Tooth Triage: Disparities in Dental Health

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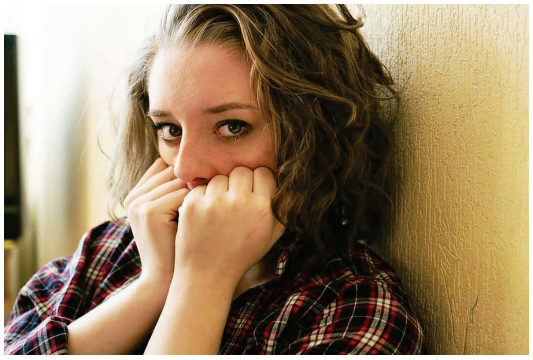
Objectives

1. Explore groups that experiences **disparities in dental health**.
2. Raise awareness of the importance pediatric dental care given **inadequate coverage of adults**
3. Review evidence-based **anticipatory guidance**
4. Develop catalog of **resources in Maine**
5. Introduce **future directions** in pediatric dental care

I have no disclosures.

5 yo Female in Pediatric Clinic with Tooth Pain

26 yo Female in Med-Peds Clinic for Hospital Follow Up



Let this sit...

Dental caries are the **most common chronic disease** of childhood.

In <1 year olds	
88% had regular **doctor** appointments	**3.6%** had regular **dentist** appointments

In Maine During 2015-2017

16% of Children → Did not receive any preventative dental care

42% of Children on MaineCare → Had a dental visit (compared to 67% of commercial insurance)

4 in 10 Mainers by 3rd Grade → Had caries

AAP unpublished data from 2007-2016 Expenditure data

Poor Dental Care Associated With Cardiometabolic Disease

- n= 11,556
- Cross-sectional study
- National Longitudinal Study of Adolescent to Adult Health
- Predominantly white with at least high school education
- Deferred dental care
- BMI, cholesterol, blood pressure

Poor dental care associated with cardiometabolic disease

TABLE 3

Regression analysis of oral health determinants of cardiometabolic risk.*

CARDIOMETABOLIC RISK: WAVE 4	TOOTH LOSS OR PERIODONTAL DISEASE: WAVE 4		DEFERRED DENTAL CARE: WAVE 1 12-19 yo		DEFERRED DENTAL CARE: WAVE 4 26-32 yo	
	ß (SE)†	*P*	ß (SE)	*P*	ß (SE)	*P*
BMI, Mean	0.67 (0.48)	.16	1.25 (0.35)‡	.001‡	0.86 (0.21)‡	< .001‡
Total Cholesterol Decile, Mean	−0.25 (0.19)	.20	−0.16 (0.11)	.15	0.05 (0.07)	.45
Triglycerides Decile, Mean	0.14 (0.19)	.46	−0.08 (0.14)	.56	0.05 (0.07)	.44
LDL§ Decile, Mean	−0.36 (0.20)	.08	−0.15 (10)	.14	0.01 (0.07)	.84
HDL¶ Decile, Mean	−0.34 (0.21)	.11	−0.13 (0.10)	.23	−0.02 (0.06)	.80
Systolic BP,# Mean	0.25 (86)	.77	0.23 (0.44)	.60	0.91 (0.29)‡	.002‡
Diastolic BP, Mean	0.01 (0.69)	.98	0.31 (0.36)	.39	1.00 (0.23)‡	< .001‡
Hypertension, %	1.07 (0.78 to 1.48)**	.67	1.00 (0.81 to 1.24)**	.99	1.16 (1.02 to 1.32)‡,**	.03‡

* Adjusted for age, sex, race/ethnicity, body mass index (BMI), poverty status, and parental education.
† SE: Standard error.
‡ Statistically significant, $P < .05$.
§ LDL: Low-density lipoprotein.
¶ HDL: High-density lipoprotein.
# BP: Blood pressure.
** Values are odds ratio (95% confidence interval).

Poor dental care associated with missed school and poor school performance

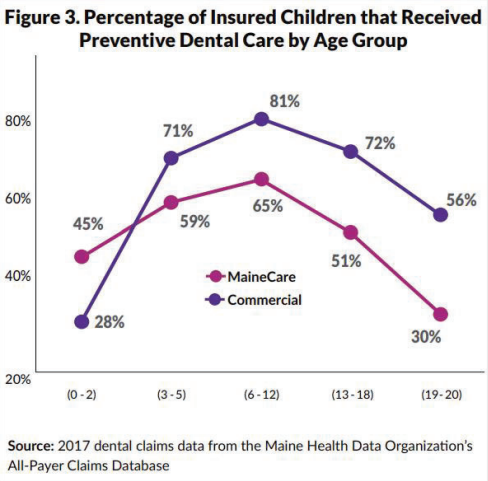
- n= 2,183
- Cross-sectional Study
- 2008 North Carolina Child Health Assessment and Monitoring Program
- Predominantly white, non-hispanic and parents had at least some college with private health insurance

Poor dental care associated with missed school and poor school performance

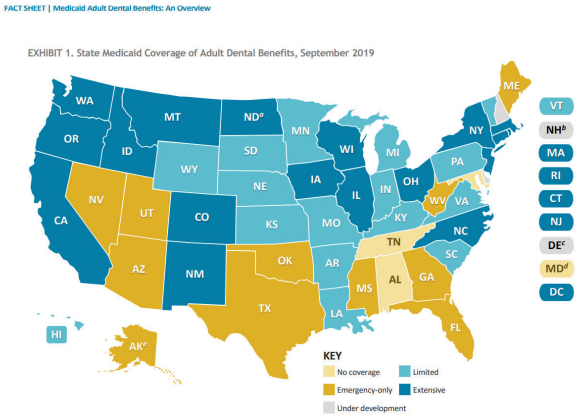
	Very Good/Excellent	Good/Fair/Poor
Miss school for dental pain	**1.39** (0.67, 2.88)	**3.89** (1.96, 7.75)

