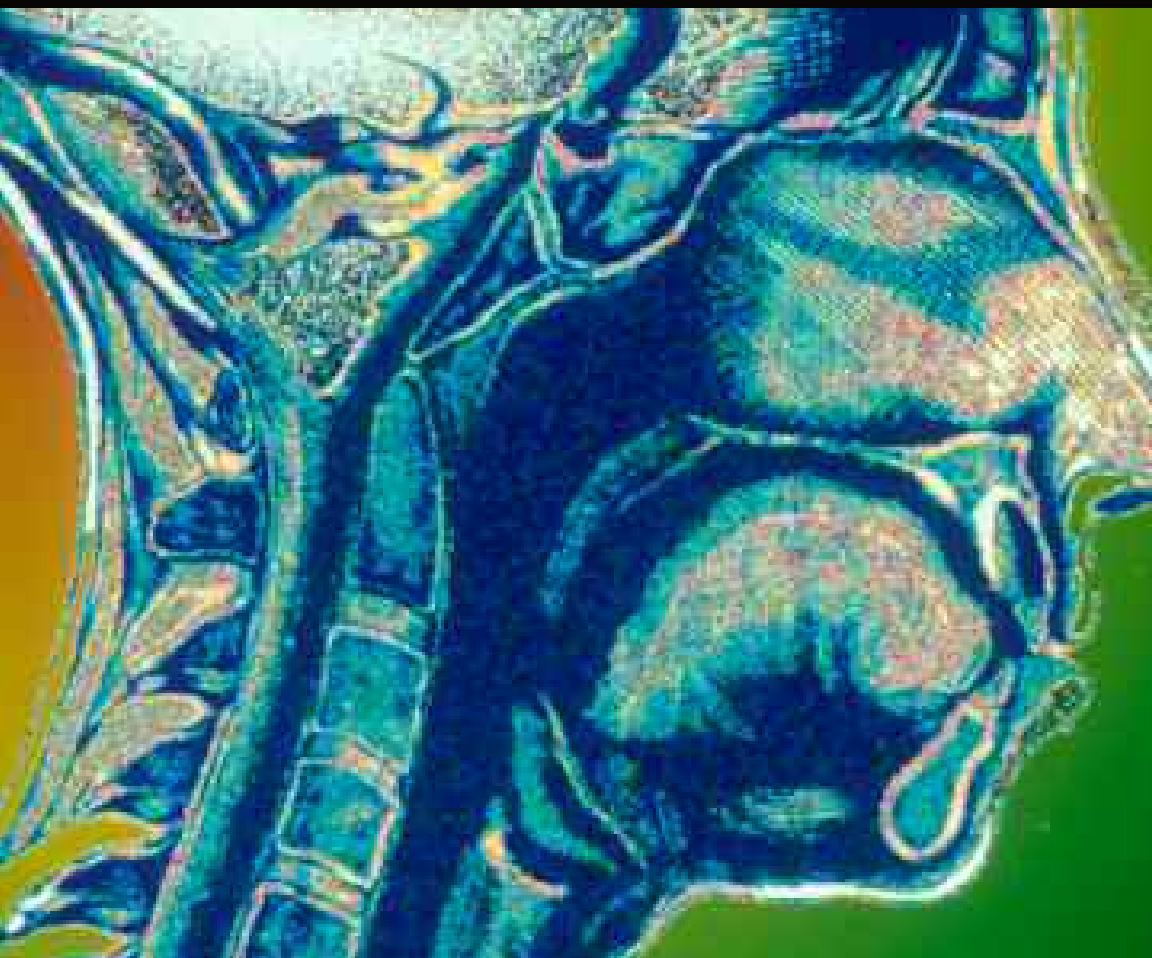


INNOVATIONS | 2007 EDITION



Otolaryngology— Head & Neck Surgery



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MEDICINE



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M E D I C I N E

Mission

The mission of Johns Hopkins Medicine is to improve the health of the community and the world by setting the standard of excellence in medical education, research and clinical care. Diverse and inclusive, Johns Hopkins Medicine educates medical students, scientists, health care professionals and the public; conducts biomedical research; and provides patient-centered medicine to prevent, diagnose and treat human illness.

Vision

Johns Hopkins Medicine provides a diverse and inclusive environment that fosters intellectual discovery, creates and transmits innovative knowledge, improves human health, and provides medical leadership to the world.

Core Values

Excellence & Discovery
Leadership & Integrity
Diversity & Inclusion
Respect & Collegiality

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Otolaryngology— Head & Neck Surgery

Dear Colleague:

Every aspect of our professional life at Johns Hopkins is devoted to patient care. Both our clinical work and our research are designed to illuminate and clarify conditions and diseases to develop enhanced treatments for our patients.

We're pleased to share with you a glimpse into our ongoing efforts, innovations and discoveries on the journey to superior patient care. Inside, you'll find our latest research that translates into better patient outcomes; innovations that bring treatments to a new level; and steps we're taking each day to improve quality, outcomes and patient safety.

Each patient we care for remains our first priority. When you refer to us, you've placed tremendous confidence and trust in us, and we'll work with you to ensure the best possible results.

Finally, we are devoted to excellence in everything we do. This booklet is part of an overall initiative for us to relay information about activities in our department, report on innovations and discoveries in the field, and enhance patients' access and experience. We're looking forward to continuing this important initiative.

Warm regards,



Lloyd Minor, M.D.

Andelot Professor and Director of Otolaryngology–Head & Neck Surgery

If you have any questions or would like to speak with Lloyd Minor or any of the Otolaryngology – Head & Neck Surgery faculty, please call 410-955-1080.

For more information on Johns Hopkins Otolaryngology–Head & Neck Surgery, visit www.hopkinsmedicine.org/otolaryngology. To refer a patient, call 443-287-6585.



Department Overview

Johns Hopkins Department of Otolaryngology—Head & Neck Surgery

Johns Hopkins Otolaryngology—Head & Neck Surgery is consistently recognized by peers around the country for our research, advanced treatments, effective use of technology and focus on patient care. Named best in the nation year after year in *U.S. News & World Report's* Best Hospital's ranking, our faculty, residents and staff devote themselves to patient safety and quality initiatives every day.

Our physicians include head and neck surgeons, facial plastic and reconstructive surgeons, endoscopic surgeons, sinus surgeons, pediatric otolaryngologists, speech pathologists, audiologists, otologists, neurotologists, laryngologists, swallowing therapists, dentists and oral surgeons who collaborate to provide comprehensive services to each patient.

Johns Hopkins' expertise ranges from common problems like tonsillitis, snoring and ear infections to such complex conditions as sinusitis, speech disorders and throat cancer.

