

UPDATE



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Interventional Audiology: Clinical Advancements and New Research

A number of new initiatives, research projects, and program updates have occurred in recent years on the audiology front in the Department of Otolaryngology.



Catherine V. Palmer, PhD, director of the UPMC Center for Audiology and Hearing Aids, describes much of the current work as fitting under the theme of interventional audiology (IA), which primarily involves treating hearing loss when it is not the primary concern of the patient, but the untreated hearing loss will negatively impact the health outcome that is of concern.

“This is a new approach and not widely adopted at this time in the field, but there is a growing interest in it as centers like ours have begun to publish data on the impact of interventional audiology. IA takes audiologists out of the clinic to where patients need them. It relies on audiologists overseeing these programs but often using assistants to provide the workforce at this level. It is a model that is showing many benefits,” says Dr. Palmer.

Dr. Palmer is an associate professor in both the Department of Communication Science and Disorders and the Department of Otolaryngology. She serves as the Director of Audiology for the UPMC Health System. Dr. Palmer conducts research in the areas of auditory learning post-hearing aid fitting, the relationship between hearing and cognitive health, and matching technology to individual needs.

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About The UPMC Center for Audiology and Hearing Aids

The UPMC Center for Audiology and Hearing Aids performs routine and specialized hearing evaluations and provides treatment for permanent hearing loss. Its goal is to provide evidence-based care related to hearing loss and unique communication challenges.

The UPMC Center for Audiology and Hearing Aids offers a variety of hearing assessments and diagnostic testing, and a number of specialized programs, including:

- **Tinnitus Treatment Program** — for those who suffer from the effects of tinnitus and/or decreased sound tolerance; the program specializes in the use of tinnitus retraining therapy (TRT)
- **Musicians’ Hearing Center** — a specialized program that cares for the auditory needs of musicians
- **Cochlear implants**



Affiliated with the University of Pittsburgh School of Medicine, UPMC Presbyterian Shadyside is ranked among America’s Best Hospitals by *U.S. News & World Report*.



Interventional Audiology Continued from Page 1

She has published more than 90 articles and book chapters on these topic areas, as well as provided more than 100 national and international presentations. Dr. Palmer is the Director of the AuD program at the University of Pittsburgh and teaches the graduate level amplification courses. She serves as Editor-in-Chief of *Seminars in Hearing* and currently is President-Elect for the American Academy of Audiology. Dr. Palmer has been awarded the Editor's Award for the *American Journal of Audiology*, the Dean's Distinguished Teaching Award SHRS, the University of Pittsburgh Provost's Award for Excellence in Mentoring, and the Pennsylvania Academy of Audiology Award for Outstanding Service.

EAR: Embedded Audiology Resources

This program entails having an embedded audiologist in the Division of Geriatric Medicine outpatient clinic one day per week. Individuals are provided hearing screenings prior to their appointment with the geriatrician.

Individuals who do not pass the screening are offered a noncustom amplifier to use during the appointment so they can more easily communicate with the physician and other health care providers in the clinic.

Dr. Palmer indicates that these individuals are offered a full hearing evaluation and may then pursue customized amplification options.

"Our most interesting finding in this clinic is the large number of individuals who purchase the simple amplifier because it meets their current needs. These data suggest both the need for amplification to be available in physician offices since the majority of individuals with impactful hearing loss do not have personal amplification and the need to offer simple, low-cost devices for patients to purchase," says Dr. Palmer.

HearCARE: Hearing for Communication Accessibility and Resident Engagement

This program involves having an audiologist in each of 33 UPMC senior living facilities (independent living, assisted living, and skilled nursing and rehabilitation facilities) once per month.

In addition, the program has a "Communication Facilitator" in one of the assisted living facilities who is there to ensure that everyone can communicate day-to-day. This aspect of the program is a new model undergoing testing and evaluation.

The program involves various activities, including caring for hearing aids, using

assistive devices (phone devices, TV devices), ensuring common rooms are equipped with listening devices, and other interventions.

"We received funding from the Hearst Foundation to begin and test this program for its first year, and we are now applying for PCORI funding to test these intervention models on a broader scale," says Dr. Palmer.

