Oral Health Innovations to Bridge the Gap Between Education and Practice: Improving Health Equity and Population Health

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OHNEP
Oral Health Nursing Education and Practice

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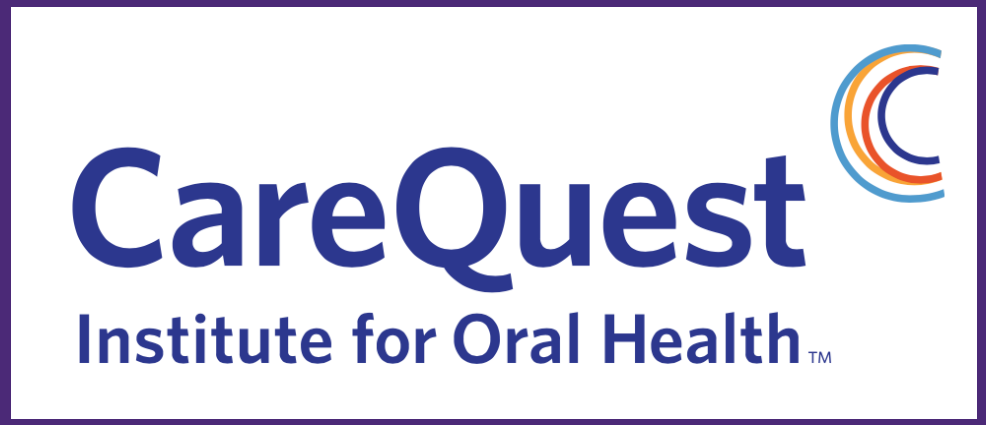
Special Thanks:



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OHNEP Program Aims

- Advance a national oral health agenda for the nursing profession
- Build interprofessional oral health workforce capacity
- Integrate oral-systemic health into undergraduate and graduate nursing programs nationwide.
  - Faculty and preceptor development
  - Curriculum integration
- Establishment of “Best Practices” in clinical settings

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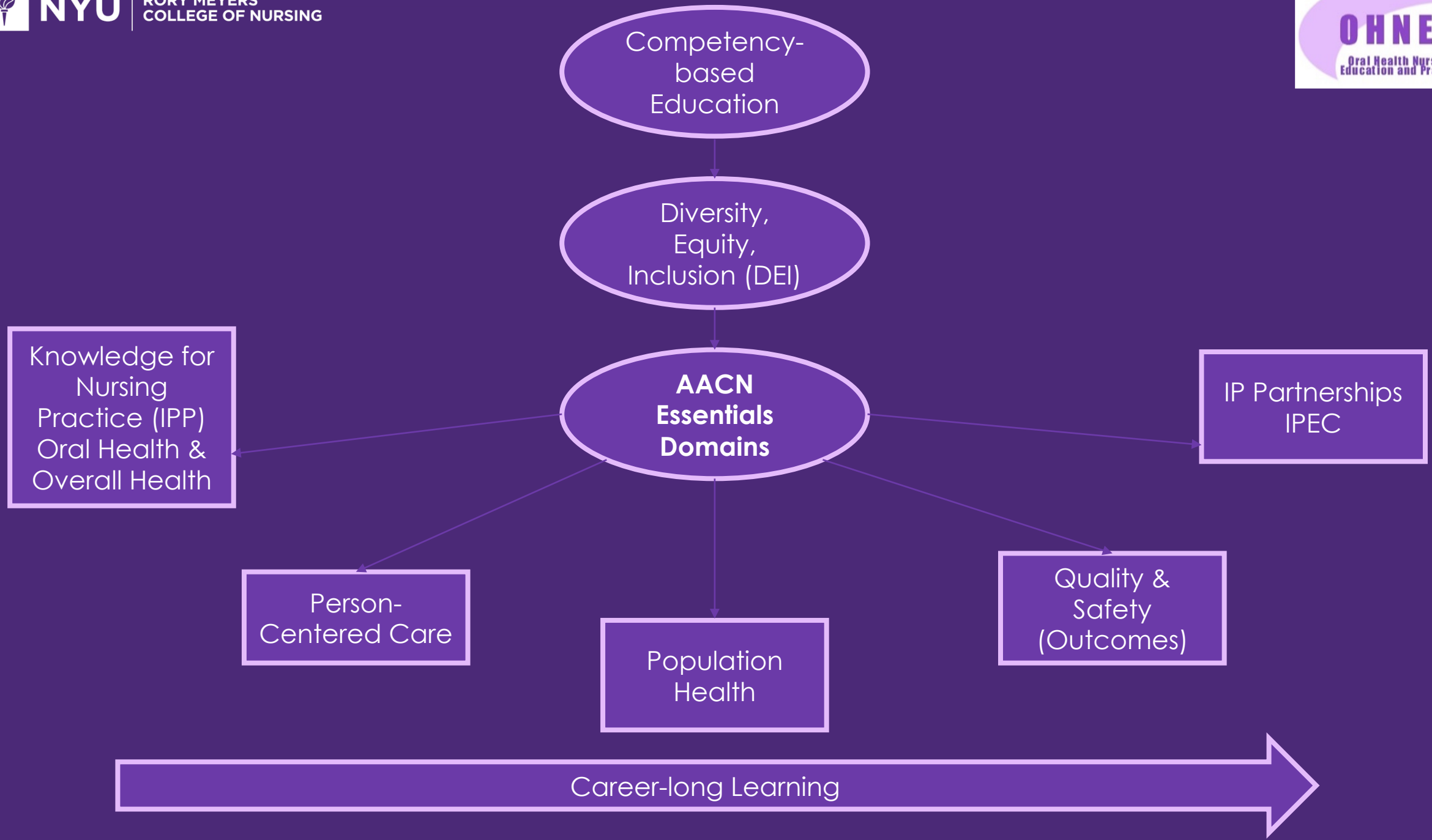

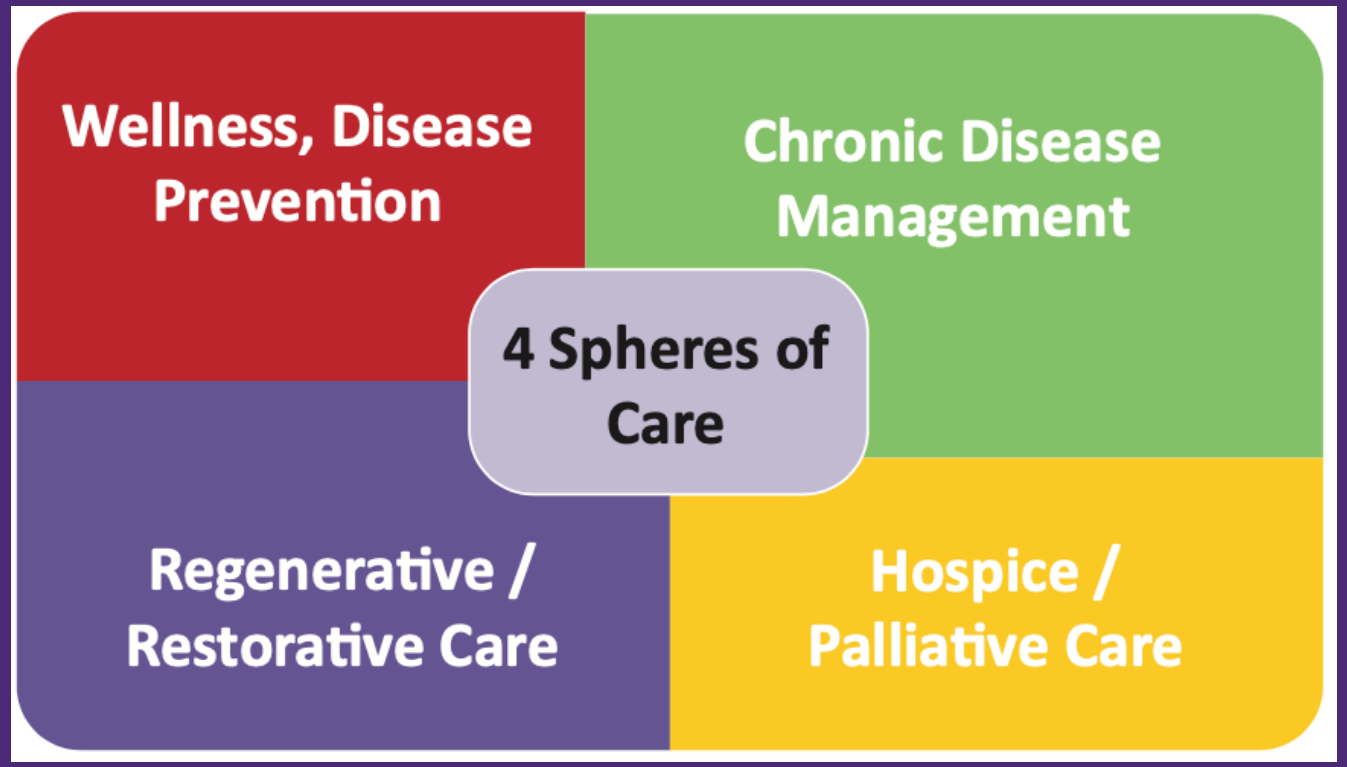
Wellness, Disease Prevention
Chronic Disease Management
4 Spheres of Care
Regenerative / Restorative Care
Hospice / Palliative Care

Management of Oral-Systemic Conditions Calls for an *Interprofessional* Team

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- 4.2 million RNs
- 355,000 NPs
- 13,000 MWs
- 1 million MD/DO
- 149,000 PAs
- 201,000 DDS/DMD
- 195,000 dental hygienists
- 150 dental therapists

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Why do we need the whole IP team?