- Absences relating to dental pain were more likely to result in poor performance
  - **1.94** (1.04 , 3.63)

Early intervention is essential



14 states have no preventative coverage

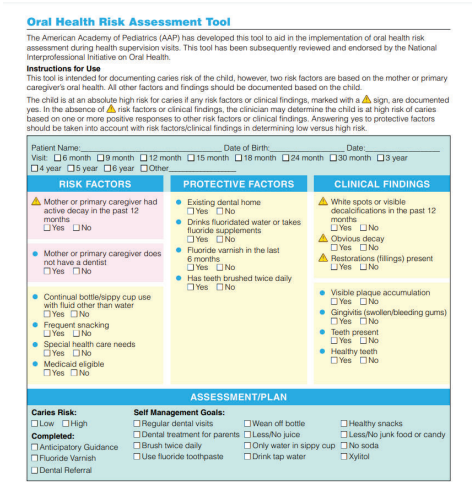


Mainecare coverage for adults (21+)

- Only covers **extraction**
  - Traumatic injury
  - "Severely decayed" teeth that "pose a serious threat" during another surgery or radiation therapy
- "Medically necessary" dentures
  - One set every 5 years

Risk assessments

- AAP
- AAPD
- California Dental Association
- ADA



Oral Health Risk Assessment Tool

The American Academy of Pediatrics (AAP) has developed this tool to aid in the implementation of oral health risk assessment during health supervision visits. This tool has been subsequently reviewed and endorsed by the National Interprofessional Initiative on Oral Health.

Instructions for Use

This tool is intended for documenting caries risk of the child, however, two risk factors are based on the mother or primary caregiver's oral health. All other factors and findings should be documented based on the child.

The child is at an absolute high risk for caries if any risk factors or clinical findings, marked with a ⚠ sign, are documented yes. In the absence of ⚠ risk factors or clinical findings, the clinician may determine the child is at high risk of caries based on one or more positive responses to other risk factors or clinical findings. Answering yes to protective factors should be taken into account with risk factors/clinical findings in determining low versus high risk.

Patient Name:_____ Date of Birth:_____ Date:_____

Visit: ☐6 month ☐9 month ☐12 month ☐15 month ☐18 month ☐24 month ☐30 month ☐3 year ☐4 year ☐5 year ☐6 year ☐Other_____

RISK FACTORS	PROTECTIVE FACTORS	CLINICAL FINDINGS
⚠ Mother or primary caregiver had active decay in the past 12 months ☐Yes ☐No	• Existing dental home ☐Yes ☐No	⚠ White spots or visible decalcifications in the past 12 months ☐Yes ☐No
• Mother or primary caregiver does not have a dentist ☐Yes ☐No	• Drinks fluoridated water or takes fluoride supplements ☐Yes ☐No	⚠ Obvious decay ☐Yes ☐No
• Continual bottle/sippy cup use with fluid other than water ☐Yes ☐No	• Fluoride varnish in the last 6 months ☐Yes ☐No	⚠ Restorations (fillings) present ☐Yes ☐No
• Frequent snacking ☐Yes ☐No	• Has teeth brushed twice daily ☐Yes ☐No	• Visible plaque accumulation ☐Yes ☐No
• Special health care needs ☐Yes ☐No		• Gingivitis (swollen/bleeding gums) ☐Yes ☐No
• Medicaid eligible ☐Yes ☐No		• Teeth present ☐Yes ☐No
		• Healthy teeth ☐Yes ☐No

ASSESSMENT/PLAN

Caries Risk: ☐Low ☐High

Completed: ☐Anticipatory Guidance ☐Fluoride Varnish ☐Dental Referral

Self Management Goals: ☐Regular dental visits ☐Dental treatment for parents ☐Brush twice daily ☐Use fluoride toothpaste ☐Wean off bottle ☐Less/No juice ☐Only water in sippy cup ☐Drink tap water ☐Healthy snacks ☐Less/No junk food or candy ☐No soda ☐Xylitol

Risk Factors

- Maternal Dental Disease
- Bottle/Sippy Cup
- Frequent Snacking
- Special Health Care Needs
- Medicaid Eligible

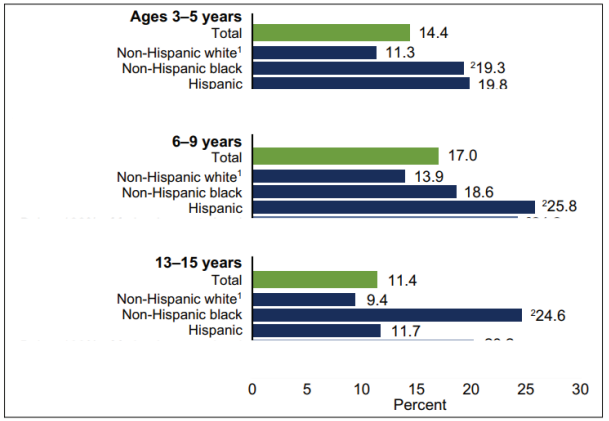
Protective Factors

- Has a dental home
- Fluoride exposure
  - In water
  - Supplements
  - Varnish in last 6 mo
- Brushes teeth twice daily

