University Hospitals Case Medical Center
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SCHOOL OF MEDICINE
CASE WESTERN RESERVE UNIVERSITY

Fall 2013

INNOVATIONS

in Otolaryngology – Head and Neck Surgery

Dysphagia Study: Treatment May Make Mealtime Easier

pg 4

BEST HOSPITALS U.S.News & WORLD REPORT NATIONAL EAR, NOSE & THROAT 2013-14

BEST GRAD SCHOOLS U.S.News & WORLD REPORT MEDICAL RESEARCH 2014

University Hospitals Case Medical Center and Case Western Reserve University School of Medicine are consistently recognized as two of the premier institutions in the nation, according to U.S.News & World Report's annual rankings.

From the Chairman

National Rankings, Personnel and Prestige All on the Rise

As anticipated, the University Hospitals Ear, Nose & Throat Institute has continued to grow in terms of personnel and prestige in 2013. We have six new physician additions to our staff, including two new pediatric otolaryngologists. Please refer to page 6 for more information.

Two institute physicians recently were added to the Best Doctors in America® honor roll from Best Doctors, Inc.: **Chad Zender, MD, FACS**, Otolaryngology, University Hospitals Case Medical Center; and Assistant Professor, Otolaryngology – Head and Neck Surgery, Case Western Reserve University School of Medicine; and **Rod Rezaee, MD, FACS**, Director, Microvascular Head and Neck Reconstructive Surgery, University Hospitals Seidman Cancer Center; and Assistant Professor, Otolaryngology – Head and Neck Surgery, Case Western Reserve University School of Medicine. Drs. Zender and Rezaee join colleagues already on the list, including **Cliff Megerian, MD, FACS**; **James Arnold, MD, FAAP**, Program Director, Otolaryngology – Head and Neck Surgery, UH Case Medical Center; and Professor, Otolaryngology, Case Western Reserve University School of Medicine; **Pierre Lavertu, MD**, Director, Head and Neck Surgery and Oncology, UH Case Medical Center; and Professor, Otolaryngology – Head and Neck Surgery, Case Western Reserve University School of Medicine; **David W. Stepnick, MD**, Division Chief, Facial Plastic Surgery, UH Case Medical Center; and Associate Professor, Otolaryngology, Case Western Reserve University School of Medicine; and **Nicole Maronian, MD**, Director, Voice and Swallowing Center, University Hospitals Ear, Nose & Throat Institute, UH Case Medical Center; and Associate Professor, Otolaryngology – Head and Neck Surgery, Case Western Reserve University School of Medicine.

Meanwhile, our residency program has been given permission to increase its residency numbers, and thus we matched four outstanding medical students on match day in March. This is, in part, due to increased volume and new educational opportunities for our trainees under the ever-increasing expertise of our growing cadre of physicians.

On a final note, I am pleased to report that our national rankings in U.S.News & World Report continue to rise. We have moved up this year to No. 18 in the U.S. in the ear, nose and throat specialty, and we are very happy to note that for the first time UH Case Medical Center has joined the honor roll of the top 18 hospitals in the U.S.

Cliff Megerian, MD, FACS
UH Ear, Nose & Throat Institute Director
Chairman, Department of Otolaryngology
UH Case Medical Center;
Richard and Patricia Pogue Endowed Chair
Professor of Otolaryngology – Head and Neck Surgery
Case Western Reserve University School of Medicine

Innovations in Otolaryngology – Head and Neck Surgery
Fall 2013, Volume 2, Issue 2
Contributors: Cliff Megerian, MD, FACS; Kumar Alagramam, PhD; James E. Arnold, MD, FAAP; Nicole Maronian, MD; Todd Otteson, MD; Diana Ponsky, MD; Rod Rezaee, MD, FACS; Kenneth Rodriguez, MD; Maroun Semaan, MD; Chad Zender, MD, FACS
Marketing Manager: Rich Riley

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The commitment to exceptional patient care begins with revolutionary discovery. University Hospitals Case Medical Center is the primary affiliate of Case Western Reserve University School of Medicine, a national leader in medical research and education and consistently ranked among the top research medical schools in the country by U.S.News & World Report. Through their faculty appointments at Case Western Reserve University School of Medicine, physicians at UH Case Medical Center are advancing medical care through innovative research and discovery that bring the latest treatment options to patients.

All National Institutes of Health (NIH) funding for basic and clinical research is awarded to the School of Medicine at Case Western Reserve University.

