INNOVATIONS
IN OTOLARYNGOLOGY –
HEAD & NECK SURGERY

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More and more medical students are choosing otolaryngology, according to the most recent data from the National Resident Matching Program. In 2014, there were 443 applicants to otolaryngology residency programs; of those applicants, 295 candidates were accepted, for an acceptance rate of 67 percent. For those who matched in otolaryngology, United States Medical Licensing Examination Step 1 scores averaged 248 and Step 2 scores averaged 252. For those applicants who didn’t match, the Step 1 average was 239 and the Step 2 average was 245. More than 400 students applied to our program last year.

Otolaryngology departments around the United States are fortunate that the best and brightest medical students are increasingly seeking to enter our specialty. We’re grooming the future leaders of the medical world in academic settings and communities throughout America. As a Department Chairman, I take this responsibility very seriously, as do our program directors.

To meet these challenges, we have to make sure that our faculty is diverse and that we offer training in all of the sub-specialties. This gives residents the opportunity to become very specialized if they choose, but also to gain experience in the totality of the field. However, we have the added responsibility of making sure that our training program encompasses more than otolaryngology and includes topics beyond clinical concern. Topics we are now striving to cover in addition to the specialty include the economics of health care, medical-legal issues, professionalism, the ethics of medicine and end-of-life care.

We also address the challenges that come with providing services to all segments of our population, including those at various levels of socioeconomic status, which changes at times in the ever-changing health care landscape. We encourage our students to take electives in topics beyond otolaryngology and use all the resources available through our university to enhance their education.

At the Department of Otolaryngology and Ear, Nose & Throat (ENT) Institute at University Hospitals Case Medical Center, we are training the next generation of leaders in health care. With our diverse faculty and their myriad sub-specializations, along with this “big picture” approach to medicine, we are equipped to fulfill this mission.

CLIFF MEGERIAN, MD, FACS
Chairman, Otolaryngology – Head and Neck Surgery, University Hospitals Case Medical Center and Case Western Reserve University School of Medicine; Interim President, University Hospitals Physician Services; Richard W. and Patricia R. Pogue Chair in Auditory Surgery and Hearing Sciences; Director, UH Ear, Nose & Throat Institute, UH Case Medical Center; and Julius W. McCall Professor, Case Western Reserve University School of Medicine

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.
Exciting firsts from the UH ENT team changes patients’ lives

Imagine you are a teenager who has never heard a sound, then recovering from surgery and hearing the voice of a loved one for the first time. In September 2014, surgeons from University Hospital Case Medical Center performed the first auditory brainstem implant (ABI) in a pediatric patient in Ohio. The 14-year-old girl was born without cochleas. Her implant, which was turned on in the operating room, allowed her to hear on all electrode channels.

Three surgeons were on the team:
- **Maroun Semaan, MD**, Director, Division of Otology and Neurotology; and Associate Professor, Otolaryngology – Head and Neck Surgery, Case Western Reserve University School of Medicine.
- **Nicholas Bambakidis, MD**, Director, Cerebrovascular and Skull Base Surgery, UH Neurological Institute, UH Case Medical Center; and Professor, Neurological Surgery, Case Western Reserve University School of Medicine.
- **Cliff Megerian, MD, FACS**, Chairman, Otolaryngology – Head and Neck Surgery, UH Case Medical Center and Case Western Reserve University School of Medicine.

In March 2014, this team had placed the first ABI in northeast Ohio in an adult patient after removing an acoustic neuroma. The 42-year-old woman had been suffering from neurofibromatosis type II, which resulted in bilateral hearing loss. "The patient’s implant was activated six weeks after surgery, and she is hearing wonderfully," says Dr. Megerian. The patient has been able to return to work.

