

County of Los Angeles Department of Public Health
Children's Medical Services
Child Health and Disability Prevention (CHDP) Program

CHDP FLUORIDE VARNISH PACKET

(continued)

19. Confirm initial screen was accomplished, verify results, and follow up, as appropriate. The Recommended Uniform Screening Panel (<https://www.hrsa.gov/advisory-committees/heritable-disorders/rusp/index.html>), as determined by The Secretary's Advisory Committee on Heritable Disorders in Newborns and Children, and state newborn screening laws/regulations (<http://genes-r-us.uthscsa.edu/home>) establish the criteria for and coverage of newborn screening procedures and programs.
20. Verify results as soon as possible, and follow up, as appropriate.
21. Confirm initial screening was accomplished, verify results, and follow up, as appropriate. See "Hyperbilirubinemia in the Newborn Infant ≥35 Weeks' Gestation: An Update With Clarifications" (<http://pediatrics.aappublications.org/content/124/4/1193>).
22. Screening for critical congenital heart disease using pulse oximetry should be performed in newborns, after 24 hours of age, before discharge from the hospital, per "Endorsement of Health and Human Services Recommendation for Pulse Oximetry Screening for Critical Congenital Heart Disease" (<http://pediatrics.aappublications.org/content/129/1/190.full>).
23. Schedules, per the AAP Committee on Infectious Diseases, are available at http://redbook.solutions.aap.org/SS/Immunization_Schedules.aspx. Every visit should be an opportunity to update and complete a child's immunizations.
24. Perform risk assessment or screening, as appropriate, per recommendations in the current edition of the AAP *Pediatric Nutrition: Policy of the American Academy of Pediatrics* (Iron chapter).
25. For children at risk of lead exposure, see "Prevention of Childhood Lead Toxicity" (<http://pediatrics.aappublications.org/content/138/1/e20161493>) and "Low Level Lead Exposure Harms Children: A Renewed Call for Primary Prevention" (http://www.cdc.gov/nceh/lead/ACCLPP/Final_Document_030712.pdf).
26. Perform risk assessments or screenings as appropriate, based on universal screening requirements for patients with Medicaid or in high prevalence areas.
27. Tuberculosis testing per recommendations of the AAP Committee on Infectious Diseases, published in the current edition of the AAP *Red Book: Report of the Committee on Infectious Diseases*. Testing should be performed on recognition of high-risk factors.
28. See "Integrated Guidelines for Cardiovascular Health and Risk Reduction in Children and Adolescents" (http://www.nhlbi.nih.gov/guidelines/cvd_ped/index.htm).
29. Adolescents should be screened for sexually transmitted infections (STIs) per recommendations in the current edition of the AAP *Red Book: Report of the Committee on Infectious Diseases*.
30. Adolescents should be screened for HIV according to the USPSTF recommendations (<http://www.uspreventiveservicestaskforce.org/uspstf/uspshivi.htm>) once between the ages of 15 and 18, making every effort to preserve confidentiality of the adolescent. Those at increased risk of HIV infection, including those who are sexually active, participate in injection drug use, or are being tested for other STIs, should be tested for HIV and reassessed annually.
31. See USPSTF recommendations (<http://www.uspreventiveservicestaskforce.org/uspstf/uspscerv.htm>). Indications for pelvic examinations prior to age 21 are noted in "Gynecologic Examination for Adolescents in the Pediatric Office Setting" (<http://pediatrics.aappublications.org/content/126/3/583.full>).
32. Assess whether the child has a dental home. If no dental home is identified, perform a risk assessment (<http://www2.aap.org/oralhealth/docs/RiskAssessmentTool.pdf>) and refer to a dental home. Recommend brushing with fluoride toothpaste in the proper dosage for age. See "Maintaining and Improving the Oral Health of Young Children" (<http://pediatrics.aappublications.org/content/134/6/1224>).
33. Perform a risk assessment (<http://www2.aap.org/oralhealth/docs/RiskAssessmentTool.pdf>). See "Maintaining and Improving the Oral Health of Young Children" (<http://pediatrics.aappublications.org/content/134/6/1224>).
34. See USPSTF recommendations (<http://www.uspreventiveservicestaskforce.org/uspstf/uspndch.htm>). Once teeth are present, fluoride varnish may be applied to all children every 3–6 months in the primary care or dental office. Indications for fluoride use are noted in "Fluoride Use in Caries Prevention in the Primary Care Setting" (<http://pediatrics.aappublications.org/content/134/3/626>).
35. If primary water source is deficient in fluoride, consider oral fluoride supplementation. See "Fluoride Use in Caries Prevention in the Primary Care Setting" (<http://pediatrics.aappublications.org/content/134/3/626>).

Summary of Changes Made to the Bright Futures/AAP Recommendations for Preventive Pediatric Health Care (Periodicity Schedule)

This schedule reflects changes approved in December 2018 and published in March 2019.
For updates and a list of previous changes made, visit www.aap.org/periodicityschedule.

CHANGES MADE IN DECEMBER 2018

BLOOD PRESSURE

- Footnote 6 has been updated to read as follows: "Screening should occur per 'Clinical Practice Guideline for Screening and Management of High Blood Pressure in Children and Adolescents' (<http://pediatrics.aappublications.org/content/140/3/e20171904>). Blood pressure measurement in infants and children with specific risk conditions should be performed at visits before age 3 years."

ANEMIA

- Footnote 24 has been updated to read as follows: "Perform risk assessment or screening, as appropriate, per recommendations in the current edition of the AAP *Pediatric Nutrition: Policy of the American Academy of Pediatrics* (Iron chapter)."

LEAD

- Footnote 25 has been updated to read as follows: "For children at risk of lead exposure, see 'Prevention of Childhood Lead Toxicity' (<http://pediatrics.aappublications.org/content/138/1/e20161493>) and 'Low Level Lead Exposure Harms Children: A Renewed Call for Primary Prevention' (https://www.cdc.gov/nceh/lead/ACCLPP/Final_Document_030712.pdf)."

