

# NewYork-Presbyterian Otolaryngology – Head and Neck Surgery

## Report on Clinical and Scientific Innovations



**Weill Cornell**  
**Medicine**

**NewYork-  
Presbyterian**



**COLUMBIA**

NewYork-Presbyterian  
A Top 5 Hospital in the Nation



New York's #1 Hospital  
19 Years in a Row

## Otolaryngology – Head and Neck Surgery

### Leadership

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## NewYork-Presbyterian

### Otolaryngology – Head and Neck Surgery

#### Report on Clinical and Scientific Innovations

<b>Welcome</b>	1
<b>Leaders in Voice Preservation and Recovery</b>	
Center for Voice and Swallowing	2
Sean Parker Institute for the Voice	4
Center for the Performing Artist	5
<b>Pioneering the Understanding and Treatment of Hearing Loss</b>	6
<b>Innovative Treatments for Allergic Rhinitis and Other Nasal Disorders</b>	9
<b>Advancing Minimally Invasive and Skull Base Surgery</b>	11
<b>Novel Approaches to Head and Neck Surgery</b>	
Exploring Molecular Drivers of Head and Neck Cancers	12
Facial Plastic Surgery	13
Pediatric Tracheostomy Care	13
<b>Sleep Apnea Management</b>	15
<b>Leading the Way in Education</b>	16
<b>Make an Appointment</b>	17
<b>NewYork-Presbyterian</b>	18

**For More Information**

[nyp.org](http://nyp.org)

# Welcome

Dear Colleague:

The Departments of Otolaryngology – Head and Neck Surgery at NewYork-Presbyterian/Columbia University Irving Medical Center and NewYork-Presbyterian/Weill Cornell Medical Center feature world-class teams who provide comprehensive ear, nose, and throat care and head and neck surgical services for patients of all ages. Our specialists customize care for every patient, whether they come to us for a common problem or a complex disorder, offering full evaluations and evidence-based treatments.

Patients receive care in the only academic medical center affiliated with two Ivy League medical schools: Columbia University Vagelos College of Physicians and Surgeons and Weill Cornell Medicine. Our internationally renowned otolaryngologists – head and neck surgeons have intensive training and years of experience, enabling them to provide advanced care. Many of them are also advancing the field through pioneering basic science and clinical research related to voice and swallowing issues, hearing loss, ear diseases, head and neck surgery, allergic rhinitis, and sleep disorders.

For example, we are world-renowned for our skull base surgery program, transoral robotic surgery, salivary endoscopy, and hearing loss services and research – including the world's first clinical trial of gene therapy to treat acquired hearing loss. Our surgeons have mastered minimally invasive techniques and use them whenever appropriate, leaving patients with no visible incisions in some cases. We have robust voice institutes to assess and remedy vocal hemorrhages and paralysis, dysphonia, and swallowing difficulties. And our investigators were among the first to use an innovative neurostimulation method to treat obstructive sleep apnea, enabling many patients to finally achieve a good night of restorative sleep.

Special services are available just for children, including care provided through our renowned Craniofacial Centers, the Pediatric Aerodigestive Center, VPI and Voice Center at NewYork-Presbyterian Komansky Children's Hospital, and the Hypernasality Program at NewYork-Presbyterian Morgan Stanley Children's Hospital. Our teams also care for children with head and neck tumors, vascular anomalies, and hearing loss.



Lawrence R. Lustig, MD



Michael G. Stewart, MD, MPH

We do not do this alone, working collaboratively with colleagues from pediatrics, neurology and neurosurgery, pulmonology, medical oncology, ophthalmology, and plastic surgery among others, to provide our patients with the most comprehensive care available. Your patients can receive all the care they need in one medical center, with access to top-ranked physicians from every specialty and subspecialty of medicine. They may also be able to participate in a clinical trial of a promising new therapy. Moreover, we offer our services in a variety of convenient locations throughout the New York metropolitan area.

We invite you to read about what we have to offer and the innovative research our investigators are pursuing that sets our otolaryngology departments apart from other hospitals in our region.

Sincerely,

A handwritten signature in black ink, appearing to read "Lawrence Lustig".

**Lawrence R. Lustig, MD**  
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**Michael G. Stewart, MD, MPH**  
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# Leaders in Voice Preservation and Recovery

Both NewYork-Presbyterian/Weill Cornell and NewYork-Presbyterian/Columbia are home to international experts in laryngology, providing comprehensive care for all types of voice and swallowing disorders. Laryngologists, voice scientists, speech/language pathologists, and other healthcare professionals collaborate to assess each patient and customize a treatment plan. Our investigators are also conducting research to evaluate outcomes and improve the care of patients with vocal fold hemorrhage, idiopathic vocal fold paralysis, dysphonia, and dysphagia. Special services for performing artists are available at both institutions.

## Center for Voice and Swallowing at NewYork-Presbyterian/Columbia

The team at the Center for Voice and Swallowing is dedicated to helping everyone – from Broadway and opera singers to nonperformers – communicate more clearly, easily, and effectively. A number of research efforts are underway to improve sore throat, cough, laryngitis, dysphagia, vocal cord scar, dysphonia, and recurrent laryngeal nerve injury.

**A new approach to throat pain.** The Center has a grant to develop an inhalation device to improve the treatment of sore throat, cough, and laryngitis. Called HAVA, the product is designed as an over-the-counter inhaled liquid mist that is inexpensive, portable, disposable, natural, tastes good, and is more effective than conventional treatments because it covers the entire upper aerodigestive tract.

**In-office surgery.** Our researchers have refined office-based minimally invasive laryngeal surgical procedures that do not require general anesthesia, such as laser treatment for vocal fold leukoplakia, laryngeal mucocoeles, papillomatosis, and Reinke's edema.



Michael J. Pitman, MD, Chief, Division of Laryngology, and Director, Center for Voice and Swallowing, NewYork-Presbyterian/Columbia

**Safer dysphagia treatment.** NewYork-Presbyterian/Columbia surgeons produced a guide and video demonstrating the safety and effective use of endoscopic cricopharyngeal myotomy, an alternative to risky transcervical surgery for patients with dysphagia.

**Care for vocal fold scars.** Investigators showed that temporalis fascia grafting is an effective, low-risk treatment for patients with vocal fold scar and sulcus vocalis. They are also evaluating the use of small intestinal submucosa implantation to stimulate tissue regeneration.