Moving Forward

Successful research and collaboration propel discovery and innovation

Chad Zender, MD, FACS, Otolaryngology, UH Case Medical Center; and Assistant Professor, Otolaryngology – Head and Neck Surgery, Case Western Reserve University School of Medicine

James E. Arnold, MD, FAAP, Program Director, Otolaryngology – Head and Neck Surgery, UH Case Medical Center; and Professor, Otolaryngology, Case Western Reserve University School of Medicine

Rod Rezaee, MD, FACS, Director, Microvascular Head and Neck Reconstructive Surgery, UH Seidman Cancer Center; and Assistant Professor, Otolaryngology – Head and Neck Surgery, Case Western Reserve University School of Medicine

Chad Zender, MD, FACS, continues his collaboration to study protein markers for head and neck cancer with **Aaron Weinberg, DMD, PhD**, Associate Dean for Research, Professor and Chair, Department of Biological Sciences; and **Ge Jin, PhD**, Assistant Professor, both of the School of Dental Medicine, Case Western Reserve University.

The focus of the research has been on the human beta defensin-3 (HBD-3), a protein that appears to be important in the development and progression of head and neck cancer. They have found elevated levels of this protein in precancerous oral cavity lesions, and are investigating its potential as a biomarker for early identification of these frequently asymptomatic tumors. They are also exploring HBD-3 in relation to head and neck cancers caused by the human papilloma virus. While research is in the early stages, eventually Drs. Zender, Weinberg and Jin hope to study the effects of different head and neck cancer treatments, such as chemotherapy and radiation, on HBD-3 levels. Results could be used to help predict a patient's response to therapy.

The UH Ear, Nose & Throat Institute also continues to study outcomes of piezoelectric BoneScalpel™ osteotomies in osteocutaneous free-flap surgeries. Approximately 130 to 150 free-flap procedures for reconstruction following removal of head and neck tumors are performed annually at University Hospitals. About 30 percent of these procedures are osteocutaneous free flaps.

Rod Rezaee, MD, FACS, and colleagues recently published a case series on free flaps in The Laryngoscope. They found that the more precise control offered by the BoneScalpel, compared with traditional scalpels, may reduce the potential for postoperative neurovascular complications. Further study is planned, including a possible cost-benefit analysis of the technology.

Other Department News

- The Arnold Lectureship, named in honor of **James E. Arnold, MD**, immediate past Chairman of our department and present Program Director, UH Case Medical Center, recently received a $100,000 endowment. The first scientific symposium and lecture in Dr. Arnold's honor was held May 1, 2013. The guest lecturer was Gerald B. Healy, MD, FACS, emeritus Surgeon-in-Chief and emeritus Gerald B. Healy Chair of Otolaryngology at Children's Hospital Boston as well as Professor of Otology and Laryngology at Harvard Medical School. Dr. Healy was Dr. Arnold's mentor at Harvard.
- An increased number of graduates are applying for residencies with UH Case Medical Center and Case Western Reserve University School of Medicine. Applications jumped from 270 two years ago to 360 last year. The Accreditation Council for Graduate Medical Education and the Residency Review Committee recently approved expansion of the department's program from three residents to four for the 2013 match.
- Dan Waldron, a patient and a member of the UH Ear, Nose & Throat Institute Advisory Council, has given the institute a $500,000 gift. The funds will go toward research, education and clinical investigation initiatives.
- The Head & Neck Cancer Center has moved into the UH Seidman Cancer Center. Located on the UH Case Medical Center campus, this 250-bed hospital is part of the National Cancer Institute-designated Case Comprehensive Cancer Center, and is the region's only freestanding cancer hospital. The cancer center now has a floor dedicated to otolaryngology, including free-flap patients. Advanced technology treatments are available on-site, including BoneScalpel osteotomies and minimally invasive, robot-assisted ENT surgeries. An on-site clinic also provides outpatient care.

Hard to Swallow

Dysphagia treatment offered at UH Voice and Swallowing Center

Nicole Maronian, MD, Director, Voice and Swallowing Center, UH Ear, Nose & Throat Institute; and Associate Professor, Otolaryngology – Head and Neck Surgery, Case Western Reserve University School of Medicine

The public is largely aware of breathing disorders, such as obstructive sleep apnea. There is also some awareness of voice disorders. When celebrity singers develop voice complications, their hoarseness garners plenty of media attention. Yet swallowing disorders, also known as dysphagia, get less attention even though they affect a large number of patients.

