2017 Symposium on Caries in American Indian and Alaska Native Children

Hood River, Oregon
November 17–18, 2017

Let Us Put Our Minds Together
And See What Life We Can Make For Our Children.
—Sitting Bull
# Table of Contents

Executive Summary ............................................................................................................. 5  
DAY #1 PLENARY SESSIONS AND BREAKOUTS ................................................................ 7  
   Review of the Agenda: Patrick Blahut, DDS, MPH ......................................................... 7  
   Presentations .................................................................................................................... 8  
      Introductory Remarks ..................................................................................................... 8  
      Keynote: In the best interests of the child: How do you decide? ................................. 9  
BREAKOUT SESSIONS ........................................................................................................ 11  
   Track A: Workshop on non-invasive treatment of caries in children ......................... 11  
   Track B: Non-clinical Symposium participants ................................................................. 11  
      Drivers and limitations of our current approach to children with caries ................ 11  
      Access: Only one part of the solution .......................................................................... 14  
      Addressing caries in AI/AN children: Medicaid considerations ............................... 15  
      Medical-Dental integration: Projects I believe in ......................................................... 17  
      Oral health surveillance in the Alaska Yukon-Kuskokwim Delta .............................. 19  
      Diagnosing developmental defects of enamel: Online training and accuracy .......... 20  
      Recent research on innovative approaches for caries in high-risk children ............. 22  
      Testing an intervention to reduce sugared fruit drinks in Alaska Native children .... 22  
      Oglala Sioux Tribe SMILEs study: Follow-up ............................................................. 23  
      Management of caries using silver nitrate and fluoride varnish: a 2-year trial ........ 24  
      Iowa College of Dentistry (ICODEN): an innovative caries control strategy .......... 25  
      Hall Crowns .................................................................................................................. 26  
      Sault Tribal Dental Program ......................................................................................... 27  
      Addressing ECC at the Southwest Dental Support Center ...................................... 28  
      The Warm Springs Model of medical management of caries .................................... 29  
      Systems Failures Impeding Progress in AI/AN Children’s Oral Health .................. 31  
      Medical-Dental Collaboration in ECC Control ............................................................. 32  
      ECC Management: DentaQuest Institute projects ...................................................... 33
Table of Contents continued

DAY #2 PLENARY SESSIONS AND BREAKOUTS ............................................................................. 34
 Summary of Key Issues from Day 1: Clinical .............................................................................. 34
 Summary of Key Issues from Day 1: Non-clinicians group ......................................................... 34
 DAY #2 BREAKOUT SESSIONS .................................................................................................. 35
 Regulatory Workgroup ................................................................................................................ 35
 Metrics Workgroup ...................................................................................................................... 36
 Infrastructure Workgroup .......................................................................................................... 37
 Technical Workgroup .................................................................................................................. 38
 Reimbursement Workgroup ....................................................................................................... 39
 CONCLUSION: What have we learned, if anything? ................................................................... 40
 APPENDIX A: Agenda .................................................................................................................. 46
 APPENDIX B: Participants .......................................................................................................... 48
Acknowledgements

QUEST\(^1\) greatly appreciates the generous support received from the DentaQuest Foundation, without which we would not have been able to convene this Symposium.

QUEST also appreciates the assistance in planning, preparation and conduct of the Symposium received from Steve Geiermann, DDS, Senior Manager, Council on Advocacy for Access and Prevention, American Dental Association. All video presentations referenced below that were given at this Symposium are available at the following American Dental Association website: http://www.ada.org/en/education-careers/events/symposium-on-early-childhood-caries-in-american-indian-and-alaska-native-children

QUEST Officials
Dee Robertson, MD, MPH, President
Fred Eichmiller, DDS, Director and Treasurer
Don Marianos, DDS, MPH, Director
Mike Kanellis, DDS, MS, Director
Lindsey Robinson, DDS, Director

Contact Information
Dee Robertson, MD, MPH
QUEST in AI/AN Children
White Salmon, WA 98672
drobertson@gorge.net

Note: The viewpoints expressed in the presentations in this report reflect the opinions of the individual Symposium participants and should not be considered the official views of QUEST or the organizations providing support for this Symposium. Also, this report contains a few short explanatory “Editorial Notes” which are the opinion of the Editor and not necessarily the opinion of the author of the presentation or the QUEST Directors.

\(^1\) QUEST in AI/AN Children is a 501(c)(3) organization whose mission is to convene and focus the expertise and resources necessary to elucidate the etiology of rampant caries in the primary dentition in American Indian and Alaska Native (AI/AN) children, and to identify optimal strategies to prevent and control it.
Executive Summary

Background
This Symposium was the 7th in a series of meetings focused exclusively on defining, understanding and attempting to ameliorate the severe dental caries experienced by many young American Indian and Alaska Native (AI/AN) children. The impetus for these symposia started in 2007 with the American Dental Association (ADA) sponsored Summit on AI/AN Access to Oral Health Care. For that meeting, Dr. Lindsey Robinson, a private pediatric dentist who was then Chair of the Council on Access, Prevention and Interprofessional Relations of the ADA, invited a panel of speakers to do a presentation on the oral health status of AI/AN children. The energy and enthusiasm resulting from that presentation launched the subsequent efforts that continue to this day to improve the oral health status of AI/AN and other disadvantaged children.

In 2009 the first of three ADA-sponsored symposia2 was held in Phoenix, Arizona. It brought together a small group of tribal representatives, academic researchers, and health professionals with decades of experience in preventive and curative services for children in AI/AN communities. Several hypotheses were advanced about potentially unique etiological factors that result in the very severe expression of caries in AI/AN children. This led to the 2nd Symposium that was held in Rapid City, South Dakota, in 2010. At this meeting Dr. Dee Robertson, the lead organizer, challenged the participants with the fundamental issue to be addressed:

There is extensive anecdotal evidence that both the prevalence and severity of caries in the primary dentition in AI/AN children vastly exceeds that of the U.S. all races rate, and that for at least 20 years has been refractory to all efforts by skilled and dedicated Indian health care program staff. Is this absence of improvement due primarily to:

1. A failure to consistently apply the dental public health approaches known to be efficacious, such as community water fluoridation, counseling on diet and hygiene, and appropriate use of caries control products, such as fluoride varnish and xylitol; or

2. Fundamental knowledge gaps for both caries researchers and dental public health researchers in our understanding of this disease in very high-risk populations of children?

---

2 The American Dental Association has generously agreed to host reports of the proceedings of all the symposia on its website: http://www.ada.org/en/education-careers/events/symposium-on-early-childhood-caries-in-american-indian-and-alaska-native-children This includes a pdf file of the video presentations referenced below for the various sessions (presenter_filename.pdf)
The tribal representatives, Indian Health Service (IHS) career pediatric dentists, and 15 experienced U.S. caries researchers representing ten prestigious research institutions spent two days examining and discussing the best data available on the subject. Their conclusion was unequivocal:

The primary impediment is that there are fundamental knowledge gaps in our understanding of this disease.

At the conclusion of the Symposium, the participants categorized the knowledge gaps into four topical areas—Epidemiology, Microbiology, Enamel Hypoplasia and Efficacious Treatment Products—and made recommendations on how to close these knowledge gaps.

Specific action plans were developed to address these gaps in the 3rd Symposium in Phoenix, Arizona, in 2012. Subsequent to this meeting, the organizers of the Symposium formed a 501(c)(3) organization called QUEST, whose name encompasses the mission of the organization: Quantifying, Understanding and Eliminating Severe Tooth Decay in AI/AN Children.

Since then QUEST has organized four more symposia on the subject—each building on the information presented and actions recommended at the prior symposium. The results of all of these can be found on the above referenced ADA website.

Prior to this most recent 7th Symposium, we had optimism for a greater collaboration between QUEST and the Indian Health Service (IHS) Division of Oral Health (DOH) than we had had in the past; instead, the professional relationship deteriorated further. In the end, even the three senior IHS health professionals from the IHS Warm Springs dental program, who had worked closely with QUEST for years, had their approval to attend the Symposium revoked shortly before the meeting. This was especially unfortunate in that they are the only IHS dental program staff who have ever documented clinically significant improvements in the oral health status of the children they serve. Despite these disappointments, as seen in the list of participants at the end of this report, there was a robust attendance from tribally-operated (i.e., non-federal) Indian health care programs, dental public health experts, academic researchers, American Dental Association, DentaQuest Foundation, state Delta Dental programs, and for the first time representation from several federally qualified health centers.
DAY #1 PLENARY SESSIONS AND BREAKOUTS

Friday morning, November 17th

Welcome: Dee Robertson, MD, MPH
Dr. Robertson’s opening remarks emphasized that, as in the past, this group would build on the considerable knowledge base established by the prior symposia. The purpose of this symposium was to:

- Review what we know about the current oral health status of AI/AN children, with emphasis on what we have learned about caries control since the prior Symposium (the ‘Known knowns’).
- Identify the most important remaining knowledge gaps (the ‘Known unknowns’) that continue to impede progress.
- Develop policy level recommendations for approaches that can support:
  - Further implementation of what we do know to be efficacious.
  - New efforts to eliminate the existing knowledge gaps.
  - On-going measurement of clinically important outcomes from current and new programmatic efforts.

Review of the Agenda: Patrick Blahut, DDS, MPH
NOTE: Dr. Blahut has a 24-year career as an Indian Health Service (IHS) dental officer, including experience at the local, regional and for the last 15 years headquarters levels. Thus, he is uniquely qualified to understand both the unique challenges to improving the oral health status in young AI/AN children, and the organizational capabilities and obstacles.

Dr. Blahut opened his presentation by noting that for each of the prior six symposia he had attended as a representative of the IHS headquarters Division of Oral Health (DOH). In this capacity, he had to receive clearance of his opening remarks to ensure concordance with the DOH official positions on (1) the prevalence and severity of dental caries in AI/AN children, and (2) the effectiveness of IHS programmatic efforts to address this disease—regardless of the accuracy of these official positions. Having retired from IHS several months prior to this current Symposium, he indicated he now is able to speak openly and fully on what he knows first-hand to be accurate.

Dr. Blahut first acknowledged Dr. Robertson for his decade of leadership in this area, especially in emphasizing the need for credible data to assess current health status and progress (or lack thereof) from programmatic interventions. He singled out for praise the combined efforts of a small group of Indian health care dentists for their innovative efforts to incorporate silver ion products (silver nitrate solution or silver diamine fluoride, hereinafter ‘SN/SDF’) to address dental caries in young high-risk children. These projects have provided the most encouraging and important data ever produced about the clinical effectiveness of IHS dental program efforts, and will be reviewed in detail later in this Symposium.
**Presentations**

**Introductory Remarks**, by Dee Robertson, MD, MPH; (Robertson_Introduction.pdf)

Dr. Robertson noted that this is the 7th Symposium since 2009 focused only on caries in AI/AN children, and then posed the question of why so many national level meetings are warranted for this non-fatal condition in such a small proportion (approximately 2%) of the U.S. children who live in AI/AN communities. He cited a recent large IHS Division of Oral Health (DOH) planning meeting in August 2017 which stated the proportion of AI/AN children age 2–5 who have caries experience is “...more than double the U.S. all races rate.” Dr. Robertson then showed a comparison (Table 1) of this caries disparity with the health disparities for AI/AN for potentially fatal diseases that often result in high levels of morbidity (e.g., pain and diminished quality of life) before there is mortality.

<table>
<thead>
<tr>
<th>2008-2010 mortality per 100,000</th>
<th>U.S. all Races</th>
<th>AI/AN Rate</th>
<th>Disparity</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chronic liver disease</td>
<td>9.1</td>
<td>43.7</td>
<td>480%</td>
</tr>
<tr>
<td>Diabetes</td>
<td>21.0</td>
<td>63.6</td>
<td>303%</td>
</tr>
<tr>
<td>Influenza and pneumonia</td>
<td>16.5</td>
<td>26.0</td>
<td>150%</td>
</tr>
<tr>
<td>Septicemia</td>
<td>11.0</td>
<td>17.4</td>
<td>58%</td>
</tr>
<tr>
<td>Kidney disease</td>
<td>15.7</td>
<td>24.2</td>
<td>54%</td>
</tr>
<tr>
<td><strong>Prevalence of caries children 2–5 years of age</strong></td>
<td><strong>22.7</strong></td>
<td><strong>54.1</strong></td>
<td><strong>238%</strong></td>
</tr>
</tbody>
</table>

Source: [https://www.ihs.gov/newsroom/factsheets/disparities/](https://www.ihs.gov/newsroom/factsheets/disparities/)

When viewed this way, many could reasonably question why the prevalence of caries in the primary dentition is even worth mentioning—much less being worthy of having multiple national level conferences over the last decade. He then answered his own question by noting that the issue takes on a different perspective when one looks at the disease severity disparity, as indicated by the proportion of young AI/AN children who require treatment for caries under general anesthesia (GA) compared to all U.S. children.

