First Near-Total Face and Maxilla Transplant in the United States

The Head & Neck Institute Collaborates with Surgeons, Transplant Specialists and Researchers for Successful Operation and Positive Outcome

A diverse team of clinicians and researchers at Cleveland Clinic performed the first near-total face and maxilla transplant in the United States in December 2008. The 23-hour procedure and the patient’s extensive postoperative care and rehabilitation benefited from the combined effort of numerous departments and institutes at Cleveland Clinic. The Head & Neck Institute (HNI) played key roles in this care team with primary involvement in the operative planning, the surgical procedure and the extensive postoperative speech, swallowing and facial nerve rehabilitation.

The recipient patient was a 46-year-old woman who had endured a gunshot wound to the midface. She was originally seen in 2004, and underwent 23 major reconstructive procedures by members of the Cleveland Clinic Plastic Surgery Department in an attempt to repair her completely absent midfacial segment, including bone, skin and underlying soft tissues. These surgeries included three microvascular flaps (fibula, ALT, radial forearm). Significant disfigurement and functional limitation persisted and she was presented for evaluation by the Cleveland Clinic Face Transplant team, which had been established as a part of an Institutional Review Board in 2004.

Team member Daniel Alam, MD, Head of the Section of Facial Plastics and Reconstructive Surgery within HNI, was approached in July 2008 by the project leader Maria Siemionow, MD, PhD, to evaluate this patient for possible candidacy for an osteocutaneous maxillofacial allograft transplant. Along with the other six surgeons on the team, they began preliminary work in the anatomy lab to develop a harvest strategy to technically achieve a successful transplantation. In September of 2009, Dr. Alam authored the operative protocol for the procedure, a 30-page operative plan detailing the procedure in a step by step fashion. Mock transplantation procedures proceeded in the anatomy lab until on Dec. 9, 2008, a donor became...
FROM THE CHAIRMAN

Dear Colleagues:

It is with great pleasure that I again welcome you to our annual newsletter to update you on the innovative programs and recent advances of the Cleveland Clinic Head & Neck Institute. It has been a remarkable opportunity to serve as Chairman of this institute and to become part of this team of remarkable care providers. We continue to strive to be innovative, compassionate and at the leading edge of care in disorders of the head and neck, and I am pleased to share a few of the highlights of our outstanding programs.

For those of you who have seen our newsletter in the past, you will notice that it is now called *Advances in Otolaryngology and Dentistry*. This name change recognizes how Cleveland Clinic has moved away from a predominantly departmental structure to institutes, in which independent departments who care for people with common disorders or in the same body area are integrated. The Head & Neck Institute is now composed of otolaryngology, dentistry, speech language sciences and disorders, audiology and oral surgery. We now manage the overall needs of patients with head and neck diseases and disorders in a comprehensive fashion while simplifying multidisciplinary care for our patients. This structure also facilitates a collaborative culture, well-rounded training programs and more comprehensive research.

Although this newsletter only serves to highlight a few of our programs, it does allow us to share with you an important program from some of our specialized clinical areas, including laryngology, pediatric otolaryngology, audiology and otology. I am particularly pleased to share with you our important role in the world’s first near-total facial transplant and our unique facial pain and temporomandibular joint dysfunction program. We will also share with you our vision and plans to become one of the premier head and neck cancer programs in the world, taking advantage of the unique international destination of Cleveland Clinic and our international outreach and satellite programs.

As I had mentioned last year, we will be completely renovating the entire 7th floor and a portion of the 5th floor of the Crile building on our main campus to accommodate the new and significantly expanded Head & Neck Institute. We have created a state-of-the-art conference center on the floor. We are implementing a global digital video, audio and still-image capture and archiving system that will allow us to share images throughout all of our sites, our operating rooms and our conference center. We are working to design remote password-protected access for our referring physicians for their patients, and for patients to access their own images. We are proud of our progress, are growing as Cleveland Clinic grows and are exploring international expansion of our services. I hope you enjoy this issue of *Advances in Otolaryngology and Dentistry*.

