



Connections Between Chronic Disease and Oral Health

Wisconsin Department of Health Services

Carrey Spencer, RDH, BSDH
Oral Health Prevention Program Coordinator
Carrey.Spencer@dhs.wisconsin.gov

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**Department of Health Services
Division of Public Health
Bureau of Community Health Promotion
Chronic Disease Prevention & Cancer Control Section
Oral Health Program**

Meet the Wisconsin Oral Health Program (OHP)



Dr. Russ Dunkel
Dental Director



Robbyn Kuester
Supervisor



Marisa Voelker
Oral Health
Workforce Coordinator



Skylar Capriola
Epidemiologist



Carrey Spencer
Oral Health
Prevention Program
Coordinator



Lacey Hellenbrand
Oral Health
Educator



Mamaa Yorke
Oral Health
Educator



Abbie Maule
Drinking Water
Specialist

Mission Statement

The mission of the Oral Health Program is to protect and promote oral health of the people of Wisconsin.

Objectives

- Oral health of Wisconsin
- Oral systemic connection
- Medical dental integration
- Oral health programming



Oral Health in Wisconsin



Oral Health

- Determined by oral hygiene, dental history, diet, stress, trauma, tobacco use, and alcohol use
- Shared risk factors with many chronic conditions like cardiovascular disease, cancer, stroke, and diabetes

Poor Oral Health Impacts Overall Quality of Life

- Self esteem
- Speaking
- Sleeping
- Eating
- Ability to learn





Adult's Oral Health

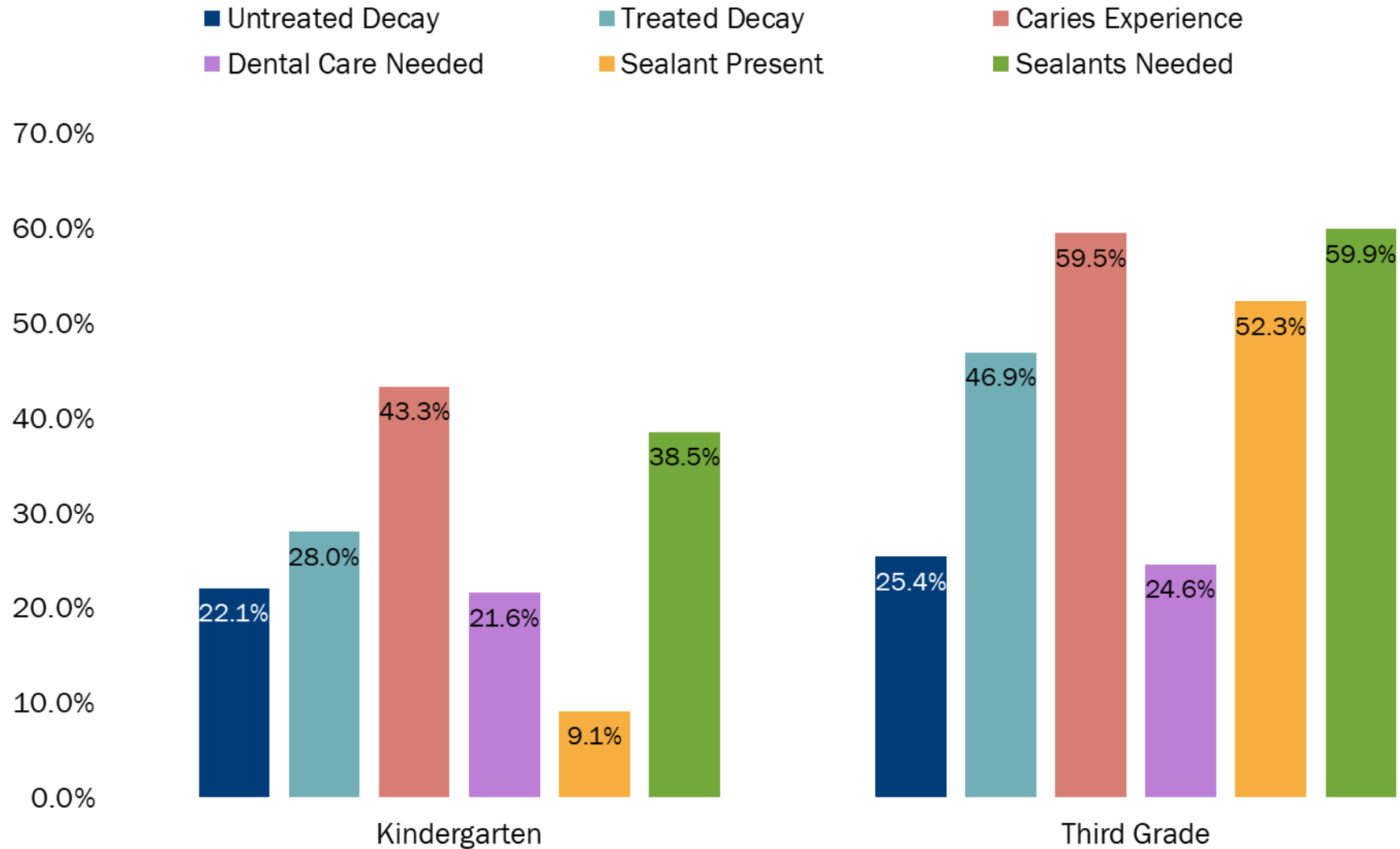
- **53.5%** of adults 18–64 have dental insurance.
- **23.1%** of adults 21–64 with Medicaid and BadgerCare Plus (MA/BC+) had a dental service.
 - Lack of dental clinics that accept MA/BC+
 - Long wait lists, not accepting new patients, or only treat children

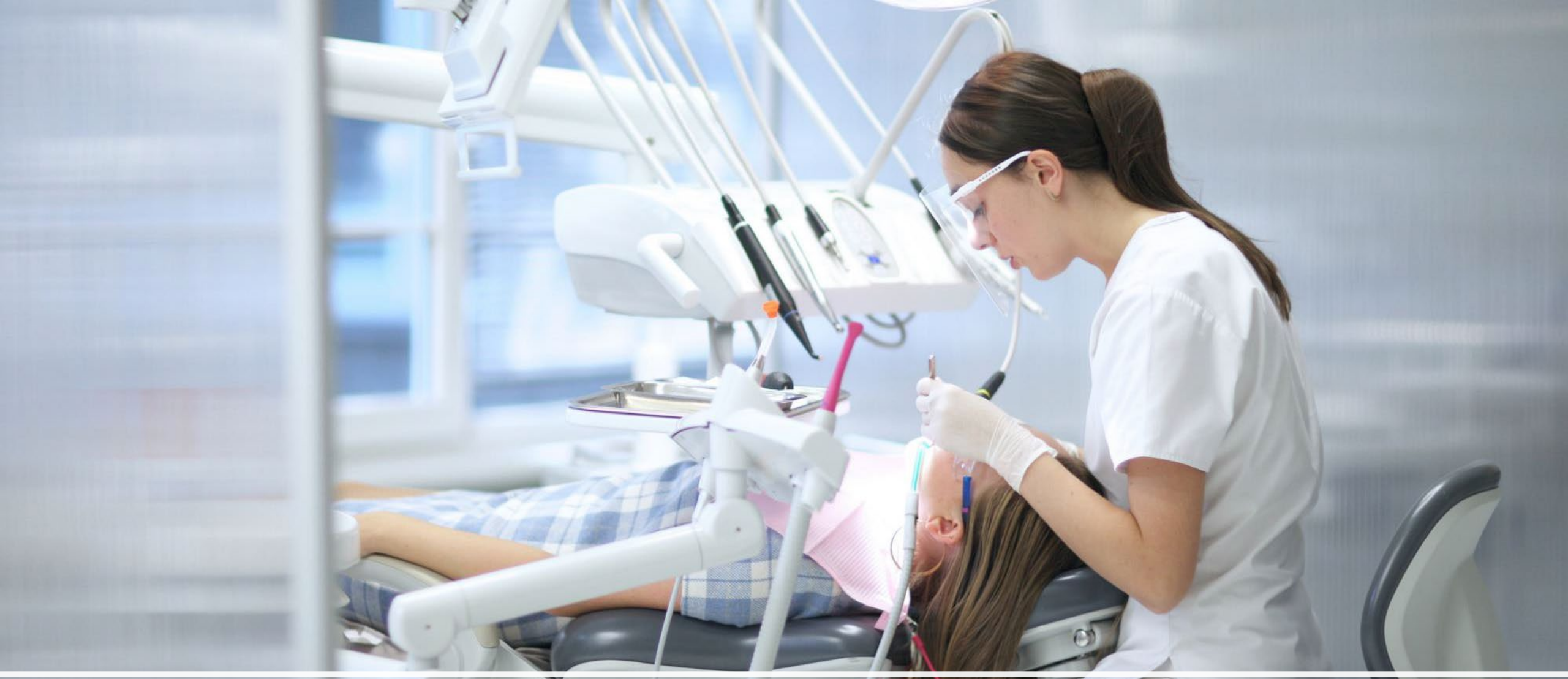
2022–2023 Wisconsin Healthy Smiles Survey

