Infant Oral Health and Early Childhood Caries: 
Issues & Promising Approaches from the Field

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Secretary’s Advisory Committee on Infant Mortality
Washington, DC
November 30, 2006
Overview

- Conceptual Overview of ECC (Early Childhood Caries)
- ECC Program Initiatives
- Challenges
What we know about dental caries in young children:

- Dental caries is an infectious, transmissible disease.
- The mother is usually the primary source of the infection. ("vertical transmission")
- Cariogenic bacteria generally are transmitted from mother to child and colonize the teeth shortly after they erupt.
- Transmissible – yes; but also a complex, chronic disease
ECC – Early Childhood Caries: A Chronic, Infectious Disease

• **Common** – prevalence / unmet need
• **Chronic** – risk varies over time
• **Complex** – multi-factorial etiology
• **Consequential** – general health / costs
• **Controllable** – balance risk factors & protective factors

• Poorly understood – emphasis on cavities, rather than disease
• Lack of systematic, risk-based approaches
Caries – a working definition:

Dental caries is a COMPLEX (multi-factorial), CHRONIC DISEASE of teeth:

✓ infectious and transmissible
✓ diet-dependent & salivary-mediated
✓ dynamic and reversible (up to a threshold)
✓ highly prevalent

→ a disease which may cause cavities in teeth
→ and have significant consequences for general health and quality of life.
‘Caries’ is NOT:

- A synonym for ‘cavity’
  - ‘Tooth decay’ is a synonym for caries
- The plural of ‘carie’
- *Think of it as being similar to diabetes!!!*
  - *A chronic disease ➔ progressive absent lifestyle changes*
  - *Diet-related*
  - *Causes damage to structures of the body*
  - *A serious condition for many . . .*
  - *Not the plural of ‘diabe’*
Dental Caries: Early Clinical Stages

Enamel Caries / “White-Spot” Lesions
Early Childhood Caries: Advanced Clinical Stages

It’s about much more than ‘baby teeth’!!!
Epidemiologic Evidence: Highly Prevalent Condition

Tooth decay is the most common chronic disease of childhood in America.

- 56% of Grade 1 children have evidence of caries (NIDR, 1995)
- 85% of Grade 12 children have decayed or restored teeth (NIDR, 1995)
- Primary tooth decay is NOT declining – 14% increase in ECC in the past decade (MMWR, August 26, 2005)
Low-Income / Racial-Ethnic Minority Children & CSHCN Are at Higher Risk for ECC

- 52% of children in MD Head Start centers had untreated tooth decay
  - 43% of 3 year-olds
  - 62% of 4 year-olds

- Over 5 decayed tooth surfaces per child with decay

The Caries Balance

Adapted from Featherstone JDB: JADA 131:887-99, 2000

Dynamic Balance between Risk Factors & Protective Factors

**Risk factors:**
- Promote demineralization / tooth decay
  - Frequent exposure to refined sugars
  - Cariogenic bacteria
  - Reduced salivary flow

**Protective factors:**
- Promote remineralization / healthy teeth
  - Fluorides
  - Plaque control
  - Saliva
  - Antimicrobials
## Tool Kits Linked to Development

<table>
<thead>
<tr>
<th>Prenatal tool kit</th>
<th>6-week tool kit</th>
<th>6-month tool kit</th>
<th>1 year tool kit</th>
</tr>
</thead>
<tbody>
<tr>
<td>Healthy Mouth for Your Baby Brochure</td>
<td>Preventing Nursing Bottle Mouth Brochure</td>
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</tr>
<tr>
<td>Immunization Schedule</td>
<td>Immunization Schedule</td>
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</tr>
<tr>
<td>Tooth/Gum Brushing and Flossing Chart</td>
<td>Tenders (finger toothbrush)</td>
<td>Mouth Mirror</td>
<td>Kick the Bottle Habit Brochure</td>
</tr>
<tr>
<td>Baby T-shirt</td>
<td>Infant/Toddler Safety Toothbrush</td>
<td>Sippy Cup</td>
<td>Teddy Bear</td>
</tr>
<tr>
<td>Adult Toothbrush</td>
<td>Adult Toothbrush</td>
<td>Adult Toothbrush</td>
<td>Adult Toothbrush</td>
</tr>
<tr>
<td>Adult Fluoride Toothpaste</td>
<td>Dental Floss</td>
<td>Child Toothbrush</td>
<td>Child Toothbrush</td>
</tr>
<tr>
<td>Dental Floss</td>
<td>Children’s Fluoride Toothpaste</td>
<td>Children’s Fluoride Toothpaste</td>
<td>Children’s Fluoride Toothpaste</td>
</tr>
<tr>
<td>Rx for Good Oral Health</td>
<td>Rx for Good Oral Health</td>
<td>Dental Floss</td>
<td>Dental Floss</td>
</tr>
<tr>
<td>TUC Prenatal Educational Insert</td>
<td>TUC 6-week Educational Insert</td>
<td>TUC 6-month Educational Insert</td>
<td>TUC 1 year Educational Insert</td>
</tr>
</tbody>
</table>

