Drivers and Limitations of Our Current Approach to Children with Caries

Dee Robertson
‘In the Best Interests of the Child’

Reminder #1: Every session and every discussion will come back to the theme of this Symposium: ‘In the best interests of the child’

Reminder #2: We are focused on solutions that promise value for very high risk children, like AI/AN and other minorities.

Reminder #3: You will probably need to stretch your mind a bit to accommodate some of the data and ideas presented.
Where Do We Start?

Let’s Start with the “Three Biggies”

**Biggie #1:** Is the magnitude of the problem as bad as I have said and keep on saying?

**Biggie #2:** If so, why is it so bad?

**Biggie #3:** Why have we made virtually no progress over the last decade? 3 decades?
Biggie #1

Is there really a 10,000% disparity in GA cases for AI/AN Children?
Biggie #2

Why is it so bad?
- This is a complex, multi-factorial, multi-layered disease process.
- It is absolutely influenced by poverty, social norms, diet, and unique environment that many AI/AN live in.
- That does absolutely not imply there is nothing we can do for these children.
Biggie #3

Why we haven’t made progress is relatively simple:

We have been approaching it in the wrong ways.
Dental Caries in Young Children:
What Are Our Overarching Goals?

1. Keep the children free of pain from:
   - the disease itself (PUFA*).
   - close encounters of the wrong kind with their dentist

2. Keep the primary dentition in the mouth until natural exfoliation.

* Pulpitis, ulceration, fistula or abscess
What Are the Currently Recommended Caries Control (aka ‘prevention’) Strategies?

And What Do We Know About How Effective Are They:
- In the published research?
- In the real world?
Risk Assessment

• I’m a physician. I’m all about risk assessment.

• What do we know about the effectiveness caries risk assessment tools in clinical practice?

  3 underlying assumptions:
  1. ???
  2. ???
  3. ???
Access to Care

• As a physician, I’m all about access to care.
• I’m even more about ‘accessing care.’
• For AI/AN children, unlimited access to highly expert pediatric dental care at no cost reduces the rate of untreated caries... but not necessarily the prevalence or severity of the disease.
Community Water Fluoridation

• I’m all for community water fluoridation.

• After I created the FIP* in the mid-1980s, there were 22 tribal communities successfully fluoridating their water systems 2 years later.

• But there was no clinical evidence of any improvement in the children two years later.

* Fluoride incentive program
Fluoride Varnish

• In the mid-1990s, I implemented a performance objective that each AI/AN child in the Northwest region receive fluoride varnish quarterly.
• In 2002 at the first International Indigenous Children’s Conference I arranged a training for pediatricians to apply it.
• It even became a ‘GPRA’ objective for IHS.
• After >20 years there has never been any evidence it makes any difference in prevalence or severity of caries in AI/AN children.
It All Started Here...

**RESEARCH REPORTS**

**Clinical**


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“Our objective...was to determine the efficacy of different fluoride varnish application frequencies...in preventing early childhood caries incidence”

“Inclusion criteria for children at enrollment were: all primary teeth caries-free without demineralized, white spots; age 6-44 mo. (mean = 20). Two years later: no FV dmfs=1.7 vs 2 FV=0.7) (effect size: 1 surface fewer)

At 40 months of age, the no FV group mean dmfs was 1.7”

DISCUSSION

“Study findings support the use of fluoride varnish to [1] prevent early childhood caries and [2] reduce caries increment in ... vulnerable and minority populations. [Our] findings are more generalizable to high-caries-risk children than other potential locations.”
After 36 months, **34.2% of the children in each group** had cavitated caries incidence (d2+fs > 0); (P = 1.000)

“Importantly, our prior study...excluded children with caries at baseline when they were 6–44 months old whereas this study...included children at even higher risk than our previous study.”

cited by 25
The intervention included both the application of FV for the children and OHP activities for children and caregivers four times each school year for 3 years.
Culturally Appropriate Interventions by Local Community Members

• The intervention included both the application of FV for the children and OHP activities for children and caregivers four times each school year for 3 years.
What Is High Risk?

