Warm Springs IHS Implements a Non-Operative Approach to Caries in Children (NOACC)

Frank Mendoza, DDS
Pediatric Dentist
Warm Springs IHS
Our Team

Frank Mendoza, DDS

- IHS dentist since 1982 (USPHS 1982-2015)
- IHS pediatric dentist since 1993
- Navajo Area Pediatric Dental Specialist 1993-98
- Pediatric Dentist (Warm Springs) and Portland Area IHS Specialist since 1998

Lula Smith, EFDA

- Warm Springs community member
- Dental assistant since 2004-2014
Confederated Tribes of Warm Springs

- Approximately 5,208 members
- Approximately 6,500 clinic users
Historical Caries Experience of Warm Springs Children

- >90% Head Start children with caries experience
- Approximately 90-110 children annually require treatment for caries under general anesthesia (GA) (the annual birth cohort = ~ 125 – 150)
- Over 1500 GA cases since 1998.
Typical Presentations of Caries in Warm Springs Children
What Have We Done at Warm Springs to Try to Control Caries in Children?

- Community water fluoridation since the 1980s
- BBTD prevention counseling programs
- Early and regular exams of children at Early Head Start and Head Start
- Use of xylitol and fluoride varnish
- Participation in CHX dental varnish clinical trial
- Implementation of all activities of the IHS ECC initiative, including the use of early access to care, FV, GIC sealants, ITRs, you name it.
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**Outcome**: No discernible change in the rate or severity of the disease
Adding Silver Nitrate to Our Other Caries Control Efforts

- Heard about this 5 years ago
- Reviewed the literature
- Talked with dentists using it
- Considered the risk:benefit ratio
- Concluded it is safe and would likely enhance the effectiveness of our current program.
Steps in Preparing to Implement the Silver Nitrate Protocol

1. Discussion with Dental Director, CEO, consultants
2. Approval by the Tribal Heath & Welfare Committee
3. Approval by the regional IHS Chief Medical Officer
4. Notification to the IHS Division of Oral Health
5. Presentations to Head Start staff and parents
7. Identified the team (EFDA & pediatric dentist)
8. Local radio announcements
9. 3-part series in the local newspaper
10. Patient education brochure
11. Informed consent
12. Database for tracking outcomes
13. Required regular reporting to the CEO and community
Silver Nitrate Treatment Protocol

- Decision on whether treatment is appropriate for the child
- **Written informed consent**
- Ask about adverse events at each visit
- Baseline surface-specific exam
- 25% silver nitrate solution followed by fluoride varnish at:
  - 0, 2, 4, 8 & 12 weeks
- Repeat surface-specific exams at:
  - 3, 6, 9, 12, 18, 24, 30, 36 & 48 months
How Will We Evaluate the Program?

- Occurrence of adverse events
- % treated teeth and surfaces arrested
- Reduction in new carious surfaces
- Reduction in invasive restorations
- Reduction in need for local anesthesia
- Reduction of need for N₂O
- Reduction of need for restorations and extractions under general anesthesia
- Level of satisfaction by kids and parents.
Our Selection Criteria

- Child has active caries (d1+, meaning cavitated or non-cavitated)
- Child is not symptomatic and does not appear to have any teeth that will become symptomatic in the immediate future.
- Primary target age is 0 – 6 years
Our 2-year Experience with this Model

- First child treated in September 2013
- As of August 15, 2015, we have enrolled 158 children.
- Only a couple of parents have chosen traditional restorations instead
- We’ve had 1 official complaint
- 5 dropped out of the protocol
- 153 still in the protocol: these are the ones I will report on today
Our 2-year Experience with this Model (continued)

- Parents have been consistently pleased
- Children have been very easy to work with
- We used knee to knee for the younger and less cooperative children
- Even the younger children are generally cooperative after the 2\textsuperscript{nd} treatment.
Our Experience (continued)

<table>
<thead>
<tr>
<th>Follow-up exam</th>
<th>n</th>
<th>d</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>6-month</td>
<td>80</td>
<td>126</td>
<td>63</td>
</tr>
<tr>
<td>12-month</td>
<td>47</td>
<td>88</td>
<td>53</td>
</tr>
<tr>
<td>18-month</td>
<td>13</td>
<td>43</td>
<td>30</td>
</tr>
</tbody>
</table>
Outcomes
## Outcomes

