Summer 2025 Vol. 32, Iss.2

Society of Physician Assistants in Otorhinolaryngology-Head & Neck Surgery

THE VANGUARD

President's Message

By Reagan Davis, MPAS, PA-C

It is with deep gratitude and great excitement that I step into the role of President of the Society of PAs in Otorhinolaryngology–Head & Neck Surgery (SPAO-HNS). I am honored to serve this community of professionals who are dedicated to advancing ENT care through excellence in clinical practice, education, and leadership.

A bit about me: I have had the privilege of practicing as a PA in otolaryngology for the past seven years at the University of Texas Medical Branch (UTMB) in Galveston, Texas. My professional passions include clinical research, teaching, and mentoring the next generation of PAs in academic medicine. Outside of work, I enjoy reading and traveling with my wonderful family — my wife, Catherine, a pediatric speech-language pathologist, and our two daughters, Olivia and Claire.

This is an exciting time for our organization. SPAO-HNS has established its first-ever strategic plan, created from the valuable feedback of our members. This plan reflects our commitment to serving your needs and shaping the future of our profession. It outlines our focus on expanding educational opportunities, strengthening professional development, and increasing visibility for ENT clinicians on a national level.

I would also like to extend a heartfelt thank you to the CME Committee and the University of Utah for planning and hosting another outstanding ENT for the PA-C conference. From the expert speakers and interactive workshops to the engaging exhibitors and the breathtaking mountain backdrop, this year's event was a true highlight.

During the conference, our Board of Directors approved the formation of a new Education Committee, which will focus on developing an onboarding curriculum specifically designed for advanced practice providers new to ENT. We are excited about the innovation and collaboration this group will bring.

This year's conference in Salt Lake City marked a record-breaking moment: It was our largest ENT for the PA-C event to date with 543 attendees! We hope to continue that momentum in March 2026, when my home institution will proudly host the next conference in Galveston, Texas. We look forward to welcoming returning attendees and new faces alike for a memorable island experience on the Gulf Coast.

Lastly, I want to recognize and welcome the Board of Directors' new members, who are eager to serve. And to those concluding their service, thank you for your dedication and contributions. Your leadership has helped pave the way for what's to come, and we are grateful.

I look forward to working alongside all of you as we lead this organization into its next chapter. Thank you for your continued support, engagement and commitment to our ENT community.

Warm regards,
Reagan Davis, MPAS, PA-C
President, SPAO-HNS

IN THIS ISSUE

Join SPAO and receive
The Vanguard quarterly newsletter!
entpa.org/member_application/

