Oral Health and Malnutrition in Nursing Homes: Findings from the Minimum Data Set Resident Assessment Instrument

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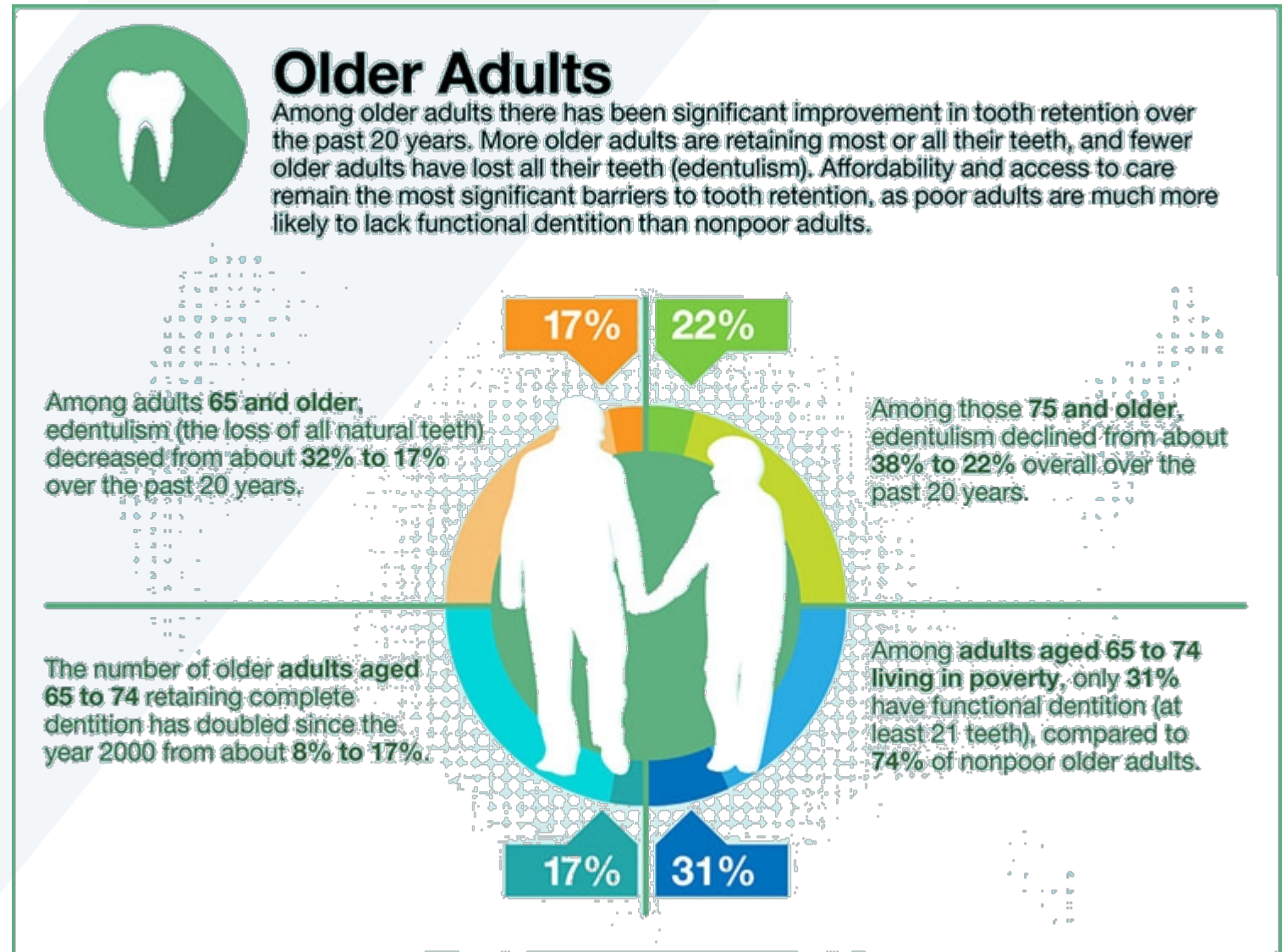Harvard School of Dental Medicine

National Center for Equitable Care for Elders

2021-2022 Health and Aging Policy Fellow

Oral Health and Older Adults

- Prevention of pain and suffering
- Adequate nutrition
- Systemic health
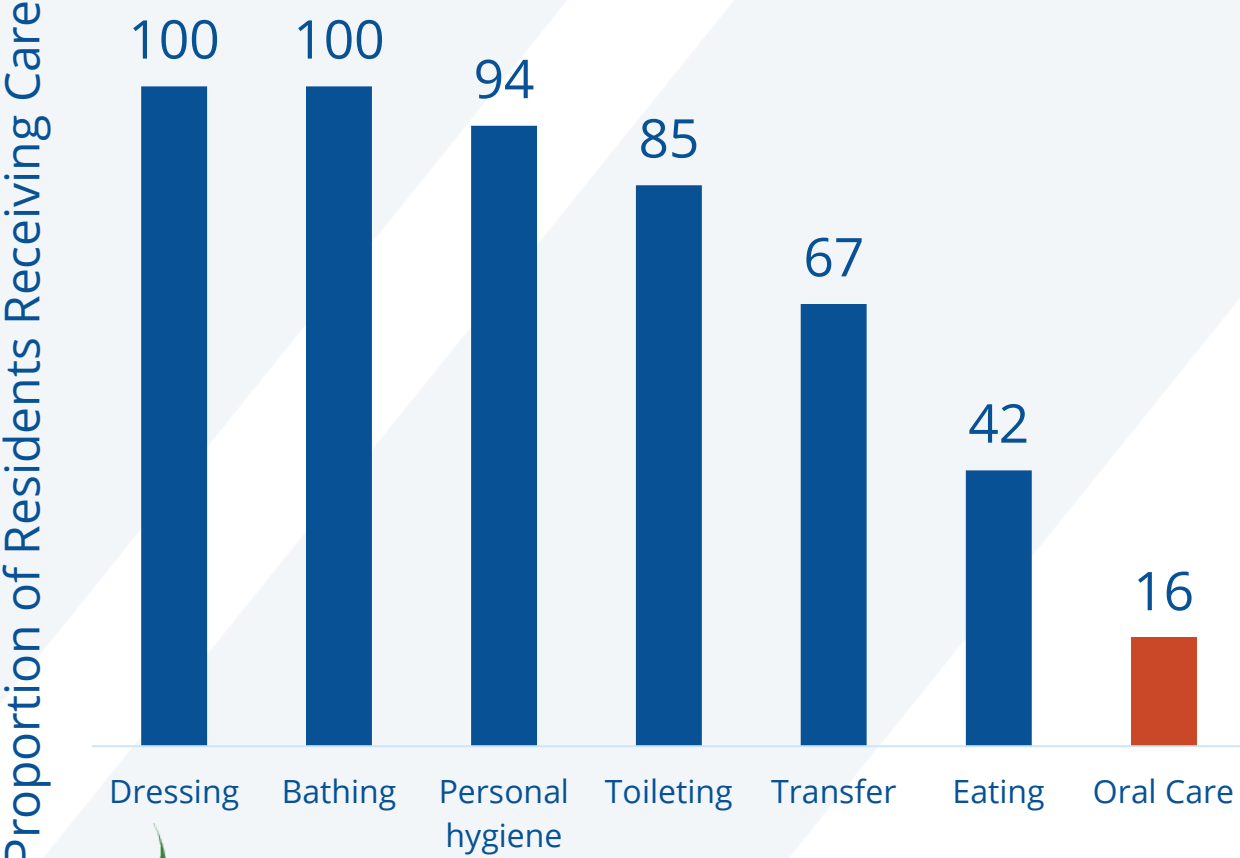- Quality of Life
- Communication
- Socialization and much more…

Older Adults

Among older adults there has been significant improvement in tooth retention over the past 20 years. More older adults are retaining most or all their teeth, and fewer older adults have lost all their teeth (edentulism). Affordability and access to care remain the most significant barriers to tooth retention, as poor adults are much more likely to lack functional dentition than nonpoor adults.

17% Among adults **65 and older**, edentulism (the loss of all natural teeth) decreased from about **32% to 17%** over the past 20 years.

22% Among those **75 and older**, edentulism declined from about **38% to 22%** overall over the past 20 years.

17% The number of older **adults aged 65 to 74** retaining complete dentition has doubled since the year 2000 from about **8% to 17%**.

31% Among **adults aged 65 to 74 living in poverty**, only **31%** have functional dentition (at least 21 teeth), compared to **74%** of nonpoor older adults.

Source: NIDCR (2021) Oral Health in America: Advances and Challenges

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Oral Care Provided by Certified Nursing Assistants in Nursing Homes

Proportion of Residents Receiving Care

Category	Value
Dressing	100
Bathing	100
Personal hygiene	94
Toileting	85
Transfer	67
Eating	42
Oral Care	16

Source: Coleman and Watson J Am Geriatr Soc 2006

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Study Objectives

To assess the oral health status of Medicare and dually-eligible (Medicare and Medicaid enrolled) beneficiaries residing in nursing homes and evaluate the relationship between poor oral health and malnutrition.