Racial/ethnic minorities

Higher prevalence of untreated caries

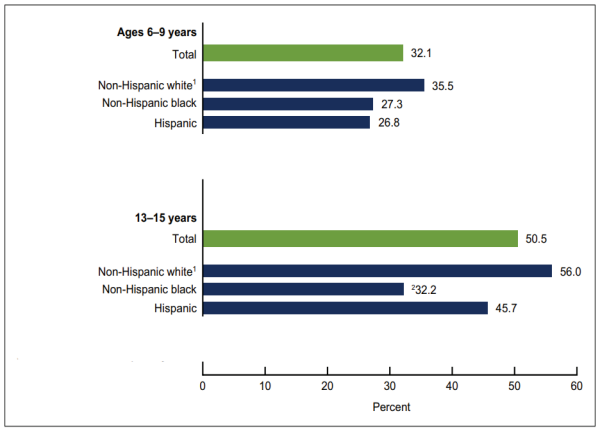
Figure 1. Prevalence of untreated dental caries among children and adolescents, by age, race and ethnicity, and poverty level: United States, 2009–2010.



[1]Reference group.
[2]$p < 0.05$.
SOURCE: CDC/NCHS, National Health and Nutrition Examination Survey, 2009–2010.

Lower prevalence of dental sealants

Figure 2. Prevalence of dental sealants among children and adolescents, by age, race and ethnicity, and poverty level: United States, 2009–2010.



[1]Reference group.
[2]$p < 0.05$.
SOURCE: CDC/NCHS, National Health and Nutrition Examination Survey, 2009–2010.

Black children at increased risk of caries

- n= 1,023
- Cross-sectional study by paid survey with hygienist performed exam
- English speaking, non-hispanic in Northeastern Ohio pediatric primary care offices
- Black children were more likely to have
  - Been to the hospital/ED for a dental-related issue in the last 12 mo
  - Lower oral health quality of life score
  - Poor access to food

Black children at increased risk of caries

Table 2 Extent of Caries Experience and Untreated Decay for the Overall Sample and According to Child's Race

		Child's race[†]		
Extent of dental caries	Overall sample (n = 1,023)	Black (n = 451)	Non-Back (n = 538)	P-value
No. of primary teeth (mean + SD)	19.1 ± 1.8 (1023)	18.9 ± 2.1 (451)	19.4 ± 1.5 (538)	0.000*
No. of permanent teeth (mean + SD)	4.8 ± 3.0 (261)	5.1 ± 3.2 (138)	4.4 ± 2.8 (115)	0.066
Primary decayed teeth (dt) (mean + SD)	1.5 ± 2.6 (1023)	1.8 ± 3 (451)	1.2 ± 2.3 (538)	0.001*
Frequency of primary dt				
(% No)	58.2% (595)	52.5% (237)	62.5% (336)	0.002*
(% Yes)	41.8% (428)	47.5% (214)	37.5% (202)	
Primary decayed and filled teeth (dft) (mean + SD)	2.0 ± 3.0 (1023)	2.3 ± 3.3 (451)	1.7 ± 2.8 (538)	0.003*
Frequency of primary dft				
(% No)	51.5% (527)	45.9% (207)	55.8%(300)	0.002*
(% Yes)	48.5% (496)	54.1% (244)	44.2%(238)	
Permanent decayed teeth (DT) (mean + SD)	0.3 ± 0.7 (261)	0.3 ± 0.7 (138)	0.1 ± 0.5 (115)	0.012*
Frequency of permanent DT				
(% No)	83.9% (219)	77.5% (107)	91.3% (105)	0.003*
(% Yes)	16.1% (42)	22.5% (31)	8.7% (10)	
Permanent decayed and filled teeth (DFT) (mean + SD)	0.3 ± 0.7 (261)	0.3 ± 0.7 (138)	0.2 ± 0.6 (115)	0.04*
Frequency of permanent DFT				
(% No)	82.8% (216)	77.5% (107)	88.7%(102)	0.02*
(% Yes)	17.2% (45)	22.5% (31)	11.3% (13)	

* Significant at a P-value < 0.05.
† Does not add up to 1,023 due to missing race data.

Immigrants

Comparing African & Asian Pediatric Refugees

- n=228
- Cross-sectional study by retrospective chart review
- Refugee Health Program at Hasbro Children's Hospital and St. Joseph Pediatric Dental Center in Providence, RI

Table 1. DEMOGRAPHIC AND ORAL HEALTH CHARACTERISTICS OF HASBRO CHILDREN'S HOSPITAL REFUGEE PATIENTS, 2010–2014

Demographic and oral health characteristics	Overall (N=228)
Male gender, N (%)	114 (50.0)
Age category, N (%)	
<2	13 (5.7)
2-5	59 (25.9)
6-12	100 (43.9)
13-18	56 (24.6)
Region of origin	
Africa *	101 (44.3)
Asia †	114 (50.0)
Other ‡	13 (5.7)
Surgical intervention under general anesthesia, N (%)	13 (5.7)
Caries risk	
Low	105 (46.1)
Medium	25 (11.0)
High	98 (43.0)
Treatment urgency, N (%)	
Routine	116 (50.9)
Urgent	87 (38.2)
Emergency	25 (11.0)
Missed appointments §, mean(SD)	1.34 (1.29)

* Includes Congo, Eritrea, Somalia, Burundi, Liberia, Senegal, Mozambique, Ethiopia, Republic of Guinea, CAR, Rwanda.
† Burma, Iraq, Nepal, Bhutan, Tibet, Thailand, Syria, Iran.
‡ Ecuador, Colombia.
§ Scheduled appointments not attended.