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- 100 million people visit their physician, but not their dentist
- 27 million people visit their dentist, but not their physician
- 85% of all U.S. children ages 2-17 in 2017 had an annual dental checkup
- Children have ≅ 12 pediatric well-child visits to their PCP by age 3

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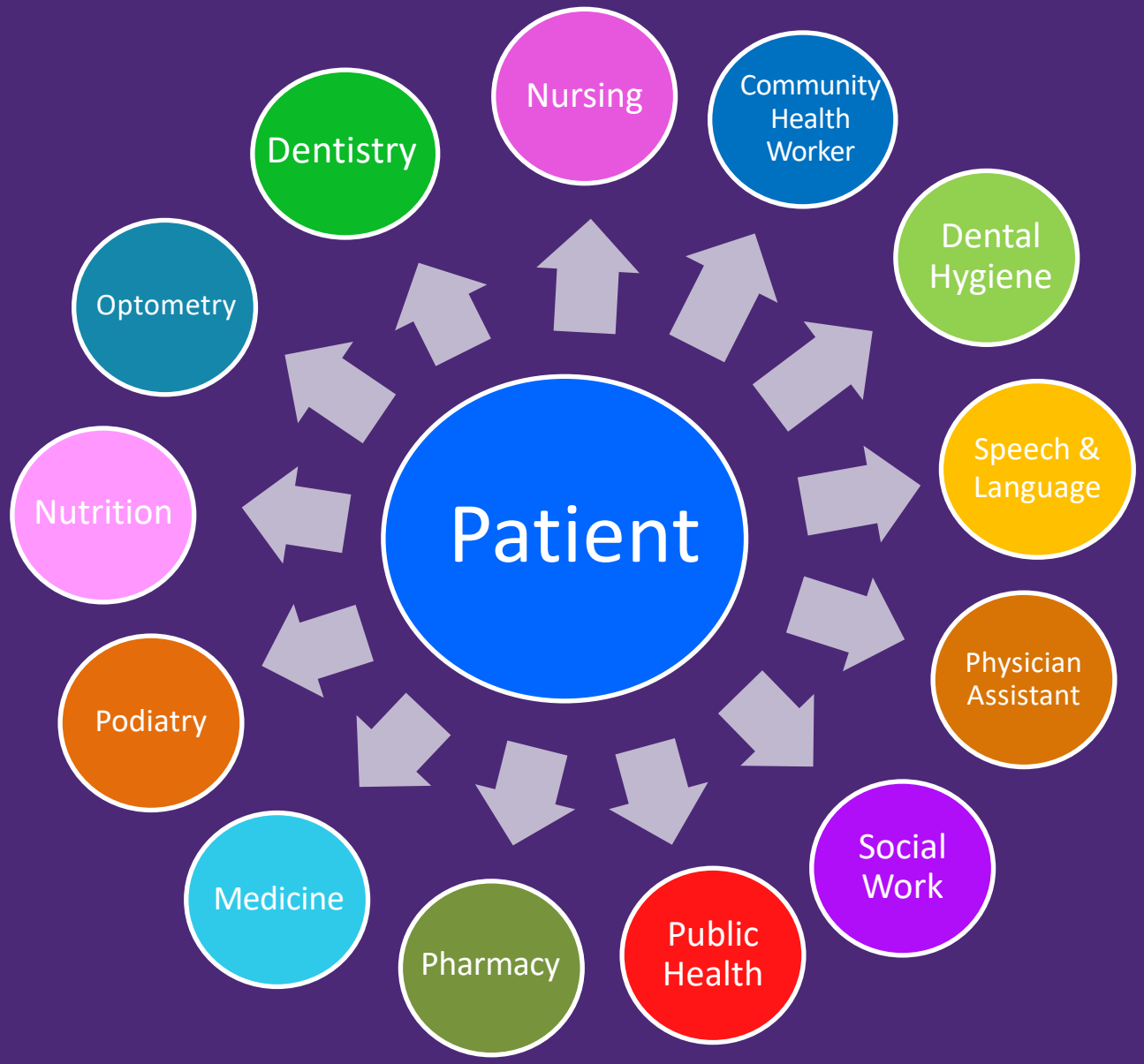
Whole Person Care



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Social Determinants of Health (SDOH)

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HEENT to HEENOT – Putting the Mouth Back in the Head

COMMENTARIES

Putting the Mouth Back in the Head: HEENT to HEENOT

Judith Haber, PhD, APRN, BC, Erin Hartnett, DNP, CPNP, BC, Kenneth Allen, DDS, MBA, Donna Hallas, PhD, CPNP, BC, Caroline Dorsen, MSN, FNP, BC, Julia Lange-Kessler, DNP, CM, RN, Madeleine Lloyd, MS, FNP, BC, PMHNP, BC, Edwidge Thomas, DNP, ANP, BC, and Dorothy Wholihan, DNP, ANP, BC, FCNP, BC

Improving oral health is a leading population health goal; however, curricula preparing health professionals have a dearth of oral health content and clinical experiences.

We detail an educational and clinical innovation transitioning the traditional head, ears, eyes, nose, and throat (HEENT) examination to the addition of the teeth, gums, mucosa, tongue, and palate examination (HEENOT) for assessment, diagnosis, and treatment of oral–systemic health. Many New York University nursing, dental, and medical faculty and students have been exposed to interprofessional oral health HEENOT classroom, simulation, and clinical experiences. This was associated with increased dental–primary care referrals.

This innovation has potential to build interprofessional oral health workforce capacity that addresses a significant public health issue, increases oral health care access, and improves oral–systemic health across the lifespan. (*Am J Public Health*. 2015;105:437–441. doi: 10.2105/AJPH.2014.302466)

DURING THE DECADE FOLLOWing publication of the Surgeon General's Report, *Oral Health in America*, health professionals, physicians (MDs), nurse practitioners (NPs), nurse–midwives (NMs), and physician assistants (PAs) began to align with the dental profession to heed Satcher's call to "view the mouth as a window to the body."[1] The most significant interprofessional movement that followed this report occurred with family practice and pediatric physicians coming together to work on preventive oral health initiatives for children in which those professionals would provide screenings, fluoride varnish, and referrals for children to find dental homes.

Mobilization of the overall health community to work collaboratively has been slower. Development of "Smiles for Life: A National Oral Health Curriculum"[2] represented an important interprofessional "tipping point" for engaging health professionals focused on treating populations across the lifespan in considering oral health and its relationship to overall health as an integral component of their practices.

Yet, evidence from national databases monitoring oral health data continue to reveal a high incidence and prevalence of dental caries, especially in lower socioeconomic and minority group populations.[3,4] Data from the 2009–2012 National Health and Nutrition Examination Survey[5] reveal that approximately one in four children (14%) aged 3 to 5 years living at the poverty level have untreated dental caries. The survey data further reveal that 19% of non-Hispanic Black children aged 3 to 5 years and 20% of Hispanic children aged 6 to 9 years had untreated dental caries compared with non-Hispanic White children aged 3 to 5 years (11%) and 6 to 9 years (14%).[6] Although national statistics show an improvement in access to oral health care for children aged 5 years and older, the data reveal significant disparities in access to care for children aged 2 to 4 years.[7]

In the adult population, oral cancer morbidity and mortality rates have not declined over the past 10 years, at least in part related to absent or inadequate oral examinations,[8] and human papillomavirus is associated with the recent rise in the incidence of oropharyngeal cancer.[9] Among adults aged 65 years and older, only 30% have a dental benefit.[10] Primary care providers have been challenged by the Institute of Medicine to play a significant role in improving these oral health disparities by building interprofessional oral health workforce capacity.[10]

One important component of the problem is that the majority of curricula for preparing health professionals have a dearth of oral health content and clinical experiences. Approximately 70% of medical schools include 4 hours or less on oral health in their curriculum; 10% have no oral health content at all.[11] Similarly, NPs and NMs have also not had a defined oral health curricular knowledge base nor a set of oral health clinical competencies.[12–15] The PA programs have generally followed medical school curricula and have not required curricular oral health content or competencies.[15]

The recent publication of several important national reports, two oral health reports by the Institute of Medicine,[10,16] the listing of oral health as one of the Healthy People 2020 Leading Health Indicators,[16] the release of the Health Resources and Services Administration document "Integration of Oral Health and Primary Care Practice,"[20] and the dissemination of "Oral Health Care During Pregnancy: A

March 2015, Vol 105, No. 3 | American Journal of Public Health

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American Journal of Public Health, 2015

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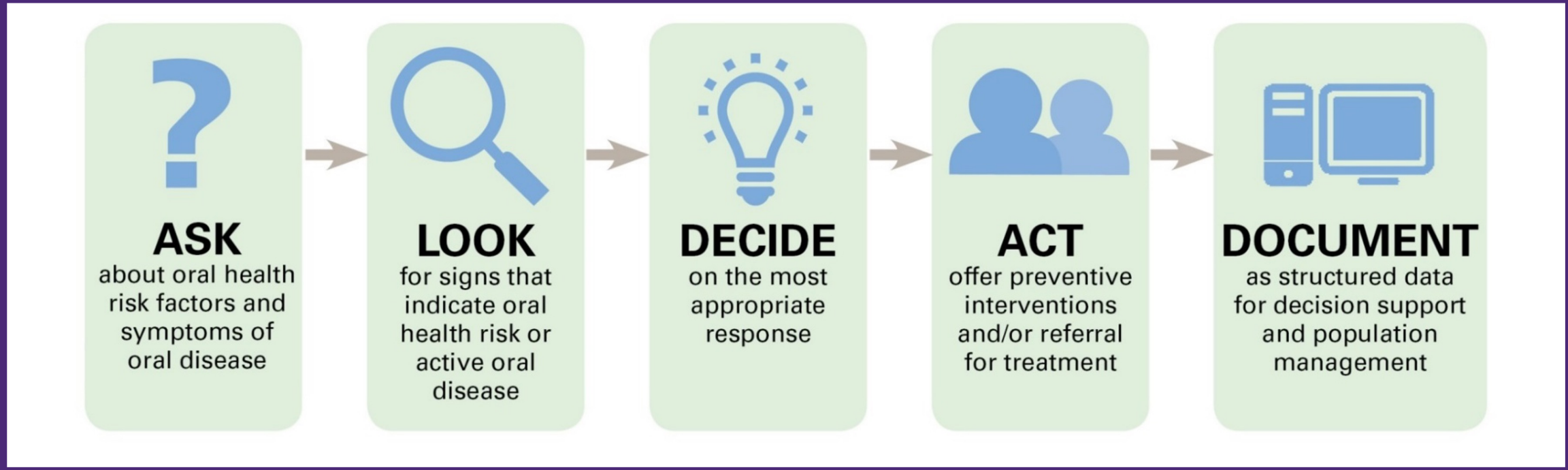
Oral Health Delivery Framework (2015)



Available at: www.QualisHealth.org/white-paper

Links Between Oral Health & Overall Health: Oral Health is Connected to Costs & Complications