Table 1: Contents of Oral Health Toolkits

*Adapted from “Teeth Under Construction, Healthy Smiles in Progress”. Cowlitz County Health Dept., Longview, WA.*
Changing Paradigms for Controlling Dental Caries

- **Old Paradigm** --> Surgical / ‘Drill & Fill’
  (dealing with consequences of disease)

  - **Later Paradigm**: Prevention!!!
    (generally “one size fits all”)

  - **“Current” Paradigm**: Early Intervention, Risk Assessment, Anticipatory Guidance, Individualized Prevention and Disease Management
    (targeted, systematic approaches)
## Caries Risk Assessment Tools

<table>
<thead>
<tr>
<th>Caries Risk Indicators</th>
<th>Low Risk</th>
<th>Moderate Risk</th>
<th>High Risk</th>
</tr>
</thead>
</table>
| **Clinical Conditions** | - No decayed teeth in past 24 months  
- No enamel demineralization (enamel caries “white-spot lesions”)  
- No visible plaque; no gingivitis | - Decayed teeth in the past 24 months  
- 1 area of enamel demineralization (enamel caries “white-spot lesions”)  
- Gingivitis<sup>+</sup> | - Decayed teeth in the past 12 months  
- More than 1 area of enamel demineralization (enamel caries “white-spot lesions”)  
- Radiographic enamel caries |
| **Environmental Characteristics** | - Optimal systemic and topical fluoride exposure<sup>+</sup>  
- Consumption of simple sugars or foods strongly associated with caries initiation<sup>+</sup> primarily at mealtimes  
- High caregiver socioeconomic status<sup>+</sup>  
- Regular use of dental care in an established Dental Home | - Suboptimal systemic fluoride exposure with optimal topical exposure<sup>+</sup>  
- Occasional (e.g., 1-2) between-meal exposures to simple sugars or foods strongly associated with caries  
- Mid-level caregiver socioeconomic status (e.g., eligible for school lunch program or SCHIP)  
- Irregular use of dental services | - Suboptimal topical fluoride exposure<sup>+</sup>  
- Frequent (e.g., 3 or more) between-meal exposures to simple sugars or foods strongly associated with caries  
- Low-level caregiver socioeconomic status (e.g., eligible for Medicaid)  
- No usual source of dental care  
- Active decay present in the mother of a preschool child |
| **General Health Conditions** | | | - Children with special health care needs<sup>+</sup>  
- Conditions impairing saliva composition/flow<sup>+</sup> |

Population-Based Approach for ECC

ASSESSMENT PARAMETERS

- **RISK LEVEL** (low, high)
- **DISEASE STATUS** (none, initial, advanced)
- **NEED FOR TREATMENT** (urgent, basic, advanced)

<table>
<thead>
<tr>
<th>No Lesions</th>
<th>No Lesions</th>
<th>Initial Lesions Only</th>
<th>Advanced Lesions</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Low Risk</strong></td>
<td><strong>High Risk</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Recommend dental exam within 12 mos.</td>
<td>Refer to dental home for dental examination &amp; prevention within 6 months</td>
<td>Refer to dental home for diagnosis &amp; verify disease status ASAP</td>
<td>Refer to dental home for diagnosis &amp; tx of lesions ASAP</td>
</tr>
<tr>
<td>Counseling to maintain low risk</td>
<td>Risk management program</td>
<td>Initial disease mgt. program to control disease/reduce risk</td>
<td>Advanced disease management program to control disease and reduce risk</td>
</tr>
<tr>
<td>Anticipatory guidance</td>
<td>Anticipatory guidance</td>
<td>Anticipatory guidance</td>
<td>Anticipatory guidance</td>
</tr>
<tr>
<td>Recommend primary prevention (e.g., fluoride, sealants, if indicated)</td>
<td>Reassess compliance in 6 months</td>
<td>Reassess in 3-6 months based on risk level</td>
<td>Reassess in 3-6 mos. based on risk level</td>
</tr>
<tr>
<td>Data entry / monitoring</td>
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<td>Data entry/monitoring</td>
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Developing Better Systems Based on Primary Care Principles