Chamut, Shoff, Yao, Fleisher, and Chalmers, 2023 Manuscript in preparation

Methods

- MDS 3.0 Nursing home assessments performed in 2020
- 2.5 million Medicare and dually-eligible beneficiaries
- Six dental problems derived from the MDS 3.0
  - broken or loosely fitting full or partial denture (chipped, cracked, uncleanable, or loose)
  - no natural teeth or tooth fragment(s) (edentulous)
  - abnormal mouth tissue (ulcers, masses, oral lesions, including under denture or partial if one is worn);
  - obvious or likely cavity or broken natural teeth;
  - inflamed or bleeding gums or loose natural teeth;
  - mouth or facial pain, discomfort or difficulty with chewing.
- Malnutrition - diagnosis in the last seven days (protein or calorie) or at risk for malnutrition

Prevalence of Dental Issues and Malnutrition

- 26% beneficiaries had at least one dental problem
- The most prevalent dental problem was no natural teeth or tooth fragments (rate of 175.10 per 1,000 residents), followed by cavities or broken natural teeth (rate of 72.89 per 1,000)
- 16% experienced malnutrition

Chamut, Shoff, Yao, Fleisher, and Chalmers, 2023 Manuscript in preparation

Dental Problem Prevalence by Race/Ethnicity, Rate per 1,000 Nursing Home Residents

Cavity or broken natural teeth
- 104.35
- 69.15
- 66.18
- 73.42
- 84.85
- 71.14
- 72.89

No Natural Teeth or Tooth Fragments
- 251.03
- 147.25
- 155.71
- 127.39
- 182.44
- 176.73
- 175.1

Abnormal Mouth Tissue (ulcers, masses, lesions)
- 2.59
- 1.44
- 2.66
- 2.28
- 1.4
- 2.2
- 2.06

Broken or Loosely Fitting Dentures
- 13.28
- 7.97
- 6.68
- 7.48
- 7.23
- 10.21
- 9.61

Pain, Discomfort, Difficulty Chewing
- 14.92
- 10.94
- 9.18
- 10.02
- 8.44
- 11.2
- 10.79

Inflamed or Bleeding Gums or Loose Teeth
- 3.71
- 2.11
- 2.84
- 2.66
- 2.26
- 2.11
- 2.15

Legend:
- Non-Hispanic AI/AN
- Non-Hispanic A/PI
- Non-Hispanic Black
- Hispanic
- Non-Hispanic/Other race
- Non-Hispanic White
- Overall

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Multilevel Logistic Regression Model Predicting the Odds of Experiencing Any Dental Problem among Medicare Beneficiaries in Nursing Homes (N=2,355,366)

Decreased Odds	
Age Group (Ref. Age 85 and older)	
42%	Less than 65
21%	Age 65 to 74
11%	Age 75 to 84
Sex (Ref. Male)	
14%	Female
Race and Ethnicity (Ref. Non-Hispanic White)	
13%	Non-Hispanic other race
Medicare Program (Ref. Medicare Advantage)	
3%	Fee-for-Service

Increased Odds	
Race and Ethnicity (Ref. Non-Hispanic White)	
16%	Non-Hispanic Black
7%	Non-Hispanic Asian/Pacific Islanders
34%	Non-Hispanic American Indian/Alaskan Native
Dual eligibility status (Ref. Medicare only)	
74%	Medicare and Medicaid
Alzheimer's disease or dementia (Ref. Not diagnosed)	
6%	Diagnosed
Chronic medical condition (Ref. 0 conditions)	
3%	1 condition
17%	2 conditions
35%	3 or more conditions
Mental disorder diagnosis (Ref. 0 mental disorders)	
2%	1 mental disorder
9%	2 or more disorders
Designation of nursing home (Ref. Urban)	
88%	Rural

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Multilevel Logistic Regression Model Predicting the Odds of Experiencing Malnutrition among Medicare Beneficiaries in Nursing Homes (N=2,355,366)

Decreased Odds
Age Group (Ref. Age 75 and older)
7%   Age Less than 65
Sex (Ref. Male)
8%   Female
Dual eligibility status (Ref. Medicare only)
28%   Medicare and Medicaid
Chronic medical condition (Ref. 0 conditions)
13%   1 condition
8%   2 conditions
3%   3 or more conditions
Mental disorder diagnosis (Ref. 0 mental disorders)
3%   1 mental disorder
9%   2 or more disorders
Designation of nursing home (Ref. Urban)
43%   Rural
Dental problem (Ref. No problem)
10%   Inflamed or bleeding gums or loose teeth

Increased Odds
Race and Ethnicity (Ref. NH-White)
14%   Non-Hispanic Black
10%   Non-Hispanic Other Race
23%   Non-Hispanic Asian/Pacific Islanders
5%   Hispanic
16%   Non-Hispanic American Indian/Alaskan Native
Medicare Program (Ref. Medicare Advantage)
37%   Fee-for-Service
Alzheimer's disease or dementia (Ref. Not diagnosed)
9%   Diagnosed
Dental problem (Ref. No problem)
24%   Broken or loosely fitting dentures
19%   No natural teeth or tooth fragments
56%   Abnormal mouth tissue
20%   Cavity or broken natural teeth
64%   Pain, discomfort, difficulty chewing

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Summary

- A substantial number of nursing home residents experience oral health problems and malnutrition.

- The findings of this study strongly suggest that poor oral health increases the risk of experiencing malnutrition.

"You're Not Healthy Without Good Oral Health."
   - Surgeon General C. Everett Koop
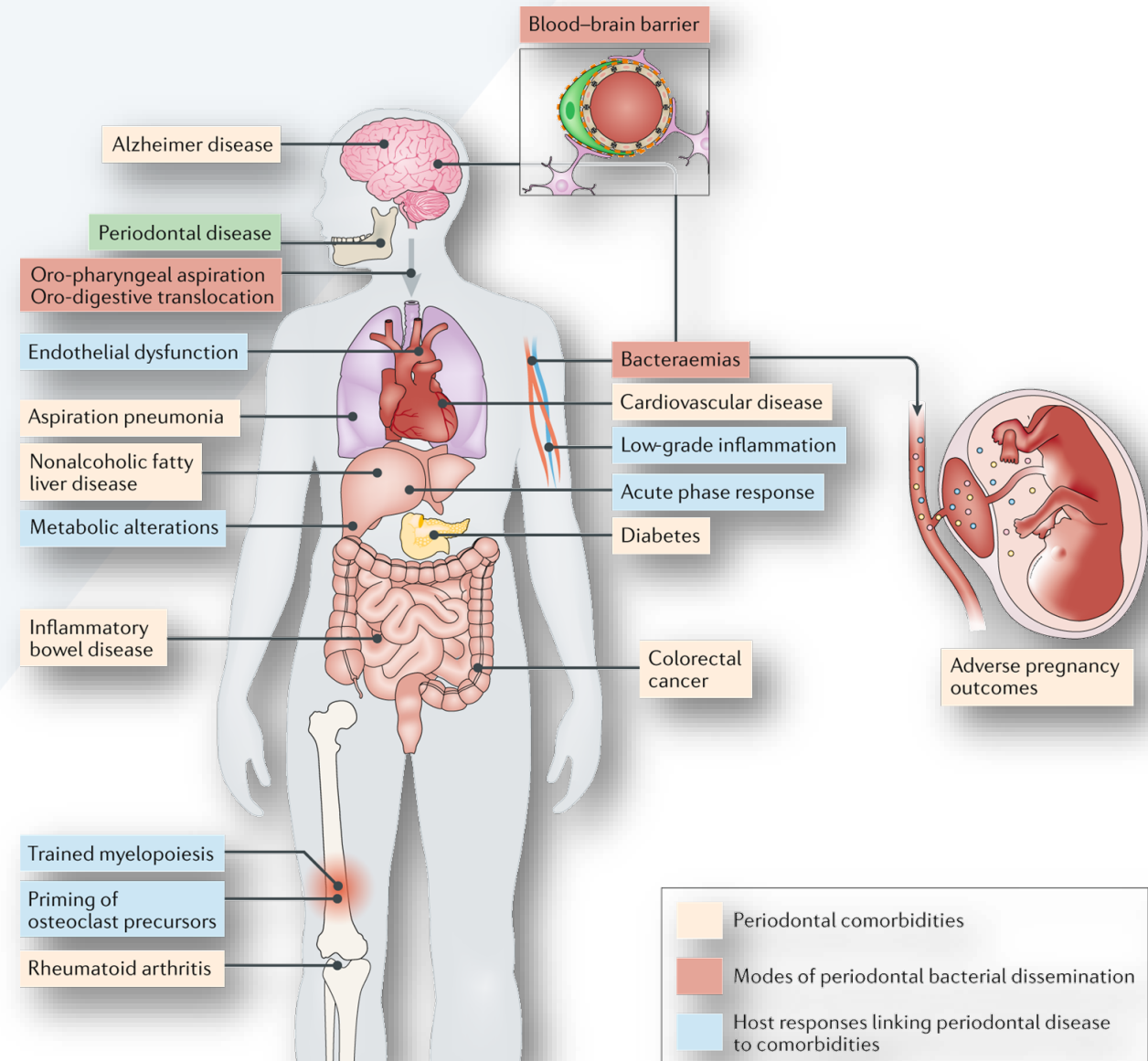
Source: Hajishengallis and Chavakis Nat Rev Immunol 2021

Thank you

Steffany Chamut, DDS, MPH, FICD

National Network for Oral Health Access Integrating Diabetes and Oral Health

Breakthrough Series Collaborative

Colleen Lampron, MPH
Collaborative Director
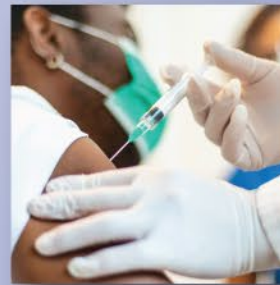
Learning Objectives