In 2017, Dr. Palmer and colleagues published initial findings of their pilot program in the journal *Seminars in Hearing*, where they outline the key components of this communication assistance program and innovative model for delivering audiology services to a diverse group of older adults in multiple residential living and care settings.

GATE: Geriatric Testing for Everyone

Impaired hearing is related to poor health outcomes, yet only 18 percent of individuals who need amplification use hearing aids. Data collected locally by Dr. Palmer and colleagues indicate that hearing loss is an under-recognized problem in older adults.

The GATE program aims were to develop an incremental cost-effectiveness analysis examining hearing screening techniques assessed against a gold standard hearing evaluation. The settings of the program included a geriatric outpatient clinic and the same senior living facilities (independent living, assisted living, and skilled nursing) as previously mentioned in the HearCARE pilot quality improvement initiative.

"Our data collection phase in the GATE program is complete, with 959 individuals being tested. Analysis is underway to identify the most cost-effective way to identify hearing loss in this population. The data we have collected in the GATE program also are being used to help support our PCORI proposal to continue and extend the HearCARE pilot. Preliminary data reveal that less than 50 percent of individuals with impactful hearing loss and their health care providers accurately identify hearing loss, which supports the need for effective hearing screening for this population in order to promote a pathway to hearing care.



Audiology and the Head and Neck Survivorship Clinic

With the high incidence of hearing loss and tinnitus affecting patients treated for head and neck cancer, either as a result of surgical procedures or from the side effects of chemotherapy and radiation treatments, managing patients' hearing health and audiology concerns are important aspects of their overall post-treatment care plan. Dr. Palmer's Center has an embedded audiologist assigned to work within the HNC Survivorship Clinic for this very purpose.

"Every HNC survivor patient has their hearing screened on the day of their first visit. If they fail the screening, they are provided with a simple amplifier so they can fully participate in their extended appointment in the clinic where they will be seeing and communicating with multiple professionals. The first visit is such an important time for these individuals. We want them to fully understand and hear everything being said, and we also want them to know exactly how vested we are in their overall health. This aspect of our approach has met with a great deal of success and positive feedback since the clinic first started in 2016," says Dr. Palmer.

Patients who fail the initial hearing screening also are offered a full audio evaluation the same day to help put them onto a pathway to hearing health care at the outset. Dr. Johnson has been interested particularly in the prevalence of hearing loss in these HNC survivors.

"These individuals experience hearing loss and tinnitus at a higher rate than the general population. Physicians treating individuals for head and neck cancer with chemotherapy or radiation should be connecting them as early as possible to audiology, so the patient will know what options exist in managing these side effects. There are data to indicate that the majority of individuals are not referred to audiology. This would be a simple practice change for most ENT physicians given the proximity of audiology services and one that could significantly improve HNC survivors' quality of life and overall hearing health," says Dr. Palmer.

Head & Neck Cancer Survivors do not have comparable hearing and tinnitus compared to "average" Americans.



These same services are provided in the UPMC Trauma Outpatient clinic, which is another example of a clinic where individuals see a number of health care providers in one day and access to communication through improved hearing is essential to support full participation.

IHEAR and UHEAR

Untreated hearing loss is linked to increased use of health care, increased hospitalization, increased readmission to the hospital, and more than \$3.3 billion in excess health care expenditures per year. The audiology group manages the UHEAR (UPMC Hearing Education and Amplification for Recovery) program, which provides simple, noncustom amplifiers to inpatients in any UPMC hospital. The hospital system views this as an accessibility issue and provides these devices at no charge.

IHEAR (Interprofessional Help Encouraging Auditory Rehabilitation) arms our physical therapy, occupational therapy, and speech-language pathology home health colleagues with education and simple amplifiers to use during their home care visits enabling ease of communication with individuals with impactful hearing loss. Care is compromised when the patient must use excessive cognitive resources just to hear the message.

These simple amplifiers allow the patient to fully and easily participate in their ongoing care.

These programs are possible because of the support of Dr. Johnson, Department executive administrator Edward Harrison and his team, and the outstanding audiologists at UPMC.

References and Further Reading

References noted in the article above, and further reading of some of Dr. Palmer's recent research can be found in the following published papers.