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Health Resources & Services Administration

This program is supported by the Health Resources and Services Administration (HRSA) of the U.S. Department of Health and Human Services (HHS) as part of an award totaling \$5,000,000 with 10 percent financed with non-governmental sources. The contents are those of the author(s) and do not necessarily represent the official views of, nor an endorsement by, HRSA, HHS, or the U.S. Government. For more information, please visit HRSA.gov.



CLINICAL REPORT

Fluoride Use in Caries Prevention in the Primary Care Setting

abstract

FREE

Dental caries remains the most common chronic disease of childhood in the United States. Caries is a largely preventable condition, and fluoride has proven effectiveness in the prevention of caries. The goals of this clinical report are to clarify the use of available fluoride modalities for caries prevention in the primary care setting and to assist pediatricians in using fluoride to achieve maximum protection against dental caries while minimizing the likelihood of enamel fluorosis. *Pediatrics* 2014;134:626–633

Dental caries (ie, tooth decay) is an infectious disease in which acid produced by bacteria dissolves tooth enamel. If not halted, this process will continue through the tooth and into the pulp, resulting in pain and tooth loss. This activity can further progress to local infections (ie, dental alveolar abscess or facial cellulitis), systemic infection, and, in rare cases, death. Dental caries in the United States is responsible for many of the 51 million school hours lost per year as a result of dental-related illness, which translates into lost work hours for the parent or adult caregiver.¹ Early childhood caries is the single greatest risk factor for caries in the permanent dentition. Good oral health is a necessary part of overall health, and recent studies have demonstrated the adverse effects of poor oral health on multiple other chronic conditions, including diabetes control.² Therefore, the failure to prevent caries has health, educational, and financial consequences at both the individual and societal level.

Dental caries is the most common chronic disease of childhood,¹ with 59% of 12- to 19-year-olds having at least 1 documented cavity.³ Caries is the “silent epidemic” that disproportionately affects poor, young, and minority populations.¹ The prevalence of dental caries in very young children increased during the period between the last 2 national surveys, despite improvements for older children.⁴ Because many children do not receive dental care at young ages, and risk factors for dental caries are influenced by parenting practices, pediatricians have a unique opportunity to participate in the primary prevention of dental caries. Studies show that simple home and primary care setting prevention measures would save health care dollars.⁵

Development of dental caries requires 4 components: teeth, bacteria, carbohydrate exposure, and time. Once teeth emerge, they may become colonized with cariogenic bacteria. The bacteria metabolize carbohydrates

Melinda B. Clark, MD, FAAP, Rebecca L. Slayton, DDS, PhD, and SECTION ON ORAL HEALTH

KEY WORDS

enamel fluorosis, fluoride, fluoride varnish, formula mixing, systemic fluoride supplements, toothpaste, water fluoridation

ABBREVIATIONS

AAP—American Academy of Pediatrics
ADA—American Dental Association
CDC—Centers for Disease Control and Prevention
EPA—Environmental Protection Agency

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The guidance in this report does not indicate an exclusive course of treatment or serve as a standard of medical care. Variations, taking into account individual circumstances, may be appropriate.

www.pediatrics.org/cgi/doi/10.1542/peds.2014-1699

doi:10.1542/peds.2014-1699

Accepted for publication Jun 9, 2014

All clinical reports from the American Academy of Pediatrics automatically expire 5 years after publication unless reaffirmed, revised, or retired at or before that time.

PEDIATRICS (ISSN Numbers: Print, 0031-4005; Online, 1098-4275).

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and create acid as a byproduct. The acid dissolves the mineral content of enamel (demineralization) and, over time with repeated acid attacks, the enamel surface collapses and results in a cavity in the tooth. Protective factors that help to remineralize enamel include exposing the teeth to fluoride, limiting the frequency of carbohydrate consumption, choosing less cariogenic foods, practicing good oral hygiene, receiving regular dental care, and delaying bacterial colonization. If carious lesions are identified early, the process can be halted or reversed by modifying the patient's individual risk and protective factors. Certain American Academy of Pediatrics (AAP) publications (*Oral Health Risk Assessment Timing and Establishment of the Dental Home*⁶ and *Bright Futures: Guidelines for Health Supervision of Infants, Children, and Adolescents*⁷) discuss these concepts in greater depth and provide targeted preventive anticipatory guidance. The Medical Expenditure Panel Survey demonstrated that 89% of infants and 1-year-olds have office-based physician visits annually, compared with only 1.5% who have dental visits.⁸ For primary prevention to be effective, it is imperative that pediatricians be knowledgeable about the process of dental caries, prevention of the disease, and available interventions, including fluoride.

Fluoride is available from many sources and is divided into 3 major categories: tap water (and foods and beverages processed with fluoridated water), home administered, and professionally applied. There has been substantial public and professional debate about fluoride, and myriad information is available, often with confusing or conflicting messages. The widespread decline in dental caries in many developed countries, including the United States, has been largely attributable to the use of fluoride. Fluoride has 3 main mechanisms of action: (1) it promotes enamel remineralization; (2) it

reduces enamel demineralization; and (3) it inhibits bacterial metabolism and acid production.⁹ The mechanisms of fluoride are both topical and systemic, but the topical effect is the most important, especially over the life span.¹⁰

RISK OF FLUOROSIS

The only scientifically proven risk of fluoride use is the development of fluorosis, which may occur with fluoride ingestion during tooth and bone development. Fluorosis of permanent teeth occurs when fluoride of sufficient quantity for a sufficient period of time is ingested during the time that tooth enamel is being mineralized. Fluorosis is the result of subsurface hypomineralization and porosity between the developing enamel rods.¹¹ This risk exists in children younger than 8 years, and the most susceptible period for permanent maxillary incisor fluorosis is between 15 and 30 months of age.^{12–14} The risk of fluorosis is influenced by both the dose and frequency of exposure to fluoride during tooth development.¹⁵ Recent evidence also suggests that individual susceptibility or resistance to fluorosis includes a genetic component.¹⁶

After 8 years of age, there is no further risk of fluorosis (except for the third molars) because the permanent tooth enamel is fully mineralized. The vast majority of enamel fluorosis is mild or very mild and characterized by small

white striations or opaque areas that are not readily noticeable to the casual observer. Although this type of fluorosis is of no clinical consequence, enamel fluorosis has been increasing in frequency over the last 2 decades to a rate of approximately 41% among adolescents because fluoride sources are more widely available in varied forms.¹⁷ Moderate and severe forms of enamel fluorosis are uncommon in the United States but have both an aesthetic concern and potentially a structural concern, with pitting, brittle incisal edges, and weakened groove anatomy in the permanent 6-year molars.

