The Oral-Systemic Connection Across the Lifespan

Systemic Conditions Linked to Oral Health Conditions

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Disclosure

Speakers agree that neither they nor members of their immediate family have any financial relationships with commercial entities that may be relevant to their presentation.
Learning Objectives

• Describe the oral-systemic connection for at least three systemic conditions from across the lifespan, from the prenatal period through older age.

• Discuss how medical-dental integration (MDI) addresses the oral-systemic connection.

• Reflect on how your own program incorporates MDI and ways in which this implementation could be expanded.
"Oral-Systemic Interactions and Medical Dental Integration: A Life Course Approach" Review Paper

COMING SOON!

Mid-November 2023
Oral Health During Pregnancy & Postpartum

Patient and provider concerns about safety of dental treatment during pregnancy may lead some to avoid routine care (George et al., 2012; 2013)

- Periodontal disease is linked to adverse pregnancy and birth outcomes:
  - Preeclampsia (Crowder, 2023)
  - Increased risk of preterm birth (Manrique-Corredor et al., 2019)
  - Infant low birth weight (Padilla-Cáceres et al., 2023)
- Pregnancy-related hormones may interact with plaque levels and other factors to increase risk of periodontal infection during pregnancy (Carrillo-de-Albornoz et al., 2012)
Oral Health During Childhood

• Misunderstanding that primary teeth are unimportant; “going to fall out anyway” (Hilton et al., 2007)

• Early childhood caries (ECC) most common childhood chronic disease (Casamassimo et al., 2009)

• ECC linked to:
  • Poor nutrition, weight loss, iron-deficiency anemia (Clarke et al., 2006; Singh et al, 2020)
  • Negative impacts on children’s behavior, school performance, overall development (Casamassimo et al., 2009)

• Treatment for ECC under sedation has risks of vomiting, respiratory depression, aspiration (Cote & Wilson, 2016)
Oral Health During Adolescence

- As adolescents become more independent from parents, increased oral health risks

- Vaping (e-cigarette use) most common form of nicotine used by adolescents (CDC, 2022)
  - 3% of middle school /14% of high school students used in past 30 days (CDC, 2022)
  - Increased risk of periodontal disease, oral lesions (CDC, 2020; Vohra et al., 2020; Ralho et al., 2019)
  - Concerns about long-term impacts of high levels of nicotine on the developing brain (US Surgeon General, 2023)

- More likely to have oral injuries due to participation in school athletics (Young et al., 2015)

- Tongue, lip piercings linked to gingival recession, tooth chipping/cracking (Plessas & Pepelassi, 2012)

- Often eat / drink more carbohydrates and sugary beverages, increased caries (Silk & Kwok, 2017)
Oral Health During Young Adulthood

- At age 21 years, legally able to buy tobacco and alcohol
  
  \((US\ Food\ &\ Drug\ Administration,\ 2021;\ CDC,\ 2022)\)

- Chronic use of both increases risk of:
  
  - Oral cancer \((Moreno-L\acute{o}pez\ et\ al.,\ 2000)\)
  
  - Pulmonary and cardiovascular disease \((Grucza\ \&\ Bierut,\ 2006)\)
  
  - Depression \((Jan\acute{e}-Llopis\ \&\ Matytsina,\ 2006)\)

Mean age of onset for Anorexia and Bulimia Nervosa is 18; for Binge Eating Disorder is 21 \((NIMH,\ 2023)\)

- Tooth erosion, gingival recession, enlarged parotid glands \((Presskreischer\ et\ al.,\ 2023)\)

- Anemia, muscle wasting, hypotension, cardiac damage, and infertility \((NIMH,\ 2021)\)
Oral Health During Middle Age

- More than 1/3 of adults over 30 have mild to moderate periodontitis; 7.8% have severe (Eke et al., 2018)

- Bi-directional relationship between periodontal disease and diabetes (Preshaw et al., 2012)
  - Lower HbA1C levels after treatment for periodontal disease (Engebretson & Kocher, 2013)

- Periodontitis linked with higher risk of stroke and ischemic heart disease (Byun et al., 2020)

- Greater risk of peripheral artery disease with periodontal disease, periodontal treatment history, tooth loss (Lubaina et al., 2022)

- Higher levels of low-density lipoproteins (LDL cholesterol) and triglycerides (Mattila et al., 2005)
Oral Health During Older Adulthood