In the United States, about 10 million patients seek treatment for dysphagia each year, and up to 100,000 new patients develop the condition each year. Age is a notable risk factor for dysphagia, which affects more than 20 percent of U.S. patients older than 50. That number increases to about 50 percent after age 60. Many patients present with severe swallowing dysfunction related to trauma or disease. Car accidents and other traumatic events can cause swallowing dysfunction. Dysphagia is also a potential complication of acute stroke, radiation treatment for head and neck cancer, and neurological diseases, including Parkinson's disease, multiple sclerosis, Alzheimer's disease, and amyotrophic lateral sclerosis.

The University Hospitals Voice and Swallowing Center treats dysphagia as well as breathing disorders and voice disorders, including hoarseness and changes in quality and loss of voice.

Focus on Dysphagia – Initial Evaluation

When patients present to the UH Voice and Swallowing Center with dysphagia, they undergo a complete medical history and are examined from the lips to the stomach. The center features several examination rooms furnished with high-tech equipment to facilitate fast, accurate patient diagnosis.

The center is equipped with specialized testing devices that allow physicians to observe the patient's throat, vocal cords and esophagus as he or she swallows. Testing options at the center include the functional endoscopic evaluation of swallowing and barium swallows, which can be done while the patient is awake.

The center's unique, team-oriented, multidisciplinary approach to patient care means that patients are seen by a board-certified otolaryngologist with fellowship training in laryngology and a speech therapist at the same time. If the patient's condition requires evaluation or treatment beyond the capacities of the initial team, specialists from other departments are consulted – usually on the same day of the patient's visit – including gastroenterology, pulmonary medicine, neurology, radiology, nutrition and surgery, as needed.

"Our goal is to give patients an answer," explains **Nicole Maronian, MD**, Director, Voice and Swallowing Center, UH Ear, Nose & Throat Institute. "Most of these patients have seen several physicians by the time they come to the center. For us, the patient-care experience is very important. We want patients to leave the office after their initial visit with a treatment plan in place."

Physical, Emotional, Social Consequences

While many patients with dysphagia suffer from mild disease, often related to reflux, severe dysphagia can be crippling.

Patients with severe dysfunction are unable to eat by mouth and are generally fed through a percutaneous endoscopic gastrostomy (PEG) tube. Dr. Maronian notes that much of American culture is centered on meals, such as family dinners or restaurant outings with friends. Thus, an inability to eat can be isolating and socially devastating, which can lead to depression and a greatly reduced quality of life. Severe dysphagia also can be associated with respiratory problems or morbidity due to nutritional issues. In some patients, the inability to swallow results in saliva dripping into the trachea rather than into the esophagus. This can cause respiratory problems, including pneumonia. These patients may require a tracheostomy tube in addition to the PEG feeding tube.

Given the comorbidities patients sometimes experience with dysphagia, including neurological disorders such as Parkinson's disease or Alzheimer's disease, invasive techniques to treat swallowing dysfunction are often suboptimal. Dr. Maronian and Dustin Tyler, PhD, Associate Professor, Biomedical Engineering, Case Western Reserve University School of Medicine, in a collaboration between UH and the Case Western Reserve University Department of Biomedical

"Most of these patients have seen several physicians by the time they come to the center. For us, the patient-care experience is very important."

On the cover: *Severe swallowing dysfunction with large volume silent aspiration*

Office-based endoscopic evaluation of speech and swallowing function

Engineering in the Case School of Engineering, are studying a less invasive technique to restore some swallowing function in patients with severe neurogenic dysphagia (i.e., dysphagia caused by impairment of the nervous system). They are initiating a new research program to look at severe swallowing dysfunction in which the vocal cords do not close to protect the airway.

In swallowing disorders, signals sent from the brain to vocal cords are often misdirected, and the brain can't stimulate the nerves to the vocal cords appropriately. If the vocal cords are unable to close, foods and beverages can be misdirected into the windpipe.

Improving Quality of Life

Dr. Maronian and colleagues are initiating a prospective study using a stimulator to initiate laryngeal closure. This will occur through electrical stimulation along a tracheostomy tube while vocal-fold motion is observed with a flexible endoscope. The electrical stimulation is directed to the larynx, rather than a direct implant on the nerve. In past animal models and clinical trials, stimulation of the nerves next to the windpipe has caused the vocal cords to close.