THE VANGUARD

8100 Three Chopt Road,
Richmond, VA 23229

SPAO Strategic Planning for a Stronger Future

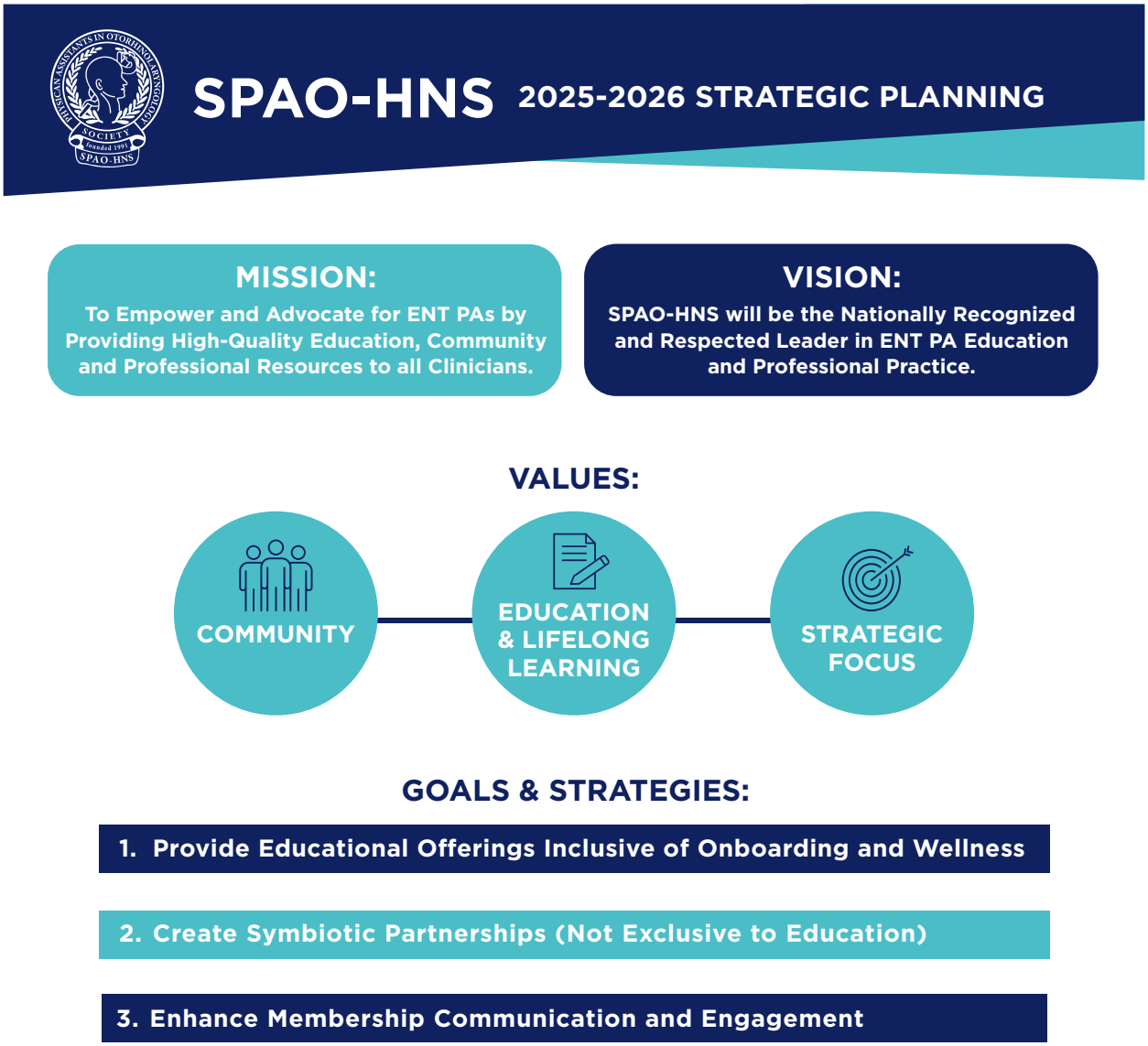
By Reagan Davis, MPAS, PA-C, President

This past March, several SPAO officers had the privilege of gathering in Washington, D.C., to attend the AAPA Executive Leadership Conference. It was an energizing and informative experience, where we engaged with PA and NP leaders from across the country and gained valuable insights into leadership, advocacy and innovation in advanced practice.

While in D.C., we also took time to reflect on your voices. Together, we reviewed the most recent SPAO membership survey to better understand what matters most to you — our members — and what you envision for the future of our organization. Guided by your input, we spent several productive and inspiring days brainstorming, exchanging ideas, and mapping out a bold path forward.

I'm excited to share that this collaborative effort led to the creation of SPAO's very first strategic plan. It includes clearly defined mission, vision and values, along with strategic goals, to support the growth, impact, and sustainability of our organization.

We are proud of this milestone and look forward to walking this journey with you.



Free Tissue Transfer: Transplant Surgery in ENT

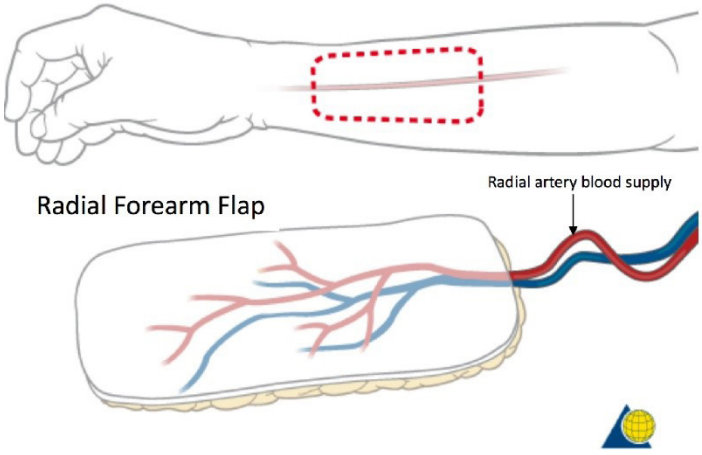
By Adam Bastin, PA-C, SPAO Member

Within the specialty of Otolaryngology, there are occasions during which large surgical defects are encountered. Free tissue transfers are a subset of surgical techniques that can be utilized to repair these surgical wounds. Free tissue transfers are when you borrow tissue from one part of the body and move it to the surgical wound using an artery and vein to support the transplanted tissue.

Common Free Tissue Transfers for ENT

Bone Free Tissue Transfer

- Fibula Free Flap
- Scapular Free Flap
- Segmental Radial Forearm Free Flap
- Iliac Crest Free Flap
- Soft Tissue Free Tissue Transfer
- Soft Tissue Forearm Free Flap
- Anterolateral Thigh Free Flap
- Latissimus Free Flap
- Rectus Abdominus Free Flap
- Posterior Tibialis Free Flap



(https://craniofacialteamtexas.com/virtual-surgery-and-technology/microsurgery/)

Surgical Procedure and Monitoring

The surgical approach for free tissue transplantation usually occurs at the same time as removal of diseased or damaged tissue. In many instances, free tissue transplantation is utilized in oncologic cases. When a large malignancy is removed, free tissue

Continued on next page...

transfer is utilized to help expedite wound healing and improve function.

