



# **Improving Access to Dental Care through Medical Dental Integration**

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**February 25, 2025**

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Professor of Pediatrics and Public Health  
Denver Health | University of Colorado**

# Objectives

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**Describe various approaches to medical-dental integration.**

**Incorporate medical-dental integration approaches into CHC care delivery.**

**Compare different medical-dental integration approaches.**

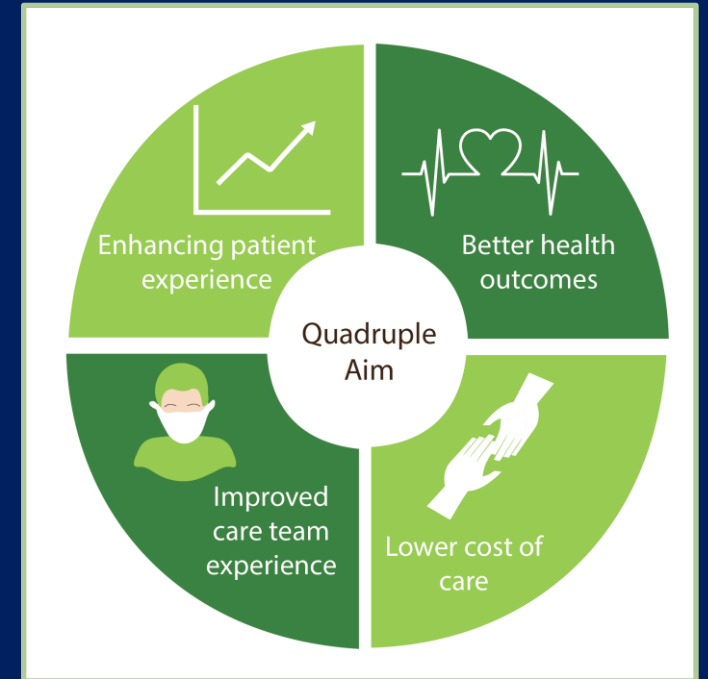
**Recognize medical-dental integration change package key drivers.**

# Quadruple Aim

Increase access to care by integrating multidisciplinary services within your primary care setting.



Prevent avoidable ambulatory care sensitive conditions.





# Perspective

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The left side of the slide features a detailed, close-up image of a tree trunk's growth rings, showing concentric, wavy patterns in shades of green and brown. This image occupies the left half of the slide.

# Community Health over the Decades

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What have we asked of our teams?



# Social-Ecological Model of Health

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# Policy: Affordable Care Act (2008)

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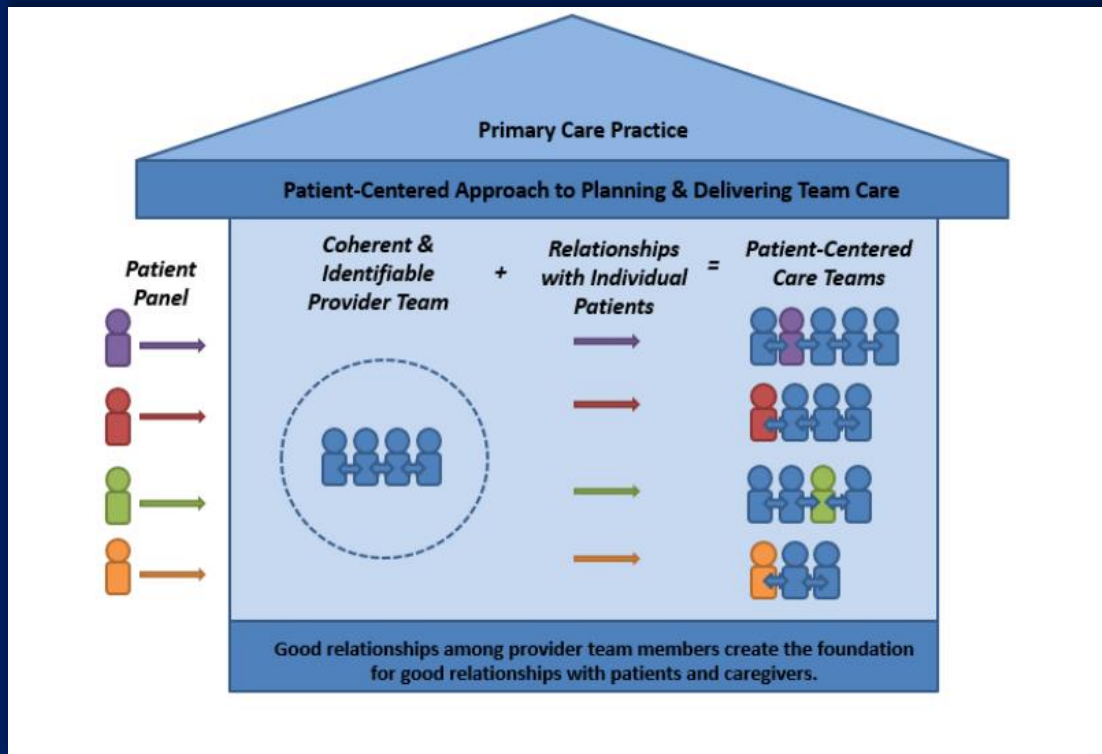
**20 million Americans have gained health insurance**

**Managed care**

**Population health**



# Community: Person Centered-Medical Home



Relationship-Based with Empanelment

Partnering with Patients

Respecting patients' unique needs, culture, values and preferences

Supporting patients in learning to manage and organize their own care

Fully including patients and their core caregivers of care plans



# Technology

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Electronic health record

Apps and Social Media

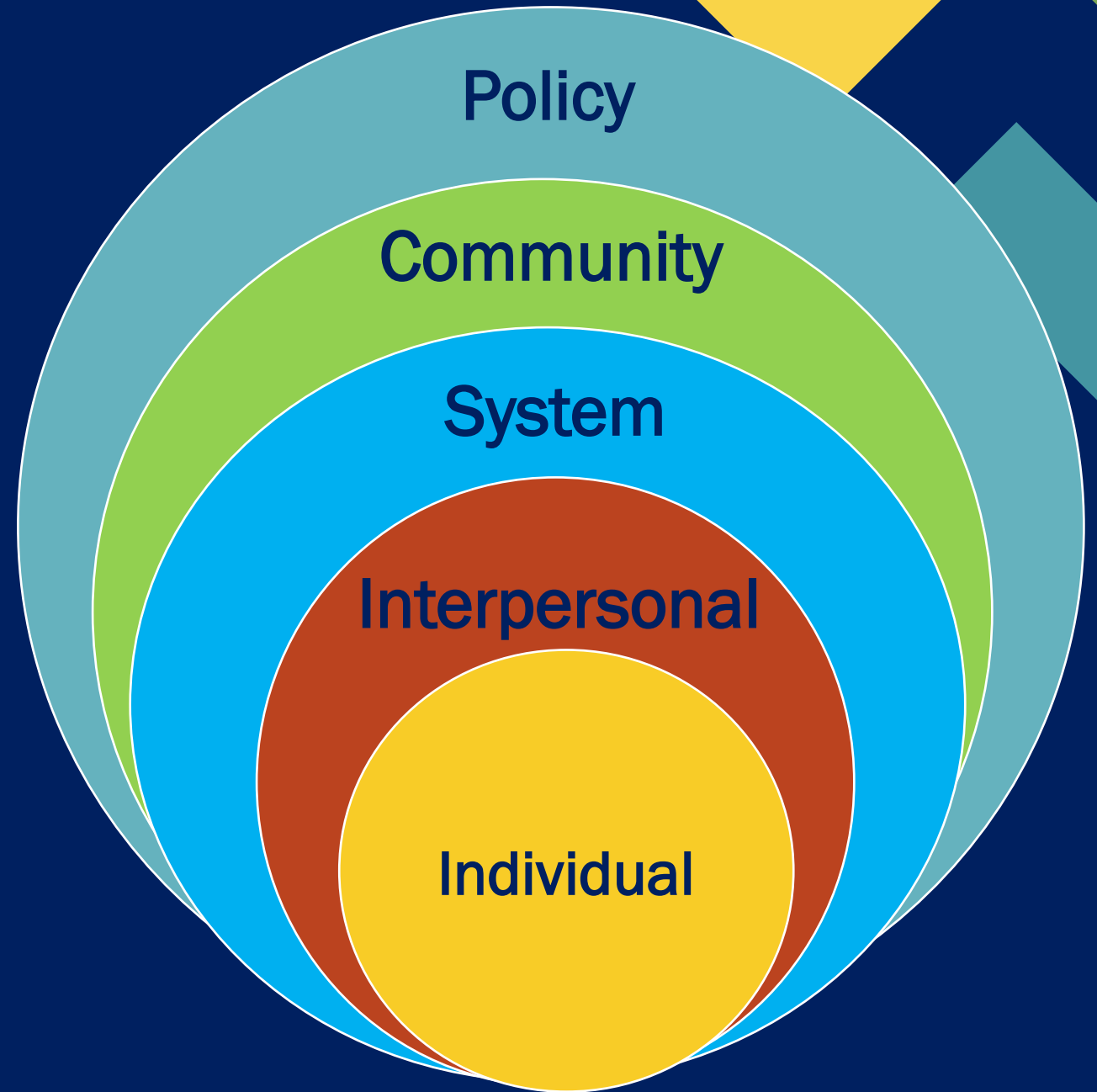
Telehealth

Artificial intelligence

Clinical Management Systems

# Interpersonal:

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# Behavioral Health

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Motivational Interviewing  
Shared-decision making

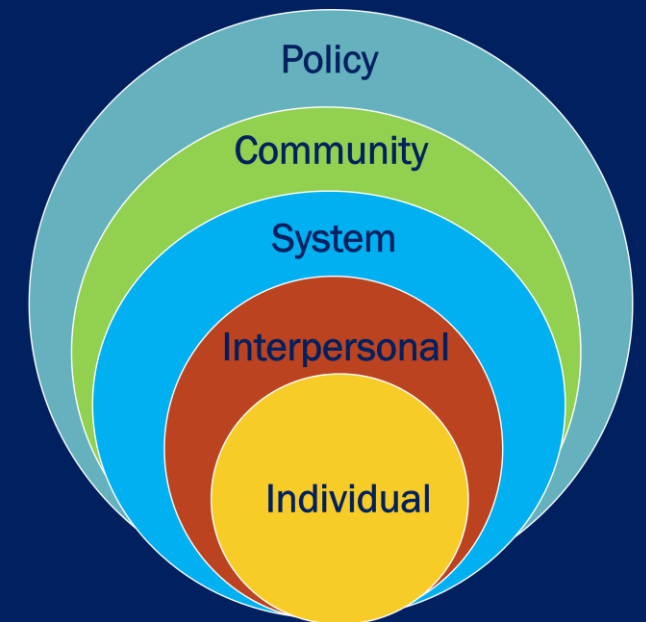
# Individual

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**Behavior-related disease**

