Effective School-based Caries Prevention Programs: Process and Outcome Measures
National Network for Oral Health Access 2014

Ellen Gould
Polished, LLC

Richard Niederman
Department of Epidemiology and Health Promotion
Center for Evidence-Based Dentistry
New York University College of Dentistry
Plan

1. The problem we are trying to solve
2. ForsythKids Process
3. ForsythKids Outcomes
4. Controversies
   a. Seal some/all
   b. Resin vs glass
   c. Diagnosis & Treatment
   d. Quality
   e. Standards of Care
   f. Implementation
ForsythKids Basic Precepts

1. Address oral health needs identified in 2000 Surgeon General’s Report
2. Meet/exceed goals of Healthy People 2010
3. Highest quality, defined by Institute of Medicine
4. Focus on comprehensive prevention (not incremental prevention)
5. Implement current best evidence (defined by Centre for EBM, Oxford)
6. Comply with US and MA regulations
7. Meet triple aim (increase access, improve health, reduce costs)
Processes
Implementation Process
Community Participation + Care + Analysis

Disparities

School Recruitment
Informed Consent
Examination
Billing

DDS/CHC Recruitment
Medicaid Enrollment
EB Comprehensive Prevention
Data Analysis

Triple Aim

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Clinical Method:  
*School-based prevention* 2x per year

**Fluoride Varnish**

- Tooth cleaning +
- Rx Toothbrush +
- Rx F Toothpaste +
- Hygiene instruction

**Glass Ionomer:**
1. Classical Sealants
2. Therapeutic Sealants (seal caries)
Know How Process

1. What are we trying to accomplish?
2. What changes can we make?
3. How will we measure improvement?
e Records evolution: ePaper, PC pad, Kindle, iPad/Android
Electronic Patient Chart

Maxilla
Dx
Tx Plan
Tx
ForsythKids Outcome Overview

Increase access:
>50% children on Medicaid

Improve health:
Reduce untreated caries by 2/3

Reduce cost:
$70/patient/visit

Meet national goals:
Exceed Healthy People 2020 before 2010
Outcomes
Outcomes
Reduction of Untreated Caries
Elementary School-Based Comprehensive Prevention

% Children Untreated Decay

Each circle = 1 school
N = 6 Schools
N/school = ~200

67% Mean of 6 schools

21% End 2010

Start 2003
End 2010
Acute Infection Reduction Following Prevention

Visit Number
% of Children with Acute Infection

Grade:
6
1
2, 5, 4
K, 3

Each symbol = average of ~2,000 students

Mean Visit 1 = 17.5%
Mean Visit 2 = 4.5%
Probability of Untreated Decay

GEE with logit link (logistic model) at subject level, repeated measures per child; exchangeable correlation matrix
Adjusted for age at exam, previous dental care, and any decay at baseline.
School and child's sex were not confounders.

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Probability of Untreated Decay

Any tooth or surface

Any permanent tooth or surface

Any deciduous tooth or surface

Occlusal first molar

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### Sequential Visit Caries Risk following Comprehensive Prevention

<table>
<thead>
<tr>
<th></th>
<th>OR²</th>
<th>OR</th>
<th>OR</th>
<th>OR</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>All</td>
<td>1st Molar O</td>
<td>Permanent</td>
<td>Primary</td>
</tr>
<tr>
<td>All Teeth</td>
<td>0.8</td>
<td>0.8</td>
<td>0.7</td>
<td>0.9</td>
</tr>
<tr>
<td>With Decay</td>
<td>0.4</td>
<td>0.4</td>
<td>0.5</td>
<td>0.4</td>
</tr>
</tbody>
</table>

1. N = 2510 children over 6 visits
2. Odds Ratio for each visit, all statistically significant
Controversies
Seal Some vs Seal All
Comparison: Whole Tooth, Occlusal, and First Molar
Glass Ionomer vs Composit
## Composite vs Glass Ionomer

<table>
<thead>
<tr>
<th>Metric</th>
<th>Composite</th>
<th>Glass</th>
</tr>
</thead>
<tbody>
<tr>
<td>Easy “visible retention”</td>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td>Actual retention</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Caries prevention</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Need Etch</td>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td>Curing</td>
<td>Light</td>
<td>Chemical</td>
</tr>
<tr>
<td>Application time/tooth</td>
<td>Slow</td>
<td>Fast</td>
</tr>
<tr>
<td>Bonding to tooth</td>
<td>Mechanical</td>
<td>Chemical</td>
</tr>
<tr>
<td>Release of fluoride</td>
<td>No</td>
<td>Yes</td>
</tr>
<tr>
<td>Kill subjacent bacteria</td>
<td>?</td>
<td>Yes</td>
</tr>
<tr>
<td>Stimulate secondary dentin</td>
<td>?</td>
<td>Yes</td>
</tr>
<tr>
<td>Cost per tooth</td>
<td>Hi</td>
<td>Low</td>
</tr>
<tr>
<td>Saliva sensitive</td>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td>Technique sensitive</td>
<td>Yes</td>
<td>No</td>
</tr>
</tbody>
</table>
Perceived Diagnosis & Treatment Plan
Perceived Diagnosis & Treatment Plan