Examples of when free tissue transfer would be used include a fibular free flap when mandible is removed to a deeply invasive oral cavity squamous cell carcinoma; anterolateral thigh free flap when a patient experiences a recurrent laryngeal malignancy and they have previously been treated with chemotherapy and radiation therapy; or a latissimus free flap with the majority of the scalp has to be removed due to a neglected basal cell carcinoma or an aggressive angiosarcoma.

Close evaluation and monitoring are paramount in success for free tissue transfer. Close clinical evaluation techniques include evaluation of tissue color, results of pin prick or scratch test, capillary refill of cutaneous tissues, vascular ultrasound doppler, and oximetry techniques.

Diligent evaluation of the transplanted tissue is critical in the immediate postoperative period to ensure successful tissue transplantation1 Frequent evaluation by medical and nursing staff is recommended. Evaluation of the tissue (if visible to the eye) includes color and temperature of the tissue. A pinprick from a small-gauge needle is often utilized to ensure the tissue is receiving adequate blood flow.

It is important to appreciate the blood return since slow, dark bleeding may be a sign of poor venous outflow, resulting in stress on the tissue. Doppler ultrasound frequently is often to listen for the pulse of blood through the transplanted tissue, handheld doppler or implanted doppler. A weak signal may indicate poor arterial flow.

Recent technological advancements have allowed medical teams to monitor oximetry of transplanted tissue remotely with the use of noninvasive near infrared spectroscopy or laser doppler flowmetry.

Surgical Outcomes of Free Tissue Transfer

Free tissue transplantation is a very reliable method for reconstructing large surgical defects of the head and neck. The success rate of free tissue transplantation is around 90-98%2. The success of free tissue transplantation can depend on multiple factors. Some factors include a patient's overall health. Many patients requiring head and neck free tissue transplantation have a history of heavy smoking and/or alcohol use.

Smoking and alcohol use may have contributed to chronic obstructive pulmonary disease, cardiovascular disease or liver damage, which may play a role in the patient's difficulty healing surgical wounds. Many of these patients have also undergone prior radiation therapy treatments which also reduce patients' ability to heal. History of radiation may also results in difficulty performing anastomosis of the native and transplanted vessels.

Benefits of free tissue transfer include an improvement in function following resection of diseased/damaged tissue. The free tissue transfer to the oral cavity may help the patient continue to eat by mouth.

Soft tissue free flap transfer to the large scalp wound may help avoid exposed skull and possibilities of osteomyelitis or prolonged wound care. Tissue transfer helps the patient achieve a better cosmetic outcome when compared to the initial tumor of the defect that would result from removal of the tumor.

Important complications to be mindful of in the post operative period include soft tissue infection, scarring, chronic pain, bleeding, delayed total or partial failure of the transplanted tissue, incomplete healing around the deep sutures resulting in a fistulous tract from the upper aerodigestive tract to the skin, or delayed complications of hardware failure in the setting of osseus free flap transfer. Occasionally the transplanted tissue will remain large, and patients will require a debulking procedure to help gain a better cosmetic appearance.

Continued on next page...

Summary

Free tissue transplantation surgery is a common procedure used to help treat large otolaryngology wounds. The procedure is highly successful but requires extremely close monitoring for the first week postoperatively. The desired results from a free tissue transplant are for the patient to have the best functional and cosmetic results so that they may thrive in their recovery.

1 Kohler S, Quimby AE, Saman M, Ducic Y. Postoperative Free-Flap Monitoring Techniques. Semin Plast Surg. 2019 Feb;33(1):13-16. doi: 10.1055/s-0039-1677880. Epub 2019 Mar 8. PMID: 30863207; PMCID: PMC6408240.

2 Spoerl S, Schoedel S, Spanier G, Mueller K, Meier JK, Reichert TE, Ettl T. A decade of reconstructive surgery: outcome and perspectives of free tissue transfer in the head and neck. Experience of a single center institution. Oral Maxillofac Surg. 2020 Jun;24(2):173-179. doi: 10.1007/s10006-020-00838-7. Epub 2020 Mar 20. PMID: 32198652; PMCID: PMC7230044.

The Bare Necessities of an Otologic Exam

By Adele Rauen, PA-C, Director at Large

Have you ever been on a mission trip with limited medical supplies, had a call from your neighbor on a Saturday night regarding ear pain after flying, had the electricity go out in your clinic from a thunderstorm with patients waiting to be examined, requested to see a consult and SPD can't find the "fancy" otoscope or the portable flex, and had a virtual visit with a patient and wanted to be able to visualize inside their ears, nose and throat?

As clinicians, we sometimes find ourselves in clinical scenarios with minimal equipment. Although we love our ergonomic headlights, audio booths, and high powered otologic microscopes, we may find ourselves without these supplies at the ready. So, what do we do? We go back to the basics!

Most of us bought a basic otoscope for Physician Assistant School. Do you have yours at home? Or a version of it at the office?

When micro-otoscopy is unavailable, make the most of what you have access to. Not all (but most) otoscopes have a light source, amplifying lens and speculum attachment . If yours has a slidable lens, it will open your scope of practice. Once you remove the lens, blunt tools can be used through the speculum to apply medication, remove wax and foreign bodies, or clean an abrasion.

