Inside the Holt/Géléoc Lab
Gene therapy strategies lend hope to hearing loss treatment (page 16)
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In the Department of Otolaryngology at Harvard Medical School, we’re committed to making a big impact in our field through our three-pronged mission of delivering expert and innovative clinical care, groundbreaking research and exceptional training programs, with the goal of challenging and inspiring the next generation of leaders in otolaryngology.

This past June, we celebrated the graduation of our 2014 residency class, along with 12 clinical fellows on their way to productive academic careers in their subspecialties (page 20). Just as our trainees in Boston will make their mark in the otolaryngology community, we are excited about our growing relationships with residency programs in the developing world, including our partnerships with otolaryngology programs at the Mbarara University of Science and Technology in Uganda and the University Teaching Hospital of Kigali in Rwanda (page 12). Education is just one way that we are deeply invested in the future of the field.

So much of what we do is inspired by our patients, who motivate us to pursue the best possible treatments for their conditions to improve the quality of their daily lives. On page 4, we highlight the breadth of experience in the Facial Nerve Center, which has cared for more than 2,000 patients with facial movement disorders over the past decade. We’re also proud of our work in the emerging field of facial transplantation, which has the potential to dramatically restore both appearance and function to patients with severe facial deformities. We explore some of the special considerations and ethical questions surrounding the procedure on page 8.

We’re also committed to improving our patients’ lives by making strides in our research endeavors. On page 6, we feature research in the area of olfactory disorders, and particularly our efforts to return the sense of smell to those who have lost it. With an animal model for age-related smell loss, there is hope that we may soon develop therapies for patients with this type of smell loss.

In our cover story, we feature one of the many ways that otolaryngology researchers at Harvard Medical School are contributing to a worldwide effort to find cures for hearing loss. With an emerging gene therapy trial for mutations of the TMC genes, which they identified as key molecules required for auditory processing in Neuron in 2013, Drs. Jeffrey Holt and Gwen Géléoc are leaders in the international movement to develop biological treatment strategies for human deafness.

As you read through the pages of our fall issue, we hope you will connect with the many ways that otolaryngology physicians and researchers at Harvard Medical School are contributing to the field through exceptional clinical care, research and teaching advancements.

Thank you for your interest in and support of the Department’s activities.

Sincerely,

D. Bradley Welling, M.D., Ph.D., FACS
Above: Daniel J. Lee, M.D., and Daniel B. Polley, Ph.D.

Right: Dr. Polley, who recently developed a computerized rehabilitation interface to reduce the intensity of tinnitus.

The One Fund Boston recently announced that it has provided $1.5 million to establish the One Fund Center, which has a two-year mission to provide personalized care and support for those injured in the Boston Marathon bombings, as well as their families.

The grant includes $500,000 to create separate tinnitus and hearing centers at Mass. Eye and Ear for the purpose of continuing care and research to help marathon bombing survivors, as well as $1 million to Mass General for treatment of survivors’ other invisible wounds.

“The One Fund Center is designed as a resource for survivors, their families and the victims’ families to connect them with exceptional care and each other,” said Jim Gallagher, president of the One Fund Boston Board. “The One Fund Board is again grateful to the entire hospital community in Boston who continue to work together in supporting and treating this very special group of individuals and their families.”

The centers at Mass. Eye and Ear will rely on Department specialists and scientists, including Sharon G. Kujawa, Ph.D., Daniel J. Lee, M.D., Daniel B. Polley, Ph.D., Alicia M. Quesnel, M.D., and Aaron K. Remensneider, M.D.

Drs. Lee, Quesnel and Remenschneider are working with marathon bombing survivors to treat their related hearing difficulties and track their progress. Dr. Polley and his team have developed a computerized rehabilitation interface to reduce the intensity of their tinnitus. Dr. Kujawa’s focus will be on the “hidden hearing loss” that can persist after exposure, even when the audiogram returns to normal.

While the bombing-related work of our doctors will certainly help survivors, the resulting research and discoveries will hopefully benefit the public as well.

“We are so proud that Boston continues its tradition of leading the way in exceptional, innovative care,” Mr. Gallagher said.
Friends and colleagues recently gathered to celebrate the establishment of an endowed fund that will become the Harvard Medical School Claire and John Bertucci Endowed Professorship in Otology and Laryngology in the Field of Thyroid Surgical Oncology, made possible through the generosity of Claire and John Bertucci.

Mr. and Mrs. Bertucci funded this professorship to honor Gregory W. Randolph, M.D., FACS, FACE, Chief of the Divisions of General Otolaryngology and Thyroid and Parathyroid Surgery at Mass. Eye and Ear. Mrs. Bertucci is a patient of Dr. Randolph’s.

"With this endowed gift, Claire and John will advance research, teaching and care for generations to come," said John Fernandez, Mass. Eye and Ear President and CEO. "They will enable our physician-scientists to pursue their boldest ideas and to push the boundaries of science."

Before Dr. Randolph joined Mass. Eye and Ear as a full-time physician in 1993, the hospital did not have a formal thyroid program. Dr. Randolph’s subspecialty interests in this area led to the formation of the Division of Thyroid and Parathyroid Surgery in 2004. Under Dr. Randolph’s leadership, the Division has become one of the finest thyroid cancer surgical care services in the country.

Dr. Randolph has dedicated much of his career to clinical research in laryngeal nerve monitoring and the development of preoperative laryngeal exam guidelines in thyroid and parathyroid surgery to promote surgical safety. He teamed up with colleagues in Anesthesia and Audiology early in his career to launch a thyroid intraoperative nerve monitoring program at Mass.

Eye and Ear. The team has used intraoperative monitoring in more than 3,500 thyroid and parathyroid surgical cases to date, making the Division one of the most experienced with the use of nerve monitoring technology in thyroid and parathyroid surgery in the world.

The Division has the lowest complication rates anywhere—a direct result of Dr. Randolph’s dedication to improving upon care through innovative research.

The Division also serves as a hub for training the next generation of leading thyroid surgical specialists. In 2004, Dr. Randolph took on his first clinical fellow in thyroid and parathyroid surgery at Mass. Eye and Ear, the first otolaryngology-based clinical fellowship of its kind.

As a permanent endowed fund at Harvard Medical School, the income from the Bertucci Professorship will support the academic activities of a senior physician like Dr. Randolph in perpetuity. Mr. and Mrs. Bertucci’s generosity ensures that long after Dr. Randolph retires, the next Bertucci Professors will continue the tradition as global leaders in thyroid surgery.

"I’m proud to say that Mass. Eye and Ear is a world leader in thyroid surgical oncology," said D. Bradley Welling, M.D., Ph.D., FACS, Chair of the Department of Otolaryngology at Harvard Medical School. "Greg has had a long list of impressive advances that have changed the way we care for patients and improved the lives of countless people. We are so grateful for this wonderful gift."
Facial Nerve Center Reviews
Decade’s Worth of Clinical Outcomes
Knowing soon after she began her residency that she had a passion for improving the lives of patients with facial paralysis, Tessa Hadlock, M.D., has dedicated her career to this very singular interest.

“I had an interest in facial paralysis very early in my training,” she said. “Ever since, I’ve been able to grow with the problem.”

Dr. Hadlock, now Chief of Facial Plastic and Reconstructive Surgery at Mass. Eye and Ear, assumed Directorship of the Facial Nerve Center in 2002. Originally established in 1989, the center was one of the first dedicated to the treatment of facial nerve disorders.

Under Dr. Hadlock’s leadership, the Facial Nerve Center has experienced incredible growth, with patient volume skyrocketing to more than 2,000 cases of facial paralysis. The volume, along with Dr. Hadlock’s dedication and focus, has engendered an environment advantageous for clinical outcomes research.

“We’re a very high throughput center and have seen many patients with facial paralysis,” said Dr. Hadlock. “Based upon deep analysis of several thousand people, we’re starting to really understand every single flavor.”

Physicians in the Facial Nerve Center recently published two clinical research papers, examining more than a decade’s worth of clinical outcomes in facial nerve disorders. One study reviewed the etiologies of more than 2,000 patients seen with facial palsy, while the other reviewed a large series of clinical outcomes following microvascular gracilis transfer for facial reanimation.

Published in the July 2014 issue of Laryngoscope, with former clinical fellow Marc Hohman, M.D., as first author, one study reported on a large demographic series of 2,047 patients seen in the Facial Nerve Center for facial palsy between June 2003 and June 2013. Though the majority of cases were identified as Bell’s palsy, the study shows that the causes of facial paralysis are myriad, and will hopefully raise awareness of the wide variety of etiologies and result in fewer missed diagnoses and better outcomes.

In the Laryngoscope paper, Drs. Hohman and Hadlock also developed a series of algorithms for different types of facial paralysis, from acute episodes to long-standing facial palsy, to aid others in their diagnostic and therapeutic approaches to these complex disorders.

