“INTEGRATING ORAL HEALTH INTO ROUTINE WELL CARE”

Presenters:
Cathleen Ballance, MD, MPH, Hackensack Meridian Health
Maxim Sulla, DDS- Tender Smiles 4 Kids

Date: May 29, 2019
In this lecture, we will discuss the “off-label” use of an FDA-approved pharmaceutical (fluoride varnish).
Severe early childhood caries on 18 mo

This child has been to the pediatrician 5-6 times
LEARNING OBJECTIVES FOR THIS SESSION

1) Review of the 10 key concepts about dental caries and oral health

2) Discuss Bright Futures and AAP recommendations for practitioners

3) Share tips and tools for implementing oral health risk assessments into your practice
The Reality

- Although dental caries (tooth decay) is largely preventable, it remains the most common chronic disease of children aged 5 to 17 years—5 times more common than asthma (59% versus 11%).
- Once established, the disease requires treatment. A cavity only grows larger and more expensive to repair the longer it remains untreated.
- Fewer than 1 in 5 Medicaid-covered children received at least one preventive dental service in a recent year; many states provide only emergency dental services to Medicaid-eligible adults.
- Poor children have nearly 12 times more restricted-activity days because of dental-related illness than children from higher-income families. Pain and suffering due to untreated tooth decay can lead to problems in eating, speaking, and attending to learning.
Caries Prevalence

Successes:
- Prevalence and severity trends have changed
- 75% of kids have only 25% of the disease

Challenges:
- 25% of children have 80% of the disease

From US Federal studies:
- 20% of preschool children have untreated lesions
- 68% among vulnerable populations like American Indian and Alaskan natives

High caries experience is associated with:
- low socio-economic level/ low health literacy
- parental education level
- ethnic minorities and recent immigrants
Severe late clinical stages of Early Childhood Caries (ECC)

Overall impact of the underlying disease on general health and quality of life
9. What is dental caries?

Caries → a disease

Cavities → consequence or a sequelae of the disease
Dental caries is an infectious, transmissible disease modified by dietary carbohydrates and critically regulated by saliva. Complex and multifactorial.
8. Dental caries is an **INFECTIONOUS**, transmissible disease

Caused by specific bacteria:
- *Mutans streptococci*: *Strep mutans*  
  *Strep sobrinus*
- *Lactobacilli*
- *Several new species identified with ECC*  
  complex and different than regular infections
Acid producing bacteria are usually less than 1 percent of the total flora in the biofilm.
7. Dental caries is an infectious, TRANSMISSIBLE disease

- Primarily Vertical Transmission
cariogenic bacteria are transmitted via saliva from mother or caretaker to child before teeth erupt and colonize the teeth shortly after their eruption

- Horizontal transmission
seems to be more common than previously thought in early childhood and pre-school age children

Parental caries status is critical
Because vertical transmission (mother, guardian, main caretaker) is the PRIMARY MODE OF INFECTION

Parental caries status it’s critical!
6. Dental caries is an infectious, transmissible disease **MODIFIED BY DIETARY CARBOHYDRATES** and critically regulated by saliva

- **Diet related**
  sugars and carbohydrates (especially refined) promote bacterial growth and provide substrate for bacteria to produce acid.
  - Frequency of exposure is critical.
    (Vipeholm Study)

- **Lifestyle dependent**
  home care and hygiene practices limit the action of diet on bacteria because it is a time dependent process.
Caries is promoted by carbohydrates, which break down to acid.

Acid causes demineralization of enamel.

Frequent snacking promotes frequent attack.

Foods with complex carbohydrates (breads, cereals, pastas) are major sources of “hidden” sugars.

