**Tooth Triage: Disparities in Dental Health**

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Internal Medicine-Pediatrics, PGY-4
Maine AAP Spring Education Series
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**Objectives**

1. Explore groups that experience disparities in dental health.
2. Raise awareness of the importance of pediatric dental care given inadequate coverage of adults.
4. Develop a catalog of resources in Maine.
5. Introduce future directions in pediatric dental care.

I have no disclosures.

**Cases**

5 yo Female in Pediatric Clinic with Tooth Pain
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AAP unpublished data from 2017-2016 Expenditure data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

<table>
<thead>
<tr>
<th>TABLE 3</th>
<th>Regression analysis of oral health determinants of cardiometabolic risk.</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td><strong>TOOTH LOSS OR PERIODONTAL DISEASE: WAVE 4</strong></td>
</tr>
<tr>
<td></td>
<td>B (SE)</td>
</tr>
<tr>
<td>BMIL Mean</td>
<td>0.67 (0.48)</td>
</tr>
<tr>
<td>Total Cholesterol, Mean</td>
<td>-0.25 (0.19)</td>
</tr>
<tr>
<td>Triglycerides, Mean</td>
<td>0.14 (0.19)</td>
</tr>
<tr>
<td>LDL, Mean</td>
<td>0.38 (0.20)</td>
</tr>
<tr>
<td>HDL, Mean</td>
<td>-0.34 (0.31)</td>
</tr>
<tr>
<td>Systolic BP, Mean</td>
<td>0.19 (0.08)</td>
</tr>
<tr>
<td>Diastolic BP, Mean</td>
<td>0.51 (0.69)</td>
</tr>
<tr>
<td>Hypertension, %</td>
<td>1.07 (0.78 to 1.48)</td>
</tr>
</tbody>
</table>

* Adjusted for age, sex, race/ethnicity, body mass index (BMI), poverty status, and parental education.
* Standard error.
* Statistically significant, p < .05.
* LDL: Low-density lipoprotein.
* HDL: High-density lipoprotein.
* BP: Blood pressure.

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

- 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
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

Who is at risk?
Risk Assessments

- AAP
- AAPD
- California Dental Association
- ADA

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.
Lower prevalence of dental sealants

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

Selvaraj et al 2020 Journal of Public Health Dentistry

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

<table>
<thead>
<tr>
<th>Extent of dental caries</th>
<th>Overall sample (n = 1,023)</th>
<th>Child's race*</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>No. of primary teeth (mean + SD)</td>
<td>19.7 ± 1.8 (1023)</td>
<td>19.9 ± 1.9 (451)</td>
<td>0.0003</td>
</tr>
<tr>
<td>No. of permanent teeth (mean + SD)</td>
<td>4.8 ± 3.0 (261)</td>
<td>5.1 ± 3.2 (118)</td>
<td>0.086</td>
</tr>
<tr>
<td>Primary decayed teeth (mean + SD)</td>
<td>1.2 ± 3.1 (1023)</td>
<td>1.2 ± 3.3 (451)</td>
<td>0.001</td>
</tr>
<tr>
<td>Frequency of primary dt (%) Yes</td>
<td>56.2% (579)</td>
<td>52.5% (297)</td>
<td>0.003</td>
</tr>
<tr>
<td>Primary decayed and filled teeth (FT) (mean + SD)</td>
<td>2.0 ± 3.0 (1023)</td>
<td>1.7 ± 2.8 (451)</td>
<td>0.003</td>
</tr>
<tr>
<td>Frequency of primary DT (%) Yes</td>
<td>51.5% (527)</td>
<td>49.9% (237)</td>
<td>0.003</td>
</tr>
<tr>
<td>Permanent decayed teeth (DT) (mean + SD)</td>
<td>0.3 ± 0.7 (261)</td>
<td>0.3 ± 0.7 (118)</td>
<td>0.012</td>
</tr>
<tr>
<td>Frequency of permanent DT (%) Yes</td>
<td>83.9% (219)</td>
<td>77.5% (107)</td>
<td>0.03</td>
</tr>
<tr>
<td>Permanent decayed and filled teeth (DFT) (mean + SD)</td>
<td>0.3 ± 0.7 (261)</td>
<td>0.3 ± 0.7 (118)</td>
<td>0.012</td>
</tr>
<tr>
<td>Frequency of permanent DFT (%) Yes</td>
<td>82.6% (216)</td>
<td>77.5% (107)</td>
<td>0.02</td>
</tr>
</tbody>
</table>

* Significant at a P-value < 0.05.

