



National Institute of Dental  
and Craniofacial Research

# Advancing Oral Health Across the Lifespan: An NIDCR perspective on America's Oral Health Priorities

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Acting Director  
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# National Institute of Dental and Craniofacial Research (NIDCR)



Aim: to advance **fundamental** knowledge about dental, oral, and craniofacial health and disease and **translate** these findings into prevention, early detection, and treatment strategies that improve overall health for all individuals and communities across the lifespan



Largest funder of oral health research in the world



Funds research that informs the practices of more than 200,000 dental healthcare providers in the United States



Provides 63% of NIH funding to U.S. dental schools

# Signature Initiatives that address America's Oral Health Priorities

- Data Driven Science (**DDS**), a dental oral and craniofacial data ecosystem
- Sjögren's Team for Accelerating Medicines Partnership (STAMP) through the Accelerating Medicines Partnership® Autoimmune and Immune-Mediated Diseases (AMP® **AIM**)
- Helping to End Addiction Long-term® Initiative, or NIH **HEAL** Initiative® and **Healing** through regeneration ( Dental Oral and Craniofacial Tissue Regenerative Consortium) and restoration (Biomaterials program)
  - Restoring Joint Health and Function to Reduce Pain Consortium (RE-JOIN)
  - Buprenorphine: Oral Complications Arising from Pharmacotherapies to Treat Opioid Use Disorders
- Communities Advancing Research Equity (**CARE**) for Health
- Community-Based Participatory Research Consortium: Advancing DAta and Practice Transformation (**ADAPT**) for oral health Equity
- Practice-Based Research Integrating Multidisciplinary Experiences in Dental Schools (**PRIMED**)
- Advancing Head and Neck Cancer EARly Detection Research (**AHEAD**)
- TMD Collaborative for IMproving PATient-Centered Translational Research (TMD-**IMPACT**)

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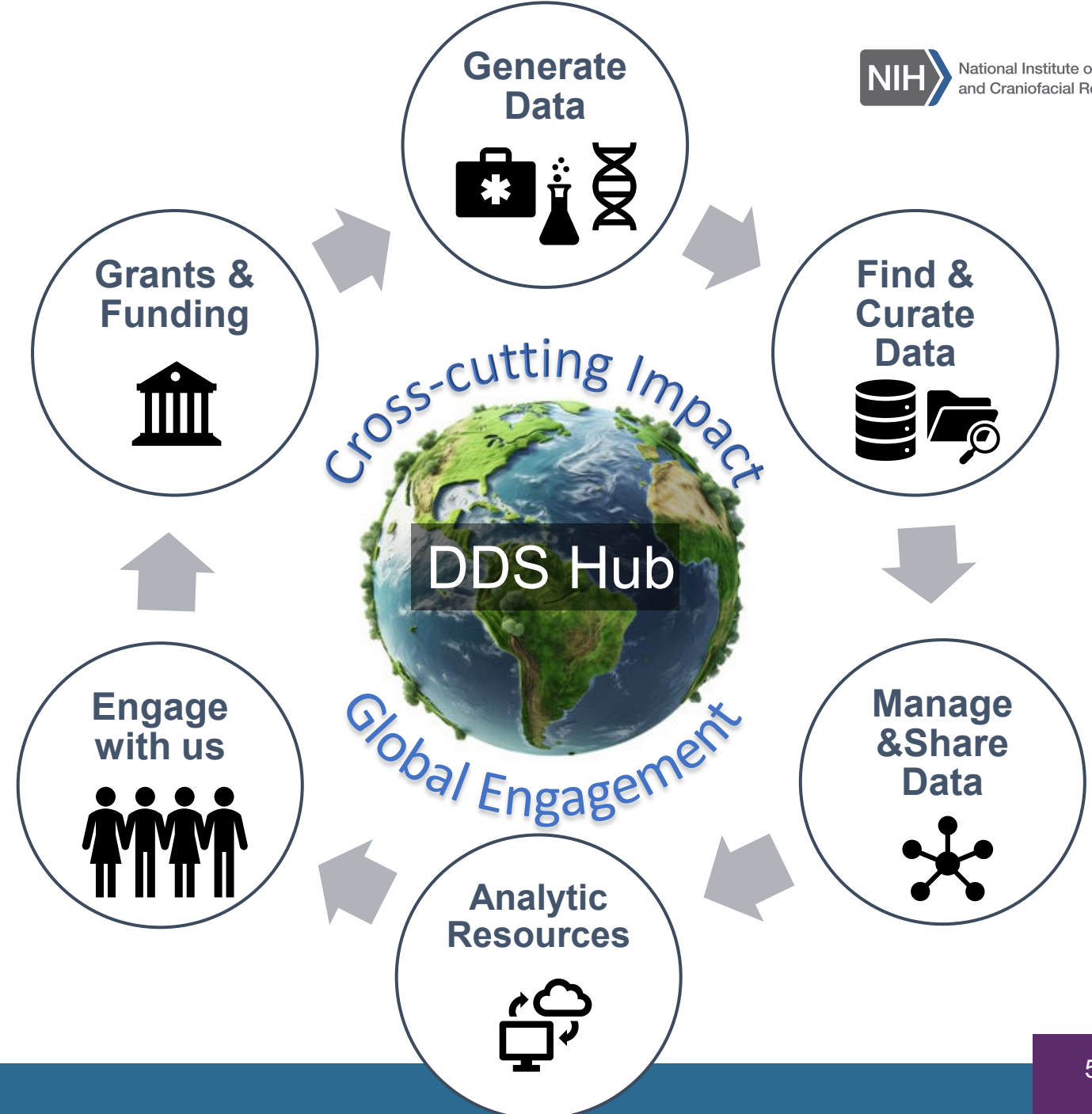
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Through **DDS**, we **AIM** to **HEAL**, **CARE**, and **ADAPT**  
while **PRIMED** to move **AHEAD** with **IMPACT**!