- Basic Screening Survey (BSS)
- Combined kindergarten (KG) and third grade survey
 - Fifth survey of third grade students (first in 2000–2001)
 - First survey of KG students



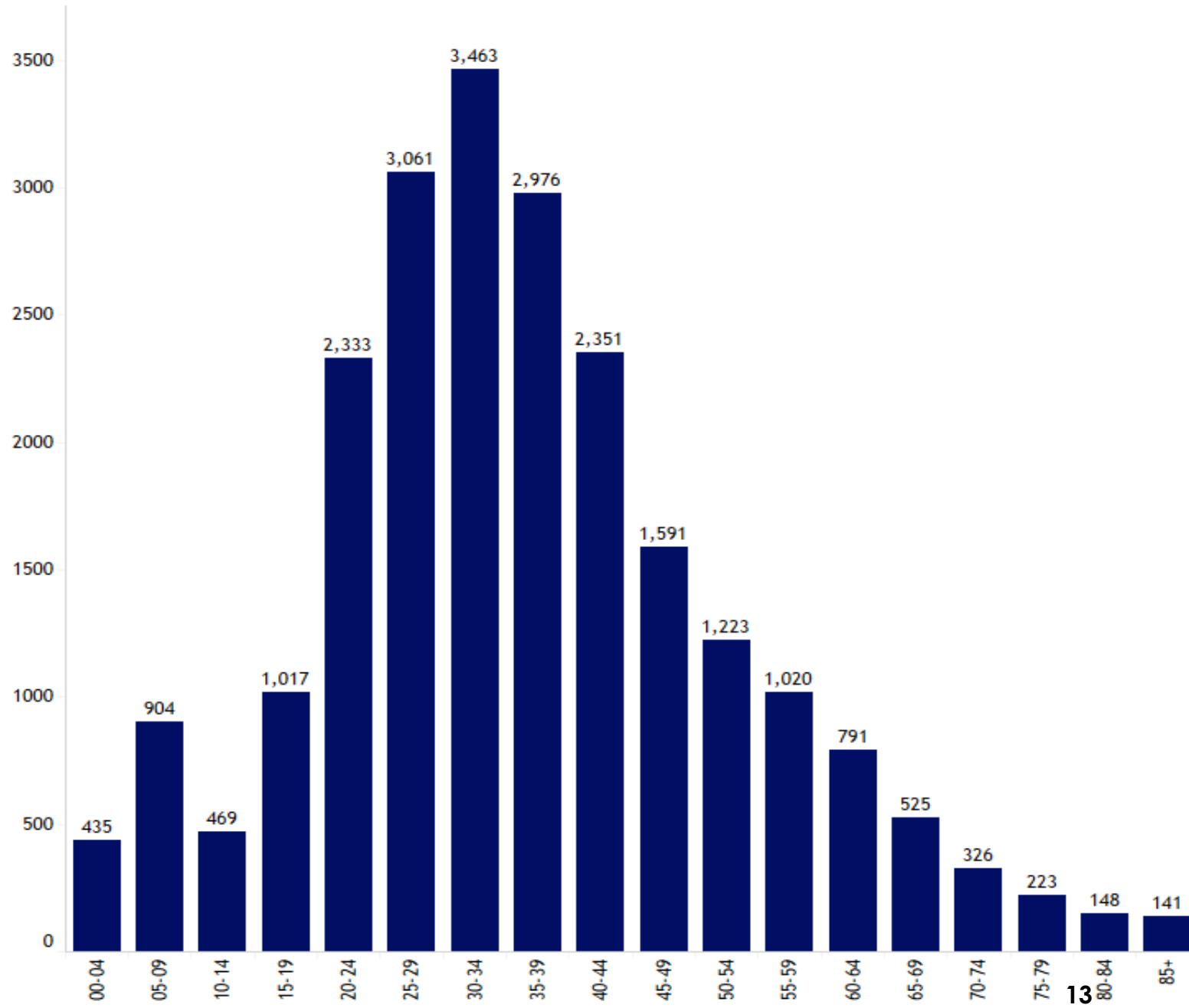
Oral Health Status by Grade





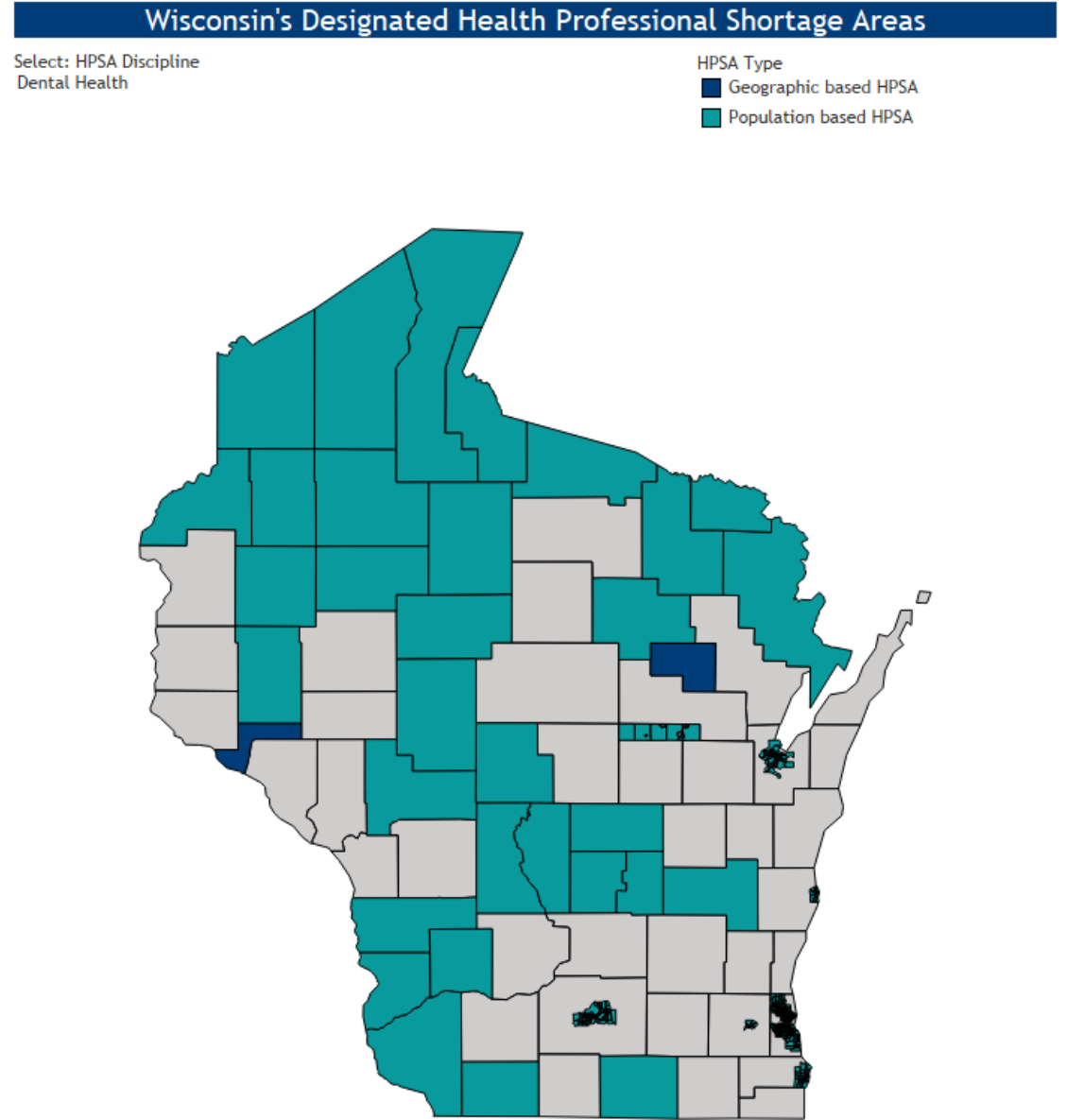
Access to Care

Number of ED Visits for Non-Traumatic Dental Conditions by Age Group



Dental Health Professional Shortage Areas (HPSA)

- **43** Dental HPSAs
 - **41** population-based
 - **Two** geographic-based
- **850,000+** Wisconsinites are impacted by a Dental HPSA.



Access to Care is Complex

- MA/BC+ provider enrollment
- Geographic location or transportation
- Child care
- Dental clinic hours of operation
- Wait lists
- Oral health literacy





The Oral Systemic Connection



**What is the most common
chronic disease?**

Dental caries (or cavities)

Oral Health Across the Lifespan

- Pregnancy
- Childhood
- Adolescence
- Young adult
- Middle age
- Older adulthood





What's In the Mouth?