<table>
<thead>
<tr>
<th>Children age 0-6 receiving treatment for caries under general anesthesia</th>
<th>U.S. all Races</th>
<th>AI/AN Rate</th>
<th>Disparity</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>0.3%</td>
<td>30%</td>
<td>10,000%</td>
</tr>
</tbody>
</table>

QUEST has highly credible data from three sources—research, surveillance and clinical practice—and in three populations of AI/AN children illustrating the 10,000% disparity in GA cases. This obviously represents extensive morbidity for the children and a great expense to the Indian health care system. Dr. Robertson concluded by stating that each of these three datasets would be discussed in full during the rest of the Symposium.

---

3 There is variation in children’s caries rates in different regions of Indian Country, and even in different communities within regions. Though the IHS DOH has never tracked this important indicator, anecdotally this severe disparity for treatment under GA is not unusual in Indian Country.
Keynote: In the best interests of the child: How do you decide? Bob Weyant, DMD, DrPH (Weyant_Keynote: Best interests of the child.pdf)

Dr. Weyant began by explaining that the phrase “in the best interests of a child” can be interpreted in multiple ways, citing examples from the United Nations Refugee Agency document entitled: UNHRC Guidelines on Determining the Best Interest of the Child:

- The deliberation courts undertake when deciding what services, actions, and orders will best serve a child.
- A primary consideration in actions affecting children.
- No discrimination.
- Every child has inherent right to life and full development.
- The need for protection from abuse, exploitation and neglect.

Referring to his 2015 QUEST Symposium keynote address,* Dr. Weyant continues to believe we are still in a “Seldon Crisis” regarding Caries in the Primary Dentition (CIPD) of American Indian children. A Seldon crisis, which is a principal theme in Isaac Asimov’s Foundation trilogy, refers to a predicted (but unwanted) situation created by a convergence of external and internal threats. There is but one possible, and inevitable, course of action that needs to be taken to address both threats at the same time.

For the case in hand—an extremely high prevalence and severity of caries in young AI/AN children—the external crisis is that few know or acknowledge the seriousness of the situation; the result is that there have been few resources aimed at the solution. The internal crisis is that among those charged with addressing the issue, there is a tendency to revert to the old methods that are ‘supposed to be effective,’ but which have failed continuously over the last three decades.

In his 2016 keynote, had Weyant asked: What are our obligations if we wish to live in a moral society: Getting the Care Delivery Model Right.* He contrasted three philosophical stances: Libertarianism, Utilitarianism and Social Justice (Contractualism) with Dr. Don Berwick’s supposition that proper dental care should be a human right.

- Libertarianism: every person for him or herself, just work hard enough and you will thrive; unregulated free markets; little insight to make a difference.
- Utilitarianism: focus on outcomes, challenge of defining the good, and “moral fog” when trying to improve the collective good.
- Social Justice or Contractualism seeks full distribution of justice, meaning it is equally applicable and available to all.

Berwick declares that proper dental care should be a human right. Is it a moral responsibility to provide health care to everyone, and beyond this, is it a good idea? There are large gaps between the care people should receive and the care they do receive. These gaps are further complicated by (a) the overuse of procedures that have no benefit; (b) underuse of procedures that can help; and (c) general misuse, such as those illustrated by various caries intervention strategies (traditional vs. effective). Currently, we find ourselves in system failure and tradition-bound as we continue to use approaches that are not efficacious in clinical practice with very high-risk children, yet we have an ethical imperative to seek solutions. We have technical capacities that we do not put into action. So, why don’t we change?

In his book *Thinking Fast and Slow*, Daniel Kahneman, says “we tend to not approach the world rationally,” but rather embrace narrative fallacies, heuristics, and cognitive biases. Patients cannot benefit from interventions they do not receive, and currently AI/AN children often do not receive the services now known to be most efficacious. It is time to acknowledge that people do not change just from being presented with good knowledge. We need implementation science and strategies to help people make the transition with effective interventions. These are system level changes to improve routine care. People must perceive that the standard of care has changed to embrace the new intervention.

The way forward is to use what works now, such as silver ion products [SN/SDF], the Hall Crown technique and fluoride varnish. Plan for the long term! This includes radical reform in the training of health professionals to meet evolving demands, thus enabling them to understand the health issues and economics, act as a team, and be able to change as needed in a timely manner.

Long term planning must include radical reform of the financing model. The Affordable Care Act (ACA) made some positive strides aiming towards value-based, patient-centered care. Under the current administration, it is unclear whether the advances will be sustained. We also need better research in primary prevention. It may be a complex and challenging system, but there are ways to turn off ‘the levers’ that promote disease.

Dr. Weyant concluded by stating that our current system is failing some of our children. Acting ‘in the best interest of the child’ requires that we start now, demand justice, and be willing to change. We must address root causes to enable a radical reform of the social infrastructure. Caries in young children could be construed to be “the canary in the coal mine.” Learn from this warning and fix the whole system. Our healthcare system should be safe, effective, patient-centered, timely, efficient and equitable. He finished with the optimistic quotation by Martin Luther King, Jr.: *Let us realize the arc of the moral universe is long, but it bends toward justice.*
BREAKOUT SESSIONS

As with the prior symposia, at this point the Symposium participants divided into two groups: **Track A** for those whose primary job involved provision of direct clinical care, while the **Track B** group included all the others, who represented a variety of ancillary disciplines. A summary of these Day #1 sessions was presented at the beginning of Day #2 (page 33).

**Track A: Workshop on non-invasive treatment of caries in children**

Dr. Mike Kanellis, Professor of pediatric dentistry at the University of Iowa College of Dentistry, led the clinically oriented Symposium participants in exercises to examine treatment approaches to various presentations of caries in young children. The clinical management of each case was discussed from the overall perspective presented in Dr. Weyant’s Keynote: Given what we now know, what is in the best interests of the children?

**Track B: Non-clinical Symposium participants**

Dr. Mike Monopoli, Executive Director of the DentaQuest Foundation, introduced this session by sharing his overview of why he and his organization continue to support QUEST. He stated that the QUEST model is showing promise, and it is now time for reflection on the next steps to implementation and action. However, we must address the whole system, not simply the dentist or any other one segment of the system. We need to identify the policies that will start to shift the frame, along with securing the necessary finances to implement the policies. Social networks have grown and need to be used effectively, and design thinking is a tool that could help us.

**Drivers and limitations of our current approach to children with caries;** Dee Robertson; MD, MPH; (Robertson_Drivers and limitations.pdf)

Dr. Robertson started by emphasizing that the discussions to follow must focus on solutions that promise value for very high-risk children, and that this may necessitate stretching our minds to accommodate the data and information presented. The overall health challenge for AI/AN children is as bad as or worse than what has been mentioned already, and there has been virtually no progress to note over the past three decades despite the continuing efforts of dedicated oral health professionals. This requires that we be willing to consider that we may have been approaching the problem from the wrong direction. Specific considerations include:

- The prevalence and severity of caries in children is obviously and clearly influenced by social determinants, especially poverty; yet this does not imply that we can do nothing for these children. Many common illnesses of childhood that formerly were experienced at high rates by these same groups of children have been eliminated or at least well-controlled for many years.
• We need to re-define our overarching goals for controlling this disease in young AI/AN children, which Dr. Robertson would posit as:
  1. Keep the children free of pain—both from the disease itself and from traumatic treatment from the health care system.
  2. For the primary dentition, keep the teeth in the mouth to serve as guides for the developing permanent dentition until they naturally exfoliate.

The first step is to take a critical look at the currently recommended caries control strategies and products, and then do on-going assessment of their level of effectiveness in clinical practice for high-risk children. He then reviewed the current recommendations for caries control in children, with an emphasis on the state of the science.

**Risk assessment:** How efficacious is risk assessment in clinical practice? According to Dr. Fontana’s comprehensive review, there is no compelling evidence that risk assessment for caries in children has made a difference in clinical outcomes. Remember that risk assessment tools are most useful for populations in which a large proportion of children are not high-risk. In most AI/AN communities, identifying the child as being AI/AN ipso facto represents a high level of risk. Even more fundamental, the underlying—but often overlooked—premise of using risk assessment instruments is that a different and more intensive set of interventions can be utilized if the child is at high-risk. But in AI/AN communities, there has been no evidence that more efficacious options have been available, eliminating the primary reason for doing caries risk assessment.

**Access to care:** Although there are limited data on AI/AN children receiving a dental service, there are no data from IHS on the proportion of children who complete their treatment plan. Nor are there data on clinical outcomes, including how long children stay caries-free after treatment. Though some limited data are available on the proportion of children with untreated caries, there is little or no evidence that access decreases the total amount of caries experience. The emphasis should be on “accessing care that is efficacious,” which is a very different issue in that it requires measurement of clinical outcomes. There are no data demonstrating that even unlimited access for AI/AN children to skilled pediatric dental care at no cost makes a difference in the incidence, prevalence or severity of the disease.

**Community water fluoridation (CWF):** Though Dr. Robertson stated he is fully supportive of CWF, despite decades of efforts, there is no credible evidence that it has reduced the caries prevalence or severity in any AI/AN community. An often overlooked issue is that there is widespread anecdotal evidence suggesting that in many tribal communities the great majority of children and adults rarely drink the tap water.

**Fluoride varnish (FV):** For over two decades IHS has of emphasized the need for frequent application of FV, and even have the physicians applying it in Well Child Clinic in many locations. Yet there are no data, or even credible anecdotal reports, of it making a difference in the oral health status of the children. The more experts in preventive dentistry have looked at the methods and outcomes of the academic research, the less confidence there is

---

4 Fontana, M; Pediatric Dentistry V37/NO3 May-Jun 2015
that FV makes much difference even in lower risk populations. There have been good studies of the use of FV to control caries in children on the Navajo reservation,\(^5\) with no evidence of any improvement—clinically significant or otherwise.

Motivational interviewing: A companion piece to the Navajo FV study showed that despite implementing an intensive and personalized motivational interviewing in a Northern Plains tribal community, there was no improvement for the treatment arm compared to the controls.\(^6\) This is not surprising as there is no convincing evidence motivational interviewing is effective for caries control.

To make any progress, the first step is for us to measure the clinical outcomes of our effort to reduce the burden of disease from caries in young AI/AN children to see if we are making progress. We also need to acknowledge that we have been substantially impeded in reaching our overall goals by starting our efforts based on three fundamental false assumptions:

- **False assumption #1: Caries in children is a preventable disease.** This is a faith-based statement with no evidence it is true in a practical sense. A more accurate and helpful statement is that “morbidity from caries in children is largely preventable, even with the limited resources we have.” Examples of this will be presented at this meeting.

- **False assumption #2: Primary prevention is always the best strategy.** This likewise is a faith-based position, and there are many examples of when it may not be the best strategy. Primary prevention is laudable, and in the ideal world is the initial way to proceed. But we need to have a safe, effective, feasible and acceptable strategy for early secondary prevention when primary prevention fails, as it does with >100,000,000 American adults who have largely preventable conditions such as hypertension, hypercholesterolemia and diabetes. In many cases this will yield a much better return on investment of limited health resources.

- **False assumption #3: Caries in the primary dentition is a dental disease, and thus must be managed by dental programs:** This has probably been the biggest false assumption of all, and almost certainly has been the biggest impediment to making progress in caries control in very young AI/AN children. In the early stages of caries in the primary dentition, accumulating evidence indicates it can usually be controlled by medical management, which can be provided by the programs that provide medical management for other pediatric diseases: specifically, the medical program.

As a way to encourage changing our thinking on this subject, Dr. Robertson cited and recommended the approach to problem solving by Jack Kilby, Nobel Award recipient for inventing the microchip (as described in *The Chip*, by T.R. Reid):

1. Start with a broad, overall perspective of the issue to identify the various dimensions and elements of the problem.

---

\(^6\) Albino, J; JDR Clinical & Translational Research; 2017.
2. Define clearly the part of the problem you want to address, while being careful you don’t try to solve the wrong problem.
3. Tune out all the obvious solutions—they have been tried and did not work.

He then noted that the large number of physicians attending this Symposium is a step in the right direction of changing our perspective on this issue. We have extensive surveillance data and decades of clinical experience leading us to conclude that doing more of what has never worked before will not yield the progress and outcomes we seek. We need a ‘non-obvious’ approach, so let’s step back and take a broad view. We know that this disease starts very early in life for AI/AN children, but the primary dentition exfoliates, so we don’t need a decades long permanent solution as we do for caries in the adult dentition. Our principal goals for the primary dentition are (1) to prevent morbidity both from the disease itself and traumatic invasive restorations—not necessarily prevent all disease; and (2) to keep the primary dentition in the mouth to serve as guides for the permanent dentition.

To date our efforts toward prevention of caries in children have been almost entirely toward primary prevention (diet, hygiene, community water fluoridation, fluoride varnish, xylitol), followed by operative restorations when this fails. A non-obvious strategy might be to focus on prevention of morbidity, and we can do this with:

- Early and consistent access to the children (which the Indian health care medical programs have).
- The ability to identify children with caries at the very earliest stage of the disease, which is often probably best done in a non-dental setting.
- A tracking and recall system equivalent to the IHS children’s immunization program, which has led to a higher proportion of AI/AN children being up-to-date for all childhood immunizations than any other population of children. A substantial number of experienced IHS dentists have attended one or more of these symposia, yet none are able to identify such an effective tracking and recall system for young dental patients.
- A secondary prevention strategy that is atraumatic, safe, effective, feasible and acceptable to parents. As you will hear more about shortly, we now have this.