# Data Driven Science (DDS) Hub

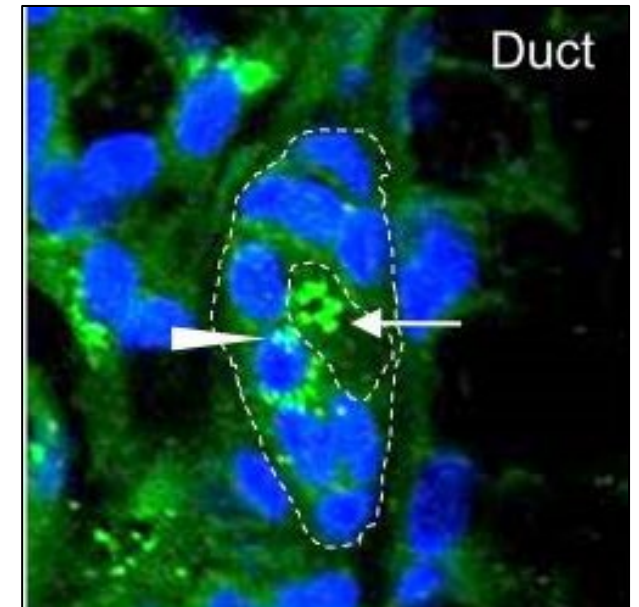
- An NIDCR data science **knowledgebase** to integrate, molecular to population level dental, oral, and craniofacial research data with overall health
- **Data sharing and data use** by the broadest possible research community
- Facilitate **evidenced-based** interventions





## Sjögren's Team for Accelerating Medicines Partnership (STAMP) through the Accelerating Medicines Partnership® Autoimmune and Immune-Mediated Diseases (AMP® AIM)

- Aims to recruit large groups of Sjögren's patients and healthy participants to better understand the **biology** of Sjögren's disease
- Goal: Better diagnostics, standards of care, and therapies for **patients with Sjögren's disease and other autoimmune-driven salivary gland defects**
- Partners and Collaborators:
  - NIH (NIAMS, NIAID, NIDCR, NEI, ORWH)
  - 8 Industries
  - 6 Foundations
  - Researchers from UCSF, OMRF, JHU, and NIDCR/DIR



LAMP3 protein (green) accumulates in the minor salivary glands of patients with Sjögren's disease. Credit: Chiorini Lab (NIDCR)

# Helping to End Addiction Long-term® Initiative, or NIH HEAL Initiative®

- Restoring Joint Health and Function to Reduce Pain Consortium (RE-JOIN)
  - Supporting research to map the network of sensory nerves that connect to two joints: the temporomandibular joint (TMJ) and the knee
  - To understand how these types and patterns of sensory neuron networks in joints change with disease and aging.
  - NIDCR, NCCIH, NIA, NIAMS, NIBIB, NINDS