Many patients with severe swallowing dysfunction already have a tracheostomy tube to prevent saliva secretions from entering the lungs. In this trial, patients will undergo placement of a modified tracheostomy tube that has sensors that will touch the tracheal wall near the location of the recurrent laryngeal nerves. When these sensors are attached to an electrical stimulation unit, impulses will be sent to the nerves. The hypothesis is that these impulses will lead to nerve stimulation that closes off the vocal cords, potentially keeping the trachea clear of swallowed material. In the future, the hope would be that this device would allow patients to attach the stimulator prior to a meal, stimulate the nerves during the meal and turn the device off after eating.

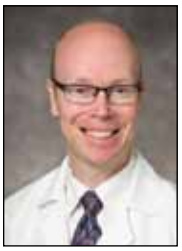
"The goal of this technology is to make the ability to eat more effortless with an easy-to-use device," says Dr. Maronian, "thereby improving quality of life for patients and their families."

Refer Your Patients

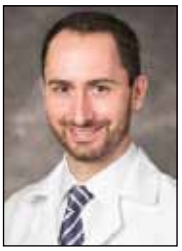
To refer a patient for possible evaluation in the research trial, please call **216-983-3455** or email Nicole Maronian, MD, at **Nicole.Maronian@UHhospitals.org**.

Comings and Goings

Recent graduates and new staff arrivals help advance ear, nose and throat medicine



Todd Otteson, MD, Chief, Pediatric Otolaryngology and Associate Medical Director, Pediatric Surgery, UH Rainbow Babies & Children's Hospital, and Associate Professor, Otolaryngology, Case Western Reserve University School of Medicine



Kenneth Rodriguez, MD, Chief, Rhinology, Allergy & Anterior Skull Base Surgery, UH Ear, Nose & Throat Institute. and Assistant Professor, Otolaryngology, Case Western Reserve University School of Medicine

James E. Arnold, MD, FAAP, Program Director, Otolaryngology – Head and Neck Surgery, UH Case Medical Center; and Professor, Otolaryngology, Case Western Reserve University School of Medicine

Chad Zender, MD, FACS, Otolaryngology, UH Case Medical Center; and Assistant Professor, Otolaryngology – Head and Neck Surgery, Case Western Reserve University School of Medicine

The UH Ear, Nose & Throat Institute takes pride in its alumni as well as its new staff members, because we know that it takes all of us working together to advance the field of ear, nose and throat medicine.

From an alumni perspective, we applaud **Anca Maria Barbu, MD**, Instructor in Surgery, Massachusetts General Hospital and Harvard Medical School. Dr. Barbu completed her residency in General Surgery and Otolaryngology at Case Western Reserve University School of Medicine in 2009. Following graduation, she joined the faculty at the School of Medicine prior to beginning a fellowship through Harvard University at Massachusetts General Hospital in Boston. During her fellowship, Dr. Barbu worked with Steven Marc Zeitels, MD, Eugene B. Casey Professor of Laryngeal Surgery at Massachusetts General Hospital, and James Alexander Burns, MD, Assistant Professor of Surgery, Massachusetts General Hospital, on a prospective clinical trial of bevacizumab (Avastin) for the treatment of recurrent respiratory papillomatosis. Dr. Barbu was recently recruited to join Dr. Zeitels in practice and is now on the faculty of the Massachusetts General Hospital Voice Center, in addition to teaching first-year medical students at Harvard Medical School and premedical students from MIT. She is the first female laryngeal surgeon to join the faculty in the division.

Joining the Team

Four otolaryngologists have joined the UH Ear, Nose & Throat Institute in 2013, and two more are scheduled to start in 2014. Pediatric Otolaryngology has increased the department's ability to treat children with the addition of two outstanding physicians: **Todd Otteson, MD**, and **Jay Shah, MD**. Dr. Otteson joined the institute June 1, serving as Chief, Pediatric Otolaryngology and Associate Medical Director, Pediatric Surgery, University Hospitals Rainbow Babies & Children's Hospital; and Associate Professor of Otolaryngology, Case Western Reserve University School of Medicine. Dr. Shah came on board as a pediatric otolaryngologist Aug. 12. He is also Assistant Professor of Otolaryngology, Case Western Reserve University School of Medicine.

Drs. Otteson and Shah have joined **James Arnold, MD, FAAP,** in providing patient care in pediatric otolaryngology. Dr. Otteson was previously an Associate Professor at the University of Pittsburgh School of Medicine, and Chief Pediatric Otolaryngologist at the Cleft-Craniofacial Clinic. Dr. Shah is joining the institute after completing a fellowship in Pediatric ENT at Children's Hospital Pittsburgh. Dr. Shah is also a Case Western Reserve University School of Medicine alumnus, having completed his residency in Otolaryngology – Head and Neck Surgery here in 2012. Pediatric otolaryngologists see patients at UH Rainbow Babies & Children's Hospital on both an inpatient and outpatient basis.

