre la Salud Dental Infantil

### ¿CUÁNDO LE EMPEZARÁN A SALIR LOS DIENTES A MI HIJO?

Los dientes de leche comienzan a salir alrededor de los seis meses, y el total de los 20 dientes de leche generalmente ya han salido a los 2 o 3 años. Cuando están saliendo, deje que su bebé mastique algo fresco, como un paño limpio y frío o un aro para morder. Señales que anuncian la dentición:

- Encías inflamadas
- Babeado intenso
- Molestia e irritabilidad

Dientes superiores	Salen	Se caen
Incisivo central	8-12 meses	6-7 años
Incisivo lateral	9-13 meses	7-8 años
Colmillo	16-22 meses	10-12 años
Primer molar	13-19 meses	9-11 años
Segundo molar	25-33 meses	10-12 años

Dientes inferiores	Salen	Se caen
Segundo molar	23-31 meses	10-12 años
Primer molar	14-18 meses	9-11 años
Colmillo	17-23 meses	9-12 años
Incisivo lateral	10-16 meses	7-8 años
Incisivo central	6-10 meses	6-7 años

### ¿POR QUÉ SON IMPORTANTES LOS DIENTES DE LECHE?

#### LOS DIENTES DE LECHE:

- Guían a los dientes permanentes a la posición correcta
- Ayudan a su hijo a hablar claramente
- Ayudan a la formación de la mandíbula y del rostro
- Mastican alimentos nutritivos
- Promueven la salud en general
- Generan autoestima

### ¡LA SALUD DENTAL DE LOS NIÑOS ES IMPORTANTE! ¡NO LA DESCUIDE!

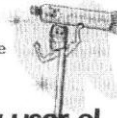
- Las caries dental es una de las enfermedades infantiles más comunes, es 5 veces más común que el asma y 7 veces más común que la rinitis alérgica (fiebre del heno).
- Más de la mitad de los niños entre 5 y 9 años han tenido al menos unas caries o empaste.
- El 78% de los jóvenes de 17 años ha tenido caries.
- Los niños que provienen de familias sin seguro médico tienen una probabilidad 2.5 veces inferior de recibir cuidados dentales que los niños con seguro médico.
- Los niños de familias sin seguro dental tienen una probabilidad 3 veces mayor de tener necesidades dentales insatisfechas que los niños con seguro.
- Por cada niño sin seguro médico, hay 2.6 sin seguro dental.
- Con frecuencia, los niños que tienen enfermedades bucales sin tratar experimentan dolor permanente, no pueden comer cómodamente o masticar alimentos nutritivos adecuadamente, se avergüenzan de tener dientes manchados y dañados y se distraen durante el juego y el aprendizaje.
- A nivel nacional, se pierden más de 51 millones de horas escolares cada año debido a las enfermedades bucales.



## Tome en cuenta estos conceptos fundamentales

¿LAS CARIES DENTAL SE PUEDE PREVENIR? ¿QUE PUEDE HACER?

- Nunca deje que su hijo se acueste con un biberón.
- Cepille los dientes de su hijo 2 veces por día, especialmente antes de acostarse.
- Una vez que su hijo aprenda a escupir, utilice pasta dental fluorada de cantidad de tamaño de un chicharo.
- Ayude a los niños a cepillarse los dientes.
- Establezca buenos hábitos de higiene bucal.
- Empiece a utilizar el hilo dental delicadamente cuando los dientes empiecen a juntarse.
- Revise los dientes de su hijo todos los meses para detectar cambios.
- Reemplace el cepillo de dientes cuando su hijo tenga una infección en la garganta, irritación de garganta recurrente, o cuando las cerdas del cepillo estén gastadas.
- Dé un buen ejemplo usted mismo manteniendo una buena higiene bucal.
- Visite al dentista regularmente a partir del primer año.



## ¿Cómo cepillar los dientes de su hijo y usar el hilo dental?

### CEPILLAR LOS DIENTES

- Coloque el cepillo de dientes sobre las encías en un ángulo de 45 grados.
- Mueva el cepillo suavemente hacia atrás y hacia adelante en movimientos cortos (por todos los dientes).
- Cepille la superficie externa, la superficie interna, y las superficies para masticar de los dientes.
- Use la punta del cepillo para limpiar la superficie interna de los dientes delanteros, utilizando un movimiento suave de arriba hacia abajo.
- Cepille la lengua para retirar bacterias y refrescar el aliento.