In summary, all the above are doable at the present time!

**Access: Only one part of the solution**; Mark Koday, DDS; (Koday_ Access is only part of the solution.pdf)

Dr. Robertson introduced Dr. Koday, Dental Director of the Yakima Valley Farmworkers Clinic programs, by briefly describing the serendipity that led them to meet, and the concordance of their perspectives on caries in children. This especially included the need to go beyond the usual strategies to reduce the proportion of young children who develop severe disease.

**Background**: Access to dental services increased in Yakima Valley from 1986 to 2016 with an expanded number of operatories, general dentists and pediatric dentists, as well as
residency programs. Over 2/3 of Medicaid-eligible kids have achieved access to dental care with at least one dental service within the last year. Untreated caries in 3 to 5-year-old children has decreased substantially, from 27% in 1996 to only 8% in 2015. So... it seems that we are winning—right? Increasing access is making a difference. But did we win? Perhaps not. Rampant decay and caries experience in 3-5 year olds have not decreased despite a huge investment of resources.

**Solutions:** The road not taken...
We must move to more of a community-based prevention effort rather than the current focus primarily on only the dental clinic and treatment. This will necessarily include better case management of caries in children, a medical/dental integration to ensure early identification and better follow-up, utilization of new secondary prevention products such as silver diamine fluoride (SDF), and also new reimbursement systems that reward value of services as measured by improvements in health status rather than measuring units of care. Selected programs that are part of the Yakima Valley Farm Workers Clinic in Washington and Oregon are currently implementing such new approaches. We will be carefully evaluating the success of these projects.

**Addressing caries in AI/AN children: Medicaid considerations;** Laurie Norris, MA, MS, JD; (Norris_Medicaid considerations.pdf)

Dr. Robertson introduced Ms. Norris by noting that our group is fortunate to have someone with her expertise on the policies and procedures at Center for Medicare & Medicaid Services that are relevant to our discussion of innovative strategies for caries control in AI/AN children, including coverage, provider types, payment, and service locations.

Ms. Norris began by reviewing the overall landscape of the rules governing Medicaid dental coverage, noting that there are challenges to understanding how Medicaid rules will impact tribal programs because the particulars will vary by state.

One overarching federal requirement is that, in general, a state’s Medicaid pediatric dental benefit must be the same for all kids across the state; the benefit can’t vary by specific group like tribal children or children living on reservations. This is called the “comparability” requirement. In other words, a state could not tailor a benefit specifically for tribal children.

She then reviewed the types of questions to ask when seeking to understand a particular state’s Medicaid coverage of, and reimbursement for, the newly available secondary prevention product, silver diamine fluoride (SDF).

- **Coverage:** Consider these questions: Is SDF (CDT code D1354) a covered service, how often, any restrictions by age or tooth, and are any prior authorizations needed? North Carolina was presented as an example of the “Coverage” issue with, for example, lots of
restrictive rules on use of silver diamine fluoride and a reimbursement rate per date of service of $24.18.
  o Where to look for answers to these questions:
    ▪ State Medicaid Provider Manuals
    ▪ State Medicaid Provider Bulletins
    ▪ Insure Kids Now website for what is covered in each state’s Medicaid children’s dental benefit: www.insurekidsnow.gov/coverage (choose a state, then click on dental benefits link)
    ▪ State Medicaid dental fee schedules

• **Provider Type:** Consider these questions: Who can deliver the service, who can bill for it, what are the supervision requirements, and how can teledentistry be utilized?
  o Where to look for answers to these questions:
    ▪ State Dental Practice Acts (scope of practice and supervision requirements)
    ▪ Billing Code specifications (rendering providers)
    ▪ Medicaid state plans (who can be the billing provider, teledentistry)
    ▪ State law (teledentistry)

• **Payment:** Consider these questions: How much will a facility be paid for a dental service? What are the implications in a managed care system? When can the state receive 100% Federal Medical Assistance Percentage (FMAP), for dental services provided at the facility? When can a facility get paid for a dental service provided off-site?

Ms. Norris discussed each of these questions in turn.

“How much will a facility be paid for a dental service?”
All tribal facilities are designated federally qualified health centers (FQHC) by federal law, and all tribes have a choice of being enrolled in Medicaid either as an FQHC or as simply a “facility.” It is better to be enrolled as an FQHC. Each state specifies an FQHC payment methodology in its Medicaid State Plan. That FQHC payment methodology would be either a “prospective payment system” (PPS) with a per visit payment rate sufficient to cover reasonable costs, or an “Alternative Payment Methodology” (APM) with rates at least as high as the PPS rates. The IHS all-inclusive rate could be selected as the state’s APM. Each state’s PPS methodology rate is recalculated annually based on actual costs at the FQHCs in the state. If, instead, a clinic is enrolled in Medicaid as a “facility,” the clinic will be paid according to the clinic services payment methodology in the Medicaid State plan. This is typically a fee-for-service approach. Typically, there is a huge difference between the fee-for-service (FFS) rate and the IHS all-inclusive rate. For example, in Michigan the FFS rate for application of SDF is $13, whereas the IHS all-inclusive rate for a dental visit is $391.
  o Where to look for your state’s Medicaid payment methodologies:
    ▪ Medicaid State Plan, Section 4.19 and Attachment 4.19B
“What are the implications in a managed care system?”
Many states deliver Medicaid services to its enrollees through managed care, and often enrollment in managed care is mandatory in the state. Tribal members are always exempt. They cannot be forced to enroll in managed care; they may choose to participate, but they are not obliged. In addition, the Medicaid managed care organizations (MCO) are required to contract with all tribal facilities. And the state must ensure that tribal FQHCs get paid the PPS rate for all services, either through the MCO contract or by supplementing the MCO payment rate with funds from the state.

   - Where to look for information about tribal facilities and managed care:

“When can the state receive 100% Federal Medical Assistance Percentage (FMAP), for dental services provided at the facility?”
Any state funds that are used to pay for services to tribal members will be fully reimbursed by the federal government because of the 100% FMAP.

   - Where to look for information about FMAP and tribal facilities:

“When can a Tribal facility get reimbursed for services provided off-site?”
If the Tribal facility is enrolled as an FQHC, it can get reimbursed for all services provided “at or through” the facility, including those provided “outside-the-four-walls” of the facility. If the Tribal facility is enrolled as a “facility” it can be reimbursed only for off-site services provided to homeless beneficiaries.

   - Where to look for information about payment for services provide off-site:

CAVEAT: This is what we know and experience now. Times are changing, so it remains to be seen what the future holds. There is a strong CMS encouragement for FQHCs to contract with private practitioners, however the dentists in the private sector are typically risk-averse and thus reluctant to take on more high-risk patients.

Medical-Dental integration: Projects I believe in; Hugh Silk MD, MPH; (Silk_Medical-Dental collaboration.pdf):
Dr. Silk described several oral health initiatives he is working with that are beginning to make a difference in oral health status for individuals and eventually communities in his region (the Northeast).
• **Center for integration of primary care and oral health (CIPCOH)** serves as a national resource for systems-level research on oral health integration into primary care training with special emphasis on training enhancements that will train primary care providers to deliver high quality, cost-effective, patient-centered care that promotes oral health, addresses oral health disparities, and meets the unique needs of all communities. CIPCOH is a joint endeavor of Harvard University Schools of Medicine and Dental Medicine (HMS/HSDM), the HMS Center for Primary Care (CPC), and the University of Massachusetts Medical School’s Department of Family Medicine and Community Health (UMMFMCH), in partnership with MCPHS University (formerly the Massachusetts College of Pharmacy and Health Sciences), and State University of New York at Stony Brook.

• Dr. Silk presented a survey showing how much oral health knowledge was part of various individual discipline training, with nurse midwives scoring highest and internal medicine physicians scoring lowest. Overall, interdisciplinary program directors found their graduates’ knowledge of oral health was less than adequate, with an average of only 1-3 hours of oral health information in their curriculum. Physician assistants are the current role models to emulate.

• The **Smiles for Life** oral health curriculum has become a standard oral health education tool, which has been widely endorsed. It can be used for personal educational enrichment or utilize the teaching curriculum on a broader scale. There has been over a million discreet site visits. A mobile application is also available. This curriculum is a major initiative of the National Interprofessional Initiative on Oral Health (www.niioh.org), which supports interdisciplinary oral health education efforts. With the current interest in better utilizing case management to integrate oral health into overall health, there are four new “**Front Line Health Worker**” modules within this curriculum.

• **From the First Tooth**, funded through a DentaQuest Foundation grant, is a multi-state initiative to implement pediatric oral health in primary care practice and clinical education. Thus far, this initiative has trained 415 practices across six states with a 74% average retention rate of providing oral health services at six months. Thirty five of 52 health education programs established pediatric oral health curricula. The average cost of recruitment, training and follow-up for an office or an educational program is approximately $1000/site. An enduring infrastructure for integrating oral health into practices and educational programs is being created.

• **Qualis Health**, one of the nation’s leading population healthcare management organizations, has published a comprehensive set of tools to help primary care practices integrate oral health in order to deliver whole-person care and improve patient outcomes and experience. The “**Oral Health Integration Implementation Guide**” provides an action plan to implement screening for oral health risk factors
and active disease, initiate appropriate preventive interventions, and coordinate
dental care for those with active disease. For more info, see

- Dr. Silk is currently promoting medical and dental integration practice by practice and
  patient by patient in a Walk across the Street project. He and colleagues have created
  a system to encourage (virtual) warm handoffs, meaning direct electronic
  communication between the medical and dental staff for specific referrals. It usually
  begins with a brief 20-minute educational in-service provided to a medical staff over
  lunch. There is a pre- and post-test, which shows demonstrable change in awareness
  and willingness to participate. An alternative educational approach is to invite local
  medical and dental societies to meet together and “speed date,” which are five-
  minute interactions between individual practice staffs to quickly discuss practical
  ways that they could encourage such “warm handoffs” and follow-up. This work is
  being replicated in Federally Qualified Health Center settings as well.

- Significant progress has been made in encouraging greater awareness of the
  importance of prenatal oral health for both providers and patients. There are specific
  “roles” for all members of the interdisciplinary health care team in furthering this
  initiative. Likewise, there is a need to continue to generate more local, state and
  national support for implementing this awareness in everyday interdisciplinary
  practice. For more info, see

**Oral health surveillance in the Alaska Yukon-Kuskokwim Delta;** Tim Thomas, MD,
(Thomas_Oral health surveillance in the Y-K Delta.pdf)

**Background:** In April 2008, the Arctic Investigations Program (AIP) of the Centers for
Disease Control (CDC) was informed of high rates of full mouth rehabilitation (FMR) in
children under 6 years of age in the YK region. It was reported that in 2007 about 400 FMRs
were performed in the YK region, which has approximately 600 births per year. These FMRs
are performed in the operating room (OR) under general anesthesia with an average cost of
$9000 per OR visit.

When the CDC team came out to the YK Delta in 2008, they examined children’s teeth in four
villages. Compared to same age US children, YK 4–5 year olds had five times the number of
dental caries in primary teeth and 6–11 year olds had twice the number of dental caries when
compared to same age U.S. children. The CDC concluded from this study that there were
high rates of untreated decay, and therefore more dental services were needed. They also
found that a large cause of decay was sugar sweetened beverages, especially soda, and
found some data indicating that fluoridating the village water systems could help prevent
decay. Last, the CDC team recommended that an Oral Health Surveillance System be
created. Such a system has been created and continues to evolve to address challenges
with representation, timeliness, completeness, accuracy (are all dental providers reporting condition of tooth in the same way?) and sustainability.

**Methods:**
We updated the electronic dental record software to create tables documenting status [decayed, missing, filled (dmft)] of the twenty primary teeth for each patient who had a comprehensive exam within the previous 12 months. We linked to demographic data (date of birth, community of residence), and dental procedures. We used census data to calculate population for our targeted age group. Data were available for years 2011-2015. We calculated average dmft for children aged 5 years born in the same calendar year and analyzed by community characteristics [in-home piped water status, dental health aide therapist (DHAT) presence].

**Results:**
Between 2011 and 2015 the proportion of 5-year-old children obtaining comprehensive exams increased from 17% to 49%. Over 90% each year had cavities; average dmft scores did not change (10.1 in 2011 and 10.8 in 2015); however, the proportion with un-treated decay declined from 85% to 70% (p<0.05). The average dmft scores in communities with (n=22) and without (n=23) in-home piped water were 10.8 and 12.2 respectively (p<0.05). Comprehensive exams increased from 16% to 63% in DHAT communities (n=28) and from 13% to 35% in non-DHAT communities (n=21). Between 2011 and 2015, 73% of the children in the YK region received FMR by 6 years of age.

**Conclusions:**
Thus far the surveillance system has demonstrated the use of electronic dental records are feasible for oral health surveillance. While certain limitations exist, the following conclusions can be drawn for the oral health status of Y-K children:
- Extensive disease persists in a large proportion of children in this region.
- Children experience a huge disease burden early in life.
- A higher proportion of children receive comprehensive exams in communities with dental health aide therapists (DHATs).

Future activities include expansion to other tribes and use of data for research and publication. Challenges remain regarding interventions, such as regular access and examinations starting at six months of age, reducing soda consumption, expanding DHAT utilization, piped water and fluoridation. Despite these challenges, the vision remains that Alaskan Native Peoples will strive to be the healthiest in the world.