<table>
<thead>
<tr>
<th>Parameter</th>
<th></th>
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</thead>
<tbody>
<tr>
<td>Mean age at enrollment</td>
<td>3.5 y</td>
</tr>
<tr>
<td>Mean dmfs</td>
<td>14.3</td>
</tr>
<tr>
<td>Mean dmft</td>
<td>6.9</td>
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</table>
Outcomes (continued)

<table>
<thead>
<tr>
<th>Parameter (all children)</th>
<th>n</th>
<th>d</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Extractions for pathology (teeth)</td>
<td>1</td>
<td>600</td>
<td>0.1</td>
</tr>
<tr>
<td>Children receiving SSCs</td>
<td>3</td>
<td>155</td>
<td>2</td>
</tr>
<tr>
<td>Total restorations</td>
<td>87</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Amalgam</td>
<td>0</td>
<td>87</td>
<td>0</td>
</tr>
<tr>
<td>GI or resin (functional)</td>
<td>35</td>
<td>87</td>
<td>40</td>
</tr>
<tr>
<td>GI or resin (esthetic)</td>
<td>52</td>
<td>87</td>
<td>60</td>
</tr>
<tr>
<td>GI or resin (progressive caries)</td>
<td>0</td>
<td>87</td>
<td>0</td>
</tr>
</tbody>
</table>
Outcomes (continued)

<table>
<thead>
<tr>
<th>Parameter (children)</th>
<th>n</th>
<th>d</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Local anesthesia</td>
<td>2</td>
<td>155</td>
<td>1</td>
</tr>
<tr>
<td>General anesthesia (GA)</td>
<td>3</td>
<td>155</td>
<td>2</td>
</tr>
<tr>
<td>GA for progressive disease</td>
<td>0</td>
<td>155</td>
<td>0</td>
</tr>
</tbody>
</table>
“Collateral Benefit” of Treating Caries in Children with Silver Nitrate

2nd molar treated for deep caries in the fissures

“Collateral benefit” to the untreated 1st molar
Outcomes (continued)

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<thead>
<tr>
<th>Parameter (children)</th>
<th>n</th>
<th>d</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pre-Post Exam NNCS* = 0</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3-month</td>
<td>89</td>
<td>136</td>
<td>93</td>
</tr>
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<td>69</td>
</tr>
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</table>

* NNCS = # new carious surfaces
Conclusion

- After 32 years, I believe I finally have something that works.😊
- It’s safe, fast, easy and inexpensive.
- I like it.
- The parents like it.
- The kids love it.
- But...
There Are One or Two Things We Don’t Know About this Protocol

- Duration of effect
- True reduction in NNCS
- # of treatments needed
- Optimal treatment interval
- Which children benefit most?
- Which teeth benefit most?
- Which surfaces benefit most?
- What is causing the collateral benefit?
- Are the collateral benefit surfaces really protected?
- How long are the collateral benefit surfaces protected?
- What happens if early symptomatic teeth are treated?
- Should we cover arrested caries with GIC?
- Will teeth with enamel hypoplasia be protected?

- How does it compare to the historical experience?
- Will the emerging adult dentition get any benefit?
- Should we cover arrested caries with GIC?
- Will teeth with enamel hypoplasia be protected?
- How does it compare to the historical experience?
- Will the emerging adult dentition get any benefit?
- Would SDF work as well?
- Would SDF require fewer applications?
- Would adding KI improve the coloration?
- If so, would this diminish the effectiveness?
- Does SN/SDF change the child’s oral flora?
- If so, does it predominantly reduce the bad guys?
We will answer these questions over the next two years.
Last...What’s Wrong with this Picture?
Last…What’s Wrong with this Picture?

- I’ve told you only about the children who enrolled in the protocol.
- Since the protocol started, I have treated just over 100 children in the operating room.
- Why?
This Is a Systems Problem – Not a Pediatric Dental Problem

- Why didn’t these children get to me earlier?
- Where are they cared for during the day?
- Are they in Early Head Start or group daycare?
- What interactions does the family have with the public health system?
- Were they seen in the medical clinic for care?
- Did the parents get good oral health education?
- Did they follow recommendations?
- Do they live in remote locations?
- Lots more…
“But About 20% of the Children Cannot Be Helped…”

- Some people believe a certain proportion of these children cannot be helped—they are destined to have rampant caries that must be treated in the OR.
- I’m now certain this is not true.
Thank you