“We developed the algorithms to say, if a patient looks like this, you could try this, because we’ve had success with that,” Dr. Hadlock said. “Over the years we’ve switched gears and melded therapies to really get the results we want.”

Another study, published in the March/April 2014 issue of JAMA Facial Plastic Surgery with former clinical fellow Prabhat K. Bhama, M.D., MPH, as first author, reviewed 154 microvascular gracilis transfer surgeries performed for facial reanimation between March 2003 and March 2013 in great detail—the largest series published on this particular reconstruction.

“We started recording variables about the operation from the very first one we performed to today,” Dr. Hadlock said. “We’ve kept track of the weight of the muscle after harvest, does it contract nicely on the table, how successful was the neurorraphy…We’ve been meticulous documenters of different potential variables that could predict outcomes.”

These publications represent an important milestone and demonstrate the broad and deep experience of the Facial Nerve Center at Mass. Eye and Ear that has flourished over the past decade.

“When the volume started to really come in, more expertise developed,” Dr. Hadlock said. “We’ve really been able to grow in this extremely narrow niche.”
Experts have long recognized that our sense of smell not only contributes to our enjoyment of life, but also to our daily safety and well-being. We rely on our sense of smell to make us aware of smoke in detecting a fire, natural gas leaks and to avoid eating rotten food. In the elderly, of which there are estimates that greater than 50 percent of the population over the age of 65 has experienced smell loss, it can be difficult to get proper nutrition, as their appreciation of flavor diminishes and appetite decreases.

For Eric Holbrook, M.D., Chief of the Rhinology Division at Mass. Eye and Ear, getting to the bottom of smell loss has been a goal since medical school, where he met James Schwob, M.D., Ph.D., his current collaborator at Tufts Medical School on a series of research projects exploring the pathophysiology of olfactory dysfunction.

“The ultimate goal is to return the sense of smell to those who have lost it,” Dr. Holbrook said. “But first, we have to better understand the underlying disorder and why it’s happening.”

While some cases of smell loss may be treated by caring for an underlying cause (often nasal obstruction, in which odors can’t reach the nerves of the olfactory system because of swelling, polyps or sinus disease), other cases are much more complex, because the mechanism is
poorly understood. Often there is not much that can be done to return function to those patients.

“It’s relatively straightforward managing patients with what we consider a ‘conductive’ loss through steroids or surgery to reduce swelling and inflammation,” Dr. Holbrook said. “But for those patients who experience smell loss from head injury or a bad cold, or they’ve lost their sense of smell with age…we don’t really have any good, proven medication or therapy for those cases.”

This subset of patients is the focus of a series of basic science research projects that Dr. Holbrook and his colleagues engage in to better understand olfactory dysfunction. To begin to understand differences in the system between those with sense of smell and those without, they have been looking at samples of tissue obtained from patients.

For the aging population—the area in which they believe they’ve made the most headway—Dr. Holbrook and colleagues suspect that smell loss may be due to an exhaustion of the unique regenerative properties of the olfactory system, which, when functioning properly, is able to continuously create new, odor-sensing neurons throughout life.

“For whatever reason, we’re losing neurons in the nose as we age, and we don’t know yet what does that,” Dr. Holbrook said. “It could be environmental factors—chronic exposure to the air and pollutants, perhaps—or it could be that, as we get older, like in other systems, the ability to make new cells diminishes.”

They have developed an animal model that uses genetics to create a long-term injury to the olfactory epithelium, and they are studying the response to that long-term injury. Dr. Holbrook and colleagues suspect that key stem cells in the olfactory system become inactive over time.

“We know that one of the key cells responsible for making new neurons is the horizontal basal cell, one of the reserve stem cell populations,” Dr. Holbrook said. “And for whatever reason, over time, the system loses its ability to ‘activate.’ We think there may be a finite ability of these cells to divide and create new neurons.”

With the animal model as a useful tool, this may offer the promise of developing and testing therapies for patients with age-related smell loss.

“There are things that we know might be able to turn that activation back on,” Dr. Holbrook said. “If we can reactivate the system’s ability to create new neurons, we have a good chance of returning function to humans, too.”

This research was supported by grants R01DC014217 and R01DC010242 from the National Institute on Deafness and Other Communication Disorders of the National Institutes of Health.

“If we can reactivate the system’s ability to create new neurons, we have a good chance of returning function to humans, too.”

Dr. Eric Holbrook
Special Considerations
IN
Facial Transplantation
A head and neck surgeon’s perspective

Donald J. Annino, Jr., M.D., D.M.D., scrubbed in on the first face transplant surgery at Brigham and Women’s Hospital (BWH) in April 2009, just a few months following the first facial transplantation ever performed in the United States, by a surgical team at Cleveland Clinic in December 2008.

Both institutions were at the forefront of bringing this complicated yet life-changing surgery for patients with severe facial deformities, which had been successfully performed on a few patients in Europe and in Asia, to the United States. It turned out that a donor appropriate for the patient at Cleveland Clinic was identified first.

“At the time, both institutions had been looking for donors to do the procedure for our patients,” Dr. Annino said.

Finding a donor is one of many obstacles that face transplant candidates and their surgeons encounter in the long process of having the surgery, which has been performed just more than 20 times worldwide to date. When searching for a donor for a face transplant candidate, the matching process must consider sex, ethnicity, age and other factors unique to the recipient.

“Sometimes candidates can be on the list for up to a year just waiting for the right match,” Dr. Annino said. “There are a lot of things that you don’t have to worry about for other organ transplants that you do for faces.”

The medical community has grappled with special considerations and ethical questions surrounding face transplant in the decade since the procedure was first
successfully performed in France in 2005. In the right situation, the procedure has the potential to dramatically improve a patient’s mental and physical health.

Face transplant is considered a viable option only in unique cases where the face is so deformed that patients are not able to have a regular social life—and after very careful consideration by a team of healthcare professionals assessing a variety of factors.

As a head and neck oncologist with career experience in reconstruction after head and neck cancer removal, Dr. Annino plays an integral role in the facial transplantation program at BWH led by Bohdan Pomahac, M.D., and the Plastic Surgery Department. Dr. Pomahac and Dr. Annino are the only two physicians who have participated in
Even with these important resources and regulations, there is some question about whether a face transplant candidate can truly give their informed consent for the procedure. With only about 20 face transplants having been performed worldwide and the first performed less than 10 years ago, it's difficult to provide patients with enough information about the history of the surgery.

“If someone comes in with cancer, we have data based on many years and thousands of patients to support our predicted outcomes,” Dr. Annino said. “But you can't say that with face transplant. We don't know what will happen in 10 years.”

Members of the team also assist candidates with navigating the difficulties of processing the surgery, ensuring that patients understand and are equipped to handle the significant change to their appearance.

“When you think of yourself, you usually think of your face—what you see in the mirror,” Dr. Annino said.
“Patients must understand that they will not look the way they did before the injury.”

If a decision is made to go forward with surgery, the surgical team engages in meticulous, proactive planning to ensure that the complicated surgery goes smoothly. It’s also a long surgery—up to 24 hours—and often requires a rotation of surgeons working in shifts.

“The harvest team has to understand what nerves, blood vessels and structures they need to get,” Dr. Annino said. “And then we have a game plan here to identify what nerves we need to find and what blood vessels. This is all based on imaging studies done before the surgery.”

As with other transplant surgeries, patients undergoing facial transplantation must commit to lifelong immunosuppressive therapy, to ensure that the body does not reject the donated organ. The commitment itself requires careful consideration on the part of the surgeon and patient, but there is also some data that indicates that immunosuppression significantly increases the risk of cancer. Cancer patients are not candidates for face transplant due to the risk of recurrence or metastasis.

“Someone who has had cancer before or who is currently struggling with cancer, especially in the head and neck area, their cancer is likely to return or spread with immunosuppressive therapy,” Dr. Annino said.

“Even those who have never had cancer are likely to get cancer with suppressed immune systems.”

Though there are many considerations and ethical questions surrounding the surgery, face transplant has the potential to restore both appearance and function to patients with severe facial deformities. For many, it has been “life giving,” because they felt socially outcast and isolated before the surgery.

Dr. Annino’s patients who have had the surgery appear to be integrating back into society fairly well.

“Before the surgery, they were reaching for any straw, because their lives were so miserable,” Dr. Annino said. “Now, they’re out doing public speaking and appearing on national news.”

“Before”

“After”

“When you think of yourself, you usually think of your face—what you see in the mirror. Patients must understand that they will not look the way they did before the injury.”

Dr. Donald Annino
The international medical community has come together in recent years to address how to best serve the developing world. A growing emphasis on capacity building through partnering with residency programs and promoting faculty development represents an important paradigm shift in global surgery efforts.

Harvard Medical School otolaryngologists have stepped up to the task through several global health initiatives, including the establishment of longitudinal relationships with local otolaryngology programs in Uganda and Rwanda.

