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Delaware Journal of Public Health

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COVER

According to www.healthypeople.gov oral health is essential to overall health. Good oral health improves a person's ability to speak, smile, smell, taste, touch, chew, swallow, and make facial expressions to show feelings and emotions. However, oral diseases, from cavities to oral cancer, cause significant pain and disability for many Americans.

The Delaware Journal of Public Health (DJPH), first published in 2015, is the official journal of the Delaware Academy of Medicine / Delaware Public Health Association (Academy/DPHA). **Submissions:** Contributions of original unpublished research, social science analysis, scholarly essays, critical commentaries, departments, and letters to the editor are welcome. Questions? Write chealy@delamed.org or call Liz Healy at 302-733-3989. **Advertising:** Please write to chealy@delamed.org or call 302-733-3989 for other advertising opportunities. Ask about special exhibit packages and sponsorships. Acceptance of advertising by the Journal does not imply endorsement of products. Copyright © 2018 by the Delaware Academy of Medicine / Delaware Public Health Association. Opinions expressed by authors of articles summarized, quoted, or published in full in this journal represent only the opinions of the authors and do not necessarily reflect the official policy of the Delaware Public Health Association or the institution

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Thursday January 11, 2018

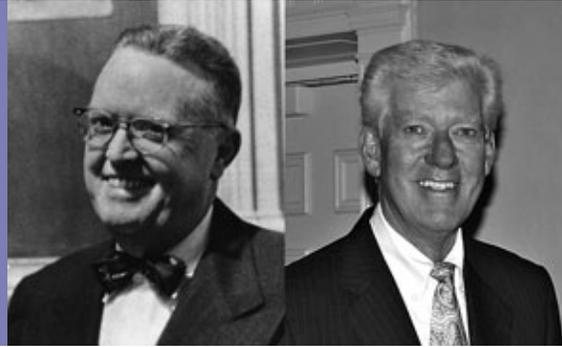
6:00 PM to 8:00 PM EST

John H. Ammon Medical Education Center

Christiana Hospital

Newark, Delaware

Register online at www.delamed.org



Frank M. and Robert R. Hoopes Medical/Dental Lecture 2018 Temporomandibular Joint (TMJ) Facts and Foibles

This year's keynote speaker is Louis G. Mercuri, D.D.S., M.S. Dr. Mercuri is a Cum Laude graduate of Georgetown University School of Dentistry, Washington, DC. He received his Certification and Master of Science degree in Oral and Maxillofacial Surgery from the University of Illinois, Chicago.

There is no cost to attend this educational activity which is underwritten by the F.M. and R.R. Hoopes Lecture Fund.

Registration will begin at 6:00 pm, followed by a reception with beer, wine, soft drinks, and hors d'oeuvres until 6:45 pm. Daniel Meara, MD, DMD and Timothy Gibbs, MPH, NPMc will open the lecture and introduce Dr. Mercuri, who will speak until 8:00 pm.

About the Fund which supports this lecture...

When Rob's father and dental partner Frank Hoopes died in 1976' Rob's mother Edna, his family, and donors of gifts for "Dr. Frank," established this lecture fund to provide honoraria for expert speakers to provide continuing dental education in Delaware. While the lectures have been open to the public, actively practicing dentists and physicians are the target audience. Frank Hoopes was ahead of his time in recognizing this need; he was especially interested in medical-dental collaboration.

During his retirement, Rob was engaged in updating the lecture program. The funds are now managed by the Delaware Community Foundation who send an annual donation to the Delaware Academy of Medicine who work with the Delaware State Dental Society to design and present the Annual Hoopes Lecture.

IN THIS ISSUE

This issue of the Journal focuses on Oral Health – a discipline far broader than the dentistry most think of then they hear the term. According to the National Institute of Dental and Craniofacial Research:

“Oral health means more than healthy teeth and the absence of disease. It involves the ability of individuals to carry out essential functions such as eating and speaking as well as to contribute fully to society.”

<https://www.nidcr.nih.gov/DataStatistics/SurgeonGeneral/sgr/part1.htm>

The mouth and adjacent areas (the craniofacial complex) can be a window to overall health, as well as the location where more systemic inflammation can begin in the form of manageable gingivitis and evolving to periodontitis. Periodontal disease is associated with poor oral health and has been linked to many serious medical conditions, including:

- Cardiovascular Disease
- Pre-term Labor
- Low-birth Weight
- Breast Cancer
- Pancreatic Disease
- Diabetes

The Mayo Clinic lists a variety of risk factors that can contribute or increase risk of periodontitis including:

- Gingivitis
 - Poor oral health habits
 - Smoking or chewing tobacco
 - Older age
 - Hormonal changes, such as those related to pregnancy or menopause
 - Substance abuse
 - Obesity
 - Inadequate nutrition, including vitamin C deficiency
 - Genetics
 - Certain medications that cause dry mouth or gum changes
 - Conditions that cause decreased immunity, such as leukemia, HIV/AIDS and cancer treatment
 - Certain diseases, such as diabetes, rheumatoid arthritis and Crohn’s disease
- <https://www.mayoclinic.org/diseases-conditions/periodontitis/symptoms-causes/syc-20354473>

Just as any other health issue, oral health is impacted by the social determinants of health, access to care, and oral health literacy. Ultimately, oral health is at the core of dentistry, which is integral to systemic health, and the American Dental Association (ADA) definition highlights the broad scope of Dentistry:

The evaluation, diagnosis, prevention and/or treatment (nonsurgical, surgical or related procedures) of diseases, disorders and/or conditions of the oral cavity, maxillofacial area and/or the adjacent and associated structures and their impact on the human body.

As a result of the essential dental-medical connection, the Delaware Academy of Medicine and the Delaware State Dental Society come together on an annual basis to explore this intersection of disciplines through the Frank M. and Robert R. Hoopes Medical/Dental Lecture held in January of each year. This year, we are pleased to have Louis G. Mercuri, D.D.S., M.S. presenting on “Temporomandibular Joint (TMJ) Facts and Foibles.”

We are especially pleased to have Delaware Academy of Medicine president, Daniel J. Meara, M.D., D.M.D. as the guest editor for this issue of the Journal.

We hope you enjoy this issue of the Journal, and welcome your feedback and comments



Omar A. Khan, M.D., M.H.S.
President Elect



Timothy E. Gibbs, M.P.H.
Executive Director

Guest Editor

Oral Health according to the World Health Organization (WHO) is:

“a state of being free from mouth and facial pain, oral and throat cancer, oral infection and sores, periodontal disease, tooth decay, tooth loss, and other diseases and disorders that limit an individuals capacity in biting, chewing, smiling, speaking and psychosocial wellbeing”

It is clear from the WHO definition, that oral health is intimately linked to overall health and quality of life. Despite that fact, oral health is a microcosm of what ails modern healthcare: challenges with access to care, prevention, and evidence-based safe and quality care. That being said, much good work is being done and this Delaware Journal of Public Health edition will highlight current areas of success while also pointing out areas of opportunity, for the future, to improve oral health in America and beyond. Specifically, Dr. Omar Khan and Executive Director Tim Gibbs introduce the concept of oral health within the discipline of Dentistry; Dr. Jeff Cole talks about the future of Oral Health in America; Medical Society of Delaware President, Dr. Prayus Tailor, discusses the importance of medicine and dentistry working together; Drs. Joseph Napoli and Linda Vallino review modern day cleft lip and palate care; Dr. Lou Rafetto and Ms. Alexandra Rafetto look at office-based anesthesia delivery in the outpatient dental setting; Delaware Public Health Dental Director, Dr. Nick Conte pushes providers to think differently around pain management strategies in oral healthcare; Dr. Joseph Alpert, in a reprint, provides an editorial emphasizing the importance of the link between oral health and systemic health; Dr. Etern Park provides and update on oral cancer and the human papilloma virus (HPV) connection; Delaware State Dental Society President, Dr. Rachel Maher, stresses the need to improve education and community outreach around oral health and dental disease; and, lastly, I add a piece about oral health being essential to achieving health of a population.

I expect that that you will enjoy this edition of the journal and I hope that it will be engaging and enlightening and that, possibly, you will be emboldened to participate in the prioritization of oral health as an essential part of the redesign of American healthcare.



Daniel J. Meara, M.D., D.M.D., M.S., F.A.C.S.

Improving Access to Dental Care for Delawareans with Disabilities

SPECIAL INTEREST FOR THE ENTIRE DENTAL TEAM

Learn about the dental care challenges faced by Delawareans with disabilities and the dental staff who treat them. This program provides training to overcome these challenges, helping to open your practice to a wider patient base.

Wednesday, January 17, 2018

8:00 a.m. - 4:30 p.m.

6 CE Credits

**Hilton Wilmington/Christiana Hotel
Newark, Delaware**

Deadline to register: January 8, 2018

This training is offered **FREE OF CHARGE** to participants.

Continental breakfast and lunch will be provided.

Oral Health Needs of Delawareans with Disabilities

Louise McCarthy, RDH, CDA, MSM

This session shares the findings from a Delaware dental care survey of adults with disabilities and parents of individuals with disabilities, as well as information about the oral health disparities experienced by Delawareans with disabilities. Compelling first-person accounts bring to light oral health and dental care issues frequently faced by individuals with disabilities and their parents/caregivers. This session will address accessibility and accommodations, dental care access, effective communication, step-by-step individualized approaches, and suggestions for improving your practice for people with disabilities.

Learning Objectives:

- Identify primary findings of the Dental Care Survey of People With Disabilities.
- Identify oral health disparities for Delawareans with disabilities.
- Increase understanding and knowledge of dental care access issues experienced by Delawareans with disabilities.
- Increase understanding and knowledge of the oral health needs of Delawareans with disabilities.

The Dental Patient with Special Needs: Patient Assessment and Planning for Dental Care

Evan Spivack, D.D.S., F.A.G.D.

Dentists are trained as physicians of the mouth, and are critical and respected members of the health care team. They have the knowledge and skills to care for patients with developmental and other disabilities, yet must ask themselves the important question: "Is this particular patient one that I can treat safely and effectively in my office?" For the most part, the answer is a resounding "Yes!" This segment will provide you with the tools to effectively assess patients with complex presentations and guide you toward providing for their dental needs. Dr. Spivack will address the importance of eliciting a thorough medical, behavioral and social history and how this contributes to developing a care plan and providing chairside treatment. This segment also provides an overview of dental and craniofacial findings and discusses these findings in the context of the individual patient with a disability.

Learning Objectives

- Elicit a thorough medical history from patients with complex needs.
- Recognize oral and dental manifestations often seen in persons with common developmental disabilities.
- Recognize various modifications in office routines that can help in the dental care of people with a variety of disabilities.
- Understand the role of interprofessional collaboration in the care of people with disabilities.

Preparing Effectively for Treating Patients with Disabilities in Your Practice

Louise McCarthy, RDH, CDA, MSM

Dental professionals are trained to provide the best dental treatment possible to meet our patients' needs, yet we sometimes have trepidations about treating a patient whose needs are new to us. That doesn't mean we are not capable or competent to treat these patients; it just means we do not feel prepared. This segment will provide you with the tools to prepare effectively for treating patients with disabilities and relieve that trepidation for both you and your patients. Ms. McCarthy will offer suggestions and strategies about the important steps to take prior to the visit that will help make the visit easier and more productive for both dental professionals and the patient.

Learning Objectives

- Understand the steps an office can take to best prepare for patients with a disability.
- Identify challenges a disability may present for dental treatment.
- Recognize the implications and importance of guardianship.
- Identify needed adjustments in the office and the operator for a patient with a disability.

Disability Awareness and Sensitivity

Cory Nourie, MSS, MLSP

Most of us have experience interacting with people with disabilities, either personally or professionally. We use those experiences to inform how we respond to and care for patients with disabilities in our practices. Together we will explore the diversity of disability and discuss practical strategies you can implement immediately to make your practice and office more accessible, accommodating, and welcoming to patients with disabilities. This segment features several engaging activities, including guest speakers with disabilities sharing their stories.

Learning Objectives

- List several stereotypes that exist about people with disabilities.
- Demonstrate how to refer to people with disabilities.
- Explain strategies to more effectively communicate with patients with disabilities.

ABOUT THE PRESENTERS



Louise McCarthy
RDH, CDA, MSM

Louise McCarthy, RDH, CDA, brings over 35 years of experience to the dental profession. She has an undergraduate degree in Public Health and a graduate degree in Science of Management. She is dedicated to improving dental care for individuals

with intellectual and developmental disabilities (IDD). Louise served 20 years as a program hygienist for Southern New Jersey with Dental Lifeline Network providing screening, prevention, education, and treatment services for over 600 patients throughout five counties. She is also an award-winning dental public health instructor for the Dental Hygiene Program at Camden County College. She has lectured extensively to dental professionals and caregivers on the importance of proper dental care for individuals with disabilities. She continues to advocate for individuals with IDD in her current capacity as Development Specialist for The Arc Gloucester in New Jersey.



Evan Spivack
D.D.S., F.A.G.D.

Evan Spivack, DDS, is a graduate of the Baltimore College of Dental Surgery-University of Maryland. He completed a general practice residency at St. Barnabas (Bronx, NY) and served as senior fellow in special care dentistry at Helen Hayes Hospital (W.

Haverstraw, NY). A general dentist leading the Special Care Treatment Center at the Rutgers School of Dental Medicine, Dr. Spivack is a professor of pediatric dentistry and has been involved in the education of dental students, dentists and dental team members for over 20 years. He has been active in the care of persons with physical, cognitive and medical disabilities in academic, institutional and private practice settings and currently provides care to patients in the Center and operating room settings. He is past president and editor of the New Jersey Academy of General Dentistry (NJAGD), a fellow of the AGO and is actively involved with the American Academy of Developmental Medicine and Dentistry (AADMD). He has published and lectured extensively on issues in special care dentistry throughout his career, and is proud to have been named the 2015 Arc of New Jersey health care professional of the year.



Cory Nourie
MSS, MLSP

Cory Nourie, MSS, MLSP is the Patient Transition Social Work Coordinator for the Nemours Alfred I. duPont Hospital for Children. Ms. Nourie is responsible for supporting young adults with disabilities and special health care needs as they move from

pediatric to adult-oriented care. She is a frequent speaker at conferences and workshops for health care providers, young adults and caregivers. She started her career providing direct support to individuals living in group homes in Delaware. She has also directed programs at the University of Delaware's Center for Disabilities Studies (CDS) focusing on inclusion, self-advocacy and disability history. Her work is published in several books and journals. She earned dual master's degrees in Social Service and Law and Social Policy from Bryn Mawr College.



Don't forget!
Registration for this
free event ends
January 8, 2018.

REGISTER HERE!

Questions? Contact Jane Donovan
at janedono@udel.edu

Funding is provided by the Delaware Division of Public Health Bureau of Oral Health and Dental Services with support from the U.S. Health Resources & Services Administration (Grant No. T12HP28874) and in collaboration with the Center for Disabilities Studies, University of Delaware.

Improving Access to Dental Care for Delawareans with Disabilities

SPECIAL INTEREST FOR THE ENTIRE DENTAL TEAM

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Wednesday, February 7, 2018

8:00 a.m. - 3:00 p.m.

5 CE Credits

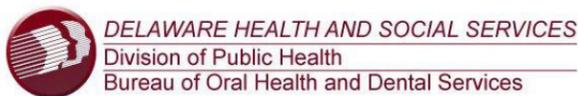
Dentsply Sirona
38 West Clarke Ave.
Milford, Delaware

Deadline to register: January 29, 2018

This training is offered **FREE OF CHARGE** to participants.

Continental breakfast and lunch will be provided. **Register early. Space is limited to 25 seats.**

Dentsply Sirona, manufacturer of dental equipment and supplies, is providing the refreshments and an hour-long tour of their facilities. CLOSED TOE shoes and photo ID are required. There are no exceptions.



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Questions? Contact Jane Donovan
at janedono@udel.edu

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A Dental Visit Might Save a Patient's Life

Dentist

Jeffrey M. Cole, D.D.S.

Registered nurse Sandy Wexler never imagined that a routine visit to her dentist for a cleaning might save her life.

That's what happened in July 2012 when her dentist noticed an enlarged lymph node on the right side of her neck and recommended that she make an appointment with an ear, nose and throat specialist to have it checked out. The specialist diagnosed Sandy with metastatic squamous cell oropharyngeal cancer, and she began treatment immediately.

After six weeks of radiation and seven weeks of chemotherapy, Sandy is cancer-free. She credits the dentist that performed the exam with saving her life.

Sandy's story exemplifies a health care system that is successfully working to diagnose and treat patients. Sandy visited her dentist, her dentist made a referral to another specialist, and Sandy received the treatment that she needed.

Every year, though, as public health officials know all too well, millions of patients fall through the cracks and live with dental disease or other illnesses that go undiagnosed or untreated.

Tooth decay is the number one chronic infectious disease among children in the U.S. About one in five children between the ages of 5 and 11 have at least one

untreated decayed tooth, according to the CDC.¹ As a result, public health programs that aim to improve the overall health of the population are incomplete if they do not include components aimed at improving the oral health of the population.

Millions of Americans suffer from untreated dental disease, not just kids. Nationwide, about half of the population over 30 years old suffer from some form of gum disease, according to the CDC.² In Delaware, where I practice dentistry, one in five low income adults say their mouth and teeth are in poor condition and three in 10 Delaware adults avoid smiling due to the condition of their mouth and teeth.³

Moreover, only 61 percent of adults in Delaware reported visiting a dentist in the past 12 months, according to a 2013 survey, compared to 59 percent nationally,⁴ despite the fact that 98 percent of publicly insured children live within 15 minutes of a Medicaid dentist and only one percent of the population lives in an area with no dentist within a 15-minute travel time.⁵



In addition, many adults with dental benefit plans don't regularly see a dentist. More than one in three adults ages 19 to 64 with private dental benefits do not use them.⁶

When I look toward the future of oral health in the U.S., any steps we take toward improving health must be based on this simple principle: healthy teeth and gums aren't a luxury. They're essential.

All Americans can achieve good oral health, and public health professionals can help make this vision a reality. The best way to ensure positive patient outcomes, while also managing the costs associated with dental health, is to ensure that every American has access to a dental home that not only treats issues as they arise, but more importantly provide preventive services and education to reduce the need for complex dental treatment.

As a nation, we've seen so much progress in addressing the oral health needs of underserved populations. Since 2000, the number of children in the U.S. without dental benefits has been cut in half. That's great news, but we can't continue to make progress unless we work together—health care providers, government, educators and industry.

There has never been a more critical time in health care than right now, and that's why as health care continues to evolve, health care providers interested in improving oral health in the community should focus their efforts in three distinct areas.

First, we have to focus on providing care now to people who are suffering from untreated disease.

Each year millions of patients in need of dental care either don't receive it, or they receive care from medical professionals who are not dentists.

For example, many people without dental coverage don't seek treatment until their pain grows so severe that it sends them to a hospital emergency department (ED), where both the staff and equipment are often not able to treat complex dental conditions. The American Dental Association is working with hospitals, and also with the American College of Emergency Physicians, to get patients out of the ED and into dental chairs, the right place for treatment. ED referral programs now exist in all states with new programs being continually developed.

Efforts are also underway to advocate for increased dental health protections under Medicaid, to expand the number of communities that fluoridate their community water supplies, to provide charitable outreach, to facilitate connections between dentists and Federally Qualified Health Centers, and to collaborate with other health professionals and organizations to help people understand that good oral health is a crucial part of good overall health.

The aim of these programs is to connect patients in need of dental care with dentists. Public health professionals who encounter these patients can facilitate these connections.

Second, we have to strengthen and expand the public/private safety net to provide more care to more people.

In its landmark report *Oral Health in America*, the U.S. Surgeon General noted that “the public health infrastructure for oral health is insufficient to address the needs of disadvantaged groups and integration of oral health and general health programs is lacking.”

Strengthening and expanding the public/private safety net requires a multifaceted approach. This includes facilitating connections between private-practice dentists and Federally Qualified Health Centers. By partnering, private dentists can help community health centers expand their capacity to provide care to under-served populations without increasing the clinics' “bricks and mortar” expenses and staffing overhead. Patients benefit because quality care is quickly and efficiently delivered, and access to dental specialty services can be increased, thereby improving the Quality Assurance footprint of the health center.

In addition, we have to continue to fight for increased dental health protections and simplified administration under Medicaid. Getting dental providers efficiently credentialed in the Medicaid program so they can quickly begin to treat patients (instead of waiting months for paperwork to be processed) is a priority for the ADA.

Third, we have to focus on disease prevention and dental health education.

Better collaboration among dental and medical professionals can be a means to ensure all Americans understand that their dental health is a crucial part of

overall health. For example, more than ever, dentists work with other medical providers as they treat patients with diabetes, a condition that can increase the risk of dental disease.

Physicians, nurses, educators and others can dramatically increase the number of patients and caregivers who receive basic dental health education. These professionals can also be trained to recognize conditions needing comprehensive diagnosis and possible treatment by a dentist.

At the national level the American Dental Association is working to advance the role of Community Dental Health Coordinators (CDHCs), which are specially trained members of the dental team. These dental professionals acquire a community health worker skillset and can reach people who typically don't receive dental care for a variety of reasons. These reasons include poverty, geography, language, culture, and a lack of understanding of the importance of oral hygiene and regular dental visits. They work in communities across the country to increase oral health awareness and to connect individuals to regular dental care within established dental homes. CDHC training is available in all 50 states, including Delaware. In fact, there are two Delaware individuals currently engaged in CDHC training.



Dr. Jeffrey M. Cole is the President-elect of the American Dental Association (ADA). Prior to that he served as the Fourth District Trustee and served as chairman of the Budget and Finance, and Strategic Planning Committees. He served as liaison to the ADA Council on Membership and Council on Annual Sessions. As a Board member, he also served; as liaison to the American Dental Political Action Committee (ADPAC) and the American Student Dental Association (ASDA) Boards, and on a workgroup that produced in-house video production studio at the ADA. Dr. Cole chaired a Board workgroup to investigate student loan management and refinancing options for the Association resulting in the ADA student loan refinancing program, introduced in 2015. Dr. Cole was a member of the Board of Directors of the ADA Business Enterprises, Incorporated (ADABEI), a wholly owned for-profit subsidiary of the ADA.

Dr. Cole served as ADA delegate or alternate for ten years. He was a member of the ADA Council on Dental Practice, chairing the economics subcommittee. He is a past president of the Delaware State Dental Society (DSDS), where he was a member of its executive committee for seven years. Dr. Cole received the DSDS Distinguished Service Award in 2015. Dr. Cole is a past president of the Academy of General Dentistry (AGD), serving as president from 2012-2013. He served as AGD treasurer, and previous to that was an AGD trustee and regional director. Dr. Cole received the AGD Dr. Mark S. Ritz Advocacy Award in 2016. This award recognized Dr. Cole's commitment to Advocacy for the profession, focused on students and new dentists in his active support for student debt relief.

Dr. Cole received his BS degree from Villanova University, and is a graduate of Georgetown University School of Dentistry. Dr. Cole completed a General Practice Residency at the Medical Center of Delaware (Christiana Care) before entering private practice. He earned his MBA from the Fox School of Business and Management of Temple University. Dr. Cole has attained Fellowship in the Academy of General Dentistry (AGD), the Academy of Dentistry International (ADI), the American College of Dentists (ACD), and the International College of Dentists (ICD).

Dr. Cole and his wife, Linda, reside in Wilmington, Del. where he maintains a solo private practice.

You're vital to improving oral health in the U.S.

Most dental disease is preventable. Together we can dramatically reduce dental disease in this country and set patients on a path to a lifetime of good oral health.

There has never been a more critical time in health care than right now. The ADA remains confident in our comprehensive agenda to improve the oral health of the public and bring more care to more patients. I ask you to join me in strengthening your commitment to these solutions.

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Dental Disease: Education and Outreach Will Help to Eliminate Disease in Delaware and Beyond



Rachel Maher, D.M.D.