- Chronic disease
- Primary care model (continuous care)
- Service integration based on limits of current dental and primary care sectors
- Questions and considerations for improving systems
Rethinking Prevention: Broad Strategies / Goals

- Reduce the burden of disease through the efficient integration of:
  - Health promotion
  - Preventive services
  - Disease management
  - Treatment services

- Expand access to ongoing diagnostic, preventive and treatment services in “dental homes”

- Application of risk assessment and targeted interventions
Klamath County, OR
Early Childhood Caries Prevention Program: Community Partners

- Klamath County Health Department
- Advantage Dental Plan, Capitol Dental
- WIC
- Oregon Institute of Technology
- CHC and Medical Plans
- University of Washington
- Oregon State Department of Health

Slide courtesy of Dr. Peter Milgrom
Key Objectives

- Develop community supported strategies to stop the transmission between mothers and children.
- Prevent caries expression in kids through parent education about risks and periodic application of fluoride varnish on erupting teeth.
- Provide a dental home for moms and kids at risk, ensuring success by utilizing a case management model for both clients and providers.
Program Goals

- 100% of 2-year old children on Medicaid will have no cavities.
- A sustainable program that grows and changes over time to meet the needs of the community.

Slide courtesy of Dr. Peter Milgrom
Program Components Based on Research / Evidence

- Home visits
  - Parent education on dental disease transmission/ECC.
  - Follow-up at WIC.
  - Tool Kits
- Case management to reduce barriers to dental care.
- Fluoride toothpaste provided to mother & child with instructions to apply daily from 1st tooth.
- Every pregnant woman and newborn assigned a dental home for necessary treatment.

Slide courtesy of Dr. Peter Milgrom
Process

- Medicaid eligible pregnant women are referred through WIC or another partner. Home visits are made prenatally, when the child is 6-weeks, 6-months, 1-year, and 2-years of age.

- Case manager makes appointment(s) for pregnant women at hygiene school (OIT). Includes assessment, radiographs by protocol, cleaning and chlorhexadine therapy. Paid for by dental managed care organization.

- Pregnant women are assigned a dental home (managed care) and scheduled for treatment to reduce dental disease. There are enough dentists.

- Baby goes to the same dental home as the mother.
Challenge: Increase the proportion of pregnant women who receive anticipatory guidance at home

80.5%
339/421*

* 2/2004 to 1/2006

Slide courtesy of Dr. Peter Milgrom
Challenge: Increase the number of pregnant women using dental care

- 55.8% of eligibles
- 69.3% of those who received a prenatal visit
- No show rate = 9%

Slide courtesy of Dr. Peter Milgrom
Challenge

- Keep in contact with new moms and get babies into dental homes

- Solution: Staff training, motivational interviewing, better contact information

Slide courtesy of Dr. Peter Milgrom
Combining Resources for Improved Oral Health for Children

**Integrated Network:**
- Dental
- Medical
- CHCs
- Churches/Faith Groups
- School/Preschool
- Programs

**Pediatric OH Training:**
- Medical providers
- Dental providers

**Local Advisory Committee**

**Community Education:**
Consistent OH Messages

**System Linkage:**
- Patient navigator links
- Link medical homes with dental providers
- Link patients to resources
- Screen for Medicaid or insurance eligibility
- Arrange transportation for target population

**Outreach to Medical Home:**
Integrate OH promotion and disease prevention into the medical home

*Slide courtesy of Christine Veschesusio*
SC More Smiling Faces Lessons Learned

- Pediatric Oral Health Training
  - Medical providers want to refer children under 3 to oral health providers in their community
  - Multiple barriers exist between medical and pediatric dental providers in implementing urgent need plans
  - Physicians welcome working with patient navigators
  - Physicians welcome development of stronger relationships with local dental community

Slide courtesy of Christine Veschesiusio
Emerging Challenges

• Increase in poverty / lower SES
• Increasing population diversity
• Lack of attention / response
• Priorities?
Healthy Development for All Kids (& Moms)!