In 2001, the AAP endorsed the guidelines from the Centers for Disease Control and Prevention (CDC), "Recommendations for Using Fluoride to Prevent and Control Dental Caries in the United States."¹⁵ Dental and governmental organizations (American Dental Association [ADA], American Academy of Pediatric Dentistry, the Department of Health and Human Services, and the CDC) have more recently published guidelines on the use of fluoride, but current AAP publications do not reflect these newer evidence-based guidelines. Table 1 provides a simple explanation of fluoride use for patients at low and high risk of caries.

The present report has 2 goals: (1) to assist pediatricians in using fluoride to achieve maximum protection against

TABLE 1 Summary of Fluoride Modalities for Low- and High-Risk Patients

Fluoride Modality	Low Caries Risk	High Caries Risk
Toothpaste	Starting at tooth emergence (smear of paste until age 3 y, then pea-sized)	Starting at tooth emergence (smear of paste until age 3 y, then pea-sized)
Fluoride varnish	Every 3–6 mo starting at tooth emergence	Every 3–6 mo starting at tooth emergence
Over-the-counter mouth rinse	Not applicable	Starting at age 6 y if the child can reliably swish and spit
Community water fluoridation	Yes	Yes
Dietary fluoride supplements	Yes, if drinking water supply is not fluoridated	Yes, if drinking water supply is not fluoridated

dental caries while minimizing the likelihood of enamel fluorosis; and (2) to clarify the advice that should be given by pediatricians regarding fluoride in the primary care setting.

CURRENT INFORMATION REGARDING FLUORIDE USE IN CARIES PREVENTION

The following information aims to assist pediatricians in achieving maximum protection against dental caries for their patients while minimizing the likelihood of enamel fluorosis. Sources of ingested fluoride include drinking water, infant formula, fluoride toothpaste, prescription fluoride supplements, fluoride mouth rinses, professionally applied topical fluoride, and some foods and beverages.¹⁸

Fluoride Toothpaste

Fluoride toothpaste has consistently been proven to provide a caries-preventive effect for individuals of all ages.^{15,19} In the United States, the fluoride concentration of over-the-counter toothpaste ranges from 1000 to 1100 ppm. In some other countries, toothpastes containing 1500 ppm of fluoride are available. A 1-inch (1-g) strip of toothpaste translates to 1 or 1.5 mg of fluoride, respectively. A pea-sized amount of toothpaste is approximately one-quarter of an inch. Therefore, a pea-sized amount of toothpaste containing 1000/1100 ppm of fluoride would have approximately 0.25 mg of fluoride, and the same amount of toothpaste containing 1500 ppm of fluoride would have approximately 0.38 mg of fluoride. Most fluoride toothpaste in the United States contains sodium fluoride, sodium monofluorophosphate, or stannous fluoride as the active ingredient. Parents should supervise children younger than 8 years to ensure the proper amount of toothpaste and effective brushing technique. Children younger than 6 years are more likely to ingest some or all of the toothpaste

used. Ingestion of excessive amounts of fluoride can increase the risk of fluorosis. This excess can be minimized by limiting the amount of toothpaste used and by storing toothpaste where young children cannot access it without parental help.

Use of fluoride toothpaste should begin with the eruption of the first tooth. When fluoride toothpaste is used for children younger than 3 years, it is recommended that the amount be limited to a smear or grain of rice size (about one-half of a pea). Once the child has turned 3 years of age, a pea-sized amount of toothpaste should be used.^{20,21} Young children should not be given water to rinse after brushing because their instinct is to swallow. Expecting without rinsing will both reduce the amount of fluoride swallowed and leave some fluoride in the saliva, where it is available for uptake by the dental plaque. Parents should be strongly advised to supervise their child's use of fluoride toothpaste to avoid overuse or ingestion.

High-concentration toothpaste (5000 ppm) is available by prescription only. The active ingredient in this toothpaste is sodium fluoride. This agent can be recommended for children 6 years and older and adolescents who are at high risk of caries and who are able to expectorate after brushing. Dentists may also prescribe this agent for adolescents who are undergoing orthodontic treatment, as they are at increased risk of caries during this time.²²

Fluoride Varnish

Fluoride varnish is a concentrated topical fluoride that is applied to the teeth by using a small brush and sets on contact with saliva. Advantages of this modality are that it is well tolerated by infants and young children, has a prolonged therapeutic effect, and can be applied by both dental and non-

dental health professionals in a variety of settings.²³ The concentration of fluoride varnish is 22 600 ppm (2.26%), and the active ingredient is sodium fluoride. The unit dose packaging from most manufacturers provides a specific measured amount (0.25 mg, providing 5 mg of fluoride ion). The application of fluoride varnish during an oral screening is of benefit to children, especially those who may have limited access to dental care. Current American Academy of Pediatric Dentistry recommendations for children at high risk of caries is that fluoride varnish be applied to their teeth every 3 to 6 months.²⁴ The 2013 ADA guideline recommends application of fluoride varnish at least every 6 months to both primary and permanent teeth in those subjects at elevated caries risk.²⁵ The US Preventive Services Task Force recently published a new recommendation that primary care clinicians apply fluoride varnish to the primary teeth of all infants and children starting at the age of primary tooth eruption (B recommendation).²⁶

In most states, Medicaid will pay physicians for the application of fluoride varnish. Information regarding fluoride varnish application reimbursement and which states currently provide payment can be found on the AAP Web site (<http://www2.aap.org/oralhealth/docs/OHReimbursementChart.pdf>) and the Pew Charitable Trusts Web site (<http://www.pewstates.org/research/analysis/reimbursing-physicians-for-fluoride-varnish-85899377335>). Because state regulations vary regarding whether fluoride varnish must be applied within the context of a preventive care code, this information should be determined before billing.