**Diagnosing developmental defects of enamel: Online training and accuracy;** Darya Dabiri, DMD, MS; (Dabiri_Developmental defects of the enamel.pdf)
This presentation highlighted work being coordinated by the University of Michigan on early childhood caries (ECC) and developmental defects of enamel (DDE). ECC affects 60-95% of
children in developed and developing countries. In 2014, prevalence of untreated ECC in American Indian/Alaska Native children (3-5 years of age) was 43.6%.

The few longitudinal studies that focus on the relationship between enamel defects and caries risk suggest that enamel hypoplasia, a common form of DDE, is a significant risk factor for caries and should be considered in caries risk assessment. A few studies have suggested that enamel hypoplasia, particularly in anterior teeth, is associated with ECC. The mechanism is believed to involve preferential colonization of mutans streptococci in hypoplastic defects.

The University of Michigan study sought to design a questionnaire to assess the ability dental providers (dentists and expanded function dental assistants) from the Indian Health Service and members of American Academy of Pediatric Dentistry to correctly identify and classify developmental defects of enamel as distinct from early dental caries. The survey respondents showed great variability in correct responses for each image developmental defects of enamel, ranging from 41 to 97 percent, for each category of the modified-DDE classification.  

The long-term objective was to develop a field guide that dentists can use to accurately diagnose and classify enamel defects. From the results, a training guide to help diagnose developmental defects of enamel was devised, though there was not general consensus among the respondents to the survey. As there was significant variation in correctly classifying images of defects among the experts, the researchers concluded that additional education is needed to help general dentists and pediatric dentists accurately identify enamel defects as distinct from early decay.

**EDITORIAL NOTE:** At the conclusion of Dr. Dabiri’s presentation, Dr. Robertson pointed out that the genesis of this excellent and much needed work was the frequent comments of IHS pediatric dentists that they “see what appear to be enamel defects in young children all the time,” but don’t know how to diagnose or treat them. Unfortunately, the applicability of this research to dental programs providing care to AI/AN children was compromised when the IHS Division of Oral Health Director required it to go through a lengthy IHS IRB review even though it had already been classified as ‘Exempt from review’ by the University of Michigan IRB. After weeks of delay, the IHS IRB likewise concluded it was ‘Exempt from review,’ but at that late date relatively few IHS dentists participated in the on-line survey.

---

Recent research on innovative approaches for caries in high-risk children; Nicola Innes, PhD, BDS, BSc; (Innes_Hall Crowns & FiCTION trial.pdf)

Dr. Innes began by noting that for many years there has been a realization that, in general, in the U.K. dental care for adults was good, but children’s dentistry didn’t seem to meet the same standard. In particular, an alternative was needed for treating carious lesions in young children that was safe and effective but relatively atraumatic. One of these alternatives is the Hall Technique, which, in brief, consists of placing a preformed metal crown directly over the crown of the affected tooth without prior preparation, local anaesthesia injections or carious tissue removal. Despite its simplicity, she stated that its success rate over the past two decades has been remarkable and consistent across 3 randomised trials. By placing a crown over the tooth, the carious lesion is isolated from the oral environment. This changes the biofilm ecology so drastically that the lesion simply cannot thrive and ultimately arrests. For more info on the Hall Technique, see https://en.wikipedia.org/wiki/Hall_Technique.

Dr. Innes next described the FiCTION study (Filling Children’s Teeth Indicated or Not), which looked at the clinical and cost-effectiveness of different treatment strategies for managing dental caries in primary teeth over three years in a general dental practice setting. The three arms of the study were: 1) conventional treatment with best practice prevention, 2) biological (viz., Hall crown, fissure sealing over lesions, etc.) with best practice prevention, and 3) best practice prevention alone. The primary clinical outcome is the amount of pain and infection associated with dental caries. The secondary outcomes are quality of life, decay incidence (patient), cost effectiveness (economics) and treatment preferences (patient/carer and provider).

The study took place over 60 months in five clinical centers across the U.K. with 1124 children randomized to one of the three treatment arms. The data is now being analyzed for determination of final outcomes. A complication of studying or indeed trying to manage this group of children is that those who develop caries early in their primary dentition have a very different caries trajectory in their permanent dentition compared to their caries-free contemporaries. Thus, in the future we may consider those children who develop caries early as a separate population from those who develop it later, and they may require different prevention and management strategies.

Testing an intervention to reduce sugared fruit drinks in Alaska Native children (Donald Chi, DDS, PhD; (Chi Reducing sugared drinks consumption.pdf)

Dr. Chi described caries as a multi-factorial disease rooted in behaviors, such as irregular dental care, inadequate fluoride, and a high sugar diet. These behaviors are embedded in various contexts, including physical, political, economic, social, and cultural. He next described his work in the villages in Alaska’s Yukon Kuskokwim Delta.
In looking at 50 distinct villages in the Yukon delta area, many parents believe sugared fruit drinks are a good substitute for fruit that is expensive or unavailable locally, thus believing they are a healthy alternative for their children. The mean daily sugar intake in these villages approaches 50 teaspoons of sugar daily, which is the equivalent of five cans of cola.

Community-based participatory research (CBPR) is important as “knowing principles is not always enough.” This type of research focuses on self-determination, social justice and equitable relations, and meaningful outcomes, while being mindful of challenges, such as epistemological, political, ethical, methodological and financial. Dr. Chi stated that CBPR is “the right thing to do,” and noted that scientists do not have all the answers, while acknowledging that feasibility and sustainability are challenging, to say the least, in small communities like the one he works in.

An intervention was developed in partnership with local communities to reduce the consumption of sugared fruit drinks. The intervention will provide access to sugar-free alternatives, health education and self-efficacy training. The goal is to teach parents about the sugar content of fruit drinks and introduce them to healthier sugar-free alternatives. The next steps for his intervention research include taste tests with children, scale development to identify behavioral mechanisms, and piloting the intervention with a small number of families. The goal is to secure funding to test the full-scale intervention, and to eventually disseminate effective pieces of the intervention to other indigenous communities.

**Oglala Sioux Tribe SMILEs study: Follow-up**

Dr. Warren provided a brief overview of the SMILEs observational study, which investigated dental caries in American Indian infants and toddlers from a Northern Plains tribal community. The study began in 2009 and followed a group of children and their mothers from one month of age to 36 months. The visits were scheduled at defined intervals: 1, 4, 8, 12, 16, 22, 28 and 36 months of age. Mother and child demographic data and mother's DMF baseline were collected at the first visit, with full dmfs caries exams for the children at each visit. By 16 months of age, 32% of children had caries experience, and by the study's end at 36 months of age, 80% had cavitated caries experience, and an additional 15% had non-cavitated caries.

Our recent follow-up study involved returning to the same community to examine these children, who were now 6 to 7 years of age. All the children in the original study were eligible for this follow-up, and the parents were offered a monetary incentive for filling out a questionnaire and allowing their children to be examined. Over about a 16 months recruitment period, approximately half of the original children were enrolled and examined.

---

8 With generous support from the Delta Dentals of Iowa, South Dakota and Wisconsin, and from QUEST
Follow-up data was collected on caries in the remaining primary dentition and permanent first molars, sealants on permanent first molars, beverage consumption, and child height and weight. Dental records for each child were obtained from both the local IHS dental program and the referral pediatric dental clinic about 100 miles away in Rapid City, South Dakota.

The preliminary findings were:
- In the intervening 3–4 years, very few of the children had even a single visit to the local IHS dental program, and the few documented visits consisted only of an exam and a referral but no on-site treatment. In contrast, about two-thirds of these children had received extensive treatment—often under general anesthesia—from the referral clinic.
- By the 7th birthday, approximately 93% had caries experience on the primary molars and canines. Of those children with stainless steel crowns, 82% had four or more. When looking at the permanent first molars, 39% had caries experience, but 45% had one or more sealant evident.
- Many children (72.8%) have caries in their primary molars at 36 months, but a relatively modest number (7.9) of surfaces are involved.
- By age 6–7 years, the mean number of surfaces involved jumps dramatically to 29.2, in part due the large proportion of children receiving stainless steel crowns.

Conclusions: Assuming an efficacious primary prevention strategy is available and possible in this group of children, it must occur by 12 months or sooner to keep the children’s incisors caries-free. Secondary prevention (early intervention) in primary incisors needs to start by 16 to 22 months. Primary prevention in primary molars must start by 28 months, and secondary prevention (intervention) in primary molars no later than 36 months.

What should be done in response to these findings? Based on our traditional way of thinking about caries in young children, options include recommending increased fluoride varnish applications, increased use of xylitol gum, use of chlorhexidine gel, motivational interviewing, and dietary intervention focusing on reducing high sugar beverage consumption. However, over the last three decades all of these have been tried at multiple locations throughout Indian Country, and there is no evidence that either individually or collectively they have been efficacious. Based on the information presented at the last two symposia, we should consider increased use of silver ion products like silver nitrate solution or SDF, but we need more information on how to best use it clinically for young children.

Management of caries using silver nitrate and fluoride varnish: a 2-year trial; Arwa Owais, BDS, MS, & Mike Kanellis, DDS, MS: (Owais_Kalona SN-FV trial.pdf)

At the 2013 Quest Symposium, we learned about Dr. Steve Duffin’s protocol for arresting caries in the primary dentition using 25% silver nitrate covered with fluoride varnish, which was applied at 2, 4, 8 and 12-week intervals. After discussion with our pediatric dental
colleagues, we used a similar but modified protocol consisting of three applications one month apart. The purpose of the Kalona Trial was to compare the conventional approach of restoring caries in the primary dentition to medically managing caries using silver nitrate and fluoride varnish.

The study population were Amish children living in Kalona, Iowa, which was settled in 1845. The average family has eight children with a high caries rate and low exposure to fluoride. Their overall oral hygiene is often insufficient, and these children have limited access to and utilization of regular dental care. Most only seek care when they are in pain. The study participants were randomized into two groups, with one-third offered conventional treatment and the others utilizing the silver nitrate/fluoride varnish protocol. Both groups received “best practice” prevention including oral hygiene instruction, fluoride varnish application and diet counseling.

The accompanying slide presentation provides details on study materials, methods, flow and clinical outcomes with major and minor failures noted. After two years, most of the teeth were doing well (90.7% silver nitrate group and 96.8% of the conventional treatment group). Overall, almost 50% of the children in each group had new caries. Overall about 75% of the new lesions were interproximal, with more in the control group (90%) compared to the SN group (70%). This confirms the need of radiographs in clinical research as most of the new lesions over the study period were detected by radiographs but not clinically.

The lessons learned from this study population were described in our recent report in the Journal of the California Dental Association. These included:

- Multiple deep interproximal carious lesions were often successfully medically managed with silver nitrate over 24-month period.
- Decay can continue to progress in treated lesions following silver nitrate application, and is affected by food impaction, cariogenic diet, poor oral hygiene and lower fluoride exposure. [Note: Our study protocol did not include filling arrested lesions with a material like glass ionomer cement, which might have reduced the high observed rate of progression in these lesions.]
- The location and size of lesions matter: treatment with SN is more effective at arresting decay in anterior teeth than posterior teeth, and smaller lesions arrest more readily than larger one.
- Interproximal application of SN is a challenge.

Iowa College of Dentistry (ICODEN): an innovative caries control strategy; Mike Kanellis, DDS, MS & Arwa Owais, BDS, MS (Kanellis_ICODEN.pdf)

Dr. Kanellis provided an overview of what is generally accepted about the clinical use and outcomes associated with silver/fluoride products, with an interest as to whether there is a

---

9 Kanellis, Owais et al. JCDA; V46:1 January 2018
primary preventive use for these products. It is known that the fluoride portion has some primary prevention activity, and the silver moiety is thought of as being a secondary prevention for frankly carious dentition. However, as initially identified by Dr. Frank Mendoza at Warm Springs, frequently children who have silver nitrate applied to carious teeth and surfaces subsequently are noted to develop with a lesser degree of staining in teeth that appeared normal at the baseline exam. These stains are usually noticed in the pit and fissure of adjacent teeth. This same phenomenon—now being called ‘collateral benefit’—was observed in our University of Iowa Kalona study just described by Dr. Owais. It appears that very small amounts of Ag⁺ can migrate through the saliva and stain decalcified, though not visibly carious, enamel in both the treated and non-treated teeth.

From these observations, it appears that small amounts of Ag⁺ can act as a ‘disclosing agent’ for identifying pre-clinical lesions and porosities, as silver will precipitate into these lesions. In addition, it seems likely that this could have a therapeutic effect as well through arresting early, pre-clinical caries, and thus provides a “very early secondary prevention” benefit.

We are proposing a demonstration project that would first provide a baseline full exam for children from 0 to 3 years of age, followed by application of a low concentration Ag⁺ combined with fluoride varnish that would be applied to all tooth surfaces at baseline and at subsequently at three-month intervals. Data would be collected regarding appearance of silver-stained surfaces at recall and evidence of caries into enamel or dentin, new restorations and extractions. Data would be analyzed for changes in number of general anesthesia cases, sedations and restorative visits for this defined population.

