

# Latest Information on Early Childhood Caries

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July 24, 2015

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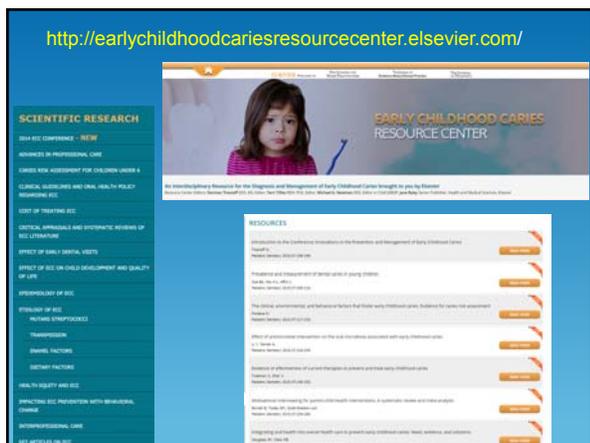
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## Innovations in the Prevention and Management of ECC

Oct. 23-24, 2014

- This conference goals were to assess the evidence, as well as the potential, of emerging approaches that can reduce ECC.
- The conference also convened a panel to review the literature assessments and conference discussions in order to start the process of developing evidence-based clinical recommendations that will reduce the incidence and improve the management of ECC.

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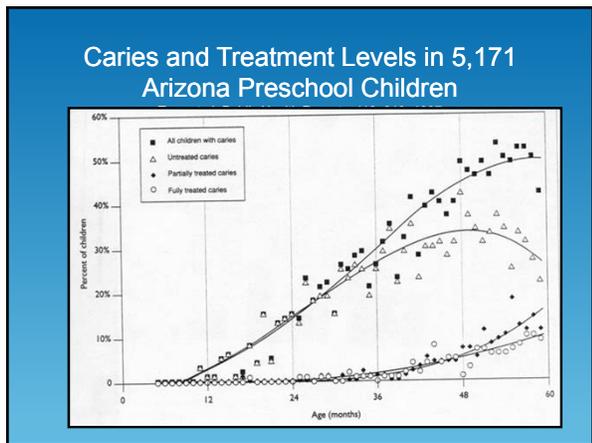
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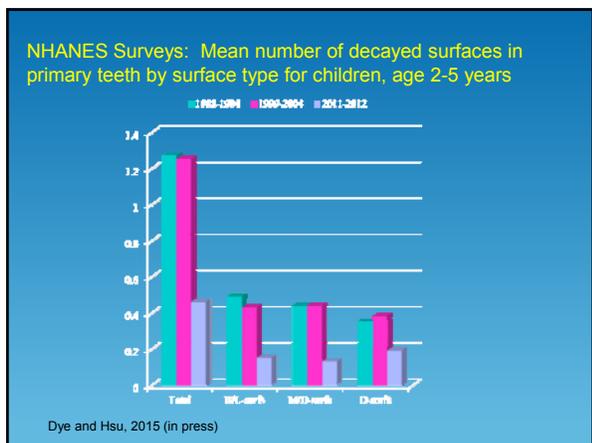
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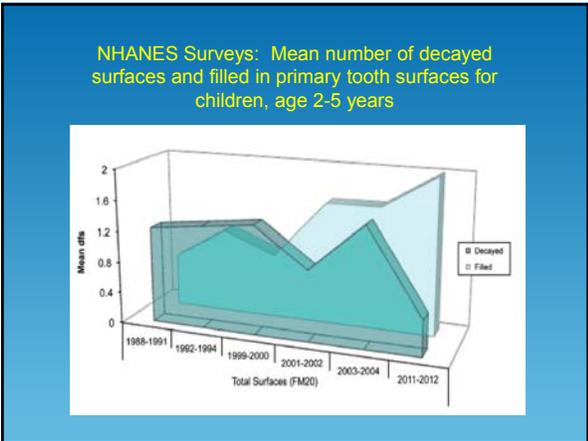
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- ### Conventional Wisdoms
- Oral health risk assessment is an important component of ECC prevention
  - Antimicrobial interventions (chlorhexidine, iodine, xylitol) reduced cariogenic microorganisms and ECC.
  - Fluoride toothpaste and fluoride varnish greatly reduce ECC.
  - Restorative dentistry is effective in disease management of ECC.
  - Education and behavioral change strategies are an important component of ECC prevention.