2006 Highlights

In this booklet, we summarize some of the many clinical innovations taking place at Johns Hopkins Medicine:

- a cure for superior canal dehiscence syndrome (*see page 16*)
- research on cochlear implants and BAHA hearing aids that will transform a patient's ability to hear (*see page 21*)
- the role of HPV in head and neck cancer (*see page 24*)
- reconstruction surgery after a patient is treated for head and neck cancer (*see page 30*)

Quality

This past year alone, we've developed more ways to improve our quality of care and patient safety:

- We created protocols to reduce cerebrospinal fluid leaks after intracranial procedures to remove acoustic neuromas (*see page 25*).
- In conjunction with other Hopkins clinical departments, we developed guidelines for deep-vein thrombosis to reduce the incidence of pulmonary embolism.
- We've embraced electronic medical records and provider order entry as these tools became universal throughout our hospitals for every inpatient. In studies across the nation, these records have been proven to reduce medication errors and to improve communication and quality of care.

As always, our efforts are ongoing to improve outcomes by translating research to clinical care and better treatments.

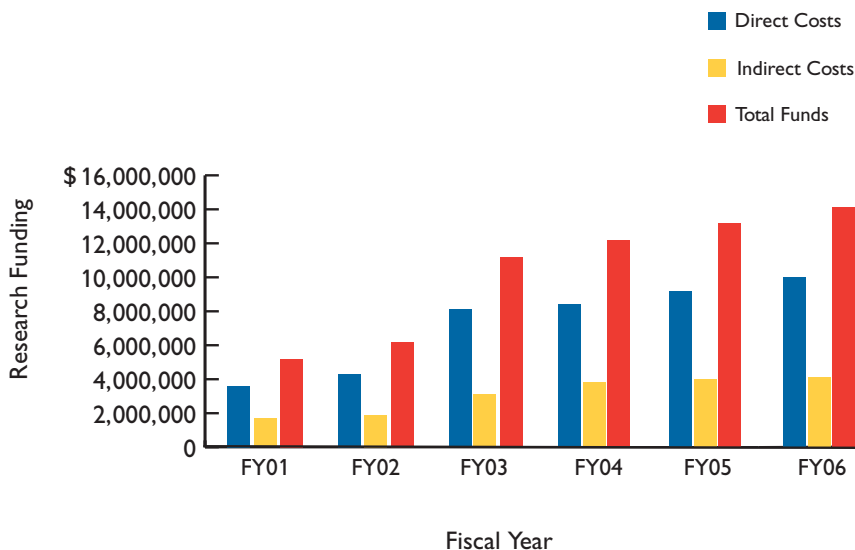


“My role is to ensure that every component of otolaryngology—head & neck surgery shines. What’s most exciting is seeing our faculty, residents and staff come together to advance our patient care mission.

In the end, this place is all about people: people working alongside one another to fulfill common dreams and aspirations related to the excellence that encompasses who we are.”

— Lloyd Minor, Director,
Otolaryngology—
Head & Neck Surgery

Research Funds



Research

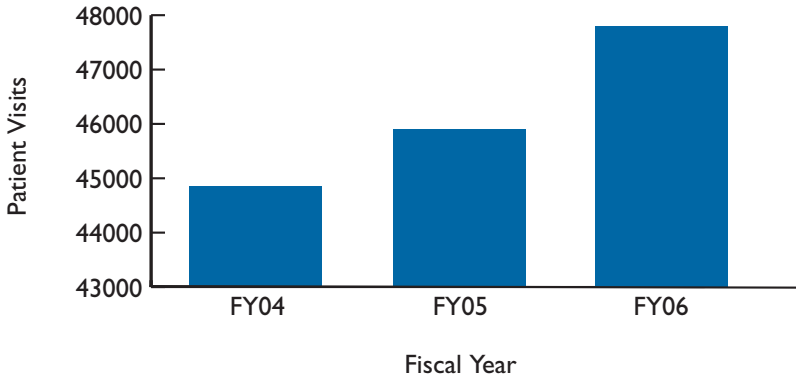
Johns Hopkins Otolaryngology–Head & Neck Surgery is at the forefront of discovery. In the past five years, our National Institutes of Health funding has nearly tripled, making Johns Hopkins the top department of otolaryngology–head & neck surgery in amount of awarded NIH grants. Our physician scientists study conditions and diseases to illuminate better treatments for our patients. As we move forward, patients will reap the benefits of our work.

Experience and Outcomes

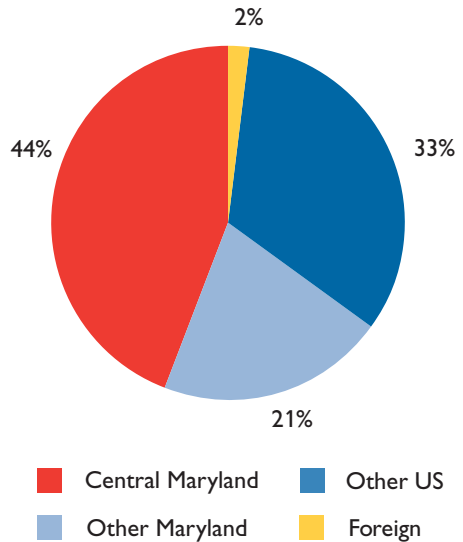
Johns Hopkins Otolaryngology–Head & Neck Surgery is one of the busiest departments in the country. Last year, we saw nearly 48,000 patient visits in our clinics.

We performed more than 4,000 surgical cases at The Johns Hopkins Hospital and Johns Hopkins Bayview Medical Center. Our head and neck cancer surgeons performed more than 500 operations. Our otologists performed nearly 200 cochlear implants, making

Patient Visits



Otolaryngology Patient Origin: Adult Inpatients



Johns Hopkins one of the top five centers for cochlear implantation in the world.

Our length of stay remains at approximately three days, which outperforms Milliman and Roberts data when length of stay for specific diagnoses and procedures is measured.

Patients from all over the United States and the world come here for treatment. Last year, more than one-third of our adult inpatients were from out of state or out of the country.

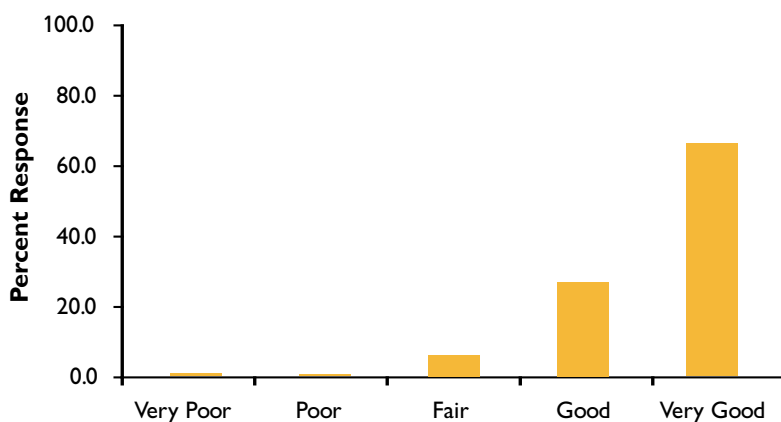
Patient Satisfaction

In our efforts to provide our patients with the best treatment and care, we continually solicit patient feedback and use this information to help improve the patient experience. Results from our most recent patient satisfaction surveys in December 2006 indicate that over 90 percent of our patients would likely recommend their Hopkins care providers and our practice.

