WARM SPRINGS IHS IMPLEMENTS A NON-OPERATIVE APPROACH TO CARIES IN CHILDREN

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(original presentation by Dr. Mendoza (with a dolup of help from Dee))
THE WARM SPRINGS FIELD PROGRAM TEAM

Frank Mendoza, DDS
• IHS dentist since 1982 (USPHS 1982-2015)
• Pediatric Dentist (Warm Springs) and Portland Area IHS Specialist since 1998

Lula Smith, EFDA
• Warm Springs community member
• Dental assistant since 2004-2014
HISTORICAL CARIES EXPERIENCE OF WARM SPRINGS CHILDREN

- >90% Head Start children with caries experience
- On average from 2010 – 2013, about 80 – 100 children annually required treatment for caries under general anesthesia (GA). (the annual birth cohort = ~ 110).
- At least 5000% higher than the US all races rate.
- >1600 GA cases at WS since 1998.
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 10% 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 6 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 (and at 3-6 months intervals)
• 25% silver nitrate solution followed by fluoride varnish at:
  0, 2, 4, 8 & 12 weeks (and multiple recall exams)
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 N$_2$O
- Reduction of need for treatment 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 4-YEAR EXPERIENCE WITH THIS MODEL
• First child treated in September 2013
• We have enrolled 315 children.
• After >1,000 appointments, we’ve recorded 0 adverse events
• 276 still in the protocol as of Sept., 2017 (4-year data)
OUR 4-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.
We’ve seen some slippage in our follow-up exams over time.
mean Baseline dmfat by 6-month age groups: Warm Springs Model IHS alpha Site vs Iowa WIC

Baseline Exam Age (m)

Mean dmfat

- WS (mean=7.5)
- Iowa WIC
Warm Springs Model Children, by # of Protocol Treatments (n=319)
CLINICAL OUTCOMES
Has using this non-operative approach changed the types or numbers of restorations for the children treated?

<table>
<thead>
<tr>
<th>Type</th>
<th>Count</th>
</tr>
</thead>
<tbody>
<tr>
<td>Amalgam</td>
<td>3</td>
</tr>
<tr>
<td>Crown</td>
<td>26</td>
</tr>
<tr>
<td>Esthetic GI</td>
<td>24</td>
</tr>
<tr>
<td>Functional GI</td>
<td>173</td>
</tr>
<tr>
<td>Resin</td>
<td>7</td>
</tr>
<tr>
<td>Total Restorations</td>
<td>233</td>
</tr>
<tr>
<td>Teeth with Decay</td>
<td>2266</td>
</tr>
</tbody>
</table>

10% needed restorations
Has using this non-operative approach changed the need for general anesthesia for the children?

<table>
<thead>
<tr>
<th>Children in Project (n=210)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Type of Anesthesia</td>
</tr>
<tr>
<td>----------------------</td>
</tr>
<tr>
<td>General</td>
</tr>
<tr>
<td>Local</td>
</tr>
<tr>
<td>(\text{N}_2\text{O})</td>
</tr>
</tbody>
</table>
One good way to measure success is whether the disease level of the children in the annual Head Start screening changes.
CLINICAL OUTCOMES (CONTINUED)

COLLATERAL BENEFIT
“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
KEY CONCLUSIONS OF DR. MENDOZA

• After 33 years, 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
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? If so, for how long?
- What happens if early symptomatic teeth are treated?

- Should we cover arrested caries with GIC?
- Will teeth with enamel hypoplasia be protected?
- How do long term outcomes compare to the historical experience?
- Will the emerging adult dentition get any benefit?
- Will teeth with enamel hypoplasia be protected?
- 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?
WHAT’S WRONG WITH THIS PICTURE?

• I’ve told you only about the children who enrolled in the protocol.
• Since the protocol started in September 2013, I have had to treat over 150 children in the operating room.
• Why?
THANK YOU