- Bacteria
- Fungi
- Viruses
- Protozoa
- Archaeae

Mouth Image 1



Mouth Image 2



Mouth Image 3



Mouth Image 4



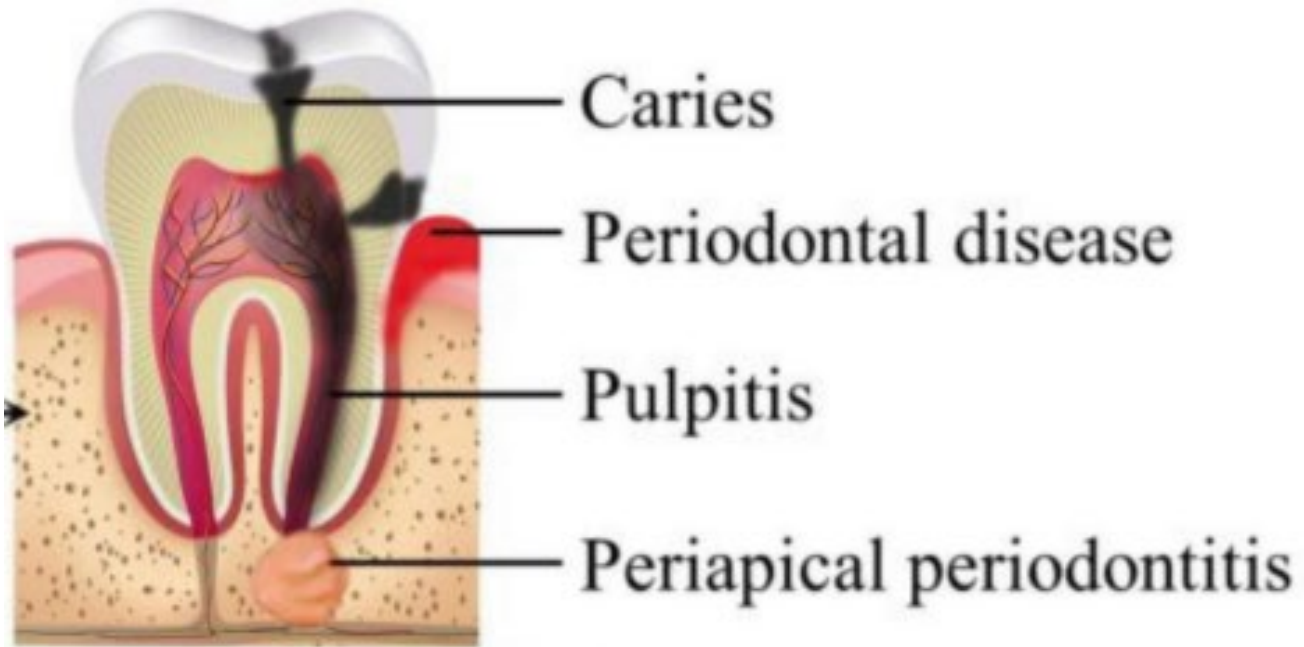
Mouth Image 5



Mouth Image 6



Oral Connections



Neurological Connections

Alzheimer's Disease



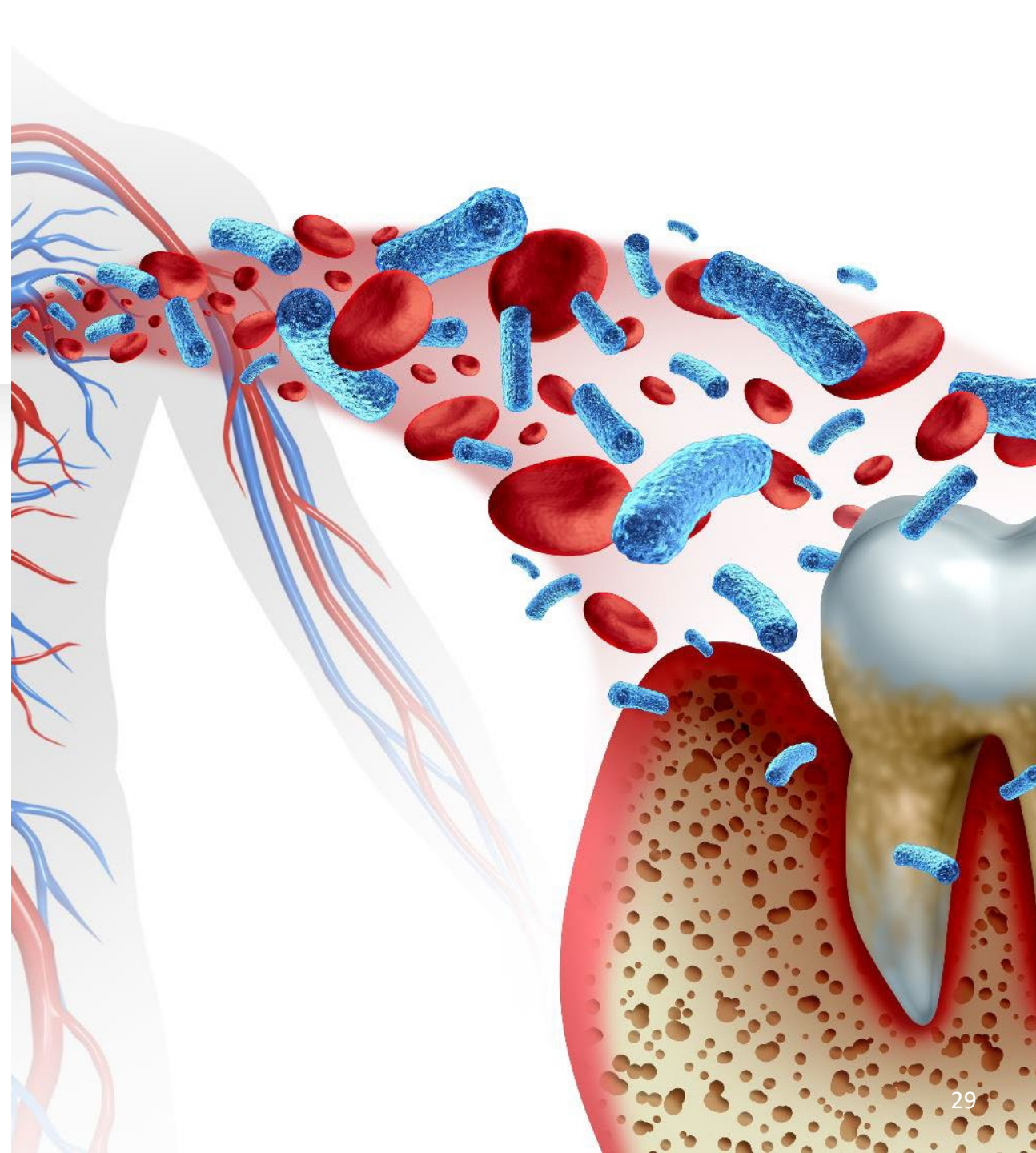
Respiratory Connections

- Respiratory tract infections
- Bacterial pneumonia



Cardiovascular Connections

- Stroke
- Heart failure
- Myocardial infarction
- Endothelial dysfunction (infective endocarditis)
- Blood vessel disease



Cancer Connections

- Pancreatic cancer
- Colon cancer
- Esophageal
- Breast
- Liver cancer
- Oral cancer, Human papillomavirus (HPV)





HPV

- Oropharyngeal cancer is reported as Wisconsin's top HPV-related cancer.
- HPV causes **70%** of oropharyngeal cancer.
- **2,186** newly diagnosed HPV-associated oropharyngeal cancers in Wisconsin between 2018–2022

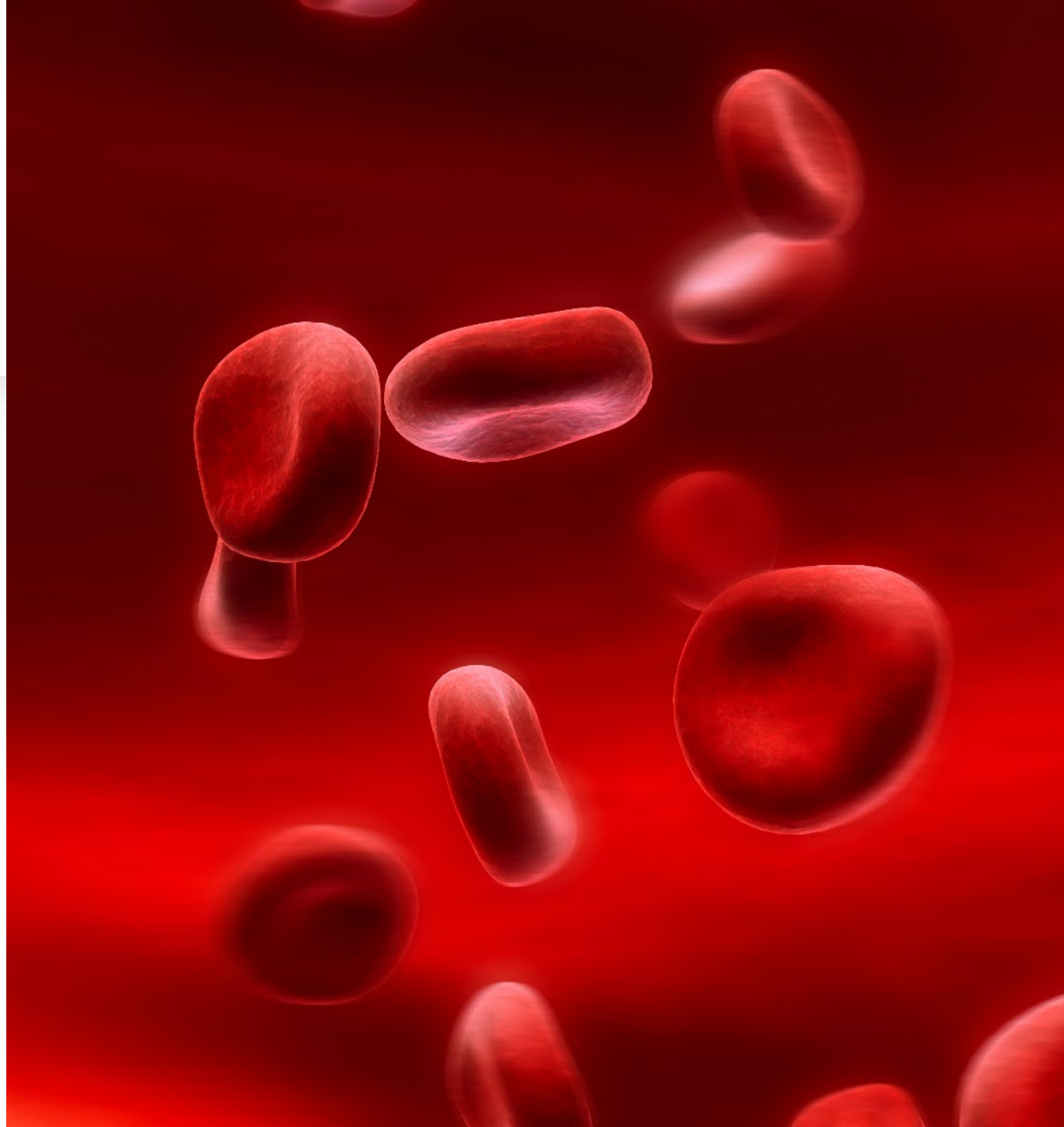
Digestive Connections

- Liver disease
- Kidney disease
- Obesity



Autoimmune Connections

- Rheumatoid arthritis
- Sjorgren syndrome
- Systemic lupus
- Crohn's disease



Sexual or Reproductive Health Connections

- Adverse pregnancy outcomes
- Prostate
- Infertility



Diabetes Connections

- Under normal circumstances, sugars in a person's bloodstream are converted to energy by a hormone called insulin.^[1]
- People with diabetes experience difficulties in effectively breaking down sugars in the bloodstream due to the pancreas not producing enough insulin or the body being unable to use insulin properly.^[1,2]
- The inability to use insulin or the lack thereof can lead to blood sugar levels being too high.^[1]

Oral Health Outcomes Related to Diabetes

People with diabetes are more likely to experience:[³]

- Dry mouth.
- Gingivitis and periodontitis.
- Prolonged healing of oral tissues.
- Thrush.