High sugar content in sodas and “natural” sugars in juice are a major source of these substrates.
5. Dental caries is an infectious, transmissible disease modified by dietary carbohydrates and CRITICALLY REGULATED BY SALIVA

- Saliva’s flow and composition alter the caries process on the tooth surface
- Has a major impact on biofilm, plaque and bacterial colonization
- Saliva flow is greatly reduced at night

Saliva is a healing fluid
DIET - NOT JUST WHAT YOU EAT, BUT HOW OFTEN

- Acids produced by bacteria after sugar intake persist for 20 to 40 minutes.
- Frequency of sugar ingestion is more important than quantity.
Enamel

Calcium phosphates

Plaque/saliva

Calcium phosphates

Neutral pH

Remineralization

demineralization

Acid pH
4. Caries is a dynamic process and reversible up to a specific point

The Caries Balance

✓ Pathological Factors
  • Acid-producing bacteria
  • Frequent eating/drinking of fermentable carbohydrates
  • Sub-normal saliva flow and function

✓ Caries

✓ Protective Factors
  • Saliva flow and components
  • Fluoride - remineralization
  • Antibacterials: chlorhexidine, xylitol, new?

✓ No Caries

JDB Featherstone
When protective factors prevail, the result is remineralization.

When harmful factors prevail, the result is further demineralization that quickly progresses into cavitation, which is irreversible.
ONCE THE ENAMEL BREAKS, THE PROCESS IS IRREVERSIBLE AND PROGRESSIVE
Treatment gets progressively more invasive, expensive…

cavities only get larger, and fast
...and complicated
IT IS IMPORTANT TO CONTROL THE DISEASE PROCESS EARLY BECAUSE:

- 40 percent of Early Childhood Caries (ECC) patients treated for restoration under General Anesthesia (GA) relapsed, experiencing tooth decay within the first year after dental surgery. (Berkowitz RJ, Ca Dent Assoc 2003)

- An eight-year study of children ages three to five found that children having tooth decay in their primary teeth were three times more likely to develop decay in their permanent teeth. (Li Y, Wang W, J Dent Res 2002)
3. FLUORIDE WORKS PRIMARILY VIA TOPICAL (SURFACE) MECHANISMS

- Fluoride inhibits demineralization by adsorbing from solution onto tooth mineral crystal surfaces.

- Fluoride enhances remineralization combining with calcium and phosphate to make a low solubility veneer of fluorapatite-like mineral.

- Fluoride can inhibit plaque bacteria: interferes with enzymes in the cell.
Fluoride speeds up remineralization -> less soluble mineral
Check on water fluoridation, and testing well water
- Fluoride prescriptions, giving optimal instructions for timing and form.
- Fluoride Water
- Counsel on toothpaste as a source of fluoride.
- Encourage on use of tap water when the water is fluoridated.

Cultural Considerations
SYSTEMIC F - PRESCRIPTION SUPPLEMENTS

- Available from physician or dentist
- *Determine water fluoride level before writing prescription!*
- Multiple sources of F make prescribing challenging!
- Recommended for patients at *high risk* who have no F in tap water starting at 6 months*
  
  *JADA 2010;141;1480-1489*
Making a shared decision

**Considerations**

- Is reconstituted infant formula the main source of nutrition for the infant?
- What type of formula is the infant consuming – powder or liquid concentrate or ready-to-feed?
- Does the child consume milk or soy based formula?
- How long will the child continue to consume formula?
- What is the level of fluoride in the water being used to reconstitute formula?

**Discussion**

- Fluoride from reconstituted infant formula may add to the chance of developing fluorosis.
- It is difficult to isolate the risk of developing fluorosis specifically from reconstituted formula.
- Children are exposed to multiple sources of fluoride during the tooth development period.
- Reducing fluoride intake from reconstituted infant formula alone will not eliminate the risk of fluorosis development.

**Decision**

- Provide information to the parents or caregivers and make a shared decision.

Examples of dental fluorosis.