Indications for Use

In the primary care setting, fluoride varnish should be applied to the teeth of all infants and children at least once every 6 months and preferably every 3 months, starting when the first tooth

erupts and until establishment of a dental home.

Instructions for Use

Fluoride varnish must be applied by a dentist, dental auxiliary professional, physician, nurse, or other health care professional, depending on the practice regulations in each state. It should not be dispensed to families to apply at home. Application of fluoride varnish is most commonly performed at the time of a well-child visit. Teeth are dried with a 2-inch gauze square, and the varnish is then painted onto all surfaces of the teeth with a brush provided with the varnish. Children are instructed to eat soft foods and not to brush their teeth on the evening after the varnish application to maximize the contact time of the varnish to the tooth. The following day, they should resume brushing twice daily with fluoridated toothpaste.

Over-the-Counter Fluoride Rinse

Over-the-counter fluoride rinse provides a lower concentration of sodium fluoride than toothpaste or varnish. The concentration is most commonly 230 ppm (0.05% sodium fluoride). Expert panels on this topic have concluded that over-the-counter fluoride rinses should not be recommended for children younger than 6 years because of their limited ability to rinse and spit and the risk of swallowing higher-than-recommended levels of fluoride.²⁷ A teaspoon (5 mL) of over-the-counter fluoride rinse contains approximately 1 mg of fluoride. For children younger than 6 years, this type of rinse provides an additional, low-dose topical fluoride application that may assist in the prevention of enamel demineralization. However, the evidence for an anticaries effect is limited. The daily use of a 0.05% sodium fluoride rinse may be of benefit for children older than 6 years who are at high risk of dental caries; however, there is no additional benefit

beyond daily use of fluoridated toothpaste for children at low risk of caries.^{28,29}

Dietary Fluoride Supplements

Dietary fluoride supplements should be considered for children living in communities in which the community water is not fluoridated or who drink well water that does not contain fluoride.²⁶ Because there are many sources of fluoride in the water supply and in processed food, it is essential that all potential sources of fluoride be assessed before prescribing a dietary supplement, including consideration of differing environmental exposures (eg, dual homes, child care). As a general guideline, if the primary source of water is fluoridated tap or well water, the child will not require fluoride supplementation, even if he or she primarily drinks bottled water, because the teeth are exposed to fluoride through cooking and brushing. The risk of fluorosis is high if fluoride supplements are given to a child consuming fluoridated water.³⁰ Information about the fluoridation levels in many community water systems can be found on the CDC Web site entitled My Water's Fluoride (<http://apps.nccd.cdc.gov/MWF/Index.asp>). Not all communities report this information to the CDC; therefore, it may be necessary to contact the local water department to determine the level of fluoride in the community water. Well water must be tested for fluoride content before prescribing supplements; such testing is available in most states through the state or county public health laboratory.

Guidelines for Use

CDC recommendations regarding fluoride supplementation are provided in Table 2. Supplements can be prescribed in liquid or tablet form. Tablets are preferable for children old enough to chew, because they gain an additional topical benefit to the teeth during the chewing process. Liquid supplements are recommended for younger children and should ideally be added to water or put directly into the child's mouth. Addition of the fluoride supplement to milk or formula is not recommended because of the reduced absorption of fluoride in the presence of calcium.³¹ The risk of mild fluorosis can be minimized by health care providers verifying that there are no other sources of fluoride exposure before prescribing systemic fluoride supplements.

Other Sources of Fluoride

Fluoride is present in processed foods and beverages and may be naturally occurring in some areas of the country. The presence of fluoride in juices and carbonated beverages does not counteract the cariogenic nature of these beverages.

Reconstitution of Infant Formula

In a study of infant feeding practices, 70% to 75% of mothers who fed their infants formula used tap water to reconstitute the powdered formula.³² According to CDC data from 2012, approximately 67% of US households using public water supplies received

TABLE 2 Fluoride Supplementation Schedule for Children

Age	Fluoride Ion Level in Drinking Water ^a		
	<0.3 ppm	0.3–0.6 ppm	>0.6 ppm
Birth–6 mo	None	None	None
6 mo–3 y	0.25 mg/d ^b	None	None
3–6 y	0.50 mg/d	0.25 mg/d	None
6–16 y	1.0 mg/d	0.50 mg/d	None

Source: Centers for Disease Control and Prevention.⁴⁵

^a 1.0 ppm = 1 mg/L.

^b 2.2 mg of sodium fluoride contains 1 mg of fluoride ion.

optimally fluoridated water (between 0.7 and 1.2 ppm).³⁵

ADA Evidenced-Based Clinical Recommendations

In 2011, the ADA Council on Scientific Affairs examined the existing evidence and made 2 recommendations. The first recommendation supported the continued use of optimally fluoridated water to reconstitute powdered and liquid infant formula, being cognizant of the small risk of fluorosis in permanent teeth. The second recommendation stated that if there was concern about the risk of mild fluorosis, the formula could be reconstituted with bottled (nonfluoridated) water.¹⁸ It should be noted that most bottled water has suboptimal levels of fluoride and that fluoride content is not listed unless it is added.