**Genetic discoveries**

**Treatment development**



# What now?

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# Medical Dental Integration and Whole Person Health

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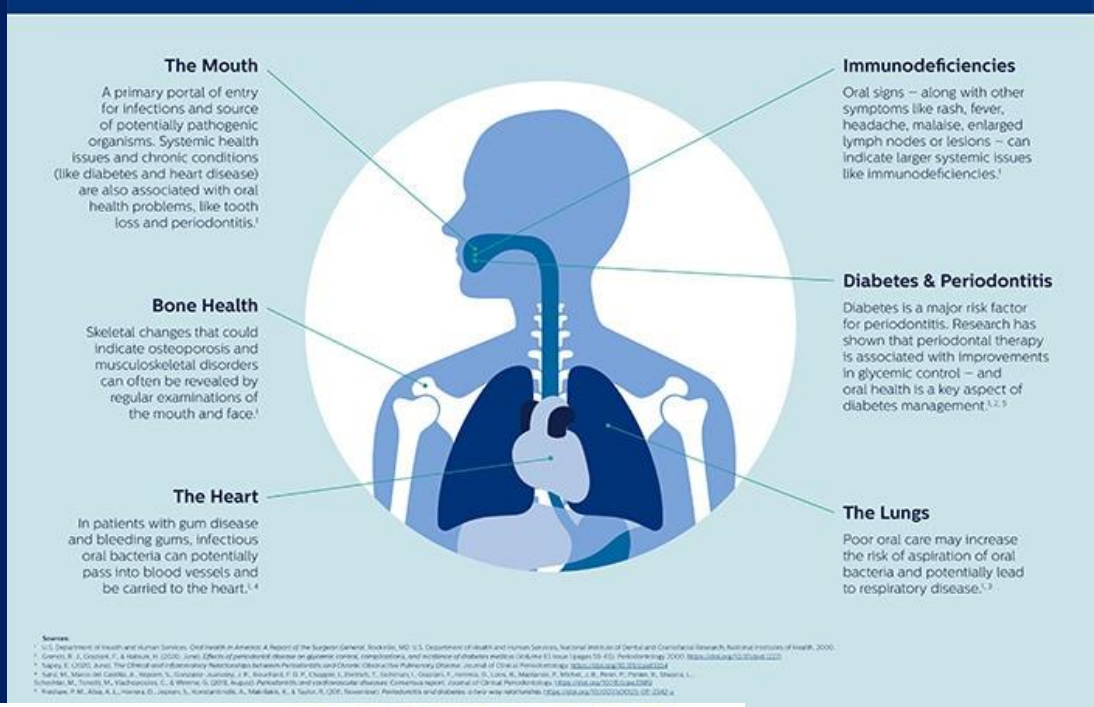


# Oral Health and Overall Health



# The mouth is part of the body

## The Connections Between Oral and Systemic Health



Sources:  
 1. U.S. Department of Health and Human Services. Oral Health in America: A Report of the Surgeon General. Rockville, MD: U.S. Department of Health and Human Services, National Institute of Dental and Craniofacial Research, National Institutes of Health; 2000.  
 2. Grenis R, Gonzalez F, & Salazar M. (2016). Joint Effects of periodontal disease on glycemic control, complications, and incidence of diabetes mellitus. *Diabetes Care*, 39(4), 682-688.  
 3. Natta E. (2018). Bad, The clinical and laboratory relationships between periodontitis and chronic obstructive pulmonary disease. *Journal of Oral Periodontology*, 15(2), 120-128.  
 4. Kato M, Masuda H, Castello A, Yasuda Y, Sasaki Y, Iwamoto Y, Kato M, Nakamura T, Shimizu I, Okamoto T, Yamazaki S, Ueda K, Mori K, Yamaguchi T, Shimizu I, Shimizu I, Shimizu I, Shimizu I. (2019). A study of periodontitis and cardiovascular diseases. *Journal of Oral Periodontology*, 16(2), 120-128.  
 5. Fildes P, Aliti A, Lippman D, Jensen T, Hongenroth A, Mahabadi K, & Taylor R. (2018). Systemic Periodontitis and respiratory disease: A review of the literature. *Journal of Oral Periodontology*, 15(2), 120-128.

Coxsackie Virus and Hand Foot and Mouth	Human Papilloma Virus and Oral Cancer
Allergies and allergy medication with xerostomia	Periodontal disease and tooth loss with malnutrition
Developmental Disorders and Gum Disease	Substance Use Disorder and Meth Mouth
Tay-Sachs disease and self mutilation	Bleeding disorders and gum manifestations

# The mouth is part of the body

Noma is a severe gangrenous disease of the mouth and face. Its pathogenesis is linked with non-specific polymicrobial organisms and a range of modifiable risk factors and underlying social determinants shared with other neglected tropical diseases (NTDs).

**Noma can be avoided through simple actions that can be performed by everyone!**

Early detection followed by prompt treatment is crucial in improving the health of the affected child and can save his/her life. Treatment can be provided at home in the early stages of the disease.

**First action: open and examine your child's mouth!**

Regular oral examination of children at home or during medical visits is an indispensable action that helps identify gum lesions that may develop into noma in at-risk subjects.



# Dental Caries

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Pain	Cellulitis	Abscess	Tooth loss
Impaired nutrition	Tooth malalignment	Adult decay	Dental anxiety