More study will be needed to determine the lowest concentration of Ag⁺ silver product at which visible staining occurs in demineralized surfaces without cavitation. We will carefully document any possible adverse events to demonstrate the safety of this innovative use of Ag⁺ for caries disclosure and control in very young children.

**Hall Crowns; Kim Hort, DMD; (Hort_Hall crowns in Alaskan children.pdf)**

As a pediatric dentist treating patients in Southeast Alaska, Dr. Hort was encountering many children with extensive disease, but did not have data on its prevalence and severity. She reviewed records and identified unique patients from 2004 to 2016. Utilizing dental health aides in each community to track the children, she determined that 74% of patients were characterized as high-risk according to her risk assessment tool. To achieve better caries control in some of the highest risk children, she evaluated Hall Crown utilization and its growing acceptance as a viable treatment option. She was especially impressed with their potential from the practical usage perspective in that frequent clinic appointments are problematic for many families in the area. She likewise saw the potential for use in very young children (especially prior to the eruption of second primary molars) and for semi-cooperative children with challenges around age, anxiety and/or cognitive impairment.
With increasing evidence of the safety and effectiveness of Hall crowns for her patients, over each of the last four years the proportion of Hall crowns to traditional crowns has increased. She summarized the outcomes of her use of Hall crowns as follows:

- 103 patients with 197 crowns over nearly 8 years
- SSC Survival: 88%, with a mean time to failure: 13.4 m (2 weeks - 32m)
- Tooth Survival: 99%, with only 2 Hall Crowns requiring pulpal therapy or extraction
- At least 20 operating room cases avoided, and an additional 14 cases delayed, through a combination of Hall crowns and use of SDF.

In conclusion, Dr. Hort believes Hall Crowns to be a good treatment option for children with moderate to large, asymptomatic lesions on posterior teeth, especially in those with limited ability to withstand traditional dentistry. Multiple crowns can be completed at one visit, thus saving operative appointments. In many children using them can help avoid the need for treatment in the operating room, and in other cases can delay this treatment until after second primary molars erupt, thus lowering the possibility of a second general anesthesia event. Parents and patients are happy to avoid local anesthetic and sedation, even if that means a slightly higher risk of crown loss.

### Sault Tribal Dental Program; David Drockton, DDS; (Drockton_Sault SN-FV project.sdf)

Dr. Drockton shared why he recently started offering a silver nitrate/fluoride varnish (SN/FV) protocol to the parents of young Sault Chippewa children, saying he was “tired of:”

- Experiencing less than desirable outcomes by referring to pediatric dentists, who are 2 to 3 hours away.
- Fighting with kids and having them hate him now and dentistry for the rest of their lives.
- Having kids need to go to the operating room for dental care.

He considered using SN/FV after hearing of it in 2015 from Drs. Blahut and Robertson, and he later shadowed Dr. Mendoza at the Warm Springs Clinic in Oregon.

On the positive side of adopting this new caries control strategy, he was able to implement its use in his own timeframe and gather data to determine his own success. He appreciated having a viable treatment option, when fellow dentists were struggling to formulate and complete traditional treatment plans, thus requiring referral to a pediatric dentist.

On the down side, Dr. Drockton shared his struggle to implement a medical management protocol, which required extensive preparation of the community and staff, when he was operating in a 90% clinical role. There were time challenges due to his many other duties, including work with his infection control committee, site accreditation, training and re-credentialing his staff, and working on a response to removal of water fluoridation from a major housing area. He also was aware of “wearing out his welcome” with the
Administrative leaders due to his frequent requests for increased fiscal support, needing to be aware of the importance of addressing periodontal disease concurrently and maintaining harmony with the entire dental staff.

Despite these obstacles, Dr. Drockton pursued the implementation of this medical management of caries for children. He took the time needed to educate his Administration, community and staff. He reassured the tribal leaders that this was not an experiment or research at the expense of the tribal people. The proposed care was not substandard. He convinced the tribe to procure the customized database the other Warm Springs Model sites were using to track his treatments and outcomes—a “miracle in of itself”—and successfully negotiated with the IT staff to install it.

After over a year of using the SN/FV protocol, his overall impression remains highly favorable, and he is just now in a position to begin a full evaluation of the protocol’s effectiveness for the children. He noted that many questions remain, including:

- How do you manage patients with this protocol in a multi-dentist facility or in a multi-facility practice in which not all the providers have adopted it?
- How do you calibrate care among multiple providers for accurate data?
- How do you deal with provider turnover?
- How to formulate a treatment plan that will be successful within your professional experience and within the reality of the patient’s lifestyle and concerns, which is challenging for seasoned providers, while always keeping in mind, “what is in the best interest of the child?”

Addressing ECC at the Southwest Dental Support Center; Dan Huber, DDS; (Huber_ SW Dental Support Center.pdf)

Dr. Huber spoke of the ongoing challenges of addressing the high levels of dental disease in his service area (most of Arizona, plus parts of Utah and Nevada), complicated by insufficient resources as manifested by:

- Vacancies for 45 dentists and 90 dental assistants.
- Caries rates that were two to four times the national average.
- High rates of untreated decay, poor periodontal status, and lots of missing teeth without prostheses.
- Competition for resources with other important programs like diabetes control.

There was a need for better data on community oral health status and effectiveness of prevention activities, including the need to develop and use better outcome measures. There is an ongoing demand for better orientation and training for dental staff in current prevention and restorative options. This aligns with the goals of the Southwest Dental Support Center, which seeks to develop outcome measures, monitor caries rates, promote innovative solutions and develop effective strategies to reduce dental disease. Unfortunately, every dental chief in the Phoenix area has a different idea about what is
going to work. The goal is to let them try different options, gather data and determine if a difference has been made. There is some data to compare from 2011 to 2016.

At the same time, there have been some significant accomplishments, including: forming a Regional Advisory Committee to determine priorities and manage activities; monitoring community/tribal oral health status; developing a greater dental assistant workforce and other oral health partnerships; increasing regional continuing dental education, including expanded functions dental assistant training; and clinical demonstration projects on innovative and traditional ways to reduce early childhood caries, including a silver nitrate project on the Hopi reservation.

Future anticipated improvements include:
- Standardized routine periodic surveillance conducted in selected clinics by a Community Health Dental Hygienist
- Utilization of the electronic dental record to report and track caries rate in specific age groups, while gathering more data points to be able to show trends.
- The eventual goal is to present trend data over a rolling 24-month period, and thus continued monitoring is essential.

**The Warm Springs Model of medical management of caries;** Patrick Blahut, DDS, MPH; (Blahut_Warm Springs Model.pdf)

Dr. Blahut introduced this presentation by stating that Dr. Mendoza’s permission to attend this Symposium had been revoked several weeks before the meeting, but given that he [Dr. Blahut] had been the IHS Project Officer for the Warm Springs Model projects since their inception, he was intimately familiar with all aspects of this innovative and successful project.

The presentation began with a summation of the historical experience of caries in Warm Springs children. Over 90% of the children in Head Start have had caries experience. On average from 2010 to 2013, about 80 children annually required treatment for caries under general anesthesia (GA), representing a rate well over 5000% higher than that of the U.S. all races. There have been over 1600 GA cases at WS since 1998 with an annual birth cohort is approximately about 110.

In response, the Warm Springs dental program had tried practically every caries control modality available, including community water fluoridation since the 1980s; Baby Bottle Tooth Decay prevention counseling programs; early and regular exams of children enrolled in Early Head Start and Head Start programs; use of xylitol and fluoride varnish; participation in 10% chlorhexidine dental varnish clinical trial; and implementation of all activities of the IHS ECC initiative, including the use of early access to care, fluoride varnish, glass ionomer cement sealants, and interim therapeutic restorations. Yet, despite all of this, there had been no discernible change in the rate or severity of the disease.
In 2013, after hearing of it two years earlier, reviewing the literature, and talking to other dentists about it, treatment of caries in children with silver nitrate (SN) was added as a secondary prevention strategy to all these other caries control efforts. After considering the risk to benefit ratio, it was concluded to be safe and would likely enhance the effectiveness of the current program. Both the local Administration and the community were educated about the material and expected outcomes.

A silver nitrate treatment protocol was developed, including selection and evaluation criteria. Since September 2013, 315 children have been enrolled; after over 1000 applications, no adverse effects have been reported. Over 80% of the children were still in the protocol as of September 2017. Although the original intent was to identify children whose caries was not far advanced, in reviewing the data the average child age at enrollment is 4.5 years, and the average number of affected teeth is 6.5. The majority of these children would have been put on the OR list before he began using this new approach. Despite this, for children who keep up with the recommended treatment schedule, almost all have their active disease controlled.

After four years of data gathering, Dr. Mendoza reports that parents have been consistently pleased, children have been very easy to work with, knee to knee positioning worked well for the younger and less cooperative children, and even the younger children were generally cooperative after the second treatment. There has been some decline in the follow up exams over time.

Dr. Mendoza states that in lieu of his silver nitrate followed by fluoride varnish protocol and having to rely upon the traditional restorative model, virtually all these children would have gone to the operating room for extensive restorative care. The SN/FV protocol has reduced the number of restorations needed from 547 to 117, and most of these were either pre-existing lesions noted at baseline examination or esthetic efforts to mask anterior staining. Five percent of these extremely high-risk children who started the protocol needed general anesthesia (GA). None of these 11 children completed 5 or more SN/FV treatment appointments; they were children who started the treatment sequence of appointments but did not return.

One way to measure success of the SN/FV protocol is to observe whether the disease level of the children in the annual Head Start screening changes. The most recent data indicate a 50% reduction in the proportion of children in Head Start screening who either have already had treatment under general anesthesia, or whose current condition necessitates that approach. This improvement has occurred over the relatively short span of three years. Dr. Blahut concluded that in his 24-year career with IHS and 10-year career as the IHS HPDP officer, he knew of no other reports of success in actual clinical outcomes, and that it was unimaginable that anyone else had come even close to achieving the success of the program at Warm Springs.
Dr. Robertson began this session by asking why Dr. Frank Mendoza—the IHS pediatric dentist with the most successful caries control strategy ever documented for AI/AN children—still has to treat about 40 children each year under general anesthesia in the operating room treatment. In short, despite the unprecedented success, it’s obvious that we need to go beyond the current strategy. To do this, he once again cited the problem-solving approach advocated by Jack Kilby, Nobel Prize Laureate for inventing the microchip: Start with the big picture, tune out the obvious solutions (they have already been tried), and then clearly identify the part of the puzzle you can address. The big picture is severe, refractory caries in AI/AN children. Dr. Mendoza tried a non-obvious solution and had remarkable success, as demonstrated by the proportion of children receiving treatment under general anesthesia, and disease level of the children in the annual Head Start screening, which declined from 66% in 2013 to 36% in 2016. Yet the glass is only half full.

Dr. Robertson then identified the two characteristics of the children still going to OR for treatment of caries. They are either (1) children whose caries was too advanced when seen for the first time by Dr. Mendoza, or (2) children who entered the SN/FV the protocol but were lost to follow up.

Each of these situations is a classic systems failure: The first a failure of early case-finding, and the second a failure of patient tracking and recall. Critically, neither of these can be resolved by the dental program alone. Dr. Robertson cited the fundamental “false assumption” that is the source of so many of our failures: the perspective that caries in children is a dental disease that must be addressed by the dental program, instead of being viewed as a health problem that must be addressed by the health care system.

So how could we do a much better job addressing the two systems failures of case-finding and tracking and recall? Dr. Robertson noted that there is an obvious and available model for this, which is the pediatric medical clinic. He cited the decades of widespread success in maintaining very high levels for the complex, multi-appointment early childhood immunization schedule, with many Indian health programs achieving 90% success. Dental programs are almost never able to achieve results like that.

He then quoted the director of a Gates Foundation program to eradicate polio in Nigeria, who stated: “We had the technology and human resources, but not the coordination.” Dr. Robertson maintains that we have a similar problem with eradicating severe childhood caries in AI/AN children. We now have the tools and knowledge, but we lack the coordination.

In looking back on the ‘known knowns’ and the ‘known unknowns’ through Jack Kilby’s perspective, he stated that our two overarching goals are:
2. Keep the primary teeth in the mouth until natural exfoliation to serve as guides for the adult dentition.

We have a safe, effective, feasible and acceptable non-surgical way to do this, but it requires early case-finding and effective tracking—neither of which dental programs routinely do well. And in any case, relatively early and asymptomatic caries in the primary teeth is a health problem that often may be best treated initially by medication in a medical clinic, with referrals to dentists only if it progresses and becomes severe. There are many dozens of examples in the medical arena that use exactly this model: Initially the disease is treated medically, and only if it is not controlled medically is the patient referred for surgery.

Recalling the basic theme of this year’s Symposium, “In the best interests of the child,” Dr. Robertson noted that the (now) obvious solution to the ‘half-empty’ status of the Warm Springs Model project is coordination with the pediatric medical clinic. He concluded by noting that that the case management coordination part of the project could be easily handled by a community dental health coordinator, community health worker, community health representative or a community dental health aide.