1. Learn how health centers are using quality improvement for interprofessional collaboration

2. Discuss the quality measures that health centers use to assess performance improvement

3. Assess NNOHA's clinical care pathway for patients with diabetes

4. Identify NNOHA's Clinical Best Practices Guide for Patients with Diabetes

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Sharing Stories

- Health Center Team will share their story in a 2-minute video

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Collaborative Background & History

The Problem

UDS Diabetes Measure: HbA1c > 9%
(lower % is better)
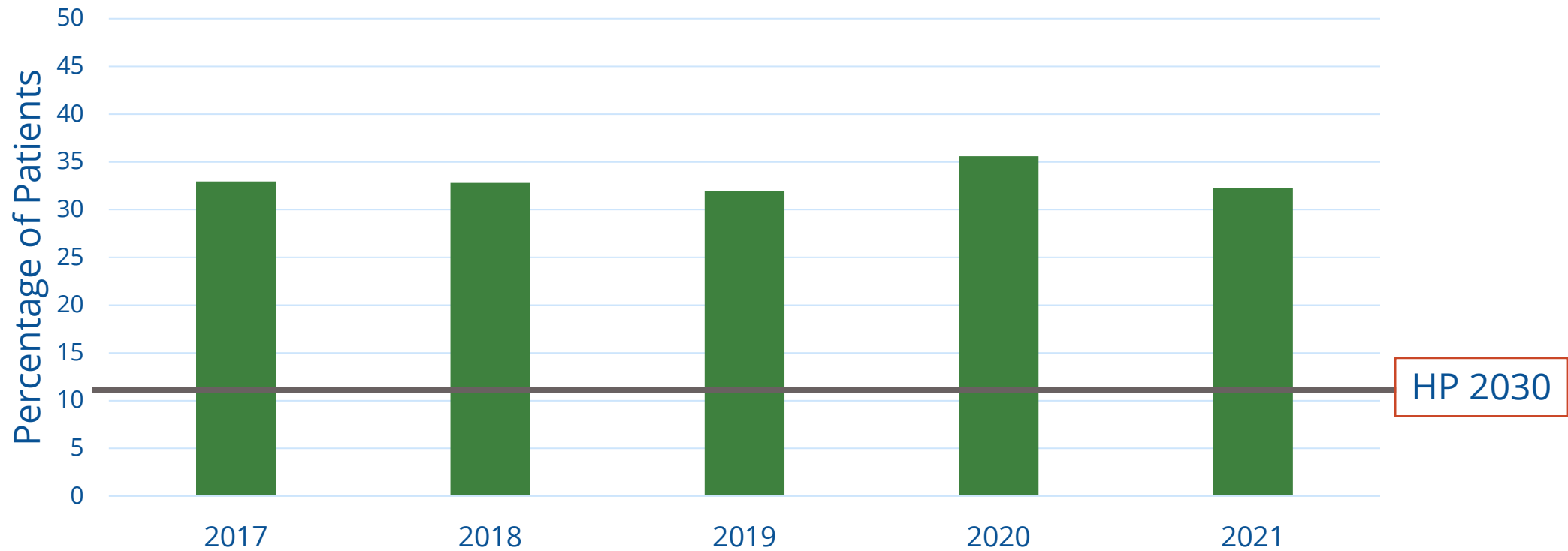
2015: A User's Guide for Implementation of Interprofessional Oral Health Core Clinical Competencies

A User's Guide for Implementation of Interprofessional Oral Health Core Clinical Competencies: Results of a Pilot Project

NNOHA
National Network for Oral Health Access

- Originally developed for uni-directional referral from primary care to dental
- Systems approach
- Model valid bi-directionally

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Institute for Healthcare Improvement Breakthrough Series Collaborative Model
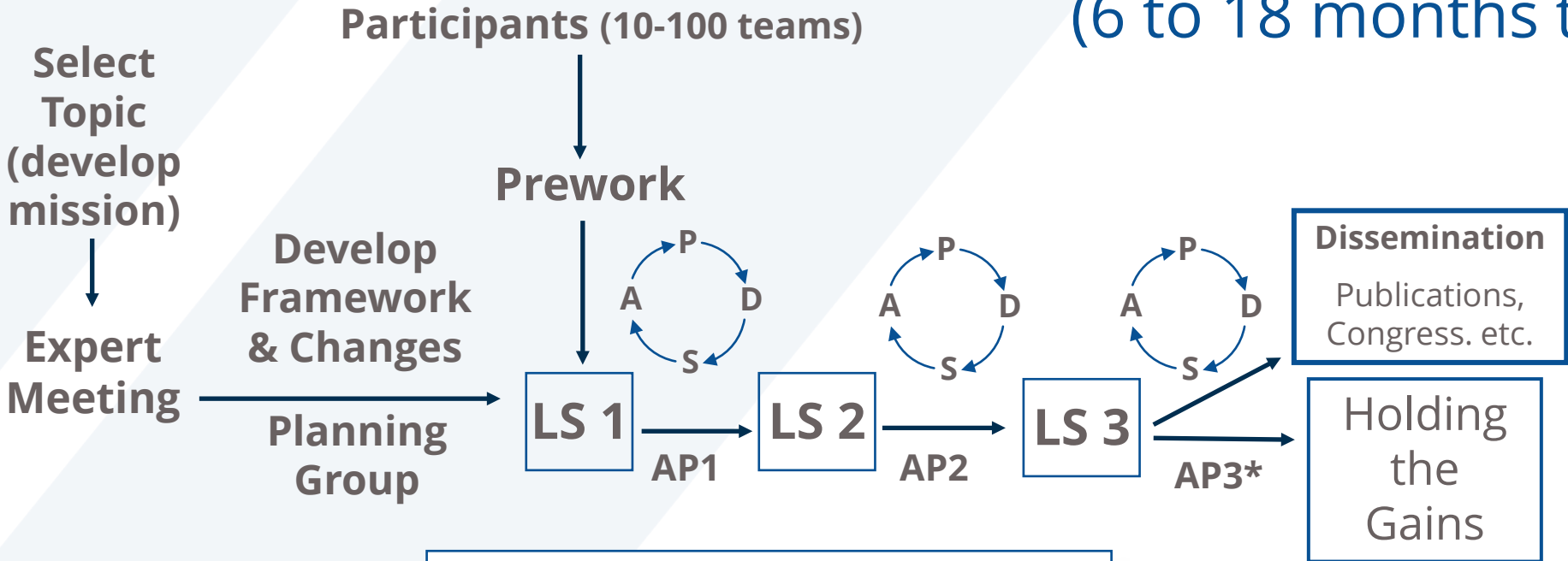
Collaborative Aim

- The aim of the NNOHA Integrating Diabetes and Oral Health Learning Collaborative is to improve outcomes for people with diabetes by increasing the number of dual users of medical and dental services by June 30, 2023.

Guidance

- Learn by doing: focus work on 100-300 patients with diabetes, typically from one medical provider's panel. We call this group of patients the Population of Focus.

- Promote Inter-professional collaboration
  - Dual users get perio treatment
  - Support improved performance on UDS metric for diabetes test within the last 12 months – keeping people current in managing their diabetes
  - Dental promotes increased testing for diabetes
  - Help patients with diabetes reduce their HbA1c, a key disease marker

NNOHA
National Network for Oral Health Access

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Ideal Care System

Overarching Principles- Patient centered holistic care
1. Every patient with diabetes diagnosis has a dental home
2. Medical and dental provide consistent messaging
3. Risk based recall visits (chronic disease management)
4. Interoperable IT systems

MEDICAL VISIT

Perform 5 Oral Health Core Clinical Competencies
1. Perform Risk Assessment including risk factors, protective factors, and clinical findings
   a. Ask if patient has regular source of dental care (if no = high risk)
2. Oral Health Evaluation: look in the mouth assess normal/abnormal findings
3. Provide preventive care, such as fluoride varnish
4. Education about diabetes & Oral health
5. Interprofessional Collaborative Practice
   a. Communicate diabetes diagnosis to the care team, including dental
   b. For patients due for dental care, develop a reliable process for referral to dental

All VISITS
Effective Engagement and Communication
1. Use motivational interviewing techniques
2. Define & agree on self-management goals (SMG)
3. Provide support for risk reduction

DENTAL VISIT
1. Know if patient has diabetes dx & status of most recent HbA1c,
2. Understand the impact of diabetes status on oral health and treatment planning
3. Education (communicate the medical/dental partnership to patient)
4. Use motivational interviewing and self-management goals to empower patient
5. Team-based care: Communicate oral health diagnosis to primary care team (medical, nutritionist, diabetes educator, care coordinator); refer to medical as indicated
6. Set follow up appointments on same day as medical follow up
7. For patients due for A1C testing, develop reliable process

Working Partnership

Assess/Refer Dental Home

Dental visit < 6 months – Refer if areas of concern and/or reinforce oral health protective behaviors