Likelihood to Recommend Practice - 2006



Overall Quality of Outpatient Care - 2006



Demonstrating Clinical Innovation and New Discoveries

Learn on the following pages how we are breaking new ground in patient care.

Demonstrating Clinical Innovation

- Sinus Surgery Technique Transfers to Skull-Base Surgery
- Using 3-D Rapid Prototyping Surgical Algorithms in Nasal Reconstruction
- A Cancer Vaccine Taps the Role of HPV in Head and Neck Cancer
- Mystery Revealed: Researchers Create a Cure for Superior Canal Dehiscence Syndrome
- A Safe, Effective Algorithm for Recurrent/Persistent Papillary Thyroid Cancer
- Novel Approach to Evaluation and Treatment of Pediatric Sleep Apnea

New Discoveries

- BAHA Clinical Trials: Efficacy of the Bone-Anchored Hearing Aid for Unilateral Deafness
- Many Directions in Tissue Engineering Research
- Treating Precancerous Lesions of the Mouth, Throat and Voice Box
- Abnormal Immune Responses in the Nose Linked to Chronic Sinusitis
- Study: HPV Status Is Recommended for Staging System



Demonstrating Clinical Innovation



Andrew Lane, M.D.

Sinus Surgery Technique Transfers to Skull-Base Surgery

Johns Hopkins Sinus Center surgeons have broad expertise in the medical and surgical management of paranasal sinus disease, using the most up-to-date, minimally invasive techniques. Thanks to mucosal-sparing instrumentation and high-resolution video technology, today's endoscopic sinus surgery offers many benefits to patients with chronic sinusitis. "We perform a targeted removal of bottlenecks that prevent normal sinus drainage," explains Andrew Lane, associate professor and director of the Rhinology and Sinus Surgery Center. "It's all done with small instruments passed through the nostrils, so there are no external scars or bruising."

For even the most complex sinusitis cases, a completely nasal endoscopic approach has been made possible by a high-tech mapping system that allows the surgeon to identify critical anatomic structures that have been distorted or obscured by severe disease or previous surgery. Called stereotac-

tic computer-assisted surgical navigation, the technology works much like a global-positioning system. With this tool, the surgeon can safely operate very near to the thin layer of bone separating the roof of the sinuses from the brain.

But Hopkins surgeons are using the surgical navigation system to do even more. “We now use it to perform endoscopic surgery for medical conditions other than sinusitis,” Lane says, “extending our transnasal approaches to the minimally invasive treatment of tumors of the nose, pituitary gland and eye, as well as to the repair of defects in the skull base through which brain fluid and tissue enter into the nose.”

Image-guided surgery brings together the skills of experienced surgeons with 2- and 3-dimensional images of the skull base obtained using CT or MRI scans. Graphic displays in the operating room link those images to the sterile instruments used by the surgeons so that the instrument tips in real space

also appear in the virtual space of the CT or MRI images. The virtual surgical field allows the surgeon to predict what lies ahead, to avoid damaging vital structures and to assure the complete removal of skull-base tumors.

With the advent of new technologies in imaging and operative and radiation management, the effective treatment of skull-base tumors requires close interdisciplinary communication.

“In this complex surgical area,” says Lane, “physicians in various specialties, such as diagnostics and surgery, must work together to plan and perform this intricate work.”



Digital construct.

The internal surface dimensions of the rapid prototype construct are set back in a manner that takes into consideration the expected thickness of the forehead flap

Using 3-D Rapid Prototyping Surgical Algorithms in Nasal Reconstruction

Recreating the human nose is perhaps the most difficult challenge in reconstructive surgery. It not only must have lifelike dimensions and surface contour, it must be vascular enough to heal predictably, stable enough to maintain symmetry, and functional enough to be acceptable to the patient's lifestyle. Normally, computer models provide 3-D imaging of the nasal structure to aid reconstructive surgeons with achieving these goals.

Johns Hopkins physicians now have developed a way to custom-reconstruct a patient's own nose. First, a medical illustrator draws an initial rendering. This drawing is then converted into a lifelike model using 3-D laser scanning and a process called rapid prototyping, which creates a solid object by delivering material in a sequential, layered approach for each cross-section of the drawing. The end result: a translucent surgical guide that fits like a mask on the patient's face.

"During the surgery, the sterilized guide can be placed directly on the patient's face to help achieve

stability and completeness of the nasal reconstruction,” says Patrick Byrne, assistant professor of otolaryngology–head & neck surgery and director of the Division of Facial Plastic and Reconstructive Surgery. “These guides improve the accuracy of creating a subsurface framework of an appropriate size, shape and contour. To our knowledge, ours is the first report of the use of custom-made 3-D translucent intraoperative surgical guides for nasal reconstruction.”

The technique is used in patients with complex, subtotal or total nasal defects.



The template is placed on the face as a visual reference. The magnitude of the individual's reconstruction is demonstrated.

FULL ARTICLES

Byrne PJ, Garcia J. Complex nasal reconstruction: improving accuracy with the use of reverse engineered 3-dimensional surgical guides. *Plastic and Reconstructive Surgery* (accepted for publication).

Byrne PJ, Garcia J. Autogenous nasal tip reconstruction of complex defects: a structural approach employing rapid prototyping. *Archives of Facial Plastic Surgery* (in press).

A Cancer Vaccine Taps the Role of HPV in Head and Neck Cancer

Recent research shows a common factor among one-fifth of all head and neck cancers, and specifically, almost 70 percent of all oropharyngeal cancers: the human papillomavirus (HPV). Once a cell is infected with the virus, HPV works to transform the normal cell into a cancer cell. Now, scientists are using that mechanism to fight the very cancer it causes.