- Buprenorphine: Oral Complications Arising from Pharmacotherapies to Treat Opioid Use Disorders
  - Supporting basic research to understand how buprenorphine causes oral complications, such as dental caries, dental abscesses or infections, tooth erosion, and tooth loss
  - NIDCR, NIDA, NCCIH

**FDA warns about dental problems with buprenorphine medicines dissolved in the mouth to treat opioid use disorder and pain**

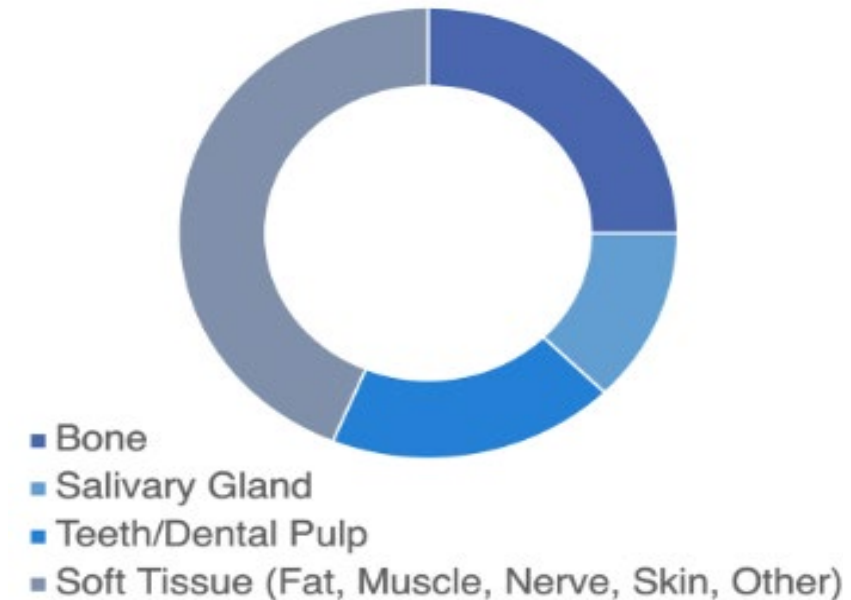
*Benefits for use outweigh these risks and oral care can help*

January 21, 2022

# NIDCR- Healing and restoring function-

## TISSUE ADDRESSED

- DOCTRC Interdisciplinary translational projects across regulatory domains and tissue types
- **Microengineering blood vessels**
- **Generating stronger cartilage**
- **Regenerating and innervating tissues**
- **Building bone from scratch** – using stem cells from human fat tissue to grow bone that can successfully integrate into surrounding tissue in an animal model.
- **Gene therapy to treat dry mouth** – re-engineering salivary gland cells to produce a water channel protein called aquaporin, thereby increasing the flow of saliva to alleviate dry mouth.
- **Restorative materials-** Biocompatible dental materials and biomaterials for amalgam replacement.



## DOCTRC/ APEX



# Communities Advancing Research Equity (CARE) for Health

**Problem:** The health of the U.S. population is declining. Decline is steepest among the underserved and underrepresented, the same group that disproportionately lacks access to oral health care.

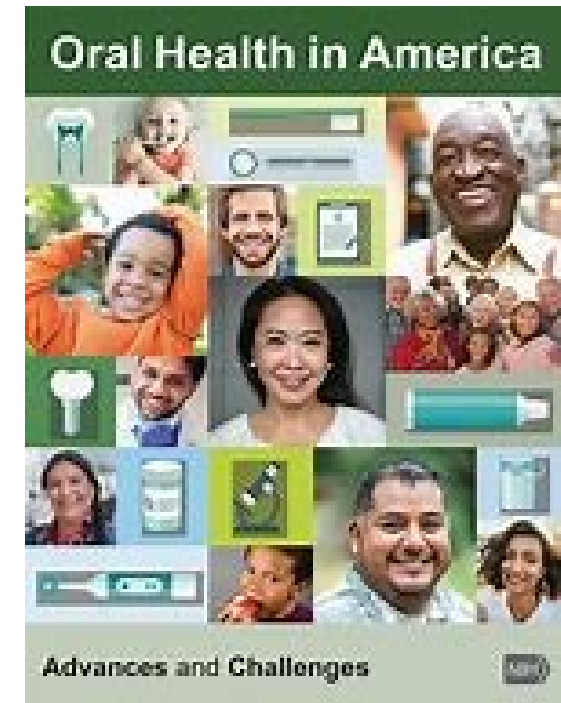
## Goals:

- Establish a **primary care-focused** clinical research network that is disease-agnostic, facilitating clinical research **in mission areas across all ICs** including NIDCR
- **Integrate innovative research** with routine clinical care in real-world settings
- Create a foundation for sustained **engagement with communities underrepresented in clinical research**
- Improve health outcomes and advance health equity for **all**



# Oral Health for some in the United States

- Gaps based on geography, socioeconomic status, and race/ethnicity
  - As of 2024, about 57 million Americans live in a dental health professional shortage area and about 67% of those shortage areas are in **rural communities**
  - Untreated caries (tooth decay) is more common in **low-income, racial/ethnic minority** groups, those with **no health insurance**
  - Periodontal disease (gum disease with bone loss) is more prevalent among adults with **low-income**
  - Complete tooth loss is disproportionately experienced by older adults with **low-incomes** and **less than a high school education**
- **What if...**(20 by age 80, no caries at age16)





- **SDoH** - non-medical structural and environmental conditions that affect health
- Nuanced factors that influence oral health wellness
- **GOAL:** Identify actionable upstream mechanism(s) for intervention

# “Precision Public Health” Approach

- Refers to an approach that considers the interplay between genetics, lifestyle, environment to improve disease prevention, diagnosis and treatment to **deliver the right interventions to the right populations at the right time**
- To address oral health disparities and advance oral health equity, we need
  - **Precisely defined populations**, using intersectionality, and structural contexts that are creating, exacerbating, and perpetuating unfair gaps in oral health outcomes
  - **Interventions** to change such contexts and conditions driving oral health disparities and inequities
  - **Partnership with the population/community** to leverage trust, their assets, and mutual benefit to collect and use data and identify, implement, and **disseminate data- and community-informed strategies** to address structural determinants impacting population oral health

# Community-Engaged Participatory Research to Advance Data and Practice Transformation (ADAPT) for Oral Health Equity

## Goals:

- accelerate progress toward reducing oral health disparities and inequities as well as broader system and societal inequities impacting health disparities through [collaborative community-based intervention projects and data mining](#)
- research projects using community-based participatory approaches to design, implement, and evaluate **population-based intervention strategies** for reducing oral health disparities and inequities in target populations
- [create research hub](#) specializing community engagement and data coordination and management
- form a CBPR research consortium that will join in [Science Collaborative for Health disparities and Artificial intelligence bias Reduction \(ScHARe\)](#), data platform

