



The Impact of a Pragmatic Oral-Health Promotion Intervention in a Safety-Net Health Care System on Dental Prevalence

National Oral Health Conference

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Conflicts of Interest/Disclosures

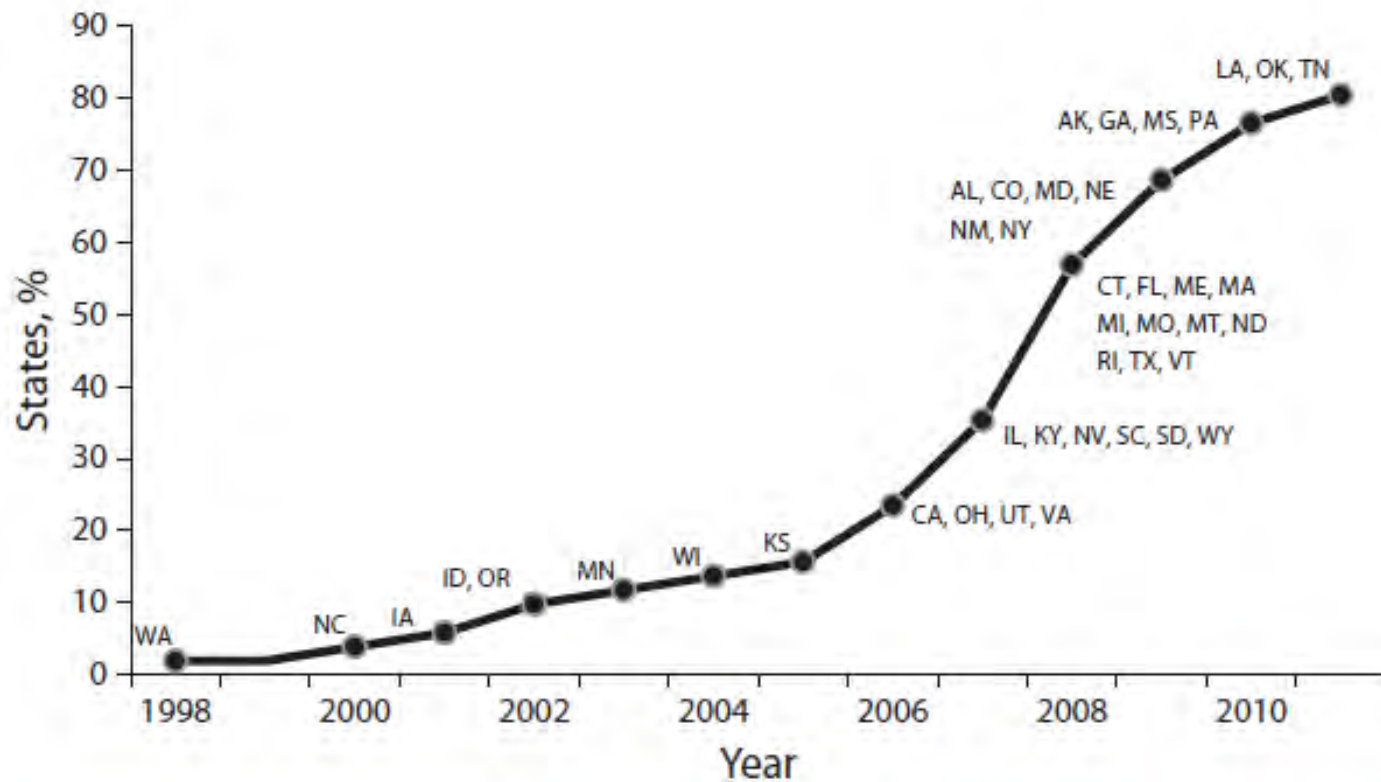
- ▶ Use of fluoride varnish in children is off-label
- ▶ No financial conflicts of interest

Early Childhood Caries

- Early childhood caries (ECC) describes disease process that results in cavities of primary dentition
- Most chronic condition of childhood
- The prevalence of caries among poor and near-poor five-year olds (50%) is twice that of their non-poor peers.



Medicaid Funding for Medical Providers



Note. Nonadopting states were AZ, AR, DC, DE, HI, IN, NH, NJ, and WV.

FIGURE 1—Cumulative percentage adoption curve for fluoride varnish: state Medicaid programs, United States, 1998-2011.



PREVENTION OF DENTAL CARIES IN CHILDREN FROM BIRTH THROUGH AGE 5 YEARS
CLINICAL SUMMARY OF U.S. PREVENTIVE SERVICES TASK FORCE RECOMMENDATION

- ▶ Controlled, clinical trials examining efficacy of fluoride varnish
 - Primary Outcome: dmfs
- ▶ Secondary database studies
 - Caries-related treatments
- ▶ Unique populations
 - First Nations People

Moyer VA, US Preventive Services Task Force. Prevention of dental caries in children from birth through age 5 years: US Preventive Services Task Force recommendation statement. *Pediatrics*. 2014;133(6): 1102–1111.