## The Center for Voice and Swallowing provides the full spectrum of care for voice, swallowing, and breathing disorders for patients of all ages and varying vocal demands.

**A patented approach to dysphonia.** Our team has achieved patents for electrical stimulation as an alternative to Botox® injections for the treatment of spasmodic dysphonia. The device is a modified cochlear implant with the lead placed in the vocal fold.

**Innovative lab models.** Scientists have developed an animal model of recurrent laryngeal nerve injury and reinnervation and identified neurotrophic factors that may be useful to treat this injury as well as vocal fold paralysis.



Ignacio Hernandez Morato, PhD, Associate Research Scientist, Department of Otolaryngology – Head and Neck Surgery, NewYork-Presbyterian/Columbia

### Selected Publications

- Serial in-office laser treatment of vocal fold leukoplakia: Disease control and voice outcomes. *The Laryngoscope*. 2017;127(7):1644-51.
- Office-based 532-nm pulsed KTP laser for marsupialization of laryngeal and vallecular mucocoeles. *The Laryngoscope*. 2017;127(5):1116-18.
- Photoangiolytic laser treatment of recurrent respiratory papillomatosis: A scaled assessment. *Journal of Voice*. 2013;27(1):124-28.
- The efficacy and safety in-office KTP laser treatment of Reinke's edema. *The Laryngoscope*. 2012;122(12):2786-92.
- Endoscopic cricopharyngeal myotomy. *Operative Techniques in Otolaryngology – Head and Neck Surgery*. 2011;22(2): 135-42.
- Endoscopic cricopharyngeal myotomy: History and technique. *The Laryngoscope*. 2009;119(1):45-53.
- Temporalis fascia transplantation for sulcus vocalis and vocal fold scar: Long-term outcomes. *Annals of Otolaryngology, Rhinology & Laryngology*. 2018;127(4):223-28.
- Treatment of spasmodic dysphonia with a neuromodulating electrical implant. *The Laryngoscope*. 2014;124(11):2537-43.
- Blockade of glial-derived neurotrophic factor in laryngeal muscles promotes appropriate reinnervation. *The Laryngoscope*. 2016;126(10):E337-42.
- Embryologic innervation of the rat laryngeal musculature – a model for investigation of recurrent laryngeal nerve reinnervation. *The Laryngoscope*. 2013;123(12):3117-26.

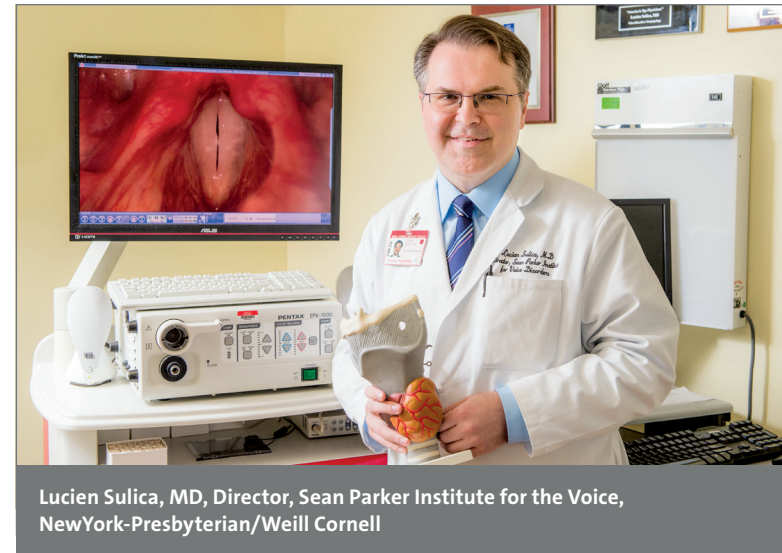
# Leaders in Voice Preservation and Recovery

## Sean Parker Institute for the Voice at NewYork-Presbyterian/Weill Cornell

The team in the Sean Parker Institute for the Voice is devoted to the accurate diagnosis and efficient treatment of voice problems, including hoarseness; limitations in volume, projection, and pitch; pitch breaks; voice fatigue; and voice spasms. We use advanced techniques, including laryngeal electromyography, to identify subtle abnormalities. Treatments include vocal cord microsurgery and injections, laryngeal Botox injections, and medialization thyroplasty (laryngoplasty). The Institute's investigators have published extensively on outcomes of patients with vocal fold hemorrhage and paralysis, particularly in singers.

**Recovery from vocal fold paralysis.** Institute investigators have found that the longer a patient has vocal fold paralysis, the lower the chance of recovery. The rate of recovery is 70 percent with treatment started close to the onset of symptoms but declines among patients who delay care.

**Predicting outcomes for vocal fold hemorrhage.** Many performers are terrified of vocal fold hemorrhaging, a risk of professional singing which can result in crippling scarring. Weill Cornell Medicine researchers found that patients with vocal fold varices have 10 times the rate of hemorrhage, although the overall incidence is low. One in four people with vocal fold hemorrhage and half of those with varices experiences a recurrence. However, long-term follow-up showed that vocal fold hemorrhage has no significant long-term impact on vocational stability, subjective voice quality, or perceptions of vocal function. Patients who experienced more than one recurrence had greater confidence in their recovery over time and learned what they needed to do in terms of short-term care and treatment.



**Award-winning speech support.** A Parker Institute laryngologist won the Health Innovation Hackathon, a sprint-like event where interdisciplinary teams come together to create solutions to benefit health, by designing an EMG-based wearable device for silent communication using cell phones for patients with no larynx. The team, called MyophonX, used 3D scanning and printing to create a mask for a laryngectomy patient. By applying machine learning to the face and neck muscle signals, they were able to use the device to differentiate patient-specific silent speech. MyophonX won the Grand Prize, providing funding to support continued work on the project.

Physicians in the Center for the Performing Artist offer expertise and particular insight into the often unique needs of performing artists, from conservatory students to professionals performing at the highest levels.