INTRODUCTION

The first-ever Surgeon General's Report on Oral Health released in 2000 stated unequivocally that "oral health is integral to general health."¹ The report revealed in persuasive detail how the mouth reflects well-being. Associations between chronic oral infections and prominent health problems – namely, cardiovascular disease, diabetes, stroke, certain cancers, Alzheimer's disease, rheumatoid arthritis, low birth weight, and failure to thrive in infants and young children – are well documented. In adults, the strong correlation between several oral diseases and noncommunicable chronic diseases is primarily a result of common risk factors related to lifestyle (e.g., dietary habits, tobacco and alcohol use, and lack of exercise.)²

Major advances in preventive measures, such as the use of fluoride during the last half of the 20th century, and the treatment of dental disease have demonstrated that significant progress in oral health can be realized through a combination of individual, community and professional collaboration. Despite these achievements, the Surgeon General's report strongly warned that there was "still much work to be done," especially in addressing the disparities that affect those who are least able to access the available resources to achieve optimal oral health.³

Indeed, many Americans have not experienced improvement in oral health. This adverse situation is attributable to a multitude of factors including, but not limited to: knowledge deficits related to oral health maintenance and disease prevention, socioeconomic factors, and complex health problems. People who

fall within these categories often experience a disproportionate level of oral health complications.

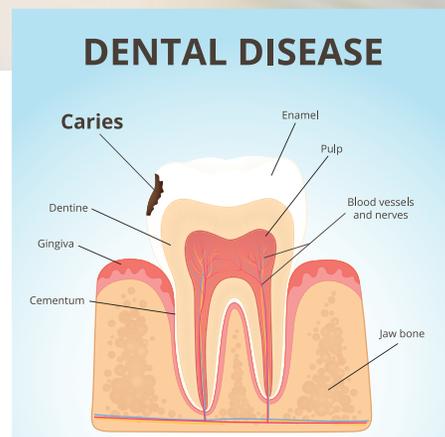
Furthermore, this issue has taken on increasing international significance. The two leading oral afflictions worldwide – dental caries (tooth decay) and periodontal (gum) disease – are still major oral health problems in most industrialized nations.

Seventeen years after the Surgeon General's report, the iconic label used to describe dental disease – "a silent epidemic" – is more real than ever. The United States continues to struggle with adequate access to and utilization of dental services.⁴ These are profound and consequential concerns for the oral health of our nation. Given the extent of the problem, dental disease is a major public health issue.

This article outlines that challenge: the incidence – both nationally and statewide; the preventive measures that can be adopted by individuals and health care professionals; and, finally, an education campaign necessary to improve our oral health.

DENTAL CARIES: THE SILENT DISEASE

Dental caries is a chronic, infectious, transmissible disease resulting from tooth-adherent bacteria, mainly Mutans streptococci, that metabolizes sugars to produce acids which, over time, cause tooth decay. Beyond the obvious pain and loss of teeth, the devastating



complications of this insidious disease include the financial and social costs, and a diminished quality of life for many Americans.

Ten years after the 2000 Surgeon General’s report cited in the introduction, a National Healthy Policy Forum held in Washington, D.C. concluded that nationwide “dental disease remains the most common illness among children and affects about 40 percent of low-income adults.”⁵ Globally, dental caries affects 60-90 % of schoolchildren and most adults.⁶ This epidemic spares no one, including babies.

A. Early Childhood Caries (ECC)

A severe form of caries associated with bottle usage (previously called baby bottle tooth decay) is highly prevalent and increasing in poor and near poor U.S. preschool children and is largely untreated in children under age three.⁷ The causes of ECC were originally attributed to bottle feeding habits and ad libitum breast feeding after the eruption of first teeth. Today, other causative factors have been found:

- Bacteria transmission through salivary contact with caregivers, family or other children (example, sharing of utensils)
- Over-consumption of sugar-containing snacks, such as juices, sodas and gummy snacks

In some severe cases, consequences of untreated ECC include hospitalizations and emergency room visits, failure to thrive, risk for delayed physical growth and development, and even life-threatening facial involvement.



Severe tooth decay in 4-year-old boy

B. Children Aged 2-19 (National)

Although dental caries has been declining in primary and permanent teeth for many children since the 1960s, there is still a high ongoing prevalence for some groups in the United States reaching epidemic levels. The following five tables are based on data compiled in 2011-2012 by the National Center for Health

Statistics. Approximately 37% of children aged 2-8 had experienced dental caries in primary teeth. Untreated tooth decay in primary teeth among children aged 2-8 was twice as high for Hispanic and non-Hispanic black children compared with non-Hispanic white children.⁸ (Figure 1)

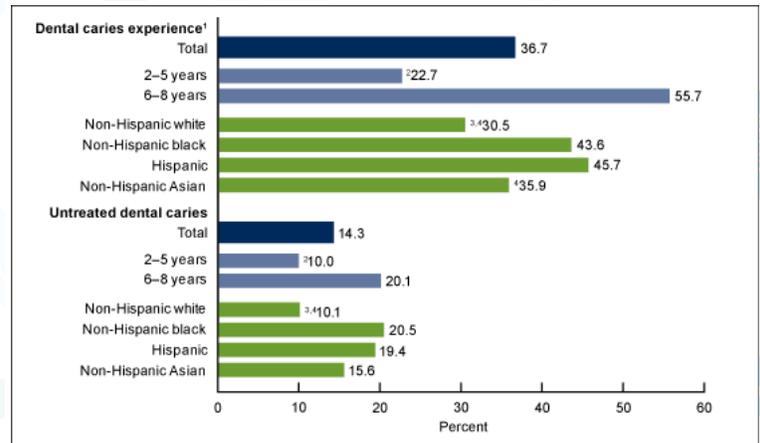


Figure 1. Prevalence of dental caries in primary teeth, by age and race and Hispanic origin among children aged 2–8 years: United States, 2011–2012

In 2011-2012, 21% of children aged 6-11 had experienced dental caries in permanent teeth. In that same age bracket, 27% of Hispanic children had dental caries in permanent teeth compared with nearly 18% of non-Hispanic white and Asian children.⁹ (Figure 2)

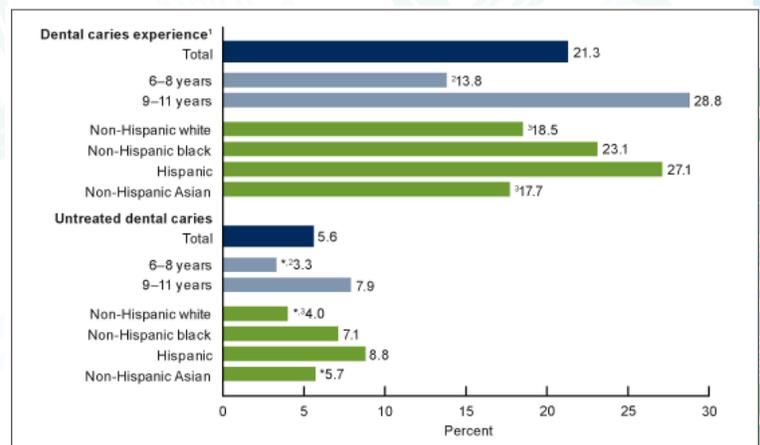


Figure 2. Prevalence of dental caries in permanent teeth, by age and race and Hispanic origin among children aged 6–11 years: United States, 2011–2012

Among adolescents aged 12-19, about three in five had experienced dental caries in permanent teeth, and 15% had untreated tooth decay. Of note, overall, the percentage with caries did not differ significantly by race and Hispanic origin in this age group.¹⁰ (Figure 3)

Delaware has not been spared the ravages of dental disease, especially among children. According to 2016 statistics compiled by the Division of Medicaid and Medical Assistance of the Delaware Department of

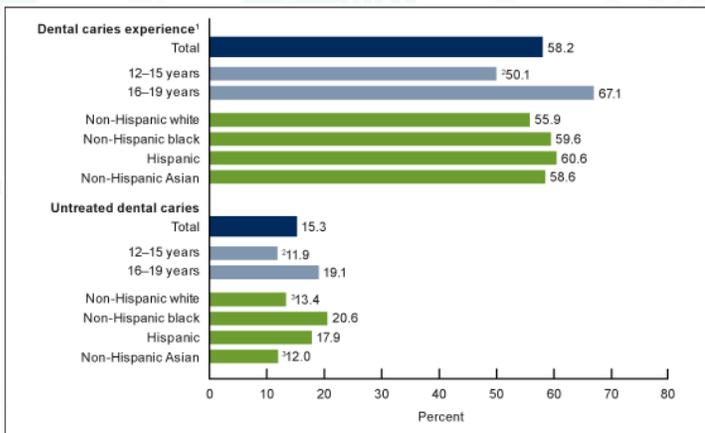


Figure 3. Prevalence of dental caries in permanent teeth, by age and race and Hispanic origin among adolescents aged 12–19 years: United States, 2011–2012

Health and Social Services, 51,286 dental fillings and 9,537 tooth extractions were performed on children aged 2 to 21 enrolled under Medicaid. Nearly \$60 million was billed for Medicaid dental services in 2016. Another statistic reveals that of the 135,984 children enrolled in Medicaid and CHIP (Children’s Health Insurance Program) less than 50% (62,955) had at least one dental visit that year. At the Roxana Cannon Arshat Surgicenter of Christiana Care Health System, 1,269 pediatric oral rehabilitation cases were performed under general anesthesia from 1/1/2015 to 9/15/2017 to treat dental caries in young children who are unable to cooperate in an office setting.

C. Adults (National)

Among adults aged 20–64, nearly 91% had dental caries, and about 27% had untreated tooth decay. Within this age group, non-Hispanic whites had the highest percentage (almost 94%) of dental caries. For untreated dental caries, however, non-Hispanic whites had the lowest percentage (22%), nearly half the percentage of non-Hispanic black adults (42%).¹¹ (Figure 4)

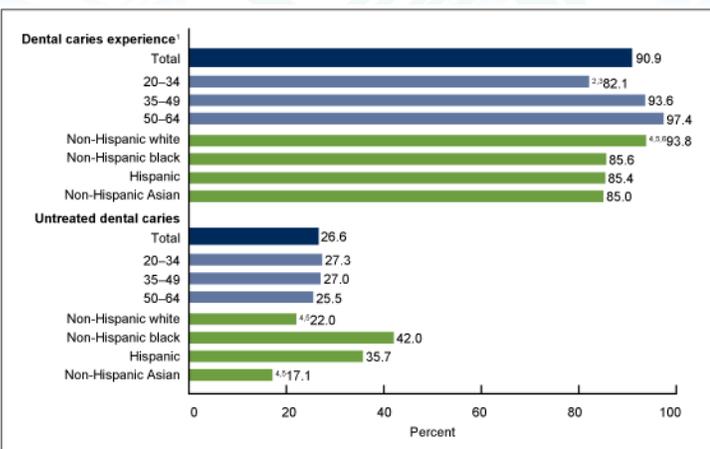


Figure 4. Prevalence of dental caries in permanent teeth among adults aged 20–64, by age and race and Hispanic origin: United States, 2011–2012

In the final age group reviewed, nearly all U.S. adults aged 65 and over had dental caries – 96%. The highest percentage of tooth decay was among non-Hispanic whites. Close to one in five Americans over the age of 65 experienced untreated dental caries in 2011–2012. No meaningful difference was manifest in untreated dental caries between those 65–74 and those aged 75 and over. Untreated tooth decay was significantly higher for non-Hispanic black adults (41%) than any other race group studied.¹² (Figure 5)

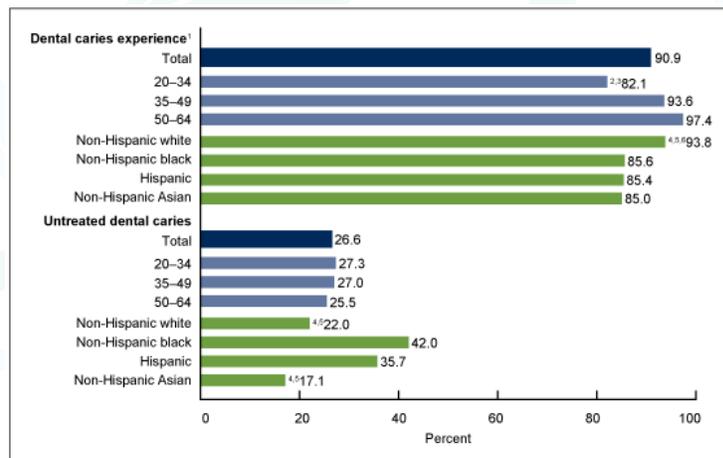


Figure 5. Prevalence of dental caries in permanent teeth among adults aged 65 and over, by age and race and Hispanic origin: United States, 2011–2012

PERIODONTAL DISEASE

The other major contributor to the epidemic of dental disease is periodontitis, also generally called gum disease or periodontal disease. It is caused by bacteria found in dental plaque that produces inflammation in the tissues of the gums and mouth. This inflammation can lead to destruction of the tissues, periodontal ligaments, and even bone. Gingivitis (gum inflammation), which is reversible, usually precedes periodontitis. However, it is important to note that not all gingivitis progresses to periodontitis.



Gingivitis – gum inflammation and some bleeding

In the early stage of gingivitis, bacteria in plaque builds up, causing the gums to become inflamed and to easily bleed during tooth brushing. Although the gums may

be irritated, the teeth are still firmly planted in their sockets. No irreversible bone or other tissue damage has occurred at this stage.



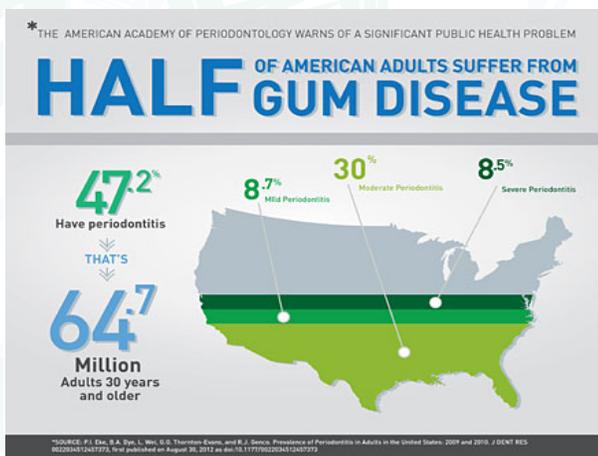
Early Periodontitis

When gingivitis progresses to periodontitis, treatment becomes much more complicated, involving special dental procedures and even periodontal surgery. The early signs of periodontitis include receding gums and the formation of pockets between the gums and the teeth, which is diagnosed by a dental examination and dental radiographs (X-rays).



Severe Periodontitis

Once the infection progresses, severe periodontitis can destroy tissues, ligaments, and bone in the mouth. It may also cause loss of teeth due to inadequate bone support.



The most recent published study from the Centers for Disease Control and Prevention estimates that 47.2 %, or approximately 64.7 million American adults, have

mild, moderate or severe periodontitis. In adults 65 and older, prevalence rates increase to 70.1%. Periodontal disease is more common in men than women (65.4% to 38.4%).¹³

When the tissue of the gums separates from the teeth during periodontal disease, the harmful bacteria can enter the bloodstream and travel to major organs.¹⁴ Mounting evidence suggests that an alarming number of systemic diseases are currently linked to periodontal disease. A partial list includes:

- Osteoporosis*
- Cardiovascular disease*
- Cancer*
- Preeclampsia*
- Preterm births*
- Metabolic Syndrome*
- Rheumatoid arthritis*
- Stroke*
- Erectile dysfunction*
- Bacterial pneumonia*
- Diabetes*

While one's oral health might contribute to various diseases and conditions, the reverse is also true – certain conditions might affect oral health. For instance, diabetes reduces the body's resistance to infection, thereby increasing the frequency of periodontal disease among those who have diabetes.¹⁵ Other conditions having an adverse effect on the mouth and gums include HIV/AIDS, osteoporosis, Alzheimer's Disease, rheumatoid arthritis, and head and neck cancers.

TREATMENT & PREVENTION

The good news is that both dental caries and periodontal disease are treatable and preventable. The epidemic levels now reached are reversible through education and collaboration. The first line of defense must begin with medical and public health professionals – including, but not limited to, OBGYNs, pediatricians, Family Medicine practitioners, and endocrinologists. These specialists, and others, are particularly critical (and often unnoticed) in this battle.

A. OB-GYNs

Prenatal health care should include an assessment of oral health. Only 22 to 34 percent of women in the United States consult a dentist during pregnancy.¹⁶ To compound matters, myths about the effects of pregnancy on dental health and concerns for fetal safety during dental treatment can cause patients and

physicians to avoid treatment of oral health issues during pregnancy.

Research shows that prenatal oral health conditions such as dental caries and periodontitis have adverse consequences for the child. One fourth of women of reproductive age have dental caries. Mothers who have high levels of untreated caries are more than three times as likely to have children who had an increased level of early childhood caries.¹⁷ Thirty percent of women of child-bearing age have periodontitis. This inflammatory disease is known to be associated with both preterm birth and low birth weight babies.¹⁸

Physicians, especially OB-GYNs, can address maternal oral issues, potentially reducing the risk of preterm birth and childhood caries through oral disease prevention, diagnosis, early management, and dental referral. Moreover, findings from a 2008 study suggest that an oral health program based on providing proactive and repeated counseling begun during a woman's pregnancy was successful in reducing severe ECC.¹⁹ Therefore, a mother's oral health status is a strong predictor of the oral health status of her children.

Some recommendations for OB-GYNs include:

- Every pregnant woman should be assessed for dental hygiene habits, access to fluoridated water, oral issues such as active caries and gingivitis, and access to dental care.
- Counseling regarding routine brushing and flossing; avoidance of sugary snacks and drinks; and to consult a dentist if necessary
- Use of oral topical antibacterial treatment (Xylitol and Chlorhexidine) of dental caries in mothers in late pregnancy and/or postpartum period can reduce oral bacteria levels and maternal transmission to infants.²⁰

B. Pediatricians

As discussed earlier, tooth decay, if left untreated even in the earliest stages of life, can have serious implications for a child's health. The Centers for Disease Control and Prevention reports that ECC is perhaps the most prevalent infectious disease of our nation's children. Dental caries is five times more common than asthma and seven times more common than hay fever in children.²¹ Without preventive care, the impact of tooth decay on child development can be significant.

Because pediatricians and other pediatric health care professionals are far more likely to encounter new

mothers and infants than are dentists, it is essential that they are (or become) aware of the associated risk factors of early childhood dental caries. The American Academy of Pediatrics recommends at least twelve check-ups for well-child care during the first three years, then yearly after age three on the following schedule: two-five days after birth, 1-, 2-, 4-, 6-, 9-, 12-, 15-, 18-months, 2 years, 2 ½ years, and 3 years.²² This schedule gives pediatricians several opportunities to make timely referrals for a child's first dental visit. According to the American Academy of Pediatric Dentistry, a child's first dental visit should occur no later than six months after the eruption of the first tooth or by age one – whichever comes first.²³

The American Academy of Pediatrics recommends that oral risk assessments should begin at six months of age. This tool allows pediatricians to identify parents and infants with a high predisposition to caries. The assessment starts by taking a simple dental history from the mother to determine dietary practices, fluoride exposure, oral hygiene, utilization of dental services, and the history of the mother's existing dental fillings or active dental caries.

Some recommendations for pediatricians to provide parents include:

- Minimize saliva-sharing activities (e.g., sharing utensils, cleaning a dropped pacifier with their saliva) to decrease transmission of cariogenic bacteria
- Implementing oral hygiene measures no later than the time of eruption of the first primary tooth. Brush the child's teeth twice daily with a "smear" amount of fluoridated toothpaste up to age three. From age three to six, a "pea" amount of toothpaste should be used.



Comparison of a 'smear' (left) with a 'pea-size' (right) amount of toothpaste.

- At-will nighttime breast-feeding should be avoided after the first primary teeth begin to erupt. Drinking juice from a bottle should be avoided, especially at bedtime. Teeth should be brushed after feedings.
- Encourage children to drink from a cup as they approach their first birthday. Infants should be weaned from the bottle after 12 months of age.

- Intake of juice should be limited to, at most, 4 ounces daily for toddlers age 1-3. For children age 4-6, fruit juice should be restricted to 4 to 6 ounces daily.
- Thumb sucking, while perfectly normal for infants, should stop between the ages of two and four.
- Children who drink primarily bottled water may not be getting the fluoride they need.
- Eliminate consumption of sugar-containing snacks or drinks.
- Encourage the establishment of a “dental home” for the child – finding a licensed dentist who will manage the child’s oral health care in a comprehensive manner. This will insure the proper access to dental screenings, counseling and preventive measures.

FLUORIDE: A PUBLIC HEALTH SUCCESS STORY

The addition of fluoride to public water supplies has played a major role in improving the public’s dental health for 70 years and has been hailed as one of the great public health achievements of the 20th century.²⁴ Community water fluoridation now benefits more than 7 out of 10 Americans.

Fluoride, a naturally-occurring mineral, is found in most all water sources – rivers, lakes, wells and oceans. Adding fluoride to public water supplies brings the level up to the amount necessary to help prevent tooth decay by making the outer surface of teeth (enamel) more resistant to the acid attacks that cause caries. The recommended amount of fluoride is .7 milligrams per liter of water. It goes without saying, of course, that water companies and public officials must be responsible to ensure safe addition and monitoring of fluoride levels in water supplied to the public.

The fluoride ingested from foods and beverages also provides a benefit because it becomes part of the saliva that bathes the teeth and helps remineralize weakened enamel. Toothpaste with fluoride has been responsible for a significant drop in cavities since 1960.

Before water fluoridation, children had about three times as many cavities.²⁵ Studies show that it continues to prevent tooth decay by 18 to 40 percent. The cost/benefit ratios of community water fluoridation are astounding: 1) The average lifetime cost per person to fluoridate a water supply is less than the cost of one dental filling; 2) For most cities, every dollar invested in water fluoridation saves \$38 in dental treatment costs.²⁶

SUMMARY & CONCLUSION

Dr. David Satcher wrote in his Preface to the Surgeon General’s landmark report, “Oral Health in America,” that most Americans at the turn of the last century could expect to lose their teeth by middle age. Thankfully, that is not the case today. However, dental disease is a silent, infectious and transmissible disease that has persisted and reached epidemic and pandemic levels, despite the continuing improvements in treatment and prevention.

The statistics are staggering but unrecognized by most: One-fourth of the U.S. population has untreated dental caries and nearly one out of every two American adults aged 30 and over is affected by periodontal disease. As previously noted here, untreated dental disease can cause or exacerbate chronic medical conditions, lead to unnecessary pain and increased costs to the medical system – to say nothing of the social and economic impact brought on by millions of missed school and office hours lost each year to dental-related illness. One cannot be totally healthy without oral health.

Prevention starts with eliminating risk factors such as diets high in sugar, inappropriate bottle feeding of infants and low fluoride levels in a community’s water supply. In addition, the practice of thorough oral hygiene every day and making regular routine dental visits to keep teeth healthy can prevent and mitigate existing dental disease.

But the steady progression of oral diseases has proved that more action is necessary – by individuals, communities and health professionals. This epidemic demands a higher level of awareness and an education campaign that starts in our local municipalities and builds at a state and national level. A blueprint for action includes the following four steps:

1. Dental and medical professionals must identify and acknowledge that dental disease is a silent epidemic.
- 2 We must utilize our medical and public health colleagues as the first line of defense in educating adults – including pregnant mothers to begin to slow down the transmission process.
3. We must rely on and utilize the published best practices, policies and standards for oral health care set forth by the American Dental Association, American Academy of Pediatric Dentistry, American Academy of Pediatrics, American Academy of Periodontology, and the American Academy of Family Physicians.

4. We must enlist specific allies – medical professionals, daycare providers, teachers, school nurses, athletic coaches, ER doctors and staff, to name a few – to make timely dental referrals for infants, children, adolescents and adults to help stem dental disease.

Dentists themselves must be the trailblazers of this education campaign. When treating children, they should encourage their parents to receive dental care and educate them about healthy oral health practices for themselves and their children. Similarly, dentists treating adult patients should inquire about their children's oral health.

A rigorous and disciplined approach to this statewide education campaign can make giant strides in improving the oral health of all Delawareans and help to eliminate dental disease in the First State.