---

*In general, liquid concentrate mixed with water has less fluoride than powder concentrate mixed with water. Ready-to-feed has the lowest concentration of fluoride compared to reconstituted formulas.*

*Soy-based formulas have slightly greater fluoride content than milk-based formulas.*

*You can learn the fluoride content of your tap water by contacting your local water supplier, the local county/state health department or online at http://apps.nccd.cdc.gov/MWF/index.asp*
Making a shared decision

Determine balance between need for caries prevention and risk of fluorosis

**Fluoride Exposure**
Consider all sources of fluoride intake including bottled water.
Contact local, county and/or state health departments about local water fluoride content or test water sample.

**Caries Prevention**
Repeat caries risk assessment at frequent intervals because risk status can change.
Caries risk assessment tools are available for dentists* and physicians**

**Comply with prescription**
Use dietary fluoride supplements as directed to maximize the caries prevention benefit.
Chew tablets or suck lozenges for 1–2 minutes before swallowing to maximize topical effect.
For infants, supplements are available as a liquid and used with a dropper.

*American Dental Association. Caries Risk Assessment Form (0–6 years). http://www.ada.org/sections/professionalResources/docs/topics_caries_under6.doc
• Fluoride concentrations are up to .7 or .8 ppm
• 8 oz bottles contain approx. .20 mg F ion
### Amount Ingested, Adequate Amounts vs. Tolerable Amount

<table>
<thead>
<tr>
<th>Age</th>
<th>Adequate Water Intake</th>
<th>Fluoridated water (0.7 ppm) 0.7 mg F/L</th>
</tr>
</thead>
<tbody>
<tr>
<td>0-6 months</td>
<td>0.7L/day of water, from milk</td>
<td>0.49 mg F/Day</td>
</tr>
<tr>
<td>7-12 months</td>
<td>0.8L/day of water, from milk and others</td>
<td>0.56 mg F/Day</td>
</tr>
<tr>
<td>1-3 years</td>
<td>1.3L/day</td>
<td>0.91 mg F/Day</td>
</tr>
<tr>
<td>3-8 years</td>
<td>1.7L/day</td>
<td>1.19 mg F/Day</td>
</tr>
</tbody>
</table>

### TABLE 2. Recommended total dietary fluoride intake

<table>
<thead>
<tr>
<th>Age</th>
<th>Reference weight*</th>
<th>Adequate intake¹</th>
<th>Tolerable upper intake²</th>
</tr>
</thead>
<tbody>
<tr>
<td>0–6 months</td>
<td>7/16</td>
<td>0.01</td>
<td>0.7</td>
</tr>
<tr>
<td>6–12 months</td>
<td>9/20</td>
<td>0.5</td>
<td>0.9</td>
</tr>
<tr>
<td>1–3 years</td>
<td>13/29</td>
<td>0.7</td>
<td>1.3</td>
</tr>
<tr>
<td>4–8 years</td>
<td>22/48</td>
<td>1.1</td>
<td>2.2</td>
</tr>
<tr>
<td>≥9 years</td>
<td>40–76/88–166</td>
<td>2.0–3.8</td>
<td>10.0</td>
</tr>
</tbody>
</table>

Fluorosis

*Reference weight in kilograms and pounds

¹Adequate intake is the amount of fluoride recommended for optimal health.

²Tolerable upper intake is the maximum amount of fluoride that is generally considered safe for long-term intake.
Professionally applied Fluorides
By Pediatrician, family practitioner, or dentist when children at high risk
SUPPLIES NEEDED TO PERFORM FLUORIDE VARNISH PROCEDURE

- Varnish
- Disposable mirrors
- Exam gloves
- Gauze
- Light source/ head lamp
FLUORIDE VARNISH APPLICATION

Clean and Dry Teeth
APPLY VARNISH WITH SMALL BRUSH

covering anterior and posterior teeth
The varnish hardens quickly after application as a yellow film.
The child can have a drink of water.
## Fluoride Modalities for Low and High Risk Patients