**OTHER DEPARTMENT NEWS**
- **UH is the first facility in Ohio to offer Inspire™ Therapy for obstructive sleep apnea (see cover story).**
- The department continues to expand its diverse faculty. New additions to the institute include **Mark Weidenbecher, MD**, and **Nicole Fowler, MD**. Dr. Weidenbecher has joined the Voice & Swallowing Center at the UH ENT Institute. His background and research interests are profiled on page 6. Dr. Fowler has joined the faculty as an Assistant Professor in Otolaryngology, Case Western Reserve University School of Medicine. After completing her fellowship in microvascular surgery and head and neck cancer at the University of Washington, she has joined the expanding head and neck oncology division. In addition, **Evan Greenbaum, MD**, from Loyola University, has joined the group as the first fellow in head & neck oncological microsurgery.
- University Hospitals also expanded otolaryngology services at UH Chagrin Highlands Health Center, which opened in October 2014, including adding the UH ENT Institute's Sinus Center and additional voice and swallowing services.
- Benefactors of UH have recently established the UH ENT Institute’s fourth and fifth endowed chairs, making it one of the few U.S. programs to have five endowed chairs. The newest chairs are the James E. Arnold, MD, and Nancy P. and Thomas W. Seitz Chair in Pediatric Otolaryngology and the Dr. Gail and Hoyt Murray Chair in Pediatric Audiology and Cochlear Implant. Each chair represents a commitment of $1.5 million for the ENT program.
- The latest rankings from U.S. News & World Report showcase UH Department of Otolaryngology’s rising national standing. The department has improved from 19 two years ago to 18 this year. Factors used to determine rankings include surgical volume, patient safety as measured by morbidity and mortality rates, availability of high-tech procedures, nurse-to-patient ratio and national reputation.
- The 12th Annual Temporal Bone Surgical Course with an Update in Otologic Surgery took place Oct. 17 and 18, 2014. Course instructors included Dr. Semaan, Dr. Megerian, and guest faculty **Dennis Borjab, MD**, Clinical Associate Professor of Otolaryngology, Wayne State University; Chief Executive Officer of the Michigan Ear Institute; Medical Director, Skull Base Surgery, Providence Hospital; and Chair of Otolaryngology Section, William Beaumont Hospital.
A New Treatment Option for Patients with Obstructive Sleep Apnea

UH CASE MEDICAL CENTER IS FIRST IN OHIO TO OFFER THE INSPIRE UPPER AIRWAY STIMULATION THERAPY

For many patients with obstructive sleep apnea (OSA), none of the treatment options seem ideal. While continuous positive airway pressure (CPAP) is the first line of treatment, compliance can be low, and some patients can’t tolerate it. Surgical alternatives can be complicated and painful, says Jonathan Baskin, MD, Chief, Otolaryngology – Head and Neck Surgery, Facial Plastic and Reconstructive Surgery, Louis Stokes Cleveland VA Medical Center; and an attending physician at UH Case Medical Center. But now there is an effective new option for some patients, and UH Case Medical Center is the first location in Ohio to offer it.

Inspire™ Upper Airway Stimulation was approved by the U.S. Food and Drug Administration on April 30, 2014. The Inspire device is a surgically implantable hypoglossal nerve stimulator that is triggered by the patient’s own respiratory effort. Patients undergo extensive evaluation, including sleep endoscopy, before surgical implantation of the upper airway device. A stimulating electrode is carefully placed around the nerve that innervates the tongue. “It’s very carefully placed on the nerve to produce a calibrated response. Our goal is to selectively and gently innervate the muscles of the tongue to move it forward, thereby providing more posterior airway space,” says Dr. Baskin.

UH IS SITE FOR PHASE III TRIAL

Inspire therapy was approved following publication of 12-month data from the Stimulation Therapy for Apnea Reduction (STAR) trial. Dr. Baskin was the surgeon for the UH site of this trial, which was a multicenter, prospective, single-group cohort design, in which the Inspire device was surgically implanted in patients with OSA who had difficulty either

REFER YOUR PATIENT. Continuous positive airway pressure (CPAP) remains the first treatment option for obstructive sleep apnea. Patients must try CPAP therapy before being evaluated for Inspire Upper Airway Stimulation. (See page 8 for more about when to refer patients for Inspire therapy.)