Specific Aims

- Determine the effectiveness of pragmatic oral health promotion program by medical providers on caries prevalence

Study Setting

- ▶ Denver Health and Hospital
- ▶ Oldest FQHC west of the Mississippi
- ▶ Largest safety-net health system in Colorado
- ▶ 8 FQHCs/12 SBCs/477-bed hospital
- ▶ Serves 1 in 4 Denver residents
- ▶ 40% of Denver's children
- ▶ 2015
 - > 200,000 patients seen
 - > 750,000 visits/year
- ▶ 105 pediatric and family medicine providers

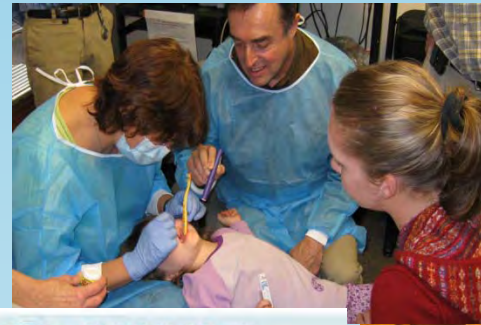
Study Design

- ▶ Pragmatic trial
- ▶ 2009:
 - 4 of 8 FQHC randomized to implement oral health promotion program/4 wait-list control FQHCs
- ▶ 2011:
 - 4 wait-list control FQHCs began implementation



Cavity Free at Three

- ▶ Caries risk assessment
- ▶ Oral health evaluation
- ▶ Fluoride varnish application
- ▶ Anticipatory guidance/education
- ▶ Self-management goal setting
- ▶ Age One Dental Visit/Establishment of Dental Home



Cavity-free AT THREE Pediatric Oral Health Screening Medical Office

NAME: _____
DOB: _____
MOM: _____
DAD: _____
Patient ID: _____

Chief complaint or reason for referral: _____

Caries risk indicators – based on parent interview: Low High

Protective factors – based on parent interview: Yes No

Oral examination: Yes No

Assessment: Check caries risk status (see checked box to check even codes high risk)

Plan: Oral health education benefits Self-management goals

Signature of Screening Provider: _____ Date of Service: _____

Cavity-free AT THREE Self-management Goals

Patient Name: _____ Date: _____

Regular dental care	Eat more fruits, vegetables, milk and cheese	Brush with fluoride toothpaste
Drink lots of water	Keep germs at bay with hand soap	Don't put baby to bed with a bottle
Wash baby out of toothbrush	Only water in a sippy cup	Drink more water less juice and soda