> 12 Months – standing orders make dental appointment

Visible signs of problem – warm hand off to dental

Dental and medical teams meet regularly to support integrated care

Test & Develop Strategies for A1C Testing
1. Dental staff does same day
2. Medical staff does same day
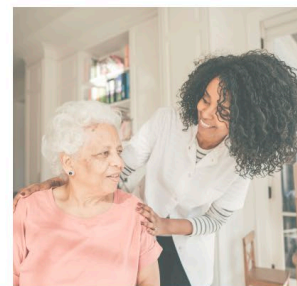3. Dental sets appointment for follow up test
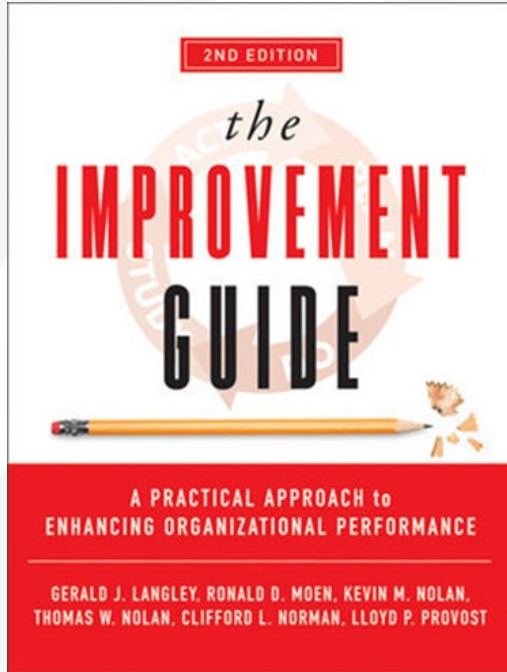
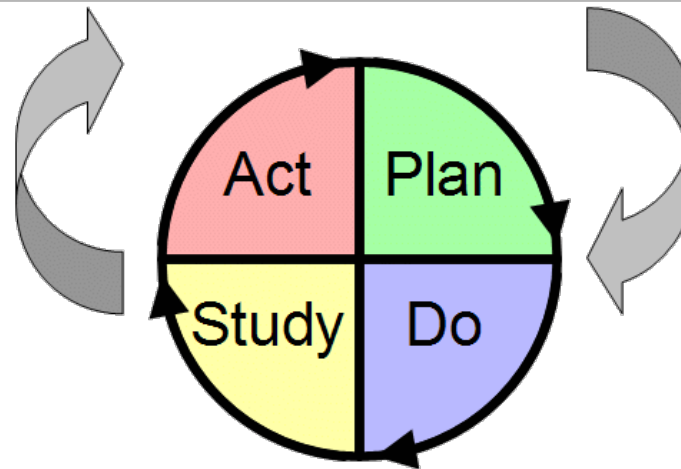# Dental Clinical Best Practices

Model for Improvement

AIM: What are we trying to accomplish?
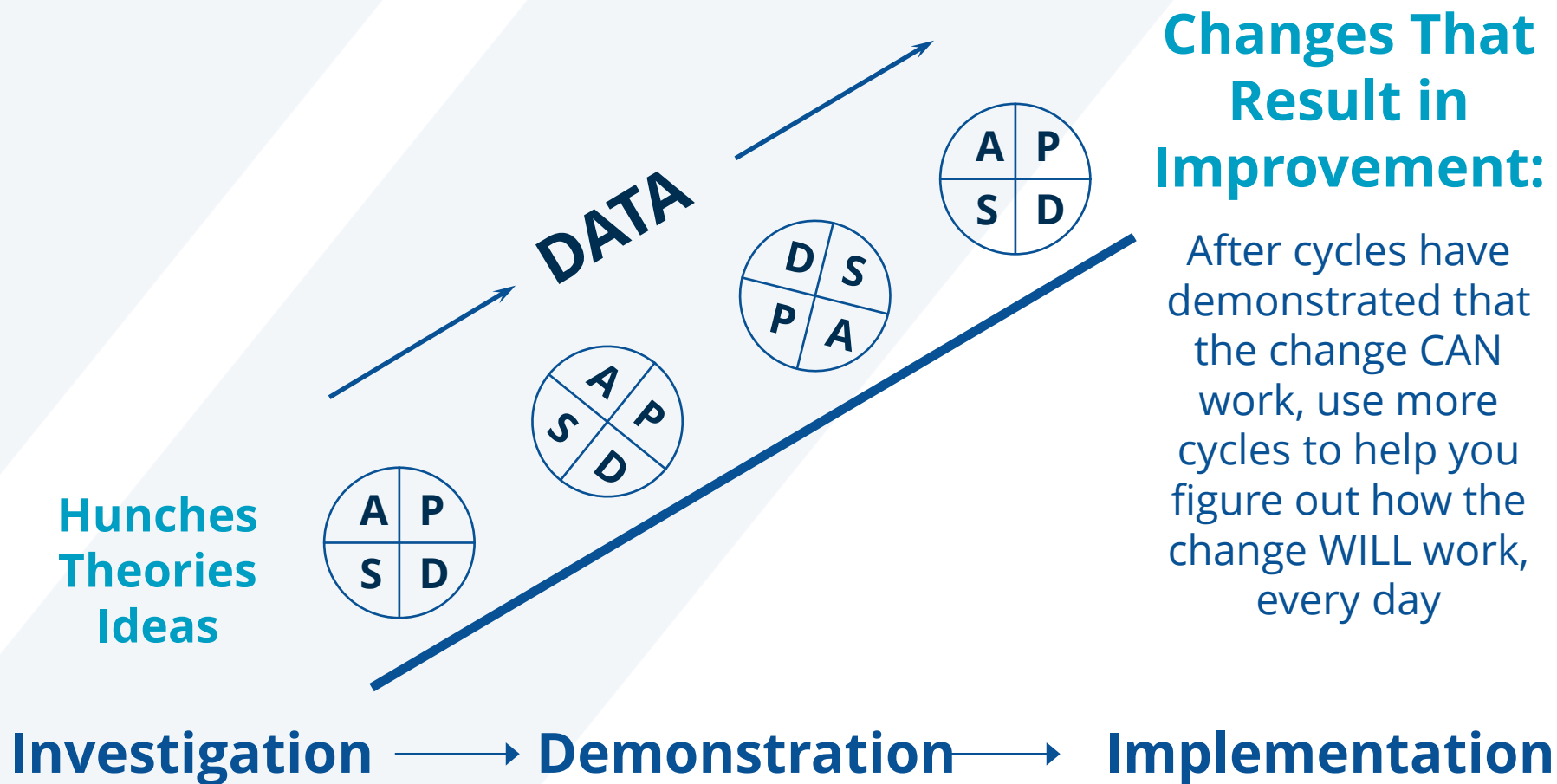
MEASURES: How will we know if a change is an improvement?

CHANGE: What changes can we make that will result in improvement?

Act   Plan
Study   Do

# Repeated Use of the PDSA Cycle

Changes That Result in Improvement:

After cycles have demonstrated that the change CAN work, use more cycles to help you figure out how the change WILL work, every day

DATA

Hunches Theories Ideas

Investigation → **Demonstration** → **Implementation**

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Results:Data Improvement

Results: Dual Care

- Dual Care: Percentage of patients in Population of Focus seen by medical and dental

- Cohort 1 used 90-day look back period for dual care

- Cohort 2 used 180-day look back period.

- Both cohorts showed some increase in dual care patients over the nine-month cycles.
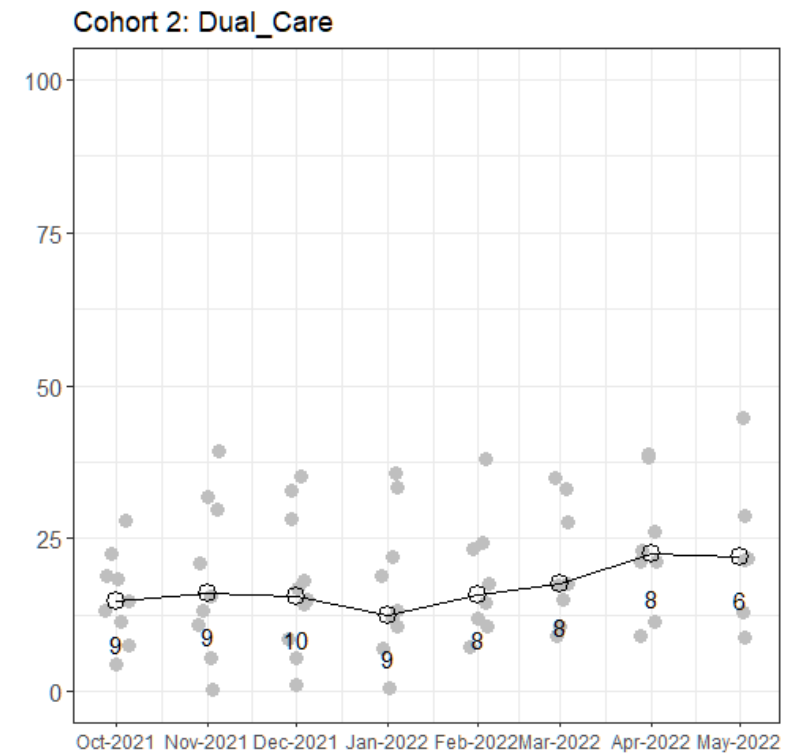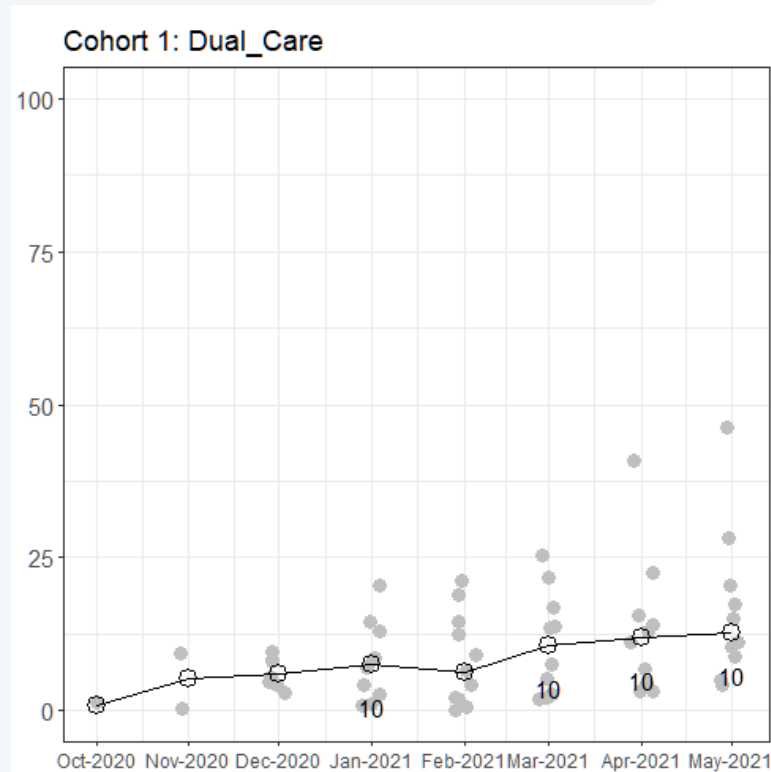
Results: A1c Test