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Dr. Rachel Maher attended Alvernia College in Reading, PA as an undergraduate. After graduating with a Bachelor of Science in biology, she attended the University of Pennsylvania School of Dental Medicine where she received her Doctorate in Dental Medicine.

Dr. Maher completed a general dental residency program at Christiana Care Health Services in Wilmington, DE. She then went on for advanced studies in Pediatric Dentistry at Children's Hospital Medical Center in Cincinnati, OH. In 2003, Dr. Maher opened her current office, Dentistry for Children in Wilmington, DE.

Dr. Maher is currently a Board Certified Diplomate of the American Academy of Pediatric Dentistry. She serves as Secretary of the Delaware State Dental Society and is an active member of the American Dental Association.

Winter-Spring 2018

All Forums are held between 8:30 – 9:30 AM

Jefferson College of Population Health Forums

January 10, 2018

Engaging Employers
in Population Health:
The Philadelphia Story

Neil Goldfarb
President & CEO
Greater Philadelphia Business Coalition
on Health

UPDATED LOCATION
College Building, Herbut Auditorium
1025 Walnut Street, Ground Floor

February 14, 2018

Jefferson & GE Partnership to
Transform Healthcare Delivery

Laura Jacobs, MPH
President
Brandon Klar, MHSA
Vice President

GE Healthcare (Camden Group)
College Building, Herbut Auditorium
1025 Walnut Street, Ground Floor

March 14, 2018

Connecting Consumers to
Resources: Closing the Gap
on Social Determinants

Chris Dunkin
Vice President of Sales
Heather Zuckerwise-Choi
Account Executive

Aunt Bertha, Inc.
Bluemle Life Sciences Bldg.
233 South 10th Street, Room 105/107

April 11, 2018*

Community-Based Population
Health Research: A Report
from the Field

Sharon Larson, PhD
Executive Director
Norma Padron, PhD, MPH
Associate Director

Main Line Health Center for Population
Health Research at Lankenau Institute for
Medical Research

Trina Thompson, DrPH, MPH, BSN
Executive Director
Marquita Decker-Palmer, MD, MPH, PhD
Associate Director
1889 Jefferson Center for Population Health
Bluemle Life Sciences Bldg.
233 South 10th Street, Room 105/107

May 9, 2018

Amplifying the Patient Voice:
Advancing Quality and
Improving Care

Shantanu Agarwal, MD, MPH
President
National Quality Forum (NQF)
Bluemle Life Sciences Bldg.
233 South 10th Street, Room 105/107

June 13, 2018

Working to Make
Philadelphians Healthier

Cheryl Bettigole, MD, MPH
Director, Chronic Disease Prevention
City of Philadelphia
Bluemle Life Sciences Bldg.
233 South 10th Street, Room 105/107

These knowledge-based Forums are designed for Thomas Jefferson University students, faculty and staff; health care professional administrators and advocates; public policy analysts and community health leaders.

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The Jefferson College of Population Health is accredited by the Accreditation Council on Pharmacy Education as a provider of continuing pharmacy education.

Each session is acceptable for 1.0 hours of continuing pharmacy education credit.
ACPE # 0079-0000-18-001-L04-P

CPE credits will be uploaded to CPE Monitor within 60 days after the program for participants who complete this activity and submit required participant information, including evaluation, NABP # and DOB.

Sidney Kimmel Medical College at Thomas Jefferson University is accredited by the ACCME to provide continuing medical education for physicians.

Sidney Kimmel Medical College at Thomas Jefferson University designates this live activity for a maximum of **1 AMA PRA Category 1 Credit(s)**[™]. Physicians should claim only the credit commensurate with the extent of their participation in the activity.

Jefferson Conflict of Interest resolution process may result in changes to the number of CME credits awarded.

* This Forum will be followed by a special Grandon Society member-only program from 9:45 – 10:30 AM

Want to know more about the Grandon Society membership?

Please visit: Jefferson.edu/GrandonSociety for more information.

Pain Management: Oral Health Leading Change to Battle the Opioid Epidemic

Nicholas R. Conte Jr., D.M.D., M.B.A.
Division of Public Health, Delaware Health and Social Services

Mark Donaldson, PharmD
Jason Goodchild, D.M.D

The mission of the Bureau of Oral Health and Dental Services (BOHDS) is to protect and promote the oral health of all Delawareans. It is my vision and that of my predecessors, that to provide the citizens of our great state with all of the resources needed to achieve optimal oral health, it will take a combination of improved access, increases in preventative services, and an educational focus that highlights the importance of oral health on overall wellness.

In 2017, oral health care providers and patients have access to more information than ever before. We should expect that as access to information increases, it would have a trickle-down effect to improve our oral health literacy, treatment programming knowledge, and ultimately our patient outcomes. However, we continue to struggle to improve health care utilization rates as we are mired by several issues that may be related to complacency and cultural perceptions.

When you talk about the dental landscape in Delaware, many issues come to mind: state licensure requirements, Medicaid utilization and reimbursement rates, dentist-to-provider ratios in Sussex County, and the fact that Delaware is one of only a few states without its own dental school. However, dentists can protect the well-being of Delawareans in many ways, including helping to fight the opioid epidemic through safer prescribing practices.

In virtually every dental practice, comprehensive and complicated multi-disciplinary care is performed every day. Historically, after a dental procedure where the dental practitioner anticipates moderate to severe pain, such as a third molar extraction or root canal therapy, the practitioner would often prescribe an immediate release narcotic analgesic. This is usually driven by the dentist's belief that these medications would best mitigate post-operative discomfort and be more effective than over-the-counter medications; and a cultural perception that post-operative pain is best-remedied using opioid analgesics.

The dentist's belief that an aggressive approach to pain management is warranted, coupled with the patient's perception that narcotics should be prescribed after undergoing an invasive dental procedure, has led to a cycle where, put simply – receiving potentially painful dental care equals a narcotic analgesic prescription. This may be a less effective means of treating the patient's post-operative pain and could expose the patient to additional risks, adverse reactions, drug interactions, and substance use disorder.

Orofacial pain typically results from two general pathologic mechanisms: tissue injury and inflammation (i.e. nociceptive pain); or from a primary lesion or dysfunction of the nervous system (i.e. neuropathic pain). The first step to manage orofacial pain is



to determine if the pain is primarily nociceptive, neuropathic, or a combination of the two. This determination is critical for selecting a medication that will address the underlying pathophysiology.

Based on current evidence, the drugs of choice to treat nociceptive orofacial pain are acetaminophen and a non-steroidal anti-inflammatory drug (NSAID). NSAIDs act by inhibiting cyclooxygenase enzymes responsible for the formation of prostaglandins that promote pain and inflammation. The combination of acetaminophen and NSAID have been shown to have a better effect than either drug alone, but more importantly, the drugs have a better side effect profile and less potential for abuse compared to opioids. These medications target the underlying physiology of nociceptive pain. In contrast, the narcotic is geared to suppress the central nervous system, helping the patient forget about the pain – but once the medication wears off and the pain returns, the patient is often left looking for more narcotics.

For this reason, we need to break the cycle of habitual opioid prescribing for routine dental pain. This change will require both patient education and clinician

discipline. The discussion must start with the patient about what to expect after surgery and why pain medications, such as ibuprofen and acetaminophen, can be more effective than opioids for treating the discomfort. It is also imperative to highlight why the pain occurs and the impact inflammation has in the process. Finally, dental practitioners should reinforce the fact that the narcotic does not treat the etiology of the pain; it merely affects the perception of pain, leaving patients more susceptible to adverse effects such as psychomotor impairment and addiction.

Many resources are available through the [Division of Professional Regulation's Prescription Monitoring Program](#) (visit dpr.delaware.gov/boards/pmp/) and the [American Dental Association](#) (visit www.ada.org) to aid clinicians in determining when opioid prescription is warranted and when patients may be better served with alternate medications. As health care providers, it is our responsibility to better educate ourselves and our patients to the dangers of opioid use. To ensure the well-being of Delawareans, we can prescribe appropriate medications for the right indications to best help our patients achieve optimal oral health.



Dr. Conte is the Dental Director of the Bureau of Oral Health and Dental Services, within the Department of Public Health, State of Delaware. Previously, Nick was the Director of Clinical Research and Education for Dentsply Sirona Restoratives during which time he worked on development teams to commercialize products ranging from composites and adhesives to impression materials and resin cements. Dr. Conte earned a B.A. from the University of Rochester in New York and completed both his D.M.D. degree and Prosthodontic Residency Program at the University of Medicine and Dentistry in Newark, New Jersey. In addition, Nick earned an MBA from Wilmington University in Delaware in 2011. He holds a faculty appointment as a Clinical Assistant Professor at Rutgers School of Dental Medicine and a fellowship in the American College of Dentists. Nick enjoys lecturing on the evolution of dental materials,

procedural based clinical solutions and team focused office efficiency.

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Mark Donaldson, PharmD received his baccalaureate degree from the University of British Columbia, and his Doctorate in Clinical Pharmacy from the University of Washington. He has further completed a residency at Canada's largest tertiary care facility, Vancouver General Hospital, and is the current Director of Clinical Pharmacy Performance Services for VHA, living in Whitefish, Montana. Dr. Donaldson is a Clinical Professor in the Department of Pharmacy at the University of Montana in Missoula, and Clinical Associate Professor in the School of Dentistry at the Oregon Health & Sciences University in Portland, Oregon. He has a special interest in dental pharmacology and has lectured internationally to both dental and medical practitioners. He has spent the last seventeen years focusing on dental pharmacology and the art of dental therapeutics, and has become a leader in this field of study. Dr. Donaldson has a number of

published works in the peer-reviewed literature and spent three years in Japan focusing on cross-cultural communication and internationalization. He currently serves on the Editorial Board for the Journal of the American Dental Association. He is board certified in healthcare management and is the past-President of the American College of Healthcare Executives' Montana Chapter. Dr. Donaldson was named as the 2014 recipient of the Bowl of Hygieia for the state of Montana and is the 2016 recipient of the Dr. Thaddeus V. Weclaw Award. This award is conferred upon an individual who has made outstanding contributions to the art and science of dentistry and/or enhanced the principles and ideals of the Academy of General Dentistry.

Email: DrMarkDonaldson@gmail.com



Jason Goodchild, D.M.D. is a graduate of Dickinson College in Carlisle, PA. He received his dental training at the University of Pennsylvania School of Dental Medicine where he still holds a faculty position as a Clinical Associate Professor in the Department of Oral Medicine. Dr. Goodchild is currently Associate Professor & Chairman of the Department of Diagnostic Sciences at Creighton University School of Dentistry (Omaha, NE). He is a Clinical Education Manager, focus North America at Dentsply Sirona Restorative (Milford, DE) involved in educating dentists on new materials and techniques to improve clinical practice. He has published numerous articles and lectures internationally on the topics of treatment planning, treatment of medical complex patients, restorative dentistry, pharmacology, emergency medicine in dentistry, enteral sedation dentistry, and dental photography. He has been an invited speaker

for the Academy of General Dentistry and American Association of Dental Examiners. He is a reviewer for the Journal of the American Dental Association, General Dentistry, and Quintessence International. Dr. Goodchild maintains a private general dental practice in Havertown, PA.

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The DPH Bulletin

From the Delaware Division of Public Health

October 2017



Governor John Carney received his 2017 flu shot from Delaware Health and Social Services Secretary Dr. Kara Odom Wallker, right. The Division of Public Health (DPH) urges all Delawareans 6 months of age and older to get an annual flu shot as soon as possible. DPH's Oct. 10 drive-thru flu clinic on the DelDOT campus in Dover administered flu shots to 850 people, including Patricia Wilmer, top left, and Sharon Robertson, holding Smokey. DPH offers free flu shots at many statewide locations. View the few clinic schedule at flu.delaware.gov; visit www.flu.gov to find mapped clinics in your area; or call DPH at 888-282-8672. Photos by Donna Sharp.

Drug Take-Back Day arrives Oct. 28

On October 28 from 10:00 a.m. to 2:00 p.m., Delawareans can anonymously drop off their unused drugs at sites across the state. For a list of sites participating in National Drug Take-Back Day, visit delawarehealthyhomes.org. Permanent collections sites are also listed there. If you or a loved one is struggling with addiction, visit www.helpisherede.com or call 800-652-2929 in New Castle County or 345-6785 in Kent and Sussex counties.

Diabetes Wellness Expo is Nov. 14

The Delaware Diabetes Coalition is holding the 16th annual Diabetes Wellness Expo on November 14, from 9:00 a.m. to 3:00 p.m. at the Dover Downs Conference Center, at 1131 N. DuPont Hwy., Dover, DE 19901. It is free and lunch is provided at no cost on a first come, first served basis. Screenings include blood glucose, blood pressure, foot care, and eye exams.



DELAWARE HEALTH AND SOCIAL SERVICES
Division of Public Health

Georgetown WIC office relocates to La Red Health Center for clients

The Georgetown office of the Delaware Women, Infants and Children (WIC) Supplemental Nutrition Program relocated from the Thurman Adams State Service Center to La Red Health Center at 21444 Carmean Way in Georgetown, DE in the College Park Shopping Center.

DPH and La Red Health Center had a shared vision to offer WIC clients medical and social services under one roof. At the new location, pregnant women, new mothers, and young children enrolled in WIC can more easily access health care and other social services. La Red Health Center offers transportation and is on the bus route and within walking distance to Wal-Mart and Redner's, both WIC vendors. The center reduces language barriers with interpreters and a language line.

Delaware WIC serves nearly 19,000 women who are pregnant, breastfeeding, or postpartum, and children and infants less than 5 years old. For more information about WIC, visit <http://dhss.delaware.gov/dhss/dph/chca/dphwichominf01.html> or call 302-424-7220 (Kent and Sussex counties) and 302-283-7540 (New Castle County).



Officials held a ribbon cutting on September 28 to welcome the Georgetown offices of the Delaware Women, Infants and Children (WIC) Supplemental Nutrition Program to La Red Health Center, located at 21444 Carmean Way, Georgetown, DE. The Federally Qualified Health Center provides affordable care to Delawareans in need. Pictured in the front center are speakers Brian Olson, Chief Executive Officer, La Red Health Center; Division of Public Health Director Dr. Karyl Rattay; and Patricia Dombroski, Regional Administrator, USDA Food and Nutrition Service, Mid-Atlantic Regional Office.

The DPH Bulletin

From the Delaware Division of Public Health

November 2017



Several dignitaries attended the Oct. 26, 2017 Delaware Health and Social Services (DHSS) conference, “A Vision for Substance Use Disorder Treatment.” From left: Division of Public Health Director Dr. Karyl Rattay, Attorney General Matt Denn, DHSS Secretary Dr. Kara Odom Walker, Senator Stephanie Hansen, and Representative David Bentz. Lieutenant Governor Bethany Hall-Long also attended and spoke. Photo by Donna Sharp.

DHSS Secretary presents vision for substance use disorder treatment

Delaware Health and Social Services (DHSS) Secretary Dr. Kara Odom Walker recently shared the DHSS vision for improving the system of care for substance use disorders. The system of care will identify and reach people quickly and match them with the treatment services they require.

The vision includes Centers for Excellence to provide comprehensive substance use disorder evaluation; induction and maintenance of medication-assisted treatment; group and individual counseling; and strategic outreach using peers at key touch points to engage new or lost-to-care clients. The centers can offer a wide array of services, including case management, links to transitional housing, and family engagement.

DHSS held the Oct. 26, 2017 conference, “A Vision for Substance Use Disorder Treatment” to share best practices and innovative work. Twelve presentations, links, and literature are posted at: dhss.delaware.gov/dhss/dph/hsp/opioidconres.html.

DHSS asks those with thoughts on Delaware’s system to share them by sending an email to: dhss_dph_web@state.de.us. The email address will remain open until Dec. 1, 2017. Early next year, DHSS will announce plans to evolve the Delaware treatment system.



DELAWARE HEALTH AND SOCIAL SERVICES
Division of Public Health

Create a safe zone around your home to protect it against wildfires

Since wildfires can occur anywhere, fall yard clean-ups should create 30-foot borders from homes that are free of wood piles, dried leaves, and newspapers, according to the Federal Emergency Management Agency (FEMA). FEMA recommends that yards have “fuel breaks” (driveways, gravel walkways, and lawns), and that homeowners remove underbrush and thin continuous canopies up to 200 feet away.

Homeowners should also prune tree branches 10 feet off the ground and keep gutters and roofs free of debris, according to www.SmokeyBear.com. Store gas grills, propane tanks, mowers, and gas cans 30 feet away from any structure. Review homeowner’s and renter’s insurance policies and inventory household contents. Photograph rooms and keep records in a safety deposit box.

In Delaware it is illegal to burn leaves, grass clippings, stumps, and household trash at any time, according to the Delaware Department of Natural Resources and Environmental Control. It is permissible to burn very small amounts (less than 27 cubic feet) of cut or fallen tree limbs or trimmed residential shrubbery between October 1 and April 30 between 8:00 a.m. and 4:00 p.m. Before homeowners conduct open burning activities (except barbecues, patio fire pits, and chimeneas), they must notify the local County Fire Board: New Castle County, 302-571-7331; Kent County, 302-734-6040, and Sussex County, 302-856-6306. Read the Citizen’s Guide to Open Burning at link <http://www.dnrec.delaware.gov/Air/Pages/OBCitizenGuide.aspx>.

DPH Director receives award



Frances A. Russo-Avena, RN, MSN, MSM, left, and Karyl Rattay, MD, MS.
Submitted photo.

DPH Director Dr. Karyl Rattay received atTACK addiction’s Medal of Honor on Oct. 19 for her ongoing work with the Prescription Drug Action Committee, for increasing access to the overdose-reversing medication naloxone and for her “empathy, compassion and dedication” to reducing the impact of addiction on Delaware families.

The DPH Bulletin

From the Delaware Division of Public Health

December 2017



Georgetown in 2010. DEMA photo.

Prepare now for winter hazards

Winter weather can bring extreme cold, snow, ice, and frigid winds. These conditions can cause power outages, hazardous driving conditions, and possibly the need to shelter-in-place. Prepare now with these recommendations from the Delaware Emergency Management Agency (DEMA):

- Have a house disaster kit that includes rock salt or sand for walkways; snow shovels and other snow removal equipment; and cold-weather clothing and blankets for warmth. Review a list of disaster kit contents at PrepareDE.org. Use stored food before it expires and replace it with new non-perishable food.
- Hire a contractor to check the structural stability of roofs to sustain unusually heavy weight from the accumulation of snow, or water, if drains on flat roofs do not work.
- For vehicles, keep gas tanks at least half full. Have a mechanic check antifreeze levels, the battery and ignition system, oil (heavier oils congeal in the cold and do not lubricate well); brakes, tires, windshield wipers and fluid, lights (including hazard lights); and the heater, defroster, and thermostat. It is also important to check for leaks in the exhaust system because carbon monoxide is deadly.
- Vehicles should have an emergency supply kit including jumper cables, spare tire, flares, sand or kitty litter, snow shovel and brush, ice scraper, tow rope, cell phone charger, first aid kit, flashlight, warm clothing and blankets, and water and non-perishable snacks.

For more information, visit PrepareDE.org.



DELAWARE HEALTH AND SOCIAL SERVICES
Division of Public Health

Rescue training benefits first responders, animal welfare advocates

When a horse is stuck in mud, how do you get it out? How do you safely evacuate horses, cows, and other livestock during a stable fire?

First responders and animal welfare advocates learned large animal rescue techniques at a training hosted by the Delaware Animal Response (DAR) team. DAR responders, large animal veterinarians, county technical rescue teams, and fire department members participated in the emergency training held at the Delaware State Fairgrounds in Harrington, DE. The training covered entrenchment and mud rescues, trailer overturns, a simulated barn fire, and a night Search and Rescue operation.

DAR Coordinator Karen Clark of the Office of Animal Welfare organized the training. The Delaware Equine Council and the Delaware Farm Bureau partnered with speakers and logistics.



First responders often direct large animal rescues such as stable fires and horses stuck in mud. The Office of Animal Welfare secured a grant to host a training that taught large animal rescue and evacuation skills. Horse mannequins were used to simulate removing a horse from an overturned trailer and another trapped in a trench. Photo by Natalie Osorio, The Delaware State Fair.

DPH invites readers to complete online survey about this newsletter

The Division of Public Health (DPH) asks its community e-newsletter readers to complete a customer satisfaction survey. Readers are asked to complete the survey by January 31 by visiting this link:

<https://www.surveymonkey.com/r/6PQXGGC>

The DPH Bulletin

From the Delaware Division of Public Health

January 2018

It's the law! Bring dogs indoors during hazardous weather warnings

Under Delaware law ([Title 16, Chapter 30F](#)), dogs cannot be left outdoors during hazardous weather warnings issued by the National Weather Service. Pet owners should plan pet-safe accommodations, store extra pet food, and have crates and bedding ready, says the Division of Public Health's (DPH) Office of Animal Welfare (OAW).

The law requires dogs to have protection from rain, ice, snow, wind, and extreme cold. A warm house with a flap and clean, dry bedding preserves their body heat and helps them remain dry. State law requires dogs to have clean, moisture-resistant bedding, and additional bedding and protection for temperatures 35°F (1.7°C) or lower. OAW recommends straw bedding because it does not hold moisture like cedar chips or old towels. While cats are not covered under the same law, outdoor felines need the same winter accommodations.

Short-haired dogs and other breeds that are not acclimated to Delaware's outdoor temperatures



cannot be kept in outdoor facilities unless a licensed veterinarian approves of it.

Ideally, all pets

should be indoors. If you're cold, they're cold.

While many believe dogs and cats are more resistant than people to cold weather because of their fur, this is untrue. Like people, dogs and cats are susceptible to frostbite and hypothermia and should be kept inside. For more information, read OAW's *PawPrints* newsletters at:

<http://www.dhss.delaware.gov/dhss/dph/oaw/oawhome.html>.

Report animal cruelty or neglect to Delaware Animal Services at 302-255-4646 or for non-emergencies, complete an online form at:

<https://animalservices.delaware.gov>.

ADDICTION IS TREATABLE.

*Picture a new you
this new year.*

HelpsHereDE.com



Public invited to get flu vaccinations at Legislative Hall on January 17

DPH's Community Health Services section is hosting a public flu clinic on January 17, 2018, from 9:00 a.m. to 3:30 p.m. in the Legislative Hall Library at 411 Legislative Ave. in Dover, DE.

Delawareans 6 months of age and older can receive free flu vaccinations. Adults should bring a photo ID for admittance to Legislative Hall. Free street and lot parking is available.

"Getting your annual flu vaccine is still your first and best line of defense against the influenza virus," said DPH Director Dr. Karyl Rattay. Also wash hands frequently with soap and water or use alcohol-based hand sanitizers; and cover sneezes and coughs with a tissue or sneeze or cough into your inner elbow. Those who are sick should stay home until they are fever free for 24 hours, with a temperature of less than 100° F (37.8° C), without the use of fever-reducing medications.

Reminder!

DPH wants your feedback about this newsletter. Take a customer satisfaction survey by January 31 by visiting this link:

<https://www.surveymonkey.com/r/6PQXGGC>



DELAWARE HEALTH AND SOCIAL SERVICES
Division of Public Health



The Population Health Partnership: Medicine and Dentistry Working Together to Improve the Lives of Delawareans

Prayus Taylor, M.D.

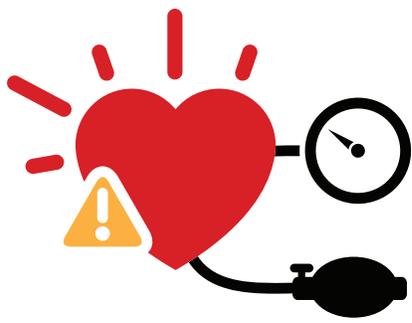
President, Medical Society of Delaware (2017)

Delaware's challenges in managing the health of its population are not so different than those experienced in other states. A shift from fee-for-service reimbursement to one that pays for value is still trying to get its footing while Republicans attempt to undo the Affordable Care Act. The current systems of reimbursement have led many primary care physicians to opt out of the insurance game altogether and pursue concierge practices. We are seeing far fewer primary care practices opening, and unsurprisingly patients are having difficulties accessing the remaining overworked and burned out physicians. Delaware has unique challenges

in recruiting physicians and part of this is due to the lack of a medical school. Indeed, fixing the root causes of a dwindling primary care community is essential. But we can simultaneously develop collaborative working relationships with other highly skilled health professionals who also see Delawareans with regularity to help deliver needed care. Our dental community comes to mind.