What I want to do (my goals): _____

I can accomplish this goal: 1 2 3 4 5 6 7 8 9 10
Not likely Definitely

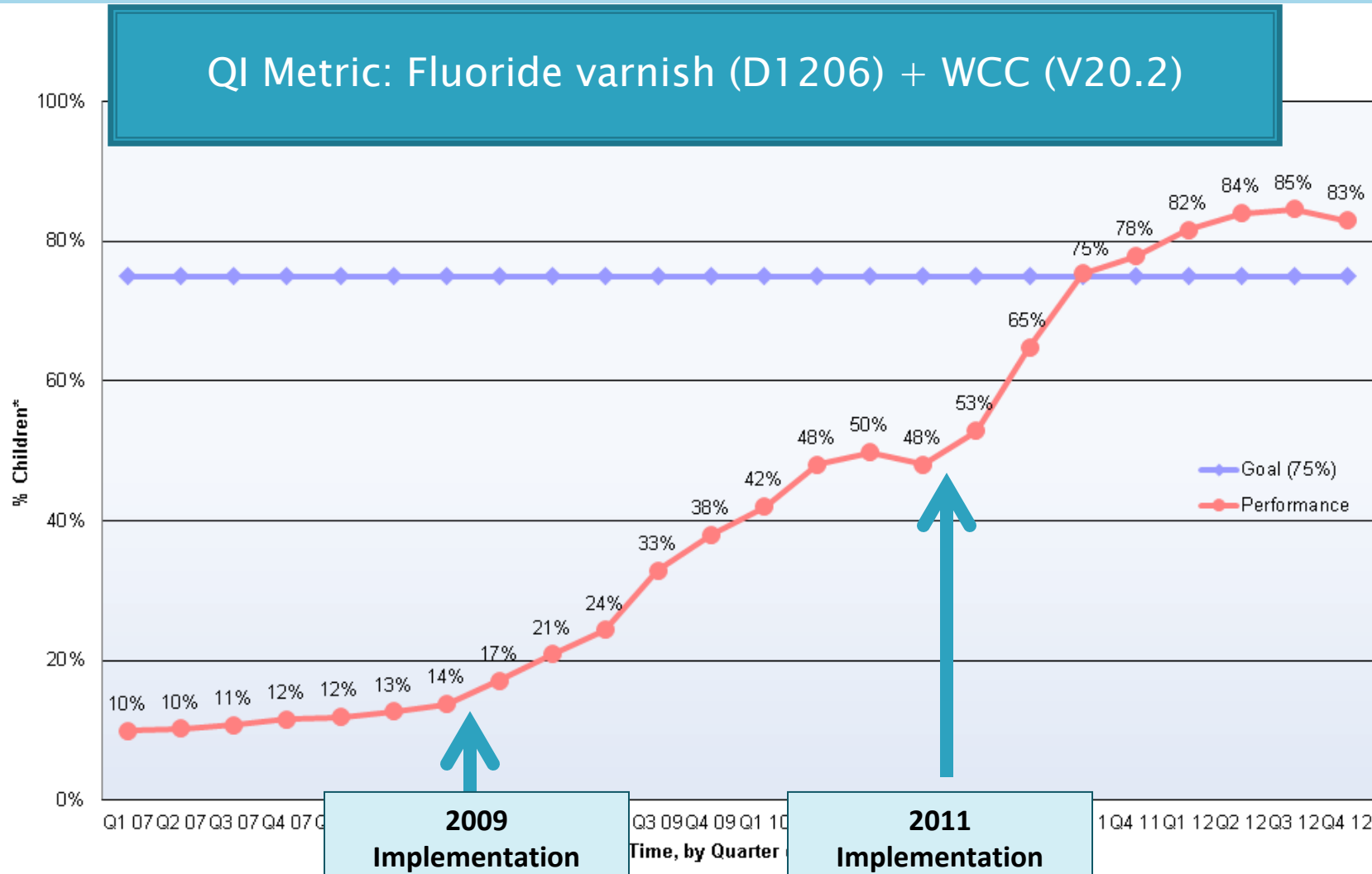
Witnessed by: _____
Signature: _____
Comments: _____



Oral Health Promotion Program

- ▶ ½ day Cavity Free at Three training for all staff
- ▶ Hands-on component
- ▶ Practice management every 3–4 months
- ▶ Training of new staff every 4–6 months
- ▶ Development of Care Guideline/Standard Work
- ▶ Billing procedures changed
- ▶ Oral health kits added to central ordering
- ▶ Ambulatory Care Quality Improvement measure
- ▶ DH wide grand rounds–oral health x 2

Denver Health



*Children were eligible if they were seen for Well Child Care in the previous 6 months and were between 12 and 35 months of age. Data source: DH administrative

Strengthening Program

- ▶ Site-based dental champions
- ▶ Quarterly practice coaching
- ▶ Strengthening of QI metrics
 - 2 FV @ WCC by 24 months
 - 3 FV @ WCC by 36 months
 - At least one dental visit by age 3

Study Population

- ▶ 2009 (baseline), 2011, 2015
- ▶ All Denver Health children
 - 36–42 months of age
 - ≥ 2 WCC @ DH
 - Any visit in past 18 months (user)
- ▶ Randomly invited in by caller masked to condition
- ▶ Dental examination + survey
- ▶ \$20 compensation

Study Population

	2009	2011	2015*
Denver Health children 36–42 months of age	1501	1646	1708
# with ≥ 4 FV	0	66	391
Called	1250 (83%)	1215 (74%)	359 (92%)
Contacted	437 (29%)	755 (46%)	236 (60%)
Scheduled	260 (17%)	517 (31%)	224 (57%)
Examined	203 (13%)	422 (26%)	163 (42%)

*2015: [≥ 4 FV(D1206) + WCC (V20.2)]

Outcomes

- Primary: dental experience
 - decayed, missing, filled surfaces (dmfs)
 - calibrated dental hygienist (ICC >0.75)
 - visual inspection (no probing/x-rays)
 - recorded on clinical data form
- Caregiver oral health behaviors
 - hand written survey (English/Spanish)
 - oral health-related behaviors/characteristics
 - Likert scale → dichotomized (favorable/unfavorable)
- Fluoride varnish
 - Denver Health administrative data
 - D1206 + V20.2

Data Analysis

- ▶ Descriptive
- ▶ Chi-square
- ▶ Logistic regression
- ▶ Zero-inflated regression

Study Population Characteristics

Socio-Demographic and Fluoride	2009 N = 203	2011 N = 421	2015 N = 158	p-value
Child age (months) Mean (range)	43.8 (36-68)	40.8 (33-66)	44.4 (38-51)	na
Gender (Male)	47.8%	51.3%	58.9%	0.11
Race (Hispanic)	81.3%	90%	96.2%	<0.001
Insurance (%) Medicaid/SCHIP	95.1%	94.5%	94.9%	0.26
Fluoride varnish @ medical visit Mean (range)*	0 (0)	1.2 (0-6)	4.4 (4-8)	<0.001