Community Water Fluoridation

Community water fluoridation is the practice of adding a small amount of fluoride to the water supply. It has been heralded as 1 of the top 10 public health achievements of the 20th century by the CDC.³⁴ Community water fluoridation is a safe, efficient, and cost-effective way to prevent tooth decay and has been shown to reduce tooth decay by 29%.³⁵ It prevents tooth decay through the provision of low levels of fluoride exposure to the teeth over time and provides both topical and systemic exposure. It is estimated that every dollar invested in water fluoridation saves \$38 in dental treatment costs (<http://www.cdc.gov/fluoridation/benefits/>). Currently, although more than 210 million Americans live in communities with optimally fluoridated water, there are more than 70 million others with public water systems who do not have access to fluoridated water.³³ The fluoridation status of a community water supply can be determined by contacting the local water department

or accessing the Web site My Water's Fluoride (<http://apps.nccd.cdc.gov/MWF/Index.asp>).

Recommended Concentration

Water fluoridation was initiated in the United States in the 1940s. In January 2011, the US Department of Health and Human Services proposed a change to lower the optimal fluoride level in drinking water. The proposed new recommendation is 0.7 mg of fluoride per liter of water to replace the previous recommendation, which was based on climate and ranged from 0.7 mg/L in the warmest climates to 1.2 mg/L in the coldest climates.³⁶ The change was recommended because recent studies showed no variation in water consumption by young children based on climate and to adjust for an overall increase in sources of fluoride (foods and beverages processed with fluoridated water and fluoridated mouth rinses and toothpastes) in the American diet.

Evidence Supporting Community Water Fluoridation

Despite overwhelming evidence supporting the safety and preventive benefits of fluoridated water, community water fluoridation continues to be a controversial and highly emotional issue. Opponents express a number of concerns, all of which have been addressed or disproven by validated research. The only scientifically documented adverse effect of excess (nontoxic) exposure to fluoride is fluorosis. An increase in the incidence of mild enamel fluorosis among teenagers has been cited as a reason to discontinue fluoridation, even though this condition is cosmetic with no detrimental health outcomes. Recent opposition has sometimes centered on the question of who decides whether to fluoridate (elected/public officials or the voters), possibly reflecting a recent trend of distrust of the US government. Many opponents believe fluoridation to be mass medication and

call the ethics of community water fluoridation into question, but courts have consistently held that it is legal and appropriate for a community to adopt a fluoridation program.³⁷ Opponents also express concern about the quality and source of fluoride, claiming that the additives (fluorosilicic acid, sodium fluoride, or sodium fluorosilicate), in their concentrated form, are highly toxic and are byproducts of the production of phosphate fertilizer and may include other contaminants, such as arsenic. The quality and safety of fluoride additives are ensured by Standard 60 of the National Sanitation Foundation/American National Standards Institute, a program commissioned by the Environmental Protection Agency (EPA), and testing has been conducted to confirm that arsenic or other substances are below the levels allowed by the EPA.³⁸ Finally, there have been many unsubstantiated or disproven claims that fluoride leads to kidney disease, bone cancer, and compromised IQ. More than 3000 studies or research papers have been published on the subject of fluoride or fluoridation.³⁹ Few topics have been as thoroughly researched, and the overwhelming weight of the evidence—in addition to 68 years of experience—supports the safety and effectiveness of this public health practice.

Naturally Occurring Fluoride in Drinking Water

The optimal fluoride level in drinking water is 0.7 to 1.2 ppm, an amount that has been proven beneficial in reducing tooth decay. Naturally occurring fluoride may be below or above these levels in some areas. Under the Safe Drinking Water Act (Pub L No. 93-523 [1974]), the EPA requires notification by the water supplier if the fluoride level exceeds 2 ppm. In areas where naturally occurring fluoride levels in drinking water exceed 2 ppm, people should consider an alternative water source or home water treatments to reduce the risk of

fluorosis in young children.⁴⁰ Well water should be tested for the level of fluoride; this testing is most commonly performed through the health department.

Fluoride Toxicity

Toxic levels of fluoride are possible, particularly in children, as a result of ingesting large quantities of fluoride supplements. The toxic dose of elemental fluoride is 5 to 10 mg of fluoride per kilogram of body weight.⁴¹ Lethal doses in children have been calculated to be between 8 and 16 mg/kg. When prescribing sodium fluoride supplements, it is recommended to limit the quantity prescribed at one time to no more than a 4-month supply. Parents should be advised to keep fluoride products out of the reach of young children and to supervise their use.

Fluoride Removal Systems

There are a number of water treatment systems that are effective in the removal of fluoride from water,⁴² including reverse osmosis and distillation. Parents should be counseled on the use of these and activated alumina filters in the home and, should they choose to use one that removes fluoride, the potential effect on their family's oral health. Commonly used home carbon filters (eg, Brita [Brita LP, Oakland, California], PUR [Kaz USA, Incorporated, Southborough, MA]) do not remove fluoride. These can be recommended for families who are concerned about heavy metals or other impurities in their home water supply but who wish to retain the benefits of fluoridated water.

SUGGESTIONS FOR PEDIATRICIANS

1. Know how to assess caries risk. As recommended by the AAP's *Oral Health Risk Assessment Timing and Establishment of the Dental Home*⁶ and *Bright Futures: Guidelines for Health Supervision of Infants, Children, and Adolescents*,⁷ pediatricians should perform oral health risk assessments on all children at preventive visits beginning at 6 months of age. An oral health risk assessment tool has been developed by the AAP/Bright Futures and endorsed by the National Interprofessional Initiative on Oral Health. This tool can be accessed at <http://www2.aap.org/oralhealth/RiskAssessment-Tool.html>. There are currently no validated early childhood caries risk assessment tools. The aforementioned tool is a guide to help clinicians counsel patients about oral health and best identify risk.
2. Know how to assess a child's exposure to fluoride and determine the need for topical or systemic supplements.⁴³
3. Understand indications for fluoride varnish and how to provide it. Fluoride varnish can be a useful tool in the prevention of early childhood caries. Additional training on oral screenings, fluoride varnish indications and application, and office implementation can be found in the Smiles for Life Curriculum Course 6: Caries Risk Assessment, Fluoride Varnish and Counseling⁴⁴ at www.smilesforlifeoralhealth.org. In addition, the AAP Children's Oral Health Web site

is a resource for oral health practice tools (<http://www2.aap.org/oralhealth/PracticeTools.html>).