# Medical Dental Integration



COMMON

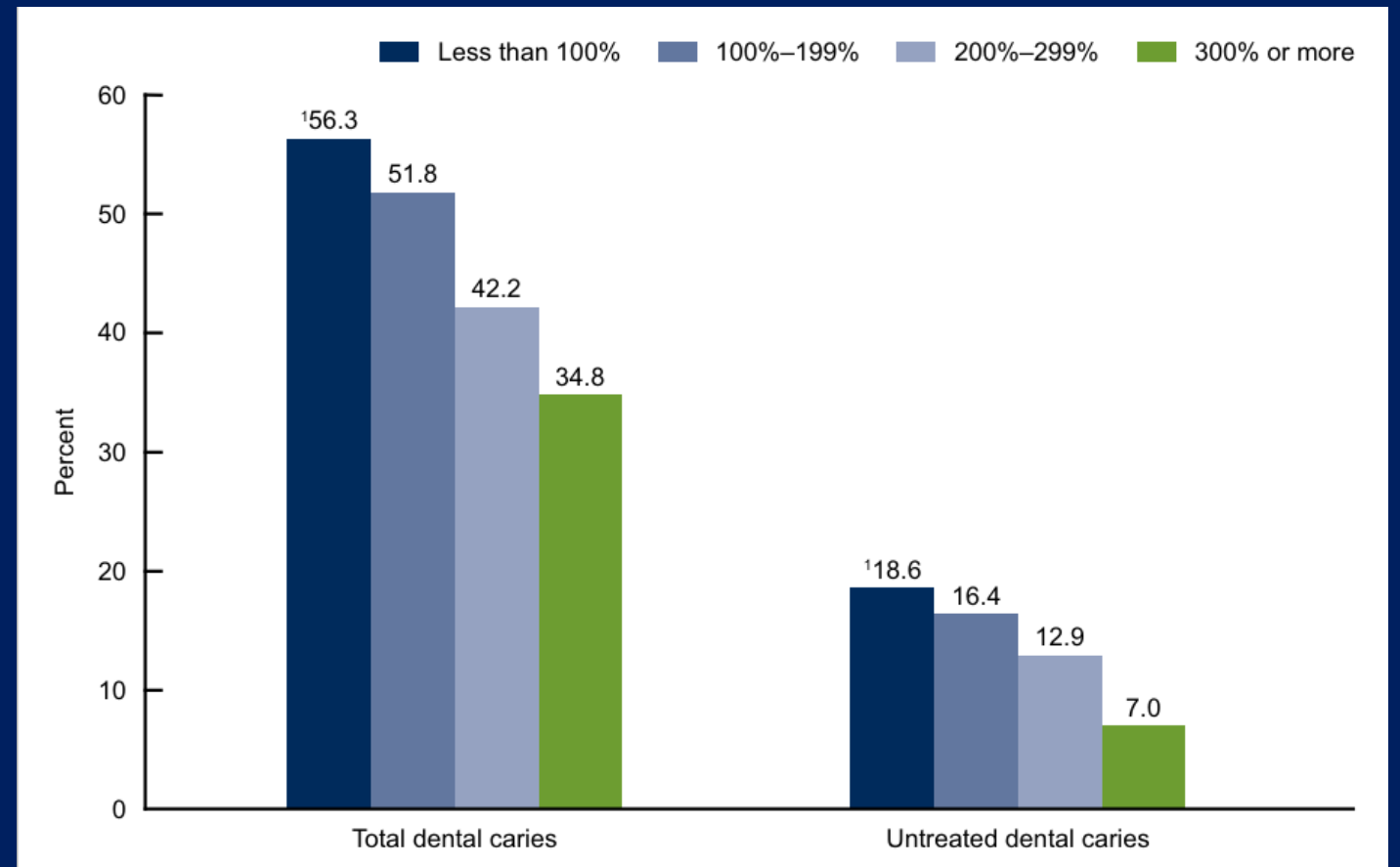


OPPORTUNITIES



PREVENTABLE

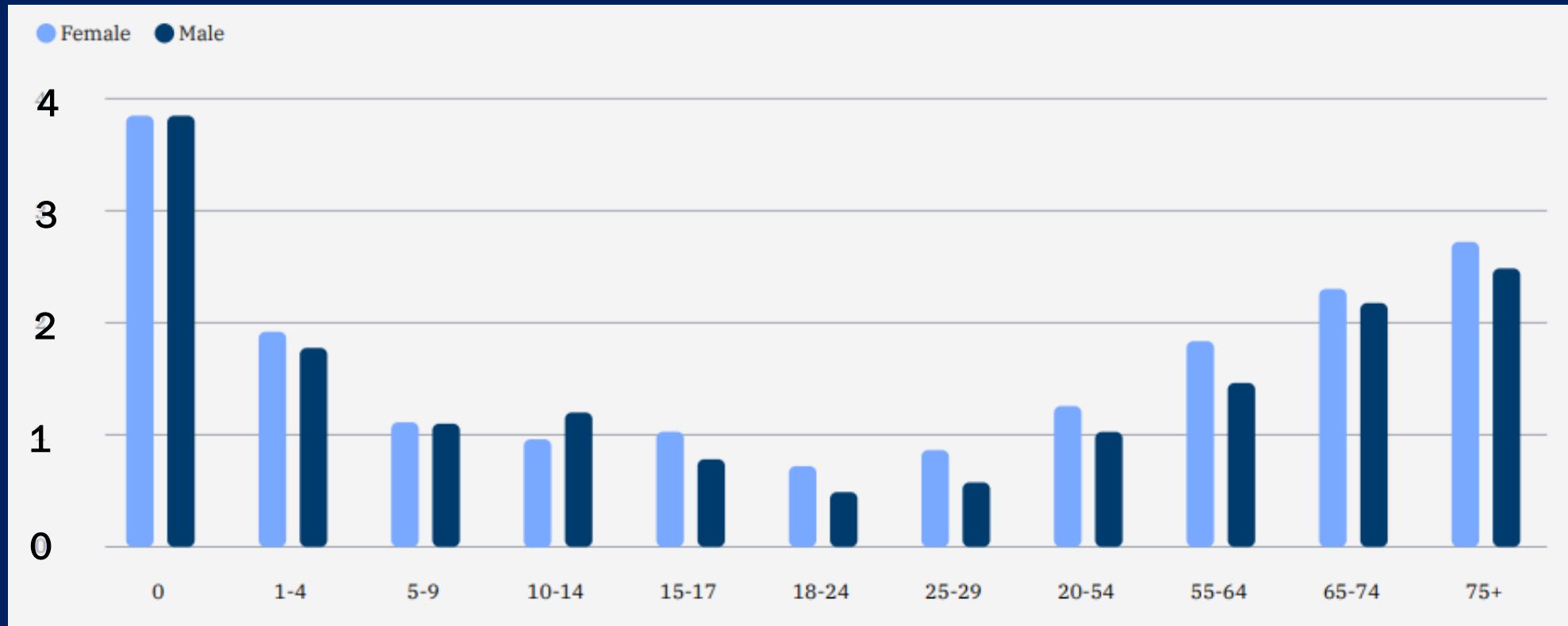
# Prevalence of total and untreated dental caries in primary or permanent teeth : youth aged 2–19 years by federal poverty level: United States, 2015–2016



NCHS: National Health and Nutrition Examination Survey, 2015–2016

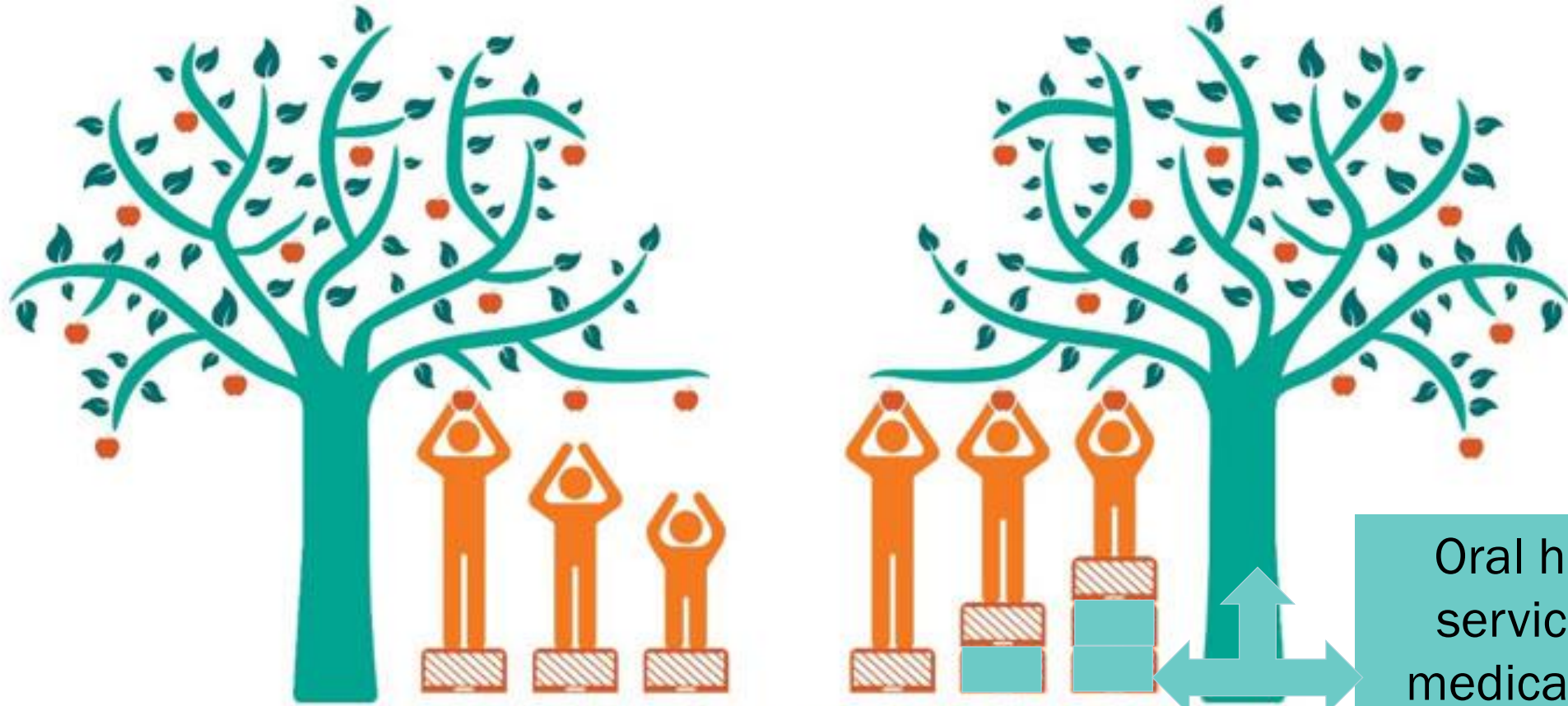


# Annual Primary Care Visits

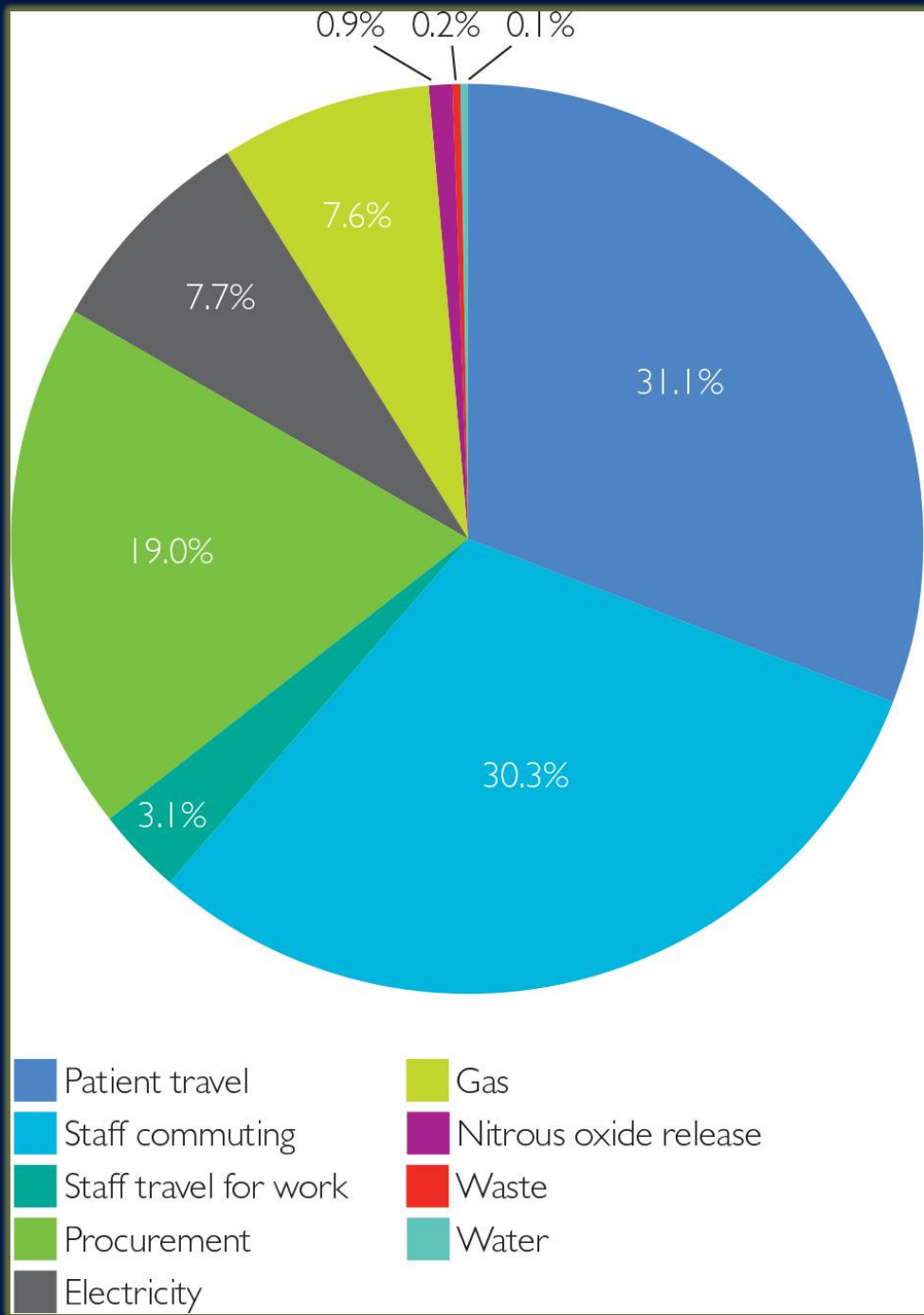


2017 Medical Expenditure Panel Survey

# Promoting Health Justice



Oral health services at medical visits



## What impact is dentistry having on the environment and how can dentistry lead the way?

*by Gavin J Wilson, Sagar Shah and Hannah Pugh*

Integrating sustainable waste management and procurement into daily practice will encourage the dental profession to tackle environmental change.