Mean dmfs: Navajo Head Start CBPR Study vs Iowa WIC Study Children

Same as Weintraub control group end of study
Motivational Interviewing Study

“Despite implementing a highly personalized intervention, initial results show no treatment effects when dmfs scores are compared for children in the 2 treatment groups.”
A randomised controlled trial to measure the effects and costs of a dental caries prevention regime for young children attending primary care dental services: the Northern Ireland Caries Prevention In Practice (NIC-PIP) trial

Martin Tickle, Ciaran O’Neill, Michael Donaldson, Stephen Birch, Solveig Noble, Seamus Killough, Lynn Murphy, Margaret Greer, Julie Brodison, Rejina Verghis and Helen V Worthington
It All Ended Here...

- **Participants**: The study participants were children aged 2–3 years [24-47 months old], who were caries free at baseline.
- **Interventions**: The intervention was composite in nature, twice a year fluoride varnish, toothbrush and toothpaste.
- **Conclusions**: A statistically significant effect could not be demonstrated for the primary outcome [conversion to caries active].
- There was a statistically significant difference in dmfs in caries-active children in favour of the intervention.
- Although adequately powered, the effect size of the intervention was small and of questionable clinical and economic benefit.
- **Future work**: Interventions designed to arrest the disease once it is established need to be developed and tested in practice.
Are We the Only Ones Worshipping False Gods?
‘Unbelievable’: Heart Stents Fail to Ease Chest Pain

A procedure used to relieve chest pain in hundreds of thousands of heart patients each year is useless for many of them, researchers reported on Wednesday.
The Three Biggies

Biggie #1: Is the magnitude of the problem as bad as I have said and keep on saying?

Biggie #2: If so, why is it so bad?

Biggie #3: Why have we made virtually no progress over the last decade? 3 decades?
Alex, today I’d like to start with false assumptions for $5000...

F.A. #1: Caries in children is a preventable disease.

In contrast, morbidity from caries in children is largely preventable.
Alex, today I’d like to start with false assumptions for $5000...

F.A. #2: Primary prevention is always the best strategy (all about ROI return on investment)
Alex, today I’d like to start with false assumptions for $5000...

F.A. #3: Caries in the primary dentition is a dental disease... that must be managed by dental programs
So Where Do We Go from Here?
Who is this man, and why is he laughing?

1. Jack Kilby
2. In 2000 he won the Nobel Prize for the ‘integrated circuit’ (aka, the microchip)
Jack Kilby’s Approach to Problem Solving

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

2. Define clearly the part of the problem you want to address (Subtitle: be careful you don’t try to solve the wrong problem).

3. “Tune out all the obvious solutions”
Our Problem To Be Solved

• The 10,000% Disparity in GA cases
• All the obvious solutions have been tried, and have failed.
• Why...
• And what can we do differently?
So Let’s Step Back and Look at the Elements of the Issue

1. This disease starts very early in life for AI/AN children. (How early – see Warren)

2. But the primary dentition exfoliates, meaning we don’t need a permanent solution.

3. Our primary goals are to avoid morbidity – not necessarily prevent all disease.

4. Our efforts have been almost entirely toward:
   - Primary prevention (diet, hygiene, CWS, FV)
   - Operative restorations when this fails.

5. Given this, what would an ideal strategy look like?
To Avoid Morbidity We’d Need...

1. Early and consistent access to the children.
2. The capability to identify the children at the earliest stage of the disease.
3. A tracking and recall system equivalent to the IHS children’s immunization program.
4. And most important...
An atraumatic, safe, effective, feasible and acceptable to parents secondary prevention:

- Agent
- Strategy
Your mission, Jim, will be to develop recommendations to address the technical, workforce, reimbursement, and metrics to achieve this...
Thank you...
Thank you...