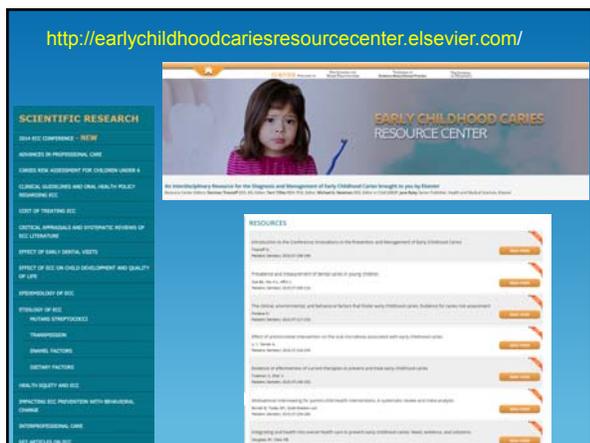


Latest Information on Early Childhood Caries

Norman Tinanoff, DDS, MS

July 24, 2015

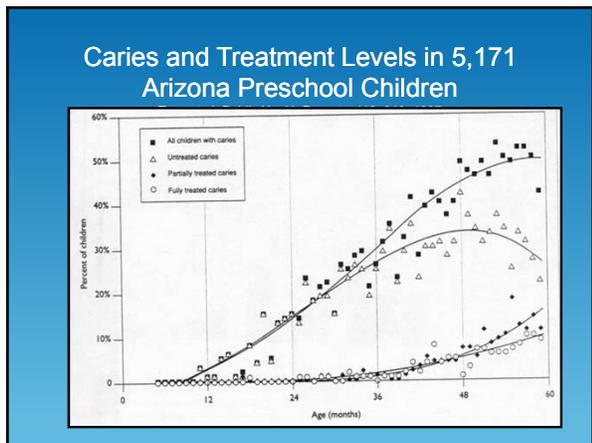


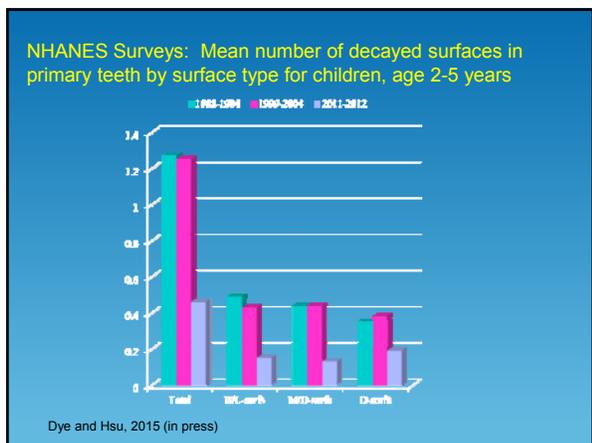
Innovations in the Prevention and Management of ECC

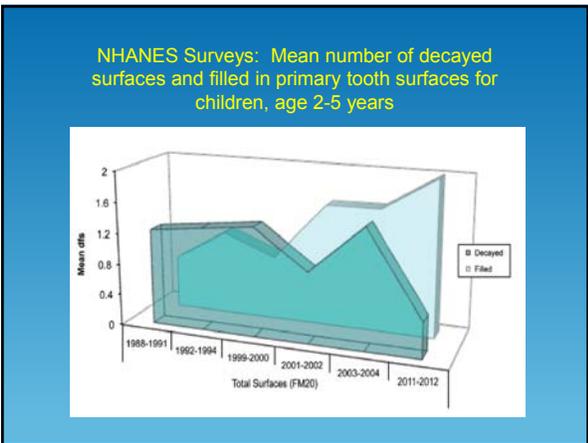
Oct. 23-24, 2014

- 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.









- ### 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.

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

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

	High Risk	Moderate Risk	Protective Factors
Biological Factors			
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	
Protective Factors			
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
Clinical Findings			
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	

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

Self Management Goals:

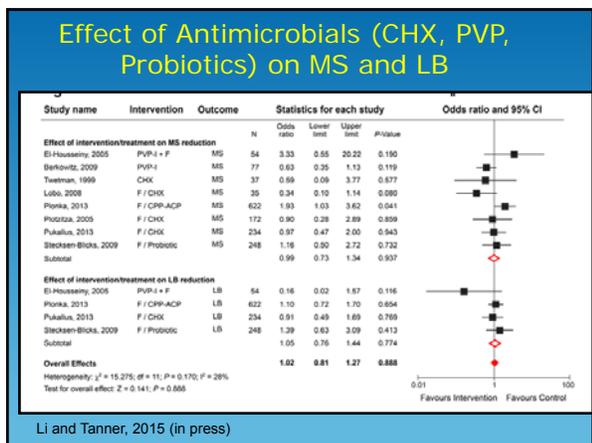
<input type="checkbox"/> Regular dental visits	<input type="checkbox"/> No soda	<input type="checkbox"/> Xylitol
<input type="checkbox"/> Dental treatment for parents	<input type="checkbox"/> Less/no juice	<input type="checkbox"/> Drink tap water
<input type="checkbox"/> Healthy snacks	<input type="checkbox"/> 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