### Selected Publications

- Time course of recovery of iatrogenic vocal fold paralysis. *The Laryngoscope*. 2018 Oct 16. [Epub ahead of print]
- Vocal fold hemorrhage: Factors predicting recurrence. *The Laryngoscope*. 2014;124(1):227-32.
- Vocal fold varices and risk of hemorrhage. *The Laryngoscope*. 2016;126(5):1163-68.
- Long-term consequences of vocal fold hemorrhage. *The Laryngoscope*. 2017;127(4):900-906.
- Dysphonia in performers: Towards a definition of laryngology of the performing voice. *Journal of Voice* 2014;28(3):349-55.
- Vocal fold pseudocyst: A prospective study of surgical results. *The Laryngoscope*. 2015;125(4):913-18.
- Contemporary review: Neurogenic cough. *The Laryngoscope*. 2015;125(7):1675-81.
- Sulcus vocalis: A new clinical paradigm based on a re-evaluation of histopathology. *The Laryngoscope*. 2016; 126(6):1397-1403.
- Laryngoscopic and stroboscopic signs in the diagnosis of vocal fold paresis. *The Laryngoscope*. 2017;127(9):2100-05.
- A prospective cross-over trial of injection augmentation versus botulinum toxin for essential voice tremor. *The Laryngoscope*. 2018;128(2):437-46.

### Center for the Performing Artist

Performing arts medicine is a specialty of the Center for the Performing Artist at NewYork-Presbyterian/Weill Cornell, which links artists requiring health care with the specialists they need to treat head and neck, hearing, and voice disorders. The Center has service contracts with major performing arts organizations in New York City, including The Juilliard School, Metropolitan Opera, and Manhattan School of Music, as well as award-winning Broadway shows. In addition to otolaryngology care, the Center facilitates care across the entire spectrum of medical conditions, with consultants in primary care and every specialty. They also provide coordination and navigation for multidisciplinary problems. The team most frequently addresses:

- Hearing issues in composers, singers, and musicians
- Rhinitis and sinusitis in singers and wind instrument players
- Temporomandibular joint disorder, for which our team developed novel exercises
- Facial trauma or lip, mouth, and jaw issues that may impede the playing of a wind instrument
- Voice problems, treated through the Sean Parker Institute for the Voice
- Neurologic repeated-use injuries in string players and ankle and foot problems in dancers, with those performers referred to the appropriate physicians

The staff also does outreach, such as educating students at Manhattan School of Music and Juilliard about the importance of good vocal hygiene and addressing any voice problems early. Free allergy and hearing screenings are offered each year to performers.



# Pioneering the Understanding and Treatment of Hearing Loss

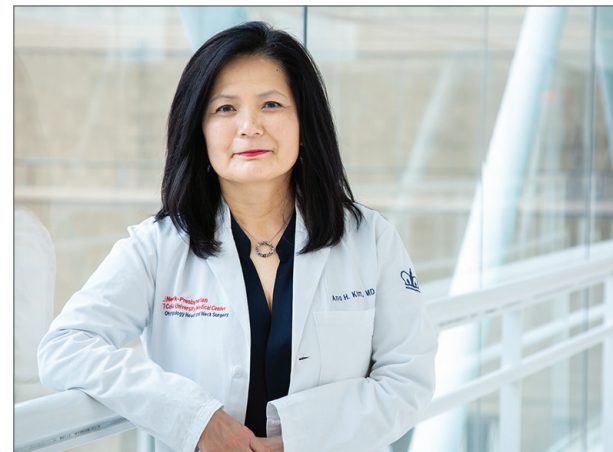
Our centers for hearing loss and other disorders of the ear are led by the nation's leading otology and neurotology specialists. Our multidisciplinary teams care for patients of all ages with ear, hearing, balance, and related skull base disorders, including:

- Tinnitus
- Dizziness
- Infectious and inflammatory diseases of the ear
- Facial nerve disorders
- Cholesteatomas
- Congenital malformations of the ear
- Tumors of the ear, acoustic nerve, and skull base

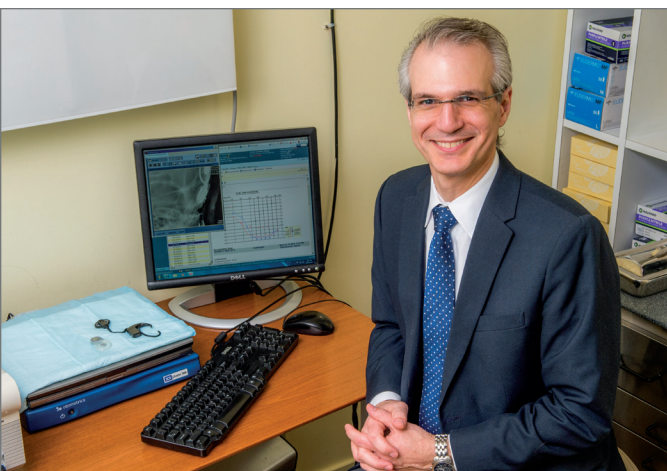
Both campuses offer comprehensive audiology services, including central auditory processing evaluations, vestibular assessments, and electrophysiological testing. Patients benefit from customized hearing aid fitting, including bone-anchored hearing aids, as well as medical and surgical treatments, and a comprehensive team approach to cochlear implantation that includes experienced pediatric and adult cochlear implant audiologists, speech therapy, school educator, and healthcare navigation for as long as they need it. Our clinical services are bolstered by robust basic science and clinical research aimed at clarifying the roots of hearing loss and improving treatments.



Justin S. Golub, MD, MS, otologist/neurotologist,  
NewYork-Presbyterian/Columbia



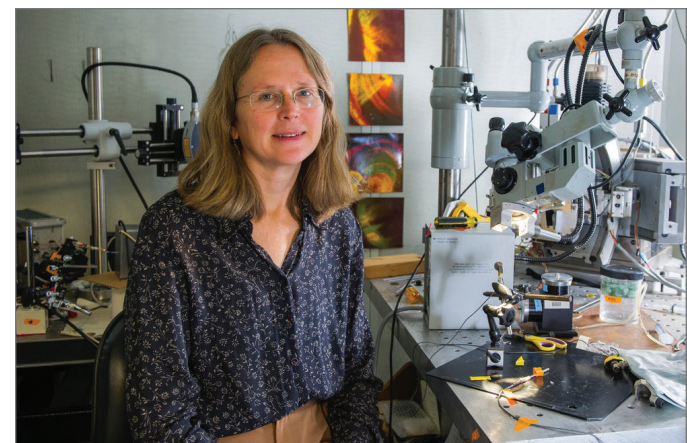
Ana H. Kim, MD, Director, Cochlear Implant Program,  
NewYork-Presbyterian/Columbia



George Alexiades, MD, Director, Cochlear Implant Center, NewYork-Presbyterian/Weill Cornell