Loops/ curettes, alligator forceps, Q-Tips that are lightly moistened with hydrogen peroxide or other cleaning agents (yes, I said Q-Tip), and sterilized drinking straws (you can cut the edge of a plastic straw to form a rounded cup for foreign object or wax removal) are all options for entering the external auditory canal. Proceed slowly, brace the otoscope on the patient's face, and try to stay as lateral as possible with the instrument.

Always ensure that the end of your instrument is visible and assess risk versus benefit fully before beginning. Use alcohol or the device manufacturers recommended cleaning supplies after use 1.

If a provider suspects a pathology on examination that can cause hearing loss, pull out the $7-15 tuning fork and perform the Weber and Rinne tests. It is a low-cost instrument that can save someone's hearing and help determine plan of care. Effusion and small perforations are difficult to visualize using a hand-held otoscope, but both can cause a conductive hearing loss component 5.

Ear fullness is one of the most common otolaryngology complaints, and underlying etiology can be secondary to external, middle or inner ear pathology. Don't miss a sudden sensorineural hearing loss that presents mainly as ear fullness.

If you do not have access to a tuning fork when evaluating a patient for possible hearing loss, you can use internal body sounds to differentiate a conductive versus sensorineural hearing loss. Internal sounds will often lateralize like a Weber test.

Continued on next page...

Asking the patient to hum has upwards of 95% accuracy and 85% sensitivity compared to a traditional Weber test with a 512 Hz tuning fork. The high-pitched hum is of greater accuracy than a low-pitched hum 4.

Telemedicine spiked in 2020 with the onset of COVID-19, and, so far, it is here to stay with varying degrees of use and benefit in most states. How can we optimize an otolaryngology exam via video?

Using the camera on the telehealth device is key. Asking ahead of the visit for the patient to provide a human guest for their exam, if applicable, can allow for camera use flexibility and exam accuracy. Educating the guest on how to guide the camera and hold it at optimal angles allows for a full outer ear and face exam.

If your patient purchased a video otoscope for at-home use, they may obtain pictures of the ear canal and ear drum for telehealth evaluation. Although the accuracy of the images varies based on photographer and technology of the scope, when applicable it is an effective tool for an otologic assessment .

Since most patients do not have tuning forks or audio booths at home, the patient can use a hearing test app for an air-conduction audiogram. Some apps were validated with a multi-institutional study comparing pure tone average (PTA) in clinic with the PTA of the app .

As discussed above, the hum test can accurately help differentiate if a unilateral loss is conductive or sensorineural .

References

1. Otoscopy – Stat Pearls. https://www.ncbi.nlm.nih.gov/books/NBK556090/
2. Tötterman M, Jukarainen S, Sinkkonen ST, Klockars T. A Comparison of Four Digital Otoscopes in a Teleconsultation Setting. Laryngoscope. 2020 Jun;130(6):1572-1576.
3. Swords C, Twumasi E, Fitzgerald M, Fitzsimons-West E, Luo M, Dunne H, Lim KH, Jones O, Law S, Myuran T, Smith G, Tailor BV, Wakelam O, de Cates C, Borsetto D, Tysome J, Donnelly N, Axon P, Bance M, Smith ME. A Multicenter Validity Study of Four Smartphone Hearing Test Apps in Optimized and Home Environments. Laryngoscope. 2024 Jun;134(6):2864-2870. doi: 10.1002/lary.31256. Epub 2024 Jan 12. PMID: 38214403.
4. Polson, Ann Maria; Menon, Unnikrishnan K.; Prem, G.1; Kumar, M.; Bhaskaran, R.2. Diagnostic Accuracy of the Hum Test in Unilateral Hearing Loss. Indian Journal of Otology 27(4): p 217-221, Oct–Dec 2021. | DOI:4103/indianjotol.indianjotol_275_20
5. The accuracy of otomicroscopy for the diagnosis of pediatric middle ear effusions. https://www.sciencedirect.com/science/article/abs/pii/S0165587610003022

Odontogenic Sinusitis: More Common Than You Think

By Andrew Worrel, PA-C, SPAO member

Odontogenic sinusitis (ODS) is a common disease process experienced worldwide, accounting for approximately 10-12% of cases of maxillary sinusitis. ODS is described as a type of inflammation or infection of the maxillary sinus secondary to an adjacent dental pathology. Common dental pathologies include endodontitis, periodontitis, oroantral fistula (OAF), or as a complication from a recent dental procedure. 3

Presentation/Signs

Although many patients with ODS do not present with typical sinusitis symptoms, common symptoms of ODS include unilateral facial pressure/pain and foul smell/malodor2. History may also reveal previous/active tooth pain or prior dental procedure. Physical exam may show facial tenderness/nasal discharge and poor dental health. Nasal endoscopy would likely show mucopurulence in the middle meatus and regional mucosal hyperemia2.