** 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 Patients

<table>
<thead>
<tr>
<th>Patient characteristics</th>
<th>African (n=91)</th>
<th>Asian (n=98)</th>
<th>P-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age group</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>&lt;2 y</td>
<td>7 (7.7%)</td>
<td>3 (3.1%)</td>
<td>0.157</td>
</tr>
<tr>
<td>2-5 y</td>
<td>22 (24.2%)</td>
<td>23 (23.7%)</td>
<td>0.930</td>
</tr>
<tr>
<td>6-12 y</td>
<td>42 (46.2%)</td>
<td>51 (52.1%)</td>
<td>0.287</td>
</tr>
<tr>
<td>&gt;13 y</td>
<td>18 (20.0%)</td>
<td>3 (3.1%)</td>
<td>0.000</td>
</tr>
<tr>
<td>Surgical intervention/amenity (a, %)</td>
<td>5 (5.5%)</td>
<td>11 (11.2%)</td>
<td>0.052</td>
</tr>
<tr>
<td>Caries (a/Halitosis) (a, %)</td>
<td>44 (48.4%)</td>
<td>74 (75.5%)</td>
<td>0.000</td>
</tr>
</tbody>
</table>

*Includes Congo, Sierra Leone, Somalia, Burundi, Liberia, Zimbabwe, Mozambique, Ethiopia, Republic of Guinea, Cote d’Ivoire.
*Includes Iraq, Nepal, Bhutan, Tibet, Thailand, Syria, Sri Lanka.
*Includes Colombia.
*Includes appliances not enrolled.

#### Table 2: Comparison of Patient Characteristics and Outcomes by Region and Age Group

<table>
<thead>
<tr>
<th>Patient characteristics</th>
<th>Region*</th>
<th>Age groups</th>
<th>P-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age group</td>
<td>African (n=101)</td>
<td>Asian (n=103)</td>
<td></td>
</tr>
<tr>
<td>&lt;2 y</td>
<td>9 (9.0%)</td>
<td>7 (6.9%)</td>
<td>0.757</td>
</tr>
<tr>
<td>2-5 y</td>
<td>28 (27.7%)</td>
<td>25 (24.6%)</td>
<td>0.736</td>
</tr>
<tr>
<td>6-12 y</td>
<td>40 (39.6%)</td>
<td>50 (48.5%)</td>
<td>0.221</td>
</tr>
<tr>
<td>&gt;13 y</td>
<td>14 (13.9%)</td>
<td>8 (7.8%)</td>
<td>0.087</td>
</tr>
<tr>
<td>Surgical intervention/amenity (a, %)</td>
<td>5 (5.0%)</td>
<td>11 (10.8%)</td>
<td>0.098</td>
</tr>
<tr>
<td>Caries (a/Halitosis) (a, %)</td>
<td>44 (43.6%)</td>
<td>74 (72.7%)</td>
<td>0.000</td>
</tr>
</tbody>
</table>

*Includes Congo, Somalia, Liberia, Zimbabwe, Mozambique, Ethiopia, Republic of Guinea, Cote d’Ivoire.
*Includes Iraq, Nepal, Bhutan, Tibet, Thailand, Syria, Sri Lanka.
*Includes Colombia.