In this vein, I see an opportunity for physicians and dentists to work together to promote the care of our citizens. Just today, I saw a patient in my clinic after a





recent dental procedure was canceled due to high blood pressure. In 12 years of practice, I had never seen a note from a dental clinic before. I found this information quite usable. It included



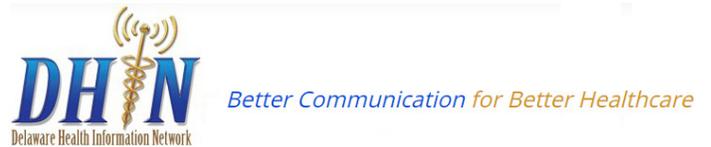
her blood pressure, a reconciled medication list and the reason for which she was seeing the dentist. It also explained why her procedure was canceled. As high blood pressure, the silent killer, usually presents with no symptoms, additional clinical touch points like this one at her dentist's office become increasingly important in recognizing how well her blood pressure is controlled in the ambulatory setting. After counseling her on a sodium restricted diet, exercise and weight loss, I did adjust her medications to get better control of her blood pressure. Finally, I communicated with her dentist about when to proceed with her dental procedure. While we in medicine may communicate more frequently with other medicine specialists, this encounter taught me that our dental colleagues can be helpful in monitoring some disease conditions.

Another example of how physicians and dentists can collaborate to promote the health of Delawareans is in the setting of diabetes and periodontitis. Diabetes is the most common risk factor for chronic periodontal disease.¹ While some patients may be asymptomatic, chronic periodontitis may be characterized by bleeding while brushing (indicative of gingival inflammation), discomfort from extensive mobility of a tooth (resulting from bone loss), or fetid odor.² Uncontrolled diabetes is associated with more severe periodontal disease. These patients usually require follow up in the dental clinic 3 to 4 times a year for cleaning and periodontal therapy. "Therefore, these visits would provide ideal points in performing tests such as point-of-care hemoglobin A1c or random blood glucose monitoring to assess diabetes control status".³ Providing this feedback to the patient's primary care physician or endocrinologist can lead to timelier dietary counseling and adjustment of diabetes

medication, thus avoiding or delaying the complications of persistently uncontrolled diabetes such as vascular disease, retinopathy and kidney failure.

Another excellent example of medicine and dentistry working together is in the treatment of obstructive sleep apnea (OSA). The American Academy of Sleep Medicine (AASM) and American Academy of Dental Sleep Medicine (AADSMD) worked together to create guidelines regarding the use of oral appliance therapy for the treatment of OSA and snoring.⁴ While positive airway pressure remains the gold standard for the treatment of OSA, oral appliances have also been shown to effective in the management of OSA. The guidelines provide recommendations and suggestions to both sleep physicians and dentists in the prescribing and oversight of dental appliance use in these conditions.

For these partnerships to work, we definitely need effective communication between providers. This has been a major stumbling block in attempts to deliver on value-based care here and across the country. Delaware is fortunate to have a central registry for health information in the form of the Delaware Health Information Network (DHIN). This could be a repository for this communication.



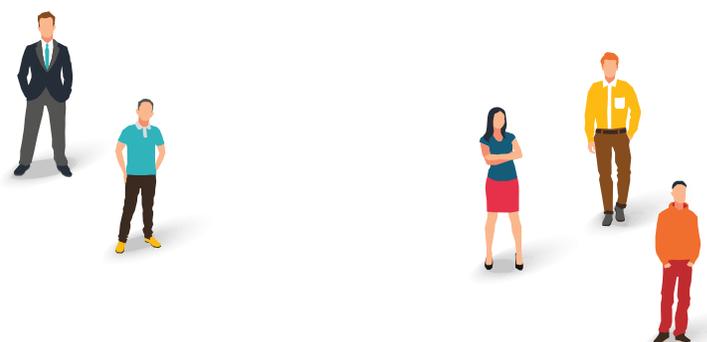
These are just a few examples of how medicine and dentistry can improve the lives of Delawareans, but there may be many more. I look forward to hearing about new and innovative collaborations that can capitalize on the training and expertise of these two highly skilled groups of doctors.

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- 4 Ramar K, et al. Clinical practice guideline for the treatment of obstructive sleep apnea and snoring with oral appliances: an update for 2015. *J Clin Sleep Med* 11: 773-827, 2015.



Prayus Taylor, M.D. is the Immediate Past President of the Medical Society of Delaware and a practicing nephrologist with Nephrology Associates, P.A. in Newark, Delaware. He also serves as Program Director for the Nephrology Fellowship Program at Christiana Care Health System (Sidney Kimmel Medical College) and is the Medical Director for FKC Brandywine Home Therapies.



Can a Toothpaste Reduce Heart Attacks and Strokes?



My father was a busy and successful dentist in New Haven, Connecticut. One of my earliest memories is of sitting in one of his dental chairs and having my teeth inspected and cleaned. Many years later when I was about to start medical school, my father told me that in his practice, patients with poor dental condition and poor mouth hygiene frequently had other serious medical conditions. Clearly, it appears that my father's comment was prescient!¹⁻⁷ A recent review revealed 468 articles published since 1991 involving the relationship between poor dental hygiene, such as periodontitis or missing teeth, and the presence of atherosclerosis often in the form of ischemic heart disease.

In the current issue of *The American Journal of Medicine*, the use of a plaque-identifying toothpaste produced statistically significant reductions in dental plaque and high-sensitivity C-reactive protein.⁸ Coronary heart disease events were not recorded because the number of patients was small and the treatment duration was 60 days. The authors reported that a plaque identifying toothpaste significantly reduced hs-CRP. This interesting study raises many new questions requiring the initiation of at least one large randomized double-blind trial to test whether this observed reduction in hs-CRP will result in fewer myocardial infarctions and strokes in a large sample with treatment and follow up of several years.

The relationship between inflammation and atherosclerosis is now well established, and poor oral hygiene is certainly an important potential site in the body for continuous inflammatory stimulation. If the use of a plaque-identifying toothpaste were shown to reduce coronary events, this would represent a simple, easily performed

method for reducing the impact of coronary arterial atherosclerosis. I commend the investigators for seriously considering such a trial. The study design would be straightforward, as would be the determination of the cardiovascular outcomes. I for one hope that such a trial will confirm my father's clinical observations made many decades ago!!

As always, I welcome your questions and comments on *The American Journal of Medicine* blog at: <http://amjmed.org/>.



Joseph S. Alpert, MD
University of Arizona College of Medicine
Tucson
Editor in Chief
The American Journal of Medicine

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Achieving Excellence in Cleft Care: From Birth to Adulthood

Joseph A. Napoli, M.D., D.D.S.

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INTRODUCTION

Orofacial clefts, comprised largely of cleft lip with or without cleft palate (CL/P) and cleft palate only (CPO) are among the most common congenital anomalies (Figure 1). Because of the anatomic location of the



Figure 1. Complete bilateral cleft lip and palate. Note eruption of teeth from premaxilla.

birth defect, a wide range of structural and functional impairments occur that are best managed by a variety of healthcare specialists. Although most associated problems are a result of the defect, some are by iatrogenic means. Moreover, while most issues are managed during childhood, adults with CL/P will often have cleft related treatment needs. The purpose of this article is to describe the issues associated with orofacial clefts, management of these issues, and discuss strategies to achieve excellence in care for our patients and families affected by these conditions throughout their lives.

OVERVIEW OF CLEFT LIP AND PALATE AND ASSOCIATED PROBLEMS

The incidence of orofacial cleft nationally is approximately 1 in 600 births. In Delaware, the estimated incidence for cleft lip, with or without cleft palate is approximately 1 in 1270 births and 1 in 1600 for cleft palate only (Mai, Isenburg, Langlois, Alverson, Gilboa, Rickard, ... Kirby (2015).

Among the earliest concerns for a child born with a cleft palate is airway obstruction, specifically in those children with CPO associated with Pierre Robin sequence (PRS). The airway impairment occurs at the level of the tongue base resulting from mandibular hypoplasia. Feeding difficulty may also occur either simply related to the cleft palate which prevents generation of the intraoral negative pressure necessary for suction, or airway compromise (i.e. Pierre Robin sequence), which can limit the rate of nutrition intake, causing failure to thrive.

A cleft of the palate very often leads to eustachian tube dysfunction due to the anatomic arrangement of the

tensor veli palatini and levator palatini muscles. Otitis media with effusion is almost universal among children born with cleft palate and, if left untreated may lead to permanent conductive hearing loss. It should be noted that some children with cleft palate will pass the newborn hearing screening exam, only later to develop fluid build-up in the middle ear, resulting in hearing loss identified on later examination. Hearing is critical to the development of normal speech. Hearing loss at an early age can impair speech and language development and this could be particularly significant in children with cleft palate who are already at risk for speech difficulty.

The soft palate is part of a complex valve mechanism necessary for normal speech production. When incomplete closure of the velopharyngeal port occurs (velopharyngeal dysfunction), speech will sound hypernasal and can limit intelligibility. In some children with velopharyngeal dysfunction (VPD), their attempts to compensate for the “air leak” during speech production can lead to other complex speech sound errors (known as “compensatory errors”) which may be very difficult to correct. In addition to the speech errors related to VPD, speech errors associated with dental malocclusion may also occur. These latter types of errors are not amenable to speech therapy and require orthodontic and/or surgical procedures to allow correction.

In patients with cleft lip and palate, particularly if the anterior maxilla and the alveolar ridge are affected by the cleft, the alignment and position of the teeth are likely to be adversely affected. Dental anomalies are also prevalent in patients with cleft lip only (Vallino, Zuker, & Napoli, 2008). This will often make dental hygiene difficult and lead to an increase in dental caries rate. Additionally, the bone defect resulting from the cleft creates inadequate support for teeth along the cleft which may lead



Figure 2. The x-ray shows the bony defects in bilateral cleft lip and palate.

to tooth loss (Figure 2). Furthermore, surgery to repair the cleft lip and palate may interfere with growth of the maxillary segments leading to severe malocclusion of the jaws. Occlusal defects can have an adverse effect on eating, speech and facial appearance.



Figure 3. Occlusal view of an alveolar cleft.

Oronasal fistulas associated with cleft of the maxilla may result in regurgitation of food and fluid leaking out of the nose, and possibly causing embarrassment (Figure 3).

As already mentioned, poor dental alignment increases the risk of caries. Other risk factors for caries include extensive

need for orthodontic care, presence of scar in the labial vestibule which may reduce access for tooth brushing, and other associated medical issues which may reduce dental care as a priority for parents whose children have multiple congenital anomalies.

Finally, but not least in importance, are the psychosocial burdens associated with cleft lip and palate. From the aforementioned issues, one can easily see the financial, emotional, and social burden carried by families afflicted with this condition. Teasing and bullying have long been a concern for families of individuals with facial difference or speech abnormalities and may lead to poor self-esteem. Much has been written about effect of facial differences on the psychological welfare of children and adults alike. Although much of this information appears in health care literature, the topic has also been addressed in popular media, for example, Wonder (Palacio, 2012).

The cost of cleft care is significant, and certain aspects of care may not be covered by insurance. While most of the surgical procedures are covered, associated dental (especially orthodontic care and implant replacement of missing teeth) and psychologic services may not be covered.

TREATMENT

Obstructive airway issues in neonates and infants with cleft palate are most commonly associated with Pierre Robin Sequence. In this condition, the mandible is small and retrognathic. This can result in glossoptosis with the base of tongue positioned posteriorly, obstructing the airway. Treatment options range from non-surgical maneuvers such as positioning the child in the side lying or prone position in mild cases, to tracheostomy in the most severe cases. Before committing to tracheostomy, however, other options may be considered including tongue to lip adhesion (glossopexy) or mandibular lengthening by distraction osteogenesis (MLDO). A hypoplastic mandible is sometimes identified prenatally and may alert the obstetrician and neonatologist of a potential newborn with an at-risk airway. In the absence of airway obstruction, mandibular hypoplasia is not treated during infancy.

Feeding difficulty attributed to cleft palate is most commonly associated with inability to create negative intraoral pressure which is necessary for suction. Another cause of feeding difficulty is airway obstruction, (typically in patients with Pierre Robin sequence). While breastfeeding may be possible for infants with a small palatal cleft or isolated cleft of the lip, the majority of infants with cleft palate are unable to breastfeed.

Feeding challenges are addressed by establishing a safe airway, use of special bottles and nipples designed for infants with cleft palate, and supportive coaching for the select infants that may be able to breastfeed. Successful management relies on the expertise of multiple specialists working together including surgeons with expertise in airway management, nurses, occupational therapists, and speech-language pathologists with experience in feeding therapy, and lactation consultants.

Management of the effects of eustachian tube dysfunction is critically important for otologic health, in particular as it relates to infection and hearing loss. Otitis media in children with cleft palate frequently requires otologic surgery, specifically bilateral myringotomy with pressure equalizing tube placement. If myringotomy with tubes is required, this can be combined under the same general anesthetic as another procedure, commonly at time of cleft palate repair. Vigilance must be maintained from infancy, through childhood, and into adulthood to assure the ongoing otologic health and maintenance of optimal hearing as this is so critical not only to speech and language development, but also for

the ability to succeed in the classroom and during one's employment.

Cleft palate repair is usually done at approximately one year of age. The speech-language pathologist (SLP) begins to address speech sound development at about this time and continues to follow the patient's communication progress during the course of his or her development. The majority of children who have repair of cleft palate will have normal speech, especially when done by an experienced surgeon. However, due to various factors, complete velopharyngeal closure may not be achieved even after cleft palate repair, resulting in hypernasal speech and nasal air emission. The SLP with experience in cleft associated speech problems provides guidance to patients-and surgeons-during management of these issues. With proper diagnostic tests, including videonasoscopy, the site and anatomic configuration of velopharyngeal portal and inadequate closure can be identified, information that is useful in determining the need for surgical correction of VPD. When surgery is not indicated or cannot correct the problem, prosthetic management such as a palatal lift or palatal bulb appliance, can be fabricated by a maxillofacial prosthodontist to treat VPD (Figure 4). Fortunately, a number of secondary operations have



Figure 4. Speech bulb appliance combined with a partial denture to replace missing anterior teeth.

been designed over the years to correct VPD. Caries is largely a preventable disease. Oral hygiene instruction should be initiated well before the full complement of primary teeth erupt. We recommend hygiene instruction for parents at time of

eruption of primary incisors, allowing infants to become used to examination of the mouth and teeth.

Support for the permanent teeth in the vicinity of the cleft requires healthy bone and stability of the maxillary segments affected by the cleft. This is accomplished by placing a bone graft, usually autogenous bone harvested from the patient's iliac crest, across the cleft gap in the alveolar process to bridge the bone defect and unite the

maxillary segments. This procedure is known as alveolar cleft bone grafting and is usually done when patients are in mixed dentition prior to eruption of maxillary permanent canine, sometime between age 7 and 10 years (Napoli, 2017). There is usually a crossbite on the side of the cleft; bilateral crossbite in patient with bilateral cleft lip and palate. Prior to placing the bone graft, transverse maxillary expansion is accomplished with an orthodontic palatal appliance. This will correct the maxillary width and allow reconstruction of the alveolar bone defect with bone graft. Benefits of this procedure include closure of the oronasal fistula, provision of bone for support of teeth in region of cleft, and skeletal support for later nasal reconstruction.

As children with cleft lip and palate enter the teen years and young adulthood, particularly those with bilateral cleft lip and palate, the malalignment of the jaws worsens, creating a class III malocclusion. Both the crossbite and class III malocclusion are iatrogenic and associated with surgical procedures done to repair cleft lip and palate during infancy and childhood. If severe enough, orthognathic surgery is required to correct the malocclusion and midface deficiency (Napoli and Vallino, 2017). If the anterior-posterior discrepancy is very severe, conventional orthognathic surgery may be insufficient to correct the occlusion and advancing the maxilla by distraction osteogenesis may be necessary (Figure 5). There is significant risk in attempting to correct the skeletal malocclusion with orthodontics alone including resorption of tooth roots, especially the maxillary incisors, with tooth loosening, and in severe cases, loss of teeth.



Figure 5A

Perhaps the most significant issue associated with facial differences associated with cleft lip and palate is the psychological burden carried by both the affected individuals and their family members. Additionally, the costs of services to care for these individuals can significantly add to the stress experienced by affected families and may even become a barrier to adequate care. While the stigmata of the cleft cannot always be

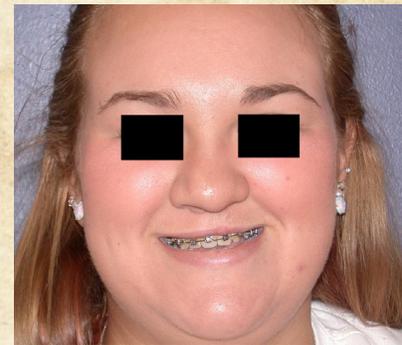


Figure 5B



Figure 5C



Figure 5D

removed, and the financial obligations completely mitigated, much can and should be done to reduce the burden and assist individuals and their families in their ability to manage these issues. Psychologists and other mental health professionals, and social workers are vital members of the cleft and craniofacial team and actively play a role in caring for these patients. Access to psychological care for children and families is considered standard of care by (American Cleft Palate-Craniofacial Association (ACPA) Parameters of Care, 2009), and is often initiated during team visit.

PRINCIPLES OF HEALTHCARE EXCELLENCE

The Oxford dictionary defines excellence as “the quality of being outstanding or extremely good” (Oxford, 2017). Achieving excellence in healthcare for patients with CLP compels us to provide a comprehensive approach to care that will deliver to a patient the best possible outcome and satisfaction with care, leading to a positive impact on the person’s quality of life. To do this effectively, we need to create a culture of excellence that at least includes a standard set of guidelines such as that set forth by the ACPA Standards of Care (ACPA Parameters of Care, 2009). The culture should be that of patient-centered care, innovation without compromising quality outcomes, and continual improvement.

Creating excellence in healthcare is an ongoing process. There are at least five core features central to a model of healthcare excellence: it is patient-centered, accessible, collaborative, includes measurable outcomes, and cost-effective. Each feature will be described below.

PATIENT-CENTERED CARE

A hallmark of excellence is that treatment is patient-centered. Each patient and caregiver(s) brings to the team or provider a set of values, preferences, and desired healthcare outcomes based on their experiences and perceived needs. Patient-centeredness is a unique blend and appropriate balance of a clinician’s findings

and input, active participation of parent/patient, and the services that can be provided within a given context (Vallino and Louw, 2017).

Certainly, for some decisions, there is clearly one optimal path to take (i.e., cleft palate repair prior to onset of speech), but for most decisions, there are other options (i.e., surgical or prosthetic management of hypernasal speech), including no intervention (as in the case where a teenager does not want surgery to improve speech). This patient/family involvement in the decision adds value to the management plan.

ACCESSIBLE

Beginning in infancy, most individuals with CLP receive the services of a team starting in early infancy (some prenatally). A connected referral network should be barrier free (Vallino, Ruscello, and Zajac, in press). This means that the patient and family should be able to locate a team where services are provided, or community-based providers (i.e., dentist, general care providers, psychologists) who can manage the health care needs of the person with a CL/P. The latter is particularly vital as the young adult with cleft palate transitions from a pediatric interdisciplinary team to an adult-centered team.

In addition to accessibility of care, care needs to be affordable. Recognizing the reimbursement limitations and lack of or inadequate health insurance for some individuals, the move towards excellence needs to actively address the financial issues for individuals with cleft lip and palate.

COLLABORATIVE

Collaboration begins early in the child’s care to establish care that will carry over into adulthood. Collaboration, especially with providers outside the team is critically important, especially for young adults who are beginning to transition between settings whether it is an adult-centered interdisciplinary team or a community-based system with independent providers (Vallino and Louw, 2017). This interprofessional collaboration provides and assures seamless care for the patient and families.

MEASURING OUTCOMES

Evaluating outcomes and satisfaction is a critical component to health care excellence. It is too important to overlook. Measuring outcomes is difficult and sometimes seemingly impractical but it

is a very necessary feature of healthcare excellence. We need to begin by considering measures that are multidimensional, those that are both biomedical and psychosocial (e.g., patient-report of satisfaction with outcome). Robust measures and the means by which it is organized will produce evidence of positive (or negative) outcomes, which may lead to changes in care delivery. Evaluating outcomes is a powerful motivator for continuous improvement.

COST-EFFECTIVE

Lastly, healthcare must be cost effective without compromising care. Needless or unnecessary treatment can lead to high cost of care. The use of electronic medical records in both hospital and physician offices between these providers is increasing (Rumball-Smith, Shekelle, and Bates, 2017). Its use and availability can enhance communication and collaboration between the hospital-based team providers, thereby reducing redundancy in care (Grady and Redburg, 2010), and costs.

These elements should be nurtured by the leadership of teams involved in cleft care and the organizations they serve to sustain a culture of excellence and continual improvement.

ACHIEVING EXCELLENCE IN CLEFT LIP AND PALATE CARE

From the aforementioned sections, one can begin to see the complex interrelationship of all the issues associated with an orofacial cleft. The impact of the cleft and the perceived impact on the quality of life evolves over the course of the individual's life (Zajac and Vallino, 2017; Vallino and Louw, 2017).

No individual specialist or caregiver is equipped to provide all the necessary care associated with cleft lip and palate and the term "team" has been introduced earlier in the article. Fortunately, K. Herbert Cooper, an orthodontist in Lancaster, Pennsylvania recognized the benefit of having clinicians caring for children with cleft lip and palate see the children together for evaluating and planning care. In 1938, the concept of team care was launched. Dr. Cooper established the Lancaster Cleft Palate Clinic with the initial team consisting of a surgeon, an orthodontist, and a speech-language pathologist. Since then, team care has become recognized as standard practice in managing the health care needs of these individuals with orofacial clefts in this country and around the world. Initially, the team

dealt with the obvious issues: visible facial deformity, dental problems, and speech abnormalities but over time many more needs were recognized and addressed.

As greater understanding of the complexity and wide-ranging effect of orofacial clefts developed, other specialties were added to the clinical team including otolaryngology, genetics, dysmorphology, audiology, psychology, and social work. This has been driven by a greater understanding and awareness of the importance of psychologic health, relationship of otitis media to hearing loss and speech development, advancements in medical genetics and teratogenicity, association with other congenital anomalies, especially cardiac and renal, and finally the complex financial considerations as barriers to care. Given the wide range of services required, a team patient care coordinator is necessary to assure that all these needs are met.

Excellence in care begins when an expectant family first learns of a pregnancy with a fetus having a cleft, or any other congenital anomaly for that matter. There is often an associated level of anxiety and sometimes despair surrounding what was hoped to be a very joyous beginning. Prior to high quality prenatal ultrasound, orofacial clefts were not identified until the actual birth, or in the case of CPO, perhaps days to weeks after birth, often rendering care givers ill prepared to deal with both the emotional as well as the physical needs of the infant. Since the advent of high quality prenatal ultrasound, most cleft lips are identified at about 20 weeks of gestational age. This could be considered a mixed blessing, with increased months of anxiety during the remainder of the pregnancy. But it also provides opportunity for education and counseling, very often allaying fears and possibly returning the expected birth into more joyous and celebratory event. Prenatal identification allows care givers to prepare and anticipate the need for higher level airway management and/or availability of special feeding items. It also alerts for the need to evaluate for other congenital anomalies. A prenatal visit with family should be arranged with the hope of providing increased understanding of the issues and support for the family.

Excellence continues at the birth institution, for example, where staff identify the child at risk for airway obstruction and initiate measures to have the delivery occur in a setting where the airway can be secured if necessary.