Johns Hopkins researchers are developing a novel, multimodality treatment regimen for HPV-associated tumors that consists of a mild chemotherapeutic agent, epigallocatechin-3-gallate (the active ingredient in green tea), plus a DNA vaccine that enhances the immune system's ability to recognize and kill HPV-infected cells. In preclinical animal models, the combination of the DNA vaccine and epigallocatechin-3-gallate (EGCG)

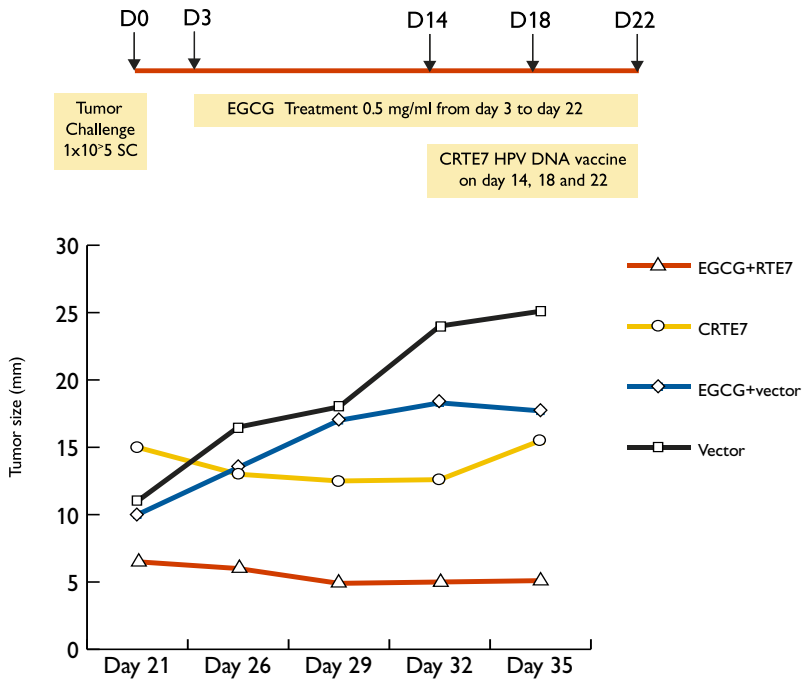
was found to reduce the tumor burden or decrease the number of HPV-associated cancer cells. It works by enhancing the immune system's already vital role in controlling HPV infections.

“An HPV vaccine made of DNA triggers a rapid response of immune cells that target HPV and helps the immune system kill cells infected by the virus,” explains Sara I. Pai, assistant professor of otolaryngology—head & neck surgery. “Because normal cells do not contain HPV DNA, the therapy would be delivered only to the HPV-transformed cancer cells.”

At the same time, the EGCG induces apoptosis (cell death) within the cancer cells. “Since the immune system is already primed by the DNA vaccine, we are able to broaden the response to other tumor-specific proteins/peptides released by the dying cancer cells,” she says. In preclinical models, the

— continued on page 16

Combined HPV DNA vaccination and oral EGCG treatment generated synergistic antitumor therapeutic effects compared with monotherapy alone.



For the tumor treatment experiments, C57BL/6 mice (five per group) were inoculated subcutaneously with 1×10^5 HPV tumor cells per mouse. Three days after tumor inoculation, mice were vaccinated with the CRTE7 HPV DNA vaccine. Mice received a booster of CRTE7 HPV DNA vaccine with the same dose every four days after the first vaccination for a total of three vaccine administrations. EGCG was given in the drinking water at a concentration of 0.5 mg/mL at the start of the vaccination and continued for 18 days. Tumor volumes were measured and recorded twice per week for eight weeks following immunization. Tumor treatment experiments were repeated three times to generate reproducible data. The graph demonstrates that those mice receiving the combination of EGCG + CRTE7 HPV DNA vaccine (as depicted by the triangles) have the smallest tumor size as compared to animals receiving no treatment (squares), EGCG alone (diamonds), or CRTE7 HPV DNA alone (circles).

Cancer Res 2007. Jan15;67(2); 802–811

combination treatment led to an enhanced tumor-specific immune response and enhanced antitumor effects, resulting in a higher cure rate than either the vaccine or EGCG alone.

The research, Pai says, exemplifies a new approach to treating cancer. Patients are traditionally treated according to where the cancer occurs. This new approach looks at what is causing the patient to develop the cancer—in this case, HPV—and then aims treatment at that uniquely identified cause.

“We’re introducing targeted immunotherapy for patients with HPV-associated cancers,” she says. “It’s the concept of providing treatment tailored specifically to the individual and his or her disease process. We’re excited to be participating in this novel research.”

If the vaccine proves effective, it can serve as adjuvant therapy, generating long-lasting, circulating immune cells in the body that can recognize and destroy microscopic cancer cells to prevent local-regional or metastatic recurrence of disease.

Mystery Revealed: Researchers Create a Cure for Superior Canal Dehiscence Syndrome

Cases of people who grow dizzy or lose their balance because of excess noise or changes in pressure—even by merely coughing or laughing—had stumped clinicians for decades. But research conducted at Johns Hopkins has led to advances in defining and treating this rare and little-known medical phenomenon, called superior canal dehiscence (SCD) syndrome.

Fascinated by the relationship between balance problems and eye movements, Lloyd Minor and colleagues tracked the eye movements in his patients with dizziness problems and found a number of patients had tiny holes in the upper arch of the inner ear cavities directly above the superior semicircular canal. Changes in intracranial pressure carry through the minute openings to cause the balance-sensitive canal to bulge; this sometimes leads to a chronic state of imbalance and causes the ear to be hypersensitive to sound and motion.

Minor and his team discovered that surgically closing the dehiscence, or the area in the superior canal where the bone casing has the cracks, with a plug of fascia and bone puts an end to the symptoms.

The surgery, which takes from four to six hours, is extremely delicate. Surgeons first cut a hole above the ear and open the skull, then move aside a part of the brain to reach the superior canal of the inner ear. The canal is plugged with fibrous tissue and small chips of the patient's bone taken from the area of incision and skull opening. Once the plug is positioned within the lumen of the canal, the surgeon tamps it into the canal's opening and allows the brain's dura to return to its position over the spot.

Since the team saw its first patient with the condition in 1995, it has successfully operated on 50 people. The surgeons are learning more about SCD all the time; further knowledge could lead to earlier diagnosis with simpler tools that physicians across the country could use.

“The results of our work should allow surgeons to better counsel their patients with SCD on what is the likely improvement in symptoms after the procedure,” says surgeon John Carey, one of the lead authors of the studies.

FULL ARTICLES

Carey J, Migliaccio A, Minor L. Semicircular canal function before and after surgery for superior canal dehiscence. *Otology & Neurotology* 2007;28:356–364.

Limb C, Carey J, Srireddy S, Minor L. Auditory function in patients with surgically treated superior semicircular canal dehiscence. *Otology & Neurotology*. 2006;27:969–980.



Image navigation is used during the surgery to repair superior canal dehiscence. The patient's CT scan, obtained preoperatively to confirm the diagnosis and show the location of the dehiscence, is displayed in three planes of view referenced to an instrument used in the surgery. The lower right panel shows the image through the operating microscope.

A Safe, Effective Algorithm for Recurrent/Persistent Papillary Thyroid Cancer

Papillary thyroid cancer (PTC) accounts for 75 percent of thyroid cancer cases in the United States; it is treated primarily with total thyroidectomy with or without neck dissection. Though the incidence of well-differentiated thyroid cancer is on the rise, mortality rates are not—they have remained the same for 30 years. The majority of cases responsible for this increase in incidence are those of tumors that are less than 2 cm in size.