Anil K. Lalwani, MD, Co-Director, Cochlear Implant Program, NewYork-Presbyterian/Columbia



Elizabeth S. Olson, PhD, Professor of Biomedical Engineering and Auditory Biophysics (in Otolaryngology – Head and Neck Surgery) at Columbia

**Understanding age-related hearing loss.** Columbia University researchers are leaders in the understanding of age-related hearing loss (ARHL) and its relationship to other variables. They have demonstrated links between ARHL and depression, cognitive impairment, and dementia. Moreover, preliminary brain imaging studies show smaller brain volumes as well as white matter tract dysfunction in adults with hearing loss. These findings suggest that prevention or treatment of hearing loss may be an effective strategy for managing depression and cognitive impairment. Our investigators have also created innovative big data analytical models to show that older age is not a significant predictor of cochlear implant performance when controlling for confounders. With funding from the National Institutes of Health, otolaryngology investigators at Columbia University are now collaborating with Department of Psychiatry researchers to study the effects of hearing loss on cognition, depression, and social withdrawal in the elderly.

**Predicting hearing aid success.** Weill Cornell Medicine investigators are exploring ways to predict how well individuals with hearing loss will fare once they begin using hearing aids. Patients do not always do as well as doctors would like, so researchers would like to identify markers of hearing aid success and failure.

**Pursuing gene therapy.** NewYork-Presbyterian/Columbia is one of four centers in the world conducting a clinical trial in which cellular regeneration is being used to treat hearing loss. Most causes of hearing loss are due to the death of inner ear hair cells. The study is assessing an investigational drug called CGF166 containing a gene that has been shown in laboratory studies to produce hair cells.

**Clarifying auditory mechanics.** Laboratory scientists at Columbia University's Fowler Memorial Lab are exploring the workings of the “cochlear amplifier,” the hair cells responsible for boosting sound signals entering the inner ear. Only a quarter of hair cells in the inner ear – the inner hair cells closest to the auditory neurons – send messages to the brain to translate sound into hearing. The remaining outer hair cells take on the task of amplifying incoming signals and also greatly enhance the differentiation of a sound into its various frequencies. Hearing aids amplify sound volume but lack the localized action of the natural ear's amplifier and cannot fully replace it. Fowler Lab investigators are among just a handful of researchers in the world using *in vivo* laboratory models to measure hair cell motion, electrical responses, and driving pressures in the inner ear to glean vital insights that elevate the understanding of normal hearing. They are also seeking to understand the basis of high-fidelity transmission of the middle ear.

**Improving cochlear implants.** To improve outcomes in cochlear implantation, scientists from the Fowler Lab developed a nontraumatic hydro-assisted method using viscous fluid to “carry” the implant into the cochlea, thereby preventing damage. With funding from the National Institutes of Health – and working with collaborators from Columbia University Engineering, Harvard University, and MIT – they designed an intracochlear microphone to serve as a component of a cochlear implant, which would overcome one of the biggest burdens of conventional cochlear implants: having to wear a portion of the device externally, including a magnetic disc on the scalp. They continue to refine the microphone to improve sensitivity and reduce unwanted feedback.

# Pioneering the Understanding and Treatment of Hearing Loss

The cochlear implant program at Columbia University continues to expand as researchers identify more patients who may benefit from this treatment. Newer implants have electrodes that are thinner and more flexible, allowing for the preservation of the cochlea and residual hearing. There are also implants called “electric acoustic stimulation” that combine cochlear implants to stimulate the middle and high frequencies in individuals with age-related hearing loss whose low-frequency hearing is sufficient or amenable to hearing aid use. In addition, Columbia University has one of the area’s largest programs assessing cochlear implants for people with single-sided deafness.

**Drug delivery to the cochlea.** Current methods to administer drugs to the cochlea to treat hearing loss, vertigo, and tinnitus are limited by an inconsistent rate of molecular transport across the round window membrane (RWM). Researchers from Columbia University’s Departments of Otolaryngology and Engineering have teamed up to devise a novel way to introduce one or more microscopic perforations through the RWM using a 3D-printed microneedle to enhance the rate and reliability of drug diffusion; it is being assessed in a laboratory model.

**Enhancing music enjoyment in cochlear implant users.** Many users of cochlear implants struggle with music perception, particularly with pitch-based and melodic musical elements. Columbia University investigators have found that re-engineering music to reduce its complexity by reducing harmonics and reverberation time improved music enjoyment for cochlear implant users.

**Seeking effective treatment for chronic tinnitus.** Ringing in the ears is one of the top two ear problems reported by military personnel (the other being noise-induced hearing loss) and has been linked with depression in people who



experience it chronically. With funding from the U.S. Department of Defense, Columbia University otolaryngology and psychiatry investigators are collaborating on a pilot study assessing the use of intravenous ketamine to treat tinnitus. If the results are positive, this therapy could become the first effective treatment for chronic tinnitus.

**Understanding brain damage from noise trauma.** Recent studies have suggested that noise, such as that associated with high-volume music on headphones or earbuds, not only destroys hair cells necessary for hearing, but also causes neuro-inflammatory changes and irreversible damage to neurons in



parts of the auditory centers of the brain. Columbia University scientists have created a mouse model to explore the pathophysiology of such traumatic noise-induced hearing loss to better understand this process and identify potential therapeutic targets. Treatment for sudden noise-induced hearing loss must be initiated within seven to 10 days of the trauma to avert permanent neuronal damage. The investigators would also like to explore the role of genetic sensitivity to noise-induced hearing loss.

**Improving hearing after acoustic neuroma treatment.** Many patients with acoustic neuroma experience hearing loss in the affected ear. While contralateral rerouting of sound hearing aids – bringing sound from the deaf to the hearing ear – bone-anchored hearing aids, and cochlear implants are effective options for hearing rehabilitation, some patients forego these treatments, choosing instead to make modifications for the rest of their lives to listen only through the “good ear.” Weill Cornell Medicine investigators are conducting research to understand why acoustic neuroma patients make the choices they do after treatment – such as the choice of a particular hearing rehabilitation technique versus the decision to go without – with the goal of optimizing hearing after surgery.

**Cost-effectiveness studies.** Our researchers have conducted studies to delineate the most cost-effective approaches to evaluating patients with sensorineural hearing loss and vertigo.