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### Value of Traditional Caries Risk Assessment Factors

Risk Factor	Value
Multivariate prediction models	2
Cariogram	3
Previous caries	2+
High levels of MS	2++
Low SES	2++
Enamel defects	2++
Salivary buffering	4
Oral hygiene/use of fluoride	
Frequent sugar exposure	
Maternal factors	2+
Post-eruptive age	

1 = RCTs or Systematic Review  
2 = Case-Control/Cohort studies with low risk of bias  
3 = Non-Analytic Studies  
4 = Expert Opinion

Scottish Intercollegiate Guideline Network, Systematic Review, 2014

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### Caries Risk Assessment for 0-5 Year Olds (AAPD, 2015)

	High Risk	Moderate Risk	Protective Factors
<b>Biological Factors</b>			
Mother/primary caregiver has active caries	Yes		
Parent/caregiver has low SES	Yes		
Child has >3 between meal sugar snacks	Yes		
Put to bed with a bottle containing sweets	Yes		
Child has special health care needs		Yes	
Child is a recent immigrant		Yes	
<b>Protective Factors</b>			
Child exposed to fluoridated drinking water			Yes
Child has teeth brushed daily with F toothpaste			Yes
Child receives professional topical fluoride			Yes
Additional home measures			Yes
Child has dental home/regular dental care			Yes
<b>Clinical Findings</b>			
Child has white spot lesions or enamel defects	Yes		
Child has visible caries	Yes		
Child has elevated mutans streptococcus	Yes		
Child has plaque on teeth		Yes	

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### AAP Risk Assessment Tool

Patient Name: \_\_\_\_\_ Date of Birth: \_\_\_\_\_ Date: \_\_\_\_\_

Visit:  6 month,  9 month,  12 month,  15 month,  18 month,  24 month,  30 month,  3 years,  4 years,  5 years,  6 years,  Other \_\_\_\_\_

RISK FACTORS	CLINICAL FINDINGS	PROTECTIVE FACTORS
<ul style="list-style-type: none"> <li>▲ Mother or primary caregiver had active decay in the past 12 months. Yes <input type="checkbox"/> No <input type="checkbox"/></li> <li>● Mother or primary caregiver does not have a dental. Yes <input type="checkbox"/> No <input type="checkbox"/></li> <li>● Continual bottle/sippy cup use with fluid other than water. Yes <input type="checkbox"/> No <input type="checkbox"/></li> <li>● Frequent snacking. Yes <input type="checkbox"/> No <input type="checkbox"/></li> <li>● Special health care needs. Yes <input type="checkbox"/> No <input type="checkbox"/></li> <li>● Medicaid eligible. Yes <input type="checkbox"/> No <input type="checkbox"/></li> </ul>	<ul style="list-style-type: none"> <li>▲ White spots or visible decalcifications in the past 12 months. Yes <input type="checkbox"/> No <input type="checkbox"/></li> <li>▲ Obvious decay. Yes <input type="checkbox"/> No <input type="checkbox"/></li> <li>▲ Restorations (fillings) present. Yes <input type="checkbox"/> No <input type="checkbox"/></li> <li>● Visible plaque accumulation. Yes <input type="checkbox"/> No <input type="checkbox"/></li> <li>● Gingivitis (swollen/bleeding gums). Yes <input type="checkbox"/> No <input type="checkbox"/></li> <li>● Teeth present. Yes <input type="checkbox"/> No <input type="checkbox"/></li> <li>● Healthy teeth. Yes <input type="checkbox"/> No <input type="checkbox"/></li> </ul>	<ul style="list-style-type: none"> <li>● Existing dental home. Yes <input type="checkbox"/> No <input type="checkbox"/></li> <li>● Drinks fluoridated water or takes fluoride supplements. Yes <input type="checkbox"/> No <input type="checkbox"/></li> <li>● Fluoride varnish in the last 6 months. Yes <input type="checkbox"/> No <input type="checkbox"/></li> <li>● Has teeth brushed twice daily. Yes <input type="checkbox"/> No <input type="checkbox"/></li> </ul>

**Self Management Goals:**

<input type="checkbox"/> Regular dental visits	<input type="checkbox"/> No soda	<input type="checkbox"/> Xylitol
<input type="checkbox"/> Dental treatment for parents	<input type="checkbox"/> Less/no juice	<input type="checkbox"/> Drink tap water
<input type="checkbox"/> Healthy snacks	<input type="checkbox"/> Wean off bottle	<input type="checkbox"/> Less/no junk food or candy
<input type="checkbox"/> Brush with fluoride toothpaste 2X/day	<input type="checkbox"/> Only water in sippy cup	