Michael S. Benninger, MD
Chairman
Cleveland Clinic Head & Neck Institute
The Cleveland Clinic Head & Neck Institute recognizes the importance of comprehensive evaluation and management of head and neck patients, and having Dentistry and Otolaryngology in the same institute facilitates coordination of care in a unique environment for the benefit of patients and caregivers.

A comprehensive evaluation of the masticatory system, including the condition and position of the temporomandibular joints in relation to the patient’s occlusion, the assessment of cervical muscle function and restriction, and the identification of all parafunctional masticatory habits, is the starting point for analysis of dysfunction within the masticatory system and resultant muscle disorders, such as myofascial pain dysfunction (MPD). The recognition of all aggravating and perpetuating factors involved in the formation of myofascial trigger points serves as the basis for comprehensive TMD management by decreasing muscle hypercontraction and overload to the condylar joint surfaces. Elimination of active trigger points decreases the referral patterns of MPD and heterotopic pain, which if not diagnosed can lead to inappropriate treatment.

Trigger point referral patterns from active cervical and masticatory muscle trigger points can refer to some of the following areas:

- Ear Pain
  - Lateral Pterygoid
  - Deep Masseter
  - SCM
  - Medial Pterygoid
- Sinus Pain
  - SCM
  - Temporalis
  - Lateral Pterygoid
  - Trapezius
  - Masseter
  - Digastric
- Throat Pain
  - SCM
  - Digastric
  - Medial Pterygoid
- Tinnitus
  - Deep Masseter
  - SCM
- Barohypoacusis
  - Medial Pterygoid

Travell J, Simons J: Myofascial Pain and Dysfunction, A Trigger Point Manual; Williams and Wilkins; Baltimore/London; 1999

A trained dental professional can provide a key consultative service to the otolaryngologist in the assessment of occlusion, parafunctional habits, muscle disorders and TMJ arthralgia that may contribute to or cause a patient’s ENT complaint(s).
Historically, the primary utilization of electromyography (EMG) in the head and neck has been for evaluating facial nerve injury. Over the last couple of decades, EMG has become an essential part of the practices in a number of otolaryngologic and head and neck areas. It is used in evaluation of facial, neck and spine disorders, while aiding both in diagnosis and in treatment, and particularly in identifying muscles for botulinum toxin (BOTOX®) injection. EMG is also being used to prevent injury during thyroid and facial nerve surgery.

Laryngeal EMG (LEMG) has become an essential tool for the voice and laryngology team at Cleveland Clinic. It is critical to the evaluation of laryngeal function and for localizing muscles for injections (principally BOTOX®). It is also a simple and very well tolerated procedure that is done frequently in the voice clinic.

Patients with neurogenic disorders of the larynx are best evaluated with EMG prior to intervention. These patients tend to fall into a number of categories: gross movement disorders, such as immobility of one or both vocal folds; subtle irregularities of vocal fold motion or position that might suggest paresis; and consideration of neurological diseases that involve the larynx, such as tremor, ALS or myasthenia gravis. In such conditions it is important that these evaluations be done in concert with an experienced electromyographer/neurologist, so that subtle changes in nerve-muscle interaction can be carefully evaluated.

The principal situation where we use LEMG diagnostically is in patients with immobility or hypomobility. In patients who have an immobile vocal fold, the LEMG helps to clarify whether the problem is due to an interruption in nerve impulses to the muscle or fixation of the vocal fold, often due to problems with the cricoarytenoid joint. In unilateral vocal fold immobility, we will typically perform an LEMG 6 months after the identification of the immobility. That is a good point in time to determine if the vocal fold will not return to function. If at that time EMG evidence of recruitment suggests ongoing reinnervation, subsequent return of function can often be expected. If the patient is doing poorly from a clinical standpoint, then an injection for medialization with a temporary substance would be indicated. If there is no reinnervation or reinnervation without recruitment, then the chance of return of normal function is remote. If the patient requires improvement in voice, then a more permanent procedure, such as a medialization laryngoplasty or reinnervation, would be indicated.