Pediatric Dentistry Ogawa et al. 2019

Comparing African & Asian Pediatric Refugees

- Asian patients
  - had higher caries risk

Table 2. COMPARISON OF PATIENT CHARACTERISTICS AND OUTCOMES BY REGION AND AGE (N=228)

Patient characteristics	Region*			Age groups				
	Africa (N=101)	Asia (N=114)	*P*-value†	<2 (N=13)	2-5 (N=59)	6-12 (N=100)	13-18 (N=56)	*P*-value†
Male gender, N (%)	49 (49.0)	57 (49.6)	0.690	4 (31)	27 (46)	54 (54)	29 (51.8)	0.383
Age category, N (%)								
<2 yrs	7 (7.0)	3 (2.6)		–	–	–	–	–
2-5 yrs	33 (33.0)	23 (20.0)		–	–	–	–	–
6-12 yrs	42 (42.0)	51 (44.4)		–	–	–	–	–
13-18 yrs	18 (18.0)	38 (33.0)	0.002	–	–	–	–	–
Surgical intervention under general anesthesia, N (%)	5 (5.0)	8 (7.0)	0.545	1 (7.7)	9 (15.3)	3 (3.0)	0 (0.0)	0.002
Caries risk (Med/High), N (%)	44 (44.0)	74 (64.4)	0.006	6 (46.2)	30 (50.9)	58 (58.0)	29 (51.8)	0.726
Treatment urgency, N (%)								
Routine	60 (59.4)	47 (40.9)		9 (69.2)	29 (49.2)	47 (47.0)	31 (55.4)	
Urgent	30 (30.0)	52 (46.1)		3 (23.1)	22 (37.3)	43 (43.0)	19 (33.9)	
Emergent	10 (9.9)	15 (13.2)	0.032	1 (7.7)	8 (13.6)	10 (10.0)	6 (10.7)	0.724
Missed appointments, mean (range)	1.22 (5)	1.52 (10)	0.092	0.77 (3)	1.34 (5)	1.17 (4)	1.77 (10)	0.014

* Analysis included "Other" category, however due to the very small number of patients in this category, only larger groups displayed in table.
† *P*-values are calculated using analysis of variance (ANOVA) for continuous variables (missed appointments) and chi-square or Fisher's exact test for categorical variables (region, gender, age group, caries risk, treatment urgency, surgical intervention).

Pediatric Dentistry Ogawa et al. 2019

Comparing African & Asian Pediatric Refugees

- Asian patients
  - had higher caries risk
  - required more emergent intervention

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Comparing Refugee vs. US Pediatric Patients

- n= 224
- Cross-sectional study with oral health assessments
- Refugee Health Assessment Program with Massachusetts Department of Public Health
  - Africa- Somalia, Liberia, and Sudan
  - Eastern Europe- Bosnia
- Third National Health and Nutrition Examination Survey of US children
- Rates of untreated caries and history of caries

Eastern European vs. African Refugees

TABLE 2. Oral Health Habits by Region of Origin

Parameters	Africa	Eastern Europe	Other	P*
Ever been to the dentist?				
No	87.2% (68/78)	46.2% (6/13)	73.3% (22/30)	.005
Yes	12.8% (10/78)	53.8% (7/13)	26.7% (8/30)	
Used toothbrush in home country?				
No	89.8% (53/59)	35.7% (5/14)	79.2% (19/24)	<.001
Yes	10.2% (6/59)	64.3% (9/14)	20.8% (5/24)	

* Based on χ^2 tests of independence.

TABLE 3. Distribution of Oral Health Parameters by Region of Origin

Parameter	Africa	Eastern Europe	Other	P*
Treatment urgency				
No obvious problem	40.5% (49/121)	16.9% (10/59)	34.1% (15/44)	<.001
Early dental care	54.5% (66/121)	50.8% (30/59)	52.3% (23/44)	
Urgent dental care	5.0% (6/121)	32.2% (19/59)	13.6% (6/44)	
Caries experience				
No caries experience	62.0% (75/121)	20.3% (12/59)	50.0% (22/44)	<.001
Caries experience	38.0% (46/121)	79.7% (47/59)	50.0% (22/44)	
Untreated caries				
No untreated caries	65.3% (79/121)	23.7% (14/59)	50.0% (22/44)	<.001
Untreated caries	34.7% (42/121)	76.3% (45/59)	50.0% (22/44)	
Dental caries				
No obvious caries	65.3% (79/121)	22.0% (13/59)	47.7% (21/44)	<.001
1–4 carious surfaces	15.7% (19/121)	13.6% (8/59)	15.9% (7/44)	
5–9 carious surfaces	14.9% (18/121)	25.4% (15/59)	25.0% (11/44)	
≥10 carious surfaces	4.1% (5/121)	39.0% (23/59)	11.4% (5/44)	
Oral pain present				
No pain	89.3% (108/121)	84.7% (50/59)	93.2% (41/44)	.390
Pain	10.7% (13/121)	15.3% (9/59)	6.8% (3/44)	
Early childhood caries				
No	83.3% (10/12)	78.6% (11/14)	100% (6/6)	1.000†
Yes	16.7% (2/12)	21.4% (3/14)	—	
Oral pathology				
Normal	91.7% (110/120)	82.8% (48/58)	90.9% (40/44)	.205
Abnormal	8.3% (10/120)	17.2% (10/58)	9.1% (4/44)	
Gingival bleeding				
No	79.5% (93/117)	80.0% (40/50)	95.2% (40/42)	.057
Yes	20.5% (24/117)	20.0% (10/50)	4.8% (2/42)	
Calculus				
No	49.1% (57/116)	40.0% (20/50)	54.8% (23/42)	.348
Yes	50.9% (59/116)	60.0% (30/50)	45.2% (19/42)	

— indicates no data.
* Based on χ^2 tests of independence.
† Based on Fisher's exact test comparing Africa and Eastern Europe only.