The Biological Relationship between Periodontal Disease and Diabetes

Diabetes

- Increase in blood glucose levels
- Cascade of proinflammatory events
- Evidence of enhanced cell death via apoptosis
- Combination of enhanced inflammatory response and cell death may contribute to the degradation of the periodontal tissue



Periodontal disease

- Inflammatory response occurring in periodontal tissues cause of release of proinflammatory cytokines
- Proinflammatory cytokines are insulin antagonists
- Cytokines gain access to the circulatory system, travel to distant tissues and organs, and act as mediators
- Antagonistic mediators make it more difficult to control blood glucose levels



Oral Health of Wisconsin Adults with Diabetes

Access to Medical and Dental Care

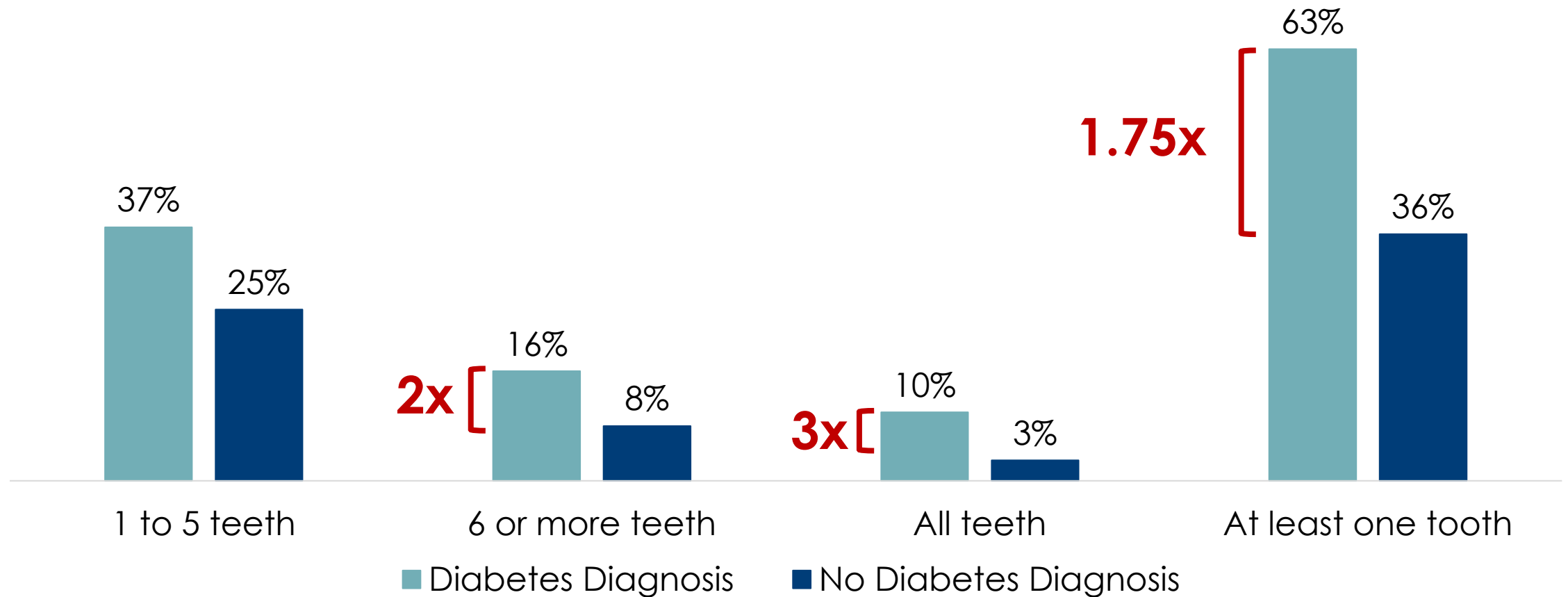


94% of adults with diabetes had a medical visit within the past year.

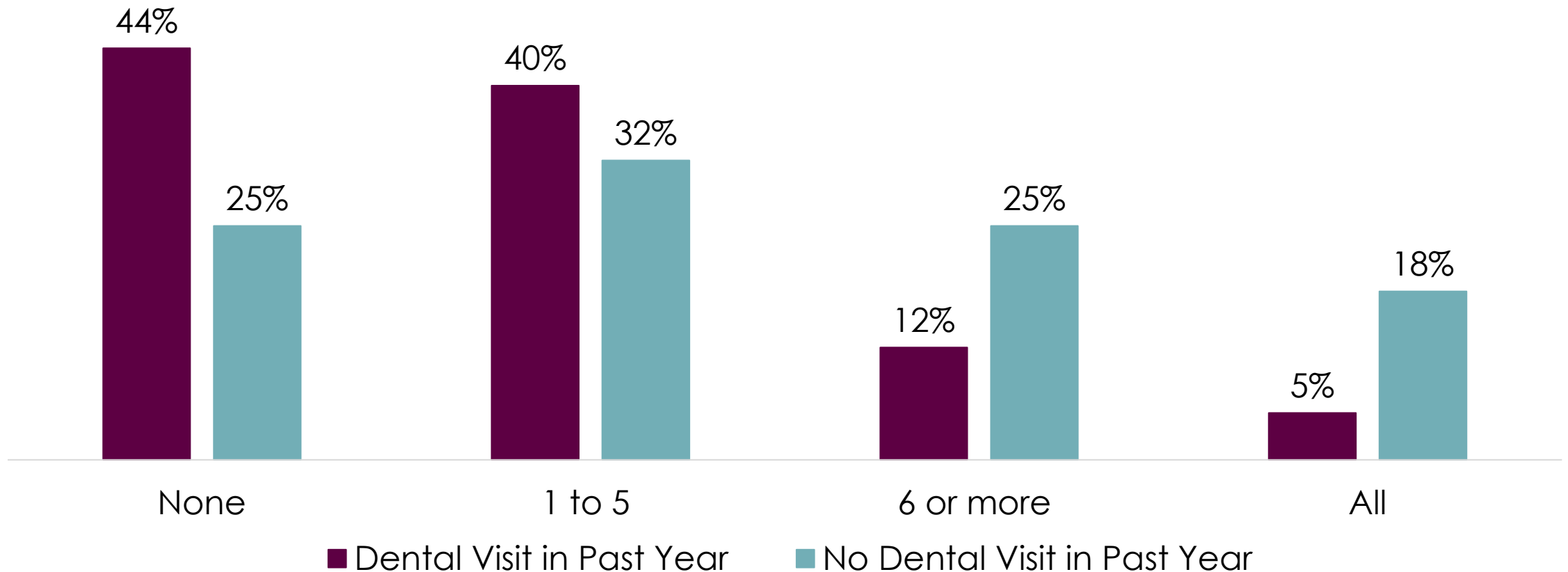


66% of adults with diabetes had a dental visit within the past year.

Tooth Extractions Due to Gum Disease or Tooth Decay



Tooth Extractions Among Adults with Diabetes by Dental Visit Status



Key Takeaways

- **One in three** adults with diabetes did not visit a dentist within the past year.
- Adults with diabetes are significantly **more likely** to have teeth extracted due to gum disease or tooth decay.
- Data suggests that adults with diabetes that visit the dentist routinely are at **less risk** of tooth loss.



Medical Dental Integration (MDI)

What is MDI?