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HNC Survivorship Update: New Research and Clinical Programs

Head and neck cancers (HNC), even if cured from a primary disease standpoint, can leave lasting and severe morbidities and quality-of-life issues for patients. HNCs constitute the sixth leading cause of cancer worldwide, and there are approximately 60,000 new cases diagnosed annually in the United States. The majority of new cases are diagnosed as late-stage disease and typically have been associated with older adults — over the age of 50. However, with the rising rate of human papillomavirus-associated HNC, the overall trends are leading to an increase in cases and more cases diagnosed in younger individuals.



Jonas Johnson, MD, FACS
*Chair, Department of
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Marci Nilsen, PhD, RN
*Researcher, University of Pittsburgh
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Helping to prepare patients for these potentials before treatment and working with them to help them cope with the post-treatment management of their condition after the fact is the domain of the UPMC Head and Neck Cancer Survivorship Clinic in the Department of Otolaryngology.

The burdens of these cancers for afflicted patients are significant, from diagnosis through treatment, to post-treatment survivorship. The physical, emotional, psychological, and financial implications of a diagnosis of head and neck cancer tend to be overwhelming for many, and they persist long after the diagnosis and initial therapies have been provided.

Encompassing a range of disciplines and services, the Survivorship Clinic tackles all aspects of HNC patient care prior to and after treatment. Physical therapy, dental health, swallowing therapy, and audiology are combined alongside other disciplines to create a cohesive, individualized program of care designed to deal with the biopsychosocial complexities of HNC patients. Launched officially in December 2016, the Survivorship Clinic has surpassed the 1,000-patient mark in its first two years of operation, highlighting the need for such a clinic and also reinforcing the significant challenges and ongoing care HNC survivors need.

Beyond and behind the Clinic's multidisciplinary care structure is an active research program that is investigating crucial aspects of HNC patient care — some of which receive little attention in the field but are nonetheless critical to long-term outcomes, patient satisfaction, and quality-of-life measures, and the oft-burdensome continuing costs of care and financial impacts associated with HNC.

Below are overviews of several recently published studies on topics in HNC survivorship from members of the Survivorship Clinic, and also discussions of several important new areas of focus in their research.

Treatment Burdens in HNC: Neck Disability Correlates With Swallowing Difficulties

Just published in January, Drs. Nilsen and Johnson, along with colleagues from the Department, provide several new insights on treatment burden in HNC survivors based on data collected from their clinic, during its first two years of operation.

Their paper, "Burden of Treatment: Reported Outcomes in a Head and Neck Cancer Survivorship Clinic,"¹ published in the journal *Laryngoscope*, reinforces the significant and highly prevalent effects bearing down on HNC survivors post-treatment.

Of particular note is the prevalence of swallowing dysfunction and its impact on quality-of-life measures in HNC survivors. The study was notable in that swallowing dysfunction appeared to be worse the further out from treatment one gets. HNC survivors beyond the six-year point reported more or worse swallowing difficulties than did others.

Of the 228 individuals in the study, 56 percent, or 132 individuals, reported they were suffering from three or more side effects related to their overall treatment, with varying degrees of decrease in quality-of-life measures.

"Everything we are learning tells us that post-treatment dysfunction and quality of life is compromised in the majority of HNC patients, and more so than I think the

medical community realizes. Difficulty swallowing is not just a simple problem that can be dismissed. The degrees to which it can affect an individual and the severity of complications that can arise are profound. Part of our research priority is to make this information as widely known as possible. Real suffering is happening, much in a silent manner by those afflicted. Our goal is to cast a light on it and work to devise treatment approaches that are less toxic while giving every level of support we can to survivors for as long as they need it," says Dr. Johnson.

Pain in the HNC Survivor

Continuing along the post-treatment line of research, Drs. Nilsen and Johnson published findings on a study² that examined the prevalence and predictors of pain in HNC survivors, and the influence of pain on various quality-of-life measures.

As one might expect, a significant portion of individuals in the study reported having some form or degree of pain after their HNC diagnosis and treatment. A fraction more than 45 percent indicated some level of ongoing pain, with 11.5 percent classing their level of pain as severe. This is all at a median of 6.6 years after diagnosis, showing that not only is pain prevalent, but it can be persistent.

Cognitive Impairment Research

The issue of cognitive impairment in pre- and post-treatment head and neck cancer patients is a new line of research Drs. Nilsen, Johnson, and their colleagues in the Survivorship Clinic are actively engaged in and working on manuscripts for publication.