“It’s an exciting time for global surgery,” said Wendy Williams, Associate Director of Administration for the Office of Global Surgery and Health at Mass. Eye and Ear. “We think these departments can be sustainable, with their own local faculty to generate their future otolaryngology surgeons.”

About five years ago, Jo Shapiro, M.D., Director of the Otolaryngology Division at Brigham and Women’s Hospital, made her first visit to the Mbarara University of Science and Technology (MUST) in Uganda. She was asked by David Bangsberg, M.D., M.P.H., Director of the Center for Global Health at Mass General, to address a pressing need for mentorship in the otolaryngology residency program at MUST.

Dr. Ramon Franco leads a laryngology rotation at the Mbarara Regional Referral Hospital in Uganda.
“They were looking for an otolaryngologist to go and help with the residency program,” Dr. Shapiro said. “It was an honor, and I was excited about the potential of the program.”

Dr. Shapiro set to work on developing a curriculum for the otolaryngology residency in Mbarara, which was later approved by MUST and the Uganda Ministry of Health. Dr. Shapiro continues to support and mentor residents in the program, as well as spread the word on her experiences through international meetings.

Through the generosity of the Kletjian Foundation, Mack Cheney, M.D., opened the Office of Global Surgery and Health at Mass. Eye and Ear in 2013 and began a pilot program at MUST, building upon the long-standing relationships established there by Drs. Bangsberg and Shapiro. The Office is working to provide a consistent presence of HMS otolaryngology faculty in Uganda by coordinating resources and frequent faculty visits throughout the year.

“We’re making a lot of progress,” said Dr. Cheney, the Kletjian Chair of Global Surgery and Director of OGSH at Mass. Eye and Ear. “The residents and faculty there seem to be getting the message that we’re invested in them long-term.”

The Office has coordinated two rotations of HMS faculty in Mbarara so far, with another planned for November. When they are in between visits, they provide consistent mentorship through teleconferencing, with future plans for online curriculum and journal club development. The overarching goal of OGSH is to develop an environment where local programs can advance independently.

“We have faith in the people there,” Ms. Williams said. “We’re working with very bright residents and capable young faculty who just haven’t had the educational resources and mentorship available to allow them to progress professionally.”

More recently, the Office has provided resources to support outpatient clinical outcomes data capture for the otolaryngology clinic at the Mbarara Regional Referral Hospital. This resource not only provides important information about local disease burden in otolaryngology, but also encourages professional development for the program.

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The idea is to collect the data not just while our physicians are there, but to give MUST a system to collect outcomes data themselves,” Ms. Williams said. “It also opens their eyes to research opportunities and helps them to understand how their ongoing work is making an impact.”

To better understand how OGSH is building capacity in Mbarara, Jennifer Shin, M.D., has served as an advisor in evidence-based practice. Years ago, Dr. Shin developed a validated clinical practice instrument that is used to evaluate performance within the Harvard Otolaryngology residency program. The instrument is now used in Mbarara to document educational impact.

“If the faculty in Uganda ultimately incorporate the clinical practice instrument into their program, they could use it to track progress, which can be very useful for self-sufficiency,” Dr. Shin said. “It’s an instrument that their faculty could use, just as our faculty use it to evaluate our own residents in Boston.”

Providing equipment for residents and faculty in Uganda is a priority for both OGSH and MUST. Mass. Eye and Ear recently donated equipment for MUST to develop a temporal bone laboratory, which will significantly enhance otologic instruction in Uganda. The lab will serve as an invaluable regional resource for surgical skills training.

Around the same time that OGSH began their work in Mbarara, Roger Nuss, M.D., of Boston Children’s Hospital began a teaching and mentoring relationship with the otolaryngology department at the University Teaching Hospital of Kigali in Rwanda, a neighboring country of Uganda. Cheney and Nuss are exploring opportunities to combine their efforts.

“Our developing relationships happened almost in parallel, and we’re excited about the possibilities to share faculty and resources between Mbarara and Kigali, which are separated by just a five hour drive,” Ms. Williams said. “It would also bring diversity to the faculty of each program.”

“Rwanda and Uganda are in many ways sister countries—a lot of the population crosses back and forth,” Dr. Nuss said. “By coordinating efforts, we may be able to have some of the more adult-oriented otolaryngologists come to Rwanda, and in turn have some of the pediatric-oriented otolaryngologists go to Uganda.”

Dr. Nuss initially made contact with the otolaryngology residency program in Rwanda in 2012 and developed a plan to have faculty from Boston Children’s Hospital travel to Kigali three times each year to collaborate with the residents and faculty. The hospital in Kigali began an otolaryngology residency program four years ago to improve its capacity to manage otolaryngology problems.

For the most part, the region is optimistic about the growing medical community in Rwanda. The young physicians there feel a strong sense of nationalism and are committed to rebuilding their medical infrastructure 20 years after the genocide, which wiped out their medical system almost entirely.

“In many ways, it’s an exciting time for Rwanda,” Dr. Nuss said. “There’s a lot of hope on the horizon, and the young otolaryngologists there know that they are important players in the medical field and that they’re going to improve their country.”

Dr. Nuss’ team recently received funding from a grateful patient donor to develop a teaching module for residents in Rwanda, specifically to improve diagnostic accuracy of acute/chronic ear disease, which is one of the biggest issues in the country and leads to hearing loss.

“If the teaching module works well in Rwanda, there is an opportunity to take elements of the curriculum to Uganda and apply it there,” he said.

The growing collaboration between HMS otolaryngologists developing important relationships in the global health community opens the door for many possibilities.

“Being able to speak with one voice and acting in unison helps to optimize resources and also helps avoid confusion, so that our international partners are not having to juggle different groups,” Ms. Williams said. “If we can link our individual projects in a way that benefits each other, we can make a much bigger impact.”

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Wendy Williams
Drs. Roger Nuss and Jon Sherman with members of the otolaryngology program at the University Teaching Hospital of Kigali in Rwanda.
When Jeffrey Holt, Ph.D., and his wife Gwenaelle Géléoc, Ph.D., were offered faculty positions in the Harvard Medical School Department of Otolaryngology four years ago, they made the difficult decision to move their research efforts—and their lives together—from Charlottesville, Va., to Boston.

At the time, they were excited about a possible hearing research breakthrough, in which they believed they had found two genes and proteins responsible for hair cell transduction in the inner ear. The two scientists, who met as postdocs at Mass General, had served ten years on the faculty at the University of Virginia, where they had grown a highly productive research program in inner ear physiology.

“We really struggled with the decision to move, because we loved Charlottesville and weren’t looking for a change,” Dr. Holt said. “But we recognized that this was an important discovery, and we were excited about the opportunity for collaboration in Boston, a city where the science is just phenomenal.”

Drs. Holt and Géléoc have since made substantial contributions in the area of gene therapy for hearing loss. In their lab at Boston Children’s Hospital, they have identified TMC1 and TMC2 as components of the hair cell transduction channel, key molecules required for auditory processing, and have designed a gene therapy trial using viral vectors to correct mutations in TMC1. They are also developing similar gene therapy strategies for Usher syndrome, a genetic condition that affects hearing and vision.

“We’re developing vectors to target the hair cells of the inner ear and also the photoreceptors of the retina, which are also affected by Usher syndrome,” Dr. Géléoc

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Holt/Géléoc Lab
Gene therapy strategies lend hope to hearing loss treatment

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It’s an exciting time. There are a lot of labs involved in this research right now, and I think we’re moving faster now than we were 10 years ago.”

Dr. Gwen Géléoc
said. “We’re working to find ways to counteract the progression of deafness and retinal degeneration.”

As researchers in genetic hearing loss, they now play a role in an international movement to develop biological treatment strategies for human deafness. Otolaryngology researchers around the world are working concurrently to develop stem cell therapies, drug therapies and gene therapy approaches in the hopes that multiple successful strategies will cover the broad, varying types hearing loss. Drs. Holt and Géléoc reviewed exciting progress in the field in a 2014 issue of Science.

“It’s really a multifactorial problem, because deafness can arise from many different sources,” Dr. Holt said.

“Unfortunately, every gene, every mutation affected may require a different approach and demand a very personalized treatment,” Dr. Géléoc said. “So I think having all these different approaches tested concurrently will give us the best chance.”

Genetic inner ear research has accelerated in the ten years since the Human Genome Project was declared complete, with more than 20,000 genes identified in human beings. Scientists have taken on the challenge of identifying what those genes are doing and where they are expressed in the body.

In 2013, Drs. Holt and Géléoc published a paper in Neuron that demonstrated that TMC1 and TMC2 are part of the hair cell transduction channel in the inner ear, opening the door for a gene therapy trial to correct mutations of TMC genes that cause hearing loss.