## Selected Publications

- Age-related hearing loss and its association with depression in later life. *American Journal of Geriatric Psychiatry*. 2018;26(7):788-96.
- Sensation and psychiatry: Linking age-related hearing loss to late-life depression and cognitive decline. *American Journal of Psychiatry*. 2018;175(3):215-24.
- Brain changes associated with age-related hearing loss. *Current Opinion in Otolaryngology and Head and Neck Surgery*. 2017;25(5):347-52.
- Observed hearing loss and incident dementia in a multiethnic cohort. *Journal of the American Geriatrics Society*. 2017;65(8):1691-97.
- Assessing cochlear implant performance in older adults using a single, universal outcome measure created with imputation in HERMES. *Otology & Neurotology*. 2018;39(8):987-94.
- A novel perfusion-based method for cochlear implant electrode insertion. *Hearing Research*. 2014;314:33-41.
- An intracochlear pressure sensor as a microphone for a fully implantable cochlear implant. *Otology & Neurotology*. 2016;37(10):1596-1600.
- Cost-effective analysis of unilateral vestibular weakness investigation. *Otology & Neurotology*. 2015;36(2):277-81.
- Cost analysis of asymmetric sensorineural hearing loss investigations. *The Laryngoscope*. 2010;120(9):1832-36.
- *In vitro* perforation of the round window membrane via direct 3-D printed microneedles. *Biomedical Microdevices*. 2018;20(2):47.
- Reduction of the harmonic series influences musical enjoyment with cochlear implants. *Otology & Neurotology*. 2017;38(1):31-37.
- Reverberation time influences musical enjoyment with cochlear implants. *Otology & Neurotology*. 2015;36(2):e46-50.
- Specific targeting of retrocochlear auditory pathway for optimal pharmacotherapy delivery using a mouse model. *Otology & Neurotology*. 2012;33(6):1085-91.
- Connexin 43 (Cx43) and hearing: Possible implications for retrocochlear auditory processing. *The Laryngoscope*. 2013;123(12):3185-93.
- Electric-acoustic stimulation. *Otolaryngologic Clinics of North America*. 2019;52(2):311-22.
- Impact of underlying diagnosis on speech and quality of life outcomes after cochlear implantation in single-sided deafness. *Accepted Otology & Neurotology*.

# Innovative Treatments for Allergic Rhinitis and Other Nasal Disorders

NewYork-Presbyterian's ENT surgeons care for all types of sinus and nasal disorders, from the most common to the most complex. Our teams offer the full range of care for patients with:

- Chronic nasal obstruction (somnoplasty was pioneered at NewYork-Presbyterian/Columbia)
- Epistaxis (specializing in endovascular embolization and transnasal vascular ligation)
- Refractory rhinosinusitis
- Nasal polyps
- Disorders of taste and smell

NewYork-Presbyterian/Weill Cornell physicians developed and patented an oral mucosal immunotherapy (OMIT) delivered via a toothpaste for patients with allergic rhinitis in whom injections or sublingual immunotherapies (SLIT) are ineffective, inconvenient, or intolerable – especially children. Marketed as Allerdent®, the treatment offers a number of benefits compared with SLIT, which needs to be held under the tongue for two minutes and can be challenging to dose correctly. OMIT exposes all immune tissues in the mouth to the therapy, including the vestibule and gums, as the patient brushes with the paste for two minutes twice daily.

Studies show that oral mucosal immunotherapy is as effective, safe, and convenient as sublingual immunotherapy for treating allergic rhinitis.

**Effective and convenient.** Studies have shown that OMIT is as effective, safe, and convenient as SLIT for use by patients with allergic rhinitis. The convenience of home administration was ranked highly as an important factor by study participants.

**Customized and compounded.** In the office, the physician mixes the allergenic protein extracts a patient needs and then sends them to a specialty pharmacy for compounding into a special toothpaste, which comes fluoridated and unfluoridated and in a variety of flavors and is delivered through a metered pump.

**Additional patient benefits.** In addition to more accurate dosing of the therapy, OMIT also promotes good dental hygiene.

## Selected Publications

- Patient preferences for route of allergy immunotherapy: A comparison of four delivery methods. *International Forum of Allergy & Rhinology*. 2016;6:454-59.
- Oral mucosal immunotherapy for allergic rhinitis: A pilot study. *Allergy & Rhinology*. 2016;7(1):21-28.

# Advancing Minimally Invasive and Skull Base Surgery

NewYork-Presbyterian's head and neck surgeons are leaders in the use of minimally invasive approaches – including transoral robotic surgery, salivary endoscopy, and transnasal skull base surgery – to remove tumors and obstructions of the salivary glands, mouth, throat, thyroid and parathyroid glands, larynx, and cervical spine. Our teams were among the first adopters of robotic techniques and continue to expand its applications across the field of otolaryngology.

**Pioneering sialendoscopy.** NewYork-Presbyterian/Weill Cornell is one of the few institutions offering salivary endoscopy, a highly technical procedure, to remove stones in the salivary glands – sparing patients from invasive open procedures on the parotid or submandibular glands, which raise the risk of nerve damage. They also use sialendoscopy to address salivary gland inflammation, such as that seen in patients with Sjögren's syndrome – opening the obstructed duct with a balloon and stent and applying steroid treatment.

**Expanding ear endoscopy.** NewYork-Presbyterian/Columbia has a growing ear endoscopy program – the first in the New York metropolitan area – offering less invasive transcanal access to middle ear surgeries for otologic diseases (such as tympanic membrane perforations, conductive hearing loss, and small cholesteatomas) that would otherwise require a larger incision to remove tissue blocking the surgical site. In concert with carefully executed surgical maneuvers, the endoscope offers a number of advantages for select ear surgeries.

**Leaders in skull base surgery.** NewYork-Presbyterian surgeons are among the world's leaders in the use of transnasal and transoral endoscopic approaches in children and adults, leaving the patient with no visible incisions. Our surgeons are experienced in the full range of endoscopic skull base procedures, including



David A. Gudis, MD, Chief, Division of Rhinology and Anterior Skull Base Surgery, NewYork-Presbyterian/Columbia



Ashutosh Kacker, MD, otolaryngologist and skull base surgeon, NewYork-Presbyterian/Weill Cornell

the treatment of sinus and nasal cancers, pituitary tumors, neuropapillomas, Schwannomas, dermoid cysts, angiofibromas, cervical vertebral dislocation causing compression of the spinal cord, and Chiari malformation. ENT surgeons and neurosurgeons work side by side to access these delicate areas.