Cote et al. 2004

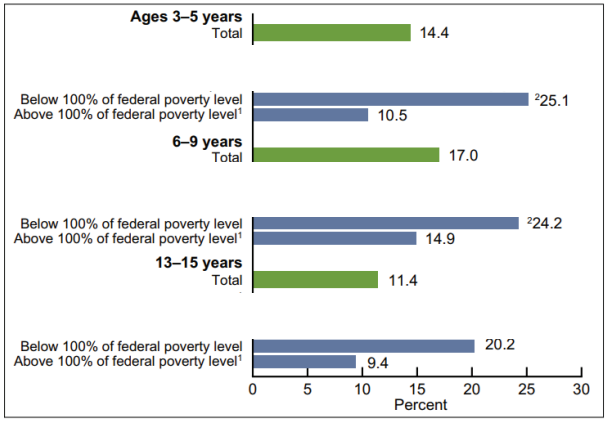
Comparing refugees to US patients

- Eastern European Refugees - White US Children
  - 2.8X more likely to have had caries
  - 9X more likely to have active untreated caries
- African Refugees - Black US Children
  - ½ as likely to have had caries
  - Just as likely to have active untreated caries

Low income

Higher prevalence of untreated caries

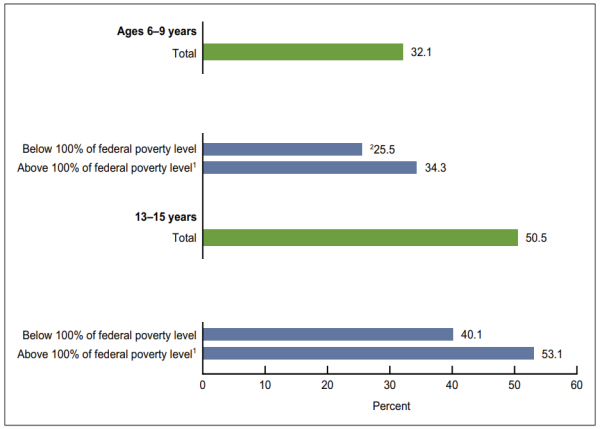
Figure 1. Prevalence of untreated dental caries among children and adolescents, by age, race and ethnicity, and poverty level: United States, 2009–2010.



[1]Reference group.
[2]$p < 0.05$.
SOURCE: CDC/NCHS, National Health and Nutrition Examination Survey, 2009–2010.

Lower prevalence of dental sealants

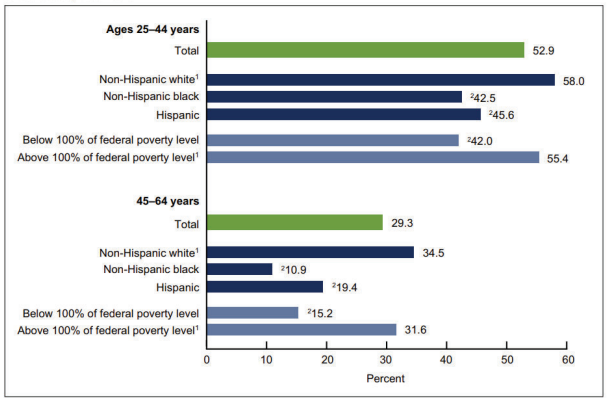
Figure 2. Prevalence of dental sealants among children and adolescents, by age, race and ethnicity, and poverty level: United States, 2009–2010.



[1]Reference group.
[2]$p < 0.05$.
SOURCE: CDC/NCHS, National Health and Nutrition Examination Survey, 2009–2010.

Lower prevalence of tooth retention

Figure 3. Prevalence of complete tooth retention among adults, by age, race and ethnicity, and poverty level: United States, 2009–2010.



[1]Reference group.
[2]$p < 0.05$.
SOURCE: CDC/NCHS, National Health and Nutrition Examination Survey, 2009–2010.

Children with special health care needs

Developmental delay and caries rate

- n= 115
- Cross-sectional study
- Head Start in Washington State
- Independent variable: Developmental delay
- Dependent variable: Prevalence of dental disease

Factors associated with increased caries

	Prevalence Ratio	P value
Developmental Delay	**1.26**	**0.04**
Older Age (5 vs. 3)	4.21	<0.001
Communication Difficulty	2.47	<0.001
Lower Parental Education	2.58	<0.001
Having a Dental Home	0.61	0.01
Fluoridated Water	0.37	<0.001

Autism Spectrum disorder

- n= 200
- Case-control study with questionnaire and clinical examination
- Alexandria, Egypt
- Carried diagnosis of ASD by DSM IV, matched to controls matched to age, sex, and socioeconomic status

Patients with ASD have more difficulty with dental health

Table 1. Dental history among children with Autism Spectrum Disorder (ASD) and healthy children.

	Children with ASD *N* (%)	Healthy children *N* (%)	*P* value
Dental visit in previous year†,‡	44 (44.4)	66 (66.7)	0.002*
Ease of finding a dentist†,§			
Easy	10 (23.8)	46 (75.4)	<0.0001*
Difficult	27 (64.3)	15 (24.6)	
Could not find	4 (9.5)	0 (0)	
Treatment received†			
Extraction‡	24 (61.5)	28 (47.5)	0.17
Filling‡	12 (30.8)	29 (49.2)	0.07
RCT¶	5 (12.5)	17 (28.8)	0.08
Medication¶	8 (20.5)	3 (5.1)	0.02*

*Statistically significant at $P \leq 0.05$.
†number does not add up to total due to item non-response.
‡Chi-squared test is used.
§Mann–Whitney *U*-test used.
¶Fisher exact test is used.