- A1c Test: Percentage of Patients with current A1c test, per clinic definition.

- Cohort 2 had much higher levels of current A1c test than Cohort 1.

- The difference is likely due to fewer in-person medical visits in 2020.
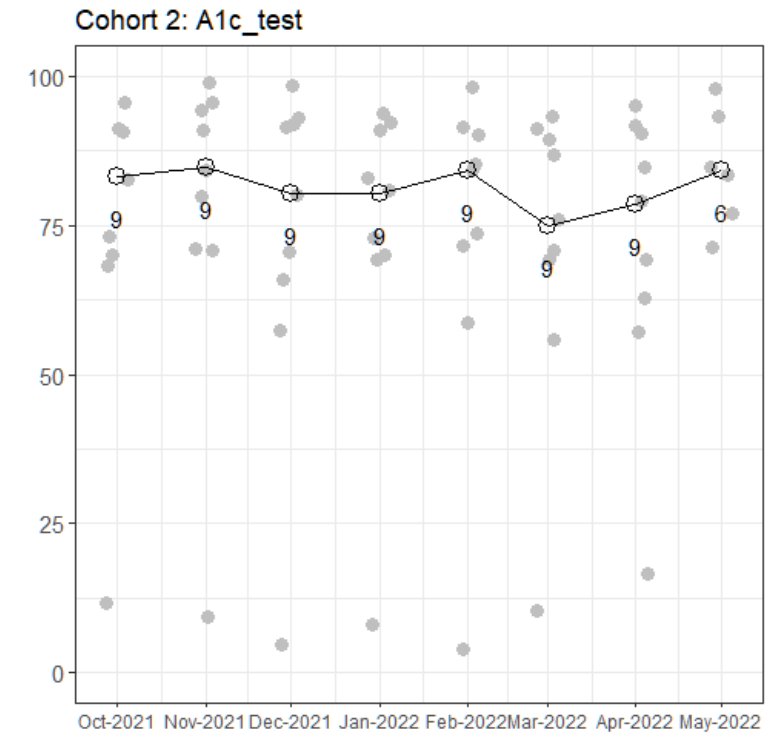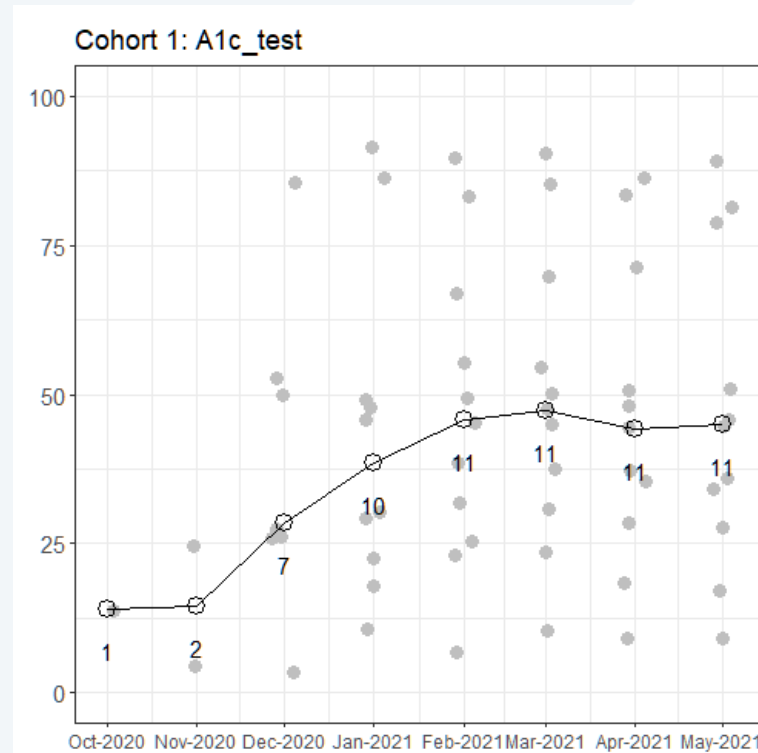
Results: A1c > 9%

- A1c > 9%: Percentage of Patients with A1c > 9%, tested in the measurement month.

- We do not expect to see any change in overall population A1c control in the short periods of our cohort work.

- Ultimately, we expect better A1c control from more timely and consistent testing and reduction in oral infection and inflammation.
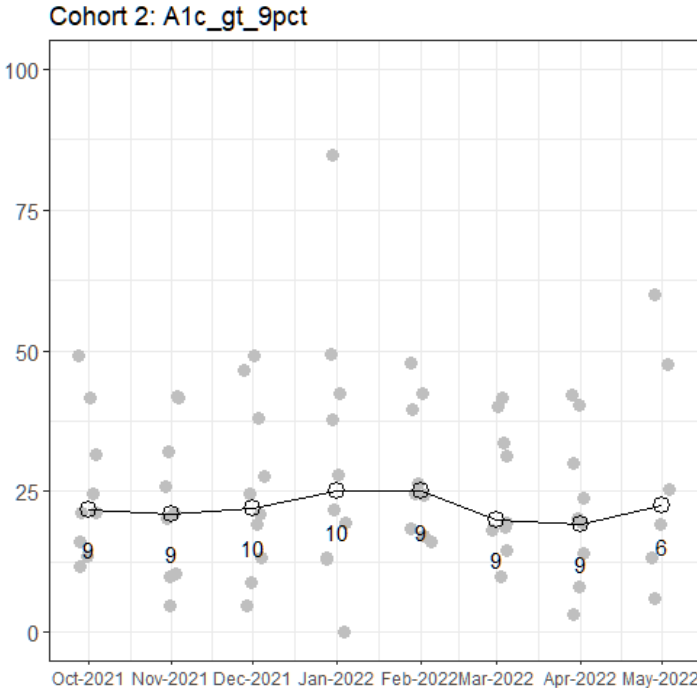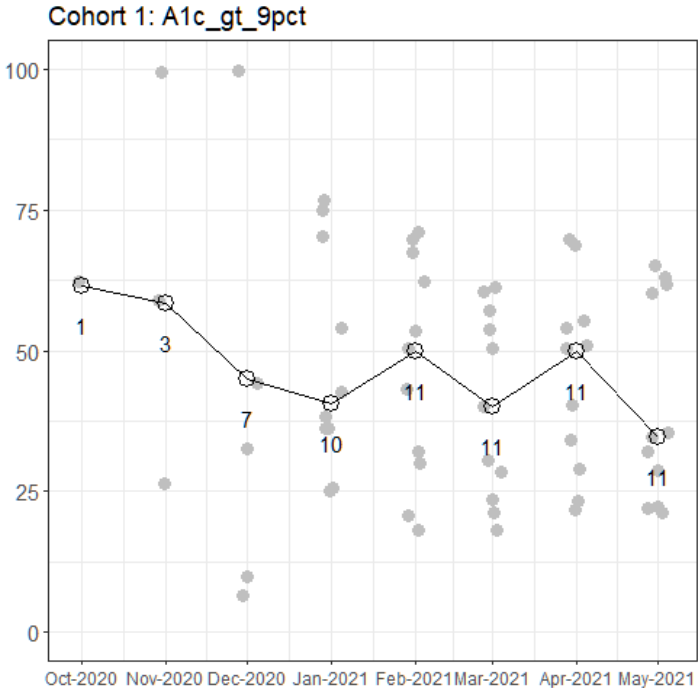
Lessons learned for success

- Teaching QI to health center dental programs
- Implementing best clinical practices for disease management
- Monitoring change through the use of QI measures
- Establishing reliable systems to deliver care, and capture data within each health center program