After birth, excellence in care requires coordinated treatment with correct timing. This is influenced by team

cohesion and how well the members work together. It also requires that the team understands that its members cannot always provide all the care themselves, but must very often collaborate with clinicians outside of the team's home institution, especially if the team covers a wide geographic area and insurance programs dictate where patients can receive services. In a way, the "team" would be expanded to include school based speech-language pathologists, community based dentists, including orthodontists, or others who provide care to the patients of a given team.

Excellence requires an understanding that care begins as early as possible and continues into adulthood as needed. It includes an understanding as to how this condition not only affects the individual but other family members who may be a source of support for the patient.

TRANSITION OF CARE

Some teams are limited by age regulations of the home institution, a particular issue in some free-standing children's hospitals. Team care through a general hospital with an associated pediatric unit is less likely to be affected. Much of the care for cleft lip and palate is provided prior to early adulthood but for some patients, unresolved needs remain into adulthood which can and should be addressed. These may include scar revision, correction of nasal deformity, treatment of malocclusion, replacement of missing teeth, ongoing dental care, counseling for job and relationships. As highlighted earlier, collaboration among institutions and caregivers between pediatric facilities and facilities managing adults, can ensure satisfactory, and hopefully seamless transition for affected individuals and continue to provide excellent care in people born with cleft lip and palate.

SUMMARY

Over the past half century, much has been done to improve the lives of those afflicted with orofacial clefts. Maintaining these gains by continuing team care and adopting accepted pathways toward healthcare excellence should be the goal of all involved with caring for this very common condition.

LEGEND TO FIGURES

Figure 1. Complete bilateral cleft lip and palate. Note teeth in premaxilla. Image from Joseph A. Napoli M.D., D.D.S., Plastic, Maxillofacial, and Craniofacial Surgery, Alfred I. DuPont Hospital for Children. Zajac

and Vallino. Evaluation and Management of Cleft Lip and Palate: A Developmental Perspective, 2017, Plural Publishing, Inc. Reprinted with permission.

Figure 2. The x-ray shows the bone defects in bilateral cleft lip and palate. Image from Joseph A. Napoli M.D., D.D.S., Plastic, Maxillofacial, and Craniofacial Surgery, Alfred I. DuPont Hospital for Children. In: Zajac and Vallino. Evaluation and Management of Cleft Lip and Palate: A Developmental Perspective, 2017, Plural Publishing, Inc. Reprinted with permission.

Figure 3. Alveolar process cleft with oronasal fistula. Image from Joseph A. Napoli M.D., D.D.S., Plastic, Maxillofacial, and Craniofacial Surgery, Alfred I. DuPont Hospital for Children. In: Zajac and Vallino. Evaluation and Management of Cleft Lip and Palate: A Developmental Perspective, 2017, Plural Publishing, Inc. Reprinted with permission.

Figure 4. Speech prosthesis combined with a partial denture to replace missing anterior teeth. Image from Dennis Ruscello, Ph.D., West Virginia University. In: Zajac and Vallino. Evaluation and Management of Cleft Lip and Palate: A Developmental Perspective, 2017, Plural Publishing, Inc. Reprinted with permission.

Figure 5. A-C. Preoperative occlusal and facial views of a young adult with cleft lip and palate. D, E. Postoperative frontal and profile view of same patient after maxillary advancement using distraction osteogenesis. Image from Joseph A. Napoli M.D., D.D.S., Plastic, Maxillofacial, and Craniofacial Surgery, Alfred I. DuPont Hospital for Children. In: Zajac and Vallino. Evaluation and Management of Cleft Lip and Palate: A Developmental Perspective, 2017, Plural Publishing, Inc. Reprinted with permission.

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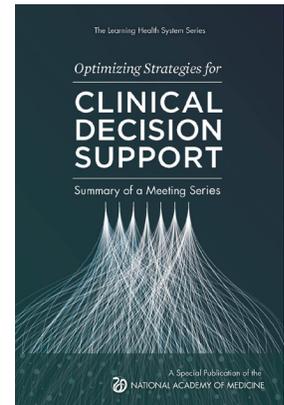
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NAM Special Publication

Optimizing Strategies for Clinical Decision Support

As a result of a collaboration between the NAM and the Office of the National Coordinator for Health Information Technology, this NAM Special Publication summarizes and builds upon a meeting series in which a multistakeholder group of experts discussed the potential of clinical decision support (CDS) to transform care delivery by ameliorating the burden that expanding clinical knowledge and care and choice complexity place on the finite time and attention of clinicians, patients, and members of the care team. This summary also includes highlights from discussions to address the barriers to realizing the full benefits of CDS-facilitated value improvement.

Optimizing Strategies for Clinical Decision Support identifies the need for a continuously learning health system driven by the seamless and rapid generation, processing, and practical application of the best available evidence for clinical decision-making, and lays out a series of actionable collaborative next steps to optimize strategies for adoption and use of clinical decision support. [Download the Special Publication >>](#)



NAM Perspectives

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Community Health Heroes

In the latest interview in this series, we talk to Kim Irwin, executive director of Health by Design, a coalition of diverse partners working to ensure that communities throughout Indiana have neighborhoods, public spaces, and transportation infrastructure that promote physical activity and healthy living. [Read the interview>>](#)

NAM Culture of Health Program

On November 9, 2017, the National Academy of Medicine hosted the second public meeting of its ongoing Culture of Health program, which brought stakeholders together to:

- Visualize health through the lens of art and communities
- Illustrate links across social determinants of health via the science and lived community experience
- Highlight recent movements that have resulted in positive change
- Identify challenges and solutions in creating a culture of health

A webcast of the second public meeting is now available. [View the recorded webcast >>](#)

As part of the program, NAM called upon artists of all kinds to illustrate what health equity looks, sounds, and feels like to them. A digital art gallery featuring the submissions is now available. [Visit the digital gallery>>](#)

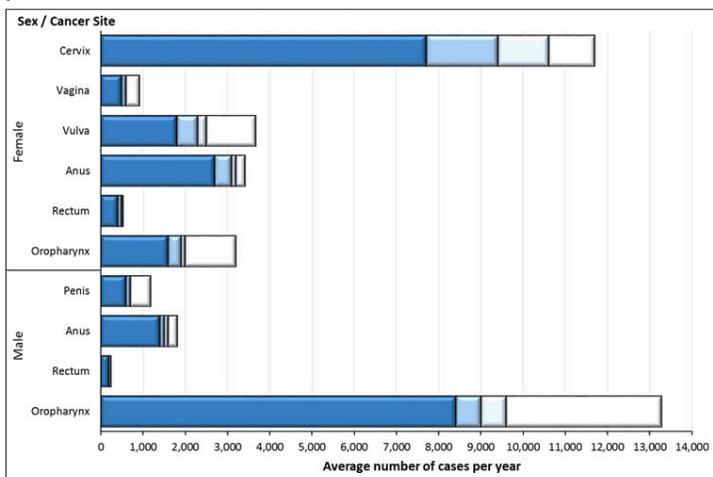
The National Academy of Medicine's Culture of Health Program, funded by the Robert Wood Johnson Foundation, is a multiyear collaborative effort to identify strategies to create and sustain conditions that support equitable good health for all Americans.

Human Papilloma Virus (HPV) and the Implications for Oral Cancer Prevention and Treatment: Can HPV Vaccination Improve Public Health?

Etern Park, M.D., D.D.S.

Human papillomavirus (HPV) is the most commonly diagnosed sexually transmitted disease in the United States. Based on data from 2009 to 2013, approximately 39,800 HPV-associated cancers occur in the United States each year: about 23,300 among women, and about 16,500 among men. Cervical cancer is the most common HPV-associated cancer among women, and oropharyngeal cancers are the most common among men.

Unlike cervical cancer, where all carcinogenic outcomes are attributed to HPV infection, role of HPV in oral cancer development is confounded by its multi-factorial etiology including tobacco and alcohol. Recent studies demonstrated that incidence of HPV-related head and neck cancer is increasing while the prevalence of smoking and alcohol induced cancers has been declining. Up to 70% of cancers of the oropharynx may be linked to HPV. It is estimated that about 3,200 new cases of HPV-associated oropharyngeal cancers are diagnosed in women and about 13,200 are diagnosed in men each year in the United States.



U.S. assessment of HPV types in cancers: implications for current and 9-valent HPV vaccines. *Journal of the National Cancer Institute* 2015.

The human papilloma virus is a double-stranded DNA virus that infects the epithelial cells of skin and mucosa. Over 200 distinct HPV strains have been identified. HPV 16 is the most common viral subtype responsible

for oropharyngeal cancer with implications regarding potential preventive measures.

Patients with HPV-positive disease are different from patients with HPV-negative disease. HPV-positive patients are more likely younger, nonsmoker, and have a better prognosis. Studies showed that the risk of cancer progressing for patients with HPV-positive oropharyngeal cancer is significantly reduced compared with HPV-negative patients. Risk stratification by p16 or HPV status has been evaluated and incorporated into clinical trials. For instance, different chemoradiotherapy programs (RTOG 1016), different radiation doses after induction chemotherapy (ECOG 1308) and primary management with trans-oral robotic surgery (ECOG 3311) are studied. Patients with HPV-positive, advanced oropharyngeal carcinoma were treated with chemoradiotherapy with radiation doses reduced by 15-20% were associated with high progression-free survival and an improved toxicity profile. Radiation de-escalation has potential to improve the therapeutic ratio and long-term function for the patient with HPV-positive oropharyngeal cancer.

American Joint Committee on Cancer (AJCC) staging system in the seventh edition (2010) did not distinguish between HPV-positive and HPV-negative head and neck cancer. In the upcoming eighth edition (2017, to be implemented on January 1, 2018), separate staging

AJCC Comprehensive Stage	T and N staging	
	HPV-related (p16+)	Non HPV-related
Stage I	T0-T2N0-N1	T1N0
Stage II	T0-T2N2 or T3N0-N2	T2N0
Stage III	T4 or N3	T1-3N1 or T3N0
Stage IVA	M1	T1-T3N2a-N2b or T4aN0-N2b
Stage IVB	NA	Either T4b or N2c
Stage IVC	NA	M1

systems have been established. The new system has only three stages for non-metastatic HPV-related oropharyngeal cancer.

Although HPV-related oropharyngeal cancer is associated with a better prognosis and response to therapy than HPV-negative tumors, current treatment for patients with HPV-related oropharyngeal cancer is essentially same as for those with HPV negative tumors. Multi-center clinical trials are currently underway to determine de-escalation treatment can be applied to HPV positive tumors. In non-oropharyngeal cancer, eg. tongue, floor of the mouth, or gum cancer. HPV-positivity is less common. Its prognostic implications are unknown at this time for HPV positive non-oropharyngeal cancer.

In the United States, there are only two cancer preventive vaccines are approved. Hepatitis B virus (HBV) vaccine is for prevention of chronic HBV infection which can lead to liver cancer. The other is HPV vaccine. Currently three different vaccines are available which vary in the number of HPV types they contain and target. Among Gardasil, Gardasil 9, and Cervarix, Gardasil 9 is the only HPV vaccine available in the United States as of 2017. Advisory Committee on Immunization Practices recommend 2-dose schedule routine vaccination at age 11 or 12 years up to 26 years since 2006 for females and since 2011 for male. Clinical trials have demonstrated that FDA-approved HPV vaccines can prevent anogenital HPV infections and precancerous lesions that lead to HPV-associated cancers, including cervical and anal cancer; however, potential impact of current HPV vaccines on oral HPV infections that lead to cancer has not yet been tested through clinical trial.

National Health and Nutrition Examination Survey (NHNES) study of more than 2,600 young adults in the United States found that the prevalence of oral infection with four HPV types, including two high-risk types, was 88% lower in those who reported receiving at least one dose of an HPV vaccine than in those who said they were not vaccinated.

HPV vaccines are strongly recommended for cancer prevention; however, a self-reported survey in 2015 showed only 60% of girls and 50% of boys under age 18 received more than one HPV vaccine dose. Recently, it has been noted that the incidence of HPV-positive oropharyngeal cancer has been rising, while the incidence of cervical cancer has declined, due to highly effective cervical cancer screening program. There are

no formal screening programs for the non-cervical cancers, including oropharyngeal cancer. In the head and neck cancer management, many would agree that early diagnosis and treatment are the most important prognostic factor. Perhaps promotion of universal HPV vaccination could bring even more positive impact on public health, potentially longer life spans and reduction of treatment related morbidity while improving post cancer treatment quality of life.

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Dr. Park is a member of the American Association of Oral and Maxillofacial Surgeons, American College of Oral and Maxillofacial Surgeons, American Dental Association, American Dental Education Association, American Medical Association and American Society of Clinical Oncology. He speaks fluent Korean.



Office Anesthesia in Dentistry: Assuring Safety While Reducing Anxiety

*Alexandra Rafetto, B.S.
Louis K. Rafetto, D.M.D.*

BACKGROUND

An inability to cooperate with dental treatment may indicate the need for anesthesia “beyond” that of local anesthesia, including moderate and deep sedation and general anesthesia.

Further, given the number of patients with significant medical conditions that walk into dental offices on a daily basis, often requiring multiple medications in the effort to maintain some level of control, the possibility of a crisis occurring may be greater now than ever.

Given the above, 2 questions come to mind;

- 1) How safe is anesthesia in the dental office and,*
- 2) What can be done to ensure the best opportunity for favorable outcomes?*

HOW SAFE?

The incidence of anesthesia related complications in the dental office is difficult to estimate, in large part because they are a rare occurrence. Studies looking at adverse outcomes differ in the method used for counting and often rely on self-reporting. Further, given that there are no uniform requirements for reporting adverse events in different states and territories, there are likely many unreported crisis events that were handled without

patient injury. It is safe to say that despite advances in safety over time, the risk of adverse anesthetic events is not zero.

Recently, both the California and Texas dental boards conducted 5-year retrospective reviews of deaths or permanent injuries associated with the administration of in the care of dental patients.

The California Board conducted a retrospective review of pediatric (21 & under) anesthesia deaths from 1/1/2010 – 12/31/2015. There was no reliable estimate of the number of patients treated during this time interval.

They identified 9 documented deaths. One occurred in an oral surgery office with the rest in the offices of general dentists, pediatric dentists and itinerant dentist anesthesiologists. Of interest was the fact that 3 occurred in a hospital or surgical center and 3 were associated with local anesthesia overdose.

The Texas panel reviewed “major events” (mortality or permanent morbidity) and “mishaps” (no permanent morbidity) of cases investigated by



the state dental board between 2011-16. Six cases were identified including 5 deaths and 1 brain injury. Two of the patients were adults, both of whom were medically compromised, and 4 were children, 3 were “healthy” and one who had cardiac disease. Four of the 6 cases involved “second” anesthesia providers including MD anesthesiologists and dentist anesthesiologists.

In a 2013 article in *Pediatric Anesthesia*, media reports of pediatric dental anesthesia mortality from 1980 – 2011 in dental offices, ambulatory surgery centers, and hospitals were reviewed. ¹ The report did not likely capture every death and did not indicate if the death was directly associated with the anesthetic. They found that most of the deaths occurred among 2–5 year-olds (n = 21/44), in an office setting (n = 21/44), and with a general/pediatric dentist (n = 25/44) as the anesthesia provider. In the latter group, 17 of 25 deaths were linked with a sedation anesthetic.

This series likely represents a fraction of the overall morbidity and mortality related to dental anesthesia and suffers from the absence of a database that could provide an estimate of incidence and prevalence of morbidity and mortality.

The best, although not definitive, data comes from the specialty of oral and maxillofacial surgery. At the American Association of Oral and Maxillofacial Surgeons (A.A.O.M.S.) Clinical Science Innovations in Oral and Maxillofacial Surgery meeting in April 2017 ², Thomas B. Dodson reviewed relevant outcomes studies in the effort to arrive at estimated death and adverse outcome rates. Studies cited included:

- 1) 4 separate Massachusetts Society of Oral and Maxillofacial Surgeons anesthesia outcome studies - Self-reported surveys for 1992, 1999, 2003, and 2008.
- 2) A.A.O.M.S. Outcomes System 2001 – A 10 year prospective cohort study of consecutive subjects undergoing OMS procedures in the office-based ambulatory anesthesia setting by volunteer OMSs practicing in the United States.
- 3) A.A.O.M.S. Study on Anesthesia/Third Molar Benchmark Study 2011 to 2012 – A one-year prospective cohort practice based research network study that included consecutive subjects who underwent procedures in the private practice O.M.S. offices (randomly selected practices in the United States).

Together these studies suggest an estimated death rate of 1.5 per million anesthetics for the office based team

model in oral and maxillofacial surgery, although this seems unrealistically high, likely because of the method of collecting data in the Massachusetts surveys.

Others numbers have been cited in the effort to quantify the incidence of serious adverse events, including the often referred to anesthetic death rate estimate by Oral and Maxillofacial Surgery National Insurance Company (O.M.S.N.I.C.) of 1 per 365,554 patients. This estimate has since been retracted by O.M.S.N.I.C. due to the difficulty of making an accurate determination.

Along with above efforts to establish a reliable safety estimate, there have been those who have used their own version of risk estimates to further specific political agendas. However, at this time it remains impossible to accumulate accurate data on the nature and frequency of anesthetic related complications.

WHAT IS THE SOURCE OF ADVERSE OUTCOMES?

Philosophers Samuel Gorovitz and Alasdair MacIntyre explored the nature of fallibility, proposing 3 major factors that come into play ³:

- 1) **Ignorance:** Despite ongoing efforts, science affords only a limited understanding of how things behave,
- 2) **Ineptitude:** Even when knowledge is available, we may fail to apply it correctly.
- 3) **Necessary Fallibility:** Some things science and technology will never be able to explain or understand. This they categorized as “omniscience”.

The first and second proposed reasons for fallibility seem to be surmountable sources of error. We generally believe that given time, science will overcome ignorance, and training and technology will overcome ineptitude. However, when we ask science (or medicine and dentistry) to move beyond explaining how things generally behave to predicting exactly how a particular thing (or patient) will behave, we may be asking too much. While we can and should do our best to limit uncertainty when we treat patients, in the end we cannot completely escape fallibility.

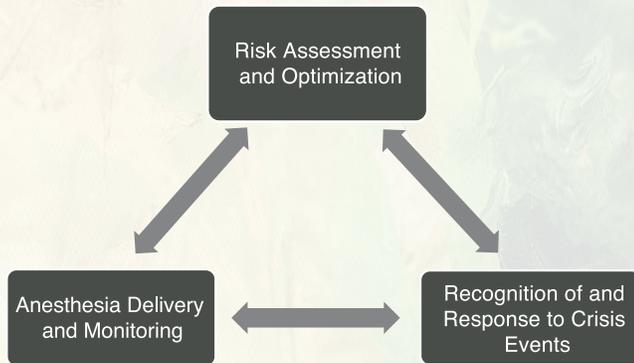
Attention began to focus on the issue of medical errors with the 1999 the Institute of Medicine, which reported that between 44,000 to 98,000 deaths per year were due to “adverse events”. Despite many studies designed to identify ways to correct such errors, in 2016 it was reported that medical errors were the 3rd leading cause of death in the U. S., further illustrating the complexity of the problem.

It is now recognized that adverse events and bad outcomes are generally not just the result of personal errors. Often factors conspire in a manner that makes errors more likely to occur, which was presented graphically through the well known “Swiss cheese” analogy proposed by psychologist James Reason.

Professor Reason is well known for his work on systems errors. In one of his public lectures, he stated (paraphrased) “Almost every day we choose whether or not to cut corners in order to meet operational demands. For the most part, such shortcomings bring no bad effects and so become a habitual part of routine work practices. It’s easy to forget to fear things that rarely happen. Unfortunately, this gradual reduction in systems safety margins exposes it to increasingly vulnerable accident-causing factors.”⁴ This statement identifies an important human factor that increases the chance of an adverse event occurring and emphasizes the need for constant vigilance on the part of the entire anesthesia team.

THE PROCESS

Consider this triad, which suggests an approach to safe anesthesia delivery:



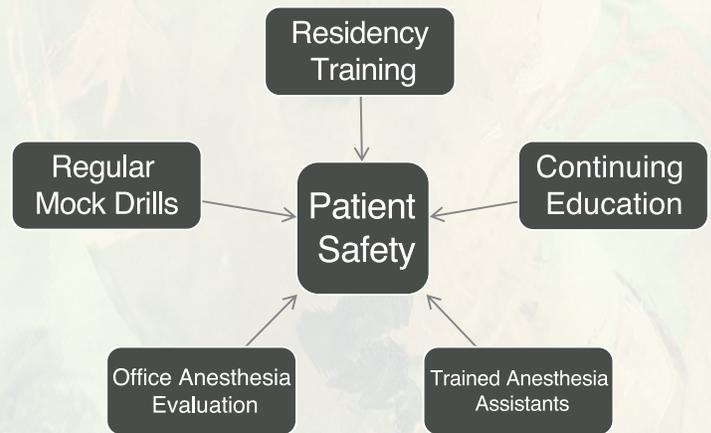
1) Risk evaluation and Optimization – Unique for every patient in the effort to develop a personal anesthetic plan. Should include consultation with other experts as needed and awareness of the limits of the facility and capabilities of the anesthetic team. Young patients and the medically compromised are at increased risk for respiratory or other complications and have a greater risk of sustaining life-threatening events. Training and protocols should have specific measures for these patients. It is worth adding that “fear” can be a good thing when approaching the delivery of anesthesia, for as it has been rightly said, Chernobyl operators never learned to be afraid.

2) Anesthetic Delivery and Monitoring – Includes having a well-trained and functional team in place to assist with delivery of anesthesia and monitoring of the patient during the procedure.

3) Recognition and Response to Crisis Events – Ability to recognize pre-emergency and emergency events as well as the capability to effectively respond to crisis situations.

EFFORTS TO MINIMIZE ADVERSE OUTCOMES

The following diagram (adapted from the A.A.O.M.S. Culture of Safety meeting in 2017) provides a perspective on key factors that contribute to establishing a culture of safety in office-based anesthesia.



Education and Training – Targeted at pre-operative risk assessment and optimization of patients across a wide spectrum of age and risk factors, understanding of anesthetic agents, techniques of administration, monitoring, and the ability to recognize and manage adverse events. Training should emphasize patient selection with the understanding that some patients are not good candidates for anesthesia in the office setting.

Life-long Learning / Continuing Education – Ongoing education of the practicing anesthesia provider and his/her team must be targeted toward reinforcing skills and knowledge from residency and other formal educational programs. This must encourage development of good judgment with emphasis on the ability to determine if any given patient is an appropriate candidate for treatment. Ideally, training should include both didactic and simulation (ex. - A.C.L.S., A.A.O.M.S. simulation courses including Basic Emergency Airway Management and Crisis Management programs, etc.). Team members can be trained through formal programs like the Dental Anesthesia Assistants National Certification Exam (D.A.A.N.C.E.) or other similar programs.

Team Model – The anesthetic team must function in a manner that supports one another in the effort to provide the best possible care. Training must include the entire team of individuals responsible for the care of the patient ranging from trained assistants and nurses to the doctor in charge of treatment.

Management of Medical Emergencies – The anesthetic team and support personnel must be trained and current in recognition and management of emergencies. REGULAR mock drills must be conducted and targeted to address a wide variety of potential likely emergency events.

Office Anesthesia Evaluation Program – Regular evaluations using the A.A.O.M.S. Office Anesthesia Evaluation (O.A.E.) assessment process assists in organizing the team and increasing awareness of strengths and weakness in the effort to identify and encourage change(s) as necessary. The O.A.E. or other like programs should be used to credential both practitioners and facilities.

In addition to evaluating the provider and staff, the facility must be evaluated and found to be designed to promote safety in the management and recovery of patients. The necessary monitoring equipment must provide advance warning of hypoxic events. Facilities must be equipped with monitoring equipment, defibrillators, emergency drugs and age appropriate airway devices that allow effective crisis intervention and should be available and functional at all times. All resuscitative drugs should be checked and equipment tested at routine accepted intervals.

Note - In Delaware, individuals and practice venues offering anesthesia services are accredited by the state with inspections performed every 3 years. The current state program is built upon the A.A.O.M.S.'s Office Anesthesia Evaluation, an office inspection program required for all oral surgeons to maintain membership in their national organization. The state offers different "levels" of permits based on the depth of anesthesia provided.