**Advanced parathyroid surgery.** NewYork-Presbyterian/Weill Cornell is a leader in the use of imaging to guide parathyroid surgery. They employ high-sensitivity four-dimensional computed tomography/ultrasound to localize abnormal parathyroid glands, without the need for full surgical opening of the neck. The program is one of the first of its kind in the country, offering an approach that can spare patients from unwarranted surgery.

**Specialized reconstruction.** For patients who require open surgery, our reconstructive surgeons collaborate with facial and plastic surgeons, performing flap procedures to preserve function and cosmesis.



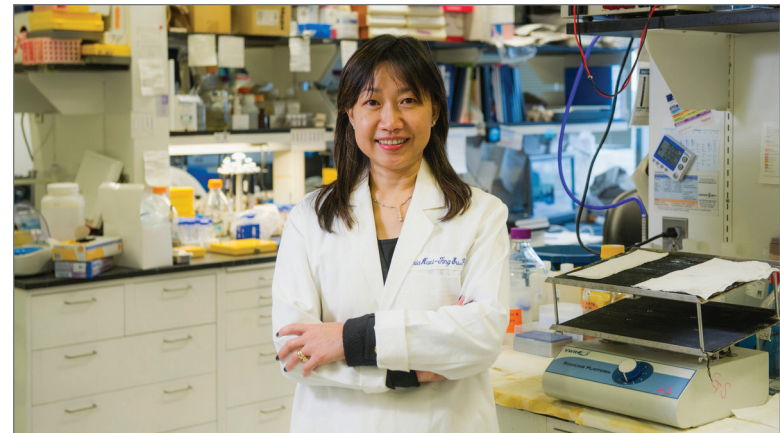
# Novel Approaches to Head and Neck Surgery

## Exploring Molecular Drivers of Head and Neck Cancers

Columbia University scientists at the Herbert Irving Comprehensive Cancer Center have created laboratory models to study tumorigenesis and identify signaling pathways and biomarkers involved in head and neck cancer development and progression. One model was established with mutations in the PI3KCA oncogene, which is involved in multiple cancers. Using whole genome sequencing and other methods, the researchers have found that more than 10 percent of patients with these cancers have PI3KCA mutations. Numerous anticancer agents are being evaluated in clinical trials that target the PI3K signaling axis, so gaining an understanding of the role of this protein and its signaling pathway in head and neck cancer development may unveil new treatment options for patients whose tumors are driven by this oncogenic mutation.

The p16 tumor suppressor gene is often missing in head and neck cancers that are negative for the human papillomavirus (HPV). Patients with HPV-negative head and neck cancers have poorer outcomes than those with HPV-positive tumors. The Columbia University investigators created a second laboratory model in which the p16 gene is deleted. CDK inhibitors, several of which are already marketed for cancer treatment, may be therapeutic options for patients whose cancers are lacking this gene. The scientists hope to use both the PI3KCA and p16 models to test new therapeutic approaches. They also hope to use liquid biopsies to search for downstream biomarkers in patients who may have multiple mutations.

Head and neck cancers are continuing to increase in incidence due to their link with HPV. The Herbert Irving Comprehensive Cancer Center has expanded its head and neck cancer research program by recruiting several new investigators. All of the scientists meet monthly to discuss their research and pool their ideas to forge new collaborations and glean new avenues of study.



Gloria H. Su, PhD, Professor of Pathology and Cell Biology (in Otolaryngology – Head and Neck Surgery at the Herbert Irving Comprehensive Cancer Center) at Columbia

Columbia University scientists at the Herbert Irving Comprehensive Cancer Center have created laboratory models to study tumorigenesis and identify signaling pathways and biomarkers involved in head and neck cancer development and progression.

NewYork-Presbyterian Morgan Stanley Children's Hospital  
is home to the only multidisciplinary tracheostomy care program  
for children in New York City and one of only a few such  
comprehensive tracheostomy programs in the country.

### Facial Plastic Surgery

Our teams include otolaryngologists with additional fellowship training in facial plastic and reconstructive surgery. They provide treatment for conditions and deformities related to trauma and cancer and a wide range of elective cosmetic procedures, including:

- Repair of head and neck trauma and complicated facial fractures
- Plastic and reconstructive surgery for patients who have had large excisions
- Cosmetic procedures of the face and neck to restore form and function
- Complex craniofacial reconstruction in children and adults

Our head and neck reconstructive plastic surgeons are conducting research related to nerve and cartilage regeneration, which would allow for more comprehensive facial restoration following disfiguring congenital, oncologic, or traumatic defects. They're also using 3D printing to design components for facial reconstruction.

### Pediatric Tracheostomy Care

NewYork-Presbyterian Morgan Stanley Children's Hospital is home to the only multidisciplinary tracheostomy care program for children in New York City. Established in 2018, our pediatric Tracheostomy Care Program is one of only a few such comprehensive tracheostomy programs in the country. The mission of the program is to provide the highest quality of care and support for children with tracheostomies and their families. These include children who are ventilator-dependent with a history of extreme prematurity and underdeveloped lungs, as well as children with congenital airway obstruction, laryngotracheal stenosis, tracheomalacia, and chronic neuromuscular disorders. Tracheostomy can be an intermittent treatment for children until they outgrow ventilator dependence or undergo surgical correction of an anatomic obstruction to breathing. For others, tracheostomy may be a long-term part of life.



Through the program, patients and their families are provided with a support system that features a comprehensive team of specialists to promote optimal respiration, feeding, and speech/language abilities. Led by a pediatric otolaryngologist who is a specialist in endoscopic airway surgery, airway reconstruction, and tracheostomy care, the team also includes speech/language pathologists, pulmonologists, nurses, and medical assistants. Also key to the program is a tracheostomy care coordinator who helps families bridge the transition from inpatient to outpatient care, ensuring they have the proper training they need to care for their child at home, obtain needed home equipment and services – such as 24-hour nursing and care from speech/language, physical, and occupational therapists – and other resources to support their child.

(continued on page 14)

# Novel Approaches to Head and Neck Surgery

The hospital offers a monthly clinic just for tracheostomy patients, some of whom require clinical visits once or twice a month while others may only need to come in once or twice annually. Having a child who needs a tracheostomy dramatically changes family dynamics and home life, and the NewYork-Presbyterian Morgan Stanley Children's Hospital team prepares, trains, and

supports families adjusting to this transition, as well as the transition back to normal breathing in children whose tracheostomy tubes can be removed. Many children with tracheostomies learn to speak, and are able to eat, drink, and play. Through this dedicated program, the team helps each child to thrive and achieve the best quality of life possible.