*Authors: Gavin J Wilson, Sagar Shah and Hannah Pugh\*,  
Fellows on the Chief Dental Officer's Clinical Fellow Scheme*

*\*Corresponding author:  
E: hannah.pugh4@nhs.net*

*Keywords: dentistry, sustainability, carbon footprint,  
plastic use, climate change, single-use*

# Bright Future

FOURTH

Guidelines for Health Supervision of Infants, Children, and Adolescents



American Academy of Pediatrics  
DEDICATED TO THE HEALTH OF ALL CHILDREN™



## Preventive Dental Services at Medical Visits

Endorsed by AAP, AAPD, ADA.

AAP Section on Oral Health.

USPSTF Recommendation B.

All 50 states reimburse.

3% (2008) → 18% (2018)

For children < 3 years of age.

1 of 4 bill for FV.

Lewis C, Quinonez R, Sisk B, Barone L, Krol D, Kornfeind KR, Braun PA. Incorporating Oral Health into Pediatric Practice: National Trends 2008, 2012, 2018. *Acad Pediatr.* 2022 Jun 19:S1876-2859(22)00301-1. doi: 10.1016/j.acap.2022.06.008. Epub ahead of print. PMID: 35732259.



**IMPORTANCE** A 2014 review for the US Preventive Services Task Force (USPSTF) found that oral fluoride supplementation and topical fluoride use were associated with reduced caries incidence in children younger than 5 years.

**OBJECTIVE** To update the 2014 review on dental caries screening and preventive interventions to inform the USPSTF.

**DATA SOURCES** Ovid MEDLINE, the Cochrane Central Register of Controlled Trials, and the Cochrane Database of Systematic Reviews (to September 2020); surveillance through July 23, 2021.

**STUDY SELECTION** Randomized clinical trials (RCTs) on screening, preventive interventions, referral to dental care; cohort studies on screening and referral; studies on diagnostic accuracy of primary care oral examination or risk assessment; and a systematic review on risk of fluorosis included in prior USPSTF reviews.

**DATA EXTRACTION AND SYNTHESIS** One investigator abstracted data; a second checked accuracy. Two investigators independently rated study quality.

**RESULTS** Thirty-two studies (19 trials, 9 observational studies, and 4 nonrandomized clinical intervention studies [total 106 694 participants] and 1 systematic review [19 studies]) were included. No study evaluated effects of primary care screening on clinical outcomes. One study (n = 258) found primary care pediatrician examination associated with a sensitivity of 0.76 (95% CI, 0.55 to 0.91) and specificity of 0.95 (95% CI, 0.92 to 0.98) for identifying a child with cavities, and 1 study found a risk assessment tool associated with sensitivity of 0.53 and specificity of 0.77 (n = 697, CIs not reported) for a child with future caries. No new trials of dietary fluoride supplementation were identified. For prevention, topical fluoride compared with placebo or no topical fluoride was associated with decreased caries burden (13 trials, n = 5733; mean caries increment [difference in decayed, missing, and filled teeth or surfaces], -0.94 [95% CI, -1.74 to -0.34]) and likelihood of incident caries (12 trials, n = 8177; RR, 0.80 [95% CI, 0.66 to 0.95]; absolute risk difference, -7%) in higher-risk populations or settings, with no increased fluorosis risk. Evidence on other preventive interventions was limited (education, xylitol) or unavailable (silver diamine fluoride), and no study directly evaluated primary care dentistry referral vs no referral.

**CONCLUSIONS AND RELEVANCE** There was no direct evidence on benefits and harms of primary care oral health screening or referral to dentist. Dietary fluoride supplementation and fluoride varnish were associated with improved caries outcomes in higher-risk children and settings.

JAMA | US Preventive Services Task Force | EVIDENCE REPORT

## Screening and Interventions to Prevent Dental Caries in Children Younger Than 5 Years Updated Evidence Report and Systematic Review for the US Preventive Services Task Force

Roger Chou, MD; Miranda Pappas, MA; Tracy Dana, MLS; Shelley Selph, MD; Erica Hart, MBS; Rongwei F. Fu, PhD; Eli Schwarz, DDS, PhD, MPH

# Sharing

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# Levels of Medical-Dental Integration

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# Denver Health



An innovative health care system that is a model for success in the nation.

## TRUE NORTH

Change the world by transforming the health of our patients and community.

## VALUES

**EXCELLENCE** - We are better every day.

**COMPASSION** - We care for everyone.


**RELENTLESSNESS** - We fight for everyone.

**STEWARDSHIP** - We use resources responsibly.

**LEARNING** - We educate the next generation.



**ACUTE CENTER FOR EATING DISORDERS AND MALNUTRITION**  
Proving medical stabilization for patients with life-threatening eating disorders - credited with saving more than **2000** lives



**ROCKY MOUNTAIN POISON AND DRUG SAFETY**  
Saving Lives with Answers, serving multiple states and over **100** national and international brands



**EMERGENCY RESPONSE**  
Operating Denver's emergency medical response system, the busiest in the state - handling **118,000+** emergency calls and logging over 12 million miles on our emergency vehicles each year



**NURSELINE**  
Registered nurses fielded over **216,000** calls in 2020 - advising on medical information, home treatment, and when to seek additional care - giving patients peace of mind 24/7



**DENVER HEALTH MEDICAL CENTER**  
One of Colorado's busiest hospitals with **23,500+** inpatient admissions annually, ranked in the top 5% for inpatient survival



**DENVER HEALTH MEDICAL PLAN, INC.**  
Keeping our community healthy by providing healthcare insurance to **120,000+**




**DENVER CARES**  
Providing a safe haven and detox for public inebriates



**ERNEST E. MOORE SHOCK TRAUMA CENTER**  
Region's top Level I Trauma Center for adults and Level II Center for children + whole family care



**HEALTH CENTERS**  
Offering total family care in **10 neighborhood centers** where families need it the most - **640,000+** patient visits completed annually



**DENVER HEALTH PEDIATRICS AT DENVER PUBLIC SCHOOLS SCHOOL-BASED HEALTH**  
Keeping kids healthy in school by providing vital health care to Denver Public Schools students through **19 in-school clinics**, free of charge



**ROCKY MOUNTAIN CENTER FOR MEDICAL RESPONSE TO TERRORISM**  
Working every day to plan for the "what if" for **5 states**



**DENVER HEALTH FOUNDATION**  
Accelerating Denver Health's mission by providing resources for important projects and programs through fundraising and philanthropy



**CORRECTIONAL CARE**  
Providing medical care to prisoners in Denver's jails via telemedicine



**PUBLIC HEALTH INSTITUTE AT DENVER HEALTH**  
Keeping the public safe through prevention, clinical services, and community outreach



# Preventive Oral Health Services in Medical

## Pediatrics



Image credits: Braun

## Approach



## Results

20% ↓ any decay  
(46.7% → 37.3%)

AJPH RESEARCH

Effectiveness on Early Childhood Caries of  
an Oral Health Promotion Program for  
Medical Providers

Patricia A. Braun, MD, MPH, Katina Widmer-Racich, MA, Carter Sevik, MS, Erin J. Starzyk, PhD, MPH, Katya Mauritson, DMD, and  
Simon J. Hambidge, MD, PhD

**Braun PA, Widmer-Racich K, Sevik C, Starzyk EJ, Mauritson K, Hambidge SJ. Effectiveness on Early Childhood Caries of an Oral Health Promotion Program for Medical Providers. Am J Public Health. 2017; 107:S97-S103.**

# Quality Improvement

\*At least 3 dental visits or fluoride applications by 42 months

N = 1377

Report month		Peds Oral Health Metrics		50% Dental Visit or Exam by 36 months	75% Fluoride Varnish or Dental Visit or Exam by 18 months	70% 2 Fluoride Varnish or Dental Visit or Exam by 30 months	50% 3 Fluoride Varnish or Dental Visit x 42 months
July 2024							
Measure type							
Peds Oral Health							
Population							
CHS All							
Gender							
(All)							
Race Ethnicity							
(All)							
Insurance							
(All)							
Language							
(All)							
		CHS Overall		76.0%	89.7%	88.5%	90.2%
		Family Med	Total	74.2%	93.9%	91.3%	94.8%
		Internal Med	Total	44.0%	90.9%	88.0%	80.0%
		Peds	Eastside Peds/Teen	94.7%	90.0%	88.6%	88.4%
			Webb Ped Clinic	68.9%	86.3%	84.2%	79.6%
			Westside Peds/Teen	82.1%	86.0%	87.9%	94.4%
		SBHC	Total	19.2%	33.3%	100.0%	66.7%