The reported incidence of recurrent/persistent thyroid papillary thyroid cancer is increasing as well, chiefly due to increasingly sensitive follow-up tests. Compared to primary thyroidectomy, though, re-operative thyroid bed surgery (RTBS) has a significantly higher frequency of operative complications, especially in recurrent laryngeal nerve (RLN) injury and hypocalcemia. Physicians are faced with an evolving clinical management dilemma, says Johns Hopkins head and neck surgeon Ralph Tufano.

“Increasingly sensitive diagnostic tests in the surveillance for recurrent or persistent cancer have driven us to treat all disease, macroscopic or microscopic,” says Tufano. “The dilemma centers on the question, Are we overdiagnosing and treating recurrent/persistent cancers that are of no clinical significance? When do the risks outweigh the benefits of treatment?” Until physicians are better able to identify patients who should be treated aggressively versus those who should be monitored carefully, surgeons must continue to operate on all of them.

To conquer that challenge, Tufano and his team of researchers have created an algorithm for safe and effective RTBS for recurrent/persistent thyroid cancer. In a retrospective study of 33 patients, Tufano’s team evaluated treatments and outcomes to define a management algorithm that includes three main components:

- Detection of recurrent/persistent PTC with high-resolution neck ultrasound examination
- Pre-RTBS high-resolution neck ultrasound examination to map location and size of suspicious lesions within the thyroid bed and neck
- Guidelines for operative technique, including using recurrent laryngeal nerve monitoring



Electrodes located within the endotracheal tube allow recurrent laryngeal nerve activity to be monitored during complex thyroid and parathyroid surgeries.

NIM™ STANDARD EMG REINFORCED ENDOTRACHIAL TUBE COURTESY OF MEDTRONICS ENT

“Safe and effective RTBS is based on a multidisciplinary approach that enables the identification and localization of recurrent/persistent PTC,” Tufano explains. “The surgical algorithm described provides a pathway that all head and neck surgeons can comfortably utilize to treat this complex and challenging patient population to prevent disease progression.”

In the future, Tufano says, nonsurgical techniques such as ultrasound-directed radiofrequency ablation may enhance treatment while reducing morbidity. He and his colleagues plan to start a pilot study to determine safety and feasibility of this technique later this year.

FULL ARTICLE

Farrag T, Agrawal N, Sheth S, Bettegowda C, Ewertz M, Kim M, Tufano R. An algorithm for safe and effective re-operative thyroid bed surgery for recurrent/persistent papillary thyroid carcinoma. *Head and Neck* 2007; (epub ahead of print).

Novel Approach to Evaluation and Treatment of Pediatric Sleep Apnea

Sleep apnea is common in children but often goes unrecognized. If left untreated, sleep apnea may result in health problems as well as behavioral and academic problems. Johns Hopkins pediatric otolaryngologists have created novel protocols for diagnosing and treating this and other disorders.

“We use a multidisciplinary approach to treating children with suspected sleep disorders that includes a full, comprehensive evaluation using a group of specialists with experience in such sleep problems to obtain a focused diagnosis and treatment,” says pediatric otolaryngology director David Tunkel.

Most patients undergo specialized pediatric sleep studies performed at Johns Hopkins—studies that, many times, are not offered at other facilities. “The standards for pediatric sleep studies are very different from those for adults,” Tunkel explains. “It is vital that a child receives an evaluation at a facility that specializes in pediatric studies.”

If the child must have surgery, Hopkins pediatric otolaryngologists

offer two advanced methods of adenotonsillectomy—powered intracapsular and coblation—that reduce bleeding and postoperative pain compared with other methods.

The powered intracapsular tonsillectomy and adenoidectomy uses a precision microdebrider that removes nearly all of the tonsils and adenoids, leaving a minute amount of tissue intact to protect the throat muscles and decrease postoperative pain. This method also decreases recovery time from two weeks to less than four days.

Coblation uses radio waves that turn saline into a lukewarm stream of charged ions that carry enough energy to quickly dissolve the targeted tissue, resulting in minimal tissue damage to surrounding areas. Benefits include less postoperative pain and a faster recovery period with a return to eating in one to three days, as opposed to seven to 10 days.

In addition, for the 5 percent of pediatric patients who require a more extensive treatment regimen, including craniofacial surgery, experienced Johns Hopkins facial plastic and reconstructive surgeons are available.

New Discoveries

BAHA Clinical Trials: Efficacy of the Bone- Anchored Hearing Aid for Unilateral Deafness

The bone-anchored hearing device now provides an effective alternative for those with hearing loss due to chronic otitis media, congenital ear canal malformations and single-sided deafness who cannot benefit from conventional hearing aids.

In studies over the past three years, Johns Hopkins researchers found that a bone-anchored hearing device (made by Cochlear Corp.) placed on the side of the deaf ear works better in subjects with normal monaural hearing than does contralateral routing of signal (CROS) amplification. These patients showed improved word discrimination in noise and said they were consistently satisfied with BAHA amplification; they rated CROS poor. General directional hearing decreased with CROS use and was unchanged by the BAHA device. Twenty-two of 23 subjects followed up in the 2006 study continue to use their BAHA device over an average follow-up that now exceeds two years.



Bone anchored hearing device

FULL ARTICLE

Lin L, Bowditch S, Anderson J, May B, Cox K, Niparko J. Amplification in the rehabilitation of unilateral deafness: speech in noise and directional hearing effects with bone-anchored hearing and contralateral routing of signal amplification. *Otology & Neurotology*. 2006; 27:172–182.

Many Directions in Tissue Engineering Research

Johns Hopkins researchers are exploring tissue engineering—using cartilage and bone—to replace missing structures in a patient's body. This is an early-stage study, explains researcher Kofi Boahene, but success could lead to techniques to use a patient's own cells to form new bone to replace bone removed because of cancer, for example. Traditional methods commonly take bone from the patient's fibula or scapula to refill such areas.

Researchers also are studying the treatment of keloids, or excessively thick scars. They hope to find a way to engineer proteins to help improve scar formation.

A third area of scientific study is engineering mechanisms that would inject fillers into the facial area as a way of reconstructing deformities without open surgery. An abstract describing this work, *Tissue Engineering with Photofillers*, was well received at the Triological Society Annual Meeting in Chicago, April 2006.

Treating Precancerous Lesions of the Mouth, Throat and Voice Box

Johns Hopkins researchers are leading a one-of-a-kind international, multi-institutional trial of the biological agent Cetuximab to treat aggressive precancerous conditions of the mouth, throat and voice box. The study is ideal for patients who have had recurrent precancerous lesions, who cannot be treated by surgery or who have had previous head or neck cancer.

Patients eligible for the study have unresectable, diffuse high-grade dysplasia; previously treated head and neck squamous cell carcinoma with persistent or recurrent high-grade dysplasia; and lesions with such high-risk molecular features as 3p and 9p chromosomal loss. These patients have a risk of progressing to malignancy that ranges from 40 percent to 70 percent over a five- to 10-year interval.