### HILO DENTAL

- Corte aproximadamente 18 pulgadas de hilo dental y enróllelo casi por completo alrededor de uno de sus dedos mayores.
- Enrolle el resto del hilo dental alrededor del mismo dedo en la otra mano. Este dedo tomará el hilo dental que se vaya utilizando. Sostenga el hilo dental firmemente entre sus dedos pulgar e índice.
- Guíe el hilo dental entre los dientes de su hijo frotando suavemente. Nunca introduzca bruscamente el hilo dental en las encías.
- Cuando el hilo dental llegue a las encías, rodee el diente colocando el hilo dental en forma de U. Suavemente deslicelo en el espacio entre la encía y el diente.
- Sostenga el hilo dental firmemente contra el diente. Frote suavemente el costado del diente, alejando el hilo dental de la encía con movimientos hacia arriba y hacia abajo.
- Repita este método en el resto de los dientes.
- No olvide el lado posterior del último diente.

<sup>1</sup>Asociación Dental de EE.UU. (14 de marzo, 2005) *La limpieza de los dientes y encías (Higiene bucal)*. [http://ada.org/public/topics/cleaning\\_faq.asp](http://ada.org/public/topics/cleaning_faq.asp)

Este es un proyecto de la *Coalición de Missouri para la Salud Bucal*.

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#### Agradecimientos especiales:

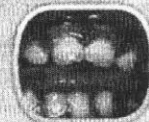
*Fundación para la Salud de Missouri*  
*Asociación Dental de Missouri*  
*Universidad de Missouri - Facultad de Odontología de la Ciudad de Kansas*  
*Academia de Odontología Pediátrica de Missouri*  
*Asociación de Primeros Cuidados de Missouri*

## Etapas de las caries:



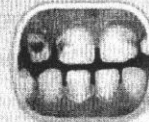
### ▲ BOCA SANA

No se observan problemas dentales. Superficies dentales blancas y uniformes. Encías color rosa y firmes.



### ▲ CARIES LEVE

Los primeros signos de la caries se manifiestan como lesiones. Las lesiones pueden presentarse como manchas blancas, opacas o turbias. Aparecen en bandas a lo largo de la encía.



### ▲ CARIES MODERADA

Descoloramiento color café o negro en los dientes. Dientes rotos y/o que se están gastando. Los dientes del niño pueden volverse sensibles al calor o al frío.



### ▲ CARIES GRAVE

Caries múltiples y grandes. Está generalmente acompañada por abscesos de la encía. Es posible no sentir dolor si el nervio ya ha sido dañado.

# Brush Up on Healthy Teeth

## *Simple Steps for Kids' Smiles*



### *1. Start cleaning teeth early.*

As soon as the first tooth appears, begin cleaning by wiping with a clean, damp cloth every day. When more teeth come in, switch to a small, soft toothbrush. Begin using toothpaste with fluoride when the child is 2 years old. Use toothpaste with fluoride earlier if your child's doctor or dentist recommends it.

### *2. Use the right amount of fluoride toothpaste.*

Fluoride is important for fighting cavities. But if children younger than 6 years old swallow too much fluoride, their permanent teeth may have white spots. To keep this from happening, use only a small amount of toothpaste (about the size of a pea). Teach your child to spit out the toothpaste and to rinse well after brushing.

### *3. Supervise brushing.*

Brush your child's teeth twice a day until your child has the skill to handle the toothbrush alone. Then continue to closely watch brushing to make sure the child is doing a thorough job and using only a small amount of toothpaste.

### *4. Talk to your child's doctor or dentist.*

Check with the doctor or dentist about your child's specific fluoride needs. After age 2, most children get the right amount of fluoride to help prevent cavities if they drink water that contains fluoride and brush their teeth with a pea-sized amount of fluoride toothpaste twice a day.

Parents of children older than 6 months should ask about the need for a fluoride supplement if drinking water does not have enough fluoride.

Do not let a child younger than 6 years old use a fluoride mouth rinse unless the child's doctor or dentist recommends it.

***Early care for your children's teeth will  
protect their smile and their health.***



# Refresque Sus Conocimientos sobre Dientes Sanos

*Pasos Sencillos para Sonrisas Infantiles*



## 1. Empiece a limpiar los dientes desde muy temprano.

Tan pronto como aparezca el primer diente, empiece a limpiarlo con un trapo limpio y húmedo todos los días. Cuando salgan más dientes, utilice un cepillo de dientes pequeño de cerdas suaves. Inicie el uso de pasta de dientes con fluoruro cuando el niño cumpla los dos años de edad. Utilice pasta de dientes con fluoruro antes si el médico o dentista del niño lo recomienda.