<table>
<thead>
<tr>
<th>Fluoride Modality</th>
<th>Low caries risk</th>
<th>High caries risk</th>
</tr>
</thead>
<tbody>
<tr>
<td>Toothpaste</td>
<td>Starting at tooth emergence, smear of paste until 3 y, then pea-size</td>
<td>Starting at tooth emergence, smear of paste until 3 y, then pea-size</td>
</tr>
<tr>
<td>Fluoride varnish</td>
<td>Every 3-6 month starting at tooth emergence</td>
<td>Every 3-6 month starting at tooth emergence</td>
</tr>
<tr>
<td>Over the counter mouth rinse</td>
<td>Not applicable</td>
<td>Starting at age 6 if child can reliably swish and spit</td>
</tr>
<tr>
<td>Community water fluoridation</td>
<td>YES</td>
<td>YES</td>
</tr>
<tr>
<td>Dietary fluoride supplements</td>
<td>YES, if drinking water is not fluoridated</td>
<td>YES, if drinking water is not fluoridated</td>
</tr>
</tbody>
</table>
Fluoride varnish application program:

All NJFC children between 6 months to 7 years are eligible to receive 2 fluoride treatments per year from PCP, plus 2 additional treatment per year from Dentists.

All Medicaid HMO’s required:

1. To complete Oral Health training through NJAAP or Smiles for Life Curriculum
2. After training, submit certificate to each Medicaid – HMO (HNJH requires attestation form)

Average payment is between $19 to $25. (HNJH pays $15 per fluoride application plus $10 if patient sees dentist within 30 days)

Commercial Insurance (Horizon BCBS):

BCBS is participating in the fluoride varnish program CPT® code 99188
2. CARIES IS AN ENTIRELY PREVENTABLE DISEASE

Early identification of risk is crucial
Health providers should work as a team
Behavior modification is just as important as fluoride varnish or restorative treatment.

- aids in preventing further decay
- re-mineralizing incipient lesions on some children
PREVENTION, DIAGNOSIS, AND TREATMENT OF ORAL DISEASES, INCLUDING NEEDED DENTAL RADIOGRAPHS AND USE OF LOCAL ANESTHESIA, ARE HIGHLY BENEFICIAL AND CAN BE UNDERTAKEN DURING PREGNANCY WITH NO ADDITIONAL FETAL OR MATERNAL RISK WHEN COMPARED TO THE RISK OF NOT PROVIDING CARE.
Shift to a preventive model where we promote and preserve health
Good oral health and control of oral disease protects women’s health and quality of life before and during pregnancy, and has the potential to reduce the transmission of pathogenic bacteria from mothers to their children.
Higher caries experience is associated with:

- Mothers who have high caries experience
- Lower socio-economic status and lack of dental home
- Ethnicity
- Parental education level

However,

- Poverty alone (or being on Medicaid) is not an indicator of high risk
- Belonging to a racial minority or being a recent immigrant does not automatically place a child on high risk
1. DENTAL HOME

AAP Oral Health Policy. May, 2003
AAPD and ADA Policies

Infants should have a dental home by age 1 or at the eruption of the first tooth.
RISK ASSESSMENT.

Use a form to visualize the caries balance weighing in risk factors vs. protective factors from parent interview to complement the clinical findings.

<table>
<thead>
<tr>
<th>RISK FACTORS</th>
<th>PROTECTIVE FACTORS</th>
<th>CLINICAL FINDINGS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mother or primary caregiver had active decay in the past 12 months&lt;br&gt;Yes □ No □</td>
<td>Existing dental home&lt;br&gt;Yes □ No □&lt;br&gt;Drinks fluoridated water or takes fluoride supplements&lt;br&gt;Yes □ No □&lt;br&gt;Fluoride varnish in the last 6 months&lt;br&gt;Yes □ No □</td>
<td></td>
</tr>
<tr>
<td>Continual bottle/sippy cup use with fluid other than water&lt;br&gt;Yes □ No □&lt;br&gt;Frequent snacking&lt;br&gt;Yes □ No □&lt;br&gt;Special health care needs&lt;br&gt;Yes □ No □&lt;br&gt;Medicaid eligible&lt;br&gt;Yes □ No □</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pathological Factors&lt;br&gt;Acid-producing bacteria&lt;br&gt;Frequent eating/drinking of fermentable carbohydrates&lt;br&gt;Sub-normal saliva flow and function&lt;br&gt;White spots or visible decalcifications in the past 12 months&lt;br&gt;Obvious decay&lt;br&gt;Restorations (fillings) present&lt;br&gt;Visible plaque accumulation&lt;br&gt;Gingivitis (swollen/bleeding gums)&lt;br&gt;Teeth present&lt;br&gt;Healthy teeth</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