Since that paper was published, they have identified viral vectors to introduce TMC genes into the sensory cells of the inner ear. Preliminary data demonstrate successful restoration of cellular function in a dish and partial restoration of auditory function in deaf mice up to one month old. The team will continue to measure responses to optimize the treatment and to see if it can be extended throughout the two-year lifetime of a mouse.

“It was one of those eureka moments, the first time we did this and it actually worked,” Dr. Holt said. “To be able to restore the mechanical sensitivity of the cells to a responsive state was just phenomenal.”

In a separate set of experiments, they have tested this approach on live human inner ear tissue extracted during surgical removal of brain tumors. They developed techniques to keep the inner ear tissue alive in a dish and have had success with the viral vectors in this situation. This intermediate step provides further support for the technique eventually translating to humans.

“We want to carry this through to the maximum in the mouse model before we begin adapting to humans,” Dr. Holt said. “But I think if the successes continue at the rate they have been, we should be there in a reasonable timeframe—perhaps within a few years.”

Their work in developing viral vectors to treat mutations of TMC1 has informed a similar project on developing gene therapy strategies for Usher syndrome.

“Really, most of what we’re learning from the TMC project can be used for the Usher project, and vice versa,” Dr. Géléoc said.

Studying a mouse model of the Usher 1c gene mutation, Dr. Géléoc is working to understand the development of hearing deficits associated with Usher syndrome. Her research has shown that, in the mouse model for Usher syndrome, the ear develops normally.

“It was one of those eureka moments, the first time we did this and it actually worked.

To be able to restore the mechanical sensitivity of the cells to a responsive state was just phenomenal.”

Dr. Jeffrey Holt
“Our work is demonstrating that the ear is really developing quite well in the beginning, which gives us a window of opportunity for therapy,” she said. “The fact that the sensory epithelium develops normally means that we could potentially reinsert the missing gene and allow the sensory epithelium to survive.”

The gene therapy work in the Holt/Géléoc lab has attracted the attention of philanthropist Ernesto Bertarelli. The Bertarelli Foundation funded a preliminary project headed by the Holt/Géléoc team in collaboration with Patrick Aebischer of the École Polytechnique Fédérale de Lausanne in Switzerland. Based on their initial studies and their proof-of-concept successes, the Bertarelli Foundation has just pledged an additional $720,000 to support continued development of gene therapy for TMC1 mutations and Usher Syndrome 1c.

There is some hesitation in the medical community related to gene therapy, especially the fear that the viral vectors will get into the vasculature and then throughout the body, causing side effects elsewhere. However, inner ear researchers are fortunate that a regulatory process prohibits the therapeutics from going systemic.

“The ear is actually a good model for gene therapy, because the fluid-filled spaces of the inner ear are protected by the blood-labyrinthine barrier,” Dr. Holt said. “We’ve found that the viral vectors will stay there after injection.”

As they continue this remarkable progress in their research toward developing gene therapy strategies for hereditary hearing loss, Drs. Holt and Géléoc feel very fortunate for their partnership in the lab and in life, which has allowed them unique opportunities for achieving professional goals and work-life balance.

“When we were both ready to start a lab, we said, ‘why don’t we start a lab together and see how that goes?’ And that test drive carried off into a lifetime experience,” Dr. Géléoc said. “I feel that we can really bounce ideas off one another and get things moving much faster this way.”

Dr. Géléoc also feels that their partnership allows her to enjoy more hands-on time in the lab, something she may not be able to do as the sole principal investigator.

“With the Usher project especially, I’m fully involved in the tissue prep, recordings, the confocal microscope work…” she said. “And I believe in the data because I’ve seen it first-hand.”

It’s a system that’s working well for them in a field that’s moving forward at a fast pace and with a bright future.

“I think it’s an exciting time,” Dr. Géléoc said. “There are a lot of labs involved in this research right now, and I think we’re moving faster now than we were 10 years ago. Only a short time ago, it was just a dream, but now, scientists are really thinking that biological treatments for deafness could be a reality in the not too distant future.”
Faculty and staff from the Department of Otolaryngology at Harvard Medical School gathered in Meltzer Auditorium at Mass. Eye and Ear to celebrate the class of 2014 on Friday, June 27th. The day began with the Department’s 2nd Annual Meeting prior to the graduation ceremony and a celebratory banquet and roast to send off the graduates in style.

“Graduation day is an opportunity for all of us to reflect on what brings us together—for the faculty and nurses who train a new group of residents and fellows every year, for the junior residents and students awaiting their own graduation day and for the graduates and their families celebrating the culmination of years of training and hard work,” said Dr. Stacey Gray, Director of the Harvard Otolaryngology Residency Program. “It is a special day and one we look forward to celebrating as a Department each year.”

Our outstanding graduates—four chief residents and 12 clinical fellows—were acknowledged in a program led by Dr. Gray, Associate Residency Director Dr. Kevin Emerick, and Chief and Chair of Otolaryngology Dr. Brad Welling, among others. Dr. Joseph Nadol delivered a fascinating graduation address entitled, “Early History of the Department of Otology and Laryngology at Harvard Medical School.”

Prior to the graduation ceremonies, the day began with the Department’s 2nd Annual Meeting, an event that brings together faculty and trainees from every corner of the Department and features scientific presentations and updates from representatives from each division. Topics presented ranged from predicting treatment outcome in HPV-positive oropharyngeal cancers to microlaryngeal surgical training through simulation to the special emphasis on global surgery in the Facial Plastic and Reconstructive Surgery division.

The meeting provided the rare opportunity for thoughtful discussion among faculty and staff across subspecialties in the department.

“With so few occasions throughout the year to gather all members of the department together, the annual meeting offers the benefit of having everyone in the same room and the opportunity to share updates on current initiatives,” said Dr. Gray.
The Graduates

Residents

Megan M. Abbott, M.D., M.P.H., was extremely productive during residency. Her research fellowship project had several different components, including “Value creation in cleft lip and palate care,” as well as “Time-driven activity-based costing,” under the mentorship of Dr. John Meara. She accumulated more than 11 publications from this project alone, with several other publications and local and national presentations throughout her residency. She was praised for her consistent professionalism, compassion for patients and willingness to be a team player. Dr. Abbott has returned to her Maine roots by joining Maine Medical Partners in Otolaryngology in Portland.

Throughout her residency, Gillian R. Diercks, M.D., balanced compassionate care and effective leadership. In reviews from her senior year, faculty noted how she approached the job with a strong willingness to take good care of her patients as well as her team. She also accomplished a significant amount from a scholarship standpoint. Mentored by Dr. Christopher Hartnick, her research project involved the design and implementation of a multicenter randomized double-blinded placebo controlled trial to evaluate the bleeding risk of using ibuprofen after tonsillectomy—a huge undertaking, with more than 500 patients enrolled to date. Dr. Diercks is now pursuing fellowship training in pediatric otolaryngology at Mass. Eye and Ear.

Aaron K. Remenschneider, M.D., M.P.H., excelled in many areas throughout his residency. His research project, mentored by Dr. Ralph Metson, involved the implementation of a program to follow quality of life outcomes for patients undergoing endoscopic sinus surgery at Mass. Eye and Ear, with more than 700 patients enrolled to date. The work resulted in several presentations at national meetings, as well as three major publications. In addition to this project, Dr. Remenschneider served as editor of the otolaryngology section of the Pocket Primary Care MGH handbook and was appointed to the CORE Otology study section in 2013. He was also very active in the American Academy of Otolaryngology–Head and Neck Surgery (AAO-HNS) and served on the Endocrine Surgery Committee, the Core Otolaryngology and Practice Management Committee and as the AAO-HNS Section for Residents and Fellows liaison. Dr. Remenschneider is now pursuing fellowship training in Neurotology at Mass. Eye and Ear.

Though his strong research background indicates that his ultimate goal is to be a clinician scientist, Ahmad R. Sedaghat, M.D., Ph.D., demonstrated leadership on both clinical and research fronts during his residency. In his chief resident evaluations, faculty noted that he was excellent in the operating room, great with patients and a team leader. Dr. Sedaghat’s research project looked at the evolution of histamine receptors, with Dr. Claus Wilke of the University of Texas at Austin as his mentor. In addition to this project, he has presented at national meetings throughout residency, and he has been involved in more than 25 publications, most as first author. Dr. Sedaghat is now pursuing fellowship training in Rhinology at Mass. Eye and Ear.