4. Advocate for water fluoridation in the local community. Public water fluoridation is an effective and safe method of protecting the most vulnerable members of our population from dental caries. Pediatricians are encouraged to advocate on behalf of public water fluoridation in their communities and states. For additional information and water fluoridation facts and detailed questions and answers, see http://www.ada.org/sections/newsAndEvents/pdfs/fluoridation_facts.pdf, <http://www.cdc.gov/fluoridation/>, and <http://www.ilikemyteeth.org>.

LEAD AUTHORS

Melinda B. Clark, MD, FAAP
Rebecca L. Slayton, DDS, PhD

SECTION ON ORAL HEALTH EXECUTIVE COMMITTEE, 2011–2012

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Pediatrics 2014;134;626
DOI: 10.1542/peds.2014-1699 originally published online August 25, 2014;

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CHDP Dental Training: Fluoride Varnish

April 2019



COUNTY OF LOS ANGELES
Public Health

Child Health & Disability Prevention (CHDP) Program
Oral Health Subcommittee
Adapted by Los Angeles County CHDP Program
Fluoride Varnish Committee

<http://www.dhcs.ca.gov/services/chdp/Pages/FluorideVarnish.aspx>

Training Objectives



COUNTY OF LOS ANGELES
Public Health

- Recognize the importance of providing Fluoride Varnish (FV) in the medical office
- Understand Steps to Fluoride Varnish application
- Provide Patient Education after application
- Demonstrate knowledge of Fluoride Varnish application



IMPORTANCE OF FLUORIDE VARNISH

- What are Dental Caries?
- What is Fluoride/Fluoride Varnish?
- Why CHDP Providers?



What are Dental Caries?



- Dental caries is an infectious disease in which acid produced by bacteria dissolves tooth enamel (demineralization).
- Can progress to local/systemic infections & death (rare).
- Most common chronic childhood disease in the U.S.
- Early childhood caries is the single greatest risk factor for caries in permanent teeth.

What is Fluoride?



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Public Health

- Naturally occurring element
- Promotes re-mineralization of tooth enamel
- Inhibits bacteria's ability to produce acid by blocking bacterial enzymes
- Helps prevent dental decay



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What is Fluoride Varnish?



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Public Health

- A concentrated topical fluoride that is applied to teeth by using a small brush and sets on contact with saliva
- 1 application can reduce decay risk up to 59%*
- Fluoride varnish is recommended every 3-6 months for children at high risk of caries (CHDP population)



For more information: * <https://www.ncbi.nlm.nih.gov/books/NBK202094/>

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Why CHDP Providers?



- Medical providers see young children **earlier** and **more frequently** than by dentists
- **Low income**, young children are at higher risk for dental decay*
- Medical providers can help **prevent tooth decay** by applying fluoride varnish



For more information: * www.ncbi.nlm.nih.gov/pmc/articles/PMC2257982/?tool=pubmed

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Fluoride Varnish Facts

- Fluoride Varnish Considerations
- Which Teeth Benefit?
- Frequency of Application
- Who Can Apply?



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Fluoride Varnish Considerations



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Public Health

- Concerns about Fluorosis
 - Per American Dental Association, fluorosis is when young children consume too much fluoride from any source over long periods when teeth are developing under the gums (Mouthhealthy.org)
 - After 8 years of age, there is no further risk of fluorosis (except for the third molars).
- Concurrent use of FV with other types of Fluoride
 - Fluoride varnish is recommended even if other types of fluoride are being used, including:
 - Systemic fluoride (e.g. water fluoridation, tablets or drops)
 - Other topical fluorides (e.g. fluoridated toothpaste, mouth rinses, foam or gel trays)

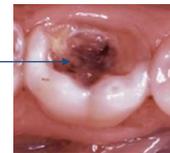
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Fluoride Varnish Considerations



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Public Health

- Allergies/Contraindications:
 - Allergy to colophony (resin from conifers) – *rare*
 - Ulcerative gingivitis and/or stomatitis
 - Pulp exposure or deep decay
- Trauma Informed Care (TIC)
 - Organizational structure and treatment framework that involves understanding, recognizing, and responding to the effects of all types of trauma. (SAMHSA*)
 - Practical Tools include allowing material things of comfort; explaining steps of exam or procedure and letting them know why; having culturally and age appropriate language/visual aides
- Special Needs and/or Developmental Delay



*Substance Abuse and Mental Health Services Administration

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Fluoride Varnish - Which Teeth Benefit?



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Public Health

No Visible Decay

but may have high risk factors



Preventable with fluoride varnish and good home care

Advanced Decay

destroyed enamel



Irreversible, however with fluoride varnish decay progression is inhibited
~ Dental treatment needed ASAP ~

Beginning Decay

white chalky decalcification near gum line



Reversible with fluoride varnish and improved home care to inhibit progression of caries

DO NOT Apply to Teeth with pulp exposure or tissue lesions



Avoid these areas, but apply fluoride varnish to all other teeth in the mouth.
~Immediate treatment needed for severe decay~

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Frequency of Application



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Public Health

- Apply during a well child exam, follow-up visit, or stand-alone appointment.
- Fluoride varnish should be applied every 3-6 months starting at tooth emergence.
- Medical offices can be reimbursed for FV by Medi-Cal 3x in a 12 month period for children under 6yrs of age*



*<http://www.dhcs.ca.gov/services/chdp/Documents/Letters/chdppin0608.pdf>

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Fluoride Varnish - Who Can Apply?