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Brain

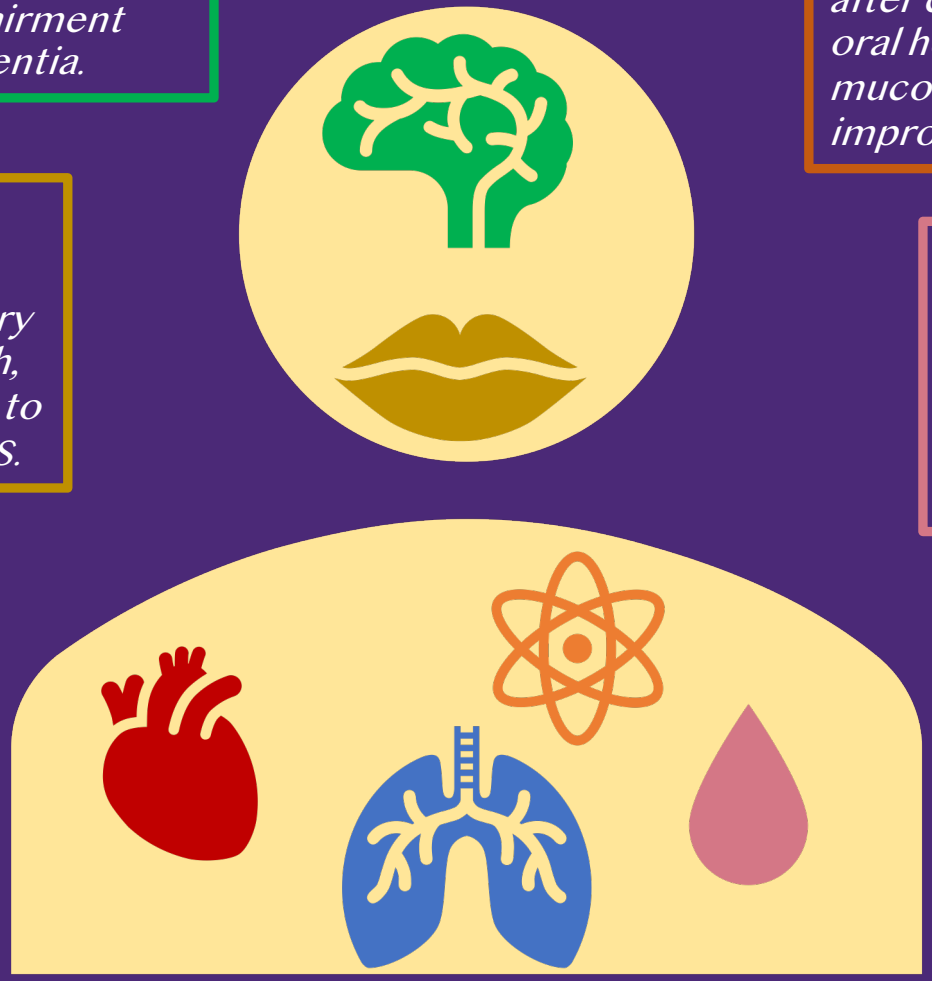
Adults with more tooth loss have a 1.4x higher risk of cognitive impairment and 1.28x higher risk of dementia.

Mouth

HPV is the leading cause of oropharyngeal carcinoma and a very small number of front of the mouth, oral cavity cancers. HPV is thought to cause 70% of oral cancers in the U.S.

Heart

People with periodontal (gum) disease are 2 to 3x more likely to suffer from a heart attack or other serious cardiovascular issue



Cancer

Dental care is crucial before, during and after cancer care to decrease risk for painful oral health complications, such as mucositis, as well as decrease cost and improve quality of life for patients.

Diabetes

The relationship between diabetes and periodontal disease is bi-directional, meaning that both diseases when not treated or controlled directly affect the other negatively.

Lungs

Periodontal disease may increase risk for respiratory disease including COPD.

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Cardiovascular Disease & Oral Health

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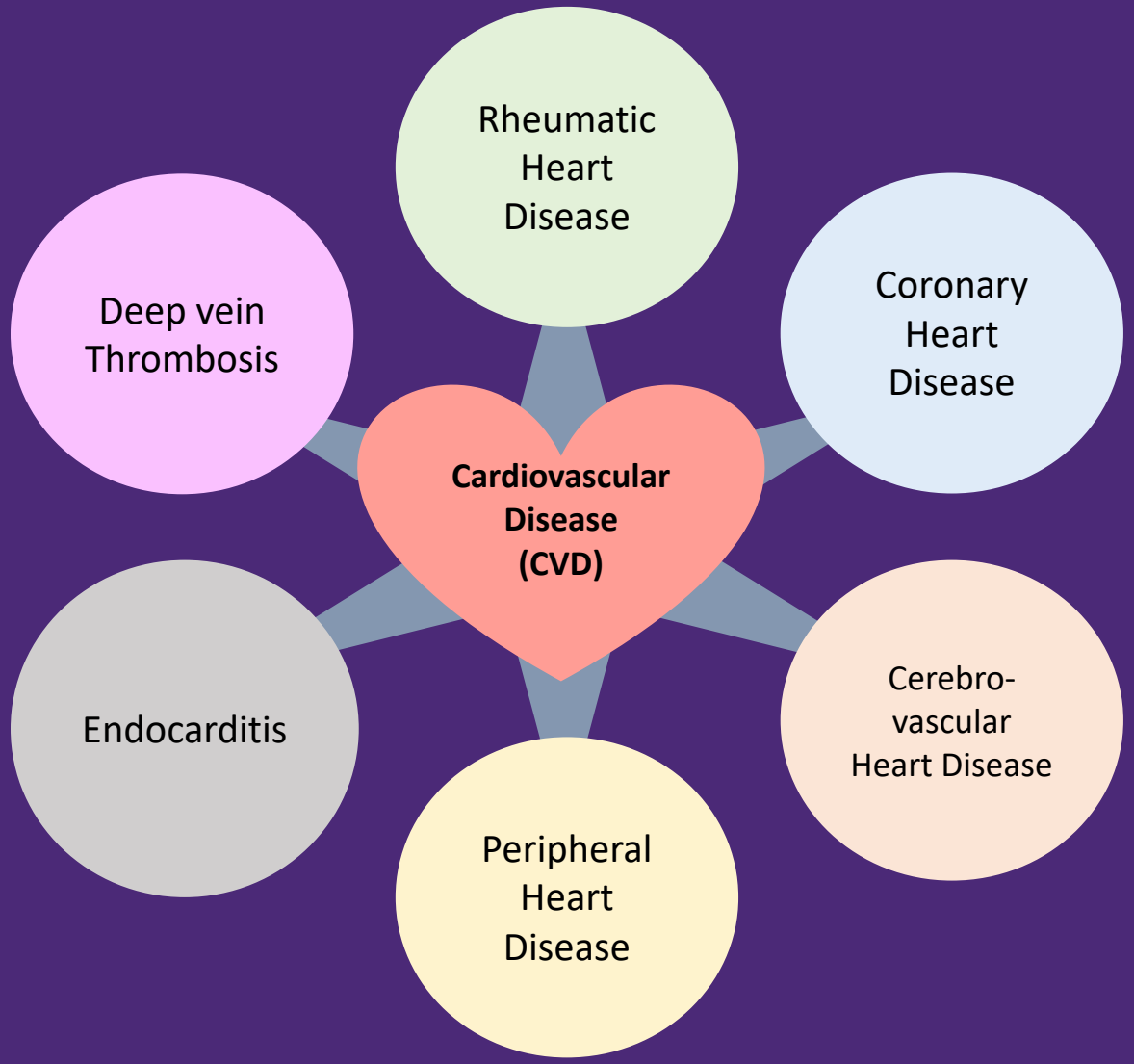
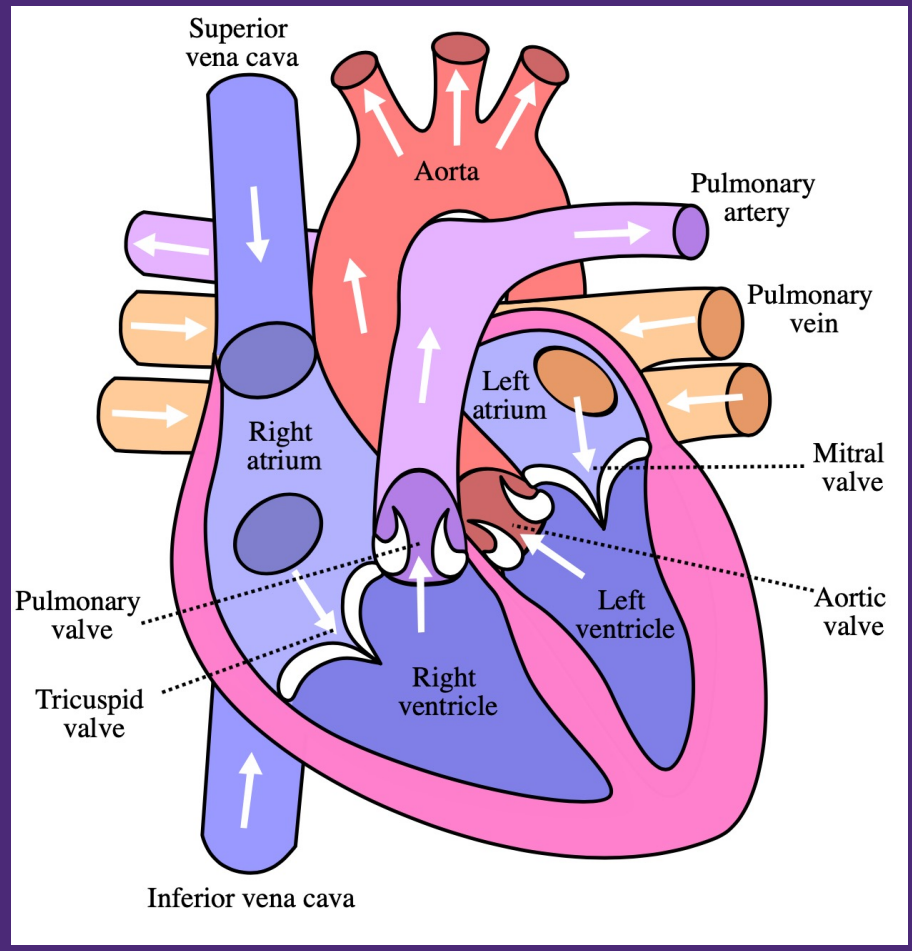
Cardiovascular Disease (CVD)

- Most common cause of death in the US and worldwide
  - 17.5 million (31%) of global deaths
- 92.1 million American adults suffer from some form of CVD
- 2,200 Americans die of CVD each day



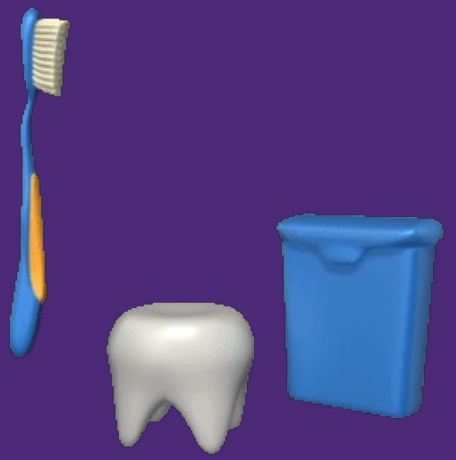
Cardiovascular Disease (CVD)

- *Oral manifestations:* periodontal disease, xerostomia, lichenoid lesions, dysgeusia
- Studies reveal chronic oral infections and pro-inflammatory markers may contribute to the pathogenesis of periodontal disease and CVD
- Many studies have examined the links between oral health and CVD, finding poor oral health to be associated with increased risk of CVD and cardiac events including fatal cardiovascular infections (i.e. bacterial endocarditis)



How an Interprofessional Health Team Can Make a Difference

- **Think** about CVD as complex and multifaceted → requires coordinated team-based approach to providing care
- **Consider** the barriers r/t social determinants of health in maintaining overall health and accessing affordable dental care
- **Educate** patients and families on the importance of good home oral health and hygiene practices
- **Manage** oral bacteria levels and inflammation by coaching about good oral hygiene behaviors → reduces risk of developing CVDs and CVD-related complications
- **Refer** to appropriate team members
- **Document** oral health assessment findings and interventions