Clinical Fellows
Massachusetts Eye and Ear

Prabhat K. Bhma, M.D., M.P.H.
Facial Plastic and Reconstructive Surgery Fellowship Directors: Tessa Hadlock, M.D.
Future Plans: Department of Otolaryngology–Head and Neck Surgery, Alaska Native Medical Center, Alaska Native Tribal Health Consortium in Anchorage, Alaska

David H. Jung, M.D., Ph.D.
Neurotology Fellowship Directors: Daniel J. Lee, M.D., and Michael McKenna, M.D.
Future Plans: Full-time staff, Otolaryngology and Neurotology Division, Mass. Eye and Ear

Giant C. Lin, M.D.
Rhinology Fellowship Directors: Ralph B. Metson, M.D., Stacey T. Gray, M.D., and Eric H. Holbrook, M.D.
Future Plans: Advocare, Private Practice, New Jersey

Joshua C. Meier, M.D.
Rhinology Fellowship Directors: Ralph B. Metson, M.D., Stacey T. Gray, M.D., and Eric H. Holbrook, M.D.
Future Plans: Nevada ENT Associates, Private Practice, Reno, Nevada

Paul M. Paddle, M.D.
Laryngology Fellowship Director: Ramon A. Franco, Jr., M.D.
Future Plans: Clinical Practice in Laryngology and General Otolaryngology at Monash Health, St. Vincent’s Health and Alfred Health in Melbourne, Australia.
Derek J. Rogers, M.D.
Pediatric Otolaryngology
Fellowship Director:
Christopher J. Hartnick, M.D., M.S.
Future Plans: Attending in Pediatric Otolaryngology, Madigan Army Medical Center, Tacoma, Washington

Aaron D. Tward, M.D., Ph.D.
Neurotology
Fellowship Directors: Daniel J. Lee, M.D., and Michael McKenna, M.D.
Future Plans: Assistant Professor of Otolaryngology–Head and Neck Surgery, University of California, San Francisco

Bharat B. Yarlagadda, M.D.
Head and Neck/Micovascular
Fellowship Directors: Daniel G. Deschler, M.D., and Derrick T. Lin, M.D.
Future Plans: Otolaryngology Staff, Lahey Clinic, Burlington, MA

Clinical Fellows
Pediatric Otolaryngology
Boston Children’s Hospital

Eric A. Gantwerker, M.D.
Fellowship Director: Reza Rahbar, D.M.D, M.D.
Future Plans: Pursuing a Master’s of Medical Sciences in Medical Education at Harvard Medical School

Anne F. Hseu, M.D.
Fellowship Director: Reza Rahbar, D.M.D, M.D.
Future Plans: Fellowship in Laryngology, Massachusetts General Hospital

Amy L. Hughes, M.D.
Fellowship Director: Reza Rahbar, D.M.D, M.D.
Future Plans: Connecticut Ear, Nose and Throat (Private Practice)

Laura L. Neff-Rogers, M.D.
Fellowship Director: Reza Rahbar, D.M.D, M.D.
Future Plans: Pursuing a Master’s of Public Health at Harvard School of Public Health

From left to right: (standing) Prabhat K. Bhama, M.D., M.P.H., Giant C. Lin, M.D., Aaron D. Tward, M.D., Ph.D., Bharat B. Yarlagadda, M.D., (sitting) Paul M. Paddle, M.D., Joshua C. Meier, M.D., Derek J. Rogers, M.D., and David H. Jung, M.D.

From left to right: Eric A. Gantwerker, M.D., Anne F. Hseu, M.D., Laura L. Neff-Rogers, M.D., and Amy L. Hughes, M.D.

From left to right: Joseph B. Nadol, Jr., M.D., Kevin S. Emerick, M.D., Jo Shapiro, M.D., Stacey T. Gray, M.D., Michael J. Cunningham, M.D., David S. Caradonna, M.D., D.M.D., D. Bradley Welling, M.D., Ph.D.
Residents (PGY-2)

Originally from Oakland, Calif., Jennifer Fuller, M.D., received her undergraduate degree in Health and Developmental Psychology and Spanish from Stanford University. She then attended medical school at the University of California at Los Angeles School of Medicine and completed her internship in general surgery at Beth Israel Deaconess Medical Center. Dr. Fuller’s research interests include global health and outcomes research.

Deepa Galaiya, M.D., grew up in New Jersey and attended Brown University in Providence, R.I., where she earned undergraduate degrees in International Relations and Biophysics. She went on to pursue her medical degree from Stanford University School of Medicine, prior to coming to Boston for residency. While at Stanford, Dr. Galaiya received the Howard Hughes Medical Institute Fellowship, the Soros Fellowship for New Americans and an Outstanding Teaching Assistant Award. She completed her internship in general surgery at Brigham and Women’s Hospital.

Born in India, Anuraag Parikh, M.D., earned his undergraduate degree in chemistry from Princeton University and his medical degree from the Columbia College of Physicians and Surgeons. While at Columbia, he worked as a research assistant in the Department of Otolaryngology—Head and Neck Surgery, conducting research on therapies for nonsyndromic cleft lip and palate in Honduran patients. Dr. Parikh completed his internship in general surgery at Brigham and Women’s Hospital.

New Clinical Fellows

Massachusetts Eye and Ear
Head and Neck/Microvascular
Neerav Goyal, M.D.

Neurotology
Aaron Remenschneider, M.D., M.P.H.

Rhinology
Ahmad Sedaghat, M.D., Ph.D.
William Yao, M.D.

Facial Plastic and Reconstructive Surgery
Nathan Jowett, M.D.

Laryngology
Inna Husain, M.D.

Pediatric Otolaryngology
Gillian Diercks, M.D.

Boston Children’s Hospital
Pediatric Otolaryngology
Victor Duarte, M.D.
Steven Hamilton, M.D.
Heather Herrington, M.D.
Julie Strychowsky, M.D.

The Department welcomes four new residents to Mass. Eye and Ear this year, Drs. Jennifer Fuller, Deepa Galaiya, Anuraag Parikh and Sid Puram. We also welcome five new interns, Drs. Ashton Lehmann and Katie Phillips to Brigham and Women’s Hospital, Drs. Yin Ren and Rosh Sethi to Massachusetts General Hospital and Dr. Vivek Kanumuri to Beth Israel Deaconess Medical Center.
Alumni Profile

Richard J. Wong, M.D., FACS, first became interested in otolaryngology as a medical student at Harvard, during a rotation at Mass. Eye and Ear, watching surgeons operating meticulously in the head and neck area.

“I remember watching otolaryngology procedures and thinking that the anatomy was absolutely fascinating,” he said. “Although the anatomic region is focused, the different functional processes that occur in that area are so varied and complex. The rotation transformed me, and I fell in love with the specialty.”

Now a head and neck oncologist at Memorial Sloan Kettering, Dr. Wong maintains a busy surgical practice at the prestigious cancer center in New York City, where he also serves as Vice Chair of Clinical Activities in the Department of Surgery. His clinical interests include all aspects of head and neck surgical oncology, including thyroid cancer, oral cancer, parotid tumors, melanoma and sinonasal tumors, among others.

Describing his research as a “passion developed early on,” Dr. Wong is the principal investigator of a laboratory funded by an R01 grant from the National Cancer Institute. Investigations in the lab recently uncovered mechanisms of how tumor cells invade nerves and spread along their pathways. This process, called perineural invasion, is associated with poor clinical outcomes for a variety of cancers, including head and neck, salivary, prostate and pancreatic cancers.

“Historically, people thought that cancers would simply grow along the nerves, which were a passive route of least resistance,” Dr. Wong said. “Our work is now showing that the nerve microenvironment is a very active participant in facilitating the process of perineural invasion. The nerve sends out a variety of signals to the cancer cells that draw them toward the nerve, stimulating cancer cell migration and invasion.”

In addition to his clinical work and research program, Dr. Wong is dedicated to teaching. He serves as site director for Memorial Sloan Kettering in the combined otolaryngology–head and neck surgery residency program of New York-Presbyterian Hospital and leads a T32 grant from the National Cancer Institute that supports the training of head and neck surgeon-scientists.

A native of New York, Dr. Wong earned his undergraduate degree from Stanford before moving to Boston for medical school and residency training at Harvard. When applying to residency programs, he was drawn to the collegial atmosphere he observed at Mass. Eye and Ear during rotations in medical school.

“The culture at Mass. Eye and Ear seemed different from some of the other hospitals I had been exposed to — the physicians were happy and the atmosphere was relaxed yet academic,” he said. “I felt that there was a strong camaraderie among the residents, and that they had great relationships with the attendings.”

Reflecting on his experience in the program, Dr. Wong views the diversity of hospitals and programs as a unique and valuable opportunity for a resident in otolaryngology.

“As residents, we were exposed to many different approaches toward the same problem,” Dr. Wong said. “In addition, we were exposed to world experts in each subspecialty. The combination of Mass. Eye and Ear, Mass General, Boston Children’s Hospital, Brigham and Women’s Hospital and Beth Israel Deaconess Medical Center provided a unique experience and exposure to an incredibly diverse faculty. You get to meet leaders in each of the different otolaryngology subspecialties at these remarkable hospitals.”

Following the completion of his residency training in otolaryngology at Harvard Medical School, Dr. Wong accepted a clinical fellowship in head and neck oncology at his current institution, Memorial Sloan Kettering Cancer Center. As he progressed through his training toward becoming a head and neck oncologist, Dr. Wong recalls a growing passion for making an impact on cancer patients’ lives.