Although traditional treatments have included complete surgical excision, many patients cannot be treated effectively with conventional surgical therapy. In this study, supported by a National Cancer Institute SPORE grant, as well as funding from Zila Inc., and Bristol Myers Squibb, physicians are using Cetuximab to block the epidermal growth factor receptor and assessing the response of patients to this novel agent.

For more information on this study, call Joseph Califano, principal investigator, at 410-955-6420.

Abnormal Immune Responses in the Nose Linked to Chronic Sinusitis

Although chronic rhinosinusitis affects almost 40 million Americans each year, its causes remain poorly understood. But ongoing research in the Johns Hopkins Sinus Center has revealed previously unrecognized abnormalities in the immune system function that protects the lining of the nose and sinuses in patients with hard-to-manage chronic sinusitis.

“The local immune system of the nose may be more important in the development of sinusitis than previously thought,” says study lead author Andrew Lane, associate professor and director of the Rhinology and Sinus Surgery Center. Hopkins rhinology scientists have demonstrated that nasal lining cells, or epithelial cells, can sense invading bacteria or fungi and secrete antibiotic-like chemicals to inhibit potential infections.

But in the chronic sinusitis associated with nasal polyps, the ability of epithelial cells to recognize and react to bacteria appears to be impaired, allowing the invad-

ing organisms to gain a foothold in the sinuses. Simultaneously, polyp epithelial cells produce high levels of other chemicals that are associated with immune response against parasites, even though no parasites are present. This misplaced immune response may worsen swelling and allow the infection to proceed unchecked.

Current Sinus Center research focuses on how epithelial cells may be redirected toward a more normal immune response that would clear the infection and reduce the polyp swelling, which could lead to new treatments for chronic sinusitis.

FULL ARTICLE

Ramanathan M, Lee W, Lane A. Increased expression of acidic mammalian chitinase in chronic rhinosinusitis with nasal polyps. *American Journal of Rhinology.* 2006;20:330–335.

Study: HPV Status Is Recommended for Staging System

In a recent abstract praised by the American Society of Clinical Oncology, Johns Hopkins researchers propose that human papillomavirus (HPV) status should be a stratification factor in future clinical trials and should be included in the system used for staging head and neck cancers.

In a multicenter phase II clinical trial, researchers reviewed data on patients with head and neck squamous cell cancers. They found that HPV-positive patients responded better to concomitant chemoradiation when compared to HPV-negative patients.

The abstract received the 2007 American Society of Clinical Oncology (ASCO) Bradley Stuart Beller Foundation Fellowship Merit Award. This award was established in 1985 to recognize the top abstract submitted by a fellow, as determined by the Scientific Program Committee. The manuscript is currently under review for publication. Authors in order, Hopkins authors in bold: **Carole Fakhry, William H. Westra**, Sigui Li, Anthony Cmelak, John A. Ridge, Harlan Pinto, **Arlene Forastiere, Maura L. Gillison**.

For more information about our published research, visit PubMed at www.pubmed.gov. Articles and abstracts are indexed by author, topic or journal.

Patient Safety and Quality Measures

Safely Reducing Spinal Fluid Leakage after Removal of Acoustic Neuromas

Great advances have been made in the microsurgical technique of removing acoustic neuromas, but cerebrospinal fluid (CSF) rhinorrhea had been—until recently—one of the few remaining sources of perioperative morbidity.

Following craniotomy and removal of temporal bone surrounding the tumor, previously air-filled spaces can become flooded by CSF, which then flows into the ear and then the nose via the eustachian tube. These fistulas increase the risk of meningitis if untreated and are associated with additional days in the hospital and the risks of additional invasive procedures. This complication, which occurs in as many as 16 percent of cases, has encouraged surgeons to seek changes in technique aimed at eliminating fistulas and reducing CSF rhinorrhea.



Axial T1-weighted MRI with gadolinium showing large acoustic neuroma (vestibular schwannoma) occupying the left cerebellopontine angle and extending into the internal auditory canal (arrow) where it is surrounded by petrous bone (black on MRI). This tumor was removed via a suboccipital craniotomy with removal of the posterior lip of petrous bone (arrowhead) for optimal removal and preservation of auditory and facial nerves. When air cells in this bone are opened, a CSF fistula may develop.

Johns Hopkins neurosurgeons and neurotologists found that a new technique using hydroxyapatite bone cement (HAC) at the site of surgery to reconstruct the drilled posterior wall of the porus acusticus significantly reduces the incidence of CSF leak when compared to previous methods. Traditional methods included the use of bone wax, fat, muscle, fibrin glue or a combination of these placed in the drilled bone. Less than 6 percent of cases in which surgeons have used HAC required revision surgery for management of CSF leak.

“Lowering CSF leak reduces the chance for meningitis and other complications that can accompany prolonged hospitalization and bed rest, which is used to encourage spontaneous healing of the fistula,” says neurotologist Howard Francis. “The safety of the surgical management of acoustic neuromas is now greater than it was even two years ago as we update our techniques.

“We will strive to do even better by continuing to examine our results and seeking additional opportunities to increase safety and reduce risks.”

Oropharynx Cancer Responds Well to Neck Dissection with Radiotherapy

Many methods are used to treat oropharynx squamous cell carcinoma. Patients with small primary tumors (T1–T2) without nodal metastasis will have similar outcomes in terms of local control and disease-free survival with either surgery alone or radiation therapy alone. But when bulky nodal disease (N2 or greater) is present, there is no consensus on the best treatment.

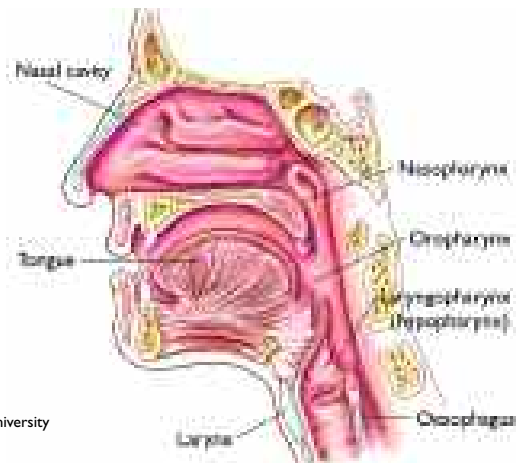
Now, research at Johns Hopkins shows that treating small oropharynx primary tumors presenting bulky nodal disease with early initial neck dissection followed by radiation therapy (with or without

chemotherapy) demonstrates excellent overall and disease-free survival rates.

All 16 patients whose cases were reviewed for the study survived; in all but one (94 percent) there was no evidence of the disease at last follow-up (follow-ups ranged from six to 75 months). The study shows a significant improvement in outcomes in selected patients with T1/T2 primaries and stage III/IV disease.