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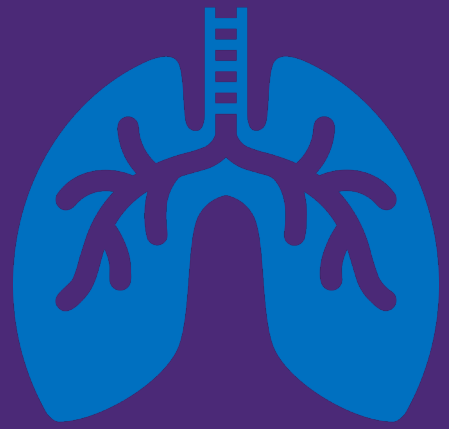
Non-Ventilator Hospital-Acquired Pneumonia & Oral Health



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Non-ventilator Hospital-acquired Pneumonia

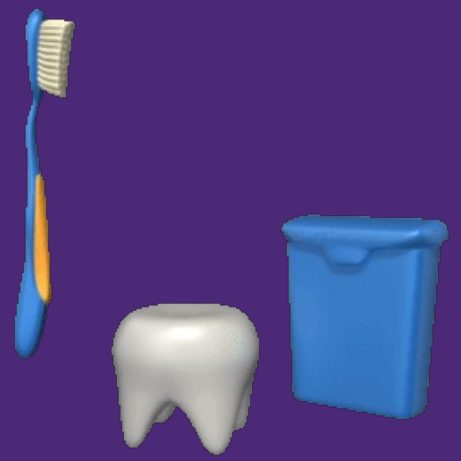
- 1st most common HAI in U.S.
- Affects 1 in every 100 hospitalized patients
- Increased morbidity → 50% are not discharged back home
- Increased mortality →15%-30%
- Extended LOS → 4-9 days
- Increased Cost → $28K to $109K
- 2x likely for readmission <30 day

Non-ventilator Hospital-acquired Pneumonia

- NVHAP is a subset of HAP defined as pneumonia identified ≥48 h (2 days) in patients without mechanical ventilation.
- Primary source of pneumonia is aspiration of bacteria present in the oral biofilm
  - ✓ Dental plaque becomes the reservoir for pathogens including antibiotic-resistant organisms in the hospital setting
  - ✓ Plaque buildup and bacterial overgrowth, along with micro-aspiration when patients are bedridden and lying supine, increases the risk for NVHAP
  - ✓ Reducing the bacterial burden in the mouth through consistent oral care is associated with a significant reduction in the incidence of NVHAP

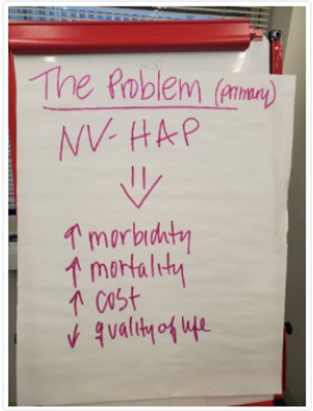
How the Healthcare Team Can Make a Difference

- Maintain regular oral care with consistent toothbrushing, flossing and denture cleaning.
- Elevate the head of the patient's bed.
- Minimize the use of acid-suppressing medications and sedation.
- Perform dysphagia screening in high-risk patients.
- Use modified diets and feeding strategies for patients with abnormal swallowing.
- Follow standardized processes to place and manage feeding tubes.
- Conduct breathing exercises, chest physiotherapy and incentive spirometry.
- Educate patients and families about NVHAP prevention.



National Organization for NV-HAP Prevention and Hospital-Acquired Pneumonia Prevention by Engaging Nurses (HAPPEN) Web Pages

National Organization for NV-HAP Prevention (NOHAP)



Saving lives by preventing Non-Ventilator Hospital-Acquired Pneumonia (NV-HAP)

Hospital-Acquired Pneumonia (HAP) is the #1 hospital-acquired infection in the U.S. and 60% of HAP cases occur among non-ventilated patients. Fortunately, we are discovering effective ways to prevent Non-Ventilator Hospital-Acquired Pneumonia (NV-HAP).

The National Organization for NV-HAP Prevention (NOHAP) is a network of healthcare leaders designing a national NV-HAP research agenda and developing policies to combat NV-HAP. The goal is to implement effective prevention strategies to improve patient safety, enhance quality of life, and save lives.

We are working to educate patients and health care providers on these prevention strategies, such as improving oral care for Veterans and the general public.

HAPPEN (Hospital-Acquired Pneumonia Prevention by Engaging Nurses)

Providing consistent oral care to hospitalized Veterans and long-term care residents cuts the risk of developing pneumonia in half.

The HAPPEN team is collaborating with VA leaders, the CDC, the Joint Commission, FDA, HRSA, insurers including Medicare and Medicaid, the Patient Safety Movement Foundation, academia, and private industry to develop a national research agenda, policy, and an implementation/ marketing plan for the nation.

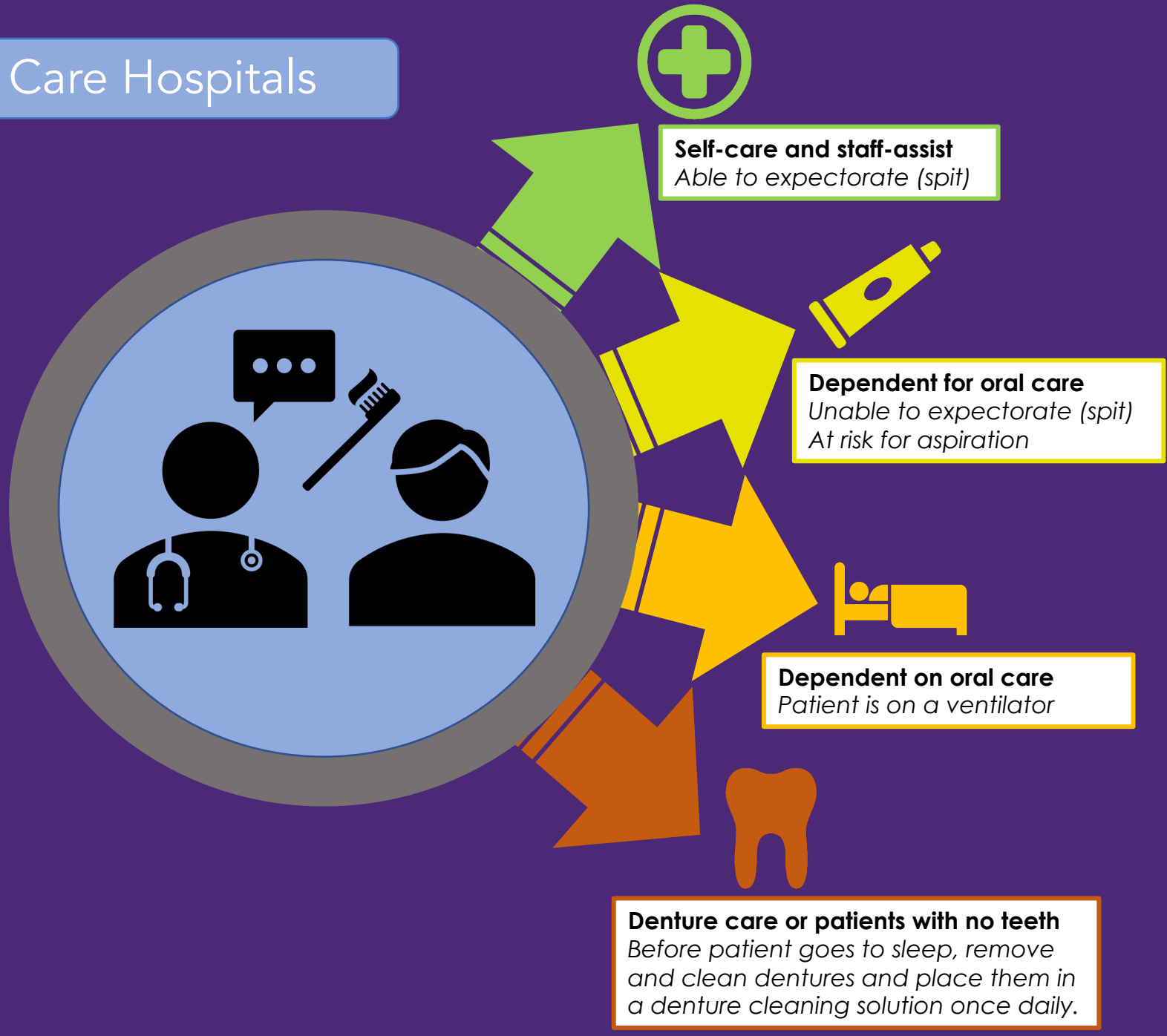
HAPPEN team members at each site include professionals in nursing, medicine, infection control, quality management, dental, speech and language pathology, and others.

VA hospitals that have implemented the program report a decrease in pneumonia rates of 40-60%. Implementation doesn't require a significant investment in either time or money.

More information available through the Veterans Health Administration (VHA) website https://www.va.gov/health/

Oral Care Protocol for Acute Care Hospitals

- **Complete oral care assessment** includes a swallow assessment first. Determine if a bite block is required and if additional swallow assessment is required.
- **Always use Personal Protective Equipment (PPE)** when assisting patients with mouth care and wash your hands before and after the procedure per policy.
- **Document oral care** in the patient record.
- **Disposable oral swabs *do not* replace tooth brushing.** They are for comfort care, one-time use only; do not leave oral swabs soaking in a cup for use later.
- **Maintain adequate oral hydration** when possible to maximize salivary flow.



INTEGRATED HEALTH CARE

Integrating Oral Health Care into Patient Management to Prevent Hospital-Acquired Pneumonia: A Team Approach

By Shannon Munro, PhD, APRN, BC, FNP, and Dian Baker, PhD, APRN, BC, PNP

Hospital-acquired pneumonia (HAP) is a substantial health risk for hospitalized patients and the leading hospital acquired bacterial infection occurring in U.S. hospitals.[1-2] In 2016, the Centers for Disease Control and Prevention named prevention of health care associated infections in the top 10 public health concerns for patient safety.[3] Most hospital-acquired pneumonia cases originate with bacteria in the mouth.[4] Therefore, dental professionals have the unique opportunity to educate patients and their caregivers, students, and other health care providers about prevention of HAP through consistent oral hygiene, two to four times daily, in addition to regularly scheduled outpatient dental cleaning and assessment.