**ASSESSMENT/PLAN**

**Caries Risk:**  Low  High

**Completed:**

- Anticipatory Guidance
- Fluoride Varnish
- Dental Referral

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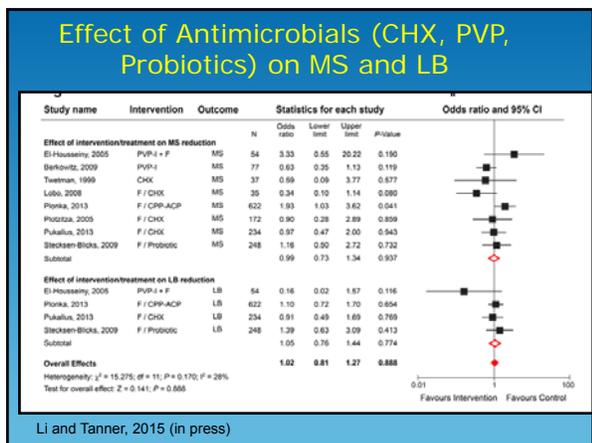
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Li and Tanner, 2015 (in press)

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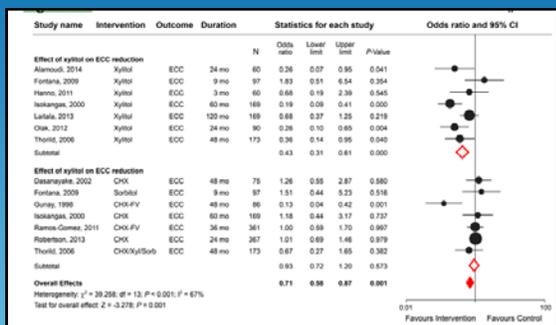
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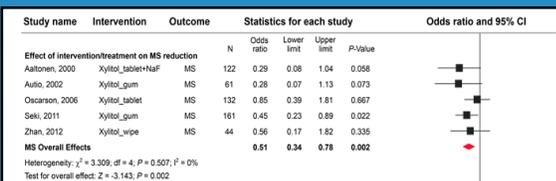
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### Effect of Antimicrobial Maternal Interventions on ECC



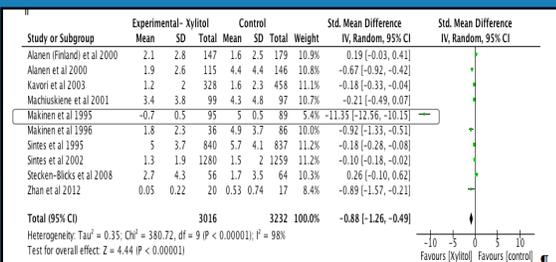
Li and Tanner, 2015

### Effect of Xylitol on MS



Li and Tanner, 2015

### Effect of Xylitol on Caries



Marghalani et al, 2015 (submitted)

### Effect of Fluoride Toothpaste on Caries

Author and Year	Preventive Fraction, Significance
Schwarz, 1998	-42.7, Significant
You, 2002	-16.1, Significant
Rong, 2003	-30.6, Significant
Jackson, 2005	-11.9, Non-Significant
Fan, 2008	-41.9, Significant
Overall approximately 31% reduction	

Santos, 2013

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### Effect of Fluoride Varnish on Caries

Author and Year	Std. Mean Difference/Significance
Holm, 1979	-.43, Significant
Grodzka, 1982	-.07, Non-Significant
Clark, 1985	-.18, Non-Significant
Frostell, 1991	-.38, Significant
Audio-Gold, 2001	-.34, Non-Significant
Weintraub, 2006	-.33, Significant
Hartman, 2007	.03, Non-Significant
Lawrence, 2008	-.08, Non-Significant
Overall approximately 20% reduction	

JADA, 2013

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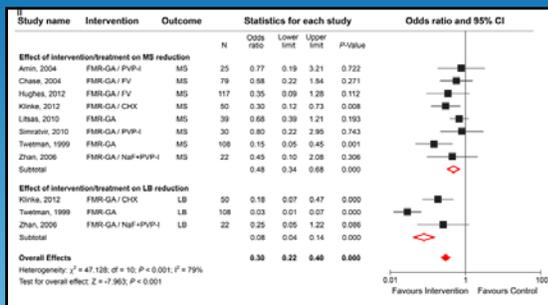
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### Effect of Restorative Care on MS and LB