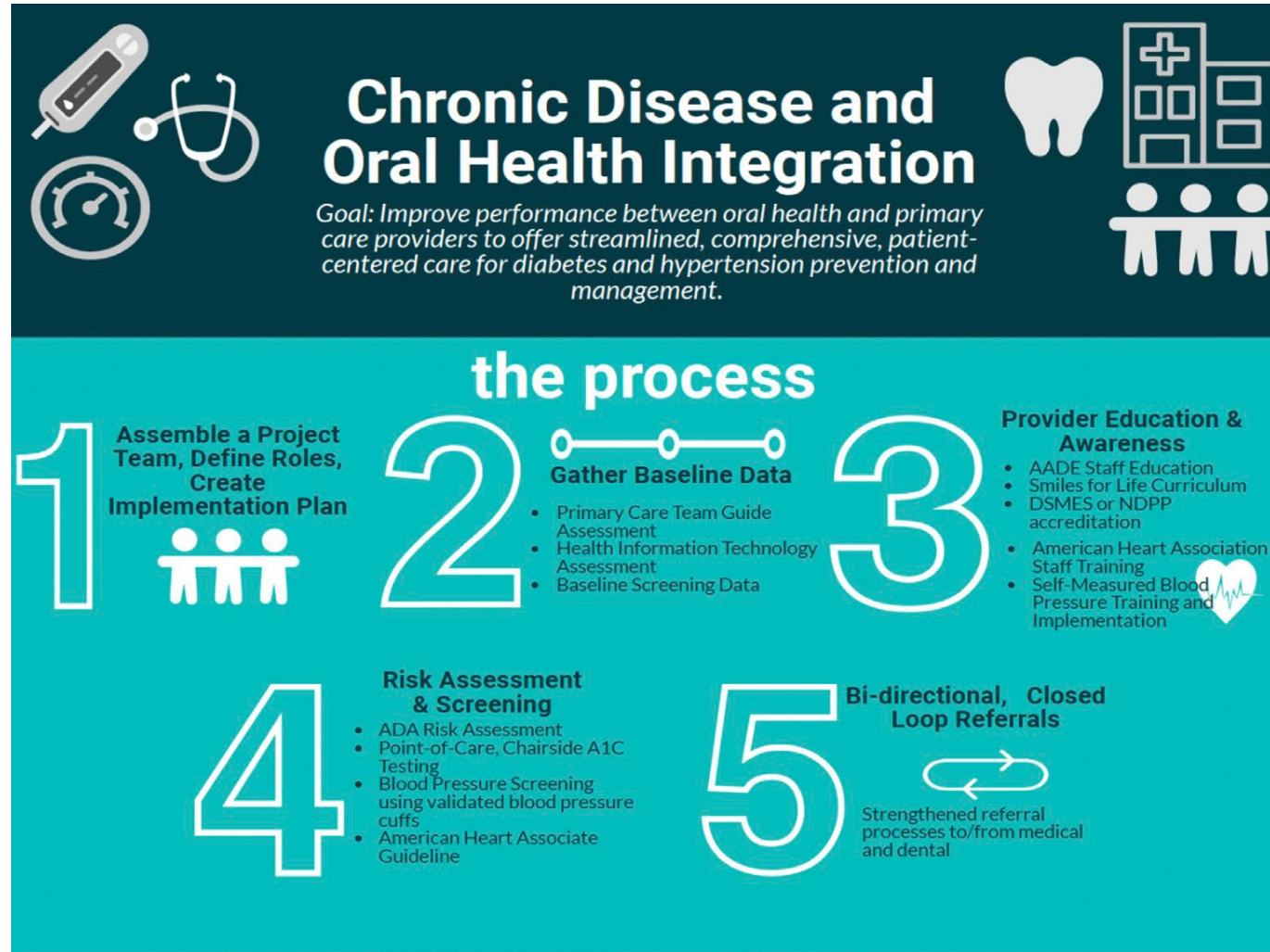
“An approach that integrates dental medicine into primary care and behavioral health”^[7]



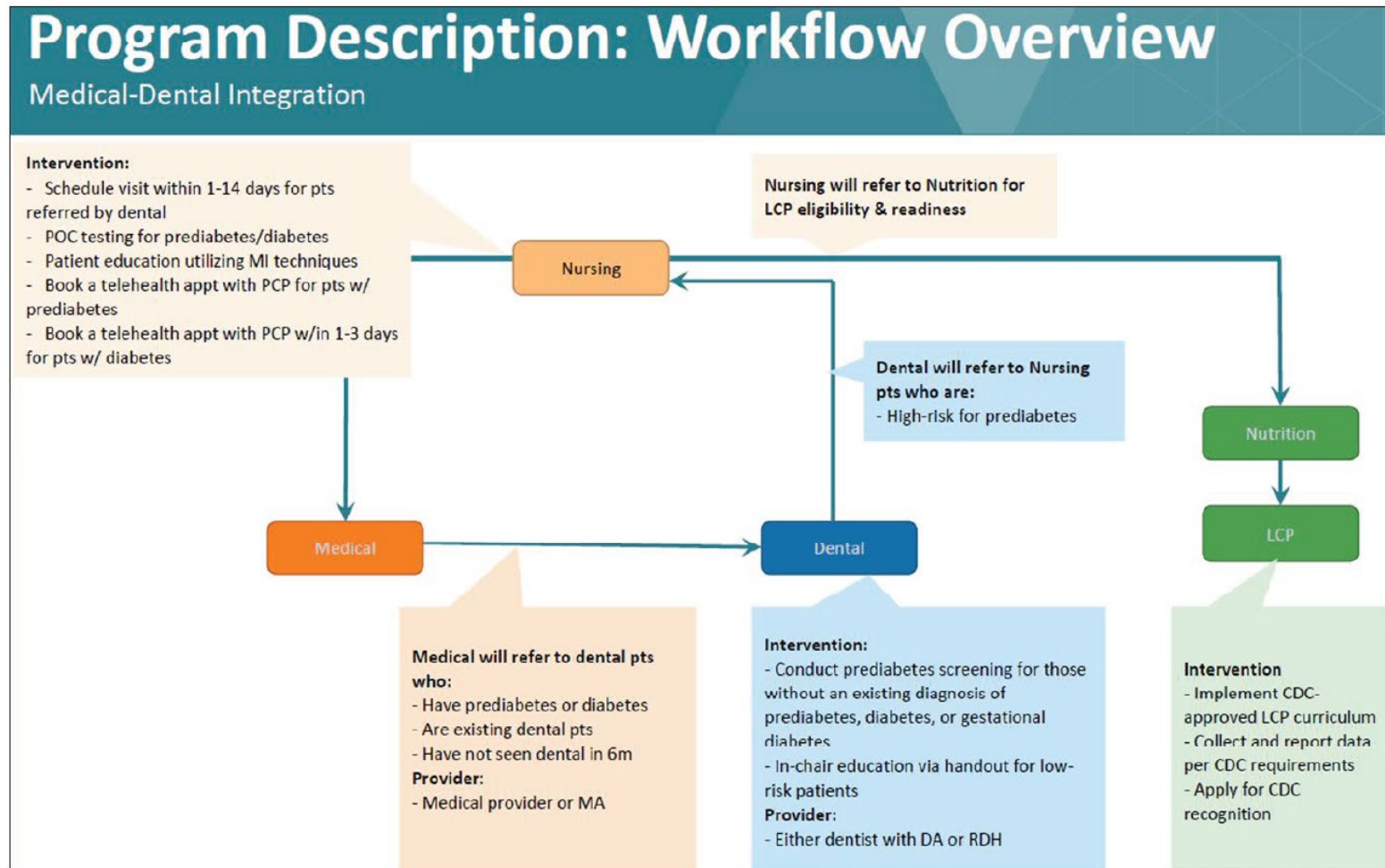
What does MDI look Like?

