A Non-Operative Approach to Caries in Children (NOACC)

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Full Disclosure

I have no relevant financial relationships with the manufacturer of any commercial product or providers of commercial services discussed in this presentation.
Who AM I?

I am a dentist and dental director for Dental Clinics run by Public Health Seattle - King County, WA, including:

- Five Public Health Clinics
- Two County Jail Dental Clinics
- Mobile Homeless Dental Clinic
- School-based Mobile Prevention Team

Life before dentistry

- Before I became a dentist I was in research science.
- My PhD is from the University of Washington’s school of Public Health and Community Medicine.
King County Clinics

- Our clinics serve primarily low income pregnant women, adult homeless and kids
  - Annually, we provide approximately 25,000 dental visits for 12,000 children
  - ~20% pregnant women, ~20% homeless adults and ~60% kids (almost all live in areas with water system fluoridation)
- Our clinics are Federally Qualified Health Centers. Patients are either covered by Medicaid or are uninsured.
- Our clinic reimbursement is by the number of Medicaid encounters
- I have two clinical days a week—one with adults and the other with high risk young kids—usually about 20 a day.
- I have been treating high risk young children for 10 years.
Overall Approach to Managing Caries in Children

- The foundation is an emphasis on primary prevention, including:
  - Counseling on diet and hygiene
  - Regular use of fluoride varnish
  - Sealants on permanent first molars
- I do not currently use a formal caries risk assessment tool
- On their initial visit approximately
  - 20% of my patients at ages 1-3 have visible decay
  - 50% of 4-7 yr olds have to return for restorative work after their initial visit
The usual pattern of caries in children I see:

- Decay by age 1-3: A group of children with very aggressive disease that starts when the teeth erupt and attacks:
  - 1st - upper anteriors (worst where teeth contact but also facial decay along the gum line)
  - 2nd - occlusals of the molars
- Decay in age 4-7: A different group of children, with only weakened/decalcified enamel on the upper anteriors and posterior occlusals, but lots of interproximal caries.
When Primary Prevention Fails
Chapter #2

Approaches we have tried with very limited or no success

- Increased frequency of fluoride varnish
- Chlorhexidine swabs & rinses
- Iodine swabs
- Fuji triage on occlusals
When Primary Prevention Fails
Chapter #3

Primary Anteriors
- Have had a high level of failure* with materials & techniques including:
  - Compressible composite
  - Flowable composite
  - Compomer
  - Glass Ionomer
  - Opening Contacts

Primary Molars
- Failure somewhat less common and less rapid
- Unacceptably high rates of failure* with primary molars restored with amalgam or compomer or composite
- Good success with stainless steel crowns

*Failure= need to treat the tooth again due to material failure, recurrent decay or newly decayed surfaces
Typical Presentations of Caries in Children in My Clinic
My Use of Silver Nitrate to Control Caries in High Risk Children

- I first learned of using silver nitrate to control caries in children in August 2012.

- Beginning in October 2012, I began using it for selected children with decay:
  - First with young kids with aggressive decay on their anterior teeth.
  - Then I moved on to include occlusals.
  - Last I started treating interproximal decay in primary molars.
Our Routine Treatment Protocol

- **Visit 1**: Exam, fluoride varnish and counseling on oral health with a strong focus on diet and hygiene

- **Visit 2**: First silver nitrate application and fluoride varnish
  - Schedule to return any time after one week

- **Visit 3**: Second silver nitrate application and fluoride varnish
  - Evaluate surfaces that can be scored for arrest during a visual exam
  - If full arrest at Visit 3, schedule in 6 months for re-evaluation
  - If not, or if interproximal decay, schedule to return after one week for 3rd application

- **Visit 4**: Third silver nitrate application and fluoride varnish
My Overall Impressions of Silver Nitrate to Treat Caries in Children

1. This stuff works.
2. For the children in my clinic, the health benefits far exceed any hypothetical risk from using it.
3. When restoring teeth after arrest, I usually find solid dentin under the arrested lesion.
4. I am eager to see the longer term results.
5. Did I mention that this stuff really works?
Specific Observations on the Effectiveness of Silver Nitrate

- The results seem to be about the same for anteriors and visible decay (OBL) on posterior teeth.
- I don’t have enough experience or data on effectiveness of arresting interproximal decay.
- Arrest seems to be independent of changes in oral hygiene and diet.
- After decay has been arrested, I sometimes do restorations.
- When I do restorations, I usually use glass ionomer or composite.
Adding Silver Nitrate to Our NOACC Approach Is a Win-Win Situation

For the last ten years I have been looking for ways to reduce the need for operative dentistry in kids.

- After starting to use silver nitrate, I do far fewer:
  - Scoop and fill glass ionomers
  - Operative fillings
  - Stainless steel crowns
- The kids like it.
- The parents like it.
- I like it.
Problems and Concerns About Using Silver Nitrate As an Adjunct

- Parental concern about the discoloration
- Technique sensitivity
- Requires dentists adapt to a new treatment planning and treatment style
- Efficacy
- Duration of effect unknown at this time
Caveats to the Following Data

1. These data are for my patients
2. The first set of patients was chosen selectively as I was getting familiar with the technique
3. I did the treatments
4. I did the diagnoses of active caries and arrest
5. For patients whose decay did not appear initially arrested, I asked them to return for additional silver nitrate applications
6. 38 of the 113 patients did not return for evaluation of arrest
**My 1-3 month* Follow-up Data (n=74)**

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Pre-Tx</th>
<th>Post-Tx</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total dmfas**</td>
<td>446</td>
<td>448</td>
</tr>
<tr>
<td># surfaces w/ active caries</td>
<td>446</td>
<td>121</td>
</tr>
<tr>
<td># of surfaces arrested</td>
<td>0</td>
<td>327</td>
</tr>
<tr>
<td>% carious surfaces arrested</td>
<td></td>
<td>73%</td>
</tr>
<tr>
<td>% of carious teeth arrested</td>
<td></td>
<td>68%</td>
</tr>
</tbody>
</table>

* Range: 2 weeks- 4 months after baseline  
** We elected not to score surfaces already filled or missing at baseline, and post-tx scores only the treated surfaces.
**My 6-month* Outcome Data**

*(n=27)*

<table>
<thead>
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<th>Parameter</th>
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</thead>
<tbody>
<tr>
<td>Total dmfas**</td>
<td>150</td>
<td>160</td>
</tr>
<tr>
<td># surfaces w/ active caries</td>
<td>150</td>
<td>10</td>
</tr>
<tr>
<td># of surfaces arrested</td>
<td>0</td>
<td>150</td>
</tr>
<tr>
<td>% carious surfaces arrested</td>
<td></td>
<td>94%</td>
</tr>
<tr>
<td>% of treated surfaces arrested</td>
<td></td>
<td>83%</td>
</tr>
</tbody>
</table>

* Range: 5 – 11 months after baseline

** We elected not to score surfaces already filled or missing at baseline, and post-tx scores only the treated surfaces.
Acknowledgements:
This Has Been a Team Effort from the Start

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(and computer wizard)

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Thank you...