KNOWLEDGE AND PERFORMANCE IN ANESTHESIA DELIVERY

The ability to deliver anesthesia in a safe manner requires not only knowing “what to do”, but also the ability to put acquired knowledge and skills to work.

1) **KNOWLEDGE:** All anesthesia teams must have a contemporary base of knowledge and skills related to risk assessment, anesthesia delivery and crisis management.

2) **PERFORMANCE:** The ability to use accumulated skills and knowledge to work, employing a mindset that allows the team to recognize and respond in an effective manner.

KNOWLEDGE:

The usual approach to learn the science and related information that support safe anesthesia delivery is to apply traditional learning skills we developed as students / residents / fellows. There are plenty of courses, books and other resources available to help in the effort to obtain and update this base of knowledge. In addition, “guidelines” have been issued by a number of organizations in an effort to improve and standardize anesthetic management. An example is the *Parameters of Care, Clinical Practice Guidelines for Oral and Maxillofacial Surgery*, which reflects clinical practice guidelines that reviews standards for treating patients receiving office-based anesthesia, including the monitoring procedures and equipment that should be followed by the surgeon and staff.

It is important to recognize that both knowledge and skills decline over time. For example, in Resuscitation (2008), Smith, Gilcrest and Pierce reported that A.C.L.S. skills degrade faster than B.L.S. skills. 4 They considered 133 subjects and found the following:

B.L.S.:	63% passed B.L.S. skills at 3 months
	58% passed at 12 months.
A.C.L.S.:	30% passed A.C.L.S. skills at 3 months
	14% passed at 12 months.

The take home point should be that knowledge (and skills) need to be updated and reinforcement on a regular basis.

After obtaining the necessary knowledge base, teams should develop a written plan that concisely summarizes (protocols) keys to management, especially should be done in the event of a crisis. This should guide the organization of appropriate equipment and medications along with how and when to administer each.

PERFORMANCE:

Of equal importance is developing a productive mindset that keeps the team from getting sidetracked by the negative influences stress and fear can have in the moment of crisis. Making decisions under pressure is never a simple undertaking, particularly given the emotions and complexity inherent in crisis situations.

MOCK DRILLS/CRISIS RESOURCE MANAGEMENT

Given that adverse events are not entirely preventable, it is important to understand that once an incident is triggered, the best chance of a successful outcome occurs when there are well-trained people and systems in place to recognize and respond effectively.

While simulators provide the best method for conducting mock crisis experiences, they are not yet readily available and affordable for most. The next best approach is mock drills.

Properly conducted, mock drills allow team to “be there in advance” of the real thing, so that if and when a crisis occurs, members of the anesthesia team will be familiar with their role in the response process. The familiarity and confidence that can result from having practiced for such events equips us to embrace the challenge when it presents itself rather than allowing the challenge to control the moment.

TIPS FOR EFFECTIVE CRISIS MANAGEMENT

During the crisis:

- Call for help early
- Mobilize resources
- Allocate attention wisely
- Use all available information
- Communicate effectively

Failure to speak up because of fear of being wrong or intimidation, failure to confirm communication (not closing the loop), and neglecting to include important facts are common errors in communication. Clear, unambiguous language is preferable during all medical communication, and especially during critical incidents. An effort should be made to avoid implied and inferred communication, communicating in a manner so that you cannot be misunderstood

A popular approach to crisis management follows the acronym “STOP”:

- S - Stop (control anxiety and fear)
- T - Think (get properly organized)
- O - Observe (identify key factors / avoid denial)
- P - Plan
- A - Act (deliberate and decisive actions)
- R - Revise / Reassess

Flow chart of how mock drills should work:

Pressure occurs when you are attempting to do something you are not sure you are capable of. The further you are from the familiar, the further away you are from being comfortable and confident. With pressure, “outside things” begin to interfere with your ability to execute a skill or apply knowledge. This applies to every thing we do in all walks of life. Consider a multi-year study of the top 10% of 12,000 athletes and business leaders using 360 degree multiple rater assessments. The study found that; 1) Pressure adversely impacts cognitive success, 2) Pressure downgrades behavioral skills, 3) Pressure makes people perform below their capacity, and 4) Pressure is often camouflaged.

In the face of pressure and anxiety, the team must be able to process a barrage of imperfect and sometimes conflicting information. It is crucial that they be able to quickly assimilate and process such information, weed out that which is not important, prioritize what is left, test information against prior medical knowledge and experience, make tentative differential diagnoses, decide on a course of action, manage resources effectively, all the while reevaluating the situation in light of evolving information. All this must be done in a timely manner.

Things that can be done to reduce errors include:

- 1) Reduce interruptions
- 2) Reduce distractions
- 3) Improve communications
- 4) Use “stop” or “check” points at critical times during the procedure
- 5) Team training

It is important that the team adopt a productive mindset during a crisis. Such a mindset is often referred to as the being in “the zone”, when we are able to focus on one thing to the extent that we do not notice other less important distractions.

One way to encourage entering the zone of performance is to use tools commonly employed by sports psychologists, for example “imagery”. This is done by rehearsing in a manner that allows us to visualize / live through a potential adverse event in advance. So equipped, we are better able to access and act on the knowledge and skills we have built up and respond in an effective manner when a real crisis occurs, having already “felt and experienced” what it is like.

Have an Intention (Goal of the Response)

Pay Attention (Focused Response)

Debriefing (Team reviews what actually happened)

By paying attention to the results of a mock drill (virtual or real), the team gains an opportunity to identify what worked and what did not work. Ideally, someone from the outside should conduct the training, as they are better able to identify things that may not be obvious to those that work there all the time and are involved in the drill.

Mock drills should be realistic, immersive learning experiences that support:

1. Identification of shortcomings
 1. Were communications clear?
 2. Roles and responsibilities understood?
 3. Resources available?
 4. What errors were made?
 5. What went well?
2. Implementation of strategies to solve them.
 1. Use the “1-2-3 approach”;
1) Tell, 2) Show, and 3) Do.
3. Revise / Improve systems to improve team performance.

FINAL THOUGHTS

Employing best practices in anesthesia care is critical in the effort to ensure a culture of safety. The office environment should encourage trust among team members, be non-putative when mistakes are identified and exhibit a willingness to learn and change in the effort to reduce errors and improve safeguards.

Offices that provide mild, moderate and deep sedation and general anesthesia should employ an ongoing process to monitor and evaluate clinical performance, patient outcomes and adverse events in an effort to support continuous performance improvement.

Unfortunately, safety is an asymptote and unanticipated crisis events can and do occur. Therefore the anesthetic team should be well prepared to respond in a timely and effective manner to any adverse event that may occur. Currently this is best accomplished through regular mock safety drills that address the spectrum of potential and actual crisis situations.

Going forward, it is important for the dental community to make a concerted effort to improve their anesthesia data base and work to standardize reporting requirements of adverse or near miss events. While the A.A.O.M.S. is in the process of gathering such data nationwide through their data registry system (OMSQOR registry with FIGmd), there is no such mechanism currently in place for non-oral surgeons who provide mild, moderate and deep sedation and general anesthesia.

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4. American Society of Anesthesiologists *Standards for Basic Anesthetic Monitoring*, 2015.
5. American Society of Anesthesiologists *Guidelines for Office-Based Anesthesia*, 2014.
6. American Academy of Pediatrics *Guidelines for Monitoring and Management of Pediatric Patients Before, During, and After Sedation for Diagnostic and Therapeutic Procedures: Update 2016*.
7. American Dental Associations *Guidelines for the Use of Sedation and General Anesthesia by Dentists*, 2016.



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Lung cancer is the leading cause of cancer death in both men and women in Delaware and the U.S.

Lung cancer is the most frequently diagnosed cancer in Delaware[1] – and the leading cause of cancer death in both men and women in Delaware and the U.S.[2] Nationally, each year, an average of 411 people per day die from lung cancer.[3]



November is Lung Cancer Awareness Month. **Did you know that there are steps you can take to reduce your risk of lung cancer?** Don't smoke or quit smoking, avoid secondhand smoke, and get your home tested for radon. [Learn more.](#)

Risk Factors[1]

The following are ***lifestyle risk factors***, which a person can modify to reduce his or her risk of getting lung cancer:

- The use of tobacco products: An estimated 85 to 90 percent of all lung cancer cases are caused by tobacco use, according to the U.S. Department of Health and Human Services.
- Exposure to secondhand smoke: When a person breathes in secondhand smoke, it is like he or she is smoking.
- Other suspected lifestyle risk factors include a diet low in fruits and vegetables, a diet high in cholesterol, heavy alcohol use, and smoking marijuana.

The following are ***environmental and medically related*** causes of lung cancer:

- Occupational exposures: Asbestos, mustard gas, radioactive ores, metals (chromium, cadmium, and arsenic), certain organic chemicals, and paint
- Environmental exposures: Radon gas released from soil or building materials, asbestos (among smokers), air pollution, and high levels of arsenic in drinking water
- Radiation therapy to the chest (especially for people who smoke)

The following are ***nonmodifiable*** risk factors (these cannot be changed):

- Family history of lung cancer
- Personal history of tuberculosis

To protect against lung cancer, individuals should avoid tobacco and secondhand smoke, consume a diet rich in fruits and vegetables, engage in recommended levels of physical activity, and maintain a healthy weight.

Early Detection

In January 2013, lung cancer screening guidelines recommending that health care providers discuss screening options with patients who meet certain high-risk criteria for developing the disease were released. High-risk patients are defined as those who:

- Are ages 55–74 and in fairly good health
- Have a smoking history equivalent to a pack a day for 30 years or longer
- Currently smoke or have quit within the past 15 years

Talk to your health care provider about whether you should get screened for lung cancer. [Learn more.](#)

Don't give up on giving up.

Smoking harms nearly every organ of the body and damages your overall health. Regardless of age, smokers can greatly reduce their risk of disease, including lung cancer, by quitting. If you or someone you love is a smoker, we can help. We understand that everyone is different and requires different resources. Learn more about [three FREE ways you can get the help that's right for you.](#)

[1] Delaware Department of Health and Social Services, Division of Public Health, Cancer Incidence and Mortality, 2009-2013, http://www.dhss.delaware.gov/dhss/dph/dpc/files/im09-13_july2017.pdf

[2] Centers for Disease Control and Prevention, <https://www.cdc.gov/cancer/lung/index.htm>

[3] Centers for Disease Control and Prevention, <https://www.cdc.gov/cancer/lung/statistics/>



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SAVE THE DATE

Inaugural Delaware
Lung Cancer Symposium
April 16th, 9:30am-3pm

John H. Ammon Center, Main Auditorium
Christiana Hospital

INBRE study performed by Oral and Maxillofacial Surgery at Christiana Care, looked at the viability of hyperglycemia screening in patients presenting to a high-volume, urban, academic program. Interestingly, over 40% of the patients screened did not have a primary care provider, and thus, the program was also an opportunity to connect patients to other needed healthcare resources. Tobacco cessation, screening for hypertension, and nutrition education are some additional examples of how dentists can integrate into population health.

TEAM CARE

Opportunities exist for formalized physician-dentist team care for segments of a population, such as in the optimal care of patients with diabetes, cancer and obstructive sleep apnea. The team care model brings experts together under one roof to broadly address the patient's needs and coordinate the care. The cleft team model is an existing example of such a successful care delivery model.

TAKING CARE TO THE PATIENT

Taking care to the patient, such as placing a dental clinic in a primary care office or in a community center can ease the challenge of access. Further, embedding oral health resources in 'hotspots' of need, such as the emergency department, is another means of addressing access to and the quality of oral healthcare for populations of patients. The result is that these types of programs create more robust communication and coordination of care across medicine and dentistry and increase access points to care.

SOCIAL DETERMINANTS OF HEALTH

Social determinants greatly impact health. Lack of transportation, healthy food deserts, occupation limitations, inadequate social or family support, housing challenges, and lack of education are social determinants that directly impact the health, including oral health, and well-being of patients. Thus, these issues must be part of any comprehensive plan to achieve population health and improved access to care.

HEALTH INSURANCE

Lastly, dental insurance coverage must become something that is affordable and attainable by all. 40% of Americans do not have dental insurance coverage and the result is inadequate oral health for many, with little to no health maintenance and instead, attempts

to access care only when an acute issue arises, such a pain and swelling. Simply, access to quality care, that includes prevention and not just acute care, is essential to changing the story around oral healthcare and keeping people healthier from an oral health standpoint will improve systemic health, which will improve the health of the entire population.

ACHIEVING CHANGE

Ultimately, to drive change and for access and quality of oral healthcare to improve, silos must be removed, outcomes must be measured, incentives must align, innovation must be fostered, and insurance must be affordable. Population health depends on it.

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- 4 Singer T. Society & Culture: Researchers launch a new model of healthcare that links nursing and dentistry. News@Northeastern. January 20, 2016.



Daniel J. Meara, M.D., D.M.D., M.S., F.A.C.S. joined Christiana Care Health System in 2010, after completing a craniomaxillofacial surgery fellowship at West Virginia University/Charleston Area Medical Center. Prior to that, he completed oral and maxillofacial surgery residency at the University of Alabama, Birmingham, where he also completed a separate general surgery internship. He also previously completed an internship in internal medicine at the University of Pittsburgh. He is the current president of the Delaware Academy of Medicine/Delaware Public Health Association and is chair of the Department of Oral and Maxillofacial Surgery & Hospital Dentistry.

Dr. Meara earned a bachelor's degree in economics at the University of Notre Dame. His master's degree in toxicology is from Michigan State University. His medical degree is from Wayne State University in Detroit, Michigan, and his dental degree is from the University of Alabama. He spent research time at the National Institute of Health and has studied abroad in England, Australia and Japan. Currently, he is completing his master of healthcare delivery science degree at Dartmouth College.

Dr. Meara is board certified and a diplomate of the American Board of Oral and Maxillofacial Surgery. He is also a fellow of the American Association of Oral and Maxillofacial Surgeons, the American College of Oral and Maxillofacial Surgeons, the American College of Surgeons, the International College of Dentists and a member of the American Cleft Palate—Craniofacial Association. Dr. Meara is a recipient of the Faculty Educator Development Award, and has interests in residency education, surgical simulation, and performance improvement. Clinical interests include facial injuries, orthognathic surgery, and cleft/craniomaxillofacial surgery.

EXECUTIVE SUMMARY

Environmental Justice for Delaware

Mitigating Toxic Pollution in New Castle County Communities

HIGHLIGHTS

This report studies the health risks for seven communities located along an industrial corridor in the northern portion of Delaware's New Castle County. These communities have higher percentages of people of color and/or higher poverty levels than the Delaware average. We found that people in the seven communities face a substantial cumulative health risk from exposure to toxic air pollution and their proximity to polluting industrial facilities, hazardous chemical facilities, and contaminated waste sites. These health risks are substantially greater in comparison to those of a predominantly White and affluent Delaware community as well as Delaware as a whole. Significant and expedited improvements in regulatory and public policy are needed at the national, state, and municipal levels to address these issues.

Numerous studies have found that people of color and those living in poverty are exposed to higher levels of environmental pollution than Whites or people not living in poverty. Studies have also found that, compared to national averages, a significantly greater percentage of Blacks (African Americans), Latinos (Hispanics), and people at or near poverty levels tend to live near industrial facilities that use large quantities of toxic chemicals and present a risk of major chemical disasters with potentially severe consequences for nearby communities. Environmental justice requires attention to, and actions to address, the disproportionate health and other quality-of-life impacts on these communities. This harm is amplified by the cumulative impacts from other negative socioeconomic and health factors, such as the lack of access to health care, public transportation, and healthy foods; poor housing conditions; and stress from unemployment, poverty, and crime, among other factors.



Environmental Justice Health Alliance

DELAWARE CONCERNED RESIDENTS
FOR ENVIRONMENTAL JUSTICE

COMMUNITY HOUSING AND EMPOWERMENT CONNECTIONS INC.

coming clean



People of color and people in poverty are being disproportionately affected by air pollution in Delaware, due to the motor vehicles, power plants, and chemical facilities in their communities.

Gretchen Goldman/UCS

Proximity to Major Pollution Sources and Chemical Facilities

This report builds on past work by using publicly available data from the Environmental Protection Agency (EPA) to examine the potential for cumulative negative impacts from health and safety risks for seven communities in Delaware. The seven communities—Belvedere, Cedar Heights, Dunleith, Marshallton, Newport, Oakmont, and Southbridge—have higher percentages of people of color and/or higher poverty levels than the Delaware average and are located along an industrial corridor in the northern portion of Delaware’s New Castle County. We compared them to Greenville, a predominantly White and affluent community located outside the industrial corridor and to the population of Delaware overall. While this report focuses specifically on seven environmental justice communities, other nearby environmentally impacted communities such as Rosegate, Rose Hill, and Hamilton Park likely face similar risks to residents’ health and safety.

Our analysis looked at potential cumulative impacts from the following health and safety issues for these communities (details of methodology are described in the full report):

- risk of cancer and potential for respiratory illnesses affecting residents in the seven communities that stem from toxic outdoor air pollution;
- proximity to facilities in the EPA’s Risk Management Program (RMP) that use large quantities of toxic, flammable, or explosive chemicals and pose a high risk of a major chemical release or catastrophic incident;
- proximity to major polluting industrial sources that report their pollution emissions to the EPA Toxics Release Inventory (TRI); and
- proximity to contaminated hazardous waste sites listed in the EPA’s Brownfield and Superfund Programs.

Dunleith and Oakmont have several brownfield sites as well as close proximity to facilities releasing significant quantities of toxic chemicals into the air. Within its boundaries or within a mile beyond them, the Southbridge community has 2 high-risk chemical facilities, 13 large pollution-emitting industrial facilities, 4 Superfund sites, and 48 brownfield sites. Southbridge is home to more than half of all brownfields in Delaware.

Effects of Toxic Air Pollution on Cancer Risk and the Potential for Respiratory Illnesses

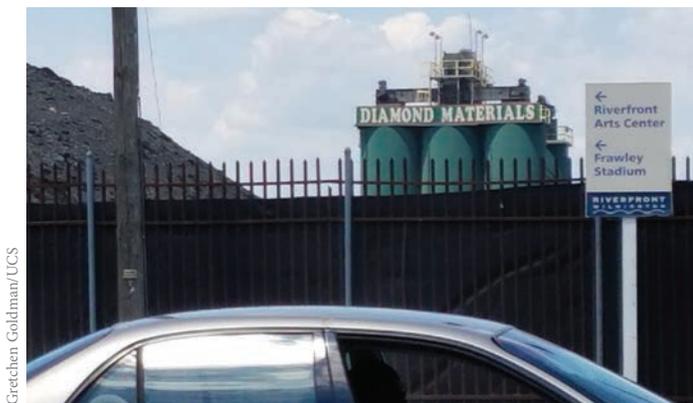
Of the seven environmental justice communities studied, people in Marshallton face the highest cancer and respiratory health risks. Cancer and respiratory health risks there are 33 and 71 percent higher, respectively, than for the comparison community Greenville and are 28 and 55 percent higher than for Delaware overall.

Formaldehyde was by far the most significant chemical contributing to cancer risk, accounting for approximately one-half of the overall cancer risk in most cases.

The communities of Dunleith, Oakmont, and Southbridge, whose residents are predominantly people of color and that have a substantial low-income population, have cancer risks 19 to 23 percent higher than for Greenville and 14 to 18 percent higher than for Delaware overall. Respiratory hazard in these three communities is 32 to 43 percent higher than for Greenville and 20 to 30 percent higher than for Delaware overall.

Cancer risks in Newport, Belvedere, and Cedar Heights, which have a substantial proportion of people of color and poverty rates above the Delaware average, are 21, 15, and 12 percent higher than for Greenville, respectively, and are 16, 10, and 7 percent higher than for Delaware overall. Respiratory hazard in Newport, Belvedere, and Cedar Heights is 44, 30, and 24 percent higher than for Greenville, respectively, and 31, 18, and 13 percent higher than for Delaware overall.

The top five chemicals that contributed the most to cancer and respiratory hazard risks were generally consistent across all communities. Formaldehyde, which in outdoor air is



Gretchen Goldman/UCS

At home, work, school, pray, and play, the health of community members is put at risk by chemicals and pollution released by industrial facilities.

Health Risks for Delaware Environmental Justice Communities Compared with the Wealthier and Predominantly White Community of Greenville and Delaware Overall

Community	Increase in cancer risk, compared to Greenville	Increase in respiratory hazard, compared to Greenville	Increase in cancer risk, compared to Delaware overall	Increase in respiratory hazard, compared to Delaware overall
Marshallton	33%	71%	28%	55%
Dunleith	19-23%	32-43%	14-18%	20-30%
Oakmont	19-23%	32-43%	14-18%	20-30%
Southbridge	19-23%	32-43%	14-18%	20-30%
Newport	21%	44%	16%	31%
Belvedere	15%	30%	10%	18%
Cedar Heights	12%	24%	7%	13%

The seven environmental justice communities studied, all located along an industrial corridor, experience much higher health risks than wealthier and predominantly White community of Greenville as well as Delaware as a whole.

commonly emitted by gasoline-fueled cars and trucks, industrial boilers, incinerators, residential energy combustion, and manufacturing facilities that use urea formaldehyde in their processes, and is formed from the breakdown of organic outdoor air pollutants, was by far the most significant chemical contributing to the cancer risk, accounting for approximately one-half of the overall cancer risk in most cases. Although formaldehyde also contributed the most to cancer risk in Marshallton (the community with the highest cancer risk in the study), the cancer risk related to benzene, a common ingredient in gasoline and emitted by motor vehicles and oil refineries and from burning coal and oil, was about 40 to 70 percent higher than in the other environmental justice communities and more than twice that of Greenville. In addition to being classified by the EPA as a carcinogen, benzene is also a neurotoxin.

Acrolein, which is produced from the breakdown of burning gas and oil in cars and trucks as well as in power plants, contributed the majority of respiratory hazard in all the study communities, typically accounting for approximately 70 percent or more of the total respiratory hazard. As was the case with the higher cancer risk from benzene, acrolein-related respiratory hazards in Marshallton were about 25 to 50 percent higher than in the other environmental justice communities and about twice that of Greenville.

Children at Risk

Children are especially vulnerable to the effects of toxic air pollution. In addition to daily exposure to toxic pollution in the



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Air pollution exposure can lead to significant risk for developing respiratory disease and cancer. Children are especially vulnerable.

air, children in these communities are at risk of being exposed to toxic chemicals accidentally released from hazardous chemical facilities in or near their communities. For example, the John G. Leach School and Harry O. Eisenberg Elementary School near Dunleith, with a total of 661 students, are located within one mile of a high-risk chemical facility.

Particularly concerning is that seven schools within one mile of Southbridge, with a total of more than 2,200 students, are in locations with substantially higher cancer risks and respiratory hazards than schools in all other communities in this study. The almost 300 elementary-school-aged students in the Kuumba Academy Charter School near Southbridge have cancer risks due to toxic air pollution that are almost three times higher, and respiratory hazards that are more than three times higher, than schools in Greenville. Students at six other schools within one mile of the Southbridge area have cancer risks that are 55 to 74 percent higher, and potential respiratory hazards that are 81 to 125 percent higher, than those at schools in Greenville.

Conclusion

People in the seven communities along the industrial corridor in the northern portion of Delaware's New Castle County face a substantial potential cumulative health risk from (1) exposure to toxic air pollution, (2) their proximity to polluting industrial facilities and hazardous chemical facilities, and (3) proximity to contaminated waste sites. These health risks are substantially greater than those of residents of a wealthier and predominantly White community in Delaware and for Delaware as a whole.

Recommendations and Solutions

The first four recommendations that follow aim to improve the safety of high-risk industrial facilities, expand communities' access to information about the acute hazards posed by nearby facilities, and improve communities' preparedness for responding to a toxic chemical release. These actions may have the additional benefit of reducing the daily load of toxic air

pollution that affects these communities. The next two recommendations address both the acute risks from chemical facility accidents as well as the risks from daily chronic exposure to toxic air pollution. The last recommendation addresses the need to reduce motor vehicle air pollution in these communities.