Diagnosis/Treatment

There are no consensus diagnostic criteria for ODS, but a definitive diagnosis correlates a dental pathology to sinus disease. A CT maxillofacial or sinus is important in diagnosing odontogenic sinusitis. It may show evidence of a periapical lucency or OAF and maxillary disease which is consistent with odontogenic sinusitis. Unfortunately, the diagnosis of ODS is sometimes missed as a CT scan cannot identify periapical periodontitis, which makes involvement of dental specialists important.

ODS is usually caused by anaerobic bacteria, specifically Fusobacterium nucleatum, pigmented Prevotella spp, Bacteroides spp., Porphyromonas spp, and Peptostreptococcus spp . First line empiric treatment includes penicillin + β-lactamase inhibitor. Antibiotics like amoxicillin-clavulanate may be sufficient, but adding metronidazole will extend and improve anaerobic coverage Nasal endoscopy can be utilized to obtain cultures of mucopurulence, which would indicate an anaerobic/oral bacteria and provide antibiotic sensitivities.

Complications

Untreated ODS has similar complications to untreated rhinosinusitis, specifically extrasinus spread of bacteria. These complications include preseptal cellulitis or abscess, postseptal cellulitis, subperiosteal abscess, orbital abscess and cavernous sinus thrombosis, meningitis, cerebritis, intracranial abscesses and sinus wall osteomyelitis. Orbital complications are more frequent than intracranial and osseous complications.

As a general rule, any patient who presents with unilateral facial pressure/pain and ipsilateral vision changes should be evaluated emergently for complicated sinusitis. While direct extension from the maxillary sinus to surrounding structures is a major cause of extrasinus complications, hematogenous spread is also likely involved. Furthermore, a recent review regarding patients with ODS suggests that 60% of complicated ODS cases did not have dental pain .

I have seen many incidents of odontogenic sinusitis in my practice over the last few years. The following is a case report I

Continued on next page...

personally diagnosed and treated.

Subjective

73 y.o. male with h/o esophageal stricture presents for right-sided facial pressure. He reports this initially occurred while on a cruise 8 months ago. His facial pressure eventually resolved and now recently developed cough, dysphonia, intermittent facial pressure and malodor. He denies any shortness of breath, wheezing, discolored nasal discharge or nasal obstruction. Cough is worse in the morning and productive of white/yellow phlegm. He was seen by PCP in July and prescribed doxycycline. Then again 3 months later, prescribed Amoxil 500 mg TID x10 days by PCP. He is not currently on any rinse or nasal sprays.
He does not recall previously having allergy testing.
He denies a history of asthma, OSA, nasal trauma, sinonasal surgery, or tobacco use
He reports a history of reflux symptoms which is currently managed with PPI as needed.

Objective

Physical Exam
Nose: Left septal deviation, no mucosal edema, no facial tenderness
Mouth: mucosal membranes moist, abnormal dentition (evidence of tooth decay, missing teeth)
Otherwise physical exam unremarkable

Flexible nasolaryngoscopy showed: Thick white mucus from right middle meatus draining into right posterior choana (cultured), enlarged inferior turbinates, and anterior left septal deviation

Images taken from scope:

right middle turbinate with edema and right middle meatus with white mucus

Right posterior MM space

Right posterior choana

Both images here showing thick white mucus, usually associated with CRS

Continued on next page...

Treatment and Plan

I diagnosed the patient with maxillary sinusitis. His throat clearing seemed to be secondary to right-sided acute on chronic sinusitis. The patient was started on daily saline rinses and daily intranasal corticosteroid (INCS) spray. Nasal culture was obtained, and CT sinus was recommended if not improved with medication therapy.

Anaerobic culture grew fusobacterium nucleatum. The patient was prescribed Augmentin for anaerobic coverage and oral prednisone burst for symptomatic treatment. Despite this, his symptoms persisted, so patient underwent CT sinus 2 weeks later.

Axial

This view demonstrates complete opacification of right maxillary sinus with aerated opacification suggesting acute sinusitis. Also notes left septal deviation. No osteogenesis of the maxillary walls to suggest chronic sinusitis.

Sagittal

This view demonstrates the etiology of this patient's problem, which is an oroantral fistula (OAF). This space is about half a centimeter and is allowing bacteria to seep into the maxillary sinus, creating odontogenic sinusitis.

Coronal

This view confirms similar findings on the other two views.

Continued on next page...

I referred the patient to an outside dental specialist. My health system does not have any OMFS on staff. If this patient had undergone a functional endoscopic sinus surgery (FESS), the patient would likely have a poor outcome (e.g. persistent symptoms) due to the lack of source control.

Conclusion:
All ENTs (and other medical professionals) should have a high suspicion for odontogenic sinusitis for any patient who presents with evidence of maxillary sinusitis and history of dental pain and/or previous oral surgery. A detailed history and physical exam, especially of the oral cavity, teeth and gingiva is important for any clinician with suspicion of ODS. A multidisciplinary approach (between OMFS and otolaryngologists) is important to treat this disease process.