In addition to the new pediatric physicians, **Kenneth Rodriguez, MD**, became Chief, Rhinology, Allergy & Anterior Skull Base Surgery, on July 15. Dr. Rodriguez is a graduate of the University of Pittsburgh residency training program and has completed a fellowship in Rhinology and Anterior Skull Base Surgery at the University of North Carolina at Chapel Hill. Dr. Rodriguez joined **A. Tony Reisman, MD**, Chief, Otolaryngology – Head and Neck Surgery, University Hospitals Ahuja Medical Center; **Chad Zender, MD**; and **Diana Ponsky, MD**, Otolaryngologist and Facial Plastic Surgeon, UH Case Medical Center – all Assistant Professors of Otolaryngology at Case Western Reserve University School of Medicine and all sharing an interest in rhinology. The team will expand its ability to work with neurosurgery in anterior skull base disorders and formally expand the Sinus Program.

Madana Jeevanandam, MD, joined the institute Sept. 1. He will be completing a one-year Head and Neck fellowship.

The Laryngology division, under the leadership of **Nicole Maronian, MD**, is proud to announce the recruitment of **Mark Weidenbecher, MD**, who will join the institute upon completion of his fellowship at Massachusetts General Hospital in July 2014. Additionally, the Head and Neck Surgery division, under the leadership of **Pierre Lavertu, MD**, is proud to announce the recruitment of **Nicole Fowler, MD**, who will join the group in August 2014. Dr. Fowler is completing a fellowship in Head and Neck Microvascular Reconstructive Surgery at the University of Washington. "These additions to the School of Medicine faculty are one example of the institute's growth in the number of patients we can serve while continuing to improve our already nationally recognized programs," says **Cliff Megerian, MD, FACS**.

UH Otolaryngologists Publish Noteworthy Clinical and Preclinical Study Findings

Maroun Semaan, MD, Co-Director, UH Ear, Nose & Throat Institute, Ear, Hearing & Balance Center and Cochlear Implant Surgery; and Assistant Professor, Department of Otolaryngology – Head and Neck Surgery, Case Western Reserve University School of Medicine

Kumar Alagramam, PhD, Director, UH Ear, Nose & Throat Institute Translational & Basic Science Research Center; and Anthony J. Maniglia Chair for Research and Education and Director of Research and Associate Professor of Otolaryngology, Case Western Reserve University School of Medicine

Restoring Hearing in FAO and AIED

Safe and effective cochlear implants may be possible for patients with far-advanced otosclerosis (FAO) as well as individuals with autoimmune inner ear disease (AIED), according to research findings recently published by **Maroun Semaan, MD**, Co-Director, UH Ear, Nose & Throat Institute, Ear, Hearing & Balance Center and Cochlear Implant Surgery; and Assistant Professor, Otolaryngology – Head and Neck Surgery, Case Western Reserve University School of Medicine, and colleagues. Both findings were based on retrospective case reviews and published in the American Journal of Otolaryngology and in Otology & Neurotology, respectively.

The investigators performed a chart review of 30 patients with severe FAO, in which hearing aids were not an effective treatment option compared with 30 age-matched controls. All patients had received cochlear implants at the UH Ear, Nose & Throat Institute. The authors found that the presence of radiographic abnormalities was not predictive of poor hearing outcomes. There was no difference between treatment groups in terms of mean short- and long-term postoperative speech reception threshold, word and sentence scores; no patients in either group experienced postoperative facial nerve stimulation. "Our findings indicate that once cochlear patency is established, patients with cochlear ossification had good hearing outcomes, making cochlear implant a safe and effective auditory rehabilitative option for patients with FAO," says Dr. Semaan.

Dr. Semaan and colleagues performed a similarly designed chart review of patients with AIED, a condition in which dysregulation of the immune system can cause deafness to the inner ear. The study included 10 patients with AIED in a total of 12 implanted ears compared with 12 randomly selected control-group patients who had been deafened postlingually by nonimmune-mediated disease. The researchers found no significant differences between treatment groups in terms of short- or long-term post-implantation words and sentence scores. They concluded that patients with immune-mediated disease may benefit from cochlear implantation. About 50 percent of patients in this study had cochlear fibrosis or ossification; the study authors also concluded that earlier implantation might be indicated in some patients prior to the occurrence of post-inflammatory obliterate cochlea changes.