# Questions | Discussion

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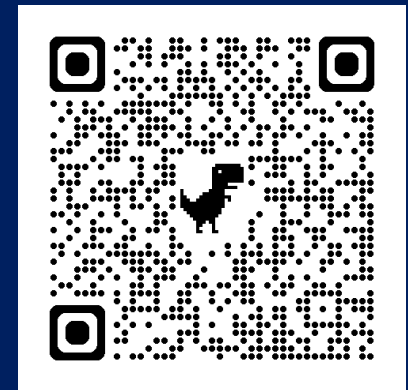
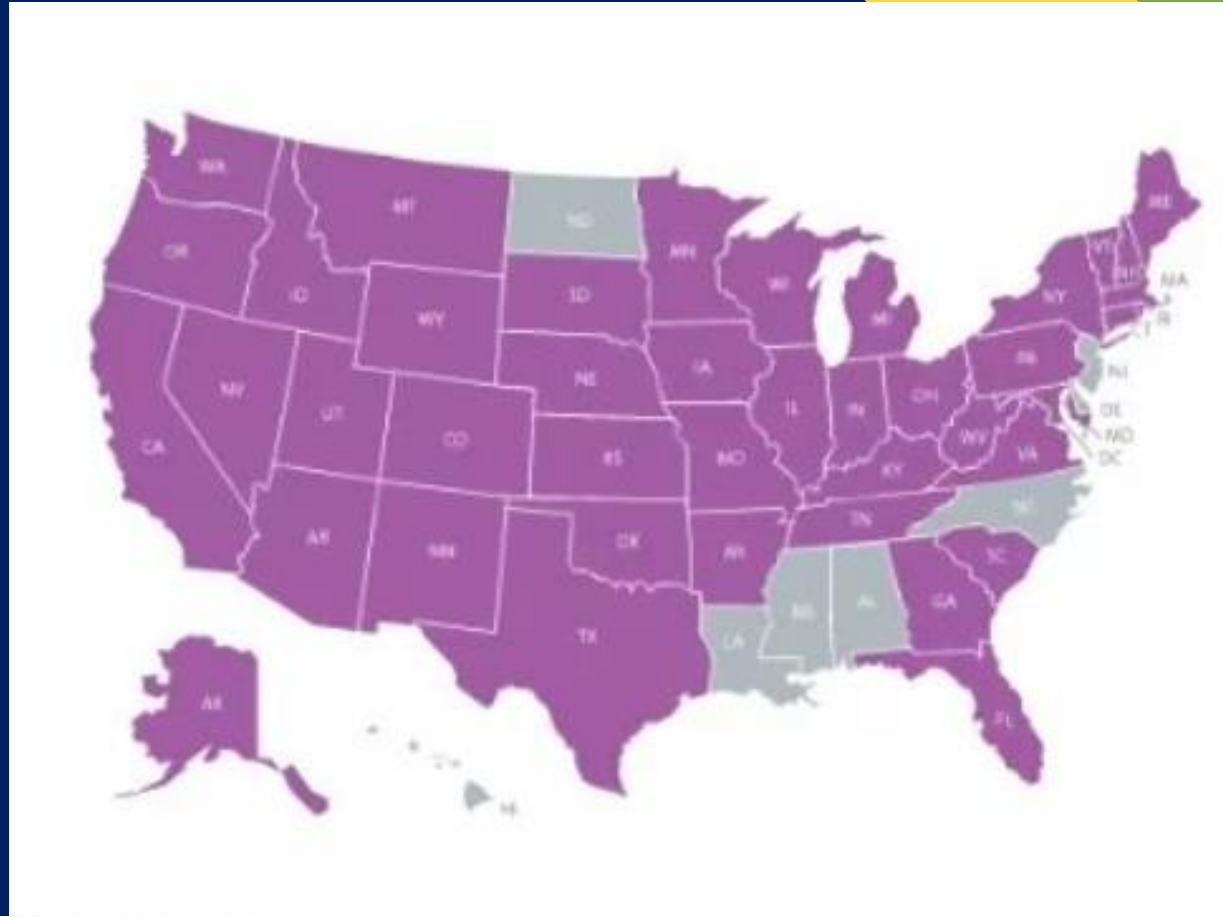
# Levels of Medical-Dental Integration

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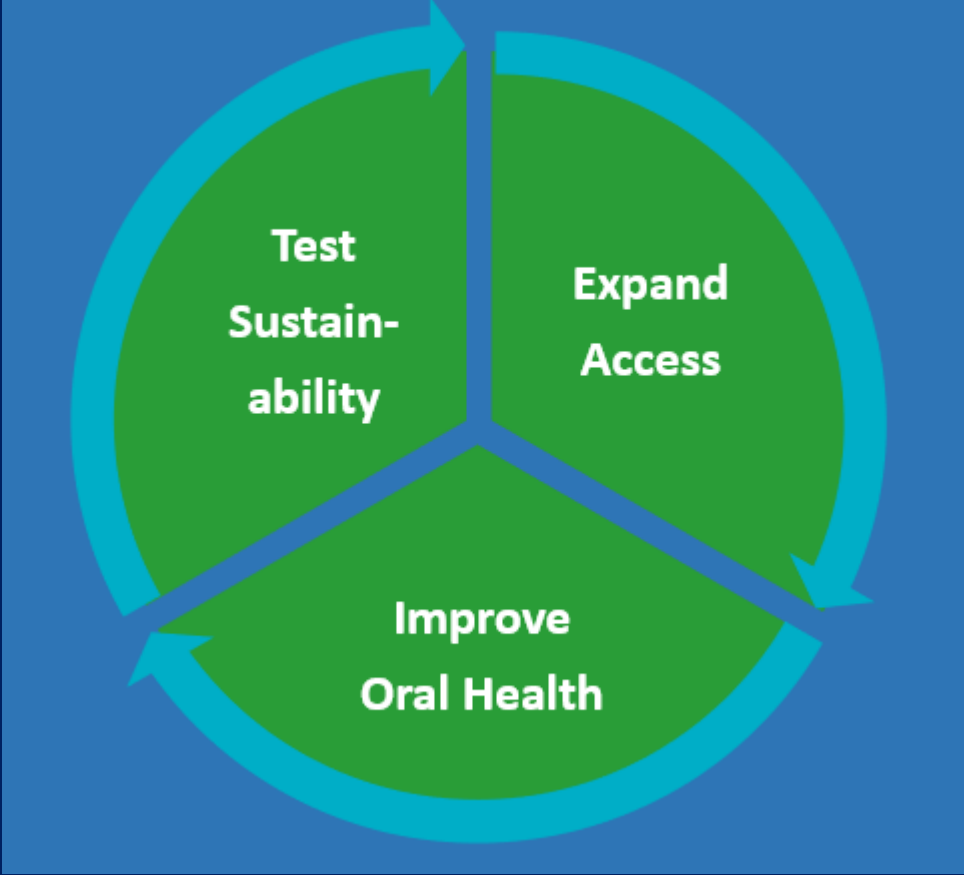
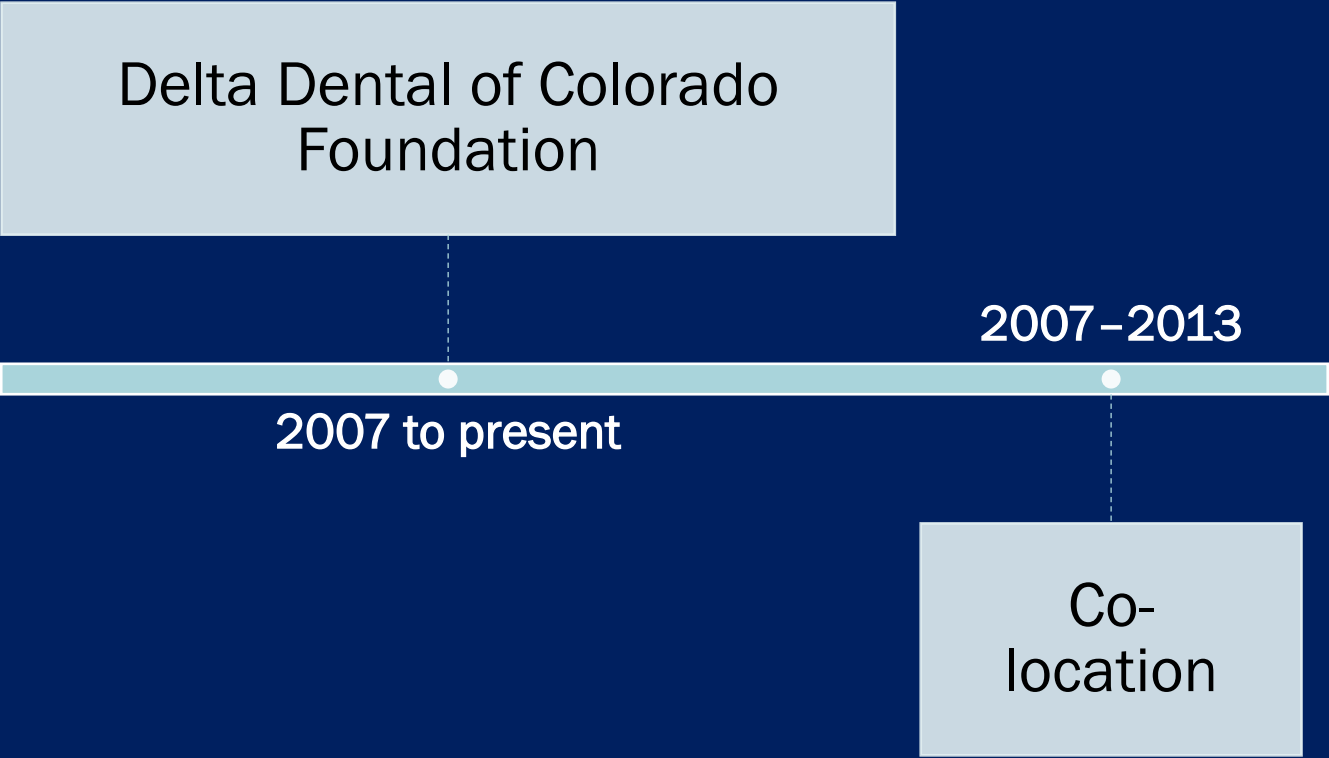