### Comparing Refugee vs. US Pediatric Patients

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

#### Table 3: Comparison of Patient Characteristics and Outcomes by Region and Age Group

<table>
<thead>
<tr>
<th>Patient characteristics</th>
<th>Region*</th>
<th>Age groups</th>
<th>P-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age group</td>
<td>Refugee (n=224)</td>
<td>US (n=223)</td>
<td></td>
</tr>
<tr>
<td>&lt;2 y</td>
<td>20 (9.0%)</td>
<td>18 (8.1%)</td>
<td>0.612</td>
</tr>
<tr>
<td>2-5 y</td>
<td>55 (24.3%)</td>
<td>52 (23.4%)</td>
<td>0.897</td>
</tr>
<tr>
<td>6-12 y</td>
<td>77 (34.4%)</td>
<td>75 (33.8%)</td>
<td>0.707</td>
</tr>
<tr>
<td>&gt;13 y</td>
<td>32 (14.2%)</td>
<td>28 (12.6%)</td>
<td>0.726</td>
</tr>
<tr>
<td>Surgical intervention/amenity (a, %)</td>
<td>16 (7.2%)</td>
<td>19 (8.5%)</td>
<td>0.498</td>
</tr>
<tr>
<td>Caries (a/Halitosis) (a, %)</td>
<td>47 (21.2%)</td>
<td>76 (34.1%)</td>
<td>0.000</td>
</tr>
</tbody>
</table>

*Includes Congo, Somalia, Liberia, Zimbabwe, Mozambique, Ethiopia, Republic of Guinea, Cote d’Ivoire.
*Includes Iraq, Nepal, Bhutan, Tibet, Thailand, Syria, Sri Lanka.
*Includes Colombia.

### 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**

<table>
<thead>
<tr>
<th>Parameters</th>
<th>Africa</th>
<th>Eastern Europe</th>
<th>Other</th>
<th>P*</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ever been to the dentist?</td>
<td>87.2%</td>
<td>66.2%</td>
<td>73.3%</td>
<td>.005</td>
</tr>
<tr>
<td>No</td>
<td>12.8%</td>
<td>33.8%</td>
<td>26.7%</td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>89.4%</td>
<td>43.7%</td>
<td>79.2%</td>
<td>.001</td>
</tr>
<tr>
<td>Used toothbrush in home?</td>
<td>10.2%</td>
<td>64.3%</td>
<td>20.8%</td>
<td></td>
</tr>
</tbody>
</table>

* Based on χ² tests of independence.