There have been some prior studies on the subject conducted, but very little is known outside of the fact that many HNC patients report cognitive issues before and after their treatments, making it likely another unfortunate consequence of HNC. Very little also is known about any long-term cognitive issues or declines.

Drs. Nilsen and Johnson have devised study protocols that use a battery of testing to determine baseline cognition and changes after diagnosis and treatment, and they also are interested in DNA changes in patients that may point to or correlate with changes over time.



"Chemotherapy and radiation treatments and even the anesthesia given during surgical procedures may be affecting or causing changes in cognition. We hope to be able to tease apart some of these changes and their effects using an accelerated aging framework. Essentially this means that any part of treatment can have an impact on one's biological makeup — DNA damage, oxidative stress, and changes in the blood-brain barrier. Cancer therapies can affect all of these and more, essentially accelerating the aging process and perhaps contributing to cognitive declines," says Dr. Nilsen.

Their study hopes to enroll approximately 80 control-matched patients in two distinct cohorts — HNC patients who have had a lengthy surgery and those who have not.

Nobody knows for sure what happens to cognition in these patients. Many questions need to be answered, and we see this project as a pilot for what we hope will eventually be a much larger study. Those studies conducted so far are small and do not have the power to assess fine changes, especially across multiple areas of cognition," says Dr. Nilsen.

For this reason, this new pilot study is designed to assess many attributes of cognition, including attention, working memory, learning memory, and executive function. Secondary outcomes to be investigated include mental flexibility, psychomotor skills, and perceived cognitive ability.

Caregiver Burden in HNC

Having a family member with any serious, chronic, or long-lasting illness puts tremendous strain and stress on the individuals tasked with helping to care for their family member or loved one. The strain and stresses are emotional, physical, financial, and social. The burdens literally extend into every aspect of a person's life. Much has been written about caregiver burden in Alzheimer's disease and other chronic illness. Dr. Johnson sees the same kinds of burdens and issues with family members of HNC patients who visit the Survivorship Clinic. It is a scenario that becomes evermore apparent each day, and one that begs for heightened awareness in the medical community to better understand it, research its causes and complications, and devise solutions to mitigate the lasting damage it can cause to the individual and the family unit. All of these aspects are in focus and coming under the research priorities of the Survivorship Clinic.

"We have had family members in the office weep because of the challenges of caring for HNC survivors can be so extreme. Moreover, it extends well beyond those unfortunate individuals with a lethal form of HNC for which we can do nothing to stop it. For the individuals who are essentially cured of the cancer, they may have the rest of their lives to deal with the effects of being harmed by a treatment or therapy that cured their underlying cancer but now has affected such fundamental things as their ability to swallow, their ability to speak, cosmesis, and unrelenting pain. These are problems that affect the whole family, and our clinic is becoming heavily involved in devising ways to deal with this caregiver burden," says Dr. Johnson.

References

- ¹ Nilsen ML, Mady LJ, Hodges J, Wasserman-Wincko T, Johnson JT. Burden of Treatment: Reported Outcomes in a Head and Neck Cancer Survivorship Clinic. *Laryngoscope*. 2019 Jan 15. doi: 10.1002/lary.27801. Epub ahead of print.
- ² Cramer JD, Johnson JT, Nilsen ML. Pain in Head and Neck Cancer Survivors: Prevalence, Predictors, and Quality-of-Life Impact. *Otolaryngol Head Neck Surg*. 2018 Nov; 159(5): 853-858.

Department News and Recent Publications

New Faculty Appointments

The Department of Otolaryngology is pleased to welcome our newest faculty members who joined the Department in 2018.



Shaum Sridharan, MD (above, left) — head and neck surgery and microvascular surgery services

Candace Hobson, MD (above, center) — otology

Reema Padia, MD (above, right) — pediatric otolaryngology

Grants and Research Funding

The Department of Otolaryngology at the University of Pittsburgh continues to benefit from nearly \$9 million in extramural support. The chief sources of this support include the NIH and the NCI. These support dollars are supplemented by grants from the Department of Defense as well as philanthropy. In FY18, The Department of Otolaryngology was awarded a total of \$7.1 million in research funding. The Department of Otolaryngology is currently ranked 7th in the United States for NIH funds awarded to otolaryngology departments.