- Periodontitis is linked to significantly increased risk of dementia over 50 (Lee et al., 2020)
- Adults aged 75-80 with 5+ periodontal treatments had significantly lower adjusted risk of developing dementia (overall, Alzheimer’s, and vascular) (Saito et al., 2022)
- Risk of hospital-acquired pneumonia higher with missing teeth, heavy plaque (Ewan et al., 2015)
  - Increased oral hygiene care in acute care associated with 85% reduction in non-ventilator hospital-acquired pneumonia (NVHAP; Guiliano et al., 2021)
  - Medicaid participants with preventive or periodontal treatment prior to hospitalization had significantly reduced risk of NVHAP (Thakkar-Samtani, 2020)
Conclusions

• From the prenatal period through older age, oral health is inextricably linked to overall health

• Dental caries, periodontal disease associated with systemic health conditions that change throughout the life span

• Medical-dental integration critical to provide whole-person care for optimal health at all ages
Thank you for your attention!

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“The Oral-Systemic Connection Through the Lifespan”
https://www.carequest.org/resource-library/oral-systemic-connection-across-lifespan

“Oral-Systemic Interactions and Medical Dental Integration: A Life Course Approach” Review Paper
Coming mid-November 2023
Medical Dental Integration Across the Lifespan

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Promoting integration of oral and medical health at all levels of primary care following a life course approach benefits patients across their lifespan.
Why Integrated Health Care Systems Should Understand Oral-Systemic Interactions Through a Life Course Approach

- A life course approach considers factors that act during development and aging, which might influence disease onset.
- Dependent on the timing between exposure to risk factors and disease development and progression at the individual and population levels.

**Why is it Important to Oral-Systemic Interactions?**

- It follows the framework of risk accumulation, critical and sensitive periods of exposure, and underlying socio-environmental determinants of health experienced at different life course stages.
Life Course Approach for Diseases

- Allows health care providers to screen, refer, and advise patients who may be unaware of their risk factors for many chronic diseases.

- Over 20% of adults with diabetes mellitus and 80% of adults with pre-diabetes are unaware that they have these conditions.

  **Point-of-care diabetes testing of dental patients:**
  - 11% of patients were diagnosed with diabetes, and 47% were diagnosed with pre-diabetes.
Neuroinflammation (e.g. via inducing chronic systemic inflammation)
Secondary chronic psychological stress (via impacts on quality of life, discrimination and stigma)
Poor nutrition

Oral diseases (e.g. caries, periodontitis & tooth loss)

Shared social determinants (e.g. age, gender, ethnicity, socioeconomic position and psychosocial factors)

Mental disorders (e.g. Mood & psychotic disorders)

Oral health risk behaviours (e.g. tobacco & alcohol use, poor diet and poor oral hygiene)
Poor access to adequate dental care (e.g. low dental services utilisation, poor dental care quality & low adherence to treatment recommendations)
Effects of HPA\(^1\) & SAM\(^2\) axes’ dysregulation
Side effects of psychototropic medicines (e.g. xerostomia, eating dysregulation & tremulous movements impeding oral hygiene)

DENTAL. INTEGRATED FOR HEALTH.
Screening

Collaboration & Understanding
your professional role

Overall and oral health effects of mental health and trauma

Patient-Centered Communication Skills
Medical Dental Integration

Successes
- Sustainable Change is brought by system-wide and policy changes
- IPE is actively changing interprofessional culture
- Methodical approaches to changing business models to adapt to MDI

Limits
- Target high risk populations
- Few MDI programs have formally measured their own effectiveness
- Finding internal champions

Challenges
- Sustainability of funded projects
- Changing provider perspectives
- Mainly one way integration
- Lack of Infrastructure
- Culture change in organizations
Foundational Components of success in MDI

EHR Integration

- Hiring an extra employee that serves specifically as the bridge between EHR systems has proven successful.
- Focus on sustainable workarounds rather than complete change.

Challenges: requires extra training, lack of resources, varying EHR systems.

Planning/Evaluation Strategies

- Bring all stakeholders to the table during planning phase.
- Challenges: lack of space/resources, time for training, appointment time management appointments.
- Build evaluation strategies in the programs.

Aligning expectations between providers and administrators

- Creates a base that minimizes team dissonance.
- Can be done through MOUs/Contracts.
- Challenges: hesitancy to new ideas, competing priorities, and policy/licensing change.