To refer a patient or consult with a physician, call 866-UH4-CARE (216-844-2273) and mention the word “Inspire.”
accepting or adhering to CPAP therapy. **Kingman Strohl, MD**, Research Director of Sleep Medicine at UH Case Medical Center, was principal investigator at the UH site, which enrolled seven of the 126 patients in the trial.

The STAR trial looked at the apnea-hypopnea index (AHI, or the number of apnea and hypoxia events per hour), as well as the oxygen desaturation index (ODI, or the number of times per hour blood oxygen levels decrease by at least 4 percent). From baseline (pre-device) through 12 months, the median AHI score decreased 68 percent, from 29.3 events per hour to 9.0 events per hour (P<0.001), and the ODI score decreased 70 percent, from 25.4 events per hour to 7.4 events per hour (P<0.001). Results also indicated that patients experienced improved quality of life. The surgeries were generally free of major complications, with a serious adverse event rate of less than 2 percent.

**SURGERY PROVIDES RELIEF AND INSIGHT**

As a non-surgical treatment, CPAP remains the first-line treatment for OSA, according to Dr. Strohl. Sometimes patients who aren’t tolerating CPAP just require a bit of coaching and individualized care to adapt to it. However, about 20 percent of the time, patients are truly unable to tolerate the therapy, according to Dr. Strohl. Upper airway stimulation may be appropriate for some of those patients.

The surgery takes approximately one to three hours, depending on the individual. Patients are typically discharged from the hospital the day after surgery, although in the STAR trial, 16 percent of patients were well enough to go home the same day. Recovery takes approximately a week, and the device is not activated until a month after implantation. Post-surgical risks include sore throat from intubation, incision-site pain and muscle soreness. Device-specific complications include temporary tongue weakness after surgery and tongue soreness, as well as some discomfort with device stimulation.

The goal of any treatment is to keep the airway awake while allowing the brain to sleep, says Dr. Strohl, who sees use of upper airway stimulation as a means for physicians to learn more about OSA while providing relief for patients. As physicians gain information from each patient’s experience with upper airway stimulation, they will be able to better target those who are appropriate candidates for the treatment.

Regardless of the treatment they receive, all patients who come to the UH ENT Institute for evaluation of OSA can expect a multidisciplinary approach to their care. In addition to Dr. Strohl, **Colleen Lance, MD**, Director, Clinical Sleep Operations, UH Case Medical Center; and Assistant Professor, Medicine, Case Western Reserve University School of Medicine; and **Diane Ponsky, MD**, Otolaryngology, UH Case Medical Center; and Assistant Professor, Otolaryngology – Facial Plastic and Reconstructive Surgery, Case Western Reserve University School of Medicine, are key members of the team. Board-certified specialists in ENT and sleep medicine, pulmonologists and neurologists are consulted as necessary. Psychiatry and psychology resources are also available to help patients overcome some of the challenges of CPAP therapy, such as difficulty wearing the mask due to post-traumatic stress disorder.

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**BEYOND TIRED: SERIOUS RISKS OF OSA**

Obstructive sleep apnea can have much more serious consequences for sufferers than just feeling tired. “I can’t overstate how important it is to have another treatment option for OSA. Untreated severe sleep apnea is a potentially dangerous condition,” says **Jonathan Baskin, MD**.

Potential complications of untreated severe OSA include:

- Cardiovascular conditions, including hypertension and increased risk for heart disease and stroke
- Daytime fatigue and irritability
- Complications related to medications and surgeries
- Eye problems, such as glaucoma
- Possible increased risk of death
Innovative Care FOR VOICE AND SWALLOWING PROBLEMS

Adults and children who have voice problems or problems with breathing or swallowing can find the help they need at University Hospitals Voice & Swallowing Center. Conditions treated at the Center include hoarseness, swallowing problems, changes in quality of voice, airway issues and laryngeal cancer.

The Center provides a team-oriented, multidisciplinary approach to patient care. Patients meet with a board-certified, fellowship-trained laryngologist and speech therapist at the same time. “The goal is to allow the patient to leave the room with an answer and a cohesive treatment plan,” explains Nicole Maronian, MD, Director of the Voice & Swallowing Center at the UH Ear, Nose & Throat Institute.