## 2. Utilice la cantidad correcta de pasta de dientes con fluoruro.

El fluoruro es importante para prevenir las caries. Sin embargo, si un niño menor de seis años traga demasiado fluoruro sus dientes permanentes podrían desarrollar manchas blancas. Para evitar esto, utilice una cantidad pequeña de pasta de dientes (aproximadamente el tamaño de un pequeño grano de maíz). Enseñe a su hijo a escupir la pasta de dientes y a enjuagarse bien después de cepillarse.

## 3. Supervise el cepillado.

Cepille los dientes de su hijo dos veces al día hasta que él aprenda a utilizar el cepillo de dientes sin ayuda. Luego continúe supervisando al niño cuidadosamente hasta que esté seguro que se cepilla correctamente y que utiliza una cantidad pequeña de pasta de dientes.

## 4. Hable con el doctor o dentista de su hijo.

Converse con el doctor o dentista acerca de las necesidades de fluoruro de su hijo. Después de cumplir los dos años, la mayoría de los niños ingieren la cantidad necesaria de fluoruro para prevenir las caries si beben agua que contenga esta sustancia y se cepillan los dientes dos veces al día con una pequeña cantidad (del tamaño de un pequeño grano de maíz) de pasta de dientes con fluoruro.

Los padres de niños mayores de seis meses deben preguntar si es necesario administrar un suplemento de fluoruro en caso de que el agua potable no contenga cantidad suficiente.

No deje que un niño menor de seis años utilice enjuague bucal con fluoruro a menos que el doctor o dentista del niño lo haya recomendado.

*Si empieza a cuidar desde muy temprano los dientes de su hijo protegerá su sonrisa y su salud.*

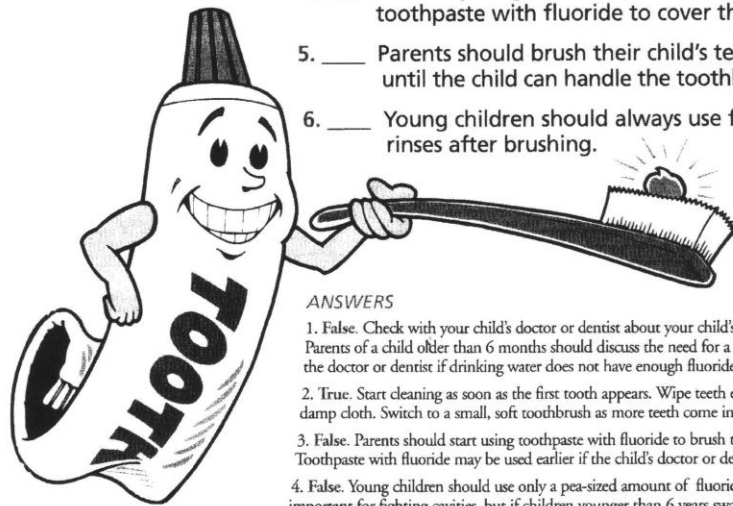


# Brush Up on Healthy Teeth

## *A Quiz for Parents About Simple Steps for Kids' Smiles*

Learn more about keeping your child's teeth healthy with this true or false quiz.

1. \_\_\_ All children older than 6 months should receive a fluoride supplement every day.
2. \_\_\_ Parents should start cleaning their child's teeth as soon as the first tooth appears.
3. \_\_\_ Parents should start brushing their child's teeth with toothpaste that contains fluoride at age 3.
4. \_\_\_ Children younger than 6 years should use enough toothpaste with fluoride to cover the toothbrush.
5. \_\_\_ Parents should brush their child's teeth twice a day until the child can handle the toothbrush alone.
6. \_\_\_ Young children should always use fluoride mouth rinses after brushing.



### ANSWERS

1. False. Check with your child's doctor or dentist about your child's specific fluoride needs. Parents of a child older than 6 months should discuss the need for a fluoride supplement with the doctor or dentist if drinking water does not have enough fluoride to help prevent cavities.
2. True. Start cleaning as soon as the first tooth appears. Wipe teeth every day with a clean, damp cloth. Switch to a small, soft toothbrush as more teeth come in.
3. False. Parents should start using toothpaste with fluoride to brush their child's teeth at age 2. Toothpaste with fluoride may be used earlier if the child's doctor or dentist recommends it.
4. False. Young children should use only a pea-sized amount of fluoride toothpaste. Fluoride is important for fighting cavities, but if children younger than 6 years swallow too much fluoride, their permanent teeth may have white spots. Using no more than a pea-sized amount of toothpaste with fluoride can help keep this from happening.
5. True. Children usually do not have the skill to brush their teeth well until around age 4 or 5. Parents should brush their young child's teeth thoroughly twice a day until the child can handle the toothbrush alone.
6. False. Fluoride mouth rinses have a high concentration of fluoride. Children younger than 6 years should not use fluoride mouth rinses unless the child's doctor or dentist recommends it. Young children tend to swallow rather than spit, and swallowing too much fluoride before age 6 may cause the permanent teeth to have white spots.