Integrated Dental Hygiene—

A Simple Innovation Yielding Big Results

Presented By

Monica McKee, MPH, RDH

VP Ancillary Clinical Services, Oklahoma City Indian Clinic
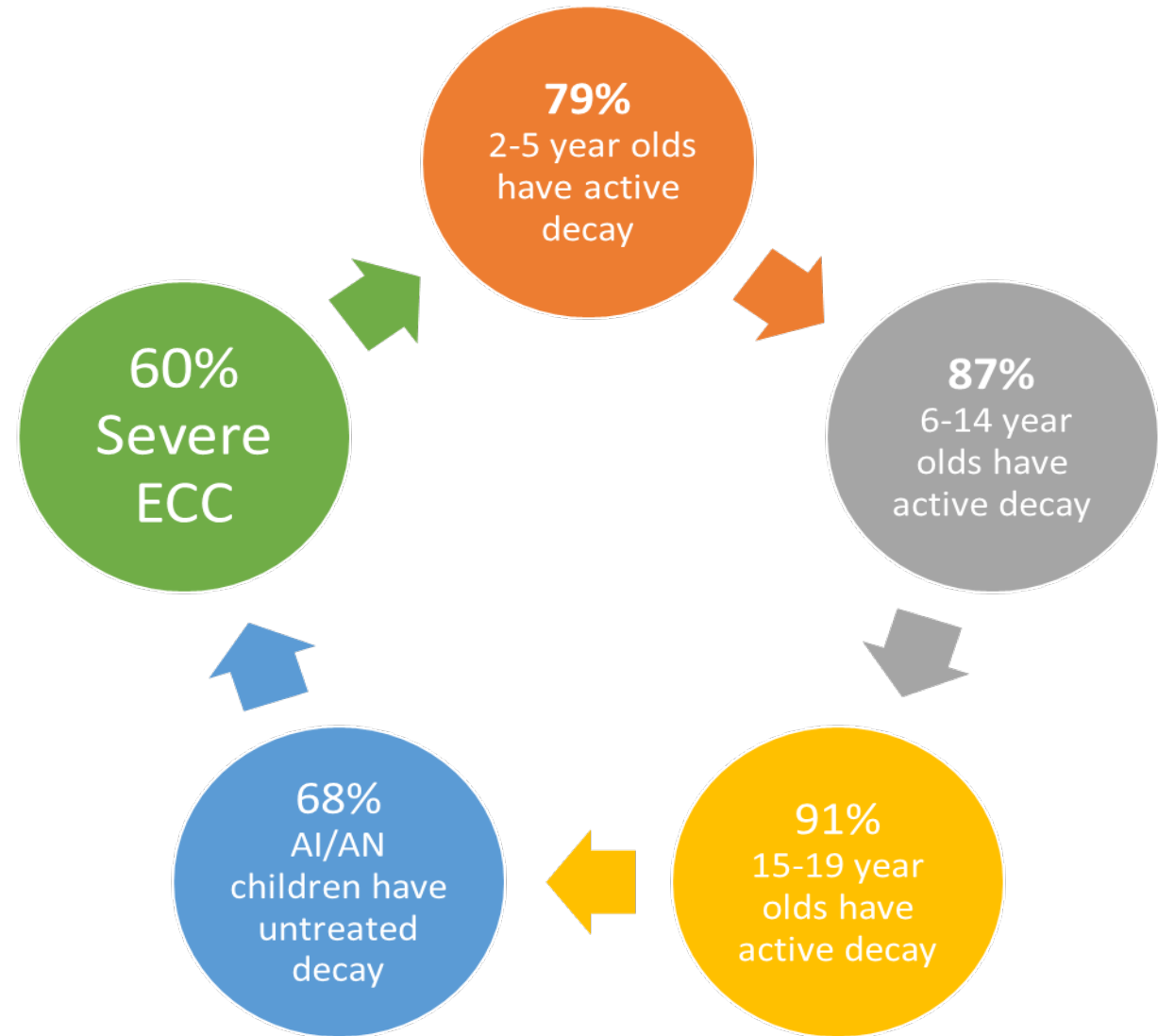
AGENDA

- Learning Objectives

1. Participants will be able to list specific oral hygiene education needs for each trimester of pregnancy.

2. Participants will be able to list three benefits to an Integrated Dental Hygiene Program during pregnancy

3. Participants will be able to list at least two successes of the OKCIC Integrated Dental Hygiene Program.

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Oral Health in Indian Country

The Statistics are Staggering

- **79%** 2-5 year olds have active decay
- **87%** 6-14 year olds have active decay
- **91%** 15-19 year olds have active decay
- **68%** AI/AN children have untreated decay
- **60%** Severe ECC

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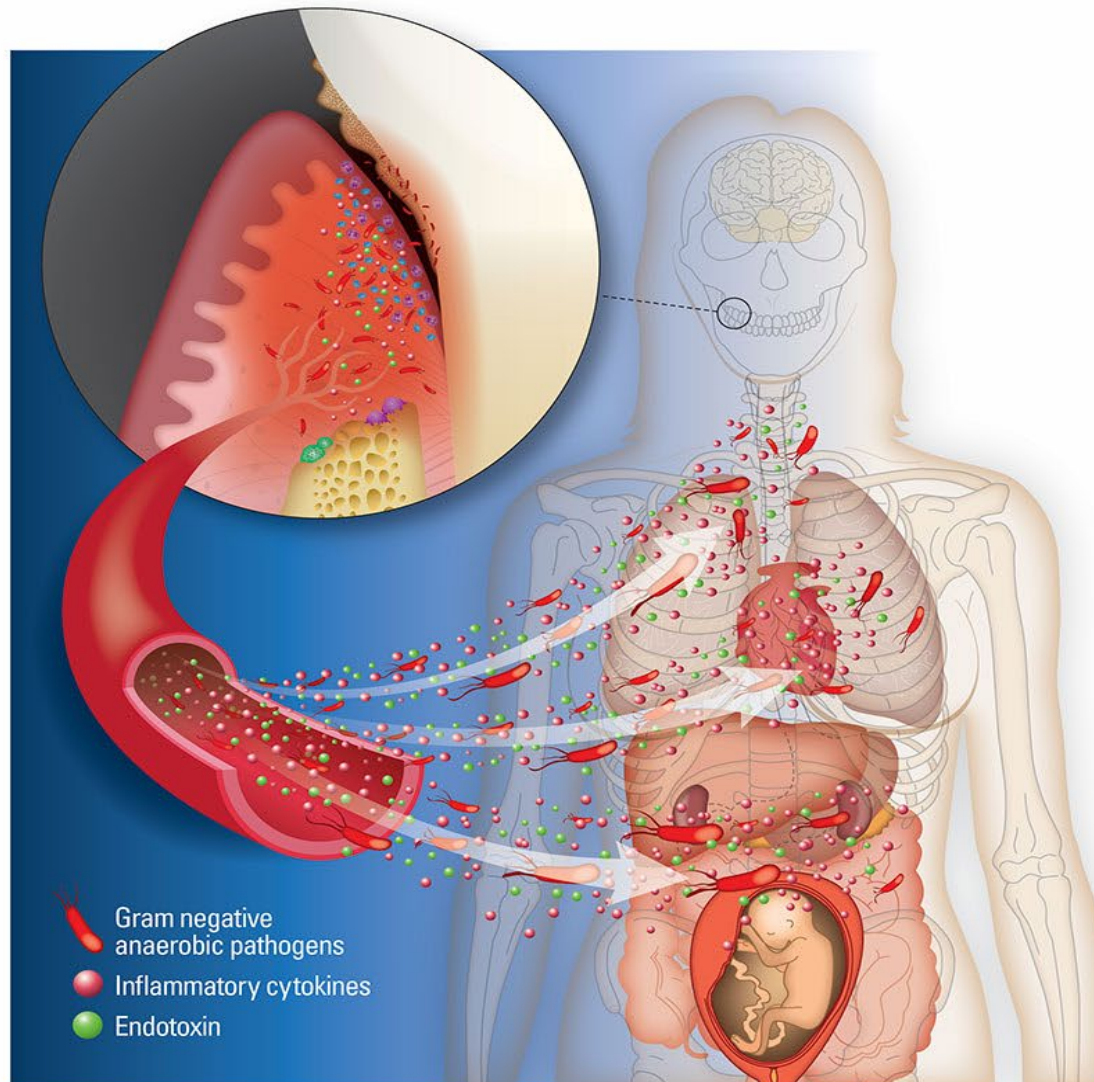
Dental Caries

The most common form of chronic disease in Native children

Native children ages 2-4 are 5x more likely to experience tooth decay than the average US rate.

Oral Health

Stroke
- Those with severe periodontitis have increased risk of getting stroke and periodontal treatment can help to reduce the risk. [26]

Alzheimer's Disease
- *P. gingivalis* with its toxic protease (gingipain) was identified in patients' brains with pathologic mechanism. [25]

Heart Disease
- Those with severe periodontitis may have increased risk of fatal heart attack. [15,16]
- Bacteria in the gingiva may travel through the bloodstream, reaching atheroma and causing clotting problems in the cardiovascular system. [30]
- Controlling periodontal disease can retard the progression of carotid atherosclerosis. [35,36]

Uncontrolled Diabetes
- People with type 2 diabetes are three times more likely to develop periodontal disease than those without diabetes.[13] Periodontal treatment can potentially help with controlling HbA1c. [37]
- Pathogens can be identified in pancreatic islet. [33]

Respiratory Infections
- Poor oral hygiene and periodontal infection are associated with increased anaerobic periodontal pathogens in the lungs of patients with lower respiratory track infection and pneumonia. [27-28]
- Improved oral hygiene and periodontal treatment can reduce risk of pneumonia and mortality rate. [38-39]

Osteopenia and Rheumatoid Arthritis
- Reduction in bone mass (osteopenia) is associated with periodontal disease and related tooth loss. [20]
- Periodontal pathogens can be present at the joint and periodontal disease is associated with arthritis. [18,31]

Cancer
- Periodontitis is associated with esophageal, breast, pancreatic, and colon cancer. [21,22]

Preterm or Low-Birthweight Babies
- Women with advanced periodontal disease may be more likely to give birth to an underweight or preterm baby. [17]
- Oral microbes can cross the placental barrier, exposing the fetus to infection. [32]

Gram negative anaerobic pathogens
Inflammatory cytokines
Endotoxin

The Medical-Dental Home Model

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The Medical-Dental Home Model

Emphasis on "Dentistry in every Department"

- Oral screenings and topical fluoride performed at every well child check

- Oral screening and assessment for pregnant mothers at time of positive pregnancy test

- Education and coordination of care for diabetics

- Deploy dental staff to health fairs, after school activities, camps and events to provide education, screenings and topical fluoride application.