**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**

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

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Africa</th>
<th>Eastern Europe</th>
<th>Other</th>
<th>P*</th>
</tr>
</thead>
<tbody>
<tr>
<td>Treatment urgency</td>
<td>40.5%</td>
<td>16.9%</td>
<td>54.1%</td>
<td>.001</td>
</tr>
<tr>
<td>No focal problem</td>
<td>59.5%</td>
<td>83.1%</td>
<td>45.9%</td>
<td></td>
</tr>
<tr>
<td>Emergency dental care</td>
<td>43.4%</td>
<td>30.4%</td>
<td>53.3%</td>
<td>.005</td>
</tr>
<tr>
<td>Urgent dental care</td>
<td>56.6%</td>
<td>70.6%</td>
<td>46.7%</td>
<td></td>
</tr>
<tr>
<td>Caries experience</td>
<td>42.0%</td>
<td>20.3%</td>
<td>70.0%</td>
<td>.001</td>
</tr>
<tr>
<td>No caries experience</td>
<td>58.0%</td>
<td>79.7%</td>
<td>30.0%</td>
<td></td>
</tr>
<tr>
<td>Caries experience</td>
<td>38.0%</td>
<td>20.7%</td>
<td>70.0%</td>
<td>.001</td>
</tr>
<tr>
<td>Untreated caries</td>
<td>45.3%</td>
<td>23.2%</td>
<td>70.0%</td>
<td>.001</td>
</tr>
<tr>
<td>Untreated caries</td>
<td>54.7%</td>
<td>76.8%</td>
<td>30.0%</td>
<td></td>
</tr>
<tr>
<td>Dental caries</td>
<td>45.3%</td>
<td>22.0%</td>
<td>47.7%</td>
<td>.001</td>
</tr>
<tr>
<td>No dental caries</td>
<td>54.7%</td>
<td>78.0%</td>
<td>52.3%</td>
<td></td>
</tr>
<tr>
<td>1-4 carious surfaces</td>
<td>15.7%</td>
<td>13.6%</td>
<td>15.9%</td>
<td>.001</td>
</tr>
<tr>
<td>5-9 carious surfaces</td>
<td>14.9%</td>
<td>13.6%</td>
<td>25.4%</td>
<td>.001</td>
</tr>
<tr>
<td>≥10 carious surfaces</td>
<td>4.1%</td>
<td>4.1%</td>
<td>11.4%</td>
<td>.001</td>
</tr>
<tr>
<td>Oral pain present</td>
<td>89.2%</td>
<td>84.7%</td>
<td>91.3%</td>
<td>.990</td>
</tr>
<tr>
<td>Pain</td>
<td>10.7%</td>
<td>15.3%</td>
<td>8.7%</td>
<td>.001</td>
</tr>
<tr>
<td>Early childhood caries</td>
<td>83.0%</td>
<td>76.6%</td>
<td>100%</td>
<td>1.000</td>
</tr>
<tr>
<td>No</td>
<td>16.7%</td>
<td>24.4%</td>
<td>0%</td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>83.0%</td>
<td>76.6%</td>
<td>100%</td>
<td></td>
</tr>
<tr>
<td>Oral pathology</td>
<td>91.7%</td>
<td>82.8%</td>
<td>90.9%</td>
<td>.005</td>
</tr>
<tr>
<td>Nonspecific</td>
<td>8.3%</td>
<td>17.2%</td>
<td>9.1%</td>
<td>.405</td>
</tr>
<tr>
<td>Abscess</td>
<td>8.3%</td>
<td>17.2%</td>
<td>9.1%</td>
<td>.405</td>
</tr>
<tr>
<td>Gingival bleeding</td>
<td>79.5%</td>
<td>80.0%</td>
<td>95.2%</td>
<td>.007</td>
</tr>
<tr>
<td>No</td>
<td>20.5%</td>
<td>20.0%</td>
<td>4.8%</td>
<td>.004</td>
</tr>
<tr>
<td>Yes</td>
<td>20.5%</td>
<td>20.0%</td>
<td>4.8%</td>
<td>.004</td>
</tr>
<tr>
<td>Calculus</td>
<td>60.1%</td>
<td>40.0%</td>
<td>84.6%</td>
<td>.004</td>
</tr>
<tr>
<td>No</td>
<td>39.9%</td>
<td>60.0%</td>
<td>15.4%</td>
<td>.004</td>
</tr>
<tr>
<td>Yes</td>
<td>39.9%</td>
<td>60.0%</td>
<td>15.4%</td>
<td>.004</td>
</tr>
</tbody>
</table>

* indicates no data.

* Based on χ² tests of independence.

* Based on Fisher’s exact test comparing Africa and Eastern Europe only.
Higher prevalence of untreated caries

Lower prevalence of dental sealants

Lower prevalence of tooth retention

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**

<table>
<thead>
<tr>
<th></th>
<th>Prevalence Ratio</th>
<th>( P ) value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Developmental Delay</td>
<td>1.26</td>
<td>0.04</td>
</tr>
<tr>
<td>Older Age (5 vs. 3)</td>
<td>4.21</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>Communication Difficulty</td>
<td>2.47</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>Lower Parental Education</td>
<td>2.58</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>Having a Dental Home</td>
<td>0.61</td>
<td>0.01</td>
</tr>
<tr>
<td>Fluoridated Water</td>
<td>0.37</td>
<td>&lt;0.001</td>
</tr>
</tbody>
</table>

**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.**

<table>
<thead>
<tr>
<th></th>
<th>Children with ASD N (%)</th>
<th>Healthy children N (%)</th>
<th>( P ) value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dental visit in previous year</td>
<td>44 (44.4)</td>
<td>66 (66.7)</td>
<td>0.002*</td>
</tr>
<tr>
<td>Ease of finding a dentort</td>
<td>16 (23.8)</td>
<td>46 (75.4)</td>
<td>&lt;0.001*</td>
</tr>
<tr>
<td>Difficult</td>
<td>27 (48.3)</td>
<td>15 (24.6)</td>
<td></td>
</tr>
<tr>
<td>Coast not find</td>
<td>4 (9.5)</td>
<td>6 (10)</td>
<td></td>
</tr>
<tr>
<td>Treatment received</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Extraction</td>
<td>24 (61.5)</td>
<td>28 (47.5)</td>
<td>0.17</td>
</tr>
<tr>
<td>Filling</td>
<td>12 (30.8)</td>
<td>29 (49.2)</td>
<td>0.07</td>
</tr>
<tr>
<td>Root Canal</td>
<td>9 (23.0)</td>
<td>17 (28.8)</td>
<td>0.08</td>
</tr>
<tr>
<td>Medication†</td>
<td>8 (20.5)</td>
<td>3 (5.1)</td>
<td>0.02*</td>
</tr>
</tbody>
</table>