LEMG is also helpful diagnostically in assessing for incomplete nerve injury that has resulted in asymmetrical motion, or subtle voice problems in which the etiology cannot be determined. In bilateral vocal fold immobility, particularly after an intubation, an LEMG relatively early will help to determine if the immobility is due to fixation of the joints or denervation.

The other important use for EMG in the larynx is to isolate muscles for injection. Although this strategy is primarily used to inject BOTOX for adductor or abductor spasmodic dysphonia, it also can be used to inject the cricopharyngeus muscle in patients with cricopharyngeus spasm and dysphagia and to inject for essential voice tremor.

Key Point:

- Laryngeal electromyography (LEMG) is an essential means for evaluating the larynx and for isolating muscles for laryngeal injection. We principally use LEMG for diagnostics in patients with vocal fold immobility or hypomobility. It is also helpful in assessing for incomplete nerve injury or subtle voice problems.
available. The donor was matched well to skin color, age and facial structure. The patient and donor shared 2/6 major HLA antigens and the donor was CMV+ and the recipient CMV–.

The donor and recipient patient procedures were done simultaneously in adjacent operating rooms. Dr. Alam began the procedure by identifying potential recipient vessels in the vascularly depleted neck of the recipient patient. He then transitioned to the donor room to perform the facial procurement according to the predefined operative protocol, while the team of plastic surgeons worked on preparing the recipient for the transplant by removing extensive scar tissue and plating from her multiple prior procedures. After the harvest was completed, Dr. Alam performed the microvascular anastomoses and reperfused the new donor face. Bone plating, anastomoses of the facial nerves, soft tissue inset, and skin and mucosal closure were then done to complete the primary operative procedure.

As a part of the operative plan, the donor's parotid and submandibular glands were transferred as duplicate structures to the recipient as a means of protecting the facial nerve and facial vascular systems from injury during harvest. This redundant tissue remains in the patient at this time and is easily evident in her lateral face. This redundant glandular tissue will be removed in a planned secondary procedure after the patient’s facial nerve has shown recovery and can safely be traced by electrical stimulation.

The patient has had an uneventful postoperative course. She is being gradually weaned down on her immunosuppressive regimen without any significant clinical evidence of rejection. On day 47, a routine planned mucosa biopsy showed evidence of some mild rejection, but this finding was managed with an immunosuppressive pulse and it resolved without sequelae. There have been no clinically evident rejection episodes to date.

The postoperative rehabilitation of the patient also has been managed primarily by members of the HNI. Michael Huband, DDS, Head of the Section of Maxillofacial Prosthetics, has worked extensively with the patient to create a palatal obdurator to close a posterior soft palate fistula and to greatly improve her speech and swallowing function. He also will play an integral role in potential future dental rehabilitation of the upper maxilla as the transplant possessed only anterior incisors.

Speech rehabilitation has been led by Brian Hedman in the section of Speech and Language Pathology. He has worked with the patient on a daily basis during her prolonged hospital stay and subsequently as an outpatient. Finally, routine rhinologic care and monitoring of the patient’s sinuses was done by Pete Batra, MD, former Head of the Rhinology Section.

The extensive involvement of the Head & Neck Institute and its broad range of clinical subspecialties in the care of this complex case highlights the wide scope of care that the institute can provide. From major reconstructive procedures to long-term outpatient therapy, the comprehensive care of the HNI is most evident in this particular patient. Collaboration with other Cleveland Clinic surgeons, transplant specialists and researchers, led by Dr. Siemionow, has resulted in a successful and innovative procedure.

For references, please email the editor.
Cleveland Clinic opened a multidisciplinary Pediatric Hearing Management Clinic (PHMC) in January. This unique “team” approach to evaluating and managing children with hearing loss is proving to be comprehensive and efficient because all of the children’s auditory care providers are now in one setting.

The PHMC is also convenient for parents because it allows for the arrangement of multiple appointments for children with various healthcare specialists within a single visit. “This is important, because very young children can often get confused or anxious with the multiple follow-up visits parents regularly have to make,” says Donald Goldberg, PhD, Co-director of the Hearing Implant Program in the Cleveland Clinic Head & Neck Institute. Dr. Goldberg is also an audiologist and speech-language pathologist with the PHMC.