Table 2. Oral hygiene practices and dietary habits between children with Autism Spectrum Disorder (ASD) and healthy children.

	Children with ASD *N* (%)	Healthy children *N* (%)	*P* value
Oral hygiene†			
Brushing teeth†	51 (52.6)	82 (82)	<0.0001*
Using fluoridated tooth paste†	48 (65.8)	70 (80.5)	0.04*
Child has a brushing problem†	56 (57.7)	12 (12.5)	<0.0001*
Child needs supervision upon brushing†	61 (78.2)	34 (37.8)	<0.0001*
Snacking			
Has snacking habits†	65 (67)	68 (69.4)	0.72
Daily snacking frequency‡			
Once/day	20 (24.7)	27 (30.7)	0.15
Twice/day	26 (32)	37 (42)	
More	29 (35.8)	18 (20.5)	
Types of snacks preferred†			
Fruit	27 (34.2)	47 (52)	0.02*
Sweets	40 (50.6)	61 (67.8)	0.02*

*Statistically significant at $P \leq 0.05$.
†Chi-squared test is used.
‡Mann–Whitney *U*-test used.
Number does not add up to total due to item non-response in both groups in investigated variables.

Not all CSHCN are created equal

- n= 150
- Retrospective Longitudinal Cohort study
- Patients from a private dental practice in Charlotte, NC
- Comparing multiple different special health care needs
  - Autism Spectrum Disorder (ASD)
  - Congenital Heart Disease (CHD)
  - Cerebral Palsy (CP)
  - Down Syndrome (DS)
  - Control

CSHCN have associated risk factors

- Public insurance
- Sugar drinks/snacks
- Dry mouth-inducing medication
- Oral hygiene difficulty
- Liquid/pureed diet
- G- tube dependent

Table 1. DISTRIBUTION OF DEMOGRAPHIC CHARACTERISTICS AND SELECTED* POSTULATED RISK FACTORS AMONG THE 150 STUDY PARTICIPANTS (30 IN EACH DIAGNOSIS GROUP†) AND BIVARIATE ASSOCIATION TESTING RESULTS WITH DIAGNOSIS

	ASD	CP	CHD	DS	Controls	P-value ‡
Age, years	Mean±(Standard deviation)					
Start of follow-up period	6.4±3.8	4.4±2.9	4.8±3.1	6.6±5.4	3.4±2.3	0.002
End of follow-up period	13.1±4.9	10.3±7.1	9.6±5.5	15.1±7.7	10.9±5.3	0.005
Family income level (inferred by insurance)			n (%)			
Public insurance only	21 (70)	21 (70)	16 (53)	10 (33)	3 (10)	<0.0005
Private insurance and public	1 (3)	6 (20)	3 (10)	5 (17)	1 (3)	
Private insurance only	6 (20)	3 (10)	11 (37)	15 (50)	24 (83)	
No insurance	2 (7)	0 (0)	0 (0)	0 (0)	1 (3)	
Missing	0	0	0	0	1	
>3 between-meal sugar snacks/drinks per day			n (%)			
No	21 (70)	21 (70)	16 (53)	16 (53)	26 (90)	0.02
Yes	9 (30)	9 (30)	14 (47)	14 (47)	3 (10)	
Missing	0	0	0	0	1	
Patient has visible cavities or fillings			n (%)			
No	17 (57)	19 (63)	8 (27)	22 (73)	22 (73)	0.001
Yes	13 (43)	11 (37)	22 (73)	8 (27)	8 (27)	
Patient taking xerostomia-inducing medications			n (%)			
No	15 (50)	14 (47)	14 (47)	23 (77)	27 (90)	<0.0005
Yes	15 (50)	16 (53)	16 (53)	7 (23)	3 (10)	
Caregiver or patient have difficulty performing oral hygiene			n (%)			
No	24 (80)	24 (80)	27 (90)	18 (60)	29 (97)	0.004
Yes	6 (20)	6 (20)	3 (10)	12 (40)	1 (3)	
Patient's diet is liquid/ pureed only or supplemented			n (%)			
No	28 (93)	18 (60)	27 (90)	28 (93)	30 (100)	<0.0005
Yes	2 (7)	12 (40)	3 (10)	2 (7)	0 (0)	
Patient is G-tube dependent			n (%)			
No	30 (100)	17 (57)	26 (87)	29 (97)	30 (100)	<0.0005
Yes	0 (0)	13 (43)	4 (13)	1 (3)	0 (0)	

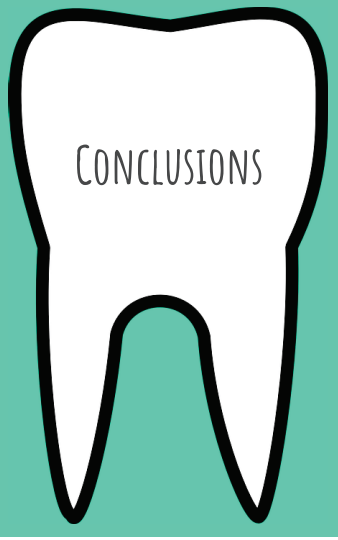
Not all CSHCN are created equal

Group †	Children 6-71 months old					
	Age (years)			dmfs		ANOVA*
	n	Median (range)	Mean±(SD)	Median (range)	Mean±(SD)	P_1=0.02 P_2=0.02
ASD	13	3.3 (1.6-5.7)	3.3±1.5	0 (0-40)	7.4±15.1	AB
CP	22	3.0 (1.0-4.9)	2.9±1.0	0 (0-56)	6.3±13.6	AB
CHD‡	21	3.7 (0.6-5.7)	3.3±1.6	6 (0-61)	13.3±18.4	B
DS	17	2.8 (1.1-5.5)	3.2±1.3	0 (0-47)	3.9±11.6	AB
Controls	24	2.3 (0.5-4.7)	2.4±0.9	0 (0-4)	0.3±0.9	A