Background

A few definitions are in order. Community acquired pneumonia is noted when patients arrive at the hospital with the onset of symptoms reported ≤ 48 hours after admission.[5] All types of HAP occur more than 48 hours after admission.[5] Ventilator-associated pneumonia (VAP) occurs following endotracheal intubation. VAP has been significantly reduced over the last decade by efforts to reduce the bacterial burden in the mouth.[5] Non-ventilator-associated hospital acquired pneumonia (NV-HAP) is a non-device related infection and the focus of our prevention efforts.[5]

A solitary case of NV-HAP is shown to result in an average direct cost of $40,000 with associated mortality rates ranging from 15-30 percent.[6] NV-HAP comprises 60 percent of HAP cases, has an incidence ranging from 1.22-8.9/1000 patient days, and places an estimated 35 million U.S. patients at risk each year.[5,7]

Pathophysiology

Many dentists and other health care professionals are surprised to learn that 70 percent of hospitalized patients do not receive basic oral care, so there is limited source control for overrun of the bacteria in the mouth.[5,8,9] Dental plaque frequently becomes a reservoir for pathogens, including antibiotic-resistant organisms in the hospital setting. This is shown to worsen when salivary film loses its ability to protect against pathogenic bacteria.[4,10-13] The risk of plaque build-up and bacterial overgrowth along with microaspiration when hospitalized patients are bedridden and lying supine increases the opportunity for pneumonia.[14]

Oral antibiotics and topical application of antimicrobial products are not always effective against bacteria embedded in oral biofilm. Thus, the simple mechanical removal with a toothbrush is a key step in reducing the risk of NV-HAP by 40-60 percent.[5,7,15-16] In a systematic review by Sjogren et al.,[17] an estimated 1 in 10 deaths among the elderly may be prevented by improving oral hygiene. Bassim et al.[18] found the odds of dying from pneumonia were three times higher in patients receiving no oral care. Kaneoka et al.[16] found that tooth brushing alone reduces the relative risk of pneumonia and reduced the risk of fatal pneumonia in a meta-analysis of five randomized controlled trials consisting of 1,009 subjects receiving care in a neuro-intensive care unit, rehabilitation unit, and three nursing homes (RRfixed, 0.61; 95 percent CI (0.40–0.92), p=.02; RRfixed, 0.41; 95 percent CI (0.23–0.71); p =.002 respectively).

Risk assessment

In addition to those with poor oral hygiene, medically fragile patients are at high risk for NV-HAP (e.g., low body mass index, inadequate nutrition, prolonged dependency for activities of daily living, age ≥65 years).[9] Patients prescribed multiple medications including central nervous system depressants and acid-blocking medications are also at risk.[9] One or more of these risk factors are present in more than 80 percent of hospital admissions.[9]

The highest risk occurs among patients with dysphagia, impaired cough reflex, xerostomia, incompetent lower esophageal sphincter, and poor oral hygiene.[11] NV-HAP cases have been found among all age groups in every type of hospital setting; thus, prevention efforts should be geared toward all patients.[5,9,19]

Dental professionals in private practice are encouraged

(Continued on Page 50)

Quick Safety

Issue 61 | September 2021

Preventing non-ventilator hospital-acquired pneumonia

Issue:

It's estimated that one in every 100 hospitalized patients will be affected by non-ventilator hospital-acquired pneumonia (NVHAP). While NVHAP is a significant patient safety and quality of care concern, it is not currently recognized as one of the National Database of Nursing Quality indicators for which hospitals are held accountable; nor is it one of the conditions that the Centers for Medicare & Medicaid Services (CMS) requires hospitals to report to the Centers for Disease Control & Prevention (CDC) National Healthcare Safety Network; and it is not integrated into the CMS current pay-for-reporting or performance programs.[1] As a result, this leaves NVHAP a health care-acquired condition without national tracking or accountability, and, most likely, is unaddressed by health care organizations.

A recent article in the journal *Infection Control & Hospital Epidemiology* (ICHE) detailed a call to action from national organizations, including The Joint Commission, to address NVHAP. The call to action includes launching a national health care conversation about NVHAP prevention and encouraging researchers to develop new strategies for NVHAP surveillance and prevention. This issue of *Quick Safety* focuses on the call's challenge to health care systems to implement and support NVHAP prevention, and to add NVHAP prevention measures to education for patients, health care professionals and students.[1]

Current NVHAP prevention strategies

Since the development of NVHAP requires a complex interaction of events that includes aspiration of microorganisms present in the oral cavity and a vulnerable host, most prevention measures target primary source control, and may include:[1,2]

- Maintaining regular oral care[1,2,3,4,5,6]
- Maintaining patient mobility[1,3,5,6,7]
- Elevating the head of the patient's bed[1,3,5,6]
- Reducing the use of acid-suppressing medications[1]
- Minimizing sedation[1,5]
- Performing dysphagia screening in high-risk patients[1]
- Using modified diets and feeding strategies for patients with abnormal swallowing[1,3,5]
- Following standardized processes to place and manage feeding tubes[1,5]
- Breathing exercises[1,3,6]
- Using chest physiotherapy[1]
- Using incentive spirometry[1,5,6]
- Educating the patient and family about NVHAP prevention[1]

Safety actions to consider:

The call to action acknowledges that strategies to improve the prevention, recognition, and treatment of NVHAP are currently limited by gaps in understanding of the pathogenesis of NVHAP. Also, surveillance is challenging because the clinical criteria for NVHAP are subjective, often inaccurate, variably documented, and labor intensive to apply. Despite these limitations and challenges, there are actions that hospitals and medical centers can take to prevent NVHAP while improving the quality of care and patient safety, lowering the risk of sepsis, reducing health care costs, and saving lives.[1]

1. Obtain buy-in from leadership and health care providers about the importance of NVHAP prevention. [1]
2. Overcome beliefs that NVHAP prevention strategies such as oral hygiene and mobility are optional tasks rather than standard-of-care interventions. [1]
3. Procure supplies necessary to implement effective interventions.[4]
4. Educate staff about the risks of NVHAP and prevention methods such as aspiration precautions.[3,5] Provide training on techniques to encourage patients to comply with oral care[2,4] and maintaining mobility.[5,7]
5. Implement processes that make oral care and mobility an expectation for routine care of non-ventilated patients.

The Joint Commission.

Infection Control & Hospital Epidemiology (2021), 1–6
doi:10.1017/ice.2021.239

SHEA

Commentary

Nonventilator hospital-acquired pneumonia: A call to action

Recommendations from the National Organization to Prevent Hospital-Acquired Pneumonia (NOHAP) among nonventilated patients

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Executive Summary

In 2020 a group of U.S. healthcare leaders formed the National Organization to Prevent Hospital-Acquired Pneumonia (NOHAP) to issue a call to action to address non–ventilator-associated hospital-acquired pneumonia (NVHAP). NVHAP is one of the most common and morbid healthcare-associated infections, but it is not tracked, reported, or actively prevented by most hospitals. This national call to action includes (1) launching a national healthcare conversation about NVHAP prevention; (2) adding NVHAP prevention measures to education for patients, healthcare professionals, and students; (3) challenging healthcare systems and insurers to implement and support NVHAP prevention; and (4) encouraging researchers to develop new strategies for NVHAP surveillance and prevention. The purpose of this document is to outline research needs to support the NVHAP call to action. Primary needs include the development of better models to estimate the economic cost of NVHAP, to elucidate the pathophysiology of NVHAP and identify the most promising pathways for prevention, to develop objective and efficient surveillance methods to track NVHAP, to rigorously test the impact of prevention strategies proposed to prevent NVHAP, and to identify the policy levers that will best engage hospitals in NVHAP surveillance and prevention. A joint task force developed this document including stakeholders from the Veterans' Health Administration (VHA), the U.S. Centers for Disease Control and Prevention (CDC), The Joint Commission, the American Dental Association, the Patient Safety Movement Foundation, Oral Health Nursing Education and Practice (OHNEP), Teaching Oral-Systemic Health (TOSH), industry partners and academia.

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Non–ventilator-associated hospital-acquired pneumonia (NVHAP) affects ~1 in every 100 hospitalized patients, has a crude mortality rate of 15%–30%, extends hospital length-of-stay by up to 15 days, requires ICU admission in up to 46% of non-ICU cases, increases antibiotic utilization, and is associated with readmission within 30 days in up to 20% of survivors.[1–5]

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Cite this article: Munro SC, *et al.* (2021). Nonventilator hospital-acquired pneumonia: A call to action: Recommendations from the National Organization to Prevent Hospital-Acquired Pneumonia (NOHAP) among nonventilated patients. *Infection Control & Hospital Epidemiology*, https://doi.org/10.1017/ice.2021.239

Despite the considerable morbidity, mortality, and cost associated with NVHAP, there are currently no requirements nor standards for hospitals to track or prevent this complication. Healthcare organizations and policy makers have dedicated considerable resources to preventing other healthcare-associated infections over the past 20 years. These actions have resulted in striking decreases in many device-associated infections, including ventilator-associated pneumonia; NVHAP rates, however, remain persistently high.[6,7]

Stakeholders from government, healthcare, industry, and academia formed the National Organization to Prevent Hospital Acquired Pneumonia (NOHAP) in 2020 to highlight the clinical importance of NVHAP and to catalyze a coordinated movement

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Policy Updates

- **Veterans Health Administration (VHA) network directors reporting** on NV-HAP prevention in their ECF plan (in progress).
- **NVHAP** added to the list of National Database of Nursing Quality Indicators (NDNQI), which would power system-wide transformation of health care organizations to include NVHAP as a quality outcome indicator.
- **SNOWMED** standardized clinical terms for NVHAP have been accepted by the National Quality Forum (NQF) for inclusion in electronic health records (EHR). This will locate oral health as part of the standardized terminology used for documentation of client data in EHR.
- ***Oral Health in America: Advances and Challenges***
  Three mentions regarding importance of oral care and pneumonia prevention.

Implementation Updates

VA Implementation
Performance will be part of network directors ECF plan (in progress)
HAPPEN Initiative was adopted enterprise-wide July 2021
Monitoring NV-HAP outcome and process measures nationwide

National League for Nursing: Advancing Care Excellence for Seniors (ACE.S) And Veterans (ACE.V) Training
One of the teaching strategies offers guidelines for faculty to use to teach students to prevent NV-HAP by integrating the oral care protocol into the care of hospitalized Veterans and civilians

OHNEP Interprofessional Oral Health Faculty Tool Kits:
https://nursing.nyu.edu/w/ohnep/tool-kits

NOHAP Social Media/Communication Campaign/Patient Empowerment
Social media kit/patient education on the NOHAP site

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Mental Health & Oral Health

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Mental Health

- Isolation and financial hardships of COVID-19 pandemic deeply affected mental health status worldwide
  - Poor mental health → insecurity related to poor oral health → reluctance to visit the dentist
  - Global prevalence of anxiety and depression increased 25%
  - Increased substance abuse and suicidal ideation
  - Increased incidence of domestic violence
  - Decreased access to mental health and dental care

2020 Mental Health By the Numbers

RECOGNIZING THE IMPACT

2020 was a year of challenges, marked by loss and the uncertainty of the COVID-19 pandemic.

We must recognize the significant impact of the pandemic on our mental health – and the importance of increasing access to timely and effective care for those who need it.

Among U.S. ADULTS:

1 in 5 experienced a mental illness

1 in 20 experienced a serious mental illness

1 in 15 experienced both a substance use disorder and mental illness

12+ MILLION had serious thoughts of suicide

Among U.S. ADULTS who received mental health services:

17.7 MILLION experienced delays or cancellations in appointments

7.3 MILLION experienced delays in getting prescriptions

4.9 MILLION were unable to access needed care

Many struggled to get necessary mental health care, with telehealth proving an essential option.