FULL ARTICLE

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Reducing Severity of Percutaneous Tracheostomy Complications

Johns Hopkins otolaryngologists have led efforts to standardize the protocol for performing percutaneous dilatational tracheostomy (PDT) on ICU patients. The protocol has reduced complications by 50 percent; now, all tracheostomy procedures for inpatients are performed following this protocol.

The PDT is arranged directly between the intensive care team and the surgeon, leading to a highly efficient “tracheostomy team.”

“We initiated protocols that eliminated scheduling difficulties for inpatients and standardized criteria for candidates as well as the actual way we perform the procedure,” says Nasir Bhatti, assistant professor of otolaryngology–head & neck surgery. “In addition, we developed a comprehensive postoperative care model involving the entire multidisciplinary team. The complication rate drops significantly with experience.

“We’ve established this procedure and are now seeing the result—optimal outcomes.”

Quality-of-Life for Pediatric Patients

Johns Hopkins head and neck surgeons have established multidisciplinary clinics for swallowing disorders and for hearing loss, and they are performing research studies (including one assessing quality of life for children who have tongue-tie) to better understand pediatric otolaryngologic disorders and their causes, treatments and effects on young patients. In addition to establishing trends and understanding the long-term effect of current methods of treatment, they hope their work translates to better care, says pediatric otolaryngologist David Brown.

For example, physicians at the Pediatric Fiberoptic Endoscopic Evaluation of Swallowing Clinic care for children with swallowing disorders secondary to neurologic injuries, vocal fold paresis, burns and other injuries. The team consists of Brown and pediatric otolaryngologist Stacey Ishman working with speech pathologist Maureen Lefton-Greif. Using a flexible fiberoptic endoscope, they can see a child's upper airway while he or she swallows liquids and soft foods and identify the patient's particular swallowing disorder. Then the team gives the family strategies to help the child safely swallow foods. More than 30 children are seen in this clinic each year.

The Patient Experience

Cancer Resection, Facial Reconstruction: Multidisciplinary Team Gets Patient Rocking Again

For 55-year-old musician and music teacher Paul Yutzy, Johns Hopkins surgeons Paul Flint, Patrick Byrne and Ralph Tufano rank right up there with Jimi Hendrix on the list of people who have changed his life.

Hendrix sealed a 15-year-old aspiring rocker's fate as a guitarist and vocal performer when Yutzy saw him in concert in the 1960s. This winter, Flint, Byrne and Tufano successfully treated Yutzy when tonsil/base-of-tongue cancer recurred fairly quickly after chemotherapy and radiation treatment.

Flint, a friend and former guitar student of Yutzy's, brought Yutzy to his Hopkins colleagues after symptoms indicated the return of his cancer. In a 14-hour operation, Tufano, a head and neck surgical oncology specialist, resected the base of the tongue and a portion of the lateral pharyngeal wall via a mandibulotomy approach. For the facial reconstruction, Byrne, a fa-



Paul Yutzy

cial plastic and reconstructive surgeon, performed a microvascular free tissue transfer (a radial forearm free flap) using donor tissue from Yutzy's arm near the wrist.

"Dr. Byrne performed the reconstruction from tissue on my right hand, so that my left hand was not impeded in playing the guitar," Yutzy says.

Yutzy, who has performed in local rock bands during his career, has spent the past 22 years teaching music at Friends School in Baltimore. After his bout with cancer left him weakened, he returned to instructing third-, fourth- and fifth-grade rock bands one day a week. He hopes to return soon to one of his favorite gigs—initiating 4-, 5- and 6-year-olds into the world of music.

"When introducing a child to music, you need to encompass the spirit of the song in addition to the words and notes," he says.

A recent benefit concert in his honor gave him the chance to leap back into performing.

"It was perhaps my career highlight when Paul took the stage to sing and play an amazing version of 'Mustang Sally,'" Byrne says. "Folks were dancing in the aisles."

Yutzy was touched by the presence of his physicians.

"Half my medical team was there. When I announced I wouldn't be here if it weren't for them, the audience gave them a standing ovation," he says. "Now, I plan on performing until they have to wheel me down the stage."



Richard Christian.

A Life in Balance: SCD Causes Vertigo, Falls, but Surgery Corrects All

Richard Christian's life came unhinged with a belly laugh. In the fall of 2004, the Illinois high school teacher doubled over with laughter at a joke his son told. Then the athletically built 55-year-old kept tilting forward until he collapsed.

At first worried that he might have suffered a stroke, family members felt reassured when they noted that Christian was speaking clearly and in perfect control of his extremities. But in the coming weeks, he had similar episodes, with escalating variations. Even the slightest exertions would give him the illusion that he was tumbling. He began hearing the sound of his own heartbeat thrumming in his ear as he tried to sleep, or the strange echoes of his joints moving when he tried to resume his jogging routine. A sudden sense of vertigo would seize him when the organ at church hit a certain note.

Christian saw many physicians for a diagnosis. Some explored cardiac issues. Others probed his cranial vasculature. Others thought it was a blood flow issue. Finally, in December

2005—after 13 months with this mysterious condition—Christian was referred to one of the national experts on these rare disorders: Lloyd Minor, the director of the Department of Otolaryngology—Head & Neck Surgery at Johns Hopkins.

Further testing at Hopkins performed by Minor and John Carey, associate professor, confirmed that the group of symptoms Christian was experiencing could be explained by a disorder first described at Hopkins and termed superior canal dehiscence (SCD) syndrome.

“Tiny holes in the skull in the inner-ear cavities cause changes in intracranial pressure, leading to dizziness after loud noises,” Minor explains. His research into this phenomenon led to the discovery of a cure: Plugging the holes erases the symptoms.

Minor explained to Christian the delicate operation that could give him back his balance. Surgeons cut a hole above the ear and open the skull, where they move

aside a piece of the brain to reach the holes. Once the holes are plugged with fibrous tissue and small chips of the patient's bone, the surgeon tamps the mixture down and closes the skull. It's a four- to six-hour procedure.

After months of falling and limited movement, Christian decided to have the surgery. It was a success.

Minor says Christian's was a textbook case. For Christian, the surgery helped him return to his normal life.

“I've gotten more stability and maneuverability back than I'd ever imagined I'd have again,” he says. He no longer fears slopes and stairs, and his sensations of disequilibrium are virtually gone.

Our Faculty

Lloyd B. Minor is the Andelot Professor and director of the Department of Otolaryngology–Head & Neck Surgery at The Johns Hopkins University School of Medicine. He is an otologist and neurotologist with research interests in basic and clinical vestibular physiology.