Congenital Heart Disease Associated with Dental Disease

- n= 156
- Retrospective review
- Hypothesized reasons
  - Poor dental hygiene
  - Cariogenic diets
  - Sugar-based medications
  - Parental anxieties about stressful situations

Type of congenital heart defect	No.	%
Ventricular septal defect	20	28
Tetralogy of Fallot	13	18
Hypoplastic heart syndrome	12	16
Coarctation of aorta	11	15
Atrial septal defect	10	14
Atrioventricular septal defect	8	11
Transposition of the great arteries	8	11
Pulmonary valve stenosis	6	8
Aortic valve stenosis	5	7
Patent ductus arteriosus	4	5
Pulmonary atresia	2	3
Single ventricle defects	2	3



Anticipatory Guidance

Evidenced-based anticipatory guidance

Bright Futures™
prevention and health promotion for infants, children, adolescents, and their families™

0-11 mo

- Parental hygiene
- Avoid bottle propping
- Washcloth on gums
- Don't share utensils
- Don't put pacifier in your mouth

Caregiver behavior to prevent Vertical transmission

- n= 3,035
- Cross-sectional survey
- Japanese 3 year olds and their caregivers
- Oral exams and questionnaires
- Divided by if they avoided sharing utensils/pacifiers
- Outcome variable- caries on exam

Caries Research Wakaguri et al. 2011

Caregiver behavior to prevent Vertical transmission

Table 2. Multivariate logistic regression analyses of caries experience with non-adjusted and adjusted ORs

	Behaviour to prevent vertical transmission			
	yes	no	95% CI	p value
Non-adjusted OR	referent	1.27	1.00–1.60	0.046
Multivariable OR model 1	referent	1.26	0.99–1.59	0.058
Multivariable OR model 2	referent	1.14	0.89–1.45	0.306
Multivariable OR model 3	referent	1.13	0.88–1.44	0.344
Multivariable OR model 4	referent	1.10	0.86–1.41	0.471

Model 1: adjusted for child's sex and age in months. Model 2: model 1 + adjusted for dietary history factors (when to terminate breastfeeding, when to start giving sweets and frequency of giving sweets). Model 3: model 2 + adjusted for oral health behaviours (when to start toothbrushing and frequency of toothbrushing). Model 4: model 3 + adjusted for sociodemographic factors and SES (birth order, living with/without a grandparent, attending a nursery school, smoking status of caregiver, occupation of household).

$p < 0.05$ considered statistically significant.

1-4 yo

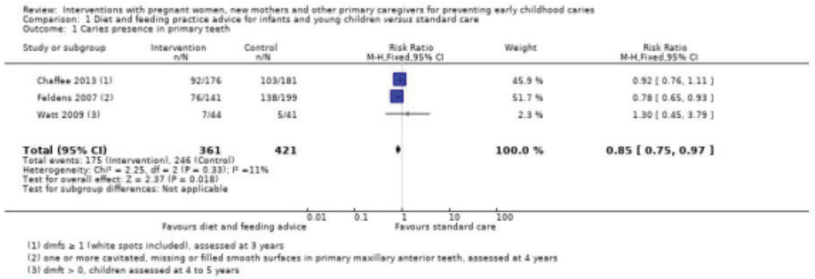
- Discourage thumb sucking
- Avoid juice and sugary beverages

Dietary Advice Impact

- n= 782
- Cochrane Review Meta-Analysis
- Three studies, 2 in Brazil, 1 in the UK
- Advice given to pregnant women and women with children <1 yo
  - Breastfeeding, avoiding sugar
  - Advise around using bottles around sleep
- Outcomes followed up to 6 years old
- Moderate grade of certainty

Cochrane Review Riggs et al. 2019

Dietary Advice Impact



5-10 yo

- Avoid sugary drinks
- Mouth guards with sports

11+ yo

- Adolescent transition toolkit
- Substance use
- Eating disorders
- Piercings

Toothbrushing

- How often?
  - Twice per day
- What with?
  - Fluoride-containing toothpaste for all
- How much?
  - < 3yo- smear leave on
  - 3-6 yo- pea-sized, spit OK, don't rinse
- Who needs supervision?
  - Can't brush teeth until they can tie shoes ~7-8 yo
  - Flossing starts 5-10 yo

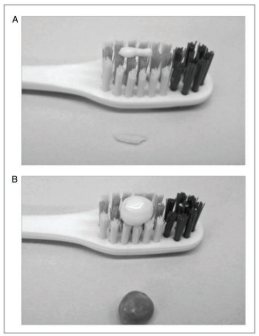


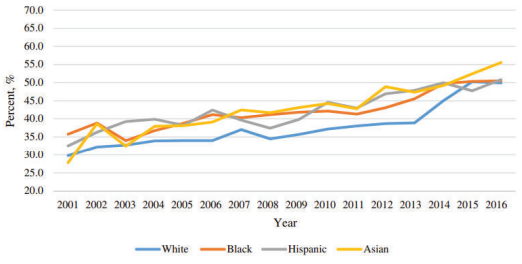
Figure 1: Recommended Amounts of Toothpaste