Li and Tanner, 2015

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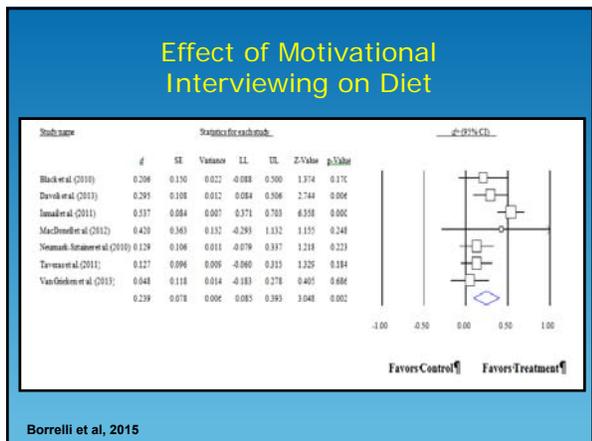
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### Effect of Chronic Disease Management on ECC

Existing Risk Category	New Clinical Findings	Fluoride Varnish Interval	Self-Management Goals	Restorative Treatment	DM Return Interval	Other
Low	No disease indicators of caries, or completely remineralized carious lesions	6-12 months	Twice daily brushing with F toothpaste	-	6-12 Months	
Medium	No disease indicators,* but has risk factors** ; and/or inadequate protective factors*** Disease indicators present with some remineralization	3-6 months	Twice or more daily brushing with F toothpaste Dietary changes	Sealants ITR Conventional Restorative	3-6 Months	Xylitol gum or candies or wipes Calcium phosphate paste
High	Active caries (disease indicators present) No remineralization occurring Heavy plaque	1-3 months	Twice or more daily brushing with F toothpaste Dietary changes	ITR Sealants Conventional restorative	1-3 months	Xylitol gum or candies Calcium phosphate paste

Ng et al., 2012

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### Effect of Chronic Disease Management

Outcomes	Boston Children's Hospital			St. Joseph Hospital		
	ECC (403) %	Baseline (N=129) %	Improvement %	ECC (234) %	Baseline (N=80) %	Improvement %
New cavitation	26	75	▼65	41	71	▼58
Pain	13	22	▼38	7	31	▼23
Referral to Operating Room	11	21	▼48	15	25	▼68

Ng et al., 2012

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### Conclusions from the Chronic Disease Model Studies

- Preventive measures work (especially fluoride and ITR) to reduce ECC
- Limit sedation and general anesthesia
- Interprofessional care
- Better care through better patient engagement
- Treat caries, not cavities
- Payment models for better health

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### Conventional Wisdom

- Oral health risk assessment is an important component of ECC prevention (there are good associations; does using risk assessment affect caries incidence?)
- Antimicrobial interventions (chlorhexidine, iodine, xylitol) reduced cariogenic microorganisms (small effect) and ECC (no effect).
- Fluoride toothpaste (good) and fluoride varnish (modest) reduce ECC.
- Restorative dentistry is effective in disease management of ECC (affects microbiology short term, no effect on caries incidence).
- Education and behavioral change strategies are an important component of ECC prevention (evidence for motivational interviewing).

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### Next Steps -- Research

- Since 1997 there has been substantial research to better understand ECC disease process, risk factors and management
- Many of these trials regarding management have should equivocal results
- There needs to be efficacy studies regarding efficacy of sealants, interim therapeutic restorations.
- There needs to be more effectiveness studies of treatment with chronic disease management approached

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### Next Steps – Clinical Guidelines

- Clinical management guidelines have not been widely adopted in dentistry
- Clinical guidelines should be based on caries risk, as well as literature and best judgment of expert panels
- Clinical guidelines have the potential to standardize decision making for appropriate levels of preventive and restorative care
- Protocols for medical management have demonstrated better and more cost effective outcomes.

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### Example of a Caries Protocol for a 0-2 Year-Old

	Diagnostic	Fluoride	Sealants	Diet Counseling	Restorative
<b>Low Risk</b>	--Recall every year --Baseline MS	--Twice daily brushing with F toothpaste	NA	Yes	Surveillance
<b>Moderate Risk</b> parent engaged	--Recall every six mo. -- Baseline MS	--Twice daily brushing with F toothpaste --Fluoride supplements* -- Prof. topical F every 6 mo.	NA	Yes	Active surveillance **
<b>Moderate Risk</b> parent not engaged	--Recall every six mo. --Baseline MS	--Twice daily brushing with F toothpaste --Prof. topical F every 6 mo.	NA	Limit expectations	Active surveillance
<b>High Risk</b> parent engaged	--Recall every three mo. -- Baseline & followup MS	--Twice daily brushing with F toothpaste --Fluoride supplements* --Prof. topical F every 3 mo.	NA	Yes	--Active surveillance -- Restore cavitated lesions in posterior with ITR
<b>High Risk</b> parent not engaged	--Recall every three mo. --Baseline & followup MS	--Twice daily brushing with F toothpaste --Prof. topical F every 3 mo.	NA	Limit expectations	--Active surveillance -- Restore cavitated lesions in posterior with ITR