Resources

1. Chow, A. W. (2023). Epidemiology, pathogenesis, and clinical manifestations of odontogenic infections. *UpToDate*. Retrieved May 28, 2025, from https://www.uptodate.com/contents/epidemiology-pathogenesis-and-clinical-manifestations-of-odontogenic-infections
2. Lin, J., Wang, C. et al (2024). Expert consensus on odontogenic maxillary sinusitis multi-disciplinary treatment. *International Journal* of Oral Science, 16:11. https://doi.org/10.1038/s41368-024-00278-z
3. Craig, J., Cheema, A. et al (2022). Extra sinus complications From Odontogenic Sinusitis: A Systematic Review. *Otolaryngology-Head and Neck Surgery*, 166 (4), 623-632

What is That Sound? Noisy Breathing in the Infant: A Look at Congenital Laryngomalacia

By Christine Willis, MMS, PA-C, Director at Large

In pediatric patients with noisy breathing, most often it will be characterized as upper airway obstruction with the most common abnormal upper airway sound being stridor. Stridor is a high-pitched whistling sound caused by turbulent airflow through a restricted airway. Stridor is typically inspiratory in pediatric noisy breathing, but it can also be biphasic or expiratory. The most prevalent cause of inspiratory stridor in infants is laryngomalacia (LGM). The incidence of LGM is relatively unknown as many mild cases are managed by pediatricians without endoscopic diagnosis. It is estimated to be between 1:2000 and 1:3000.

There are several theories of the pathophysiology of LGM, but the most widely accepted is the neurologic hypothesis postulating that supraglottic prolapse and airway obstruction are caused by weak laryngeal tone secondary to neuromuscular dysfunction evidenced by abnormal laryngeal adductor reflex function. Previously, prevalence was thought to be higher in males. However, recent studies suggest that prevalence is equal between males and females.

Low birth weight, prematurity and NICU admission following birth have all been suggested as associated factors. Children with laryngomalacia who have neuromuscular disorders or genetic syndromes, such as trisomy 21, often have more severe and persistent symptoms compared to children with isolated laryngomalacia and who are otherwise healthy.

Signs and Symptoms

Congenital LGM will almost always present in infancy with complaints of inspiratory stridor. Stridor is typically intermittent and LGM is suspected when history is significant for noisy breathing increasing during feeds or when lying supine.

Other symptoms may include feeding intolerance, poor weight gain or failure to thrive, recurrent pneumonia, and breathing difficulties and even apnea or cyanosis, though more uncommon. Severity of symptoms mirror severity of LGM.

Differential Diagnosis for Inspiratory Stridor

- Foreign body aspiration
- Unilateral or bilateral vocal fold paralysis
- Subglottic stenosis
- Subglottic hemangioma
- Laryngeal papillomatosis
- Vascular ring
- Tracheomalacia

Evaluation

The gold standard for diagnostic evaluation of noisy breathing in infants is flexible fiberoptic laryngoscopy. Laryngoscopy is not recommended for acute symptoms in the setting of suspicion for croup. Flexible laryngoscopy at bedside is preferred for

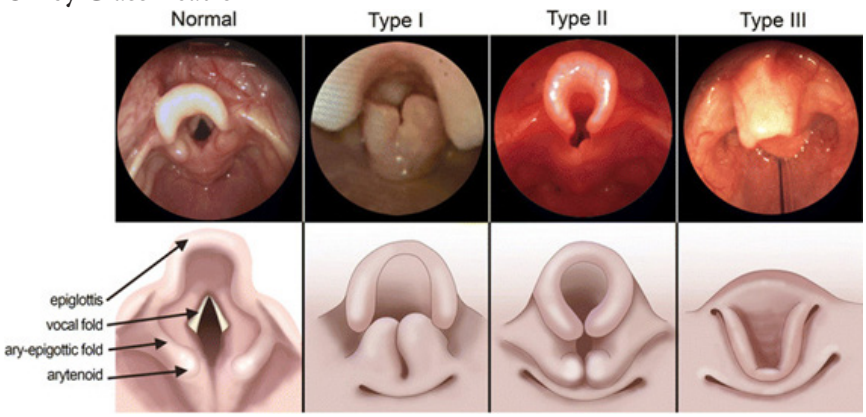
Continued on next page...

diagnosis due to convenience, as well as the ability to directly assess the dynamic collapse of the supraglottic airway during awake respiration.

Direct laryngoscopy and bronchoscopy in the operative room under general anesthesia can give a full evaluation of the aerodigestive tract up to the main bronchi. It can be used as a secondary diagnostic tool in severe cases as well as in cases that require surgical intervention.

There have been different ways to classify laryngomalacia with varying degrees of adoption. The most used classification is Olney's as described below:

Olney Classification



Type I: Prolapse of the mucosa overlying the arytenoid cartilages
Type II: Foreshortened aryepiglottic folds
Type III: Posterior displacement of the epiglottis

Treatment

Mild to moderate symptoms

In most cases of LGM, patients are treated with conservative measures. With mild to moderate stridor where there are no feeding difficulties and failure to thrive is not present, observation is recommended. Monitoring, including weight checks, can be done with the pediatrician. Those infants with mild feeding intolerances can also be treated with conservative measures such as positional (upright) feedings and thickened feedings when appropriate.