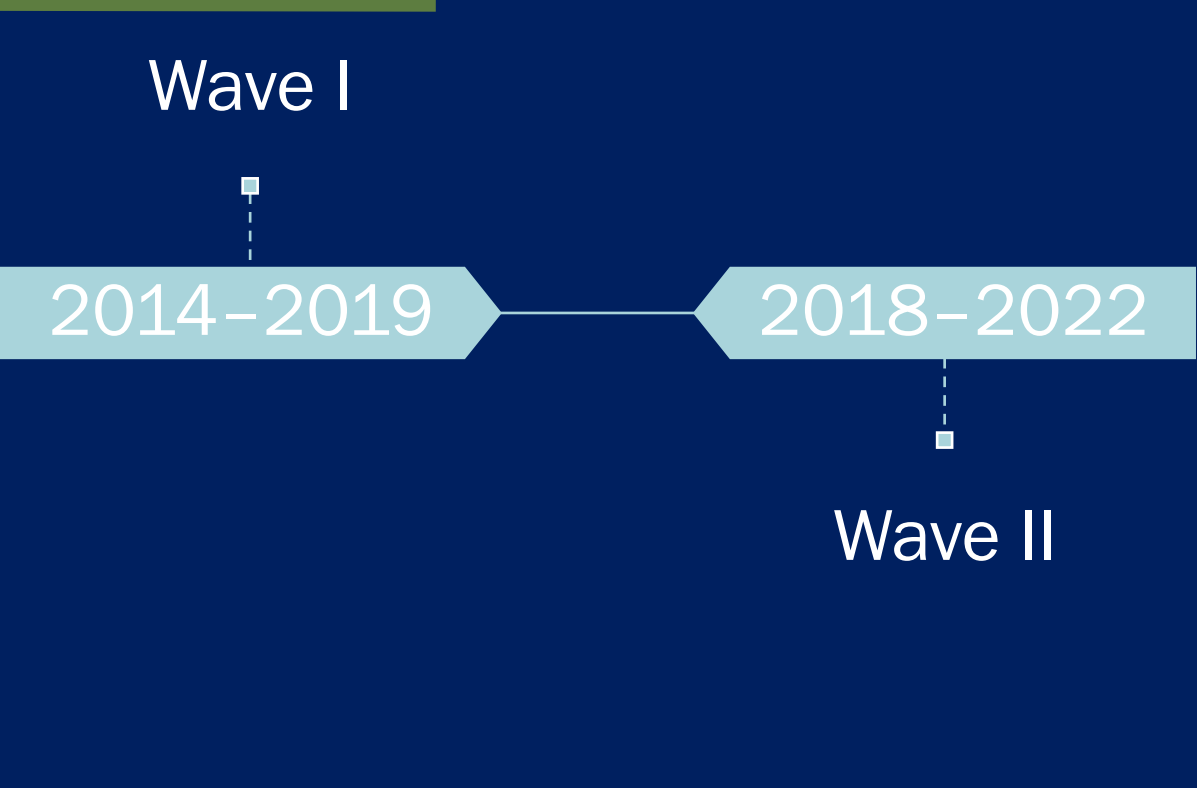
# Direct Access to Dental Hygienists



# Colorado Medical-Dental Integration (CO MDI) Project

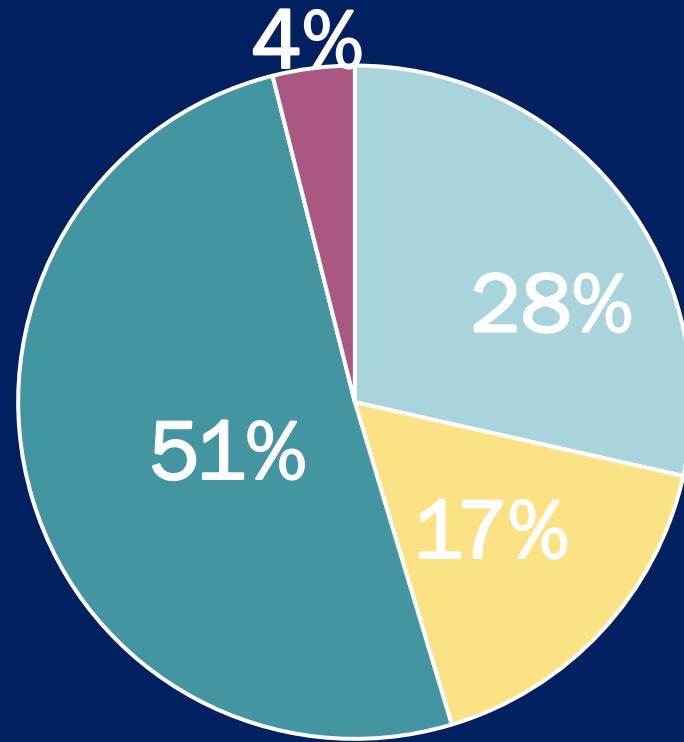


# Colorado Medical-Dental Integration (CO MDI) Project



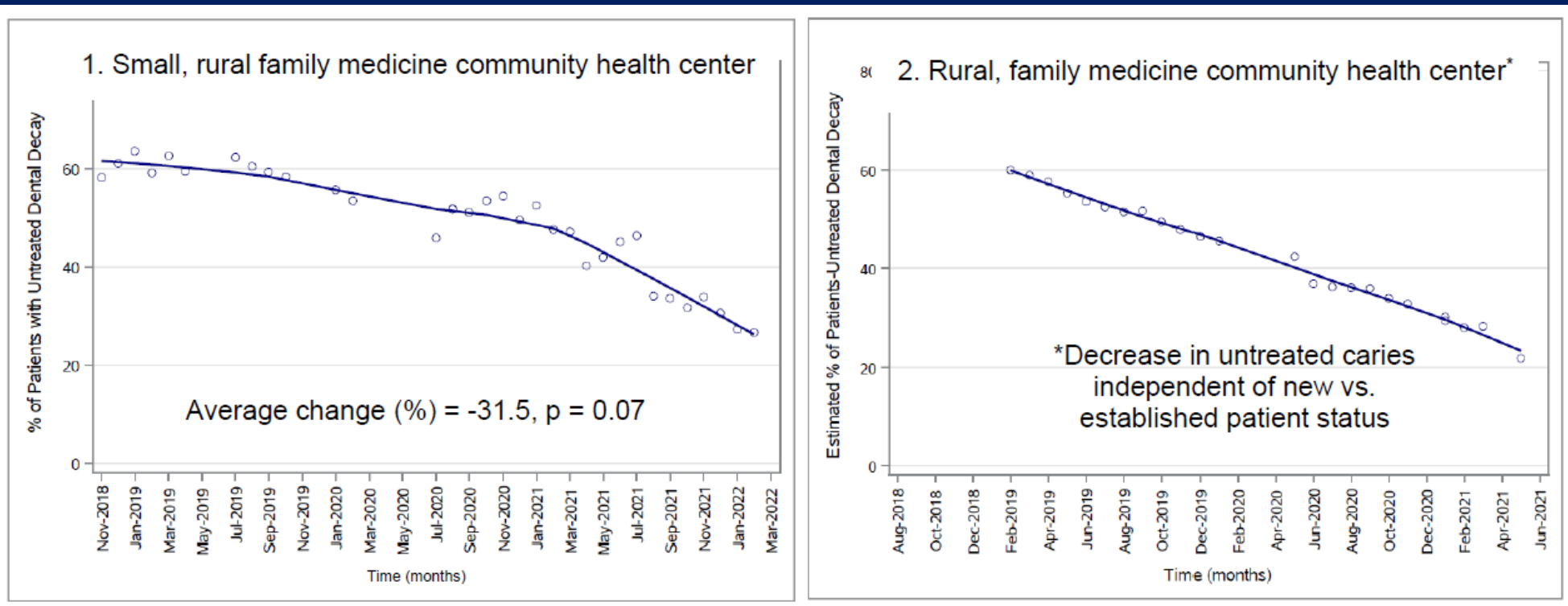
Braun PA, Cusick A. Collaboration Between Medical Providers and Dental Hygienists in Pediatric Health Care. The Journal of Evidence-based Dental Practice. 2016 Jun;16 Suppl:59-67. DOI: 10.1016/j.jebdp.2016.01.017.

# > 75,000 MDI Visits



■ 0-5 years ■ 6-18 years ■ 18-64 years ■ > 65 years

# Adjusted logistic regression analysis comparing change in proportion patients with untreated dental caries in established patients vs. new patients of dental hygienists; adjusted for time and practice.



Braun, P. A., Chavez, C., Flowerday, C., Furniss, A., & Dickinson, M. (2023). Embedding Dental Hygienists into Medical Care Teams: Implementation and evaluation of a medical-dental integration approach in Colorado. *Journal of dental*

# MDI Change Package

Engaged Leadership

Engaged Providers and Staff

Right Dental Hygienist

Dedicated Time

Continuous Process Improvement

Team Assignments and Adoption

Team Workflows



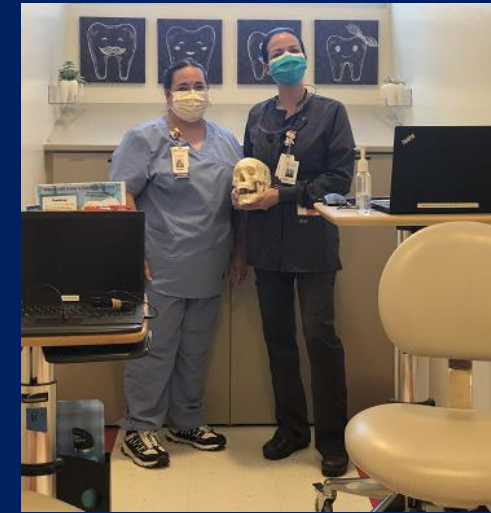
# Strengths of Integrated Model

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- Specialized provider delivering care
- In-depth visit rather than fitting one more thing into a WCC
- More effective coordinated referral to dental provider
- Focus more specifically on oral health
- Communicates importance of oral health to families
- Billing and payment

# One size doesn't fit all

- One model doesn't fit all
- CHC Oral Health Needs Assessment
- Medical, dental hygiene, hybrid models
- Full scope dental hygiene and oral health screenings