## Selected Publications

- Idiopathic chronic parotitis: Imaging findings and sialendoscopic response. *ORL; Journal of Oto-Rhino-Laryngology and its Related Specialties*. 2015;77(5):302-9.
- Sialoendoscopy in the diagnosis and management of obstructive sialadenitis. *The Laryngoscope*. 2011;121(3):495-500.
- Building an endoscopic ear surgery program. *Current Opinion in Otolaryngology and Head and Neck Surgery*. 2016;24(5):395-401.
- Quality of life after combined endonasal endoscopic odontoidectomy and posterior suboccipital decompression and fusion. *World Neurosurgery*. 2018;116:e571-e576.
- Endoscopic pituitary surgery: A systematic review and meta-analysis. *Journal of Neurosurgery*. 2009;111(3):545-54.
- Predictors of short-term outcomes following endoscopic pituitary surgery. *Clinical Neurology and Neurosurgery*. 2009;111(2):119-22.
- Endoscopic cranial base surgery: Classification of operative approaches. *Neurosurgery*. 2008;62(5):991-1002.
- Localization of small parathyroid adenomas using modified 4-dimensional computed tomography/ultrasound. *Otolaryngology Head and Neck Surgery*. 2012;146(1):33-39.
- Parathyroid localization and preservation during transcervical resection of substernal thyroid glands. *Otolaryngology Head and Neck Surgery*. 2015;152(6):1024-28.
- Dysregulations in the PI3K pathway and targeted therapies for head and neck squamous cell carcinoma. *Oncotarget*. 2017;8(13):22203-17.
- Impact of PI3K/AKT/mTOR pathway activation on the prognosis of patients with head and neck squamous cell carcinomas. *Oncotarget*. 2016;7(20):29780-93.
- Novel mutant-enriched sequencing identified high frequency of PIK3CA mutations in pharyngeal cancer. *International Journal of Cancer*. 2008;122(5):1189-94.
- PIK3CA mutations in head and neck squamous cell carcinoma. *Clinical Cancer Research*. 2006;12(5):1441-46.



# Sleep Apnea Management

Surgical intervention may be necessary for patients with obstructive sleep apnea in whom nonsurgical approaches, such as continuous positive airway pressure (CPAP), are not sufficiently effective or well tolerated, or in patients who are not adherent to the prescribed therapy. Uncontrolled sleep apnea may place patients at risk of cardiovascular issues and cognitive impairment, accidents, and diminished quality of life.

At NewYork-Presbyterian, our otolaryngologists work closely with other sleep specialists to help patients achieve restorative sleep – not only benefiting them, but their partners as well. Some patients benefit from surgical approaches, such as uvulopalatopharyngoplasty, genioglossus advancement, maxillo-mandibular advancement, or hyoid suspension.

For patients whose snoring remains or who cannot tolerate these procedures, we offer upper airway stimulation for those with appropriate anatomy using a hypoglossal nerve stimulator. This nerve stimulation stabilizes the airway during sleep, preventing the tongue from sliding back and improving airflow.

**The most experience.** NewYork-Presbyterian/Weill Cornell was the first center in the New York area approved to offer this game-changing therapy and has more experience than any other regional center using this treatment in patients with moderate to severe sleep apnea. We are now one of the few centers recognized as a Center of Excellence for building and maintaining this program.

**Patient controlled.** The device is implanted under the skin in the upper chest. The patient turns it on each night and turns it off each morning using a handheld remote. Studies have shown that patients are highly compliant with the device.



**Proven efficacy.** Hypoglossal nerve stimulation has been shown to lower the apnea-hypopnea index (number of events per hour) by 82 percent, reduce daytime sleepiness, and increase oxygen saturation. Patients have also reported improvements in heart health, a reduction in motor vehicle accidents, improved job performance, and better quality of life for their partners as well. Our researchers showed that some patients in whom hypoglossal nerve stimulation isn't sufficient may benefit from the addition of uvulopalatopharyngoplasty and tonsillectomy.

**Monitoring compliance.** NewYork-Presbyterian/Weill Cornell is now the first center in the country to start using cloud technology to monitor patient compliance with therapy and outcomes.

## Publication

- Upper-airway stimulation before, after, or without uvulopalatopharyngoplasty: A two-year perspective. *The Laryngoscope*. 2019;129:514-18.



# Leading the Way in Education

NewYork-Presbyterian's Departments of Otolaryngology – Head and Neck Surgery are hosting or have hosted large-scale events to educate their colleagues in the field:

**Annual Otolaryngology Update**, November 2019, New York, NY. NewYork-Presbyterian/Weill Cornell and NewYork-Presbyterian/Columbia hosted this annual course, and 2019 was its 13th year. The course provided practicing otolaryngologists and head and neck surgeons with updates on the latest diagnostic and therapeutic techniques, including surgical management for numerous subspecialties.

**International Surgical Sleep Society Meeting**, May 2019, New York, NY ([www.sleepsurgery2019.com](http://www.sleepsurgery2019.com)). This meeting united experts in sleep surgery from around the world and was co-hosted by NewYork-Presbyterian/Weill Cornell and co-chaired by Maria V. Suurna, MD.

**Advanced Endoscopic Skull Base and Pituitary Surgery Course.**

NewYork-Presbyterian/Weill Cornell presents this annual educational event – a comprehensive overview of the newly emerging field of endoscopic skull base surgery, combining didactic sessions with hands-on dissection using endoscopic instruments and surgical navigation equipment.

**Performing Arts Medicine Association Symposium.** NewYork-Presbyterian/Weill Cornell is a past host of this annual gathering, which is designed to meet the research and practice needs of physicians, therapists, educators, artistic directors, athletic trainers, and other professionals who seek to improve the wellbeing of performing artists.

**Columbia Endoscopic Ear, Eustachian Tube, and Sinus Surgery Course,** Spring 2019, New York, NY. The first of its kind in the New York metropolitan area and one of a select few in the world, this highly specialized course addressed innovative surgical techniques and the latest advances in patient care, including transcanal endoscopic ear surgery, transnasal Eustachian tube surgery, and endoscopic sinus and skull base surgery.