Dr. Minor received his bachelor's degree from Brown University in 1979 and his medical degree from Brown in 1982. He completed his two-year core surgical residency at Duke University, followed by a four-year postdoctoral research fellowship in vestibular physiology and a residency in otolaryngology–head & neck surgery at the University of Chicago. He then was a clinical fellow at The Otology Group and The EAR Foundation in Nashville, Tennessee. He was recruited to Hopkins in 1993 and is a professor of otolaryngology–head & neck surgery, of biomedical engineering and of neuroscience. He became the director of the Department of Otolaryngology–Head & Neck Surgery in 2003.

In 1998, Dr. Minor and his colleagues described a clinical syndrome of vertigo and balance disturbance caused by a dehiscence of bone overlying the superior semicircular canal. After making the discovery by studying the abnormal eye movements in these patients caused by loud noises, he devised a surgical procedure to correct the anatomical abnormality. Other areas of research interest include the effects of Ménière's disease on vestibular function and signal processing mechanisms in vestibular pathways.

Dr. Minor is a past president of the Association for Research in Otolaryngology and has completed a term as chair of the Auditory Research Study Section of the National Institutes of Health.

Johns Hopkins Otolaryngology—Head & Neck Surgery Faculty

Audiology and Hearing Aids

Stephen P. Bowditch, M.S., CCC-A
 Roni E. Dinkes, Au.D., CCC-A
 J. Sue Garman, M.S., CCC-A
 Angela Lataille, Au.D., CCC-A
 Mariah Menichino, Au.D., CCC-A
 Colleen Ryan, M.S., CCC-A
 Alicia White, M.S., CCC-A

Dentistry and Oral Surgery

James Christian, D.D.S., M.B.A.
 William Henderson, D.D.S.
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 Linda Niculescu, D.D.S.
 Ghassan Sinada, D.D.S.

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 Ralph Tufano, M.D.

Snoring Disorders/Sleep Apnea

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 Matthew Kashima, M.D.
 Wayne Koch, M.D.

Swallowing Disorders

Charles W. Cummings, M.D.
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 Matthew Kashima, M.D.
 Wayne Koch, M.D.

Voice Disorders

Charles W. Cummings, M.D.
 Paul Flint, M.D.

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 Michael Holliday, M.D.
 Charles Limb, M.D.
 Lloyd Minor, M.D.
 John K. Niparko, M.D.

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 Lloyd Minor, M.D.
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 M.A., CCC-SLP
 Kimberly Webster, M.A.,
 M.S. CCC-SLP

How to Refer a Patient

Johns Hopkins Otolaryngology–Head & Neck Surgery welcomes referrals of new patients. We look forward to working with you to determine the most appropriate care for your patients.

There are several ways to refer a patient. For urgent physician to physician referrals or consultation, please call the Hopkins Access Line (HAL) at **1-800-765-5447**.

You may also refer patients to any of the Johns Hopkins Otolaryngology–Head & Neck Surgery faculty, by calling **443-287-6585**.

For more information about Johns Hopkins Otolaryngology–Head & Neck Surgery, visit our Web site at www.hopkinsmedicine.org/otolaryngology

Locations

Johns Hopkins Otolaryngology–Head & Neck Surgery offers patient consultations in offices throughout the Baltimore metropolitan area, including the Outpatient Center at The Johns Hopkins Hospital, Johns Hopkins Bayview Medical Center, and ambulatory outpatient centers at Green Spring Station and White Marsh. For directions and maps, please visit our Web site at www.hopkinshospital.org/directions.

Referral Assistance

Hopkins USA

Hopkins USA provides one point of contact for our out-of-town patients. Our staff can help patients identify appropriate physicians or specialists, coordinate multiple medical appointments, arrange second opinions and obtain general information on Johns Hopkins' numerous services. In addition, Johns Hopkins USA staff can provide information about transportation, lodging and other travel needs. Call **443-287-6585** to talk with Hopkins USA. For family accommodations on the patient floor, see the Marburg Pavilion information (at right).

Johns Hopkins International Services

The professional staff of International Services coordinates all aspects of international patients' medical care, paying special attention to personal, cultural and travel-related needs. The staff will arrange consultations, second opinions or treatments and coordinate appointments in a time-effi-

cient manner. The staff also provides medical records reviews before the patient travels to the United States, language interpreters, cost estimates and assistance with travel arrangements. For more information, call **+1-410-955-8032** or visit the Web site at www.jhintl.net.

Accommodations Assistance

Accommodations Office

The Johns Hopkins Hospital has arranged special rates (and shuttle service in some instances) at local hotels for patients and their families. A full-service travel agency is available to help patients and their families with air, hotel or ground accommodations. It is open Monday through Friday, 8:30 a.m. to 5 p.m. Please call **1-800-225-2201** or **410-614-1911** for assistance.

Marburg Pavilion

Located in the historic Marburg Building, the Marburg Pavilion offers deluxe accommodations for adult patients. A limited number of private rooms and two-room suites are available for an additional charge and feature fine wood furniture, private baths, entertainment centers and an array of services such as expanded dining menus and overnight sleeping accommodations for family members. For more information, call **410-614-4777**.

Patient Relations

Patient representatives are available to help resolve any concerns about patient care, interpret the policies and procedures of the hospital, and arrange for services patients may need. At The Johns Hopkins Hospital, call **410-955-CARE (2273)** to speak with a patient representative. Hours are 8:30 a.m. to 5 p.m., Monday through Friday. The office is located in the hospital at Carnegie 100.

At Johns Hopkins Bayview Medical Center, call **410-550-0626** to speak with a patient representative about any patient care concerns. Hours are 8:30 a.m. to 5 p.m., Monday through Friday. The office is located in the Bayview Medical Office on the main level.

Sign Language

Deaf and hearing-impaired patients can arrange for interpreters or use the TTY in the patient relations offices at both The Johns Hopkins Hospital and Johns Hopkins Bayview Medical Center. For more information, call **410-955-2273** at JHH or **410-550-0626** at Bayview.

For more information, please visit the Johns Hopkins Hospital Web site at www.hopkinsmedicine.org or The Johns Hopkins Bayview Medical Center Web site at www.hopkinsbayview.org

For patient information and a visitors guide to The Johns Hopkins Hospital, visit www.hopkinshospital.org/patients/hopkinshospital.org/patients

Johns Hopkins Medicine Overview

Johns Hopkins Medicine, established in 1995 to unite Hopkins' biomedical research, clinical, teaching and business enterprises, brings together The Johns Hopkins University of School of Medicine and its faculty with the facilities and programs of The Johns Hopkins Health System. The Health System, which has its origins in the founding of the world famous Johns Hopkins Hospital, now comprises three hospitals, as

well as other elements of an integrated system, from a community physicians group to home care. The components of Johns Hopkins Medicine consistently are named at the top of national rankings for best hospital and best school of medicine, and its faculty consistently win the largest share of NIH research funds. Results of this research continue to advance efforts to diagnose, treat and prevent many diseases.



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M E D I C I N E

To contact the
Department of Otolaryngology–
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call 443-287-6585

Visit our Web site at
www.hopkinsmedicine.org/otolaryngology