The specialists who comprise the PHMC, and the services they provide, include:

- Pediatric otolaryngologists examine the child to determine possible etiologies of the hearing impairment. If needed, laboratory and radiologic evaluations are scheduled.
- Audiologists evaluate hearing loss and recommend hearing-assistive technology.
- Speech-language pathologists assess the child’s auditory and speech-language skills and, if need be, set learning goals.
- Geneticists determine if the child’s hearing impairment has a genetic basis. They offer appropriate lab and diagnostic work, such as connexin testing, and provide counseling relative to potential hearing impairment issues for siblings.

“Multidisciplinary management means all the professionals are collaborating and working together to offer expertise for parents,” Dr. Goldberg says. “And parents often have so many different questions for different providers, they sometimes don’t know who or what to focus on first.”

How the PHMC Works

Upon referral from a pediatrician, otolaryngologist or audiologist, the children and their caregivers make a two-hour visit to the PHMC. During this time, patients meet with the four specialists in 30-minute blocks. Upon completion of the appointments, the team meets to develop a management plan unique to the child’s and the family’s needs. A letter outlining the outcome and the team’s recommendations is generated and sent to the family.

“Multidisciplinary care is the future of medicine; it offers patients and their families more comprehensive, more comforting and more complete care,” says Samantha Anne, MD, a pediatric otolaryngologist involved in the development of the PHMC. “Parents who have young children with newly diagnosed hearing impairment can be overwhelmed by the required provider appointments, labs and radiologic testing, and management strategies. A program like ours makes it easier for parents to coordinate complete care for their children, and builds confidence in parents so they can handle their situation better.”

The PHMC treats children who have been diagnosed with congenital deafness, unilateral or bilateral sensorineural hearing loss, auditory neural spectrum disorder, and conductive hearing loss caused by aural atresia, microtia and ossicular abnormalities.

Dr. Goldberg says that although the program is relatively new, it is already producing successful outcomes. “Some of our patients are as young as 5 months old. Research has shown that if we can help someone that young, that child will experience incredibly positive spoken language outcomes in later years.”

Donna Goldberg, PhD  Samantha Anne, MD
Head and neck cancer is a devastating disease that occurs in a group of patients often plagued by other diseases, putting them at risk of significant morbidity and mortality, and loss of quality of life. The treatment is, therefore, often difficult and requires sophisticated surgical, medical and radiotherapeutic techniques and the active involvement of a host of supportive nurses, therapists and other patient advocates to obtain the best results.

At Cleveland Clinic, we are taking advantage of the unique resources and outreach of the medical center to establish a regional, national and international destination for head and neck tumor treatment and rehabilitation. The formation of the Head & Neck Institute has allowed the integration of most of the specialties needed in the comprehensive care of patients with complex head and neck tumors (i.e., head and neck ablative surgeons, microvascular and reconstructive surgeons, dentists and maxillofacial prosthetic experts, speech and language pathologists, and dedicated nurses and advanced practice nurses).

Our goal will be to apply the current leading edge treatments, while developing new treatments and procedures with an emphasis on functional preservation.

At Cleveland Clinic, we are taking advantage of the unique resources and outreach of the medical center to establish a regional, national and international destination for head and neck tumor treatment and rehabilitation.

In addition to treating patients, we will also develop and promulgate a novel head and neck curriculum for residents and create a comprehensive head and neck fellowship training program to help develop the next generation of clinicians. We hope to offer continuing medical education courses to current practitioners and resident trainees to allow them to update their knowledge and skill in the treatment of these patients. We will develop a basic science infrastructure, looking at ways to develop the field of personalized cancer care and accrue patients to local and nationally based cancer trials. Our goal will be to apply the current leading edge treatments, while developing new treatments and procedures with an emphasis on functional preservation.

This effort is only possible with the support of Cleveland Clinic and its outreach to multiple areas in the United States and the world. As the new head of the Section of Head and Neck Surgery and Oncology, I look forward to this effort and will keep you updated on our education and treatment successes and advances.