# Make an Appointment

## **NewYork-Presbyterian/Columbia University Irving Medical Center**

### **Adult Patients**

180 Fort Washington Avenue, 7th floor  
New York, NY 10032  
(212) 305-8555

### **Pediatric Patients**

NewYork-Presbyterian  
Morgan Stanley Children's Hospital  
3959 Broadway at 165th Street  
New York, NY 10032  
(212) 305-8933

### **Adult and Pediatric Patients**

#### **Midtown**

ColumbiaDoctors Midtown  
51 West 51st Street, Suite 385  
New York, NY 10019  
(212) 305-8555

#### **Bronx**

ColumbiaDoctors Riverdale  
3050 Corlear Avenue at West 231st Street  
Suite 202  
Bronx, NY 10463  
(646) 317-5200

## **NewYork-Presbyterian/Weill Cornell Medical Center**

### **Adult Patients**

1305 York Avenue, 5th floor  
New York, NY 10021  
(646) 962-3681

Center for the Performing Artist  
(646) 962-ARTS (2787)

Sean Parker Institute for the Voice  
240 East 59th Street, 2nd floor  
New York, NY 10022  
(646) 962-SING (7464)

### **Pediatric Patients**

NewYork-Presbyterian Komansky Children's Hospital  
428 East 72nd Street, Suite 100  
New York, NY 10021  
(646) 962-2224

### **Adult and Pediatric Patients**

#### **Upper West Side**

2315 Broadway at West 84th Street, 3rd floor  
New York, NY 10024  
(646) 962-9135

### **Lower Manhattan**

156 William Street, 12th floor  
New York, NY 10038  
(646) 962-5200

### **Westchester County**

Facial and Reconstructive Surgery  
59 South Greeley Avenue, Suite 4  
Chappaqua, NY 10514  
(914) 238-5500

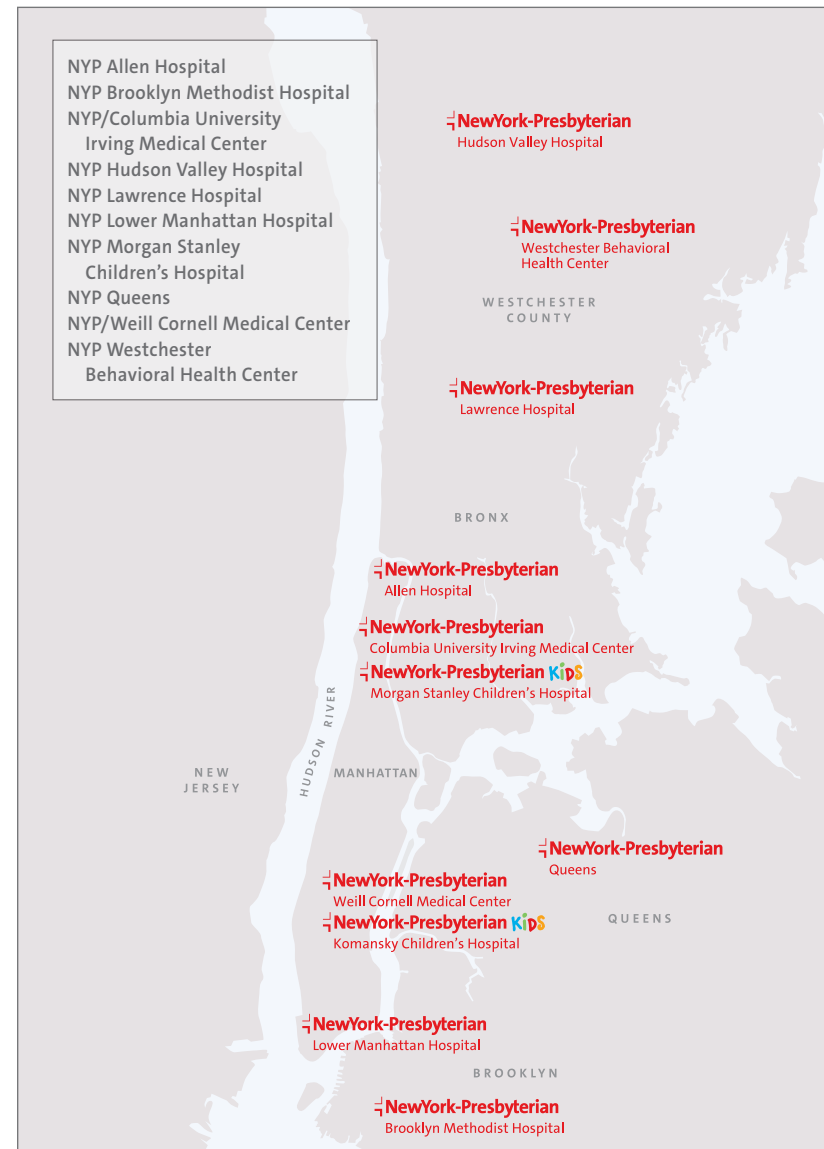
# NewYork-Presbyterian

NewYork-Presbyterian is one of the nation's most comprehensive, integrated academic healthcare systems, encompassing 10 hospital campuses across the Greater New York area, more than 200 primary and specialty care clinics and medical groups, and an array of telemedicine services.

A leader in medical education, NewYork-Presbyterian Hospital is the only academic medical center in the nation affiliated with two world-class medical schools, Weill Cornell Medicine and Columbia University Vagelos College of Physicians and Surgeons. This collaboration means patients have access to the country's leading physicians, the full range of medical specialties, latest innovations in care, and research that is developing cures and saving lives. Ranked the #5 hospital in the nation and #1 in New York in *U.S. News & World Report's* "Best Hospitals" survey, NewYork-Presbyterian Hospital is also recognized as among the best in the nation in every pediatric specialty evaluated in the *U.S. News* "Best Children's Hospitals" survey. Founded nearly 250 years ago, NewYork-Presbyterian Hospital has a long legacy of medical breakthroughs and innovation, from the invention of the Pap test to the first successful pediatric heart transplant, to pioneering the groundbreaking heart valve replacement procedure called TAVR.


NewYork-Presbyterian's 47,000 employees and affiliated physicians are dedicated to providing the highest quality, most compassionate care to New Yorkers and patients from across the country and around the world. NewYork-Presbyterian hospitals are not for profit and provide more than \$1 billion in benefits every year to the community, including medical care, school-based health clinics, and support for more than 300 community programs and activities.

For more information, visit [www.nyp.org](http://www.nyp.org) and find us on Facebook, Twitter, Instagram, and YouTube.









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