If the patient’s condition requires evaluation or treatment beyond the capacities of the initial team, the doctors consult with specialists from other departments – often on the same day of the patient’s visit. In addition to physicians, patients work with specially trained nurses, speech pathologists and dietitians to gain a better understanding of their condition and enhance the effects of treatment.

Unique treatment options exist in this specialty clinic, especially office-based therapies. Vocal cord lesions such as laryngeal papilloma have historically been treated in the operating room. UH laryngeal experts, using a potassium-titanyl-phosphate (KTP) laser, now treat these lesions in the office. This laser is also used to treat early stages of vocal cord cancer, creating ultra-narrow margins in order to obtain the best possible voice result. These laser treatments can occur in the doctor’s office, without sedation or general anesthesia, increasing convenience for patients and decreasing recovery time. Vocal cord injections for paralysis, BOTOX therapy and transnasal esophagoscopy are also offered as in-office therapies.

Research is also a priority at the Center. In one project, Dr. Maronian and UH colleagues from biomedical engineering are investigating using a stimulator to initiate laryngeal closure in patients with swallowing dysfunction. The electrical stimulation directed to the larynx is less invasive than a more traditional implant on the nerve. Dr. Maronian and colleagues presented initial findings on this approach at the 2014 meeting of the American Academy of Otolaryngology – Head and Neck Surgery Foundation. They reported that transtracheal stimulation of the recurrent laryngeal nerve caused vocal cord closure in all patients tested without pain or significant discomfort, which opens new avenues for treatment of severe dysphagia.

The Center also continues to grow to accommodate patient needs. A second site opened at University Hospitals Chagrin Highlands Health Center in October 2014, and the Center hired a second speech pathologist focused on voice and swallowing. The Center also welcomed laryngologist Mark Weidenbecher, MD, fresh off his laryngeal surgery fellowship at Massachusetts General Hospital and Harvard University. Dr. Weidenbecher’s research interests include tissue engineering of tracheas for airway reconstruction using small tissue samples of the patient’s own cells. His team extracts cells, multiplies them in the laboratory and bring them back into the appropriate configuration to create a tracheal substitute to address tracheal defects.

Dr. Weidenbecher is also planning a phase I trial of photodynamic therapy for treatment of patients with laryngeal respiratory papillomatosis. “The photosensitizing drug is given to the patient, which will later be activated by shining a specific light onto the tumor, and that will lead to tumor destruction,” explains Dr. Weidenbecher. “This concept could change how we treat many diseases and tumors in the head and neck in the future.”

Refer Your Patients. The University Hospitals Voice & Swallowing Center has two locations: UH Case Medical Center and UH Chagrin Highlands Health Center, in Beachwood. To refer a patient or consult with a physician, call 216-844-6000.
NEW APPROACH TO COMPLEX TRACHEAL RECONSTRUCTION

It was bad enough that Kathleen Brasko, 62, was suffering from bilateral pulmonary emboli and a brain bleed. Then, during her prolonged recovery on a ventilator, her trachea sustained severe damage. To help her breathe, her local physicians did a tracheotomy.

Brasko recovered but could no longer speak and felt her quality of life was greatly reduced by the resulting tracheostomy. “When she came to me, she was very unhappy. She didn’t want to go through life with a tube in her throat,” says Nicole Maronian, MD, Director of the Voice & Swallowing Center at the UH Ear, Nose & Throat Institute. While they discussed reconstruction, physicians were limited by the availability of healthy tissue in the patient’s trachea. “Her remaining trachea was too small to allow us to remove the tube,” explains Chad Zender, MD, FACS, Otolaryngology, UH Case Medical Center.