Dr. Burkey recently joined Cleveland Clinic as Head of the Section of Head and Neck Surgery and Oncology.
Cleveland Clinic’s newly redesigned Tinnitus Management Clinic (TMC) offers a unique multidisciplinary approach to treating patients with this auditory disorder. The TMC is staffed by audiologists, dentists, neurologists, psychologists and physical therapists in one setting. This environment creates improved care for patients and convenience through “one-stop” visits.

Cleveland Clinic has had a tinnitus treatment facility since 1994. Craig Newman, PhD, Head of Audiology in the Head & Neck Institute, and Sharon Sandridge, PhD, Director of Clinical Services in Audiology in the Head & Neck Institute, are Co-Directors of the TMC, which began its new clinical model in June.

“This is one of the few dedicated tinnitus management clinics in the country,” Dr. Newman says. “Our goal is to educate patients by demystifying tinnitus and improving patients’ quality of life. Knowledge is power.”

Patients who have tinnitus that cannot be treated medically or surgically can be referred to the TMC by an otolaryngologist. The patient then attends a 90-minute group education session, and meets with the following specialists:

- **Audiologist:** Evaluates the characteristics of the tinnitus and reviews sound therapy options
- **Dentist:** Determines if the patient’s tinnitus is due to dental or temporomandibular issues
- **Neurologist:** Searches for a neurological cause for the tinnitus
- **Psychologist:** Helps the patient with quality-of-life issues and recommends coping strategies
- **Physical therapist:** Finds out if the tinnitus is caused by posture or other musculoskeletal problems

Multidisciplinary care ensures that all the specialists collaborate to improve the patients’ quality of life, says Dr. Newman. “Many of our patients can’t sleep, and some are depressed and have anxiety issues. They may work with a psychologist on stress management, a physical therapist might manipulate jaw or neck muscles, and the audiologist may suggest using a sound therapy device.”

Patients’ spouses and partners are also encouraged to attend the TMC. “Tinnitus can cause problems in the marriage,” says Dr. Sandridge. “It’s difficult for the significant other to appreciate what the patient is going through because tinnitus can’t be felt by anyone other than the person who has it. We include sound bytes that simulate tinnitus so the significant others begin to understand what their loved ones are hearing.”

A number of sound therapy devices are used as part of the management process, including hearing aids and ear-level sound generators. Dr. Newman adds that the TMC has success reducing tinnitus distress with the Neuromonics Tinnitus Treatment, which uses a music stimulus that is customized by special modification based on the patient’s hearing loss. The TMC is one of eight sites across the country researching this sound therapy option.

Drs. Newman and Sandridge also have been involved in several research projects. For a Tinnitus Research Consortium-sponsored study, they and other researchers developed the Tinnitus Functional Index, a quality-of-life survey that evaluates tinnitus severity. In addition, they helped develop the Tinnitus Handicap Inventory, a quality-of-life evaluation tool that is now used around the world as an index of perceived tinnitus handicap and has proven useful as an outcome measure following treatment.
Several Tinnitus Research Projects Under Way

James Kaltenbach, PhD

At present, treatments for tinnitus are mostly palliative in nature, attempting to improve quality of life without necessarily reducing or reversing tinnitus symptoms.

We have been working to elucidate the changes in the brain that underlie tinnitus and have discovered that when rodents are exposed to intense sound for several hours, a structure in the lower auditory brainstem, called the dorsal cochlear nucleus (DCN), develops an abnormally high level of spontaneous activity that persists for months after the intense noise is turned off. This hyperactivity is now widely regarded as a neural correlate of tinnitus because increased activity of cells in the auditory system normally occurs only when sound is present. Indeed, imaging studies have shown that the auditory centers of the brain are often hyperactive in patients with tinnitus. If we can understand what causes this hyperactivity and how to eliminate it, it may be possible to eliminate tinnitus as well. Our laboratory is now investigating a number of potential therapeutic targets for tinnitus.