26.3 MILLION adults received virtual mental health services in the past year

- 34% of those with mental illness
- 50% of those with serious mental illness

Many increasingly used alcohol or drugs to cope with stress or self-medicate.

- 15% Among people aged 12 and older who drink alcohol, 15% report increased drinking
- 10% Among people aged 12 and older who use drugs, 10% report increased use

Data from CDC, NIMH and other select sources. Find citations for this resource at nami.org/mhstats

NAMI HelpLine 800-950-NAMI (6264) | NAMI | NAMICommunicate | NAMICommunicate | www.nami.org

NAMI National Alliance on Mental Illness

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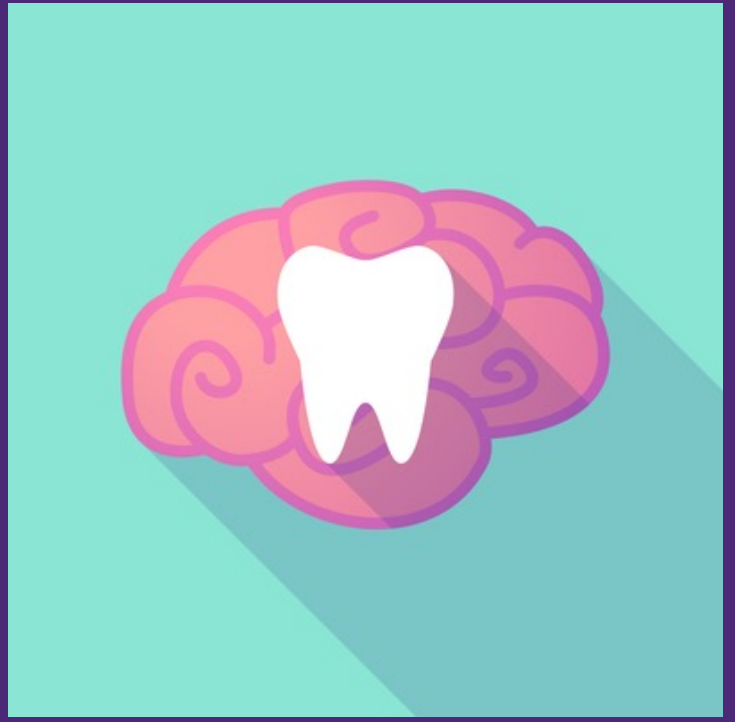
Poor Mental Health → Poor Oral Health

- Increased risk of oral health neglect due to…
  - Dental anxiety
  - Substance use
  - Depression
  - Trauma
  - Inadequate self-care
  - Cost
- Side effects of antipsychotic, antidepressant, and mood stabilizer drugs include a higher risk for oral bacterial infections, gum disease & xerostomia, as well as metabolic syndrome
- Mental illness includes a range of dysfunctional symptoms and behaviors that can significantly impact oral health → serious systemic consequences (inflammation and infection spread to other areas of the body)



Poor Mental Health → Poor Oral Health

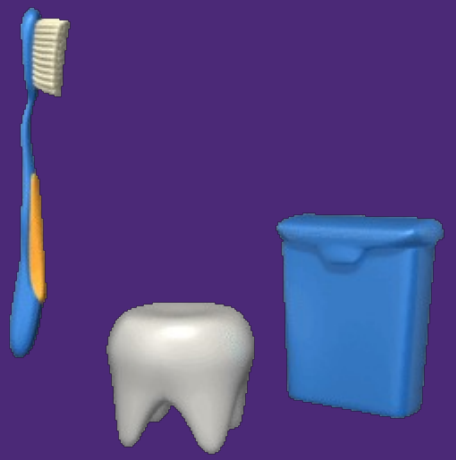
- Stress affects the immune system, sleep, personal hygiene patterns & contribute to bruxism and orofacial pain
- Bipolar patients treated with lithium and other mood stabilizers have higher rates of xerostomia, gingival hyperplasia & stomatitis
- Difficulty sleeping can contribute to a weakened immune system, leading to increased risk of periodontitis
- Lack of sleep can cause poor nutritional choices including increased coffee intake and snacking
- Anxiety and trauma → dental anxiety and dental phobias cause avoidance of the dentist

Poor Mental Health → Poor Oral Health

- People with autism and obsessive-compulsive disorders may brush & floss too vigorously or too often
- Depression can cause self-neglect, which often results in poor oral hygiene and consequential tooth decay
- Substances (i.e. cocaine, amphetamines, opioids) can cause xerostomia, leading to severe tooth decay; “Meth mouth” among methamphetamine users
- Patients with anorexia and/or bulimia more susceptible to enamel erosion and tooth decay
- Schizophrenia spectrum and other psychotic disorders increase risk for metabolic syndrome & demonstrate poor motivation related to personal care

How an Interprofessional Health Team Can Make a Difference

- **Think** about mental health as complex and multifaceted → requires coordinated team-based approach to providing care
- **Consider** the barriers r/t social determinants of health in accessing mental health and dental care needs
- **Screen** patients for dental, oral hygiene & mental health issues
- **Educate** patients on the importance of good home oral health and hygiene practices
- **Manage** oral bacteria levels and prevent inflammation by providing coaching about good oral hygiene behaviors → promote oral health care as a key component of managing mental health
- **Document** oral health assessment findings and interventions, and provide referrals to address specific oral and/or mental health issues



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All 4 Oral Health

MAY 31, 2022/

The Brain-Mouth Connection

How Good Oral Health Can Improve Mental Health

Jessamin Cipollina, MA

Mental health plays a significant role in oral health. People struggling with mental health issues such as anxiety and depression may be at higher risk of developing oral health problems like tooth erosion, cavities and gum disease. There are gaps in oral healthcare needs for individuals who struggle with mental health, including overall lack of awareness of the "brain-mouth connection" and the importance of promoting oral health among patients with mental health issues. Findings from evidence-based studies reveal that those with mental health problems are more likely to be affected by poor oral health and underutilize oral health services.[1-5] Those struggling with mental illness are often affected by the social determinants of health that limit access to regular dental care. Side effects of

Our Recent Blogs Posts

The Brain-Mouth Connection
MAY 31, 2022

Improving HPV Vaccine Confidence: An Interprofessional Challenge
APRIL 12, 2022

Sweet Salvation
FEBRUARY 21, 2022

The Need for the Needle
OCTOBER 27, 2021

The Race to Health Equity
FEBRUARY 23, 2021

Available at https://all4oralhealth.wordpress.org

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ORAL HEALTH, MENTAL HEALTH AND SUBSTANCE USE TREATMENT

A Framework for Increased Coordination and Integration

NATIONAL COUNCIL *for* Mental Wellbeing

CENTER OF EXCELLENCE
for Integrated Health Solutions

Funded by Substance Abuse and Mental Health Services Administration and operated by the National Council for Mental Wellbeing

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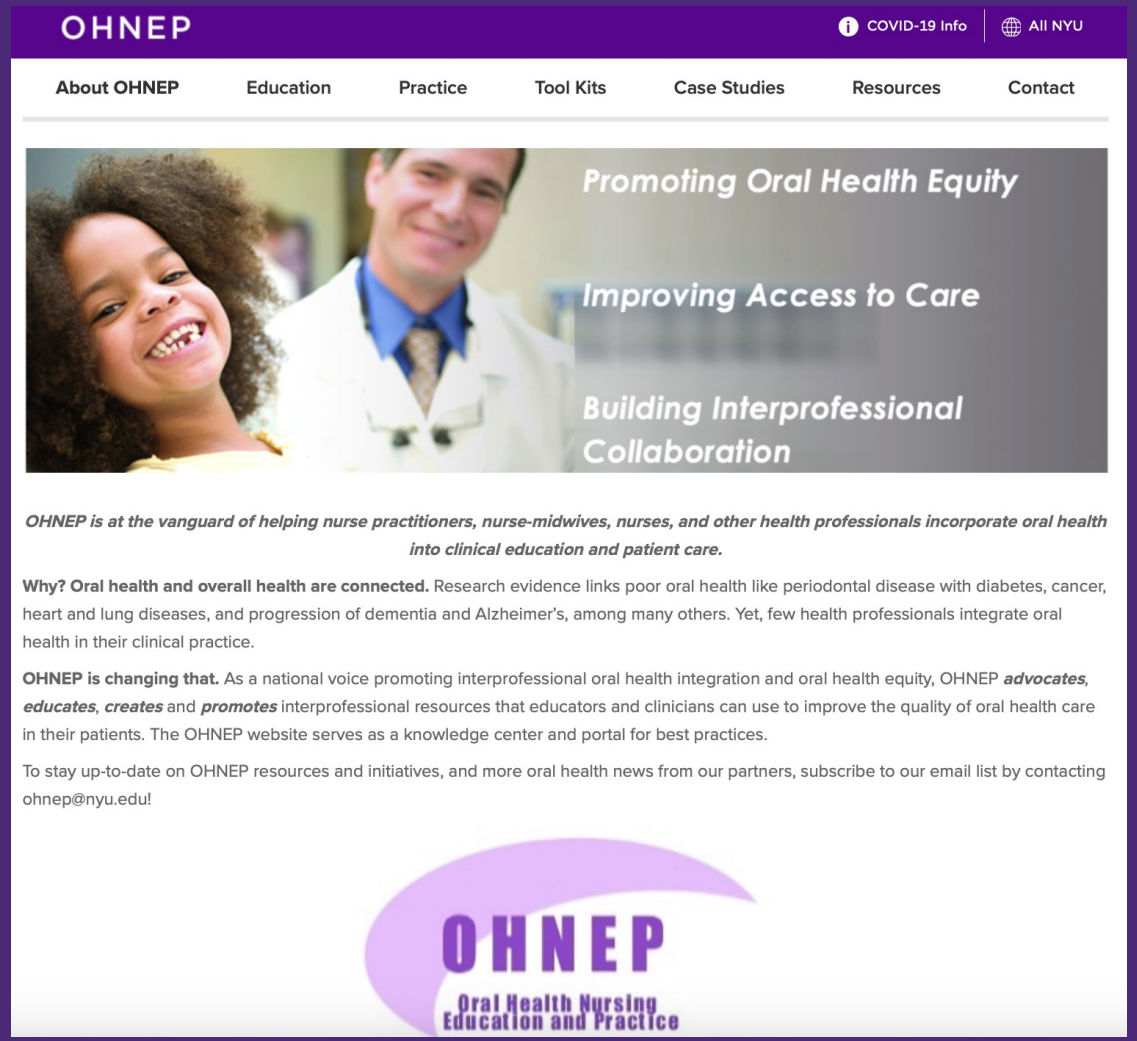
Oral Health Nursing Education and Practice (OHNEP)