\* Need to consider fluoride levels in drinking water

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### Example of a Caries Protocol for a 3-5 Year-Old

	Diagnostic	Fluoride	Sealants	Diet Counseling	Restorative
<b>Low Risk</b>	--Recall every year --Radiographs every two years --Baseline MS	--Twice daily brushing with F	No	No	Surveillance
<b>Moderate Risk</b> parent engaged	--Recall every six mo. --Radiographs yearly -- Baseline MS	--Twice daily brushing with F --Fluoride supplements* --Prof. topical F every 6 mo.	Yes	Yes	Active surveillance of incipient lesions
<b>Moderate Risk</b> parent not engaged	--Recall every six mo. --Radiographs yearly --Baseline MS	--Twice daily brushing with F --Prof. topical F every 6 mo.	Yes	Limit expectations	-- restore cavitated or enlarging lesions
<b>High Risk</b> parent engaged	--Recall every three mo. --Radiographs , six mo. --Baseline & followup MS	--Brushing with high potency F gel (with caution) --Fluoride supplements* --Prof. topical F every 3 mo.	Yes	Yes	** Active surveillance --restore cavitated or enlarging lesions
<b>High Risk</b> parent not engaged	--Recall every three mo. --Radiographs , six mo. --Baseline & followup MS	--Brushing with high potency F gel (with caution) --Prof. topical F every 3 mo.	Yes	Limit expectations	Restore , incipient, cavitated or enlarging lesions

\* Need to consider fluoride levels in drinking water

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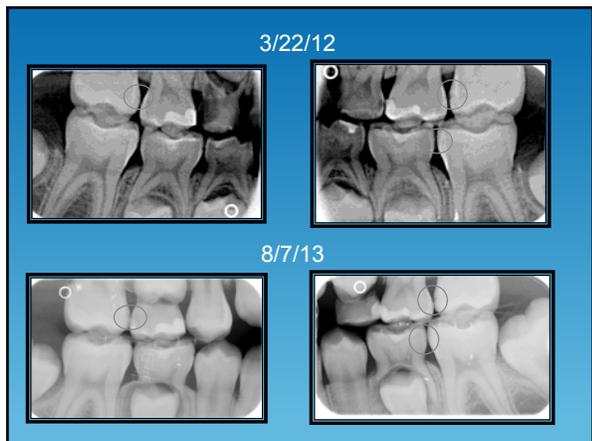
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### Next Steps -- Policy

- The cost of treating ECC is enormous
- Payment models have been slow to adapt to advances in science
- In the medical arena, there are successes with adopting evidence-based practice with financial rewards
- Oral health policies need to be more evidence based
- There have been some success with interprofessional care for ECC, especially since most children still do not see an dentist until age 3
- There has been national policy change regarding reimbursement for ECC for non-dental providers

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### Why Physicians and Oral Health?

- Children <3 are not seeing dentists.
- Early childhood caries is significantly under-addressed by dentists.
- New York, 2008 – 3.4% of children <6 visit hospital for dental issues; costs \$31M.
- 35% of pediatricians receive no oral health training in medical school.\*
- Of those with training, 75% had <3 hours of instruction.\*

\*AAP, 2007

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### Interprofessional Care

- Medical offices before age of three, with physicians and/or nurses screening, referring, guidance, fluoride varnish
- Non-professional health care workers for case management, and instruction
- Social Workers, Pharmacists, Nurse Practitioners, Ob Gyn, etc.

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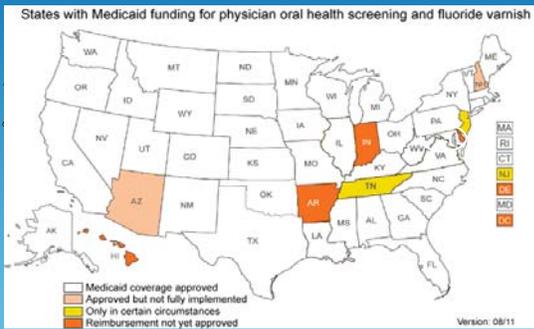
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### States that Reimburse Medical Providers for Fluoride Varnish




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