**Medical-Dental Collaboration in ECC Control;** Andrew Terranella, MD, MPH;
(Terranella_Medical-Dental collaboration at TONHC.pdf)

Dr. Robertson introduced the next speaker as a pediatrician and Clinical Director of the Tohona O’Odham Nation Health Care, saying that the two of them had long discussed and agreed on the importance of having the pediatric program be an integral part of a medical management of caries approach. Dr. Terranella’s first attempt to do this in a small IHS clinic on the Navajo reservation was met with resistance by the dental department, who worried that this was not the standard of care. A year later, the second attempt met resistance by a CEO at a small California tribal FQHC, where the revenue generated by the dental clinic was viewed as essential to sustain the health center, and who was concerned a prevention emphasis could reduce that revenue. The third attempt at Tohona O’Odham Nation Health Care in Tucson seems to have been ‘the charm,’ with both dental and health center leadership supportive of his vision of a unified medical-dental home where dental caries is identified early in children and treated as a chronic disease through team-based care.

Dr. Terranella reiterated that potential barriers to a Medical-Dental Collaboration can be the medical or dental providers, administrators, tribal leaders or patients, yet that these same players can be strong supporters once they are educated. Success comes from bringing all the players to the table. An essential first step was introducing the patients and the community to the prospect of a medical management of caries approach using a silver ion product like silver diamine fluoride, which was begun with a simple handout.

This project is a work in progress at TONHC, with current efforts being:
- Assembling a quality improvement team.
- Creating additional promotional materials, including public service announcements.
- Utilizing a dental hygienist in the medical clinic.
- Furthering engagement and education of the medical and dental staff.

Next steps include: further community and tribal engagement; development of a screening protocol and screening tool; more staff training; and development of a case management plan and database with data collection to evaluate safety and efficacy. Ideally, a key clinical component for success in his program will be embedding a dental hygienist in the pediatric medical clinic. Last, engaging the current social workers in the medical clinic to this effort will further integrate oral health into overall health.

**ECC Management: DentaQuest Institute projects;** Cindy Hannon; (Hannon_DentaQuest Institute projects.pdf)

Ms. Hannon began her presentation illustrating that a gap exists between what we desire and what we are actually able to do with regard to ECC management. This desired disease management approach is based on accepting that a patient’s caries risk status is not static, but rather can be managed and improved over time. For example, the disease management protocol at Boston’s Children’s Hospital begins with a caries risk conversation, not simply an assessment of answered questions. Such communication lays the groundwork for effective motivational interviewing.

The DentaQuest model for improvement was drawn from the original work of the Institute for Healthcare Improvement. It involves the use of champions to share the vision. The focus is on the improvement of the system of care, using a team approach and examination of available data to evaluate how the system affects the patient. From there, test, implement and adopt changes and ideas, which lead to measurable improvements in health outcomes. This became a “Learn, Act, Track, and Bring Back” disease management framework with six practical components.
DAY #2 PLENARY SESSIONS AND BREAKOUTS

Summary of Key Issues from Day 1: Clinical
Dr. Kanellis presented four case studies of common presentations of caries in children, which were then reviewed in detail by the clinicians present. The workgroups arrived at a consensus on their preferred treatment planning. These results were discussed and compared to Dr. Kanellis’ suggested treatment plan. Some notable specific comments included:

- “First, I would get out all the mushy stuff,” meaning that before any type of treatment was initiated, the speaker would prefer to remove all the overtly carious material. For two of the non-invasive modalities discussed, there is evidence that removing the soft carious material does not improve the clinical outcomes, though the opposite has been dental dogma for many years.
- “Realistically speaking, in most programs this kid [i.e., the child’s case being discussed] would be scheduled for treatment in the operating room straight away,” versus what those favoring a non-invasive approach believe to be ‘in the best interest of the child.’
- Many individual clinical issues relevant to providing optimal dental care for AI/AN children were discussed afterwards.

Summary of Key Issues from Day 1: Non-clinicians group
Dr. Marianos’ discussion began by noting that this group actually included more physicians than dentists, plus a mix of other disciplines including an attorney, program managers, dental public health experts, and dental health insurance executives. He reiterated the perspective discussed that early stages of caries in young children should be considered a medical disease or health problem rather than a dental disease. He noted the difference between “access to care” and “accessing care”—especially care that is efficacious.

As has been noted before, adopting a case management approach and innovative strategies will be essential to improve outcomes. This should include an emphasis on the need for a medical/dental integration and educational opportunities, such as the “Smiles for Life” oral health curriculum. As reimbursement is always an essential element of changing clinical practice, we need to identify new systems of reimbursement, including learning to fully navigate the CMS Medicaid rules, including coverage, provider types, prior authorizations and payment. Last, there are on-going challenges of providing care in remote areas and the need for developing surveillance measures, plus utilizing the findings of the latest research, such as the possible etiological role of inadequate Vitamin D levels leading to potential enamel defects.
DAY #2 BREAKOUT SESSIONS

Dr. Michael Monopoli, Executive Director of the DentaQuest Foundation, introduced these breakout sessions by charging each topical group to identify and prioritize issues that will inform policy development by the institutions with special interest in this topic. He noted that the diversity of backgrounds and expertise present in this room can move this project forward. He requested that each group first come to a consensus on one short-term policy, and then to identify one or two long-term policies to pursue that would bring the maximum benefit within a reasonable period of time. He encouraged the participants to keep in mind that social determinants of health influence all efforts to effect improved health status, and that it is essential for us to listen to and gather feedback from the people who are the recipients of the programs and services we recommend.

Regulatory Workgroup

Initially this group addressed barriers to incorporating the secondary prevention agent silver diamine fluoride (SDF) in the care of minority children. Two major regulatory challenges were quickly identified: state boards of dentistry and state Medicaid programs.

1. The State Boards of Dentistry are considering multiple aspects of use of SDF, including:
   - Who can apply it: Which dental programs staff? Medical personnel, as well as dental?
   - If allowed, how will supervision of application by non-dentists be done?
   - For which patients and which conditions can it be applied?
   - What are exclusion criteria for its use?

2. As reviewed by Dr. Laurie Norris earlier in the Symposium, there is currently wide variation among the various state Medicaid programs:
   - Is this procedure even covered?
   - Which health care providers are approved to use it?
   - If so, how often is it approved within a set period of time?
   - Are there specific groups of patients who should be eligible for this procedure?
   - Are there specific teeth that should be covered?

Short-Term Policy Recommendation: Increase the consistency of coverage and application issues from state to state, including all pertinent details. Accomplishing this will require communication with individual state boards of dentistry and state Medicaid programs to determine many issues identified above. It is desirable to maximize the number and type of providers who can apply SDF. The American Association of Dental Boards (AADB) and Center for Medicare and Medicaid Services (CMS) are key organizations to provide a roadmap for consistency across states.

Long-Term Policy Recommendations:
- Curricular change is needed in medical and dental education. Address both American Dental Education Association (ADEA) and the Association of American Medical
Colleges (AAMC) simultaneously about the importance of oral health to overall health. The American Dental Association (ADA) and the Commission on Dental Accreditation (CODA) are key players. The focus should be to influence the knowledge and attitude of new dentists, while at the same time begin to address the perspective of the existing dental workforce. Consider financial incentives and continuing dental education to get the message across.

- Successful integration of medical and dental electronic records and coding systems, which will be essential to avoid duplication of effort and promote better interdisciplinary communication. Utilize and integrate diagnostic codes, which could be tied to Medicaid reimbursement. The ADA and American Academy of Pediatric Dentistry (AAPD) should consider publishing a treatment guideline for SDF that could be the basis for CMS decisions on reimbursement.

Metrics Workgroup

This group focused on indicators that reflect current disease status and measures of improved oral health for children. Currently the IHS electronic dental record (Dentrix) does not have the variables needed, but it does allow adding ‘dummy codes,’ such as for pain and infection. We need to be able to track other items, such as use of silver ion products (SN/SDF), Hall crowns, referrals from the emergency room, and how many kids identified in the medical clinic with dental disease are referred to the dental program. Integrate this work with anticipated ADA (Snowdent) diagnostic codes.

It is recognized that in order to have better measures of the treatments used and the clinical outcomes we need to foster change in provider behavior, including more than just the dentists.

Policy recommendations:

- Create and administer a Knowledge, Skills and Attitudes (KSA) survey to see where we are right now. Baselines are absolutely necessary in order to be able to determine future progress, or lack thereof!
- Create opportunities for new Indian health care program dentists to spend time with providers who are currently using innovative approaches to the care of children, which could open their awareness of the need to find safe, effective, feasible and acceptable ways to reduce the number of children requiring treatment under general anesthesia.
- Create a guideline for recommended prevention and treatment techniques that are specific to very high-risk children like AI/AN, but which can be modified based on local needs.
- Continue to promote awareness of the emerging evidence that the use of general anesthesia in young children has the potential for impairing neurologic development.
Comments:
Residency training must be improved to include exposure to innovative medical management of caries approaches, and the need for documentation of outcomes. This includes use of morbidity indicators that reflect the effect of disease and treatment of disease beyond the enumeration of dmft. Data that are recorded on treatments and outcomes must be reviewed to ensure accuracy and consistency. In the long run, we need data to tie clinical outcomes to fiscal outcomes, which will serve as the basis for recommendations to regulatory bodies. We must continue to seek reimbursement models that can overcome the challenges of fee-for-service (FFS), while offering reasonable reimbursement to foster the utilization of those services proven to best address the needs of the child.

Infrastructure Workgroup
The group identified the importance of a model that provides an integrated coordination of care among medical and dental programs, along with integration of social and enabling services. Collectively, this integration constitutes a patient-centered health care approach. To overcome the challenges of achieving this in an Indian health care setting, several likely barriers must be identified and addressed:

- Lack of understanding and appreciation among dental staff of the need to ‘do something different,’ especially among the leadership.
- Frequent staff turnover and position vacancies.
- Patient demand that constantly exceeds capacity.
- Burnout for ‘yet another good idea.’
- Tribal boards that too often focus on production, resulting in not being very receptive to more prevention activities.
- Many tribes want to embrace dental therapists, which often place them in conflict with dentists, dental hygienists and assistants.
- Tribal and IHS bureaucracies that must be navigated.

Case management is an essential element to overcome some of these barriers to implementing change because it leads to better outcomes and better patient satisfaction. Use of the Qualis framework is one option for gaining medical acceptance. The question was raised as to the role of organized dentistry in providing infrastructure support.

We all recognize the need for champions to move any new concept forward. Sometimes this may be a provider, and in Indian Country it seems more often to be a member of the community. Grandmothers can be especially helpful if they become engaged. Though change usually comes from within locally and gradually, it can be fostered by outside influences, such as the National Indian Health Board. We must always be aware of the need to utilize the folks out in the community who are already engaged, such as community health workers, community health representatives, community dental health coordinators, and promotoras. Last, we cannot underestimate the importance of data to measure progress. For all the ‘new ideas’ that have been implemented in Indian health dental
programs over the decades, none have been well-organized to measure whether any clinical improvement resulted. We must go beyond this.

Comments:
Awareness of the issues is essential at all levels: top, middle and bottom. Without this, you do not get buy in from all areas, especially regarding the social elements. New awareness is needed that achieving substantive improvements in the oral health status of AI/AN children requires a Medical-Dental Collaboration, that documentation of inputs and outcomes is essential, and that good communication must be facilitated between the two sides of the house. An integrated medical/dental health record system is ideal, though difficult and expensive. Yet even with our existing system, we should be able to draw down information on the health status of our communities at the population level rather than exclusive focus only on a single patient at a time.

Technical Workgroup
This group had some of the same discussion and reached similar recommendations to those just reported by the Infrastructure workgroup.

Recommendations: Provide a strong focus on case management. In this case, to achieve improvement on clinical outcomes, we must have access to children at younger ages and see them more often. Two years ago IHS participated in a DHHS meeting specifically for the different agencies to provide recommendations on reducing the remarkably high prevalence and severity of caries in young children in Indian Country. The single conclusion of this meeting was that each site needed a dedicated caseworker for the reasons described above. To date, no action has been taken by the IHS Division of Oral Health to address this recommendation, and there are no known IHS dental programs who have successfully implemented this approach on their own.

As previously discussed, without medical-dental collaboration, the dental program will never identify children early in their disease progression, thus missing the best opportunity for atraumatic management. To be maximally effective, this collaboration needs integration of the medical and dental electronic health records. Updated consent forms could be developed to reflect interdisciplinary practice, saving time and effort from duplicative forms. This will foster more frequent and productive communication between medical and dental. One specifically identified benefit would be that it will dispel the common attitude that the children are ‘too young’ to be referred to the dental program.

The collaboration can enhance consistency in the importance of oral health messaging, and can utilize the timeliness and periodicity of well-baby visits to initiate and expand the oral health message. As most Indian health care providers have probably not been exposed to this collaborative model, we need to include training for existing and new dental and medical staff about the importance of collaboration. This could include teaching simple ways for general practitioners to address behavior issues with young children. Consistent with the
above recommendations, we need to expand the traditional scope of project of a dental program to routinely include school-based programs, Head Start, WIC, perinatal classes and others. This would likewise foster the capability to see the children earlier and more often, resulting in better clinical outcomes.

One fully ‘technical’ issue that was identified was the need to increase the use of teledentistry. It’s obvious that many small Indian health care programs will never have specialty services on-site, but current technology allows for ready consultation on a wide variety of health issues, both medical and dental.