* D1206 + V20.2

ECC Prevalence

	2009 N = 203	2011 N = 421	2015 N = 158	p-value
dmfs % (any)	46.3%	52.5%	38.0%	<0.001
dmfs (mean) Range	5.3 (0- 66)	6.0 (0- 93)	3.7 (0- 60)	<0.001
ds (any)	35.0%	44.2%	8.9%	<0.001
ds (mean) Range	1.5 (0 - 13)	1.6 (0 - 13)	0.3 (0 - 8)	<0.001

Dental Experience

	2009 N = 203	2011 N = 421	2015 N = 158	p-value
Any previous dental visit	60.1%	75.1%	91.1%	<0.001
Parent/caregiver with cavity in past 2 years	63.1%	62.2%	63.9%	0.59
Someone else in home with cavity in past 2 years	63.5%	71.9%	70.9%	0.23

Oral hygiene/Fluoride exposure

	2009 N = 203	2011 N = 421	2015 N = 158	p-value
Child's teeth brushed by someone \geq twice a day	57.1%	53.4%	61.4%	0.43
Brushed with fluoridated toothpaste	65.5%	53.0%	62.7%	0.031
Drinks tap water	64.0%	71.1%	60.1%	0.028

Diet/Carbohydrate exposure

	2009 N = 203	2011 N = 421	2015 N = 158	p-value
Does not currently use bottle	92.1%	91.9%	96.2%	0.02
Does not go to bed/naps w/ bottle	87.7%	83.6%	86.7%	0.24
Child <u>stopped</u> sleeping with bottle by 18 month or never slept with bottle	50.2%	45.5%	47.5%	0.24
Does not sleep with sippy cup	87.2%	76.0%	77.2%	0.02
Does not eat/drink between-meal sugary snacks/drinks	59.6%	64.6%	74.1%	0.03

Logistic Regression:

Association between Year and any decay (dmfs)

Year	Odds Ratio (95% Confidence Interval)	
	Unadjusted	Adjusted ***
2015 vs. 2009	0.71 (0.46–1.08)	0.52 (0.31–0.86)*
2015 vs. 2011	0.45 (0.31–0.65)*	0.34 (0.21–0.54)**
2015 vs. 2009, 2011	0.52 (0.36–0.74)**	0.39 (0.25–0.61)*



**2.56 less likely
to have dental
disease**

* P < 0.05, **p < 0.001

*** Adjusted for child age, gender, insurance, oral health characteristics

Logistic Regression:

Association between Year and any untreated decay (ds)

Year	Odds Ratio (95% Confidence Interval)	
	Unadjusted	Adjusted **
2015 vs. 2009	0.18 (0.1–0.34)**	0.17 (0.08–0.33)**
2015 vs. 2011	0.12 (0.07–0.22)**	0.12 (0.06–0.25)**
2015 vs. 2009, 2011	0.14 (0.08–0.25)**	0.13 (0.07–0.25)**



**7.69 less likely
to have
untreated
decay**

* P < 0.05, **p < 0.001

*** Adjusted for child age, gender, insurance, oral health characteristics

Strengths

- ▶ Primary outcome dental disease prevalence in representative cohorts of children receiving primary medical care at large safety-net system
- ▶ Expands knowledge of effectiveness of basic preventive oral health services by medical providers beyond caries-related services
- ▶ Results adjusted for other variables including caregiver oral health characteristics / behaviors

Limitations

- ▶ Findings may not be generalizable to other populations
- ▶ Added inclusion criteria of 4+ FV in 2015 cohort makes findings not generalizable to all 2015 DH children
- ▶ Quantity of dental care received outside of DH medical WCC visits not measured
- ▶ Potential bias in reported oral health behaviors

Conclusions

- ▶ When compared to young children who received fewer FV @ WCC in previous years, similarly-aged children who received at least 4 FV @ WCC visits in 2015:
 - Lower prevalence of early childhood caries
 - Lower prevalence of untreated dental decay
 - 2.6 times less likely to have any early childhood caries
 - 7.7 times less likely to have untreated dental decay

Implications

- ▶ Basic preventive oral health services provided at medical WCC can reduce dental disease when enough care is provided
- ▶ Adjustment for other oral health behaviors suggests that FV has an independent influence on dental disease in this population
- ▶ Children receiving care in a safety-net healthcare system benefit from medical providers engaging in coordinated oral healthcare services that include fluoride varnish
- ▶ Changing practice behaviors of medical providers requires time, establishing care-delivery processes, and ongoing practice support

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