Dr. Zender wanted to help give Brasko the means to live a normal life, but he knew traditional approaches wouldn’t work. He had recently attended a professional meeting during which a colleague had presented data on transplanting ear cartilage into the forearm and later transplanting the “composite graft” to reconstruct the patient’s windpipe, adding the strength of the cartilage to her existing trachea. This makes sense, as both areas require rigid tissue to maintain structure. In addition, the shape of the cartilage in the back of the ear matches the shape needed to reconstruct the front of the windpipe.

Dr. Zender first tried the new technique on two patients who had less complicated defects and surgical courses. After success with those patients, he used the technique to construct a new windpipe for Brasko. He took cartilage from her ear and stacked the pieces together to get a three-to five-centimeter length of composite graft to use in the reconstruction. This tissue was transplanted into the patient’s forearm, where it healed under the skin but on top of the fasciae and established blood flow. The cartilage was ready for implant after six weeks. The cartilage, the fasciae and the radial artery and veins were then revascularized and sutured to Brasko’s windpipe.

The procedure was a success, and her trachea tube was able to be removed. “We saw the patient recently, and she’s getting around. She can go for walks and enjoy life. She feels like she’s been given back a normal life through this procedure,” says Dr. Zender. And the patient agrees. Since her procedure in May 2014, Brasko has recovered well. “Sleeping, walking, talking, breathing, it’s all good!” she says. Her husband, Mike Brasko, echoes her sentiments. “It’s amazing, truly amazing,” he says.

UH physicians are confident that as this procedure evolves, they will be able to help more patients have a life that’s not dependent on a trachea tube. “We’re fortunate that UH provides an environment of collaboration so we can work together on these difficult patients and find the solutions,” says Dr. Maronian.

For more information or to refer a patient to the Voice & Swallowing Center, please call 216-844-6000 or 1-866-UH4-CARE (844-2273).
WHEN TO REFER FOR INSPIRE UPPER AIRWAY STIMULATION THERAPY

Inspire™ Upper Airway Stimulation therapy is approved for the treatment of obstructive sleep apnea (OSA) in patients who have failed continuous positive airway pressure (CPAP) therapy. Patients who are referred for possible upper airway stimulation therapy should be at least 22 years old with a BMI of 32 or less. Patients should have moderate to severe OSA, specifically apnea-hypoxia index scores of 20 to 65, with less than 25 percent central apneas. Patients must also be free of complete concentric collapse at the palate.

Upper Airway Stimulation therapy has not been tested in morbidly obese people, so it’s not recommended for those patients at this time. There is no upper limit on the age of those who may be referred. In elderly patients, the ability to use this technology depends on their mobility and facility, explains Diana Ponsky, MD, Otolaryngology, UH Case Medical Center.

In addition to the factors above, patients must be healthy enough to undergo surgery. This generally excludes patients with severe cardiac or pulmonary disease. Although the procedure generally had few complications when it was assessed in the Phase III STAR clinical trial (see cover story), patients are at risk for infections and post-surgical pain, as with any operation.

Patients who are considered likely candidates for Upper Airway Stimulation therapy will be questioned seriously to determine whether they have truly failed CPAP after giving it a good trial. This accounts for approximately 20 percent of CPAP users, according to Kingman Strohl, MD, Research Director of Sleep Medicine at UH Case Medical Center. After CPAP is ruled out, patients undergo an upper airway examination and sleep endoscopy to determine eligibility.

Patients may be referred through pulmonary or sleep medicine clinics. For more information or to refer a patient, please call 216-844-6000.

ADVANCED VESTIBULAR REHABILITATION

Using the NeuroCom® SMART Balance Master®, the most advanced technology available, specially trained therapists conduct postural, oculomotor and gait assessments to determine the root cause of each patient’s balance problem. A comprehensive treatment plan is then developed, which may include balance retraining; canalith repositioning maneuvers; removal of debris from semicircular canals to alleviate benign paroxysmal positional vertigo; gait training; and vestibular, habituation and substitute exercises to improve the brain’s ability to interpret input from the inner ear.

Advanced vestibular rehabilitation services are available at two locations:

West side: St. John Medical Center Outpatient Physical Therapy
440-414-6050

East side: Warrensville Outpatient & Neuro Rehab
216-765-2830

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