Last, the group addressed the need to facilitate conversations outside of conferences, such as this symposium. How can we keep the discussion going on between times? How can we incorporate innovative information sharing into IHS Area meetings? This would require that ‘grassroots’ staff make such a request to their chief dental officers so that their needs can be identified and addressed. They would need to provide a justification as to why they wish to bring these issues and possible solutions to the table.

Comments and points to address:
- Where does risk management fit into this scenario?
- How can we better leverage existing ancillary staff, such as community health workers, CHRs, CDHCs and others to carry our message?
- Where are legislators, tribal leaders, and patients represented in this work? We need to bring these folks into our circle sooner than later.
- We need to utilize all the supportive human resources we can. Regarding oral health education, there is a difference among a dietician, grandmother, or health coach going to the grocery store to educate folks on healthy choices. Yet each can be equally as effective in their own way.

**Reimbursement Workgroup**

Realizing the complexity of this issue, this group built on the presentations and discussions from earlier in the meeting.

**Short-Term Policy Recommendations:** (Begin to address the misassumptions)
- Develop economic models around the various practice scenarios that we routinely encounter. Develop a business model/prospectus. Refine the models over time (robust enough to cover all the options). Build an informed conversation with decision makers.
- Look at the existing funding mechanisms to make the most of what is going on already. Despite lots of local regulations, it should be possible to bring the clinics to a higher level of efficiency, both fiscal and clinical.
Long-Term Policy Recommendations: What would it look like if you started from scratch?
- How do you define ‘wellness’ in a value-based system, including quality of life indicators in the measurements? Look beyond the US and see what other countries are doing. What works and what doesn’t.
- Leverage Head Start, Early Head Start and home visitation programs to support our recommendations. Who can do this? Consider the DentaQuest Institute or University business and public health schools as possible levers.

Comments:
- In light of the inefficiencies identified in some of the presentations, we could look to the private sector as one option for increasing efficiency. But the question arises how the social structure of AI/AN communities fits into that model?

CONCLUSION: What have we learned, if anything?\(^{10}\)

As cited at the beginning of this report, by the end of the 2010 ADA-sponsored Symposium on Caries in AI/AN Children, there were two uncontested overarching findings:
1. Young American Indian and Alaska Native (AI/AN) children continue to experience a remarkably high disease burden from dental caries; the dedicated efforts of IHS and tribal dental programs had produced no evidence of any clinically significant progress since the first national IHS oral health survey in 1984.
2. The principal reason behind this lack of progress was that profound knowledge gaps remained for multiple aspects of the issue. In short, the refractory nature of this disease was NOT solely due to poor hygiene and diet, which had long been the prevailing opinion of many, including the IHS Division of Oral Health.

Largely through the efforts of QUEST and colleagues since then, some progress has been made toward eliminating the four knowledge gap categories identified at the 2010 Symposium: Epidemiology, Microbiology, Enamel defects and Effective treatments. At this point, it is incumbent on us to ask specifically what we have learned, if anything, regarding our overall efforts to reduce the burden of disease from dental caries in young AI/AN children. The following list cites both positive and negative findings since 2010, though even the ‘negative’ are highly informative in that they provide very good evidence for what is not efficacious.

What we have learned:
1. Until recently, we knew only from anecdotal reports that ‘the situation is really bad, and not getting better.’ Now, from three populations of AI/AN children using three

\(^{10}\) This is borrowed from the title of an essay by the late Tony Judt, published in the April 13, 2008, issue of the New York Review of Books, in which he reflects on the lessons of the 20\textsuperscript{th} Century.
measurement methods, there is credible evidence of the actual magnitude of the disease burden for AI/AN children from dental caries: a 10,000% disparity in the proportion of AI/AN children who receive treatment for caries under general anesthesia.

2. There is no credible evidence of any clinically significant progress as a result of the 7-year IHS DOH ECC Initiative. In fact, there is fair evidence\(^\text{11}\) from the IHS oral health survey confirming that there has been no overall progress.

3. There is fair evidence from one IHS regional review that a high level of performance on the process measures recommended by the DOH ECC Initiative does not correlate with improved clinical outcomes. In short, modalities that are reported ‘to work’ in some settings have not been efficacious when utilized in the care of AI/AN children.

4. There is strong evidence from well-designed, well-managed clinical trials in AI/AN communities that the recommended strategies, including fluoride varnish, oral health education and motivational interviewing, do not reduce the prevalence or severity of caries in children in AI/AN communities—even under structured research conditions.\(^\text{12}\)

5. There is no evidence of any improvement in clinical outcomes for AI/AN children from the IHS DOH strategy of publishing guidelines or having webinars on interventions such as SN/SDF or Hall crowns. In fact, there is no evidence of the proportion of Indian health dental programs who participate in these sessions that actually change their clinical practice as a result.

6. From Dr. Mendoza’s Warm Springs Model project data,\(^\text{13}\) there is strong evidence that the proportion of children requiring treatment under general anesthesia can be greatly reduced by a community-endorsed and supported medical management approach.

7. Dr. Mendoza’s Warm Springs Model project has also provided strong evidence that despite the progress that can be made from a medical management approach, when the local dental program tries to manage the entire effort alone, an unacceptably high proportion of children still develop severe dental caries requiring invasive restorations. A close and active (as opposed to ‘on paper’) collaboration with the local medical program is now known to be essential to address the underlying causes of the failures.

Viewed from a broader perspective, not only do we now know the above, but perhaps more important we understand the underlying reason for the absence of progress over the last decade: Our approach to caries control in AI/AN children has been largely based on an

\(^\text{11}\) Regardless of whether the findings are positive, negative or neutral, there are concerns about the accuracy of the surveillance data collected.


unhappy combination of wishful thinking and fundamental false assumptions, the most prominent being the following:

1. **Wishful Thinking**: “ECC is getting better,” which has been the official IHS Division of Oral Health position for years, but without any credible evidence to support the statement. In fact, the data collected by IHS itself has been to the contrary, and IHS pediatric dentists with decades of experience are of the same opinion: “Nothing has changed.” Unfortunately, as long as the situation is officially being reported as ‘getting better,’ and there is no mention of the incredibly high disparity for very severe caries in young AI/AN children, there is little organizational incentive to change the approach.

2. **False Assumption #1**: That implementing the usually recommended strategies for caries control in children will yield improvement. The fallacy of this assumption is best demonstrated by the above-cited high quality clinical research in AI/AN communities that was designed to reduce the prevalence and severity of caries in children, but which found no clinically significant benefit to the children.

3. **False Assumption #2**: That caries in children is a “dental disease” that needs to be addressed by the dental program. Continuing to have this attitude is a guarantee of yet more decades of failure. Indian health care medical programs need to become fully integrated with the effort. A tribally-operated health care program in the Southwest is currently implementing a highly promising model of a medical-dental collaboration which includes locating an RDH in the pediatric clinic. This has the potential to greatly improve early diagnosis, to facilitate early initiation of non-invasive treatment, and to support effective tracking and recall of the children.

In summary, despite the absence of widespread progress, at least now we have a much better understanding of why no progress has been made. We likewise understand both the great potential and the limitations of a medical management approach. The critical question is whether we, the health care system providing services to these children, and other interested oral health stakeholders will utilize the knowledge and tools we have in a coordinated, sustained and efficacious manner that is ‘in the best interests of the child.’

**EDITORIAL NOTE**: Based on all the findings of this report and observations above, below are several recommended specific steps, activities and strategies that QUEST believes hold the most (only?) promise for widespread clinically significant improvement in the foreseeable future. The recommendations are presented in two categories: (A) for local programs\(^\text{14}\) or (B) academic investigation or institutional projects. All of the below need to be approached through full and open communication with the tribal communities served. In the experience of the multiple programs QUEST has supported over the last five years, when issues are presented in this way, the communities are nearly always amenable.

\(^{14}\) Based on the expected continued lack of leadership by the IHS Division of Oral Health, it will be up to local programs to do this themselves using outside consultants as needed and as available.
The below recommendations are not intended to suggest that the standard recommended primary prevention strategies, even though they have not been found efficacious, should be abandoned by Indian health care programs. A salutary diet and oral hygiene are always the starting point for caries control in children, and are likely to augment the effectiveness of other strategies. However, the reality is that when primary prevention fails—as it almost always does for the children in some Al/AN communities—a safe, effective, feasible and non-traumatic secondary prevention is needed. Previously that was not available. Now it is.

A: Recommendations for local Indian health programs

1. Each Indian health care program needs to implement a system to document the community-specific prevalence and severity of dental caries among young children in order to determine the level of urgency to adopt a different approach. If the program doesn’t recognize there is a problem, there is little incentive to change. Various metrics could be useful, but perhaps the easiest will be to assess the disparity for children receiving treatment under general anesthesia for dental caries. The published all races rate\(^{15}\) is ~3/1000 children age 1–6, and (just as an example) any disparity >300% higher than this rate (i.e., about 1/100) higher might be considered strong justification for action. An experienced-based ‘guestimate’ is that this criterion would qualify about 90% of all Al/AN communities.

2. Each local program needs to begin to think of caries as a serious ‘health problem’ for children rather than a ‘dental disease’ that needs to be addressed by the local dental program. As a ‘serious health problem for children,’ the medical care services program will necessarily need to be substantially involved. Given that in many Al/AN communities the medical and dental programs are housed in the same facility, a close collaboration is likely to be much easier than in many private sector settings.

3. Each program needs to have a structured approach to address the major underlying causes of progression to severe disease that affect even the rare successful program, such as Warm Springs. Now that we have Al/AN-specific data showing the potential effectiveness of medical management in caries arrest, we need for the following:
   a. Early identification of incipient disease long before it becomes symptomatic.
   b. Early initiation of a medical management approach even before there is substantial structural tooth damage (i.e., a ‘cavity’).
   c. Effective tracking and recall for all children who enter the medical management protocol.

4. Each program needs an on-going realtime capability to assess the success of families in following the recommended treatment and exam schedule. The Warm Springs

Model Project has shown that with the available software, this can be done even in a busy clinical practice setting. The result may be disappointing, as several of the Project sites were surprised to find that only a minority of children started on the protocol had even a 1-year follow-up exam. Even fewer had any documentation of their oral health status after the first year, and thus the long-range level effectiveness is unknown.

5. Each program needs to have a simple, user-friendly capability for electronic communication between the dental and medical staffs concerning children receiving medical management of caries. In this way, medical program staff can easily be notified when a child is delinquent for a follow-up treatment or follow-up exam in the dental program. Through the support of QUEST, a prototype for this has been already been developed and implemented at Warm Springs. This system of routine identification of children due for follow-up treatments or exams is conceptually identical to the system used throughout IHS for maintaining high levels of up-to-date status for the complex schedule of childhood immunizations.

**B: Academic institutions or other institutional projects**

1. Similarly, there is a critical need for the earliest possible identification of initiation of caries in young children. It is hard to imagine a single pediatric disease that is easier to treat in an advanced stage. Early diagnosis means easier, more effective and less expensive treatment. The gold standard for caries classification (ICDAS) defines 2 separate stages of early caries development that can potentially be diagnosed prior to the onset of cavitation. Unfortunately, neither of these can be reliably diagnosed in a clinical setting, even by trained dentists. As a result of the careful clinical observations of the Indian health dentists who participated in the Warm Springs Model project, there is now good reason to be that the earliest pre-clinical stage of caries in the primary dentition can be identified by application of a dilute solution of Ag⁺. (See the report by Dr. Mike Kanellis on page 25 of these proceedings above, and the visual presentation ‘ICODEN’ posted on the cited ADA website.)

The actual concentration of Ag⁺ that would be needed for use in clinical practice needs to be defined, but there is some preliminary in vitro data showing that carious surfaces of teeth immersed in a very low concentration Ag⁺ solution (0.75%) will show the characteristic dark stain. Ideally, once the minimal effective concentration has been identified, a combined low concentration Ag⁺/fluoride varnish product could be made which could be applied in non-dental clinic settings at intervals by non-dentists, including even medical staff or trained community health workers. If efficacious at the community level, this could readily identify the children at the earliest possible stage, and perhaps even provide some therapeutic effect as well. And through unaccustomed serendipity, it turns out that many of the highest risk young children are easily identified and accessed in small minority communities.
2. Likewise, there is a critical need for a practical algorithm for community-level dental and medical staff to use to determine the therapeutic approach that will be ‘in the best interests of the child’ for children who present to the clinic with cavitated caries. Despite the 815 published reports of research on the effective of SDF for caries control (Gao 2016), experts in this field (Cheng 2017, and the ADA Council on Scientific Affairs) have concluded that, in effect, we still do not know how to use this product in clinical practice.