1. **Require chemical facilities to use safer chemicals and technologies.** Companies that own chemical facilities should adopt inherently safer chemicals and technologies wherever feasible, as this is the most effective way to prevent deaths, illnesses, and injuries from chemical disasters. The EPA should enforce its requirement that high-risk chemical facilities assess the use of safer processes and, further, should require that these safer alternatives be adopted wherever feasible.
2. **Ensure that facilities share information and their emergency response plans with nearby communities.** Chemical facilities should provide nearby local communities with essential information on hazards posed by their operations and their planned response in the event of an unplanned release of hazardous chemicals. Communities should be included in emergency response planning and implementation. Emergency response facilities and the measures devised under these plans should be ready for operation should a chemical release occur. The EPA as well as state and local agencies should ensure that communities have access through effective and purposeful outreach to information on facility hazards and emergency planning under its Risk Management Program and have information on facility hazards submitted to states under the Emergency Planning and Community Right-to-Know Act.
3. **Require large chemical facilities to continuously monitor and publicly report their fence-line-area emissions and health hazards.** Nearby communities should be able to easily access information (based on validated continuous monitoring) on the toxic emissions coming from industrial facilities, along with information about the chemicals' health hazards. The EPA or state or local pollution control agencies should expand current

People in the seven communities along the industrial corridor in Delaware's New Castle County face a substantial potential cumulative health risk from toxic pollution.



Gretchen Goldman/UCS

Mobile air monitoring stations like this one from the Delaware Department of Natural Resources and Environmental Control can allow communities to obtain air pollution data from locations without permanent monitoring but where pollutant levels may be high.

requirements for oil refineries to monitor benzene at their fence line by including other toxic air pollutants such as toluene and xylene, and should require fence line monitoring at other major industrial sources.

4. **Prevent the construction of new or expanded chemical facilities near homes and schools and, conversely, prevent the siting of new homes and schools near dangerous chemical plants.** The siting of new chemical facilities or expansion of existing ones in close proximity to homes, schools, or playgrounds significantly increases the possibility that an incident will result in significant and serious harm. Similarly, new homes, schools, and playgrounds should not be sited near dangerous chemical plants. Municipal authorities should adopt and enforce local ordinances that require an assessment of the potential cumulative health and safety risks when siting homes, schools, and other public facilities.
5. **Require that publicly accessible, comprehensive health-impact assessments and mitigation plans be conducted to evaluate the cumulative impact of hazardous chemical exposures on nearby communities.** A focus on cumulative impacts is a cornerstone of environmental justice. Environmental and public health agencies in Delaware and at the federal level should assess the potential impact of unplanned chemical releases and the cumulative impacts

A focus on cumulative impacts is a cornerstone of environmental justice.

of daily air pollution exposures on the health of nearby communities, especially vulnerable populations such as the elderly, children, and people with existing health conditions, and incorporate such assessments into agency decision-making to protect public health. Delaware's Coastal Zone Act should be amended to include an environmental justice analysis. A science-based stakeholder process that includes communities and other affected stakeholders should be created before any changes to the legislation can be voted on.

6. **Strengthen the enforcement of existing environmental and workplace health and safety regulations.** Environmental and workplace safety enforcement is historically underfunded. Congress should increase funding to the EPA, the Occupational Safety and Health Administration, and the states for expanding inspections and improving the enforcement of environmental and workplace health and safety laws, so that problems in chemical facilities can



Regular monitoring of air quality near pollution sources is crucial to understanding community exposure to harmful pollutants.

be identified before they lead to disasters. Locally, cities and counties must do a better job of enforcement in areas of “jurisdictional overlap.” There must be an accountability mechanism in place for communities to enforce existing ordinances, especially those with a goal of protecting public health.

7. **Adopt and enforce strict motor vehicle emissions standards and limit heavy-duty truck traffic and idling in residential areas.**

In 2014 the EPA adopted strict motor vehicle emission limits (“Tier 3” standards) to reduce hazardous air pollution from motor vehicles that phase in over the model year 2017–2025 timeframe. These emissions standards complement the EPA’s 2012 greenhouse gas limits and fuel economy standards, and together these rules are expected to substantially reduce motor vehicle toxic air and climate pollution over the next decade. It is essential that the EPA effectively enforce these current standards, and future standards be adopted that further reduce motor vehicle air pollution. Further, heavy-duty truck traffic should be limited and idling eliminated in residential areas to reduce community exposures to truck emissions.

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FIND THE FULL REPORT ONLINE: www.ucsusa.org/EJDelaware

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Driving Change with the Health Care Spending Benchmark: Delaware's Road to Value

Kara Odom Walker, M.D., M.P.H., M.S.H.S. Cabinet Secretary, Department of Health and Social Services

Presented On: Tuesday, November 7, 2017

Write-Up By: Kate Smith, M.D., M.P.H.

The Delaware Academy of Medicine/Delaware Public Health Association (Academy/DPHA) and the Delaware Chapter of the American Lung Association (ALA) hosted the Delaware Health Care Benchmark Summit on Tuesday, November 7, 2017. At this summit, Dr. Kara Odom Walker, Secretary of Department of Health and Social Services (DHSS), discussed how the Health Care Spending Benchmark should be used to drive change and ultimately decrease health care costs in the state of Delaware.

The Benchmark: Step One

Delaware's health is poor. Our per capita health care costs are more than 25% above the national average, and account for at least 30% of our state government

budget. Statewide, our health care spending is expected to more than double by 2025. Added to that, Delaware (and Sussex County, especially) is now seen as an excellent retirement destination. Our population is older, and aging faster than most of the nation. We are ranked 31st in America's Health Rankings, we are sicker than the average state, and our citizens are 11% more likely to visit the emergency room than the nation at large.

Between 2013 and 2017, Delaware's budget for health care increased by \$202 million (22%). In that same amount of time, the general fund revenue collection has grown by only 7.6%. This large increase in health care costs leads to the depletion of many other expenditures on salaries, education, infrastructure, and public safety.

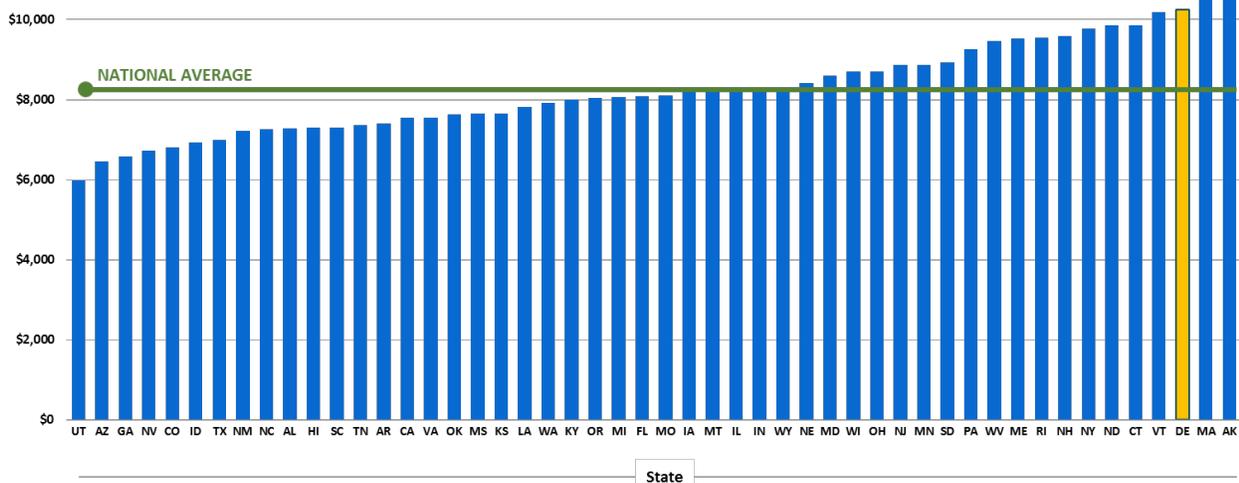


Figure 1. Per Capita Personal Health Care Expenditures, 2014

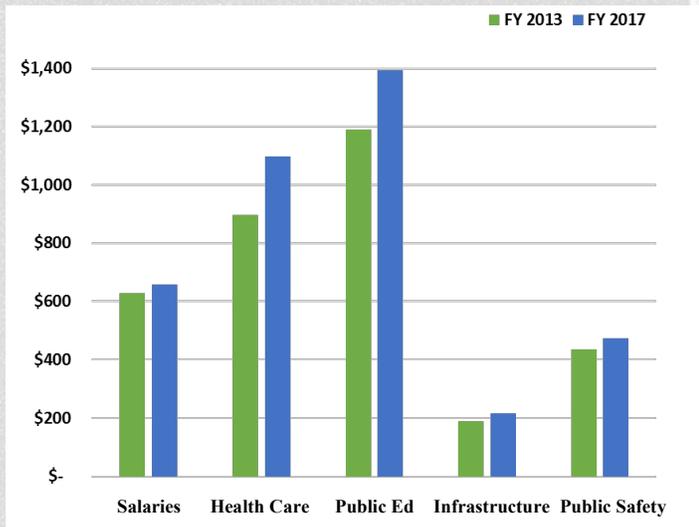


Figure 2. Delaware General Fund Expenditures², FY2013 vs. FY2017

Nearly 40% of our health spending in 2009 was on Medicare and Medicaid, but even private insurance is reporting increases of thousands of dollars every year on health spending.

Table 1. Average Annual Health Care Costs Growth Rate, 1991 - 2014

Payer	Average Annual Growth Rate
Private/Other Insurance	4.5%
Medicare	7.9%
Medicaid	9.2%

The implementation of the Affordable Care Act (ACA) did not escalate the trend in health care cost growth. In fact, Delaware health insurance premiums have been higher than the national average for more than a decade.

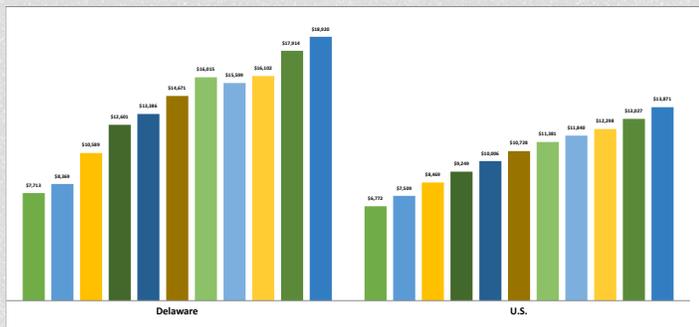


Figure 3. Family Health Insurance Premiums: Delaware and the U.S., 2000-2010³

Private insurance premiums in Delaware have grown more slowly than the national average, but they have grown. With wages held constant, health care costs are consuming more and more of workers' personal and family budgets, leading to fewer dollars free to bolster the state and local economies.

Table 2. Insurance Premiums Average Annual Growth Rate

Year	Delaware	United States
2000 – 2006	13.2%	9.1%
2007 – 2010	4.4%	5.1%

Delaware has seen an increase in total health spending every year for the last decade, although the distribution of total spending by type of service is similar for Delaware and the United States as a whole. This trend will likely not stop: experts are projecting that Delaware's total health spending will double by 2025. Not only do we have an older (and sicker) population than many states, we spend more per person in every category of service. In hospital care, physician and clinician services, personal care, and dental care, Delaware is paying more on average than the nation.

Delaware has multiple major health systems and hospitals: Bayhealth Medical Center, Beebe Medical Center, Christiana Care Health System, Nanticoke Health Services, Nemours/A.I. DuPont Hospital for Children, St. Francis Healthcare, and the Veterans Administration (VA). As such, we have more physicians (in both primary care and specialist care) than many other states. Research has shown that regions with more total physicians tend to spend more on health care than other regions, and that states with a higher proportion of specialists also tend to spend more on health care.⁴

A Starting Point

The health care benchmark will provide a starting point to improved patient-centered care, quality, and cost. Its key measures include: all-payer claims data, quality, integration, and affordability. Using the benchmark will allow Delawareans to ask questions like:

- How fast is acceptable for health care costs to grow?
- Where is the economy and the revenue growing in the state?
- How can we develop and/or monitor health care spending?
- How do we plan for inevitable increases in health care needs and expenditures?

Delaware health care spending is higher than the nation in all categories. The state also purchases health care for a greater share of its population than most other states. As a state, we have made progress in moving towards value-based payment models, and this benchmark seeks

to determine how we can give our citizens better quality health care for lower costs. It is a tool for state and legislative bodies to see which policies and procedures are working, and which ones are not. It sets a target for health care spending that can be adjusted if need-be, based on different policies (the Section 1115A Medicaid Waiver, cost versus quality improvements, site of care information, drug costs, etc.) being utilized. It allows for an open dialogue between the state and health care providers: Where are the issues and problems? Why do different institutions charge different prices for the same service?

Delaware needs to get healthier. To do this, we have to give Delawareans choices and information to help them make better health care decisions. We must recognize that the social determinants of health play a major role in health care decision-making, and seek to bolster primary care infrastructure and make improvements in health care delivery in the First State.

The road map to better health in Delaware begins with creating the benchmark, and using it to inform strategies going forward.

Improve Health Care Quality and Cost by establishing a value-based framework; creating systems of care centered on quality, patient experience, and costs; and reducing unnecessary and inappropriate care.

Pay for Value by establishing the health care spending benchmark, reorienting data-driven monitoring of cost toward value, and requiring thresholds in Medicaid Managed Care Organization (MCO) contracts.

Support Patient-Centered, Coordinated Care by creating all-payer Accountable Care Organizations (ACO) to facilitate integration of services and patient-centered medical homes and creating reimbursement approaches for safety-net services.

Support the Health Care Provider Workforce and Health Care Infrastructure Needs. By giving support to the primary care workforce (including the dental and behavioral health professions, and health-professions education), we are recognizing the work these people do in caring for all the citizens of our state. Increasing racial and ethnic diversity, preparing for the increasing needs of so-called “safety net” providers, investing in telehealth and coordination of services for our at-risk populations, and investing in a provider readiness infrastructure all serve to support the workforce.

Improve Health Care for Special Populations by strengthening health equity for people with disabilities, focusing on maternal-child health, establishing a trauma-

informed system of care, and using patient-centered medical homes for the prison re-entry population.

Engage Communities by improving community-based wellness initiatives and creating population-health metrics and community data-driven approaches.

Ensure Data-Driven Performance by using public-private collaborations to establish quality and cost targets, creating interpretation methodology for quality and cost goals, aligning payers with total-cost-of-care models, and strengthening the exchange and Medicare ACO strategies.

Summary

The benchmark is the first step to improved health in Delaware. It is based on affordability, quality, and the total cost of healthcare. It depends on payment reform (value-based payments, bundled payments, episodic payments, managed care per member per month (PMPM), and all-inclusive population-based payments) and integrated delivery reform (MCOs, Patient-Centered Medical Homes, ACOs). It is a compromise based on the idea that spending more for primary care leads to decreased overall health care spending. Its success requires everyone in Delaware to agree that we cannot stay as we are, and that every Delawarean deserves the best chance at living a long and healthy life.

To find out more please follow #ourhealthDE on social media. To view Dr. Walker's power point and an archived video of this and all other summit meetings, please go to http://dechronicdiseasecoalition.org/?page_id=475.

References:

¹ Source: Centers for Medicare & Medicaid Services, Health Expenditures by State of Residence, 2017

² Infrastructure funds reported from Transportation Trust Fund expenditures, not General Fund; Salaries are not inclusive of public education salaries; health care includes employee health benefit expenditures and Medicaid expenditures; Public Safety expenditures include expenditures by DSHS, DOC, and Youth Rehabilitative Services (DSCYF)

³ Source: Agency for Healthcare Research and Quality, Medical Expenditure Panel Survey – Insurance Component. Data for 2007 is inferred from the average of 2006 and 2008, as data for this year is unavailable.

⁴ Fisher, E.S., et al. (2003). The implications of regional variations in Medicare spending. Part 1: The content, quality, and accessibility of care. *Annals of Internal Medicine*.



Katherine Smith, M.D., M.P.H.

Dr. Smith has a background in medicine and public health, and has led research projects on foreign and domestic immunization practices. The results of her research have led to new practices for heat-stable vaccines and high-heat cold chain breaks in New South Wales, Australia. She is currently the program manager for the Immunization Coalition of Delaware, and works to increase the public's knowledge of vaccines and their role in increasing a community's overall public health.

2017 Benchmarking Overview

Controlling healthcare costs is a complicated challenge that requires many parties and institutions to agree on multiple aspects of both policy and implementation through legislation. Dr. Kara Odom Walker assumed the leadership role as Secretary for the Department of Health and Social Services (DHSS) in May. As part of the explanation of the benchmarking process authorized by the Delaware General Assembly, the Secretary has been presenting Delaware's historical picture of health care spending as having outpaced inflation and the state's economic growth.

In multiple presentations introducing the benchmark approach for health care cost controls the focus has continued to be the accomplishment of the key goals to reduce health care spending growth and improve health outcomes.

Benchmark Proposal

The benchmark proposal is to adopt a statewide health care growth in spending goal (%) linked with growth in the overall economy of the State.

In order to fully utilize the benchmarking system, a unified Health Care Authority (HCA) has been proposed. This HCA would have authority to establish the benchmark spending and achieve compliance. The draft "Delaware's Road to Value," which sets forth the details of the plan to date, can be found online at: <http://dhss.delaware.gov/dhss/dhcc/files/roadmapmerged.pdf>

What's Happened to Date

DHSS convened five health summits to present information on the following topics by presenters from those States that are working on similar changes to their healthcare systems. The archived Facebook live videos of these summits can be found on [facebook.com/delawareDHSS](https://www.facebook.com/delawareDHSS).

September 7, 2017	Overview of benchmark methodology
September 22, 2017	Transformation Strategies and Implementation
September 25, 2017	Legislative/Regulatory Approaches to Transition
October 18, 2017	Data Analytics
November 2, 2017	Governance/Authority

The benchmark proposal uses as a foundation the work by the Delaware Center for Health Innovation to transition from the current fee-for-service model of healthcare reimbursement and payment to a pay for value model. The end goal as described is to implement a population health based payment model. Transitioning from a fee-for-service to a pay-for-value based system is a process that will take time to fully implement with all payers and all providers.

The benchmarking discussion began in May of 2017 with a presentation by Secretary Walker on Delaware's healthcare spending track record and the introduction of the benchmarking approach. This was followed by a series of health summits.

The first summit provided a broad summary of how the benchmarking process works, the methodology for establishing a benchmark, and how it can be used to establish a total cost of health care.

In the second summit, insurance provider and hospital leadership gave insights into their State's experience adopting and transforming the payment structure from fee-for-service to a pay-for-value reimbursement model.

The third summit featured legislators from Massachusetts were invited to discuss their successes and present inherent challenges that arose during the transition to both a pay-for-value model, and a shift to a broader, population health based payment system.

In October, the Delaware Health Information Network (DHIN) hosted a fourth summit to explain how data analytics can and should be used when setting up benchmarking processes, legislation and procedures. Presenters strongly encouraged the use of data-driven information to support policies and procedures helpful to the benchmarking process. Additionally, the role of regulations governing data collection and data sharing among payers, laboratories, hospitals, and statewide participants were discussed.

Note, the benchmarking proposal for Delaware is to use an all-payer model consistent with the All Payer Claims Database legislation enacted in 2016. The proposal is to move all payers (Medicare, Medicaid, and commercial) to a value-based reimbursement system operating through one or more Accountable Care Organizations (ACOs).

In November, the fifth summit focused on the model for governance and authority used for implementation of the benchmark as it has been used in other states to learn from their experiences.

Looking Ahead to Implementation

As proposed, the benchmark would be implemented over a period of three years. The first year – this year – will be used to finalize an agreement on methodology applicable to Delaware’s health system, decide on a governance structure, draft proposals for legislation, and establish the regulatory procedures needed to make a healthcare spending benchmark applicable statewide.

Accountable Care Organizations (ACO) and enhanced coordination of care are envisioned to play a central role in fostering the transition. As envisioned, there will be steps to improve the coordination of care across primary care, behavioral health, long-term care, public health, and social services.

Continuous information exchange between DHSS and the provider community on quality and cost goals and targets is anticipated by all in an effort to allow practices to adjust and modify procedures and policies to obtain quantifiable results. Part of the second year initiative would include the expanded use of the DHIN, with its ability to collect and share data. Organization of a new unified HCA in the role of administrator, with the authority to adjust the benchmark methodology and policies as needed, would also be initiated.

Reviewing the state’s progress will be ongoing, and include progress reports with hearings throughout the second year, as Delaware stakeholders implement the benchmarking program.

The third year of implementation is projected to reflect broad adoption of the benchmark methodology with strong ACO participation. The goal is for all Delaware patients to be treated by providers reimbursed using the pay for value model with accompanying decreases in healthcare spending growth.

Next Steps

In December, Secretary Walker will provide recommendations to the Governor and the General Assembly. This set of recommendations and accompanying plan will be reflected in the Governor’s recommended Fiscal Year 2019 budget (to be introduced in January 2018), and will be added to the legislative agenda for 2018.

Stakeholders

Kara Odom Walker, MD, MS is the Secretary for the Delaware Department of Health and Social Services (DHSS). Shortly after assuming her position in May

2017, Secretary Walker announced the proposal for the adoption of benchmark spending reductions to reduce healthcare costs across the state.

The Delaware Center for Health Innovation (DCHI) is a privately funded, nonprofit collaboration between public and private organizations. The DCHI was established in 2014. In 2015, DCHI received a multi-year, \$35 million grant from the Federal Center for Medicare and Medicaid Innovation to implement initiatives focused on helping Delaware achieve the Triple Aim Plus One (better health, improved health care quality and patient experience, lower growth in per capita health care costs, and an enhanced provider experience that promotes patient-centered engagement).

The Delaware Health Care Commission (DHCC) was established in 2003 to address the lack of access to health care for several populations in the state, as well as to reduce the number of uninsured. The DHCC spearheaded discussion on health care access, initiatives to reduce health care costs, the implementation of a Delaware-based electronic health record platform (which became the DHIN), and the creation of the Delaware Cancer Consortium. The DHCC has also developed and implemented the State Health Care Innovation Plan (SHIP) and the Choose Health Delaware exchange.

The Delaware Medical Institute for Education and Research (DIMER) and the Delaware Institute for Dental Education and Research (DIDER) are funding programs with partner medical education institutions since Delaware has no medical or dental college. The medical teaching institutions have partnered with Delaware to provide training and clinical residency relationships with Delaware hospitals, and create a strong pipeline of medical and dental professionals for Delaware.

The Delaware Health Information Network (DHIN) is a non-profit, state related organization that is self-funding and self-supporting. The DHIN became the first operational statewide health information exchange in the nation in 2007. During the last five years, the DHIN has developed a consistent track record for the safe and secure delivery of clinical results (lab and pathology), reports (radiology and transcribed), and face sheets (hospital admission, discharge, and transfer data; demographic and billing information). The DHIN currently serves all of Delaware’s acute care hospitals, all of Delaware’s long term care and skilled nursing facilities, and 97% of Delaware’s medical providers. More than 9 million clinical results and reports are

posted on the DHIN each year, and the total patient records in the system now exceed 1.4 million.

Delaware Healthcare System and Hospitals. Delaware has multiple healthcare systems and hospitals throughout the state: Bayhealth Medical Center, Beebe Medical Center, Christiana Care Health System, Nanticoke Health Services, Nemours/A.I. DuPont Hospital for Children, St. Francis Healthcare, and the Veterans Administration (VA). The hospital based healthcare systems in addition to independent practitioners currently serve as the providers for primary, secondary, and tertiary acute care institutions, doctors' offices, and medical centers.



Dr. Kara Odom Walker is the Cabinet Secretary for the Department of Health and Social Services and a board-certified family physician.

The Future

As Delaware confronts the ongoing challenge to reduce health care spending and transition to a pay-for-value and population health model, there will be need for discussion and debate. Meeting this challenge will inevitably mean change to an established system, problems to solve, and barriers to overcome. However, if it can achieve the overarching goal, it will also mean successes and celebrations of improved care for patients. Only by working together as a state will Delaware improve overall health, healthcare quality, and patient experiences while decreasing its overwhelming healthcare spending.