**NMDA Receptor**

The NMDA receptor is of interest because of its well-known role in the mediation of excitotoxic injury and neural plasticity. Excitotoxic injury to neurons occurs when certain neural pathways are overstimulated. Too much stimulation can cause excess release of NMDA (a type of neurotransmitter called N-methyl-D-aspartate), which can trigger excess influx of calcium into cells. The excess calcium is toxic to neurons and causes them to degenerate. This mechanism may underlie the degeneration of inhibitory synapses that accompanies the emergence of hyperactivity in the DCN after noise exposure. We have found that the degree of noise-induced hyperactivity in the DCN can be greatly reduced by treating animals with an NMDA receptor blocker before they are sound exposed. NMDA receptors are also key players in neural plasticity, a phenomenon that can lead to increases in the levels of neural activity. Our group is currently investigating the potential of NMDA receptor blockers to eliminate tinnitus-related activity in the DCN after it has been induced by noise exposure.

**Acetylcholine Receptor**

We also are investigating the receptor for the neuromodulator acetylcholine. This agent is released by descending pathways of the auditory system and is another plastic mechanism the brain uses to adjust the level of neuronal excitability. Following noise-induced hearing loss, there is an increase in the sensitivity of the DCN to acetylcholine. This increase is a suspected factor contributing to the induction of tinnitus-related hyperactivity. Because this form of neural plasticity is often reversible, it is also likely to be the key to developing effective tinnitus therapies. Our tinnitus clinic is currently investigating a form of sound therapy designed to stimulate the ear over the range of hearing loss, thereby removing the trigger of neuromodulation changes leading to tinnitus. We are also investigating new approaches to activating pathways that will turn down the gain on the acetylcholine-releasing system.

**Cisplatin**

Cisplatin, known for its wide application in cancer chemotherapy, also induces hearing loss and tinnitus because of its toxicity on cochlear outer hair cells. Our research has shown that cisplatin-induced damage to cochlear outer hair cells can be largely avoided if cisplatin is administered in combination with other agents that protect the outer hair cells from injury. Two candidates that appear highly promising chemoprotectants are sodium thiosulfate (STS) and amifostine (WR2721). Future studies are planned to determine whether the protective effects of these agents can be achieved without loss of the anti-tumor effect of cisplatin.
Brian B. Burkey, MD, FACS, a head and neck surgeon, recently joined Cleveland Clinic from The Vanderbilt Bill Wilkerson Center for Otolaryngology and Communication Sciences, Department of Otolaryngology-Head and Neck Surgery, in Nashville. He has been appointed Head of the Section of Head and Neck Surgery and Oncology at Cleveland Clinic.

Dr. Burkey received his medical degree from the University of Virginia School of Medicine in Charlottesville. Dr. Burkey completed his residency in otolaryngology-head and neck surgery at the University of Michigan. He completed his fellowship training in reconstructive and microvascular surgery at Ohio State University.

Cristina Cabrera, MD, an otolaryngologist specializing in general otolaryngology; pediatric otolaryngology; sinus disease; and voice care, recently joined the Cleveland Clinic Head & Neck Institute. She received her medical degree from Thomas Jefferson University in Philadelphia. Prior to joining Cleveland Clinic, Dr. Cabrera completed her residency at the University of Kansas Medical Center.

Yolanda D. Heman-Ackah, MD, a laryngologist who specializes in professional voice care, recently joined Cleveland Clinic and has been appointed Head of the Section of Laryngology and Co-Director of The Voice Center.

Dr. Heman-Ackah earned her medical degree from Northwestern University Medical School. She completed her residency in otolaryngology-head and neck surgery at the University of Minnesota. Dr. Heman-Ackah completed fellowship training in professional voice training and professional voice disorders at the American Institute for Voice and Ear Research Graduate Hospital at Thomas Jefferson University in Philadelphia. Prior to joining Cleveland Clinic, Dr. Heman-Ackah was a partner at Philadelphia Ear, Nose, and Throat Associates.

Troy D. Woodard, MD, a nasal/sinus surgeon, recently joined the Cleveland Clinic Head & Neck Institute. Dr. Woodard received his medical degree from Johns Hopkins School of Medicine. He completed his residency in otolaryngology at Loyola University Medical Center. Prior to joining Cleveland Clinic, Dr. Woodard was a clinical instructor and rhinology fellow at the Medical College of Georgia in Augusta.