There should always be close monitoring of the respiratory status in patients with LGM. Parents should be advised to look for signs of increased work of breathing, retractions, apneas and/or cyanosis, and to seek immediate medical attention if present.

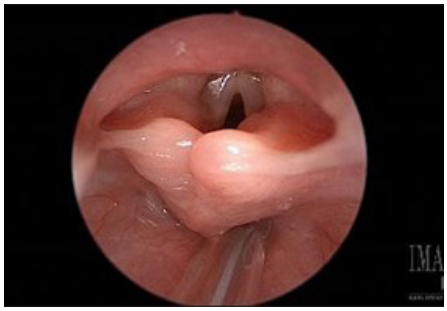
LGM is often associated with gastroesophageal reflux, particularly in severe cases, which can cause edema of the laryngeal structures and worsen the upper airway obstruction. Patients may benefit from treatment with an H2 blocker or proton pump inhibitor. Most infants with mild to moderate LGM will have resolve of symptoms by age 12 to 18 months without the need for surgical intervention.

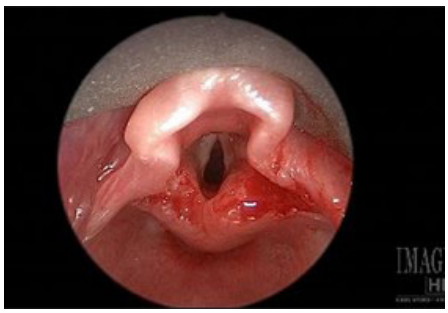
Severe symptoms

Continued on next page...

For patients with severe LGM with accompanying symptoms, such as respiratory distress, failure to thrive or aspiration, surgical intervention is warranted. This occurs in approximately 10-20% of patients with LGM. Initial treatment of choice is a supraglottoplasty which typically consists of dividing shortened aryepiglottic folds and/or removing redundant arytenoid mucosa.

Epiglottopexy can be considered; however, it is not often considered due to concern for aspiration. Supraglottoplasty is generally well tolerated and has been shown to decrease the duration of symptoms of LGM significantly.





Steroid administration during surgery is typically the recommended pharmaceutical therapy and can be used in the postoperative period to decrease airway inflammation. Postoperatively, anti-reflux treatment is becoming more routine especially if there is concomitant reflux disease.

Conclusion

Laryngomalacia is the most common laryngeal pathology in children. Most cases require observation only and will self-resolve prior to age 2. In cases where there is failure to thrive or significant respiratory issues, surgical intervention may be warranted which holds as high as a 95% success rate. Patients with LGM will need monitoring until symptom resolve.

References

Hazkani, I., Schniederjan, M., Siong Tey, C., Botros, A., Alfonso, K. (2024). Neuropathological features of pediatric laryngomalacia. *International Journal of Pediatric Otorhinolaryngology*. 182.

Klinginsmith M, Winters R, Goldman J. (2024, January 10). *Laryngomalacia*. National Library of Medicine: StatPearls. https://www.ncbi.nlm.nih.gov/books/NBK544266/

Reinhard, Antoine & Gorostidi, François & Leishman, Crispin & Monnier, Philippe & Sandu, Kishore. (2017). Laser supraglottoplasty for laryngomalacia; a 14 year experience of a tertiary referral center. *European Archives of Oto-Rhino-Laryngology*. 274. 10.1007/s00405-016-4252-6.

A Deep Dive Into the Science of Cold-Water Plunges: a Balance of Risk and Benefits

By Kelli E. King, Ph.D., Guest Contributor

In the grand scheme of human evolution, exposure to cold has always posed a dire threat to survival. When exposed to cold conditions, blood redistributes from the extremities towards the body's core to surround vital organs with warm blood1. Muscles also begin shivering to generate heat, typically starting in the extremities and moving centrally2.

However, humans are notoriously poor at tolerating the cold and have a relatively early onset to shivering as compared to other mammals in which shivering is considered a last line of defense 3. Despite this, throughout human history we have learned to adapt to the cold, both behaviorally through the utilization of fire and shelter, and physiologically.

One of the best demonstrations of the human's ability to physiologically adapt to cold environments is the Ama divers, who are renowned for collecting underwater pearls off the bay floors off the coasts of Japan and Korea. For centuries, these female freedivers would collect pearls year-round (even in the frigid winter water temperatures) while wearing the same thin clothing worn in the summer. The gradual change in water temperature throughout the year allowed progressive improvements in their physiology mechanisms (e.g., more effective shivering patterns and vasoconstriction in the extremities) to enhance their tolerance to cold water1,4.

More recently, short-duration cold plunges have gained widespread popularity involving whole-body immersions into a tub of icy water for a few minutes, intended to capitalize on health benefits such as faster recovery following exercise, improved mental health, enhanced blood glucose control, and minimized development of neurodegenerative diseases.