<table>
<thead>
<tr>
<th>True Caries</th>
<th>True No Caries</th>
<th>Predicted Outcome</th>
</tr>
</thead>
<tbody>
<tr>
<td>Diagnosed Caries</td>
<td>Seal</td>
<td>Abscess</td>
</tr>
<tr>
<td>Diagnosed No Caries</td>
<td>Seal</td>
<td>Prevent Decay</td>
</tr>
</tbody>
</table>
Perceived Diagnosis & Treatment Plan

<table>
<thead>
<tr>
<th></th>
<th>True Caries</th>
<th>True No Caries</th>
<th>Actual Outcome</th>
</tr>
</thead>
<tbody>
<tr>
<td>Diagnosed Caries</td>
<td>Seal</td>
<td>Seal</td>
<td>Stabilize (Prevent Abscess)</td>
</tr>
<tr>
<td>Diagnosed No Caries</td>
<td>Seal</td>
<td>Seal</td>
<td>Prevent Decay</td>
</tr>
</tbody>
</table>
Quality
<table>
<thead>
<tr>
<th>IOM Quality Aims</th>
<th>Office care / fillings</th>
<th>School-based / sealants</th>
<th>Comment</th>
</tr>
</thead>
<tbody>
<tr>
<td>Safe</td>
<td>Yes</td>
<td>Yes</td>
<td></td>
</tr>
<tr>
<td>Effective</td>
<td>No</td>
<td>Yes</td>
<td>SB/TS infection</td>
</tr>
<tr>
<td>Patient centered</td>
<td>No</td>
<td>Yes</td>
<td>Kids to care vs Care to kids</td>
</tr>
<tr>
<td>Timely</td>
<td>No</td>
<td>Yes</td>
<td>Multiple vs 2 visits</td>
</tr>
<tr>
<td>Efficient</td>
<td>No</td>
<td>Yes</td>
<td>Hours vs Minutes</td>
</tr>
<tr>
<td>Equitable</td>
<td>No</td>
<td>Yes</td>
<td>Access + Funds</td>
</tr>
</tbody>
</table>

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Standards of Care
Evidence Level

- High bias
  - Narrative Review / Expert Opinion
  - Animal / In vitro Studies

- Low bias
  - Unfiltered Information
  - Randomized Controlled Trial
  - Cohort Study
  - Case-Controlled Study
  - Case Series / Case Report
  - Critically Appraised Article
  - Systematic Review
  - Evidence-Based Guideline

* US Supreme Court, 2011
## States Adopting Daubert Standard

### States Adopting National Standards (Daubert Standard)

- Alabama
- Alaska
- California
- Connecticut
- Delaware
- Florida
- Georgia
- Hawaii
- Indiana
- Iowa
- Kentucky
- Maine
- Massachusetts
- Mississippi
- Missouri
- Nevada
- New Hampshire
- New Jersey
- New Mexico
- Ohio
- Oklahoma
- Rhode Island
- South Carolina
- Texas
- Utah
- Vermont
- Washington
- West Virginia
- Wisconsin
- Wyoming

### States Adopting Statewide Standards

- Arizona
- Virginia
- Washington

### States Adopting Same Local Community Standards

- Idaho
- New York

### States Adopting Same or Similar Local Community Standards

- Arkansas
- Illinois
- Kansas
- Maryland
- Michigan
- Minnesota
- Nebraska
- North Carolina
- North Dakota
- Oregon
- Pennsylvania
- South Carolina
- Tennessee
- South Dakota

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Implementation
Implementation

A. Stakeholders*
- Government
- Schools / Org.
- Clinicians
- Patients

B. Improve*: [Diagram]

C. Implementation**

1. Awareness
2. Acceptance
3. Application

*HHS, IOM 2010, 2011
**E. Rogers, 1995
Implementation

A. Stakeholder
- Government
- Organization
- Clinician
- Patients

B. Implementation

1. Awareness
2. Acceptance
3. Application

- Evidence
- Advantage
- Simplicity
- Compatibility
- Trust
- Choice

*Adopt from E. Rogers, 2003*
Final Comments
“Then we’ve agreed that all the evidence isn’t in, and that even if all the evidence were in, it still wouldn’t be definitive.”
Our thanks to:

- Delta Dental of Massachusetts (DentaQuest)
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