James Kaltenbach, PhD, was awarded $1.9 million over 5 years for “Central auditory plasticity as a basis of tinnitus” (R01), funded by the National Institute on Deafness and Other Communication Disorders/NIH.

Michael S. Benninger, MD, received a Distinguished Service Award from the American Academy of Otolaryngology in December.

Daniel Knott, MD, won the 2008 Ben Shuster Memorial Prize for most outstanding research project in the field of facial plastic surgery.
>> Physician Liaison  Referring physicians have a direct and personal link to Cleveland Clinic with our Physician Liaison. For help with any interaction involving Cleveland Clinic, contact Physician Liaison Kate Kenny at clevelandclinic.org/contactkate.

>> Outcomes Data Available  The latest Outcomes book from the Cleveland Clinic Head & Neck Institute is available. Our Outcomes books contain clinical outcomes data and information on volumes, innovations, research and publications. To view Outcomes books for many Cleveland Clinic institutes, visit clevelandclinic.org/quality.

>> CME Opportunities: Live and Online  Cleveland Clinic’s Center for Continuing Education’s website, clevelandclinicmeded.com, offers convenient, complimentary learning opportunities, from webcasts and podcasts to a host of medical publications and a schedule of live CME courses. Many live CME courses are hosted in Cleveland, an economical option for business travel. Physicians can manage their CME credits by using the myCME Web Portal, available 24/7.

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>> Remote Consults  Request a remote medical second opinion from Cleveland Clinic. MyConsult is particularly valuable for patients who wish to avoid the time and expense of travel. Visit clevelandclinic.org/myconsult, email eclevelandclinic@ccf.org or call 800.223.2273, ext. 43223.

>> Critical Care Transport Worldwide  Cleveland Clinic’s critical care transport team serves critically ill and highly complex patients across the globe. The transport fleet comprises mobile ICU vehicles, helicopters and fixed-wing aircraft. The transport teams are staffed by physicians, critical care nurse practitioners, critical care nurses, paramedics and ancillary staff, and are customized to meet the needs of the patient. Critical care transport is available for children and adults.

To arrange a transfer for STEMI (ST elevated myocardial infarction), acute stroke, ICH (intracerebral hemorrhage), SAH (subarachnoid hemorrhage) or aortic syndromes, call 877.279.CODE (2633). For all other critical care transfers, call 216.444.8302 or 800.553.5056.

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Advances in Otolaryngology & Dentistry

FALL 2009

Advances in Otolaryngology and Dentistry offers information from Cleveland Clinic otolaryngologists, speech pathologists, audiologists and dentists about state-of-the-art medical, surgical and rehabilitative techniques. It is written for physicians and should be relied upon for medical education purposes only. It does not provide a complete overview of the topics covered, and should not replace the independent judgment of a physician about the appropriateness or risks of a procedure for a given patient.

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The Head & Neck Institute is one of 26 institutes at Cleveland Clinic that group multiple specialties together to provide collaborative, patient-centered care. A staff of 30 physicians, dentists and scientists cares for adult and pediatric patients with complex ear, nose, throat and dental disorders. The institute, which is one of the largest otolaryngology programs in the United States, performed the world's first total laryngeal transplant. Cleveland Clinic is a nonprofit, multispecialty academic medical center. Founded in 1921, it is dedicated to providing quality specialized care and includes an outpatient clinic, a hospital with more than 1,000 staffed beds, an education institute and a research institute.

U.S. News Ranks Cleveland Clinic One of America’s Top Hospitals

Head & Neck Institute Ranked One of the Top Programs in the Nation

Cleveland Clinic has been ranked among America’s top hospitals since U.S. News & World Report began its annual survey of “America’s Best Hospitals” in 1990. The 2009 survey recognized Cleveland Clinic as one of the nation’s best hospitals overall, ranking the hospital as No. 4 in the country. The magazine’s “America’s Best Hospitals” survey ranks our ear, nose and throat program No. 9 in the nation.

For more details, visit clevelandclinic.org.

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