Selection of Current Grants

NIH P50 Head and Neck Cancer SPORE

Principal Investigator: Robert L. Ferris, MD

NIH P50 Middle Ear Pressure Regulation in Health and Disease

Principal Investigator: Cuneyt Metin Alper, MD

NIH R01 Inhibition of Lysosomal Flux in Carcinogen-Induced Head and Neck Cancer

Principal Investigator: Umamaheswar Duvvuri, MD, PhD

NIH R01 Cell-Specific Synaptic Plasticity in the Auditory Brainstem

Principal Investigator: Thanos Tzounopoulos, PhD

NIH T32 Research Training in Otolaryngology

Principal Investigator: Jonas Johnson, MD

NIH T32 Training in Auditory and Vestibular Neuroscience

Principal Investigators: Karl Kandler, PhD; Bill Yates, PhD

Awards and Accomplishments

Joseph Furman, MD, PhD, was named a *Pittsburgh Magazine's* 2018 "Best Doctors" in Neurology.

Barry Hirsch, MD, was named as a *Pittsburgh Magazine's* 2018 "Best Doctors" in Otolaryngology.

Dennis Kitsko, MD, received the Presidential Recognition Award from the American Osteopathic College of Otolaryngology-Head and Neck Surgery in May 2018.

Leila Mady, MD, PhD, placed first in the Robert A. & George C. Schein Resident Research Competition.

Raymond Maguire, DO, was named the 2018 Pediatric Otolaryngology Teacher of the Year as voted on by PGY4 Residents.

Catherine Palmer, PhD, was awarded the 2018 Dr. Thomas Powers Passion of Power Award for Hearing Health.

Carl Snyderman, MD, MBA, won first prize for his presentation titled "Utilization of the Contralateral Transmaxillary Approach for Chordoma and Chondrosarcoma of the Petrous Apex," in Award Session 1 of the 13th Congress of the European Skull Base Society in Warsaw, Poland, April 19-21, 2018.

Giuseppe Staltari, MD, was the recipient of the Pennsylvania Academy of Otolaryngology Head and Neck Surgery Conchal Bowl.

Recent Publications

Soose RJ, Padhya TA, Gillespie MB, Froymovich O, Lin HS, Woodson BT; STAR Trial Investigators. OSA Treatment History in an Upper Airway Stimulation Trial Cohort. *World J Otorhinolaryngol Head Neck Surg.* 2017 Jun 23; 3(2): 79-84.

Huyett P, Soose RJ, Schell AE, Fernandez-Miranda JC, Gardner PA, Snyderman CH, Wang EW. Risk of Postoperative Complications in Patients With Obstructive Sleep Apnea Following Skull Base Surgery. *Otolaryngol Head Neck Surg.* 2018 Jun; 158(6): 1140-1147.

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Huyett P, Jankowitz BT, Wang EW, Snyderman CH. Endovascular Embolization in the Treatment of Epistaxis. *Otolaryngol Head Neck Surg.* 2019 Feb 12;194599819829743.

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UPMC Physician Resources

UPMCP^{PhysicianResources.com} is your home for free CME courses, breaking news, and upcoming events from UPMC.

Free CME Courses in Otolaryngology

Select Presentations From the 2018 Head and Neck Cancer Survivorship Conference

Tamara Wasserman-Wincko, MS, CCC-SLP, presents on the prevalence of dysphagia after treatment for head and neck cancer.

Nosa Osazuwa-Peters, BDS, PhD, MPH, CHES, discusses suicide rates in head and neck cancer patients.

Evidence-Based Surveillance Imaging in Head and Neck Cancer

Tanya Jaitley Rath, MD, presents on post-treatment imaging goals in patients with head and neck cancer.

Biologics and Novel Therapeutics for Chronic Rhinosinusitis

Stella E. Lee, MD, discusses biologic therapies for chronic rhinosinusitis and current options for treatment.

Next Generation Sequencing of Locally Advanced WDTC

Umamaheswar Duvvuri, MD, PhD, gives a presentation on thyroid cancer and how to identify risk factors for progression.