In Indian health care programs for children, the situation is complicated by the very early onset and rapid progression of disease, plus a high rate of failed appointments. Thus, the algorithm needs to consider not just medical management per se but also use of ‘Hall crowns,’ which seem to offer a longer-term benefit for selected teeth in selected children. Many Indian health general dentists are not very comfortable treating young children in the first place and would likely be even less comfortable using a new treatment like Hall crowns. Thus, a training site needs to be established at which Indian health care dentists can observe the process and talk directly to the dentists using Hall crowns and the parents and children. Last, once adopted, each site needs to be able to evaluate the success of this decision tree algorithm in terms of the compliance with the protocol and the clinical outcomes.
### APPENDIX A: Agenda

**Day #1: Friday, November 17, 2017**

<table>
<thead>
<tr>
<th>Time</th>
<th>Item</th>
<th>Leader/Presenter</th>
</tr>
</thead>
<tbody>
<tr>
<td>8:00</td>
<td>Welcome and Introductions; review of Symposium purpose, agenda and expected outcomes</td>
<td>Robertson, Blahut</td>
</tr>
<tr>
<td>8:30</td>
<td>Keynote Address: “In the Best Interests of the Child”</td>
<td>Weyant</td>
</tr>
<tr>
<td>9:00</td>
<td><strong>Breakout session #1</strong></td>
<td></td>
</tr>
<tr>
<td>9:00</td>
<td><strong>Group A: Local dental program staff and academic researchers</strong></td>
<td></td>
</tr>
<tr>
<td>9:00</td>
<td>Clinical treatment planning exercise: Develop treatment plans for four common scenarios of children with caries, with the primary focus being what is “in the best interests of the child”</td>
<td>Blahut, Kanellis</td>
</tr>
<tr>
<td>10:00</td>
<td>Break</td>
<td></td>
</tr>
<tr>
<td>10:15</td>
<td>Discussion and preparation of consensus opinions on the preferred treatment approaches for children with different caries presentations</td>
<td></td>
</tr>
<tr>
<td>9:00</td>
<td><strong>Group B: Non-clinical participants</strong></td>
<td></td>
</tr>
<tr>
<td>9:00</td>
<td>Perspectives on the drivers and limitations of our current approach to children at high risk for severe caries; identification of opportunities for programmatic changes in our goals, objectives and methods.</td>
<td>Monopoli, Robertson, Koday, Norris, Silk, Thomas</td>
</tr>
<tr>
<td>10:30</td>
<td>Break</td>
<td></td>
</tr>
<tr>
<td>10:45</td>
<td>Resume presentations</td>
<td></td>
</tr>
<tr>
<td>11:30</td>
<td>Utilize information from the presentations to develop a set of issues to be discussed in the categorical breakouts on day #2.</td>
<td></td>
</tr>
</tbody>
</table>

**Friday p.m.**

<table>
<thead>
<tr>
<th>Plenary session</th>
<th></th>
<th>Leader/Presenter</th>
</tr>
</thead>
<tbody>
<tr>
<td>1:00</td>
<td>Introduction of afternoon sessions</td>
<td>Robertson</td>
</tr>
<tr>
<td>1:15</td>
<td>Reports of recent basic and clinical research that inform the use of innovative approaches for the treatment of caries in high risk children</td>
<td>- Dabiri, - Innes, - Chi, - Warren, - Owais, - Kanellis</td>
</tr>
<tr>
<td>3:15</td>
<td>Break</td>
<td></td>
</tr>
<tr>
<td>3:30</td>
<td>Outcomes of innovative Indian health care clinical practice projects</td>
<td>- Hort, - Drockton, - Huber, - Blahut</td>
</tr>
<tr>
<td>4:30</td>
<td>Systems issues impeding progress at the local level</td>
<td>Robertson</td>
</tr>
<tr>
<td>5:00</td>
<td>Adjourn</td>
<td></td>
</tr>
</tbody>
</table>
### Agenda (continued)

#### Day #2: Saturday, November 18, 2017 (plenary)

<table>
<thead>
<tr>
<th>Time</th>
<th>Item</th>
<th>Leader/Presenter</th>
</tr>
</thead>
<tbody>
<tr>
<td>8:00</td>
<td>Review agenda and goals for the day</td>
<td>Robertson</td>
</tr>
<tr>
<td>8:15</td>
<td>Summary of key issues from Day #1</td>
<td>Blahut Marianos</td>
</tr>
<tr>
<td>8:30</td>
<td>Projects of the DentaQuest Foundation and Institute relevant to the mission and activities of QUEST</td>
<td>Hannon</td>
</tr>
<tr>
<td>9:00</td>
<td><strong>Breakout session #2: Identify and prioritize issues by topical area that will inform policy development for reducing oral health disparities for AI/AN children</strong></td>
<td>Monopoli</td>
</tr>
<tr>
<td></td>
<td>A. Infrastructure: workforce, facilities, training, collaborations</td>
<td>Huber</td>
</tr>
<tr>
<td></td>
<td>B. Metrics, data &amp; reporting</td>
<td>Kanellis</td>
</tr>
<tr>
<td></td>
<td>C. Technical clinical issues, including feasibility and generalizeability</td>
<td>Blahut</td>
</tr>
<tr>
<td></td>
<td>D. Regulatory: State dental boards, DHHS, ADA, AAPD, AAPHD</td>
<td>Koday</td>
</tr>
<tr>
<td></td>
<td>E. Reimbursement and funding</td>
<td>Eichmiller</td>
</tr>
<tr>
<td>10:00</td>
<td>Break</td>
<td></td>
</tr>
<tr>
<td>10:15</td>
<td>Resume breakout groups</td>
<td></td>
</tr>
</tbody>
</table>

#### Saturday p.m.

<table>
<thead>
<tr>
<th>Time</th>
<th>Item</th>
<th>Leader/Presenter</th>
</tr>
</thead>
<tbody>
<tr>
<td>1:00</td>
<td><strong>Breakout session #3: Develop actionable policy recommendations for each topical area</strong></td>
<td>Monopoli</td>
</tr>
<tr>
<td></td>
<td>A. Infrastructure: Workforce, facilities, training, collaborations</td>
<td>Huber</td>
</tr>
<tr>
<td></td>
<td>B. Metrics, data &amp; reporting</td>
<td>Kanellis</td>
</tr>
<tr>
<td></td>
<td>C. Technical clinical issues, including feasibility and generalizeability</td>
<td>Blahut</td>
</tr>
<tr>
<td></td>
<td>D. Regulatory: State dental boards, DHHS, ADA, AAPD, AAPHD</td>
<td>Koday</td>
</tr>
<tr>
<td></td>
<td>E. Reimbursement and funding</td>
<td>Eichmiller</td>
</tr>
<tr>
<td>2:30</td>
<td>Break</td>
<td></td>
</tr>
<tr>
<td>2:45</td>
<td>Resume breakout groups</td>
<td></td>
</tr>
</tbody>
</table>

#### Plenary session

<table>
<thead>
<tr>
<th>Time</th>
<th>Item</th>
<th>Leader/Presenter</th>
</tr>
</thead>
<tbody>
<tr>
<td>4:00</td>
<td>Reports from breakout sessions</td>
<td>Robertson</td>
</tr>
<tr>
<td>5:00</td>
<td>Adjourn</td>
<td></td>
</tr>
</tbody>
</table>
# APPENDIX B: Participants

<table>
<thead>
<tr>
<th>Participants</th>
<th>Institution/Title</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lorie Becker, RDH, MS</td>
<td>Health Promotion and Disease Prevention, Ft. Peck Tribes, Helena &amp; Poplar, MT</td>
</tr>
<tr>
<td>Patrick Blahut, DDS, MPH</td>
<td>Private Consultant, QUEST, Newville, PA</td>
</tr>
<tr>
<td>Lisa Bozetti, DDS</td>
<td>Dental Director, Virginia Garcia Memorial Health Center, Portland, OR</td>
</tr>
<tr>
<td>Donald Chi, DDS, PhD</td>
<td>Associate Professor, School of Dentistry, University of Washington, Seattle, WA</td>
</tr>
<tr>
<td>Chandice Covington, PhD, RN</td>
<td>Director of Clinical Nursing Research, Fort Peck Tribe, Poplar, MT</td>
</tr>
<tr>
<td>Darya Dabiri, DMD, MS</td>
<td>Fellow, Dept. of Anesthesiology, University of Michigan School of Medicine, Ann Arbor, MI</td>
</tr>
<tr>
<td>Stephen Davis, DDS</td>
<td>Dental Director, Yakima Valley Farmworkers Clinic, Yakima, WA</td>
</tr>
<tr>
<td>Sean Davis, DDS</td>
<td>Dental Director, Yukon-Kuskokwim Health Corp., Bethel, AK</td>
</tr>
<tr>
<td>David Drockton, DDS</td>
<td>Dental Director, Sault Tribal Dental Program, Sault Ste. Marie, MI</td>
</tr>
<tr>
<td>Fred Eichmiller, DDS</td>
<td>VP for Science, Delta Dental of Wisconsin, Stevens Point, WI</td>
</tr>
<tr>
<td>Steve Geiermann, DDS</td>
<td>Manager, Council on Advocacy for Access and Prevention, American Dental Association, Chicago, IL</td>
</tr>
<tr>
<td>Jane Grover, DDS, MPH</td>
<td>Director, Council on Advocacy for Access and Prevention, American Dental Association, Chicago, IL</td>
</tr>
<tr>
<td>Cindy Hannon, MSW</td>
<td>Manager of Quality Improvement, DentaQuest Institute, Westborough, MA</td>
</tr>
<tr>
<td>Kim Hort, DDS</td>
<td>Pediatric Dentist, SEARHC, Alaska, Juneau, AK</td>
</tr>
<tr>
<td>Dan Huber, DDS</td>
<td>Area Dental Officer, Phoenix Area IHS, Phoenix, AZ</td>
</tr>
<tr>
<td>Nicola Innes, PhD, BDS, BSc</td>
<td>Professor of Paediatric Dentistry, University of Dundee, Dundee, Scotland</td>
</tr>
<tr>
<td>Mary Beth Johnson, DDS, MPH</td>
<td>Pediatric Dentist, Tuba City Regional Health Care, Tuba City, AZ</td>
</tr>
<tr>
<td>Mike Kanellis, DDS, MS</td>
<td>Associate Dean, Pediatric Dentistry, Univ. Iowa College of Dentistry, Iowa City, IA</td>
</tr>
</tbody>
</table>
## Participants

<table>
<thead>
<tr>
<th>Name</th>
<th>Title/Position</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mark Koday, DDS</td>
<td>Chief Dental Officer, Yakima Valley Farm Workers, Yakima, WA</td>
</tr>
<tr>
<td>Don Marianos, DDS, MPH</td>
<td>Private Consultant, QUEST, Board of Directors, Pinetop, AZ</td>
</tr>
<tr>
<td>Yadira Martinez, RDH</td>
<td>Lead Hygienist, Virginia Garcia Memorial Health Center, Portland, OR</td>
</tr>
<tr>
<td>Mike Monopoli, DMD, MPH</td>
<td>Executive Director, DentaQuest Foundation, Boston, MA</td>
</tr>
<tr>
<td>Heshmat Mortezavi, DDS</td>
<td>Chief Dental Officer, Tohono O'Odham Nation Health Care, Tucson, AZ</td>
</tr>
<tr>
<td>Laurie Norris, MA, MS, JD</td>
<td>Private Consultant, Rockville, MD</td>
</tr>
<tr>
<td>Nance Orsbon</td>
<td>Vice President for Professional Relations, Delta Dental of South Dakota, Pierre, SD</td>
</tr>
<tr>
<td>Arwa Owais, BDS, MS</td>
<td>Associate Professor, Univ. of Iowa College of Dentistry, Iowa City, IA</td>
</tr>
<tr>
<td>Dee Robertson, MD, MPH</td>
<td>President, QUEST, White Salmon, WA</td>
</tr>
<tr>
<td>Megan Sapp, DDS</td>
<td>Lead Dentist, Virginia Garcia Memorial Health Center, Portland, OR</td>
</tr>
<tr>
<td>Hugh Silk, MD, MPH</td>
<td>Professor, Family Medicine &amp; Community Health, Univ. Mass. Medical School, Boston, MA</td>
</tr>
<tr>
<td>Chris Swisher, DDS</td>
<td>Private Pediatric Dentist, Hood River, OR</td>
</tr>
<tr>
<td>Andrew Terranella, MD, MPH</td>
<td>Clinical Director, Tohono O'Odham Nation Health Care, Tucson, AZ</td>
</tr>
<tr>
<td>Tim Thomas, MD, MPH</td>
<td>Medical Epidemiologist, Alaska Native Tribal Health Corp., Anchorage, AK</td>
</tr>
<tr>
<td>Rodrigo Villar, MD</td>
<td>Pediatrician and Public Health Officer, Tohono O'Odham Nation Health Care, Tucson, AZ</td>
</tr>
<tr>
<td>John Warren, DDS, MS</td>
<td>Professor, Dept. of Preventive &amp; Community Dentistry, Univ. of Iowa College of Dentistry, Iowa City, IA</td>
</tr>
<tr>
<td>Bob Weyant, DMD, DrPH</td>
<td>Professor and Chair, Dept. of Dental Public Health, Univ. Pittsburg School Dental Medicine, Pittsburg, PA</td>
</tr>
<tr>
<td>Tim Wright, DDS, MS</td>
<td>Professor and Chair, Dept. of Pediatric Dentistry, Univ. North Carolina School of Dentistry, Chapel Hill, NC</td>
</tr>
<tr>
<td>Al Yee, MD, MPH</td>
<td>Program Advisor, DentaQuest Foundation, Boston, MA</td>
</tr>
</tbody>
</table>