- Co-location of services
- Integrated care model
- Data interoperability or data exchange
- Opportunities to learn more about the connection between oral health and diabetes

MDI Examples: Colorado



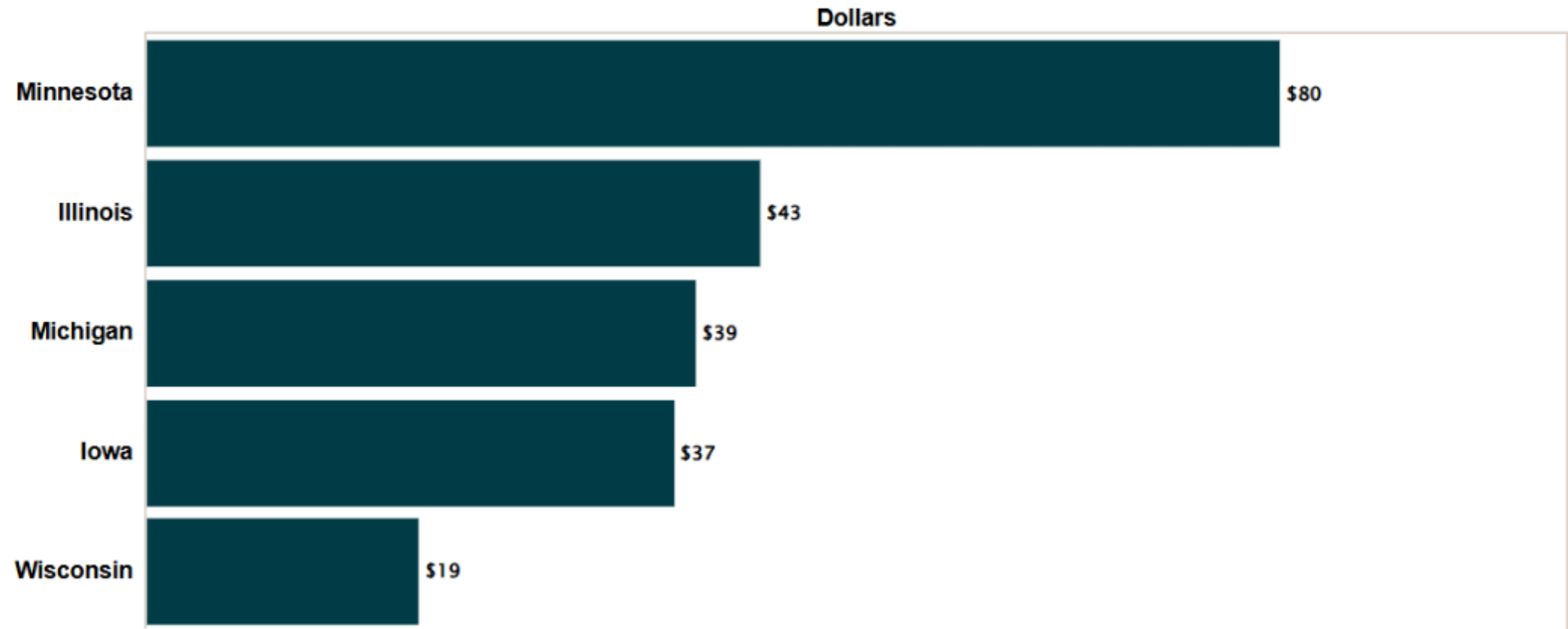
MDI Examples: Connecticut



A close-up, slightly blurred photograph of a smiling man with dark skin, wearing a white t-shirt. He is holding a clear glass filled with water in his right hand. The background is a plain, light-colored wall.

Oral Health Programming

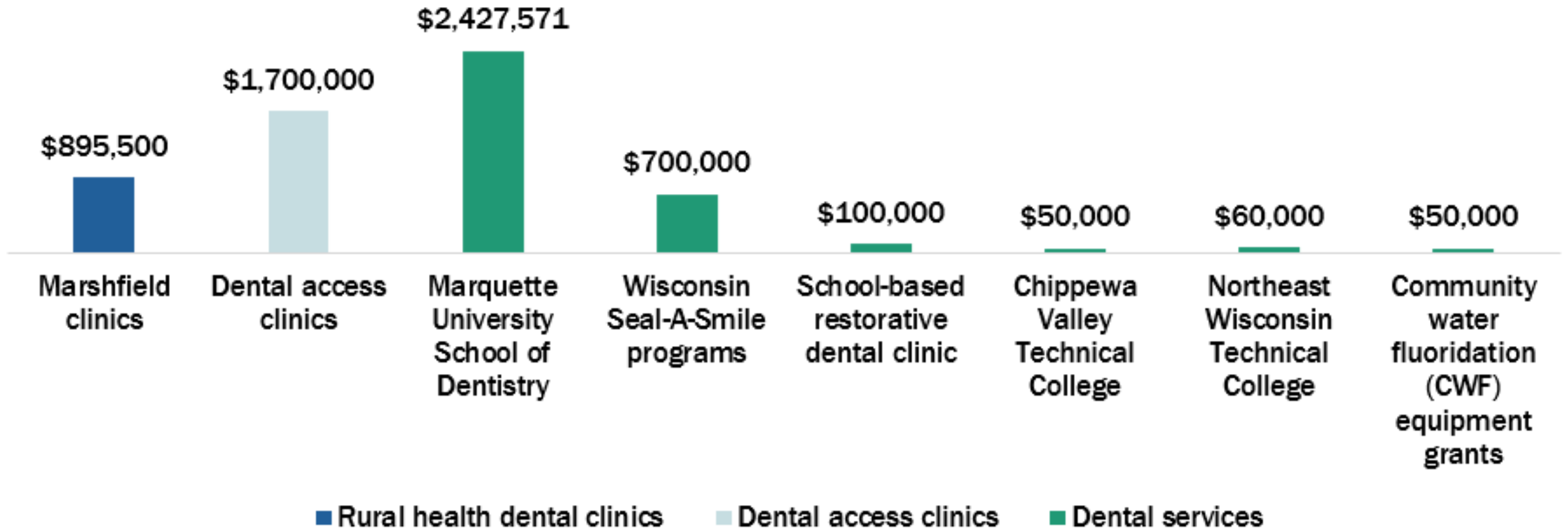
Wisconsin's Ranking in Public Health Funding



SHADAC analysis of Shortchanging America's Health, Investing in America's Health, The Impact of Chronic Underfunding on America's Public Health System, Trust for America's Health (TFAH), State Health Compare, SHADAC, University of Minnesota, statehealthcompare.shadac.org, Accessed 5/2/2025.

Oral Health Program Funding

GPR Funding for Oral Health





- Statewide school-based sealant program serving almost 1,000 schools and serving over 86,000 students.
- Collects data on service utilization and oral health status using DentaSeal.
- Collects school, county, and state level data available for programing.



Community Water Fluoridation (CWF)

- CWF equipment grants
- Educational materials
- Support local health departments





CWF as a Public Health Practice

- It is estimated that CWF reduces tooth decay among children and adults by **up to 25%**.
- CWF is recognized as one of the ten great public health achievements of the 20th century.
- The U.S. Public Health Service recommends an optimal level of 0.7 mg/L.

CWF Support

- Wisconsin Department of Health Services
- American Dental Association
- American Medical Association
- American Academy of Pediatrics
- American Council on Science and Health
- American Water Works Association
- American Osteopathic Association
- And many more...