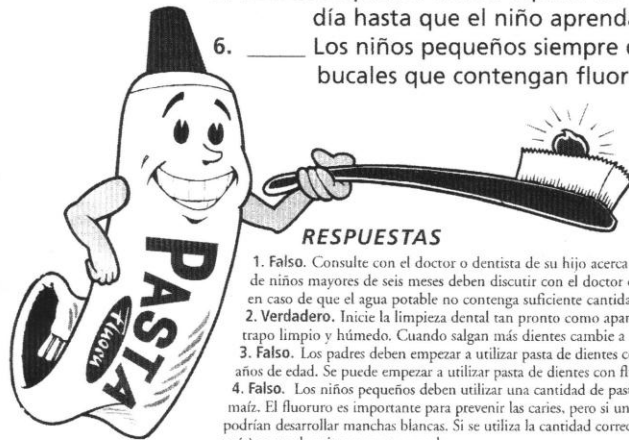


# Refresque Sus Conocimientos sobre Dientes Sanos

*Un Examen para los Padres sobre Pasos Sencillos para Sonrisas Infantiles*

Aprenda más sobre cómo mantener los dientes sanos de sus hijos mediante este examen de verdadero y falso preparado por los Centros para el Control y la Prevención de Enfermedades.

1. \_\_\_\_ Todos los niños mayores de seis meses deberían recibir un suplemento de fluoruro todos los días.
2. \_\_\_\_ Los padres deben empezar a limpiar los dientes de los niños apenas salga el primer diente.
3. \_\_\_\_ Los padres deben empezar a cepillar los dientes de sus hijos con pasta de dientes que contenga fluoruro a partir de los tres años.
4. \_\_\_\_ Los niños menores de seis años deben utilizar una cantidad suficiente de pasta de dientes con fluoruro de manera de cubrir el cepillo de dientes.
5. \_\_\_\_ Los padres deben cepillar los dientes del niño dos veces al día hasta que el niño aprenda a utilizar el cepillo de dientes solo.
6. \_\_\_\_ Los niños pequeños siempre deben utilizar enjuagues bucales que contengan fluoruro después del cepillado.



## RESPUESTAS

1. **Falso.** Consulte con el doctor o dentista de su hijo acerca de las necesidades específicas de fluoruro del niño. Los padres de niños mayores de seis meses deben discutir con el doctor o dentista si es necesario administrar un suplemento de fluoruro en caso de que el agua potable no contenga suficiente cantidad de esta sustancia para ayudar a prevenir las caries.
2. **Verdadero.** Inicie la limpieza dental tan pronto como aparezca el primer diente. Limpie los dientes todos los días con un trapo limpio y húmedo. Cuando salgan más dientes cambie a un cepillo de dientes pequeño de cerdas suaves.
3. **Falso.** Los padres deben empezar a utilizar pasta de dientes con fluoruro para cepillar los dientes del niño a partir de los dos años de edad. Se puede empezar a utilizar pasta de dientes con fluoruro más pronto si el doctor o dentista del niño lo recomienda.
4. **Falso.** Los niños pequeños deben utilizar una cantidad de pasta de dientes con fluoruro del tamaño de un pequeño grano de maíz. El fluoruro es importante para prevenir las caries, pero si un niño menor de seis años traga demasiado fluoruro, los dientes podrían desarrollar manchas blancas. Si se utiliza la cantidad correcta de fluoruro (no más del tamaño de un pequeño grano de maíz) se puede evitar que esto suceda.
5. **Verdadero.** Los niños generalmente no logran cepillarse los dientes correctamente hasta que cumplen cuatro o cinco años. Los padres deben cepillar cuidadosamente los dientes del niño dos veces al día hasta que éste aprenda a utilizar el cepillo de dientes sin ayuda.
6. **Falso.** Los enjuagues bucales con fluoruro contienen una concentración elevada de esta sustancia. Los niños menores de seis años no deben utilizar enjuagues bucales con fluoruro a menos que el doctor o dentista del niño lo recomiende. Los niños pequeños tienen tendencia a tragar en lugar de escupir, y si se traga demasiado fluoruro antes de los seis años los dientes podrían desarrollar manchas blancas.