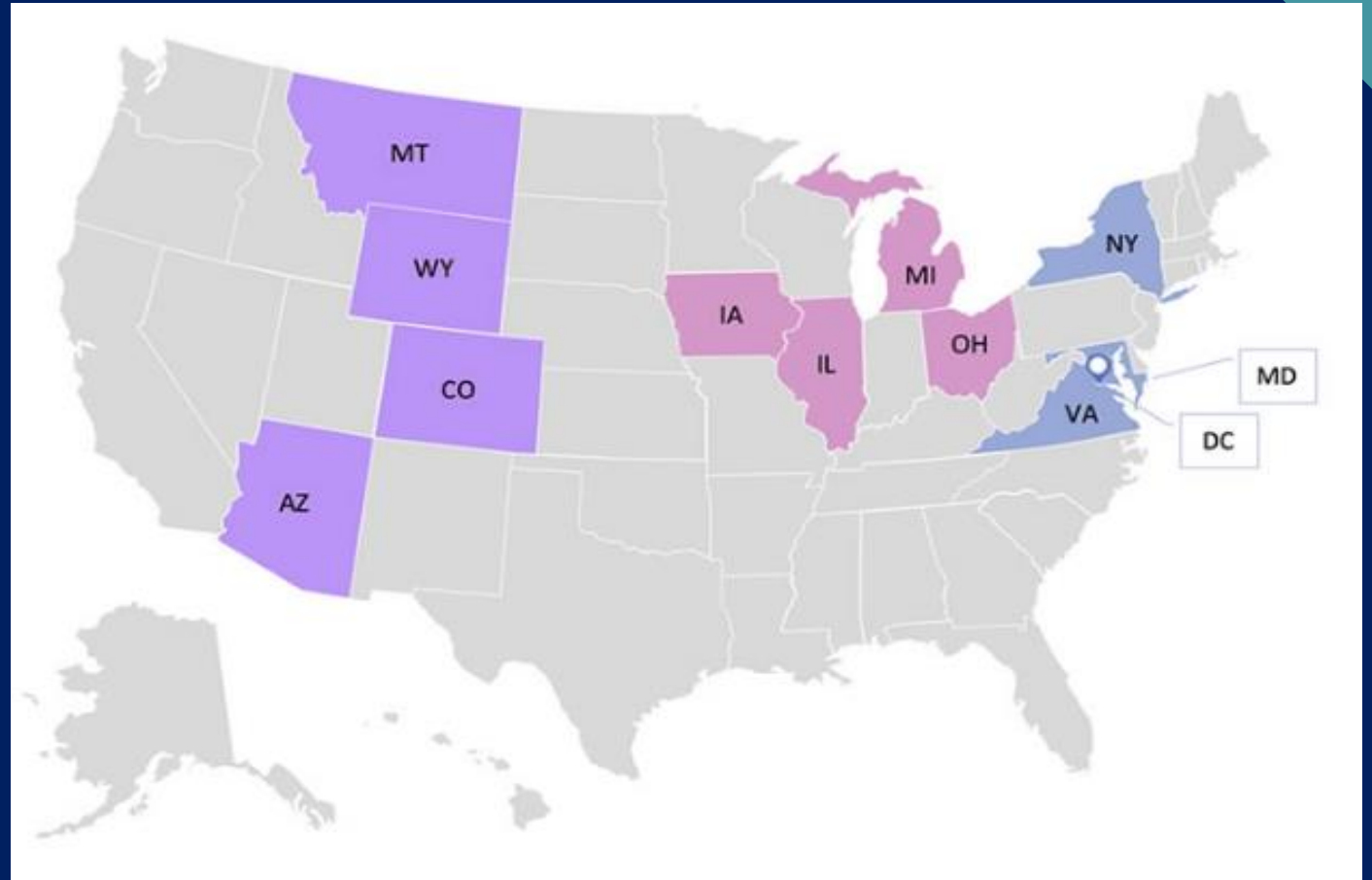


# Questions | Discussion

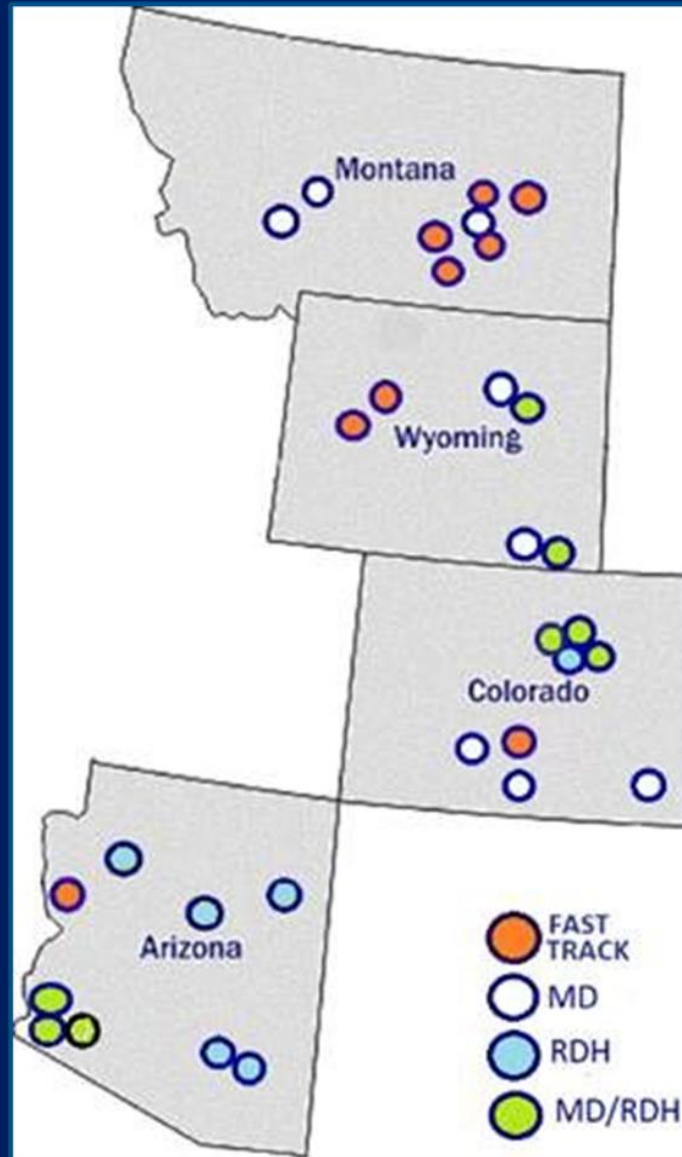
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# Networks for Oral Health Integration (NOHI) Within the Maternal and Child Health Safety Net Program

This project is supported by the Health Resources and Services Administration (HRSA) of the U.S. Department of Health and Human Services (HHS) as part of an award totaling \$6.4 million with zero percent financed with non-governmental sources. The contents are those of the author(s) and do not necessarily represent the official views of, nor an endorsement, by HRSA, HHS, or the U.S. Government.



# Networks for Oral Health Integration (NOHI) Within the Maternal and Child Health Safety Net Program



- Southwest MT, (2)
- Riverstone, MT (6)
- CHC Wyoming (3)
- Healthworks, WY (1)
- University of WY (2)
- Denver Health, CO (3)
- Clinica Tepeyac, CO (1)
- Valleywide, CO (6)
- El Rio, AZ (2)
- North County, AZ (4)
- Sunset, AZ (3)



# Networks for Oral Health Integration

Improve access to and utilization of comprehensive, high-quality oral health care for pregnant women, infants and children at high risk for oral disease.

Funded by the Maternal and Child Health Bureau, Health Resources and Services Administration (2019-2024)

Caries Risk  
Assessment

Oral Health  
Education

Dental  
Referral

Fluoride  
Varnish

Patient  
Engagement

# RoMoNOH Approach

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Synchronized,  
practice  
facilitation  
using Primary  
Care  
Association  
coaches

Expanded  
dental  
workforce  
models

Population  
management

Value-based  
care with  
incentive  
payments

Enhanced  
patient  
engagement

# MDI Change Package

Engaged Leadership

Engaged Providers and Staff

Right Dental Hygienist

Dedicated Time

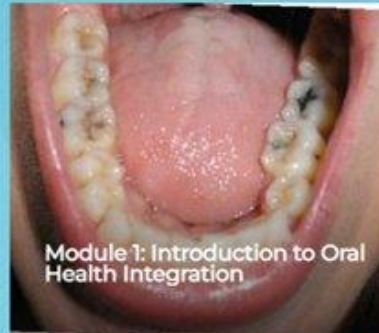
Continuous Process Improvement

Team Assignments and Adoption

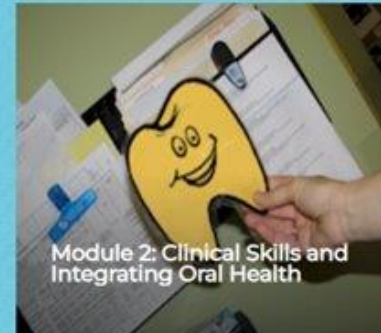
Team Workflows

# Oral Health Knowledge

## Networks of Oral Health Integration



[View Module](#)



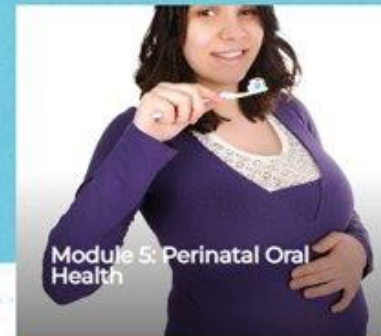
[View Module](#)



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- 322 learners
- 1,123 modules completed
- 1,123 hours of CME

# Evaluation

“We’ve talked about cavities and how to prevent them. What do you think you could do as a parent to help your child not get cavities?”

CHCs  
19/23 (83%)

2,500 bags  
sent

2,233 well  
child visits

Baseline  
survey  
N=426

Follow up  
survey  
N=184 (43%)



# Evaluation: Oral Goal Setting

Variable		<u>All, N (%)</u>	<u>Follow-up survey completed, N (%)</u>	<u>Follow-up survey not complete, N (%)</u>	<i>p</i> -value
		426 (100)	184 (43.2)	242 (56.8)	
Oral health goal setting at medical visits intervention delivery					
Did provider talk with you about your child's teeth and gums?	Yes	420 (98.6)	183 (99.5)	237 (97.9)	0.39 <sup>b</sup>
	No	5 (1.2)	1 (0.5)	4 (1.6)	
Did you make a goal?	Yes	419 (98.4)	183 (99.5)	236 (97.5)	0.99 <sup>b</sup>
	No	7 (1.6)	1 (0.5)	6 (2.5)	
# of goals set	<2	128 (30.0)	57 (31.0)	71 (29.3)	0.7 <sup>b</sup>
	≥2	298 (69.9)	127 (69.0)	171 (70.7)	
Confidence in goal	≤6 (not confident)	27 (6.5)	17 (9.4)	10 (4.3)	<b>0.0350<sup>b</sup></b>
	>6 (confident)	389 (93.5)	164 (90.6)	225 (95.7)	

Talla, S., Flowerday, C., Dickinson, M., & Braun, P. A. (2024). Does oral health goal setting during medical visits improve parents' oral health behaviors?. *Journal of public health dentistry*, 84(1), 28–35.