- Parent or caregiver with recent or current caries
- White spots
- Obvious decay

= high risk
Promote Protective Factors:

- Encourage supervised brushing with fluoride toothpaste
- Encourage drinking of fluoridated water
- Recommend healthy snacks

8 oz bottles contain approx. .20 mg F ion
DIET RECOMMENDATIONS

- Whether Mother chooses to breastfeed or bottle-feed, it is important to take good care of baby's teeth.
- Bottle can be used with only water at nights.
- Sippy cup can be used with regular beverages during meals or water only between meals.
- Watch for hidden sugars in starches and beverages (apple juice and rice).
- Sticky sweets are the most dangerous.
TARGETED COUNSELING: DIRECTED TOWARDS MODIFYING THE INDIVIDUAL’S SPECIFIC RISK FACTORS.

Not only for caries obesity/diabetes
Fight risk factors:

- Instruct parents about vertical transmission and frequency of sugar intake
- Discourage frequent snacking
- Discourage frequent consumption of sweet drinks. Bottle, sippy cup?

Not only for caries obesity/diabetes
SUPERVISED USE OF FLUORIDE TOOTHPASTE

Brushing twice daily with a FLUORIDE containing dentifrice is one of the MOST effective ways to control dental decay.

Evaluate each child before recommending training toothpaste.

Curnow, Pine, et al, 2002 reported 56% reduction with supervised brushing twice daily.
Cochrane review 2003 reports 24% caries reduction with twice daily brushing.
Counsel: child’s caries risk, dispensing right volume of toothpaste onto soft, age-appropriate sized toothbrush, frequency of brushing, and performing/assisting brushing on young children.

A “smear” of fluoridated toothpaste for children less than 2 years of age


A ”pea-size amount for children ages 2 to 5
ORAL HYGIENE RECOMMENDATIONS

- Start tooth brushing as soon as the first tooth erupts. Even better, have the baby do the teething with a frozen toothbrush.
- Use a smear of fluoridated toothpaste as soon as the first tooth erupts on high risk children.
- Supervised vs. unsupervised brushing
- Children should brush alone at age...
- Recommend flossing ASAP, if there are no spaces between the teeth. Or when the first tooth gets loose if there are spaces.
AAP POLICY STATEMENT:
“MAINTAINING AND IMPROVING THE ORAL HEALTH OF YOUNG CHILDREN”
(PEDIATRICS 2014;134;1224)

1. Administer an Oral Health risk assessment periodically to all children
2. Include anticipatory guidance for oral health as an integral part of comprehensive patient counseling
3. Counsel parents/caregivers and patients to reduce the frequency of exposure to sugars in foods and drinks
4. Encourage parents/caregivers to brush a child’s teeth as soon as teeth erupt with a smear or a grain-of rice-sized amount of fluoride toothpaste and a pea-sized amount at 3 years of age
5. Advise parents/caregivers to monitor brushing until 8 years of age
6. Refer to the AAP clinical report, “Fluoride Use in Caries Prevention in the Primary Care Setting” for fluoride administration and supplementation decisions
7. Build and maintain collaborative relationships with local dentists
8. Recommend that every child has a dental home by 1 year of age
Thank you!