SAVE THE DATE

22nd Annual Diabetes Update

Registration begins at 7:15 a.m.
John H. Ammon Medical Education Center
Christiana Hospital Campus
Newark, Delaware

**For more information
Call 302-623-5588**



Saturday, March 10, 2018 • 8 a.m. – 3:30 p.m.

ORAL HEALTH LEXICON

OF TERMS

A

Adenoids: – Lymphatic tissue between the back of the nose and the throat. The adenoids function to clear infection and trap germs entering the mouth and nose.

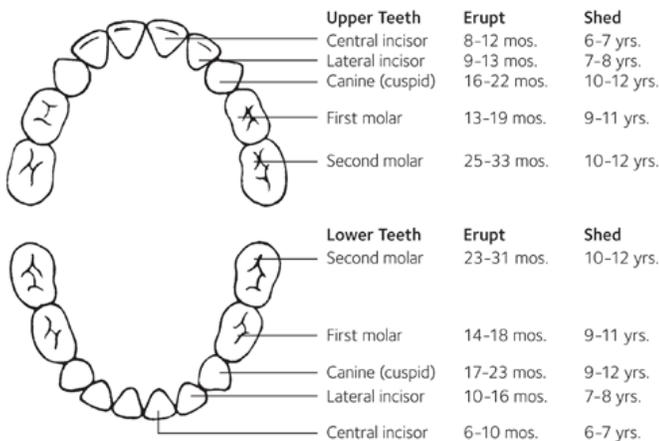
Adenoidectomy: – Surgery to remove the adenoids. Possible treatment for: repeated adenoiditis, repeated ear infections, enlarged adenoids blocking the airways.

Adenoiditis: – Swollen adenoid glands.

Aphthous Ulcer: – Also known as: canker sores. Superficial cuts in the lining of the inside of the mouth that lead to a small, sensitive, painful ulcer.

B

Baby Teeth: – Also known as: milk teeth. Teeth that fall out and are replaced by permanent teeth at around the age of 6.



C

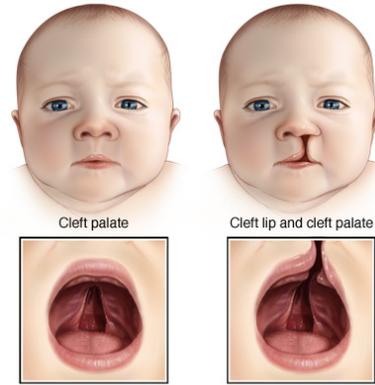
Canine: – A pointed tooth between the incisors and premolars of a mammal. Adult humans have two in each jaw, used for ripping and tearing food. (see: permanent teeth, teeth)

Canker Sore: – See: aphthous ulcer

Caries: – The scientific term for tooth decay, or cavities.

Cavity: – A decayed part of a tooth.

Cleft Lip: – A congenital split in the upper lip on one or both sides of the center, often associated with a cleft palate.



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Cleft Palate: – A congenital split in the roof of the mouth.

Congenital: – Present from birth.

Craniofacial Nerves: – There are 12 paired nerves that arise directly from the brain. These nerves relay information between the brain and parts of the head and neck.

No.	Name	Function
I	Olfactory	Sense of smell
II	Optic	Sense of sight
III	Oculomotor	Moves the eye, contracts the pupil
IV	Trochlear	Moves the eye
V	Trigeminal	Receives sensation from the face, moves muscles used for chewing
VI	Abducens	Moves the eye
VII	Facial	Moves the muscles of facial expression, two muscles of the neck; receives sense of taste from the front 2/3 of the tongue, and innervates the salivary glands (except the parotid) and lacrimal gland (eye duct).
VIII	Vestibulocochlear	Sense of sound, balance, and equilibrium.
IX	Glossopharyngeal	Sense of taste from the back 1/3 of the tongue, innervates the parotid gland, and moves one neck muscle. With the vagus nerve, provides the gag reflex.
X	Vagus	Most neck muscles; sense of taste from the epiglottis; controls muscles for voice, resonance, and the soft palate; with the glossopharyngeal nerve, provides the gag reflex.
XI	Accessory	Controls the sternocleidomastoid muscle and the trapezius muscle (major neck muscles).
XII	Hypoglossal	Moves the tongue. Important for swallowing and speech articulation.

D

Deep Sedation: – A drug-induced decrease in consciousness during which patients cannot be easily aroused, but respond purposefully following repeated or painful stimulation. The ability to breathe without help may be impaired. Cardiovascular function is usually not affected (the heart will still beat).

Deformity: – A malformed or misshapen part, especially of the body.

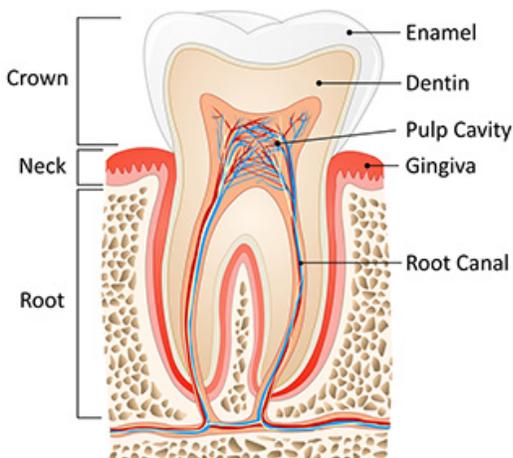
Demineralization: – Process by which acid produced by bacteria in the mouth (when carbohydrates, like sugar, are consumed) dissolve the main component of tooth enamel.

Dental Fluorosis: – Also known as: mottled enamel. Decreased mineralization of tooth enamel caused by ingesting excessive fluoride during enamel formation. Signs and symptoms: visual changes in enamel causing different kinds of tooth coloration. Severity of the condition is dependent on the dose, duration of fluoride exposure, and the age of the person during the exposure.

Dentist: – A person qualified to treat the diseases and conditions that affect the teeth and gums, especially the repair and extraction of teeth, and the insertion of artificial ones.

E

Enamel: – The outer surface of teeth



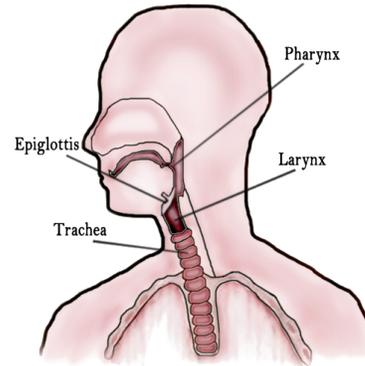
Endemic: – A disease regularly found among a population or in a certain area.

Endodontist: – A dental specialty concerned with the study and treatment of the center of the teeth. These specialists perform root canal therapy, surgery, repair cracked teeth, and treat dental trauma.

ENT: – Stands for Ear, Nose, and Throat. See: Otolaryngologist

Epidemic: – An increase, often sudden, in the number of cases of a disease above what is normally expected in that population in that area, over a period of time.

Epiglottis: – A flap of cartilage at the root of the tongue, which covers the opening of the trachea during swallowing.



Extraction: – Also known as: tooth pulling. The removal of teeth.

F

Filling: – A way to restore a tooth damaged by decay back to its normal function and shape. A dentist will remove the decayed material, clean the area, and then fill the ensuing hole with a filling material (gold, porcelain, tooth-colored composite resin, or a mix of metals).

Fluoride: – A naturally occurring mineral found in most water sources (wells, oceans, rivers, lakes). Interferes with tooth decay.

G

General Anesthesia: – A drug-induced loss of consciousness during which patients are not arousable, even by painful stimulation. The patient generally needs mechanical assistance to breathe and to keep their heart beating.

Gingivitis: – Inflammation of the gums. This is usually reversible, but can lead to periodontitis if left untreated. Signs and symptoms: inflamed, irritated gums that bleed easily during tooth brushing.

Gum Disease: – See: periodontitis.

H

Herpes Simplex Virus: – Most herpes infections in the mouth is caused by the herpes simplex virus type 1

(HSV-1), and a large proportion of the population is infected with latent (hidden) HSV-1. Some people will see manifestations of the virus by the appearance of small vesicles, or fluid-filled sacs, on the mouth or gums.

Human Papilloma Virus: – The most common sexually transmitted infection (STI), and over 79 million Americans (most in their late teens and early 20s) are infected with HPV. HPV can cause genital warts and cancers of the genital region, but is also responsible for both pharyngeal and oropharyngeal cancers.

Hygiene: – Practices to maintain health and prevent disease, especially through cleanliness

I

Incidence: – The number of new cases of a given medical condition in a given population within a specified period of time.

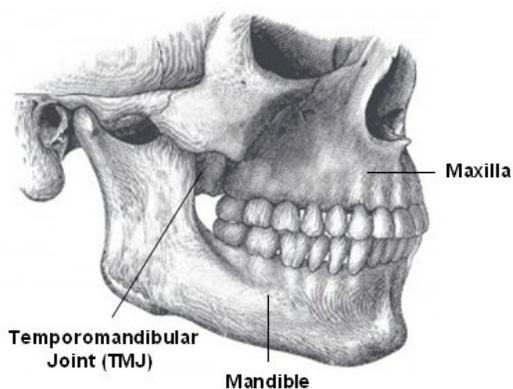
Impacted: – A tooth that has not fully pushed through the gum into the mouth.

Incisor: – A narrow-edged tooth at the front of the mouth, adapted for cutting. Adult humans have four incisors in each jaw. (see: permanent teeth, teeth)

J

Jaw: – The upper (maxillary) and lower (mandible) bones of the face, forming the framework of the mouth and containing the teeth.

JAW BONES



L

Larynx: – Also known as: voice box. A hollow, muscular organ forming an air passage to the lungs, and containing the vocal chords.

M

Mandible: – The lower bone of the jaw.

Maxilla: – The upper bone of the jaw.

Milk Teeth: – See: baby teeth.

Molar: – A tooth at the back of a mammal's mouth used for grinding and chewing. Adult humans have twelve: three on each side of the upper and lower jaws. (see: permanent teeth, teeth)

O

Oral: – Having to do with the mouth.

Oral and Maxillofacial Surgeon: – A surgeon who treats the mouth, jaws, face, and skull, as well as associated structures. Surgeons in the United States require training in dentistry, surgery, and general medicine.

Oral Cancer: – Cancer that starts in any part of the mouth. Most oral cancers develop in the tongue or in the floor of the mouth.

Oral Candidiasis: – Also known as: thrush. The most common fungal infection in the mouth.

Oral Health: – From the World Health Organization: a state of being free from mouth and facial pain, oral and throat cancer, oral infection and sores, periodontal disease, tooth decay, tooth loss, and other diseases and disorders that limit an individual's capacity in biting, chewing, smiling, speaking, and psychosocial wellbeing

Oropharyngeal Cancer: – Cancer in the mouth or throat, tonsils, adenoids, salivary glands. Common cancers include: squamous cell carcinoma (90% of oral and oropharyngeal cancer are squamous cell carcinomas), salivary gland cancer, adenoid cystic tumor (most common in the parotid gland), lymphoma, and melanoma.

Orthodontist: – A type of dentist who specializes in correcting irregularities of the teeth, as by means of braces.

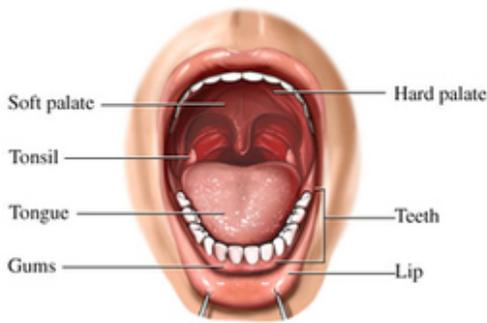
Osteomyelitis: – Inflammation of bone or bone marrow, usually due to infection

Osteonecrosis: – The death of bone tissue.

Otolaryngologist: – Also known as: an ENT. A physician trained in the medical and surgical treatment of the ears, nose, throat, and related structures of the head and neck.

P

Palate: – The roof of the mouth, separates the cavities of the nose and the mouth. Consists of the hard (bony front part) and soft palates (fleshy, flexible part towards the back).



Pandemic: – An epidemic that spreads over a very wide area. Also: the worldwide spread of a disease.

Parotid Gland: – A pair of salivary glands that drain saliva into your mouth from a tube located near your upper teeth.

Pharynx: – The part of the throat behind the mouth and nose, and above the esophagus and larynx (image 2).

Periodontal: – Of, denoting, or affecting the gums and other tissues surrounding the teeth.

Periodontal Disease: – See: periodontitis

Periodontist: – A dentist specializing in the prevention, diagnosis, and treatment of periodontal disease, and in the placement of dental implants. They are also experts in the treatment of oral inflammation.

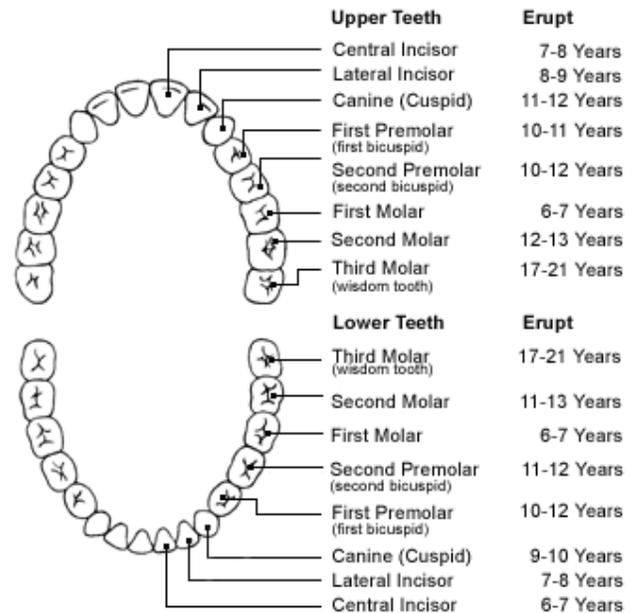
Periodontitis: – Inflammation of the tissues in the gums and mouth, caused by bacteria found in dental plaque.

Periodontitis, early: – Signs and symptoms: receding gums, pockets between gums and teeth (diagnosed by dental exam and dental x-rays).

Periodontitis, severe: – Signs and symptoms:

destruction of tissues, ligaments, and bone in the mouth. Inadequate bone support can lead to the loss of teeth. Separation of gum tissue from teeth can lead to an increase of bacteria entering the bloodstream, which can lead to infection, organ failure, and death

Permanent teeth: – Teeth that replace temporary/baby/milk teeth, and last for most of the person's life.



Premolar: – A tooth situated between the canine and the molar teeth, used for grinding and chewing. An adult human normally has eight, two in each jaw on each side. (see: permanent teeth, teeth)

Prevalence: – All individuals in a given population affected by a disease at a particular time.

Plaque: – A sticky deposit on teeth in which bacteria can proliferate (image 1)

Population Health: – The health outcomes of a group of individuals, including how those outcomes are distributed within the group. These groups are often geographic populations (nations, communities) but can also be groups of employees, ethnic groups, persons with disabilities, prisoners, students, etc.

Preventative Care: – Measures taken for disease prevention (as opposed to disease treatment). Preventative care is done before a patient is sick, or suffering from a disease.

Public Health: – The health of the population as a whole, as monitored, regulated, and promoted by the state (or nation).

R

Remineralization: – Process by which ions in the saliva can strengthen tooth enamel.

S

Saliva: – A watery liquid secreted into the mouth (via salivary glands). This functions in the tasting, chewing, and swallowing of food; moistens the mouth; and begins the digestion of starches.

Salivary Gland: – Stores and secretes saliva into the mouth. The three major salivary gland pairs are the parotid glands, the submandibular glands, and the sublingual glands.

Sjögren's Syndrome: – An autoimmune disorder. The body fails to produce enough moisture in the lacrimal (tear) ducts and the salivary glands. Signs and symptoms: dry mouth and eyes, difficulty speaking and/or swallowing.

Squamous Cell Carcinoma: – The second most common form of skin cancer, it is usually found on the areas of the body damaged by UV rays from the sun and/or tanning beds. Sun-exposed skin includes the head, neck, ears, lips, arms, legs and hands. SCC is fairly slow-growing, and when caught early is easy to treat.

Sublingual Gland: – A pair of salivary glands that drain saliva into your mouth from ducts in the floor of the mouth.

Submandibular Gland: – A pair of salivary glands that drain saliva into your mouth from a tube found under the tongue.

Systemic: – Relating to the whole, rather than a particular part. Affecting the body generally, or relating to a specific system (cardiac, lymph, reproductive, etc.) of the body.

T

Teeth: – Hard structures, embedded in the jaw of the mouth, that function in chewing. Humans have four different types of teeth: incisors, canines, premolars, and molars.



TMJ: – Also known as: temporomandibular joint. The hinge joint that connects your jaw (mandible) to the temporal bones of the skull (see jaw diagram).

TMD: – Also known as: temporomandibular disorder. A common term for any problems with the jaw and/or facial muscles that control the jaw. Injuries to the head and neck (i.e.: whiplash, a blow to the head), grinding or clenching the teeth, and arthritis are some causes of TMD.

Thrush: – See: Oral Candidiasis.

Tonsil: – Either of two small masses of lymphatic tissue in the throat, on either side of the tongue. The tonsils clear infection and trap germs entering the mouth.

Tonsillectomy: – The surgical removal of the tonsils. Possible treatment for: persistent tonsillitis, persistent strep throat, breathing problems related to tonsillitis, extreme snoring (especially in young children), sleep apnea, bleeding of the tonsils, cancer of the tonsils.

Tonsillitis: – Enlarged or swollen tonsils.

Tooth decay: – An infectious disease in which a bacteria such as *Streptococcus mutans* and *Lactobacillus* increase within dental plaque.

Trachea: – A tube extending from the larynx to the lungs. The tube is enforced by cartilage and moves air to and from the lungs (image 2).

V

Vocal Chords: – Two mucous membranes stretched across the larynx. They vibrate, and modulate the flow of air being expelled from the lungs during talking, singing, and making sounds with the throat.

Voice Box: – See: larynx.

W

Water Fluoridation: – Fluoride was added to public water supplies beginning in 1945 to increase the level necessary to prevent tooth decay. Fluoride makes tooth enamel more resistant to the acid that cause caries.

Wisdom Teeth: – Also known as third molars. Each of the four hindmost molars in humans, which usually appear at about the age of twenty. Some people never develop wisdom teeth at all. (see: permanent teeth, teeth)

Dental Resources

Online Resources

Delaware Oral Health Coalition: <http://www.dhss.delaware.gov/dhss/dph/hsm/dohchome.html>

Delaware Oral Health Program: <http://www.dhss.delaware.gov/dhss/dph/hsm/ohphome.html>

Delaware State Dental Society: <https://delawarestatedentalsociety.org/>

Free Dental Care: <http://www.freedentalcare.us/st/delaware>

Mobile Dental Clinic: <http://www.dhss.delaware.gov/dhss/dph/hsm/ohpmobile.html>

Dental Clinics

From the Delaware State Dental Society (www.delawarestatedentalsociety.org).

	Clinic	Address	City	Phone
New Castle	DeITech Dental Health Center www.dtcc.edu/our-campuses/wilmington/dental-health-center	333 Shipley (Corner of Shipley and 2 nd Street)	Wilmington	571-5364
	Division of Public Health DeLaWarr State Service Center	500 Rogers Road	New Castle	622-4540
	Henrietta Johnson Medical Center www.hjmc.org/dental	600 N. Lombard Street	Wilmington	761-4610
	Nemours Senior Care www.seniorcarenemours.org	1801 Rockland Road	Wilmington	800-292-9538
	Pierre Toussaint Dental Office www.ministryofcaring.org/support-services	830 North Spruce Street	Wilmington	652-8947
	Westside Family Health Care Wilmington Dental Office www.westsidehealth.org/services.html	1802 West 4 th Street	Wilmington	655-5822
	Wilmington Hospital Dental Clinic www.christianacare.org/dentistry	501 West 14 th Street	Wilmington	428-4850
Kent	Delaware Hope Dental Clinic	1121 Forest Avenue	Dover	735-7551
	Division of Public Health Williams State Service Center	805 River Road	Dover	857-5120
	Division of Public Health Milford State Service Center	Riverwalk Shopping Ctr 253 NE Front Street	Milford	424-7160
	Nemours Senior Care, Milford	909 North DuPont Blvd	Milford	800-763-9326
	Westside Family Healthcare www.westsidehealth.org/services.html	1020 Forest Avenue	Dover	655-5822
Sussex	Division of Public Health Shipley State Service Center	350 Virginia Avenue	Seaford	628-6780
	Division of Public Health Thurman Adams State Service Center	546 Bedford Street Extn.	Georgetown	515-3000
	La Red Health Center	21444 Carmean Way	Georgetown	855-1233

SAVE
THE DATE

ALZHEIMER'S
neurocognitive disorder
MEMORY
neurodegenerative
neurology
CAREGIVING
aging
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patient
mental function
Lewy bodies
behavioral disorder
senile dementia
remember
illness
medicine
progressive
emotional support
memory
aggression
Lewy bodies
progressive
cholinesterase inhibitors
death
confusion
think
senile dementia
remember
illness
medicine
progressive

Mild Cognitive Impairment & Dementia *Focus on Function*

Presented by
The Swank Memory Care Center
John H. Ammon Medical Education Center
Newark, DE 19718

For more information
email Cyndy Fanning at
cfanning@christianacare.org

Friday, March 9, 2018 • 8 a.m. – Noon

Sixth Annual Neurovascular Symposium

John H. Ammon Medical Education Center, Christiana Hospital Campus • Newark, DE

Save the Date
April 20, 2018



christianacare.org/neurointerventionalsurgery

18NS2



Delaware Clinical and Translational Research (DE-CTR) ACCEL Community Research Exchange

Monday, March 12, 2018

7:30a.m.-4:00p.m.

University of Delaware, Clayton Hall Conference Center

Guest Speaker:

Georgia M. Dunston, PhD

President & CEO, Whole Genome Science Foundation, Inc.
Professor Emeritus, Department of Microbiology, Howard University College of Medicine
Founding Director, National Human Genome Center, Howard University



Dr. Dunston's research on human genome variation in disease susceptibility and health disparities has been the vanguard of efforts at Howard University to build national and international research collaborations focusing on the genetics of diseases common in African Americans and other African Diaspora populations. Her passion is building community-academic partnerships that connect the African Diaspora to the global genome revolution in knowledge on human identity in precision medicine and population health.

Registration & Call for Abstracts NOW OPEN!

Visit us at: <https://www.de-ctr.org/community/researchexchange>

Afternoon Workshops:

Incorporating an
Evaluation
Framework into
Your Work

Community
Engaged
Research 101

Investing in the
Future:
Connecting New
Investigators
with Community
Partners

Translational
Research in
Practice: Using
Participatory
Action Research
(PAR)

Health
Disparities

*Application for CME credit has been filed with the American Academy of Family Physicians.
Determination of credit is pending.*

Questions? Contact us at accelceo@de-ctr.org or 302-320-6796.



CHRISTIANA CARE
HEALTH SYSTEM



Work supported by an Institutional Development Award (IDeA) from the National Institute of General Medical Sciences of the National Institutes of Health under grant number U54-GM104941 (PI: Binder-Macleod).

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From the history and archives collection

Kate Lenart, M.A.

Dental keys, like the wood-handled one pictured here, were a popular tool for extractions during the 18th and 19th centuries. Dentists would insert these instruments, also known as “tooth keys,” into the mouths of their patients, secure the tooth to be removed, and then rotate the key to extract. Several dentists modified the key’s design, resulting in several versions of the tool. Patented in 1859 by B.F. Killiam, this design features a movable bolster with a screw that could control the movement of the claw.

Dentist and historian John M. Hyson, Jr. posited that dental keys caused more accidents and injuries than all other contemporary extraction instruments *combined*. Hyson accounted for the continued use of the tool by identifying it as the quickest method of extraction available during its time.

During the 19th century, however, advancement in the design of forceps led to the decline of the dental key. Newer forceps featured beaks of varying sizes that matched the proportions of different types of teeth. With innovations like this available, the dental key gradually became a tool of the past.

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