<https://doi.org/10.1111/jphd.12597>

# Evaluation: Oral Goal Setting

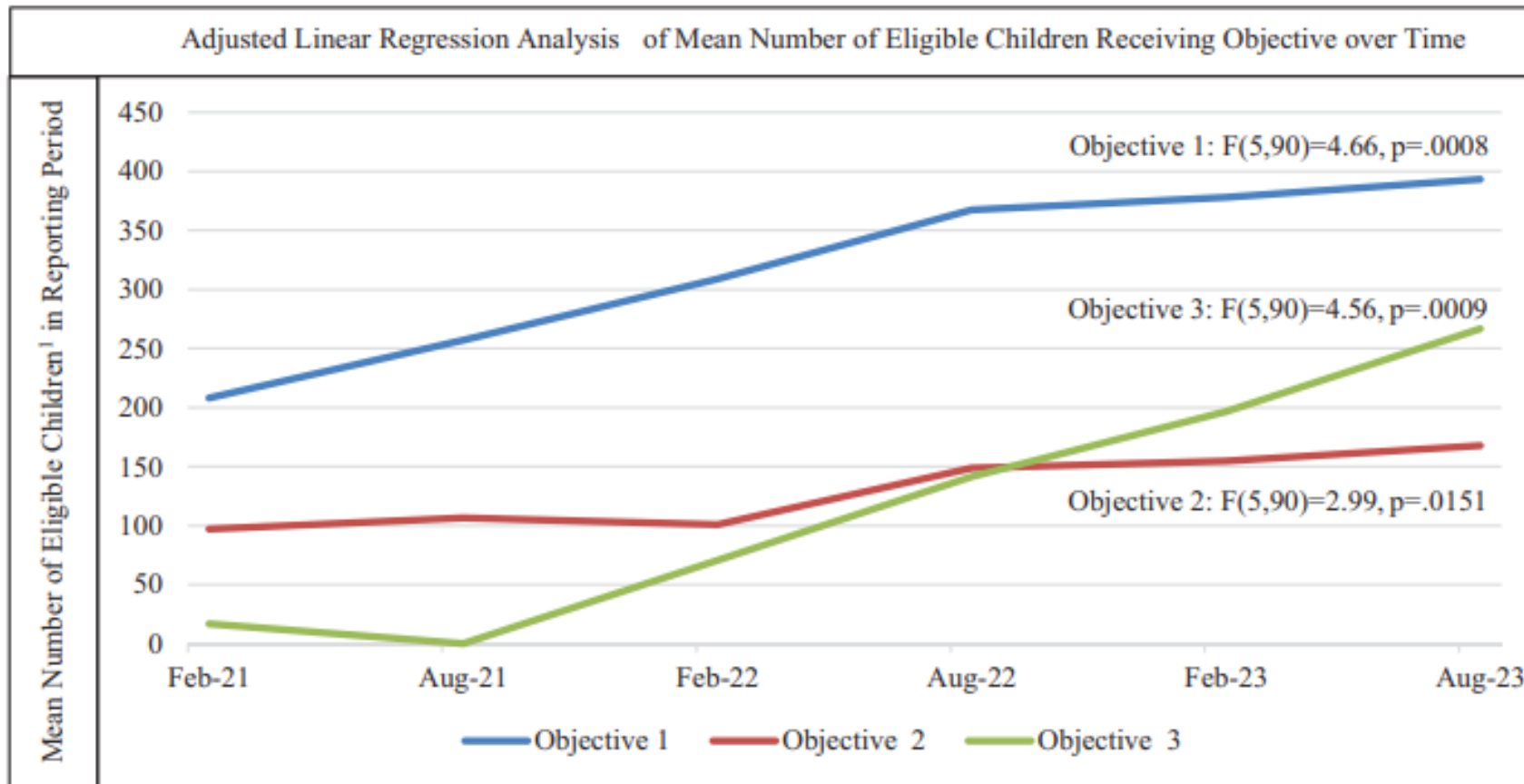
**TABLE 4** Unadjusted and adjusted oral health behavior adherence related to oral health goal ( $N = 184$ ).<sup>a</sup>

Exposure	Goal set, $N$ (%)	Unadjusted		Adjusted <sup>b</sup>	
		Parameter estimate (standard error)	$p$ -value	Parameter estimate (standard error)	$p$ -value
Brush my child's teeth more often <sup>c</sup>	97 (52.7%)	0.007 (0.155)	0.965	-0.007 (0.158)	0.9623
Brush my child's teeth more often <sup>d</sup>	97 (52.7%)	0.002 (0.172)	0.992	0.005 (0.173)	0.9735
Brush my child's teeth with fluoride toothpaste	68 (36.9%)	0.519 (0.184)	0.005	0.485 (0.189)	<b>0.0114</b>
Keep my mouth germs to myself	49 (26.6%)	0.016 (0.112)	0.886	0.065 (0.115)	0.5706
Only give my child water in their bottle or sippy cup	36 (19.6%)	-0.051 (0.224)	0.820	-0.132 (0.230)	0.5688
Give my child fewer sugary drinks	36 (19.6%)	0.057 (0.113)	0.617	0.075 (0.118)	0.5217
Stop putting my child to bed with a bottle	35 (19.0%)	0.283 (0.122)	0.021	0.273 (0.128)	<b>0.0347</b>
Stop putting my child to nap with bottle	35 (19.0%)	0.189 (0.267)	0.482	0.316 (0.276)	0.2544
Give my child tap water with fluoride	33 (17.9%)	0.638 (0.234)	0.007	0.346 (0.192)	<b>0.0254</b>

# Evaluation: Parent Experience Survey (N = 426)

	Strongly Agree	Somewhat Agree	Somewhat Disagree	Strongly Disagree
Having my child get his/her dental care at the same time that they get their medical care makes sense to me.	<b>284 (70%)</b>	<b>97 (24%)</b>	18 (4.4%)	6 (1.5%)
It would be convenient for my child to get his/her dental care from a dental hygienist as part of their medical visit.	<b>265 (65%)</b>	<b>120 (30%)</b>	17 (4.2%)	3 (0.7%)
Improving the oral health of my child will also improve his/her overall health.	<b>340 (84%)</b>	<b>64 (16%)</b>	1 (0.2%)	0 (0%)
I don't have enough time for my child to see both a medical and dental provider at the same visit.	17 (4.2%)	39 (9.6%)	<b>111 (27%)</b>	<b>238 (59%)</b>
Dental problems are not as important as other health problems for my child.	17 (4.2%)	19 (4.7%)	<b>65 (16%)</b>	<b>304 (75%)</b>

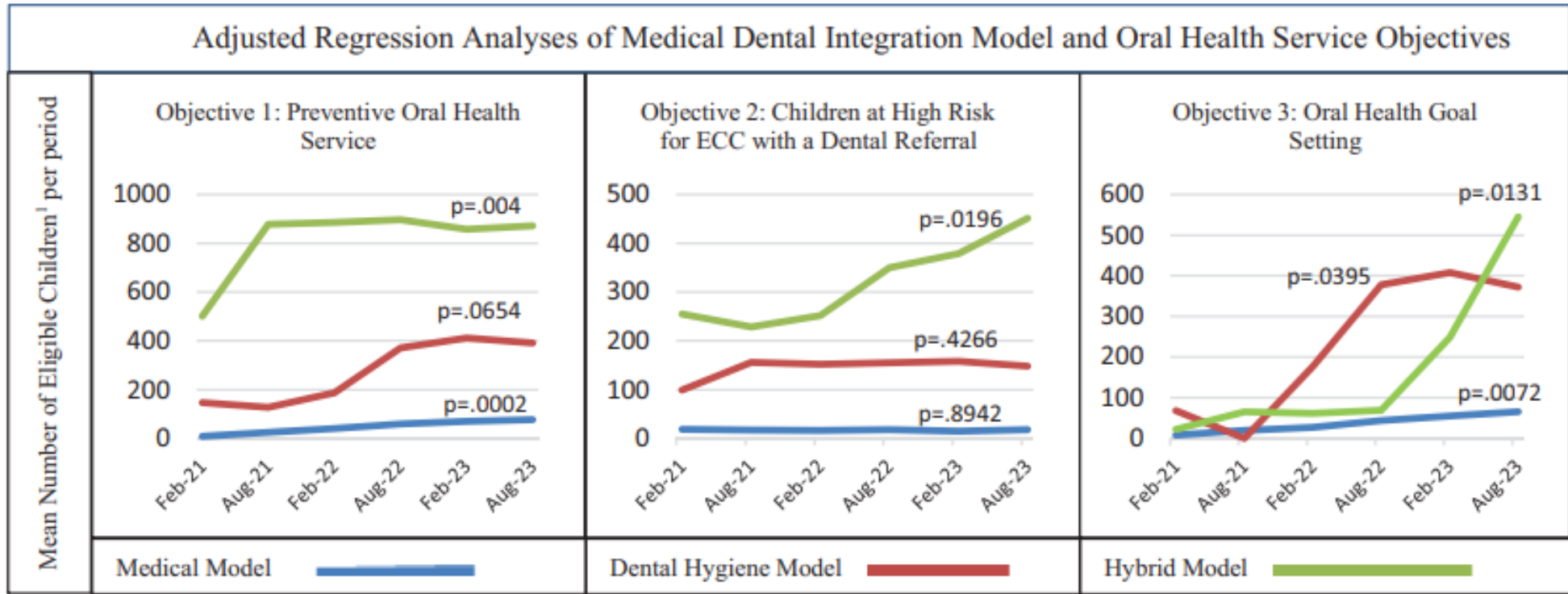
**Figure 2.** Adjusted linear regression analysis of the proportion of eligible children receiving preventive oral health services.



<sup>1</sup>Eligible children includes children 0-40 months of age seen in each 6-month reporting period for a well childcare visit in the medical clinic and at least 1 previous well childcare visit in the same medical clinic in the child's lifetime. The mean number of eligible children who received the objective-specific oral health services were include for each objective.

# Evaluation: Model

**Figure 3.** Adjusted regression analyses: associations of medical dental integration model and objectives.



<sup>1</sup>Eligible children includes children 0-40 months of age seen in each 6-month reporting period for a well childcare visit in the medical clinic and at least 1 previous well childcare visit in the same medical clinic in the child's lifetime. The mean number of eligible children who received the objective-specific oral health services were included for each objective and medical dental integration model.

# Evaluation: Model



# Questions | Discussion

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# Take-Aways

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# Garnering Leadership Buy-in

- Promote person-centered care
- Build consistent & equitable care through standard work
- Demonstrate ease of processes
- Highlight reduced burden of this work on the medical supportive care team especially the patient access team



# Role of Champion

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- **Voice of medical providers**
- **Dedicates time to meeting with coach and reviewing quality improvement metrics**
- **Communicates across teams**
- **Educates medical team colleagues, at staff and provider meetings**
- **Finds opportunities for practice improvement**
- **Sends information back to the team with reminders and tips for making changes**

# Medical Staff Buy-in and Engagement

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- **Understands importance and impact of oral health on overall health**
- **Understands common risk factors across health outcomes**
- **Sees value of integrated care**
- **Benefits of interprofessional relationships**
- **Interested in working on new project**



# Data Driven Improvement

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- **Objective measurement of improvement**
- **Identifies opportunities for improvement**
- **Motivates teams**
- **Demonstrates successes**

- **Highly motivated, adaptable, problem solver**
- **Respects timeliness and prioritization**
- **Patient navigator to dentist**



# Right Hygienist

# Lessons Learned

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- Medical dental integration is feasible & has potential to improve oral health.
- Different models of care delivery support different communities' needs.
- Medical dental integration happens with practice transformation support.
- Patients value medical dental integration.
- Payment supports implementation of models.

# Policy Opportunities

- Maintain Medicaid payment for preventive oral health services at medical visits.
- Expand Medicare Advantage benefit for dental services in medical and dental visits.
- Supportive rules/regulations around expanded dental workforce models.
- Authorize HHS oral health funding to mandatory federal budget appropriations.

# Questions | Discussion

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# Thank you

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