## Collaboration:

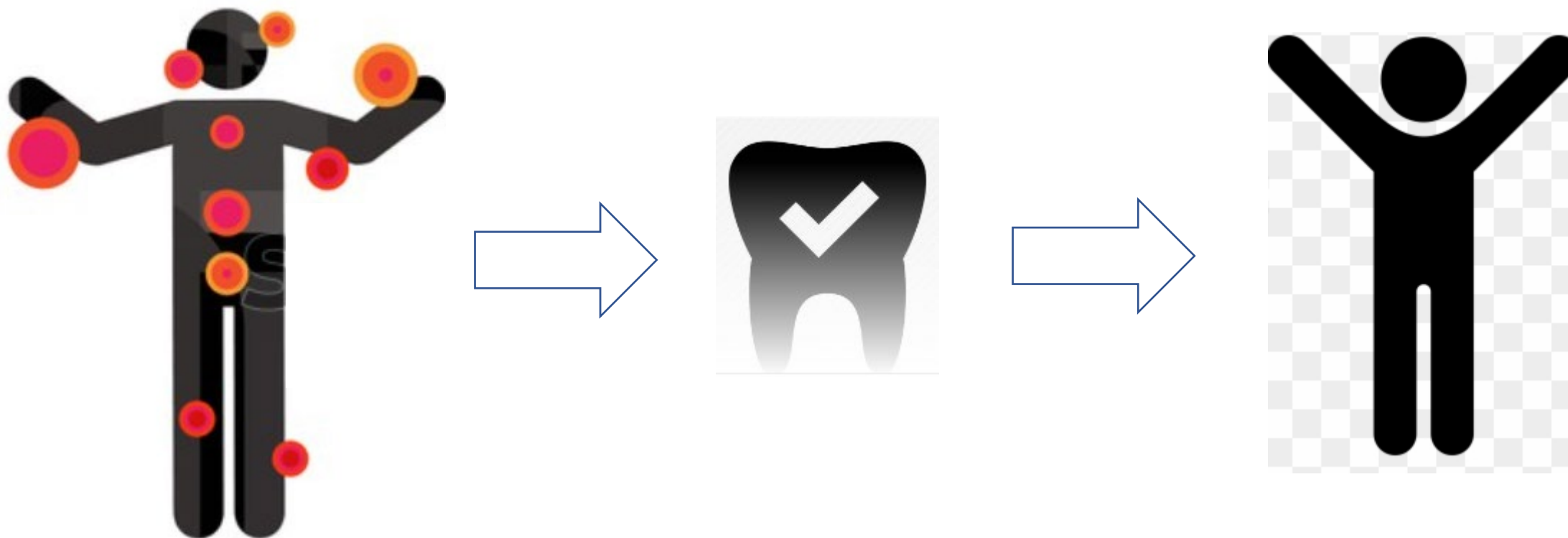
- NIDCR, NIMHD, other federal agencies







## Whole person health and chronic comorbid conditions viewing oral health as a modifiable risk factor



**CARE for Health/ ADAPT/ NIDCR-CMS retrospective studies/ Future trials**

# Practice-Based Research Integrating Multidisciplinary Experiences in Dental Schools (**PRIMED**)

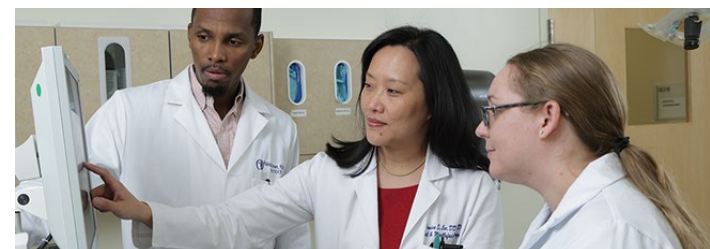
## Problem:

- Dental research workforce capacity
- Practice-based research has not been introduced into the dental training curriculum and presents an opportunity to *engage dental students in research experiences* throughout their education

## Goal:

- Provide dental students, trainees, and faculty with opportunities focused on developing clinical research skills, mentoring, and institutional collaboration
- Will amplify the impact of the existing **National Dental Practice-Based Network** while increasing the workforce

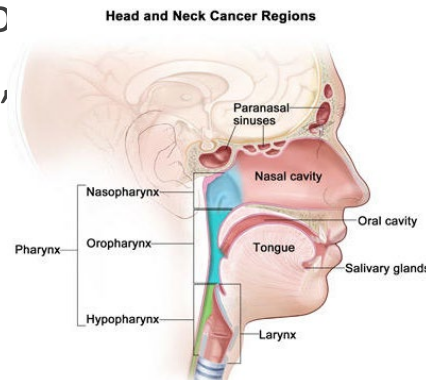
## Multiple workforce pathway and training opportunities:



# Advancing Head and Neck Cancer Early Detection Research (**AHEAD**)

## Goals:

- Accelerate translation of research to improve early detection of the head and neck cancers
- Development, evaluation, and validation of biomarkers, risk assessment, early detection, and molecular diagnosis and prognostic head and neck cancer initiation, progression, recurrence, and metastasis
- NIDCR and NCI

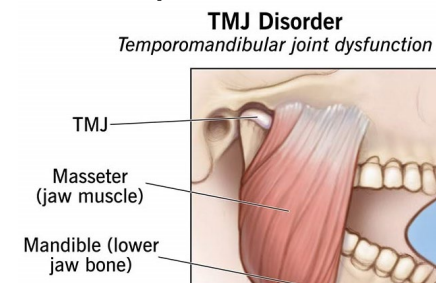


Credit: © Terese Winslow

# TMD Collaborative for Improving Patient-Centered Translational Research (**TMD IMPACT**)

## Goals:

- To advance TMD basic and clinical research, research training, and translation to evidence-based treatments and improved clinical care via establishment of a national, interdisciplinary trans-NIH patient-centered research collaborative
- NIDCR, NIAMS, NIBIB, NINDS, NCCIH, ORWH, OBSSR, and FDA



In sum:

Through **DDS**, we **AIM** to  
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Thank You!



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September 2024

[www.nidcr.nih.gov/about-us/highlights](http://www.nidcr.nih.gov/about-us/highlights)