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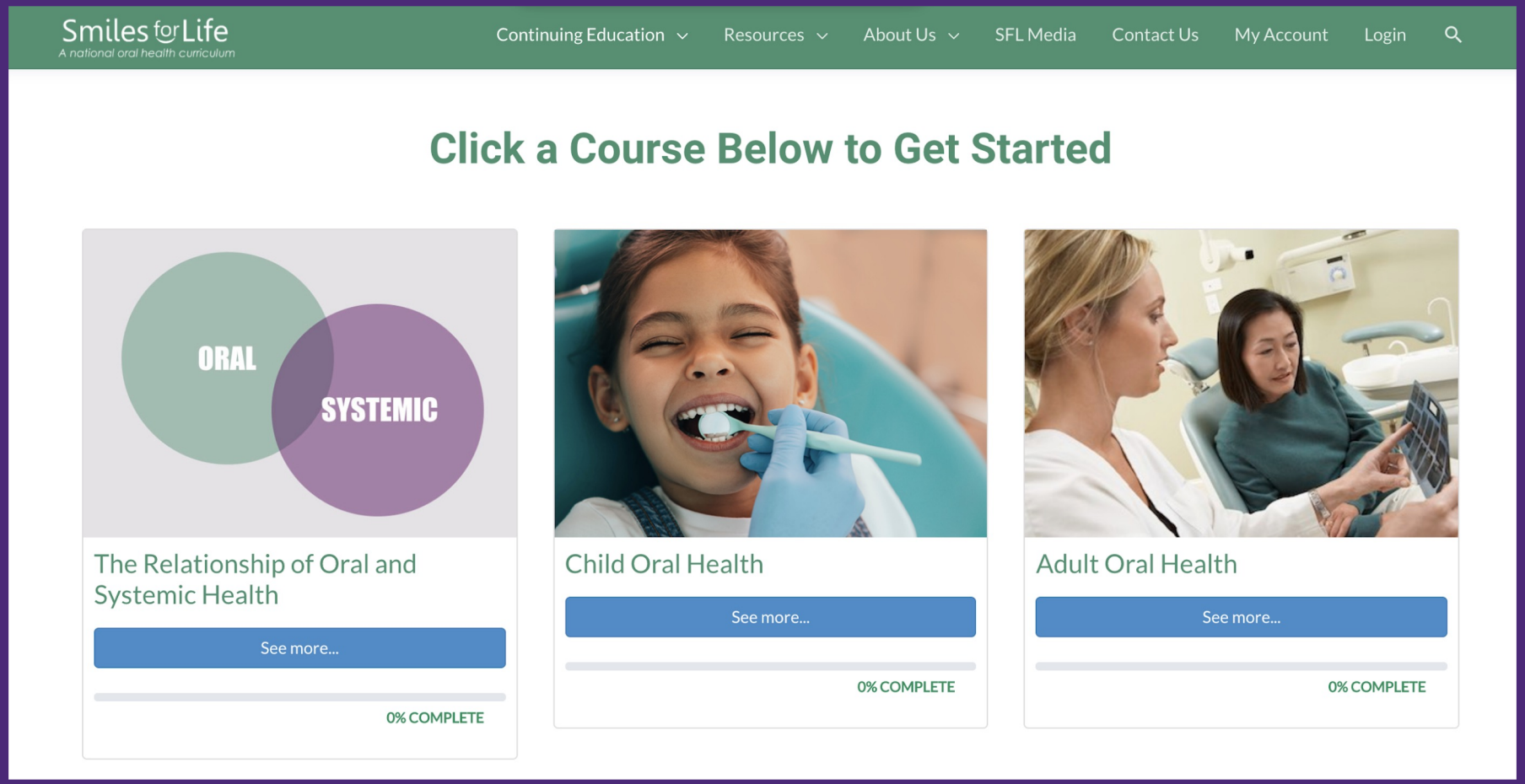
Smiles for Life: A National Oral Health Curriculum



smilesforlifeoralhealth.org

Advancing Care Excellence (ACE) Series

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Advancing Care Excellence for Persons with Disabilities (ACE.D)

Oral Health and Autism Spectrum Disorder

Oral Health and Cerebral Palsy

Advancing Care Excellence for Veterans

Oral Health and Behavioral Health Disorders

Preventing Non-ventilator Associated Hospital Acquired Pneumonia (NVHAP) with Oral Care

Available at https://www.nln.org/education/teaching-resources/advancing-care-excellence

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New! Graduate Interprofessional Oral Health Faculty Tool Kits
Third Edition

OHNEP Oral Health Nursing Education and Practice

Available at: https://nursing.nyu.edu/w/ohnep/tool-kits

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NEW! Undergraduate Interprofessional Oral Health Faculty Tool Kit

- ✓ Microbiology
- ✓ Anatomy & Physiology
- ✓ Pathophysiology
- ✓ Research Methods
- ✓ Pharmacology
- ✓ Health Assessment & Promotion
- ✓ Fundamentals

- ✓ Nursing Care of Adults & Older Adults
- ✓ Nursing Care of Children
- ✓ Maternity & Women's Health
- ✓ Community
- ✓ Psychiatric-Mental Health
- ✓ Leadership in Nursing
- ✓ Professional Nursing

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Available at: https://nursing.nyu.edu/w/ohnep/tool-kits

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Health Literacy: Oral Health Facts

Patient FACTS

www.acponline.org/patient_ed

Oral Health and You

What Is Oral Health?

Oral health is not only about keeping teeth clean. It also refers to the jaw, lips, gums, teeth, tongue, and glands that make saliva. Good oral health is important to your overall health. Many health problems, like diabetes, heart disease, and other conditions, are linked with oral health. It's important to talk to both your dentist and primary health care professional (physician, nurse practitioner, physician assistant) about oral health.

What Are Some Common Oral Health Problems?

- A **Cavity** is a hole in your tooth caused by bacteria from plaque buildup. Eating sugary foods and drinks can make plaque worse. When plaque is not cleaned off the teeth, cavities can form.
- **Gingivitis** happens when plaque stays on your teeth for too long. Gingivitis can cause gums to be swollen and tender and bleed more easily. It can also cause bad breath. This is the beginning stage of gum disease.
- **Gum Disease (Periodontitis)** occurs when tartar builds up and contributes to infections deep in your gums. It can lead to loss of tissue, bone, and teeth and can increase your risk for other serious problems, like diabetes, heart attack, or stroke.
- **Dry Mouth** can be caused by medicines for high blood pressure, depression, or other health problems.

What Are the Warning Signs of Poor Oral Health?

- Red, swollen, tender, or bleeding gums
- Bad breath that won't go away
- Loose teeth
- Sensitive or sore teeth
- Receding gums (gums that pull away from the teeth)
- Dry mouth
- Long-lasting mouth sores

How Are Oral Health Problems Diagnosed?

Most oral health problems are diagnosed after your mouth, teeth, gums, and tongue are examined. Your dentist may also use X-rays to help diagnose oral health problems.

How Are Oral Health Problems Treated?

- **Cavities** can be treated by filling or covering the holes in teeth. If a cavity or tooth decay is more serious, nerves in the tooth or the entire tooth may need to be removed.
- **Gingivitis** can be treated by a professional cleaning at your dentist's office. Good oral hygiene will keep plaque and tartar from building up again.
- **Gum disease** is treated by removing tartar and bacteria from your teeth and gums. If gum disease is more serious, you may need prescription antibiotic medicines or dental surgery.

OHNEP | ACP American College of Physicians

National *Interprofessional Initiative* on Oral Health

Patient FACTS

www.acponline.org/patient_ed

Oral Health and Older Adults

What Is Oral Health?

Oral health is not only about keeping teeth clean. It refers to the jaws, lips, gums, teeth, tongue, and glands that make saliva. As you age, you become more prone to certain oral health problems. Oral health is important to discuss with both your dentist and primary health care professional (physician, nurse practitioner, physician assistant).

What Are Common Oral Health Problems for Older Adults?

- Gum disease (periodontitis) occurs when tartar builds up and contributes to infections deep in your gums. This can lead to loss of tissue, bone, and teeth. It can also increase your risk for other serious health problems, like diabetes, heart attack, or stroke.
- Tooth decay
- Mouth and throat cancers
- Dry mouth, which can be caused by medicines for high blood pressure, depression, or other health problems

What Are the Warning Signs of Oral Health Problems?

- Red, swollen, or tender gums or other pain in your mouth or teeth
- Bleeding while brushing, flossing, or eating
- Loose or separating teeth
- Dry mouth
- Sores in your mouth
- Lasting bad breath
- A change in the way your teeth or dentures fit together when you bite
- A lump or thickening inside the mouth
- A sore throat or a feeling that something is caught in the throat that doesn't go away
- Trouble chewing, swallowing, or moving certain parts of your mouth

How Are These Problems Treated?

- Gum disease can be treated by removing all plaque and tartar buildup from your teeth and gums through a deep cleaning. If gum disease is more serious, surgery may be needed.
- Certain medicines may be used, including prescription mouthwash, gel, or oral antibiotics for infections.
- Medicines that cause dry mouth may be changed. Special mouthwashes and sugarless candies or gum may also help with dry mouth.
- Oral and throat cancers may require different types of treatment, including surgery, radiation, or chemotherapy.

OHNEP | ACP American College of Physicians

National *Interprofessional Initiative* on Oral Health

National *Interprofessional Initiative* on Oral Health — *engaging clinicians eradicating dental disease*

Available at: https://nursing.nyu.edu/w/ohnep/practice

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100 Million Mouths Campaign

Creating Oral Health Champions to Reach One Hundred Million Mouths and Advance Oral Health Equity

August 29, 2022

Primary care providers including pediatricians, internists, and family doctors as well as nurse practitioners and physician assistants serve on the front lines of health care. They are often the first to notice oral health conditions when treating other health issues. Creating a network of health care allies who can train their peers and advocate for oral health is the idea behind the One Hundred Million Mouths Campaign (100 MMC)—an initiative originally funded by Health Resources and Service Administration (HRSA) and now funded by CareQuest Institute for Oral Health, led by Harvard School of Dental Medicine faculty and other collaborators from the Center for Integration of Primary Care and Oral Health (CIPCOH).

Learn more at https://cipcoh.hsdm.harvard.edu/home

Oral Health Nursing Education and Practice Program (OHNEP)
New York University Rory Meyers College of Nursing
433 First Avenue, New York, NY 10010
ohnep.org

OHNEP Oral Health Case Study Resource Kit

Judith Haber, PhD, APRN, FAAN

Erin Hartnett, DNP, PPCNP-BC, CPNP, FAAN

Jessamin Cipollina, MA

OrALL in the FAMILY

Oral health has a significant impact on the overall health and well-being of individuals across their lifespan. The Oral Health Across the Lifespan Module was created and funded by the Oral Health Nursing Education & Practice (OHNEP) program and the National Interprofessional Initiative on Oral Health (NIIOH).

You are the RN in the OB clinic.
Ms. Jones is 24 weeks pregnant and tells you that her gums have been bleeding and she has a "lump" above one of her teeth. She is on Medicaid and does not have a dental home. During your HEENOT exam you notice that Ms. Jones gums look red and swollen and there is a 1 cm. raised red nodule on the gum above the right lateral incisor. You want to give her the correct information on what she is experiencing.