Wisconsin Oral Health Workforce Pathway Program



Future Oral Health Workforce Day (FOHWD)



Youth apprenticeship: dental assisting track



Registered apprenticeship



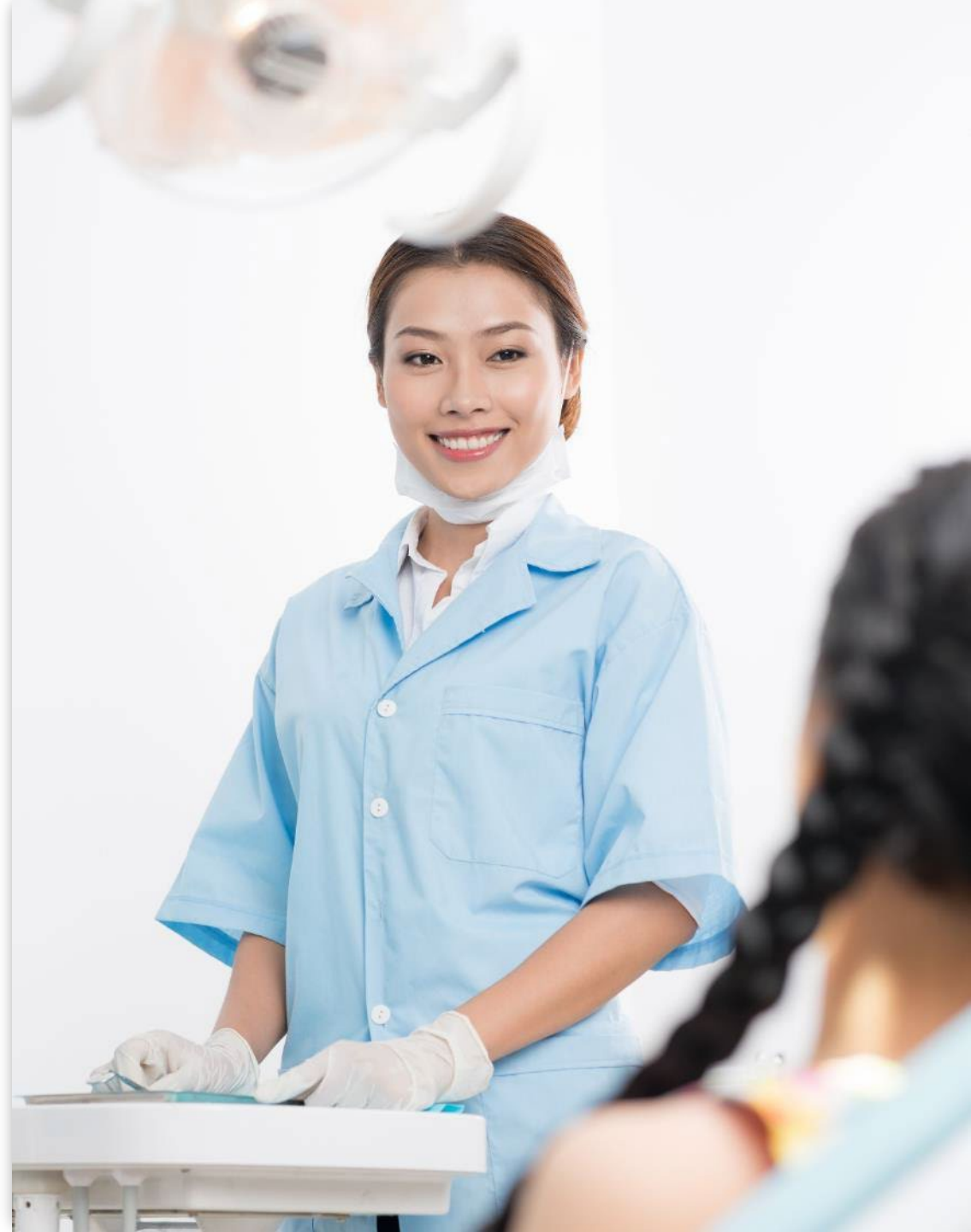
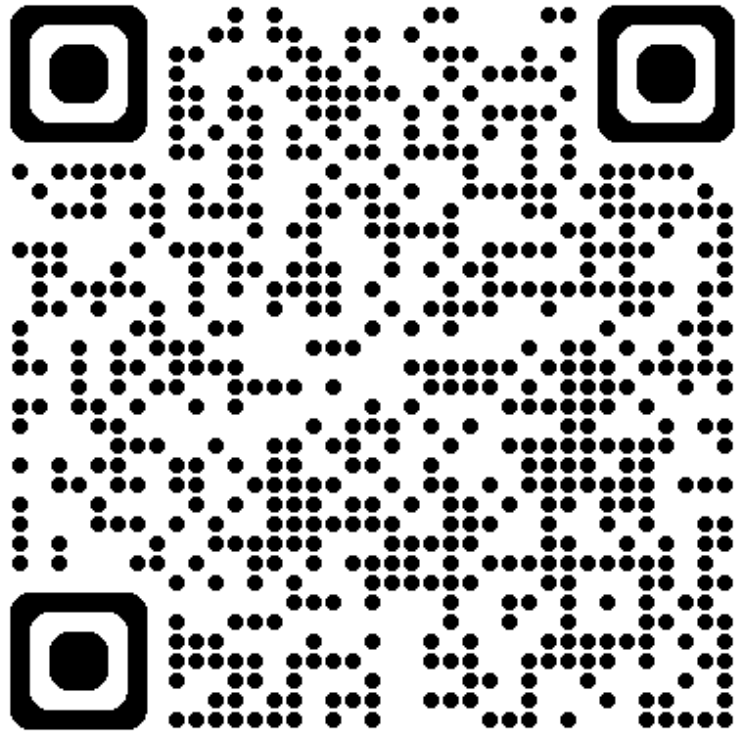
Connection opportunities



Sign up below!



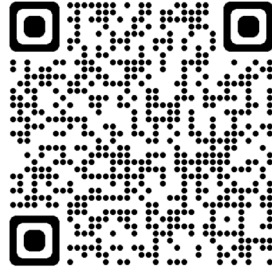
We want your feedback!



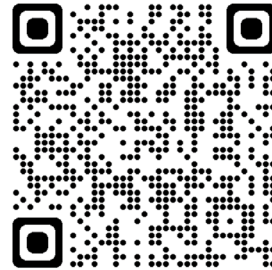


Questions

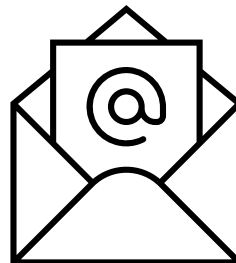
Connect with us!



Learn more on the [Oral Health Program webpage](#)



[Sign up for our newsletter](#)



Email us at
dhsdphoralhealth@dhs.wisconsin.gov

References for MDI

1. Wisconsin Department of Health Services. (2025, July 17). *Diabetes*. <https://www.dhs.wisconsin.gov/diabetes/index.htm>
2. Cleveland Clinic. (2023, February 17). *Diabetes*. <https://my.clevelandclinic.org/health/diseases/7104-diabetes>
3. Cleveland Clinic. (2019, August 29). *Oral Health Problems and Diabetes*. <https://my.clevelandclinic.org/health/diseases/11263-oral-health-problems-and-diabetes>
4. Lamster, I.B., Lalla, E., Borgnakke, W.S., & Taylor, G.W. (2008). The relationship between oral health and diabetes mellitus. *The Journal of the American Dental Association*. 139. 19S-24S. [https://jada.ada.org/article/S0002-8177\(14\)63883-6/pdf](https://jada.ada.org/article/S0002-8177(14)63883-6/pdf)
5. Păuunică, I., Giurgiu, M., Dumitriu, A.S., Păuunică, S., Pantea Stoian, A.M., Martu, M.-A., & Serafinceanu, C. (2023). The Bidirectional Relationship between Periodontal Disease and Diabetes Mellitus—A Review. *Diagnostics*. 13, 681. <https://doi.org/10.3390/diagnostics13040681>
6. Wisconsin Department of Health Services. (2024, February 16). *Behavioral Risk Factor Surveillance System*. <https://www.dhs.wisconsin.gov/stats/brfs.htm>
7. CareQuest Institute for Oral Health. (n.d.) *Medical-Dental Integration*. <https://www.carequest.org/topics/medical-dental-integration>
8. National Association of Chronic Disease Directors. (n.d.). *The Connection Between Poor Oral Health and Chronic Disease*. <https://chronicdisease.org/wp-content/uploads/2024/09/24-09-Oral-Health-and-Chronic-Disease-Pages-Lower-Res.pdf>