- Medical Office Setting
 - MD
 - Trained nurses and assistants
 - With MD/NP order *



- Community Setting*
(School, health fair or government program)
 - Any trained person
 - Under a doctor's (or dentist's) prescription
 - Following doctor's (or dentist's) protocol

* <http://www.dhcs.ca.gov/services/chdp/Documents/CHDPAnticaries/FVAB667.pdf>

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Fluoride Varnish - Application



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Fluoride Varnish Application



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Public Health

Supplies Needed

- Gauze
- Gloves
- Varnish Packet
- Tray or napkin(s)
- Hand sanitizer
- Optional
 - Mouth Mirror
- Post Procedure
 - FV Brochure



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Fluoride Varnish Application



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Public Health

Fluoride Varnish Preparation:

1. OPEN the packet of varnish
2. PUT on gloves
3. STIR varnish with applicator
4. POSITION the child securing arms and legs
5. WRAP the gauze around finger



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Fluoride Varnish Application



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Public Health

- Step 1: Dry teeth with gauze by section or quadrant



- Step 2: Apply fluoride varnish to all tooth surfaces in that area



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Fluoride Varnish Application



COUNTY OF LOS ANGELES
Public Health

- Step 3: Repeat in each section until all teeth have been painted with varnish



-Varnish immediately sets in contact with saliva

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Videos



American Academy of Pediatrics Television

<http://www.youtube.com/watch?v=zNOIGS1qo5g&feature=player>



Smiles for Life University of Connecticut

<http://www.youtube.com/watch?v=cV5OmL7C8K4&feature=player>

Modules



Maryland's Mouths Matter Module 4

http://www.mchoralhealth.org/flvarnish/mod4_0.html



Smiles for Life Training: Course #6

<https://www.smilesforlife.org/alhealth.org/buildcontent.aspx?pagekey=66053&lastpagekey=64595&userkey=13873164&sessionkey=4170798&tut=584&customerkey=84&custsitegroupkey=0>

Resources & Education



- Patient Education
- Provider Resources



Patient Education After FV Application



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Public Health

- No water restrictions after application
- Avoid crunchy, chewy, and hot foods/drinks for the rest of the day
- Do not brush/floss until the next day
- Fluoride Varnish may leave a light color coating that will be brushed off the next day

BROCHURE

Fluoride Varnish



Helping
Smiles
Stay Strong

<http://www.dhcs.ca.gov/formsandpubs/publications/Pages/CHDPPubs.aspx>

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Patient Education (cont.)



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Public Health

- Fluoride Varnish does not take the place of:
 - A dental visit
 - Brushing with fluoride toothpaste twice a day
 - Limiting sweets or sugary snacks
 - Drinking fluoridated tap water

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Provider Resources- Billing



COUNTY OF LOS ANGELES
Public Health

- Fee-for-Service Medi-Cal
 - Reimbursable 3 times (*in a 12 month period*) for children under 6yrs of age
 - Billing code: CPT 99188*
 - Reimbursement - \$18 per application
- Managed Care Medi-Cal
 - Reimbursement varies
 - Contact individual plan

*http://files.medi-cal.ca.gov/pubsdoco/rates/rates_information.asp?num=22&first=94799&last=99600

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Provider Resources- How to Order



COUNTY OF LOS ANGELES
Public Health

- Fluoride Varnish Kits:
 - Center for Oral Health 909-469-8300
 - <https://centerfororalhealth.org/store/>
 - Plak Smacker 800-558-6684
 - <https://www.plaksmacker.com/Catalog/varnish-america>
- Dental supply companies:
 - Patterson Dental Supply 1-800-672-1409
 - Henry Schein 1-800-372-4346



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Key Points



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Public Health

- Young and low income children are at the **HIGHEST** risk for dental decay.
- Medical providers see young children **EARLIER & more FREQUENTLY** than dental providers, which positions them at the front line against oral disease.

With just a swipe of fluoride varnish, I can prevent tooth decay for this little girl!

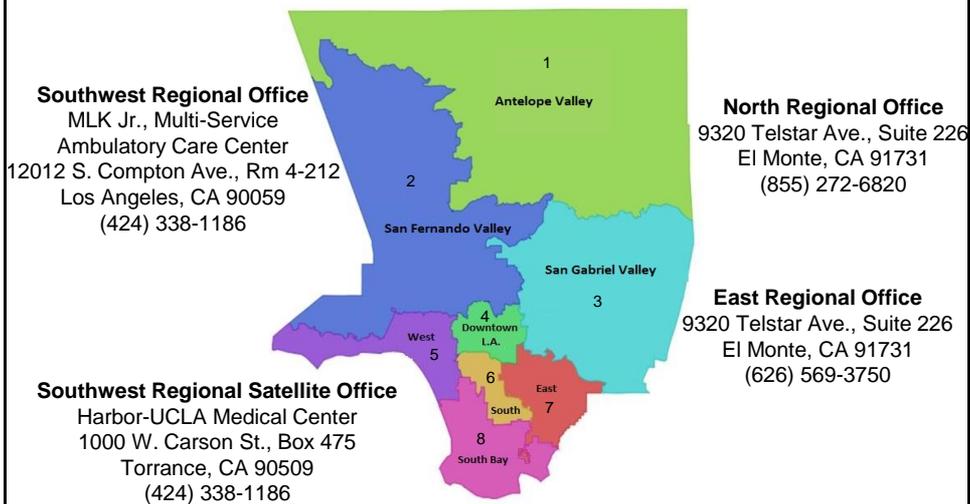


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County of Los Angeles



COUNTY OF LOS ANGELES
Public Health



For local CHDP contact information:

<http://publichealth.lacounty.gov/cms/chdp.htm>

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Medical Providers



Dental Providers



Parents/Caregivers

**Together we can
stop the
epidemic of
oral disease!**



Individuals

CHDP Program information: www.dhcs.ca.gov/services/chdp/Pages/CountyOffices.aspx

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Questions?

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STEPS TO FLUORIDE VARNISH APPLICATION

Step 1: Dry teeth with gauze by section or quadrant



Step 2: Apply fluoride varnish to all tooth surfaces in that area



Step 3: Repeat in each section until all teeth have been painted with varnish



Varnish immediately sets in contact with saliva

Tips to help fluoride varnish stay on the teeth all day...