- ***eResource***: Download and install *Smiles for Life (SFL)* app on your mobile phone
  - SFL Oral Health App (www.smilesforlifeoralhealth.org/apps.html)
- In the SFL app, select **Diagnostic Modules** and then select **Prenatal**
- Answer the 2 questions under **Prenatal**
- Follow the app as you answer the questions for Ms. Jones
  - Is she having any problems with her mouth?
  - What do you recommended for her bleeding gums
- Find the photo of the **Soft Tissue Enlargement**
  - What is this called?
  - What do you recommended Ms. Jones do for this?
  - Does Medicaid cover dental care for pregnant women in your state?

You are the RN in the Postpartum Clinic.
Ms. Jones returns for her 6 week postpartum check–up. She says her gums no longer bleed, but the lump in her mouth has gotten larger and interferes with chewing. During your HEENOT exam you notice that the 1 cm. raised red nodule on the gum above the right lateral incisor is now is now extending to the posterior aspect of the gum behind the tooth.

- Return to the photo of the **Soft Tissue Enlargement** on the SFL app.
  - What are your recommendations for her?
  - Does Medicaid cover dental care at 6 weeks postpartum?

You are the RN in the Well-Child Clinic.

Newborn
Ms. Jones brings her baby Eliza to the clinic for her 1 week newborn check-up. She is breastfeeding well.

OHNEP COVID-19: OrAll in the Family
Case Study

COVID-19 risk increases for individuals, families and communities disproportionately affected by chronic diseases and the social determinants of health. These same populations are at higher risk for oral disease. Common risk factors include obesity, poverty, stress, poor diet, alcohol and tobacco use, substance misuse, mental health issues and domestic violence. Many of these factors have been heightened during the pandemic. These and other social determinants of health contribute increased risk of COVID-19, exacerbation of chronic disease and poor oral health.

◊ **The Collins family is a multi-generational African-American family living in the Bronx.**
◊ The family wanted to gather for Grandma Collins' 90th birthday. She resides in assisted living and is fully vaccinated. The Collins family discussed how to gather as safely as possible.
◊ Grandma and Carla are fully vaccinated. Joe is reluctant to get the vaccine even though he is qualified for it. Laurette, Mike and their children Tanisha and Troy are not. **What would you consider their risk level for COVID-19 for having an indoor family dinner?**

Collins Family Members
✓ **Grandma Collins, age 90** – mother of **Carla** and **Joe**
✓ **Carla, age 68** – daughter of Grandma Collins; widow; mother of **Laurette**
✓ **Joe, age 69** – son of **Grandma Collins**; single
✓ **Laurette, age 42** and **Mike, age 44** - parents to **Tanisha, age 13** and **Troy, age 5**

Grandma Collins has mild dementia, has poor oral health, and requires assistance for all activities of daily living (ADL) including oral hygiene.

Read: *Edahiro, A., Okamura, T., Motohashi, Y., Takahashi, C., Sugiyama, M., Miyamae, F. … & Awata, S. (2020). Oral health as an opportunity to support isolated people with dementia: useful information during coronavirus disease 2019 pandemic. Psychogeriatrics, 21(1), 140-141. doi: 10.1111/psyg.12621.*

Available at: https://nursing.nyu.edu/w/ohnep/case-studies

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References

American Academy of Nurse Practitioners. (2022). NP Fact Sheet. Retrieved from: https://www.aanp.org/about/all-about-nps/np-fact-sheet

American Association of Colleges of Nursing. (2021). The Essentials: Core Competencies for Professional Nursing Education. Retrieved from https://www.aacnnursing.org/Portals/42/AcademicNursing/pdf/Essentials-2021.pdf

American College of Nurse-Midwives (ACNM). (2019) Midwives & birth in the United States. Accessed December 21, 2020. https://www.midwife.org/acnm/files/cclibraryfiles/filename/000000007531/EssentialFactsAboutMidwives-UPDATED.pdf.

Acharya A, Powell V, Torres-Urquidy MH, et al. Integration of Medical and Dental Care and Patient Data. 2nd ed. 2019. doi: 0.1007/978-3-319-98298-4

American Dental Association. (2020a). Supply and Profile of Dentists. Retrieved from https://www.ada.org/en/science-research/health-policy-institute/data-center/supply-and-profile-of-dentists.

American Dental Hygienists Association. ADHA Fact Sheet. Accessed February 1, 2021. https://www.adha.org/resources-docs/72210_Oral_Health_Fast_Facts_&_Stats.pdf.

Baker DL, Giuliano KK. Prevention practices for nonventilator hospital-acquired pneumonia: A survey of the Society for Healthcare Epidemiology of America Research Network. Infect Control Hosp Epidemiol. 2021;1-2.

Burgette J…. Joskow RW, Chalmers NI. Advancing oral health policy through persuasive messaging and effective research measures. J Public Health Dent 2021 Dec 81(1).

CareQuest Institute. The Connection Between Oral Health and Mental Health. Accessed Ma4 24, 2022. https://www.carequest.org/resource-library/connection-between-oral-health-and-mental-health

Carey E… Munro S. Non-ventilator associated hospital acquired pneumonia incidence and health outcomes among U.S. Veterans from 2016-2020. AJIC 2021.

Carr JR, Jones BE,et al. Deploying an electronic clinical decision support tool for diagnosis and treatment of pneumonia into rural and critical access hospitals: Utilization, effect on processes of care, and clinician satisfaction.J Rural Health. 2022;38(1):262-269.

Carrizales-Sepúlveda EF, Ordaz-Farías A, Vera-Pineda R, Flores-Ramírez R. Periodontal Disease, Systemic Inflammation and the Risk of Cardiovascular Disease. Heart Lung Circ. 2018 Nov;27(11):1327-1334. doi: 10.1016/j.hlc.2018.05.102. Epub 2018 Jun 2. PMID: 29903685.

Centers for Disease Control and Prevention. Mental Health, Substance Use and Suicidal Ideation During the COVID-19 Pandemic. August 14, 2020. MMWR Morb Mortal Wkly Rep 2020;69:1049–1057. DOI: http://dx.doi.org/10.15585/mmwr.mm6932a1external icon. Accessed May 24, 2022. https://www.cdc.gov/mmwr/volumes/69/wr/mm6932a1.htm

Centers for Disease Control and Prevention. (2019). Ambulatory Care Use and Physician office visits. Retrieved from https://www.cdc.gov/nchs/fastats/physician-visits.htm.

Centers for Disease Control and Prevention. (2020). Oral and Dental Health. Retrieved from https://www.cdc.gov/nchs/fastats/dental.htm.

Clark M.B, Douglass A.B., Maier R., Deutchman, M., Douglass, J.M., Gonsalves, W., Silk, H., Tysinger, J.W., Wrightson, A.S., Quinonez, R. (2020). Smiles for Life: A National Oral Health Curriculum. 4th Edition. Society of Teachers and Family Medicine. Available on Smilesforlifeoralhealth.org

Dela Cruz CS…Jones BE, et al. Understanding the host in the management of pneumonia. An official American Thoracic Society workshop report.Ann Am Thorac Soc. 2021;18(7):1087-1097.

Fiorillo L. Oral Health: The First Step to Well-Being. *Medicina*. 2019; 55(10):676. https://doi.org/10.3390/medicina55100676

Giuliano K.,…Baker D. Oral care as prevention for nonventilator hospital-acquired pneumonia: A four-unit cluster randomized study. AJN 2021;121(6), 24-33.

Giuliano, K., Penoyer, S., Middleton, A., Baker, D. Original Research: Oral Care as Prevention for Nonventilator Hospital-Acquired Pneumonia: A Four-Unit Cluster Randomized Study. AJN, American Journal of Nursing: June 2021 - Volume 121 - Issue 6 - p 24-33 doi: 10.1097/01.NAJ.0000753468.99321.93

Haber, J., Hartnett E., Hallas D., Dorsen, C., Lange-Kessler J., Lloyd, M., Thomas E., Wholihan D. (2015). Putting the Mouth Back in the Head: HEENT to HEENOT. American Journal of Public Health. March 2015, Vol. 105, No. 3, pp. 437-441.

Hummel J, Phillips KE, Holt B, H. C. (2015). Oral Health: An Essential Component of Primary Care. Qualis Health. Retrieved from http://www.safetynetmedicalhome.org/sites/default/files/White-Paper-Oral-Health-Primary-Care.pdf

References

Molayem, S. Dentists and doctors need to play on the same team. Nature Outlook. Published October 27, 2021. At https://www.nature.com/articles/d41586-021-02919-3.

Munro S,…Lucatorto M, Hehr A, Ochylski S. Implementing oral care as a nursing intervention to reduce hospital acquired pneumonia across the VA Healthcare System. Comput Inform Nurs 2021;10.1097/CIN.0000000000000808

Munro S, Baker D, Giuliano K, Sullivan SC, Haber J, Jones B, Crist M, Nelson RE, Carey E, Lounsbury O, Lucatorto M, Miller R,Pauley B, Klompas M. Non-ventilator hospital-acquired pneumonia: A call to action. Recommendations from the national organization to prevent hospital acquired pneumonia among non-ventilated patients. ICHE 2021, June 9.

Munro S, Baker D. Integrating oral health care into patient management to prevent hospital-acquired pneumonia: a team approach. Journal of the Michigan Dental Association, 2019. https://www.michigandental.org/Portals/pro/Journals/July%202019/html5/index.html?page=1&noflash

National Alliance on Mental Illness. Mental Health by the Numbers. Accessed May 24, 2022. https://www.nami.org/mhstats

National Council for Mental Wellbeing. Oral Health, Mental Health and Substance Use Treatment: A Framework for Increased Coordination and Integration. Accessed May 24, 2022. https://www.thenationalcouncil.org/wp-content/uploads/2021/09/NC_CoE_OralhealthMentalHealthSubstanceUseChallenges_Toolkit.pdf?daf=375ateTbd56

Shimpi, N., Dart, R., Umukoro, P., Acharya, A. (2019). Interdisciplinary Care Model: Cardiovascular Diseases and Oral Health. In: Acharya, A., Powell, V., Torres-Urquidy, M., Posteraro, R.,

Stevenson LD, et al. (2022). A mixed-methods evaluation of the national implementation of the Hospital-Acquired Pneumonia Prevention by Engaging Nurses (HAPPEN) initiative. Infection Control & Hospital Epidemiology, https://doi.org/10.1017/ice.2022.99.

Thyvalikakath, T. (eds) Integration of Medical and Dental Care and Patient Data. Health Informatics. Springer, Cham. https://doi.org/10.1007/978-3-319-98298-4_6

World Health Organization. COVID-19 pandemic triggers 25% increase in prevalence of anxiety and depression worldwide. March 2, 2022. Accessed May 24, 2022. https://www.who.int/news/item/02-03-2022-covid-19-pandemic-triggers-25-increase-in-prevalence-of-anxiety-and-depression-worldwide