"Patients with cochlear ossification had good hearing outcomes, making cochlear implant a safe and effective auditory rehabilitative option for patients with FAO."

—Maroun Semaan, MD

Mouse Model Increases Understanding of Usher III Hearing Loss

Kumar Alagramam, PhD, Director, UH Ear, Nose & Throat Institute Translational & Basic Science Research Center; and Anthony J. Maniglia Chair for Research and Education and Director of Research and Associate Professor of Otolaryngology, Case Western Reserve University School of Medicine, and colleagues have developed an animal model (mouse) that is targeted toward performing preclinical research to study a genetic mutation typically found in North American patients with Usher syndrome III.

Usher syndrome is an incurable disease that affects about 50,000 Americans. Patients are born with normal sight and hearing, but the disease causes both deafness and blindness. All patients eventually become deaf regardless of subtype (I – III). Although many genetic mutations have been associated with Usher syndrome III, the most prevalent among patients in North America is the N48K mutation found in the Clarin-1 gene.

Use of the mouse model, which has been genetically engineered to carry the N48K mutation on Clarin-1, will help researchers understand the mutation's role in hearing loss in patients with Usher syndrome III, according to findings recently published in the Journal of Neuroscience.

"This is a good step toward understanding how deafness occurs in Usher syndrome III," says Dr. Alagramam, who notes that the findings are the results of years of collaborative work.

The next step will be continued collaboration with a large team to further study the mouse model. The hope is that preclinical findings will lead to identification of a treatment that interferes with the mutation, with the long-term goal of developing an effective treatment for Usher syndrome III.

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When to Refer for Plastic Surgery

Focus on Rhinoplasty in Patients with Sleep Apnea

Patients choose plastic surgery for myriad reasons. Some patients want to correct a deformity caused by birth, previous surgery, skin cancer or trauma, while others wish to address aging-related concerns or simply look better. Still other patients turn to plastic surgery to help correct sleep apnea.

The departments of Plastic Surgery and Otolaryngology – Head and Neck Surgery offer functional and reconstructive plastic surgery. Specific procedures include septorhinoplasty, turbinate surgery, forehead lift, eyelid surgery, face-lift, facial implants, otoplasty (ear reshaping), chin surgery and rhinoplasty.

Diana Ponsky, MD, specializes in otolaryngology and plastic surgery. "Because form and function are so intricately linked, rhinoplasty is one of my favorite surgeries, specifically rhinoplasty to improve breathing," says Dr. Ponsky, noting that this is particularly true in obstructive sleep apnea. Patients with obstructive sleep apnea repeatedly stop breathing during sleep as the throat muscles relax and block the airway. These patients may benefit from nasal surgery to improve breathing during sleep. The surgery may be internal only (with interior changes, such as nasal septoplasty, polyp removal and turbinate reduction), or may also include external, aesthetic changes to enhance appearance.

If obstructive sleep apnea has been diagnosed or is suspected, it is important that the patient undergo an upper airway evaluation.

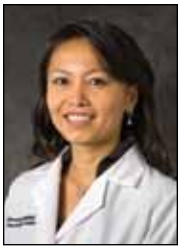
Physical risk factors for obstructive sleep apnea include being overweight or obese, and/or having a large neck, narrow airway, small chin or jaw, or large tongue, or chronic nasal congestion. Hypertension, diabetes and a family history of sleep apnea also have been associated with the condition. Demographic risk factors include male gender; postmenopausal state in women; African American, Hispanic or Pacific Islander race; and increasing age. Lifestyle factors such as smoking and use of alcohol, sedatives or tranquilizers also can increase risk.

Most patients with an obstructive component to their sleep apnea should be referred. Evaluation of upper airway anatomy will help dictate optimal treatment for obstructive sleep apnea, as many variables are involved in the pathophysiology of this disorder. These include deviated septum, obesity (leading to deposits of fat in the soft tissue of the mouth and throat), enlarged tonsils or adenoids, polyp or tumor growth, and birth defect abnormalities.

In cases where obstructive sleep apnea is suspected but testing has not yet been ordered, an anatomic evaluation by a specialist could reduce the cost of a polysomnogram.

Refer Your Patients

For more information or to refer a patient, please call **216-844-6000**.



Diana Ponsky, MD, Otolaryngologist and Facial Plastic Surgeon, UH Case Medical Center; and Assistant Professor of Otolaryngology, Case Western Reserve University School of Medicine

Image courtesy of Apple

Win an Apple iPad 2!

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