- ☑ It's ok to drink water.
- ☑ Don't give foods that are hard, crunchy, or chewy for the rest of the day.
- ☑ Give cold or warm (not hot) foods or liquids.
- ☑ Don't brush or floss child's teeth that day or night.
- ☑ Brush and floss teeth beginning the next morning.



Remember

- Baby teeth are important.
- Brush your child's teeth every morning and night with a tiny dab of fluoride toothpaste.
- Limit sugary snacks, drinks, and juices. Offer water often. Do not give soda.
- Choose a dental office for your child's "Dental Home."
- Make your child's first dental visit by age one.
- Begin regular visits every 6 months or as advised by the dentist.

For more information, call your local CHDP program:

California Department of Health Care Services
Child Health and Disability Prevention (CHDP) Program
Oral Health Subcommittee

Revised 7/16/2018

Fluoride Varnish



Helping Smiles Stay Strong



Fluoride Varnish

**Ask your medical
doctor to apply
fluoride varnish to
your child's teeth
today!**

- ❖ Is a protective coating brushed on the teeth to prevent tooth decay
- ❖ Is safe, quick, and doesn't hurt
- ❖ Helps even if using fluoride drops, tablets, rinses, toothpaste, or drinking fluoridated water
- ❖ Can be applied at well-child visits, other doctor appointments, and the dental office
- ❖ Works best when applied 2 to 5 times a year
- ❖ Can be applied as soon as the first tooth comes in
- ❖ May appear yellow on the teeth – brushing the next morning will return teeth to their normal color
- ❖ Is also effective for children with special health care needs



COUNTY OF LOS ANGELES – DEPARTMENT OF PUBLIC HEALTH
Child Health and Disability Prevention (CHDP) Program
Personnel Roster

CHDP ADMINISTRATION HEADQUARTERS		
<p>CHDP Administration 9320 Telstar Ave., Suite 233 El Monte, CA 91731 (626) 569-6020 (800) 993-2437 FAX (626) 569-9350</p> <p>Internet Address: http://publichealth.lacounty.gov/cms/CHDP.htm</p> <p>Yasangi Jayasinha MD Medical Director (626) 569-6019</p> <p>Ana Alatorre, Secretary (626) 569-6020</p> <p>Cheri Stabell, MPH Assistant Director (626) 569-6028</p> <p>Sandra Montes, STC (626) 569-6021 Irene Atilano, STC (626) 569-3780</p>	<p>Nursing</p> <p>Diane Sanchez Interim CMS Nursing Director (626) 569-6006</p> <p>Daniela Dominguez, PHN Program Specialist (626) 569-6029</p> <p>Provider Desk</p> <p>Rosamaria Fine, AAll (626) 569-6047</p> <p>Lourdes Hernandez, STC (626) 569-6045</p> <p>Gloria Aguilar, STC (626) 569-6038</p> <p>EPSDT Unit</p> <p>Gai Le, ITC (626) 569-6039 Yolanda Hurtado, ITC (626) 569-6040</p>	<p>Health Education/Nutrition</p> <p>Health Ed Coordinator – Vacant</p> <p>Sorina Sambula, MPH, HE (626) 569-6022</p> <p>Cinthiya Ather, MPH, HE (626) 569-6036</p> <p>Parvaneh Lalezari, MS, RD Nutritionist (626) 569-6037</p> <p>Clerical Staff</p> <p>Romy Gallegos, IC (626) 569-6033</p> <p>Elvira Ordonez, IC (626) 569-6046</p>
REGIONAL OFFICE	NURSING	CLERICAL SUPPORT
<p>East Regional Office (05) 9320 Telstar Ave., Suite 226 El Monte, CA 91731</p> <p>(626) 569-3750 Fax (626) 571-4580</p>	<p>Carol Van, PHNS 626-569-3770</p> <p>Maribel Castillon, PHN 626-569-3752 Norlizza Armas, PHN 626-569-3763 Gladys Lucero, PHN 626-569-3762 Lynn Tobola, PHN 626-569-3756 Kymberly Aoki, PHN 626-569-3760</p>	<p>Tracy Carter, STC 626-569-3775</p> <p>Vacant, ITC 626-569-6416</p>
<p>North Regional Office (04) 9320 Telstar Ave., Suite 226 El Monte, CA 91731</p> <p>(855) 272-6820 Fax (855) 871-0380</p>	<p>Carol, Van PHNS 626-569-3770</p> <p>Joenilyn Navarro, PHN 747-210-8664 Myra Valencia, PHN 747-210-8663 Bethany Lorca, PHN 747-210-8662</p>	<p>Tracy Carter, STC 626-569-3775</p> <p>Kimberly Mendez, ITC 626-569-6415</p>
<p>Southwest Regional Office (06) Martin Luther King, Jr. Interns & Residents Bldg. 12012 Compton Ave., Rm4-212 Los Angeles, CA 90059</p> <p>(424) 338-1186 Fax (310) 223-0090</p>	<p>Luis Avitia, PHNS 424-338-1187</p> <p>Eiko Williams, PHN 424-338-1195 Rosheda Samuel, PHN 424-338-1194 Tongia Pinner, PHN 424-338-1192 Aineeh Montano, PHN 424-338-1193</p>	<p>Dina Meza, STC 424-338-1199</p> <p>Veronica Calderon, ITC 424-338-1197</p> <p>Zonia Lopez, ITC 424-338-1198</p>
<p>Southwest Regional Satellite Off Harbor UCLA Medical Center 1000 W. Carson Street, Box 475 Torrance, CA 90509</p> <p>(424) 306-8480 Fax (310) 212-5267</p>	<p>Luis Avitia, PHNS 424-306-8484</p> <p>Carolie Arendain, PHN 424-306-8486 Maria Lewis, PHN 424-306-8483 Tressa Bobb, PHN 424-306-8485 Emy Murakami, PHN 424-306-8482</p>	<p>Dina Meza, STC</p>