“I liked oncology innately because I thought that the life-threatening nature of cancer, as a disease, is one of the most significant problems we face as a specialty,” Dr. Wong said. “I felt a natural inclination and commitment toward helping cancer patients.”

Dr. Wong credits his mentors in residency with cultivating his subspecialty interest in head and neck oncology, setting an influential example in the way they impact patients’ lives through clinical care and research.

“I think that the program prepared me well; it gave me a strong, broad foundation in all aspects of otolaryngology,” he said. “And even more importantly, it showed me how scientific discovery and clinical care need to be integrated together to achieve progress in our field.”

Richard J. Wong, M.D., FACS, Class of 1999

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24 HARVARD Otolaryngology
Special thanks to our HMS otolaryngology alumni whose support of our programs, students and faculty continues to drive new innovations and successes across all areas of education, research and patient care.

To recognize our generous alumni partners and encourage support of Mass. Eye and Ear and the mentors who have inspired us, we will be launching the Alumni Giving Society of HMS Otolaryngology at Mass. Eye and Ear in 2015.

More information coming soon! In the meantime, please consider joining your colleagues by making a gift with the enclosed envelope in this issue today. You may designate your gift in any way you choose.

To learn more, please contact Robin Popp in the Development Office at 617-573-3303.

Grateful thanks to the following alumni and faculty who made gifts of $1,000 or more in fiscal year 2014:

John F. Ansley, M.D.
Fred G. Arrigg, Jr., M.D.
Barry J. Benjamin, M.D.
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Michael S. Cohen, M.D.
Daryl G. Colden, M.D.
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Ruth Anne Eatock, Ph.D.
Kevin S. Emerick, M.D.
Jessica L. Fewkes, M.D.
Richard R. Gacek, M.D.
Richard E. Gliklich, M.D.
Stacey T. Gray, M.D.
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Paul M. Konowitz, M.D.
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William W. Mcclerklin, M.D.
Michael J. McKenna, M.D.
Cliff A. Megerian, M.D.
Ralph B. Metson, M.D.
Richard E. Mugge, M.D.
Joseph B. Nadol, Jr., M.D.
David E. Nash, M.D.
L. Mike Nayak, M.D.
H. Gregory Ota, M.D.
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Eric H. Stein, M.D.
Oon Tian Tan, M.D., Ph.D.
Britt A. Thedingher, M.D.
D. Bradley Welling, M.D., Ph.D.
Michael Zoller, M.D.
Audio games may improve hearing in noisy environments

Daniel B. Polley, Ph.D., and colleagues from Massachusetts Eye and Ear, Harvard Medical School and Harvard University have programmed a new type of game that has trained both mice and humans to enhance their ability to discriminate soft sounds in noisy backgrounds. Their findings were published in PNAS Online Early Edition the week of June 9-13, 2014.

In the experiment, adult humans and mice with normal hearing were trained on a rudimentary ‘audiogame’ inspired by sensory foraging behavior that required them to discriminate changes in the loudness of a tone presented in a moderate level of background noise. Their findings suggest new therapeutic options for clinical populations that receive little benefit from conventional sensory rehabilitation strategies.


Researchers present new findings concerning the inner ear’s response to cochlear implant electrodes

The surgical placement of a cochlear implant is considered to be the state-of-the-art treatment for bilateral profound sensorineural hearing loss in cases where a conventional hearing aid is no longer useful. In a recent paper published in the October 2014 issue of Otology and Neurotology, Mohammad Seyyedi, M.D., a research fellow, and Joseph B. Nadol, Jr., M.D., of the Otopathology Research Laboratory at Mass. Eye and Ear, published their findings concerning the pattern and degree of tissue response adjacent to a cochlear implant electrode in humans. This study was based on a total of 28 temporal bones from 21 subjects who in life had undergone cochlear implantation. An inflammatory and cellular immunologic response, including the presence of lymphocytes, foreign body giant cells, fibrosis and new bone formation was seen in 96% of cases. The inflammatory response was more severe near the point of entry of the electrode into the inner ear than distal to it.

This paper demonstrates that although in most cases a cochlear implant is biocompatible, it is not bio inert, and occasionally a severe inflammatory response may result, in turn resulting in failure of the implant. It is hoped that this study will focus attention on the need to identify materials and techniques that limit the inflammatory response of the inner ear to the presence of a cochlear implant.


FGF23 hormone deficiency may lead to hearing loss and malformation

Fibroblast growth factor 23 (FGF23) is a circulating hormone important in mineral homeostasis. Abnormal serum levels of FGF23 result in systemic pathologies in humans and mice, including rickets and calcinosis. Konstantina Stankovic, M.D., Ph.D., and colleagues sought to uncover the role FGF23 plays in the auditory system due to similarities between ear and kidney development.

They found that FGF23 is expressed throughout the cochlea in mice and demonstrated that complete loss of FGF23 causes profound deafness, while partial loss results in moderate hearing loss at high frequencies. These observations are consistent with mixed conductive and sensorineural pathology of both middle and inner ear origin. Loss of the hormone causes dramatic bone abnormalities. Given the extensive middle ear malformations and the overlap of FGF23 activity and Eustachian tube development, this work suggests a possible role for FGF23 in otitis media.


Researchers describe safe removal and reimplantation of the cochlear implant electrode following complications

Although a rare complication most commonly described in association with cochlear malformations—particularly common cavity deformity and incomplete partitioning type III, insertion of the cochlear implant electrode within the internal auditory canal has been reported. In most cases of internal auditory canal insertion, eventual reimplantation is necessary following patient discomfort or poor implant performance. Published in a 2013 issue of Laryngoscope, Selena Heman-Ackah, M.D., M.B.A., describes a fluoroscopic approach for safe removal and reimplantation of cochlear implant electrode decreasing the risk of reimplantation within the internal auditory canal. Outcomes of patients who have undergone explantation of cochlear implant electrodes within the internal auditory canal and reimplantation are presented.


Analysis of reconstructive procedures in patients undergoing laryngopharyngectomy

Robert A. Frankenthaler, M.D., and colleagues from Beth Israel Deaconess Medical Center and Harvard Medical School reviewed the clinical outcomes of 676 patients in the 2005-2011 ACS-NSQIP database undergoing laryngopharyngectomy. They assessed preoperative variables and compared postoperative outcomes in patients with flap reconstruction and in those without reconstruction. They found that when flap reconstruction involves additional measures, there may be an increase in major morbidity but not mortality. Published in the January 2014 issue of Otolaryngology–Head and Neck Surgery, their findings may lead to a better understanding of these variables to optimize the decision-making process for patients undergoing laryngopharyngectomy and/or pharyngectomy.

Comparing outcomes in surgical treatment for Zenker’s diverticulum

Jo Shapiro, M.D., and colleagues from Brigham and Women’s Hospital and Harvard Medical School recently published a retrospective analysis of patients treated surgically for Zenker’s diverticulum, either with an endoscopic procedure or an external stapler-assisted diverticulectomy. They concluded that the external diverticulectomy should be considered as a viable treatment in patients who need definitive, single-session treatment for ZD, especially to prevent life-threatening aspiration pneumonia. Their study was published in a July 2014 issue of Otolaryngology–Head and Neck Surgery.

A total of 1,241 patients were evaluated by the COS between October 2012 and October 2013. A retrospective analysis yielded results that suggest that the COS program is financially sustainable with unique advantages, especially for staff who maintain their outpatient practices without disruption and for the trainees who have the opportunity to work more closely with the entire faculty. The model is seen as a viable alternative to the full-time hospitalist staff model.


Reexamining the call team approach in pediatric otolaryngology inpatient care

Michael Cunningham, M.D., and physicians in the Department of Otolaryngology and Communication Enhancement at Boston Children’s Hospital recently introduced an inpatient “chief of service” (COS) program requiring one attending to rotate weekly with no conflicting elective duties. They assessed the program’s clinical, educational and financial impact in a review published in a September 2014 issue of JAMA Otolaryngology–Head and Neck Surgery.

Physicians review the complexity of pediatric patients undergoing tracheostomy

David Roberson, M.D., and colleagues recently published, in an April 2014 issue of Otolaryngology–Head and Neck Surgery, a comprehensive review study of pediatric inpatients undergoing tracheostomies at Boston Children’s Hospital, a tertiary care pediatric hospital. The study identifies the indications, comorbidities, hospital course, patient complexity and pre-discharge planning for patients seen in a 24-month period between 2010 and 2011. The paper reviewed the complexity of pediatric tracheostomy cases, which present unique challenges and opportunities for optimizing quality of care, and also discussed future directions, such as tracheostomy multidisciplinary care teams and nurse specialists.