Pediatric Sleep Disordered Breathing

Allison Tobey, MD, gives a presentation on how to better identify patients in need of perioperative polysomnography.

Survivorship: Lessons Learned from a Head and Neck Cancer Survivorship Clinic

Marci Nilsen, PhD, RN, gives a presentation on raising awareness of the needs of cancer survivors. Dr. Nilsen covers topics like prevention and detection of new or recurrent cancers and coordination between specialists and primary care providers.

Hemostasis During Endoscopic Sinus and Skull Base Surgery

Carl Snyderman, MD, MBA, gives a presentation on some of the techniques, materials, and tools for intraoperative hemostasis.

Video Rounds

Researching a Viable Treatment for Tinnitus

Presented by: Thanos Tzounopoulos, PhD

Dr. Tzounopoulos discusses his search for a treatment for tinnitus, in addition to his cellular and molecular studies elucidating the basic biology and mechanisms for the causes and maintenance of the condition.

Update in Robotic ENT Surgery

Presented by: Umamaheswar Duvvuri, MD, PhD

Dr. Duvvuri discusses recent advances in robotic surgery for ENT patients at UPMC.

Head and Neck Cancer

Presented by: Jonas Johnson, MD, FACS

Furthering Education and Collaboration With Surgical Telementoring

Presented by: Carl Snyderman, MD, MBA

A Clinical Review of Balance Disorders

Presented by: Joseph Furman, MD, PhD

Benefits of Sublingual Immunotherapy

Presented by: Stella Lee, MD

Evaluating the Clinical Approach to Hearing Loss

Presented by: Catherine Palmer, PhD

Save The Date: 2019 Survivorship Symposium

August 5-6, 2019 – Pittsburgh, Pennsylvania

Overview

The purpose of this symposium is to provide fundamental information necessary for a comprehensive approach to survivorship care of head and neck cancer patients. This is intended to improve health care providers' ability to provide high-quality survivorship caring to the growing population of survivors.

Who Should Attend

Professional providers, cancer survivors, primary care physicians, nurses, residents, audiologists, speech-language pathologists, physical therapists, dentists, and other interested health care professionals.

Call for Abstracts

Abstract submission is now open! Deadline for submission is April 30 at 5 p.m. Notifications regarding acceptance will be made by May 31, 2019. Submit your abstract by visiting https://pitt.co1.qualtrics.com/jfe/form/SV_5p9raaSLHkRZgKF.

Recent Publications Continued from Page 6

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Alper CM, Rath TJ, Teixeira MS, Swartz JD. A Novel Imaging Method for the Cartilaginous Eustachian Tube Lumen: Computerized Tomography During the Forced Response Test. *Ann Otol Rhinol Laryngol.* 2018 Jan; 127(1): 13-20.



ABOUT OUR PROGRAM

The Department of Otolaryngology continues to be a national leader in the exploration of otolaryngology and human communication disorders. The Department is highly ranked in research dollars awarded, and continues to provide faculty, residents, and students with the resources and support to generate new health care knowledge related to direct clinical practice and public health policy.

The department has more than 40 full-time faculty members, representing all the subspecialties of otolaryngology. While the primary mission continues to be providing high-quality patient care, we also are dedicated to advancing education and research within the field of otolaryngology.

To learn more about the UPMC Department of Otolaryngology, please visit UPMCPhysicianResources.com/ENT.

UPMC
PHYSICIAN RESOURCES

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A \$19 billion world-renowned health care provider and insurer, Pittsburgh-based UPMC is inventing new models of patient-centered, cost-effective, accountable care. UPMC provides more than \$900 million a year in benefits to its communities, including more care to the region's most vulnerable citizens than any other health care institution. The largest nongovernmental employer in Pennsylvania, UPMC integrates 87,000 employees, 40 hospitals, 700 doctors' offices and outpatient sites, and a 3.5 million-member Insurance Services Division, the largest medical insurer in western Pennsylvania. As UPMC works in close collaboration with the University of Pittsburgh Schools of the Health Sciences, *U.S. News & World Report* consistently ranks UPMC Presbyterian Shadyside on its annual Honor Roll of America's Best Hospitals. UPMC Enterprises functions as the innovation and commercialization arm of UPMC, and UPMC International provides hands-on health care and management services with partners around the world. For more information, go to UPMC.com.