Special Healthcare Needs Guidelines

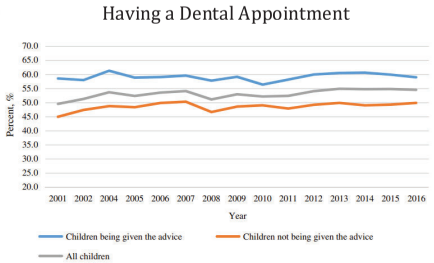
- Have a dental home with flexible appointments
- Refer as early as possible
- Be aware of patient's sensory issues/triggers
- Develop individualized preventative plan (brushing, mouth guards, etc.)
- Encourage low carb diet when able
- Review medications that cause dry mouth

Journal of Public Health Dentistry — Luo et al 2020

We can't just talk about getting to a dentist…



Getting Advice



Interventions

Interventions

Fluoride

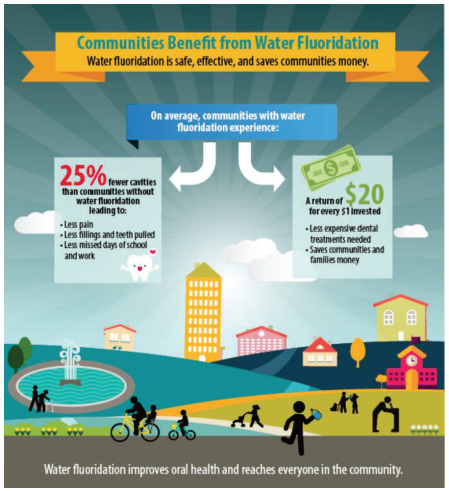
- Performed by providers
- Every 3-6 months
- Apply to all teeth
- After first eruption
- Dry with gauze
- Can drink/eat soft foods
- No brushing that evening

Sealants

- Performed by dentists/associates
- Apply to molars
- After eruption of the fist molars (~6 yo)
- Last 2-4 years
- Recommended for all children

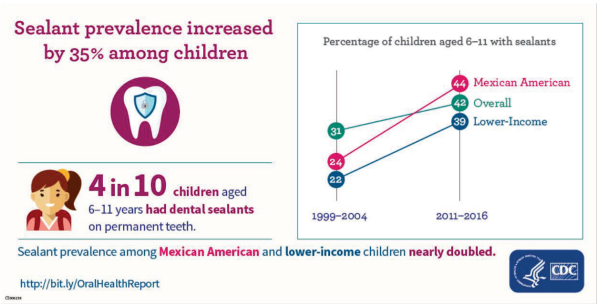
Fluoridated water

- Started in the 1945 in Grand Rapids
- In 2016, 73% of US population
- Decrease tooth decay by 25%
- Maine ranks 23rd in the US
  - 79.3% of the population served



School sealant programs

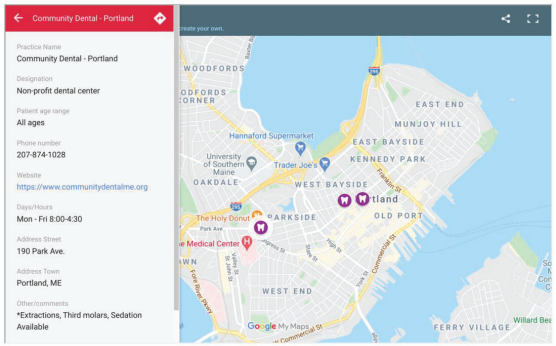
- Funded at state and federal levels
- Provide sealants in the school setting
- Siegal et al. 2010



Maine Resources

Partnership for Children's Oral Health

- Works to implement strategies to promote oral health
- Map with services across Maine



https://www.mainepcoh.org/covid19/map

From the First Tooth

- **Promoting oral health of infants, toddlers, preschoolers in primary care**
- ME, NH, VT, MA, RI, CT
- Healthy Smiles 2020 Challenge
- Virtual training

AAP Primer

- Tools for pediatricians

https://ilikemyteeth.org/ohpp/

Maine Access Immigrant Network

- Founded in 2002 by Somali Community
- Connects immigrants to health and social services in Portland
- Expanded services to South Sudanese, Rwandan, Burundian, and Congolese people
- Working on Middle Eastern immigrants
- Community Health Workers
- Workshops, events

Future directions

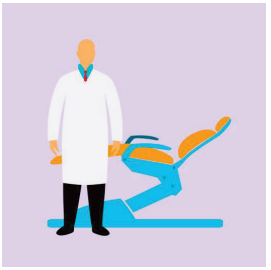
Mainely Teeth

- Serving Portland-area
- Dental hygienist
- Organizes outside referrals
- Preventative and emergency services
  - X-Ray
  - fluoride
  - nutritional advice
  - sealants
- Pediatric specialty, including experience with special needs
- 207-808-9498
- https://mainelyteeth.com/

H.P.1014: "An Act to Improve Oral Health and Access to Dental Care for Maine Children"

Virtual dental home

- Embedded dental hygienist evaluates
- E-consults with dentists
- Trial with HeadStart programs



Learning Points

1. **Disparities exist:**
   a. Racial/Ethnic Minorities- Immigrant groups differ
   b. Low Income
   c. Special Health Care Needs- Autism, DD, CHD
2. **Anticipatory Guidance helps:**
   a. Decreased sweets, decreased bottle propping
   b. Sharing utensils?
   c. Yes, you should brush twice per day
3. **There are multiple resources**
   a. Partnership for Children's Oral Health
   b. AAP
4. **The time to act is before age 21**

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