*Statistically significant at \( P \leq 0.05 \).
†Number does not add up to total due to item non-response, \( \chi^2 \)-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.**

<table>
<thead>
<tr>
<th></th>
<th>Children with ASD N (%)</th>
<th>Healthy children N (%)</th>
<th>( P ) value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Oral hygiene</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Brushing habits</td>
<td>51 (52.0)</td>
<td>62 (62.0)</td>
<td>&lt;0.001*</td>
</tr>
<tr>
<td>Using fluoride</td>
<td>48 (49.0)</td>
<td>76 (76.0)</td>
<td>0.04*</td>
</tr>
<tr>
<td>Child has a brushing problem</td>
<td>16 (32.0)</td>
<td>12 (23.0)</td>
<td>&lt;0.001*</td>
</tr>
<tr>
<td>Child uses supervision upon brushing</td>
<td>51 (52.0)</td>
<td>43 (43)</td>
<td>&lt;0.001*</td>
</tr>
<tr>
<td>Snacking habits</td>
<td>65 (67.0)</td>
<td>68 (68)</td>
<td>0.72</td>
</tr>
<tr>
<td>Spider eating habits</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Snacking frequency</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Occasional</td>
<td>26 (54.7)</td>
<td>27 (54)</td>
<td>0.15</td>
</tr>
<tr>
<td>Weekly</td>
<td>28 (55.8)</td>
<td>37 (74.0)</td>
<td>0.05</td>
</tr>
<tr>
<td>More</td>
<td>28 (55.8)</td>
<td>37 (74.0)</td>
<td>0.05</td>
</tr>
<tr>
<td>Type of snacking habits</td>
<td>47 (94.2)</td>
<td>47 (94.2)</td>
<td>0.52*</td>
</tr>
<tr>
<td>Snackers</td>
<td>47 (94.2)</td>
<td>47 (94.2)</td>
<td>0.52*</td>
</tr>
</tbody>
</table>

*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

Not all CSHCN are created equal

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

CSHCN have associated risk factors

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

<table>
<thead>
<tr>
<th>Group</th>
<th>Age (years)</th>
<th>ddfs</th>
<th>ANOVA*</th>
</tr>
</thead>
<tbody>
<tr>
<td>ASD</td>
<td>3.3 (1.6-5.7)</td>
<td>3.3±1.5</td>
<td>0 (0-40)</td>
</tr>
<tr>
<td>CP</td>
<td>3.0 (1.0-4.9)</td>
<td>2.9±1.0</td>
<td>0 (0-56)</td>
</tr>
<tr>
<td>CHD</td>
<td>3.7 (0.6-5.7)</td>
<td>3.3±1.6</td>
<td>0 (0-61)</td>
</tr>
<tr>
<td>DS</td>
<td>2.8 (1.1-5.5)</td>
<td>3.2±1.3</td>
<td>0 (0-47)</td>
</tr>
<tr>
<td>Controls</td>
<td>2.3 (0.5-4.7)</td>
<td>2.4±0.9</td>
<td>0 (0-4)</td>
</tr>
</tbody>
</table>
Conclusions

What can we do?

Evidenced-based anticipatory guidance

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

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**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

---

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

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

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).

**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

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
  - 3-6yo- pea-sized, spit OK, don't rinse
- Who needs supervision?
  - Can’t brush teeth until they can tie shoes ~7-8yo
  - Flossing starts 5-10yo

**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
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 first 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
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/

Future Directions


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

References