New Recruits

**Thomas L. Carroll, M.D.,** recently joined the Division of Otolaryngology at Brigham and Women’s Hospital as an Instructor in Otolaryngology and Laryngology at Harvard Medical School. Dr. Carroll earned his medical degree at the Wright State University School of Medicine in Dayton, Ohio and completed his residency in otolaryngology at the University of Colorado Health Sciences Center. He went on to complete a fellowship in laryngology at the University of Pittsburgh Medical Center.

**Eduardo Corrales, M.D.,** was recruited to the Division of Otolaryngology at Brigham and Women’s Hospital as an Instructor in Otolaryngology and Laryngology at Harvard Medical School. Originally from Telguigalpa, Honduras, Dr. Corrales first joined the Department in 2003 as a postdoctoral fellow in the Eaton-Peabody Laboratories after medical school in Honduras. He then completed his residency training in otolaryngology—head and neck surgery and a fellowship in neurotology and skull-base surgery at Stanford University Hospital and Clinics.

**Alice Frigerio, M.D., Ph.D.,** was recruited as an Instructor in Otolaryngology and Laryngology at Harvard Medical School as a full-time researcher in the Carolyn and Peter Lynch Center for Laser and Reconstructive Surgery. Originally from Como, Italy, Dr. Frigerio attended medical school and completed residency training in maxillofacial surgery at the University of Milan. She also obtained a Ph.D. in physiology at the University of Milan, and during the time, she spent her third year mentored by Dr. Tessa Hadlock in the Facial Nerve Center at Mass. Eye and Ear. Following the completion of her Ph.D., Dr. Frigerio returned to Mass. Eye and Ear for a research fellowship with Dr. Tot Tan, prior to her promotion to Instructor this year. Dr. Frigerio investigates the etiopathogenesis of vascular anomalies.

**David H. Jung, M.D., Ph.D.,** recently joined the Otolaryngology and Neurotology Division as an Instructor in Otolaryngology and Laryngology at Harvard Medical School. Dr. Jung received his medical degree and a Ph.D. in genetics from Harvard Medical School. He went on to complete his residency training in otolaryngology at Harvard Medical School and additional fellowship training in otology, neurotology and skull base surgery at Massachusetts Eye and Ear. Dr. Jung has a particular clinical interest in skull base disorders, including superior canal dehiscence and tumors, such as acoustic neuromas. His current research focuses on development of novel methods for cochlear drug delivery and understanding mechanisms of noise- and age-related hearing loss.

**Dukhee Rhee, M.D.,** recently joined the Stoneham location of Mass. Eye and Ear as Instructor in Otolaryngology and Laryngology, Part Time at Harvard Medical School. Dr. Rhee received her medical degree from the Albert Einstein College of Medicine and completed her residency in otolaryngology at Montefiore Medical Center in New York. Dr. Rhee’s clinical interests include adult and pediatric general otolaryngology, laryngology and thyroid and salivary gland disorders.

A former clinical fellow in pediatric otolaryngology, **Jennifer Setlur, M.D.,** recently returned to Mass. Eye and Ear as an Instructor in Otolaryngology and Laryngology, Part Time at Harvard Medical School. Dr. Setlur was recruited to the Concord office to expand pediatric otolaryngology services in this area, and will also practice general adult otolaryngology. She spent the past few years working as a pediatric otolaryngologist at Yale-New Haven Children’s Hospital.

**David A. Shaye, M.D.,** recently joined the Facial Plastic and Reconstructive Surgery Division at Mass. Eye and Ear as Instructor in Otolaryngology and Laryngology at Harvard Medical School. Dr. Shaye earned his medical degree from Albany Medical College and completed his residency in otolaryngology at the University of California at Davis. He went on to complete his fellowship training in facial plastic and reconstructive surgery at the University of Minnesota. Dr. Shaye specializes in aesthetic and reconstructive surgery of the face, head and neck, and focuses his research on global surgery, especially cleft lip and palate, burden of disease assessment and mobile phone technology to improve surgical follow-up.

**Boston Children’s Hospital recently welcomed Derek J. Stiles, Ph.D., CCC-A, FAAA,** the new Director of Diagnostic Audiology in the Department of Otolaryngology and Communication Enhancement. Dr. Stiles was recruited as Instructor in Otolaryngology and Laryngology at Harvard Medical School. Dr. Stiles first joined the department as a trainee in Audiology at Mass. Eye and Ear in 2000. He received his Ph.D. in Speech and Hearing Science at the University of Iowa in 2010 and has practiced in San Diego, Iowa City and Chicago over the years.
Multidisciplinary Concussion Clinic at Boston Children’s Hospital
Jacob Brodsky, M.D., Medical Director of the Balance Program at Boston Children’s Hospital Waltham, recently teamed up with clinicians from the departments of sports medicine, neurology, neurosurgery, ophthalmology and physical therapy to create a multidisciplinary concussion clinic at Boston Children’s Hospital. This clinic, which started in July 2014, provides comprehensive multi-specialty care to children with post-concussive syndrome and takes place two Tuesdays per month at The Micheli Center for Sports Injury Prevention in Waltham.

Awards, Grants and Honors
Eelam Adil, M.D., was named “star reviewer” by the American Academy of Otolaryngology–Head and Neck Surgery journal.

Neil Bhattacharyya, M.D., mentored past resident Daniel Roberts, M.D., on a research project that received the William W. Montgomery, M.D., resident research award at the Triological Society combined meetings.

Benjamin S. Bleier, M.D., received the 2014 Norman Knight Leadership Development Award during the Mass. Eye and Ear Trustees Meeting held on June 3rd. This award provides critical seed funding to promising otolaryngologists at the start of their academic careers.

Pete Creighton, M.D., received the 2014 William W. Montgomery, M.D., resident research award from the Triological Society.

Michael J. Cunningham, M.D., was the inaugural recipient of an Advocacy Award given by the American Academy of Pediatrics (AAP) Section on Otolaryngology–Head and Neck Surgery.

Dr. Cunningham and Reza Rahbar, D.M.D., M.D., served on the International Scientific Committee for the 12th International Congress of European Society of Pediatric Otorhinolaryngology (ESPO) in Dublin, Ireland.

Dr. Cunningham also received the Trevor McGill, M.D. Award for Excellence in Teaching, an annual award given by the pediatric otolaryngology fellows in the Department of Otolaryngology and Communication Enhancement at Boston Children’s Hospital.

Dr. Cunningham also served as Visiting Professor for the Department of Otolaryngology and Communication Sciences at Vanderbilt University Medical Center in Nashville, Tenn, where he delivered the annual 7th Unit S. Lectureship.

Bertrand Delgutte, Ph.D., was appointed as a member of the Auditory System Study Section, Center for Scientific Review for the National Institutes of Health.

Daniel G. Deschler, M.D., also contributed an invited commentary in the July issue of JAMA Otolaryngology–Head and Neck Surgery, titled “Extracapsular Dissection of Benign Parotid Tumors.”

Ronald K. de Venecia, M.D., Ph.D., was awarded more than $10,000 from Otonomy, Inc., as part of a new clinical trial for his project entitled, “A prospective randomized double-blind placebo controlled multicenter phase2b study of oto-104 given as a single intratympanic injection in subjects with unilateral meniere’s disease.”

Jayme R. Dowdall, M.D., received the 2014 Holt Leadership Award from the American Academy of Otolaryngology–Head and Neck Surgery.

Albert Edge, Ph.D., Michael McKenna, M.D. and Konstantina Stonkovic, M.D., Ph.D., were awarded a U.S. patent for their discovery of a neuroprotection role of osteoprotegerin and biophosphonates against neurodegenerative hearing loss, which opens new pharmacologic strategies to treat sensorineural hearing loss—and neurodegeneration in general.

Kevin S. Emerick, M.D., was recently named a 2014 honoree for the MGH Cancer Center “One Hundred.”

Selena Heman-Ackah, M.D., M.B.A., was selected to receive a two-year Faculty Fellowship from the Harvard Medical School Office for Diversity Inclusion and Community Partnership. The fellowship is designed to enable HMS junior faculty to pursue activities that enhance their career development as researchers and clinicians/teachers, lead to advancement within the Harvard system and promote diversity within the HMS community. Dr. Heman-Ackah will use the fellowship funding to investigate preventive therapies for the treatment of age related and noise-induced hearing loss.

Eric H. Holbrook, M.D., was appointed Chief of the newly formed Rhinology Division at Mass. Eye and Ear.

Paul M. Konowitz, M.D., was appointed Division Chief of Suburban Centers and Network Development at Mass. Eye and Ear.

Sharon Kujawa, Ph.D., was appointed to the Communication Disorders Review Committee for the National Institutes of Health.

Dr. Kujawa was also awarded two new grants this year. One is from the Office of Naval Research, titled “Drug Treatment for Noise-Induced Cochlear Neurodegeneration,” and the other is from the Department of Defense, titled “Aging After Noise: Biomarkers, Clinical Assessment and Pharmacotherapy of ‘Hidden’ Noise Injury.”