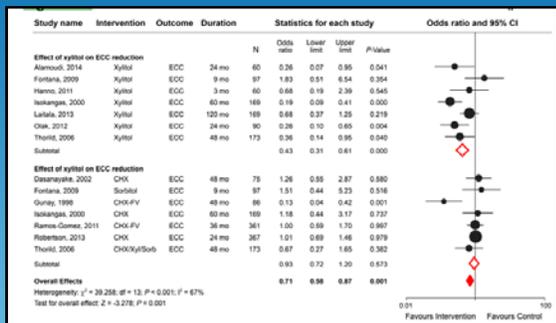
Caries Risk: Low High

Completed:

- Anticipatory Guidance
- Fluoride Varnish
- Dental Referral

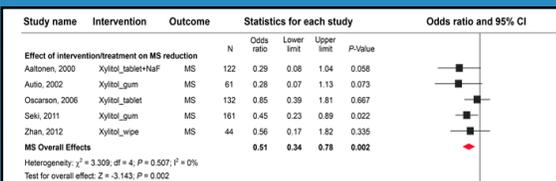


Effect of Antimicrobial Maternal Interventions on ECC



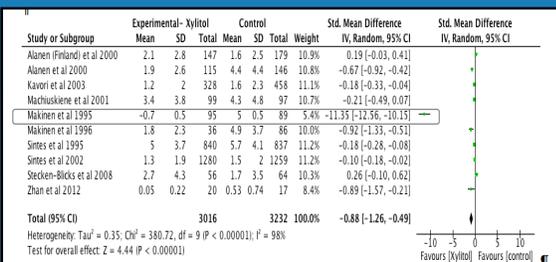
Li and Tanner, 2015

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	

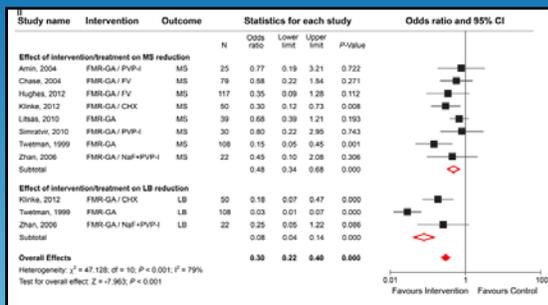
Santos, 2013

Effect of Fluoride Varnish on Caries

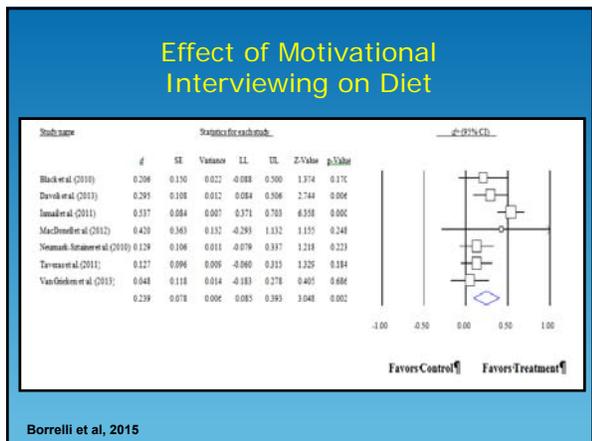
Author and Year	Std. Mean Difference/Significance
Holm, 1979	-.43, Significant
Grodzka, 1982	-.07, Non-Significant
Clark, 1985	-.18, Non-Significant
Frostell, 1991	-.38, Significant
Audio-Gold, 2001	-.34, Non-Significant
Weintraub, 2006	-.33, Significant
Hartman, 2007	.03, Non-Significant
Lawrence, 2008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

JADA, 2013

Effect of Restorative Care on MS and LB



Li and Tanner, 2015



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

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

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

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).

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

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.

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

	Diagnostic	Fluoride	Sealants	Diet Counseling	Restorative
Low Risk	--Recall every year --Baseline MS	--Twice daily brushing with F toothpaste	NA	Yes	Surveillance
Moderate Risk 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 **
Moderate Risk 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
High Risk 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
High Risk 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

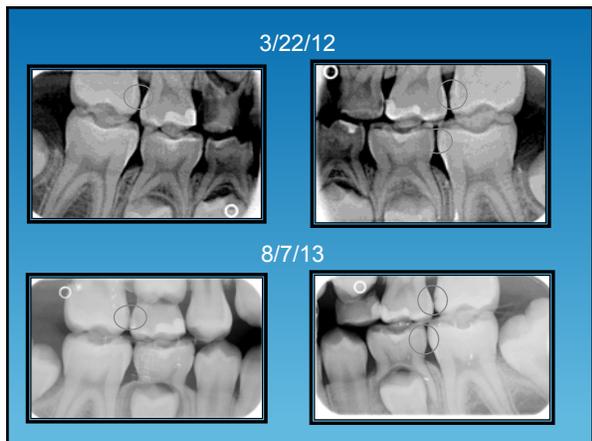
* Need to consider fluoride levels in drinking water

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

	Diagnostic	Fluoride	Sealants	Diet Counseling	Restorative
Low Risk	--Recall every year --Radiographs every two years --Baseline MS	--Twice daily brushing with F	No	No	Surveillance
Moderate Risk 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
Moderate Risk 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
High Risk 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
High Risk 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





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

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

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.

States that Reimburse Medical Providers for Fluoride Varnish