- Utilization of Integrated Dental Hygienists

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Integrated Dental Hygiene

- An innovative approach to improving oral health outcomes by introducing trained dental professionals into the Medical setting.

- At OKCIC, Integrated Registered Dental Hygienists (I-RDH) are integrated into medical clinics with their primary focus being the relationship between oral and overall health.
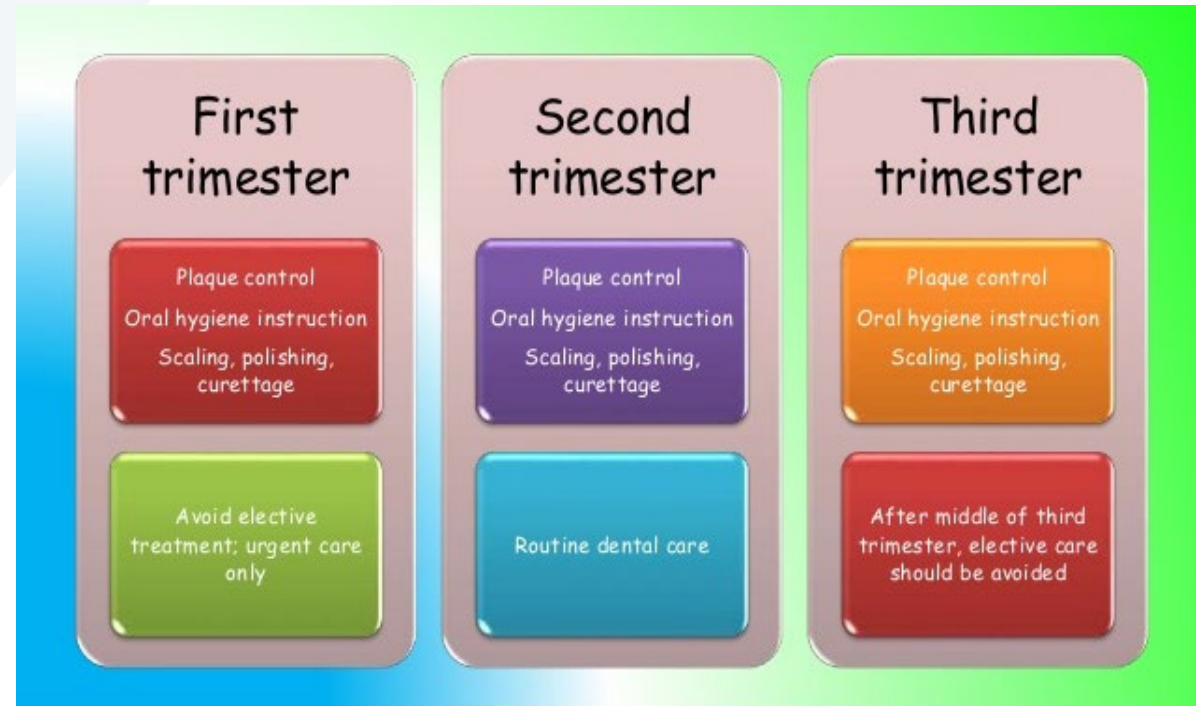
A Dental Visit at the Doctor?

Prenatal Visits

•   The I-RDH evaluates several things such as plaque index, gingival health, dental caries, presence of disease, etc.

•   Pregnant mothers receive an oral health assessment at initial appointment when pregnancy is confirmed

•   Each mom is scheduled a comprehensive dental exam, and all identified dental needs are scheduled.

•   At each subsequent visit, oral hygiene instructions are tailored to the applicable trimester and/or symptoms the mother is having

  •   Morning sickness
  •   Cravings
  •   Bleeding gums

Dentistry and Prenatal Care

*After delivery, care is continued for both mom and baby at follow-up medical appointments.*

First trimester	Second trimester	Third trimester
Plaque control	Plaque control	Plaque control
Oral hygiene instruction	Oral hygiene instruction	Oral hygiene instruction
Scaling, polishing, curettage	Scaling, polishing, curettage	Scaling, polishing, curettage
Avoid elective treatment; urgent care only	Routine dental care	After middle of third trimester, elective care should be avoided

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The Medical-Dental Home Model

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Initial Data Collection

- During the study period, 482 OB patients were due for dental access. None received dental access during their Medical/prenatal visit.

OB Patients Due for Dental Access and Resulting # of Missed Opportunities
October 2021-March 2022

■ OB Pts Due — # Missed Opportunities
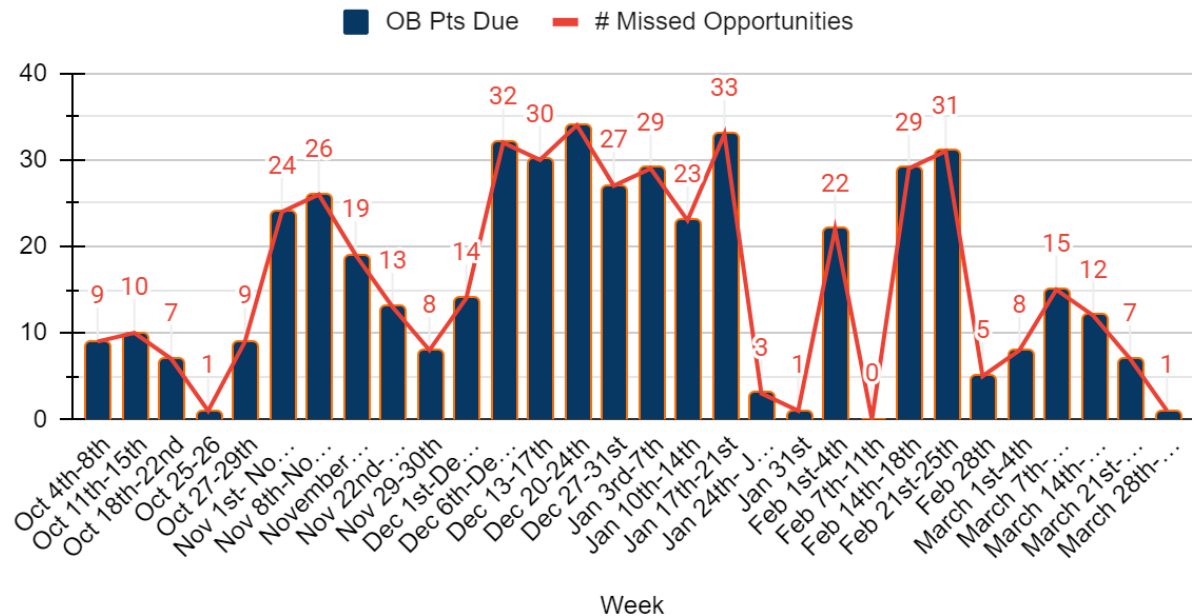
Initial Intervention and Remeasurement

- By utilizing Clinical RDH's, as they were available over the study period collectively, a 29% decrease in missed opportunities was observed, exceeding the goal of 10%, with no addition of staff.

OB Pts Due vs Screened and Resulting # of Missed Opportunities October 2021-March 2022
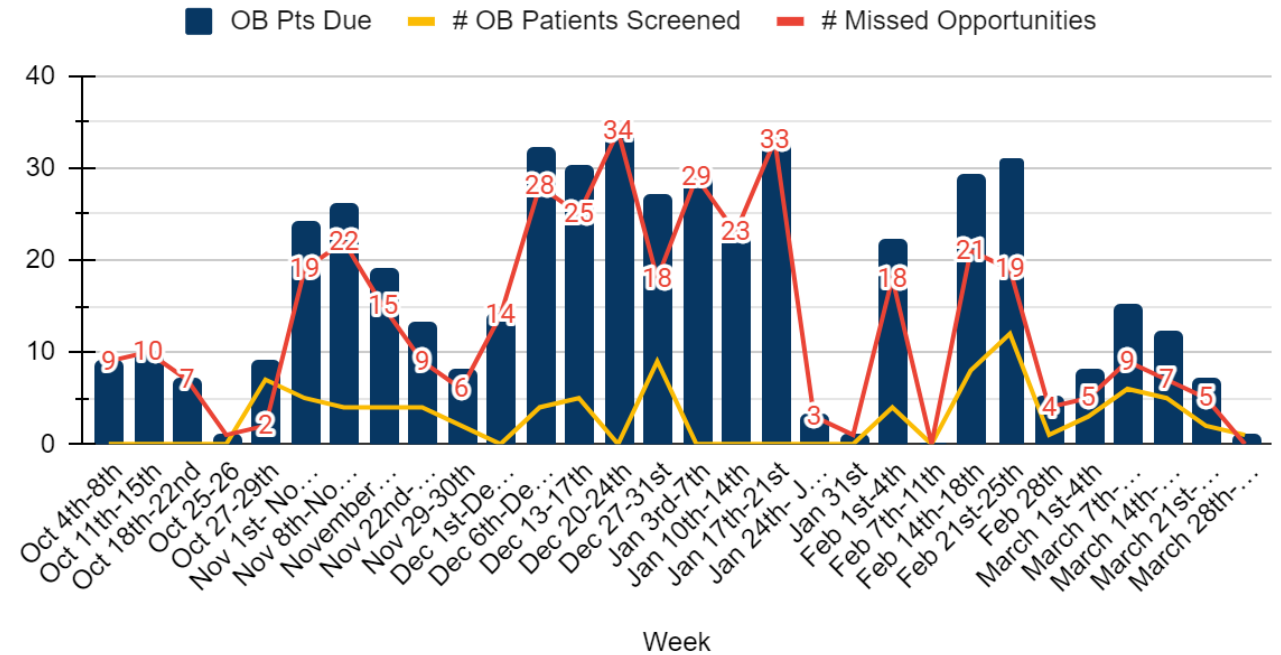
Improvements in Dental Quality Metrics 2018-2023