Involving the entire team leads to higher success rates.
Basic Challenges: Scheduling, culture shift, and budgeting

Curriculum change can be a slow and difficult process, especially when multiple schools are involved

Creating evaluation methods and being able to adapt to the results of them to improve programs

Challenges

Interprofessional Education and Interprofessional Practice

Why IPE?

Teach students their specific roles in the healthcare team

Creating a new culture in which the future healthcare workforce is more naturally inclined to collaborative practice.

Facilitate larger global health outcomes than any profession could have individually

3 Transitional Stages: Letting go, neutral zone, and the new beginning

Primary Focuses During Each Stage

Letting go: Identifying IPE point person, reaching out to other health professionals, participating in IPE workshops and webinars

New Beginning: Evaluation methods and publication of IPE efforts

Neutral Zone: Faculty Development, strengthening school's relationship with parent university through strong leadership
Call to Action

• Educating MDI medical, dental, and allied healthcare workforce members in MDI.

• Implementing bidirectionality of integrated medical and dental teaching and practice.

• Changing state practice acts and scope of practice for dentists.

• Increasing patient awareness to improve acceptability of MDI models.
Accelerating Whole-Person Integrated Care

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National Center for Chronic Disease Prevention and Health Promotion
Division of Oral Health

American Dental Education Association
November 1, 2023
Challenge:
• While oral health is essential to overall health, medical and dental care in the United States are provided through distinct systems of workforce development, practice, and payment.

Solution:
• Develop a roadmap to bridge the systems to improve oral health equity and overall health outcomes.
Developing a Framework

• In 2020, CDC began funding the National Association of Chronic Disease Directors (NACDD) to develop a national action framework to accelerate whole-person integrated care in public health and health care systems.

• NACDD engaged KDH Research & Communication (KDHRC) as a partner in this work.
Process for Framework Development
CONNECT WITH PARTNERS

ESTABLISH STEERING COMMITTEE

CONDUCT KEY INFORMANT INTERVIEWS AND FOCUS GROUPS

CONDUCT LITERATURE REVIEW

HOST AND ATTEND CONVENINGS
Framework Development

• Engaged a Steering Committee for ongoing guidance
• Gathered information from a systematic review of published and gray literature
  ▪ Reviewed ~4,000 and coded 428 peer-reviewed articles (325 domestic, 103 international)
• Validated research through key informant interviews
  ▪ Conducted 44 individual and 4 group interviews
• Hosted virtual meeting in May 2022 with diverse experts
• Presented at partner meetings and topical breakout groups
MDI Steering Committee

Ms. Katy Battani, RDH, MS
- Project Manager – Partnership for Integrating Oral Health Care into Primary Care, National Maternal and Child Oral Health Resource Center, Georgetown University

Mr. Dan Burke, JD
- Chief Enterprise Strategy Officer and General Counsel – Pacific Dental Services

Ms. Anita Glicken, MSW
- Executive Director – National Interprofessional Initiative on Oral Health
- Associate Dean and Professor Emerita – University of Colorado Anschutz Medical Center

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Ms. Candace Owen, RDH, MS, MPH
- Education Director – National Network for Oral Health Access

Dr. Hugh Silk, MD, MPH, FAAFP
- Professor – University of Massachusetts Medical School
- Co-Principal Investigator – Center for Integration of Primary Care and Oral Health
- Medical Director – Community Healthlink
Overview of the Framework

- Based on input gathered from literature review and interviews, the levers are taking shape around **four pillars**:
  - Awareness
  - Workforce Development and Operations
  - Information Exchange
  - Payment
Overview of the Framework

...and each is further broken down into **three levels of engagement:**

- **Micro-** (e.g., consumers, a particular clinic or school)
- **Mid-** (e.g., state health departments, healthcare systems)
- **Macro-** (e.g., payers, federal government, national professional organizations)
Partner Engagement Initiative
Mission:

• Build awareness about the relationship between oral health and overall health.
• Convene diverse partners and facilitate collaboration among medical, dental, and public health systems and partners.
• Promote evidence-based and emerging strategies to achieve health equity principles.
• Recognize partner commitments and celebrate successes in whole-person integrated care.
Partner Input

In addition to work to inform the Framework, CDC:

• Hosted in-person meeting in May 2023 to begin priority setting
Partner Engagement Plan

• Several models are being considered to provide an "information exchange hub."
• This platform will facilitate dialogue among partners within and across the four pillar areas.
• Recruit diverse partners into action-oriented workgroups to accelerate integration over the next 3–5 years.
• Over time, progress on objectives and activities that support the Framework will be tracked and promoted more broadly.