Daniel J. Lee, M.D., was Visiting Professor in the Department of Otolaryngology at Tripler Army Medical Center in Honolulu, Hawaii.

Derrick T. Lin, M.D., was appointed Division Chief of Head and Neck Oncology at Mass. Eye and Ear.

Trevor McGill, M.D., was awarded the T.J. Wilson Award by the European Society of Pediatric Otolaryngology (ESPO).

Michael J. McKenna, M.D., was Visiting Professor in the Department of Otolaryngology at Tripler Army Medical Center in Honolulu, Hawaii.

Jennifer Melcher, Ph.D., was elected Chair of the Scientific Advisory Committee of the American Tinnitus Association.

Daniel Merfeld, Ph.D., was named the inaugural Champion of Vestibular Medicine Award winner by the Vestibular Disorders Association. Champions of Vestibular Medicine are medical professionals who have had significant impact on: 1) increasing awareness of vestibular disorders and/or 2) contributing significantly

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**Awards, Grants and Honors continued**

To reduced diagnosis times and/or increased treatment effectiveness for vestibular disorders.

Ralph B. Metson, M.D. will serve as Vice President of the Eastern Section of the Triological Society this year.

Joseph B. Nadol, Jr., M.D., was awarded a new U24 grant for $543,119 from the National Institutes of Health in support of the NIDCD National Temporal Bone, Hearing and Balance Pathology Resource Registry.

Heidi Nakajima, M.D., Ph.D., was appointed to the Helen Carr Peake Prize selection committee at Massachusetts Institute of Technology.

Dr. Nakajima was also awarded a Certificate of Reviewing Excellence by the editors of Hearing Research.

Mass. Eye and Ear recently opened a satellite office in Medford, Mass., with long-time Mass. Eye and Ear physician H. Gregory Ota, M.D., serving as Medical Director of the practice.

Dr. Ota has been on-staff at Mass. Eye and Ear since 1986, and has served as Director of the Emergency Department’s Otolaryngology Service since 2011.

Daniel B. Polley, Ph.D., was awarded an R01 grant from the National Institutes of Health for his project, “Activity-dependent influences on auditory circuits.” The award is for $397,594.

Alicia M. Quesnel, M.D., was nominated for an Excellence in Mentoring Award at Harvard Medical School.

Reza Rahbar, M.D., D.M.D., was Visiting Professor in the Departments of Otolaryngology at McGill University in Montreal, Quebec and at Prince Sultan Military Medical in Riyadh, Saudi Arabia.

Gregory W. Randolph, M.D., is an invited member of the International Thyroid Oncology Group, an international collaborative research and clinical trials organization.

Steven D. Rauch, M.D., was appointed Chief of the newly formed Vestibular Division at Mass. Eye and Ear.

Michael B. Rho, M.D., was appointed Medical Director for Otolaryngology at Mass. Eye and Ear, Stoneham.

**New textbook:** *Facial Surgery: Plastic and Reconstructive*

Tessa Hadlock, M.D., and Mack Cheney, M.D., recently celebrated the release of *Facial Surgery: Plastic and Reconstructive*, published by CRC Press. The book provides basic knowledge in facial plastic surgery for residents as well as experienced practitioners. With detailed descriptions of the latest surgical techniques, it captures and highlights meaningful new surgical methods with a deliberate emphasis on evidence-based medicine.

David Roberson, M.D., was inducted as a Fellow of the Royal College of Surgeons in England ad eundem in July.

Konstantina Stankovic, M.D., Ph.D., received a new grant award from the Department of Defense (US Army Medical Research) for her project entitled, “Preclinical validation of anti-nuclear factor kappa B therapy against vestibular schwannoma and Neurofibromatosis type 2.” The award is for 3 years and $655,999.

Michelle Valero, Ph.D., received an NIH fellowship award for her project titled, “The Middle Ear Muscle Reflex and the Diagnosis of Cochlear Neuropathy.”

Karen Watters, M.D., served on the Local Organizing Committee for the 12th International Congress of ESPO in Dublin, Ireland.

D. Bradley Welling, M.D., Ph.D., was awarded $1,189,164 for 3 years from the Department of Defense for his project entitled, “Exploratory Evaluation of AR-42 Histone Deacetylase Inhibitor in the Treatment of Vestibular Schwannoma and Meningioma.”

**Department ranked 4th for otolaryngology care by U.S. News and World Report**

In a report released by *U.S. News and World Report* and physician network Doximity, the Department of Otolaryngology at Mass. Eye and Ear/Mass General was ranked 4th in the nation for otolaryngology care.
Upcoming Events

MassEyeAndEar.org/ENTCalendar

Please visit the online calendar for updated information about upcoming events in the Harvard Medical School Department of Otolaryngology, including:

- Grand Rounds
- Regular Clinical Conferences
- Visiting Professor Lecture Series
- Research Seminars
- Harvard CME Courses

Save the Date!

Stay tuned for further details on an HMS Otolaryngology Alumni Reception at the Combined Otolaryngology Spring Meetings (COSM) in Boston, Mass. The reception will be held in the Mass. Eye and Ear cafeteria on April 22, 2015, with guided tours of the hospital for alumni.

Alumni News

2007 Michael Moore, M.D., a graduate of the Harvard Otolaryngology Residency Program, was recently promoted to Associate Professor of Otolaryngology—Head and Neck Surgery at Indiana University School of Medicine, where he serves as Director of Head and Neck Surgery.

2000 Jeffrey Spiegel, M.D., a former fellow in the Facial Plastic and Reconstructive Surgery Division at Mass. Eye and Ear, was recently on the cover of Plastic Surgery Practice magazine with a feature article on the way his practice is breaking new ground in facial analysis and developing new procedures. Dr. Spiegel is currently a Professor of Otolaryngology—Head and Neck Surgery at Boston University School of Medicine, with a private practice in Chestnut Hill, Mass.

1999 Hinrich Staecker, M.D., Ph.D., a former fellow in the Otology and Neurotology Division at Mass. Eye and Ear, was awarded the Edmund Prince Fowler Award by the Triological Society for his basic science thesis on inner ear hair cell regeneration. Dr. Staecker is currently a Professor of Otolaryngology—Head and Neck Surgery at the University of Kansas.

1993 Jeffrey E. Terrell, M.D., a graduate of the Harvard Otolaryngology Residency Program, is currently a Professor of Otolaryngology at the University of Michigan, with a focus on rhinology and sinus surgery. For the past few years, he has served as Associate Chief Medical Information Officer in the University of Michigan Health System, working with a large team of colleagues on implementing EPIC electronic health records in the ambulatory and inpatient settings, as well as in the operating rooms.

1986 Robert L. Witt, M.D., FACS, a graduate of the Harvard Otolaryngology Residency Program, currently serves as Director of the Head and Neck Multidisciplinary Clinic at Helen F. Graham Cancer Center in Newark, Del., as well as a Professor of Otolaryngology—Head and Neck Surgery at Thomas Jefferson University. Dr. Witt edited his third book this year, Thyroid Cancer: Current Diagnosis, Management, and Prognostication for Otolaryngology Clinics of North America.

1985 Mark C. Weissler, M.D., FACS, a graduate of the Harvard Otolaryngology Residency Program, currently serves as the Vice-Chair of the Board of Regents of the American College of Surgeons and continues to serve as a Director of the American Board of Otolaryngology. Dr. Weissler is currently the Joseph P. Riddle Distinguished Professor of Otolaryngology/Head and Neck Surgery and the Division Chief of Head and Neck Oncology at the University of North Carolina.

1979 Stuart H. Bentkover, M.D., FACS, a graduate of the Harvard Otolaryngology Residency Program, presented at the 11th International Symposium on Facial Plastic Surgery on “Transition from General Otolaryngology to Facial Plastic Surgery Only.” He was also featured on Channel 3 in Worcester on August 8, 2014, discussing skin cancer prevention and treatment.

1966 Herbert Silverstein, M.D., a graduate of the Harvard Otolaryngology Residency Program, is the President and Founder of the Silverstein Institute and the Ear Research Foundation. This year, he has published a paper in the American Journal of Otolaryngology—Head and Neck Medicine and Surgery, as well as two book chapters, and he will be the keynote speaker at the John Shea, Jr. Otology Course Workshop in Memphis on November 7, 2014. The Ear Research Foundation hosted the 13th minimally invasive office ENT course. Dr. Silverstein recently produced his 12th jazz album, “Monday Morning,” to benefit the Ear Research Foundation.

Errata, Harvard Otolaryngology #10

In the Alumni News section, John H. Krouse, M.D., Ph.D. is incorrectly identified as a 1979 graduate of the Harvard Otolaryngology Residency Program. Dr. Krouse graduated from the program in 1989. The staff of Harvard Otolaryngology regrets this error.