- Since the addition of the I-RDH in 2022, OKCIC has seen a significant increase in each of the three quality measures reported to the Indian Health Services.
  - Dental Access
  - Dental Sealants
  - Topical Fluoride

OKCIC Trends in Dental Access and Services 2018-2023

Addition of I-RDH

Legend: Dental Access, Dental Sealants, Topical Fluoride

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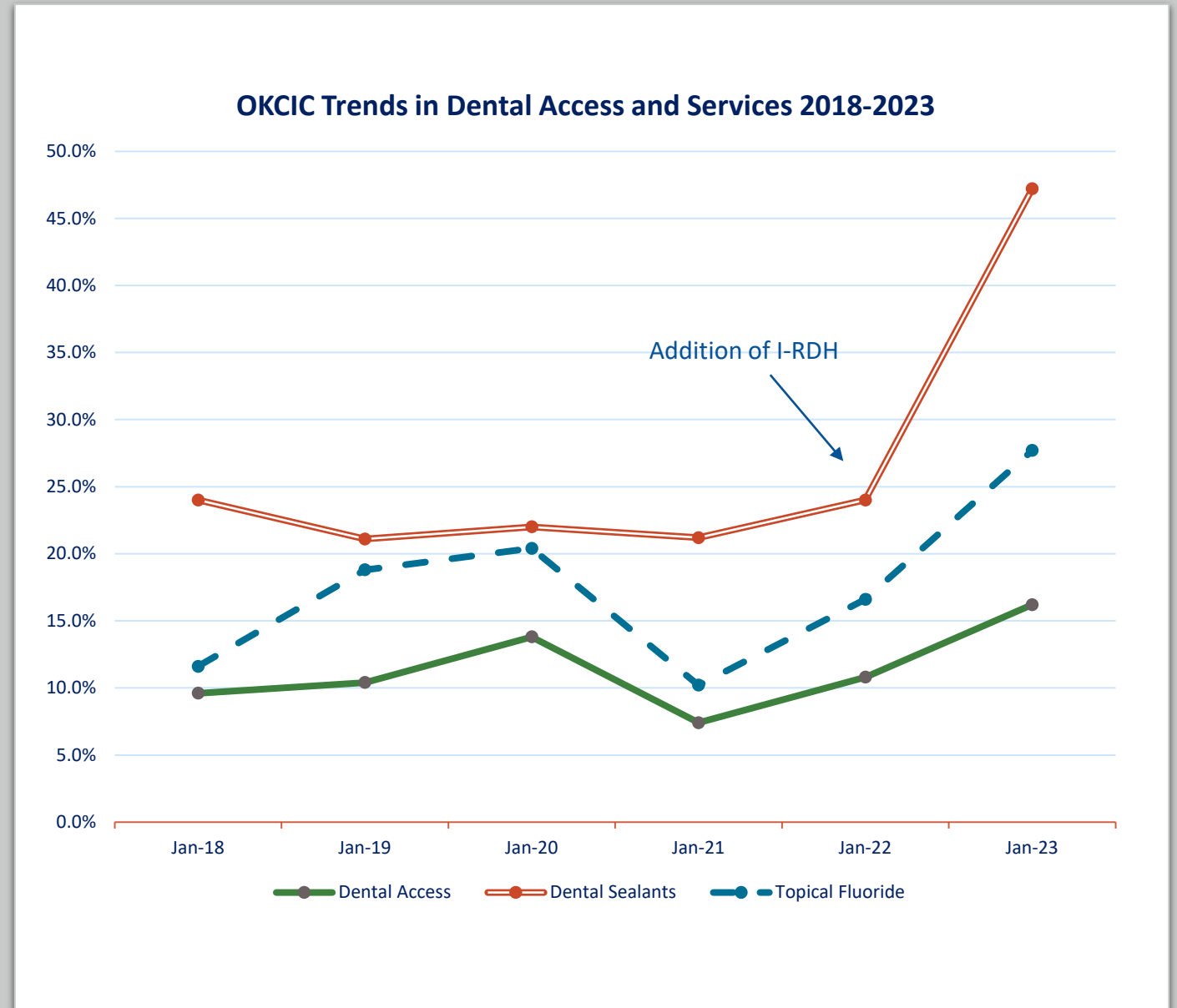
Current State
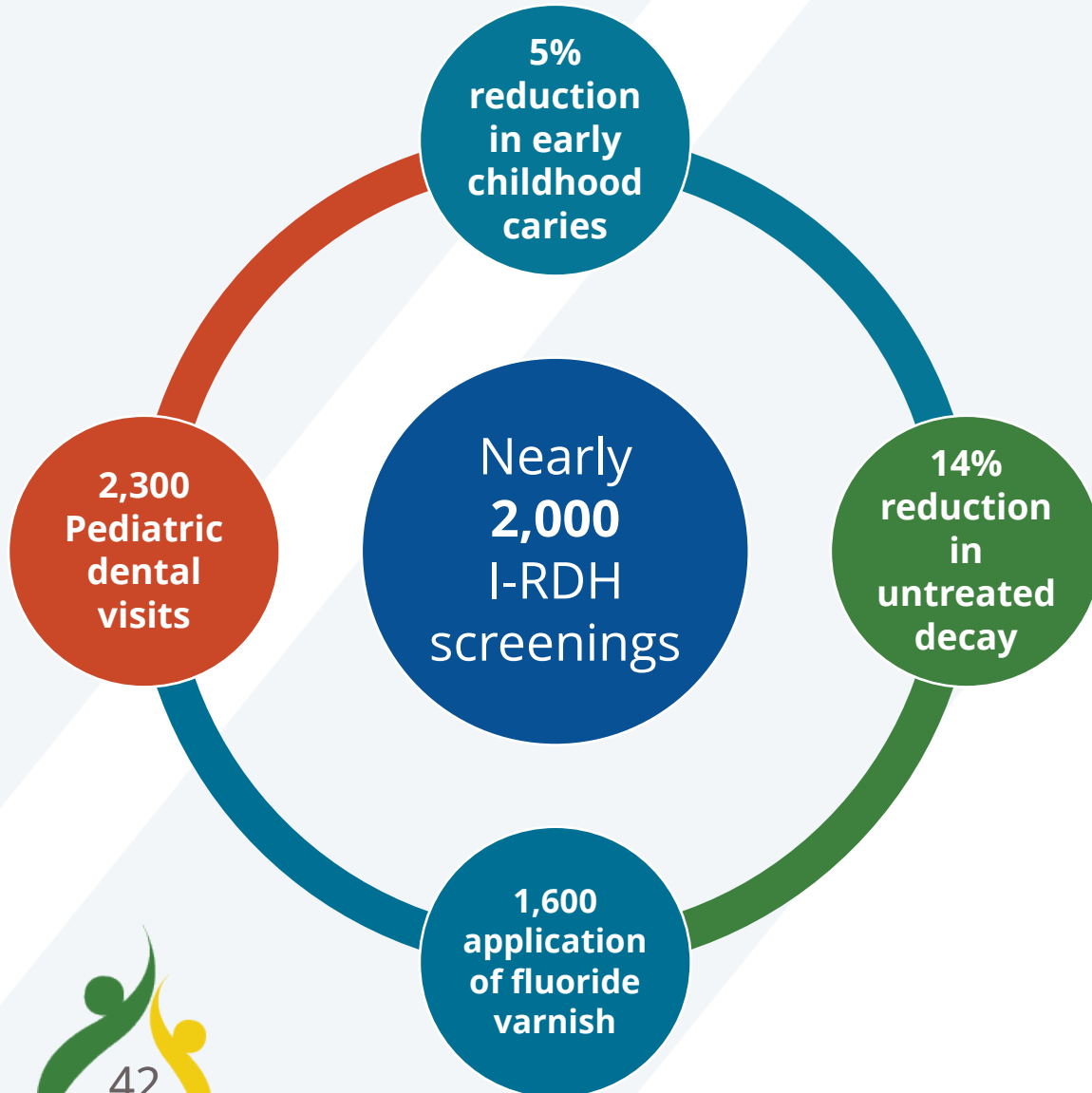
Our Vision:

1. Decrease the incidence of tooth decay and oral disease in the Native American community

2. Improve dental access

3. Spread the integrated dental hygiene model

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Thank You!

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