While the validity of many health claims associated with cold plunges have yet to be explored, we have recently identified that exposure to cold water can improve our tolerance to the cold at a cellular level5. This is evidenced through changes in a critical cellular protective mechanism called autophagy.

As occurs with any form of cellular stress, exposure to cold temperatures leads to an accumulation of damaged components within the cell that can interfere with normal cell function. In response, autophagy is a degradation mechanism that addresses the buildup of damage in almost every cell (that is, any cell with a nucleus).

To accomplish this, damaged proteins and organelles within the cell are sequestered in a lipid bilayer structure called an autophagosome. The autophagosome then fuses with a lysosome, which contains hydrolases that can shred the contents within to break down the material into its basic building blocks (e.g., amino acids). These cellular products can then be recycled and reused within the cell to facilitate near-normal cell function. In addition to addressing acute cellular stressors, stimulating autophagy has become a focal point in preventative medical research to act prophylactically to many chronic health conditions, including the suppression of cancers6, slowing the progression of Alzheimer's disease7 and inhibiting the development of diabetes8, among a plethora of others.

Continued on next page...

With greater volumes of stress comes greater volumes of damage that can overwhelm the natural recycling system of autophagy. In extreme cold conditions such as exposure to cold water, damage to cells can quickly develop, leading to autophagic dysfunction.

Additionally, autophagy becomes less effective as we age, further perpetuating the notion of cold vulnerability in older adults. These insights motivated our recent investigation into whether autophagic dysfunction during intense cold exposure (60 minutes in 14°C, 57°F water a day) can be reversed with repeated exposures, through acclimation5.

Over a seven-day period, young males repeated the same cold-water plunge, which reversed autophagic dysfunction and enhanced cytoprotective autophagy by the seventh day. While these findings have direct implications in supporting the health benefit claims associated with repeated cold exposures, this was also the first investigation to show that autophagic function can be improved in humans.

Further investigation is under way to determine whether this proof of concept can be applied to older adults and other populations with suppressed autophagic function to improve their overall health.

While cold water immersion has immense potential to benefit human health, the risks of cold are still prevalent and potentially severe. In comparison to cold air, cold water has a much higher rate of heat transfer, meaning it takes less time to overcome our heat conservation and heat production mechanisms.

In some cases, cold water can lower core temperature to less than 35°C (95°F, which marks the threshold for clinical hypothermia) in as little as 30 minutes. At these cold body temperatures, severe cognitive impairments develop including confusion, lowered proprioception, and loss of consciousness9.

Further, hypothermia manifests as multi-organ distress that can lead to incidents of fatal heart arrythmias9. However, cold exposure poses a threat prior to reaching hypothermia. The redistribution of blood to the core adds excess strain on the heart which can cause adverse cardiovascular events, particularly in individuals with poor heart health.

Across the globe, excess deaths observed during the winter are attributed to pronounced cold-induced elevations in blood pressure and excess strain on the heart10. Thus, it's critical that individuals should consult their primary care physician to ensure their heart is healthy enough to withstand the stress of cold plunges.

But how long and how cold is necessary to see benefits from cold plunges? Unfortunately, it is unclear currently as to which cold plunge regimens are effective. What we do know is that any water under 25°C (77°F) is classified as cold11.

Further, maximal shivering responses tend to plateau around 10-15°C (10-59°F) water12. Cold plunges lasting 60 minutes at these frigid temperatures improved autophagy when exposed over a period of seven consecutive days; however, this water temperature and duration may very well be more intense than necessary to see health benefits (and would be dangerous if repeated without monitoring core temperature and other vital signs).

Continued on next page...

While this exciting area of research is still in its infancy, cold-water immersion holds a great deal of potential to support cellular to whole-body health and promote healthy aging.

References

1. Makinen TM. Different types of cold adaptation in humans. *Front Biosci* (Schol Ed). 2010;2(3):1047-1067.
2. Bell DG, Tikuisis P, Jacobs I. Relative intensity of muscular contraction during shivering. *J Appl Physiol* (1985). 1992;72(6):2336-2342.
3. Haman F, Blondin DP. Shivering thermogenesis in humans: Origin, contribution and metabolic requirement. *Temperature (Austin)*. 2017;4(3):217-226.
4. Sugawara J, Tomoto T, Lin HF, Chen CH, Tanaka H. Aortic reservoir function of Japanese female pearl divers. *J Appl Physiol (1985)*. 2018;125(6):1901-1905.
5. King KE, McCormick JJ, Kenny GP. The Effect of 7-Day Cold Water Acclimation on Autophagic and Apoptotic Responses in Young Males. *Adv Biol (Weinh)*. 2025;9(2):e2400111.
6. Yun CW, Lee SH. The Roles of Autophagy in Cancer. *Int J Mol Sci.* 2018;19(11).
7. Zhang XW, Zhu XX, Tang DS, Lu JH. Targeting autophagy in Alzheimer's disease: Animal models and mechanisms. *Zool Res.* 2023;44(6):1132-1145.
8. Gonzalez CD, Lee MS, Marchetti P, et al. The emerging role of autophagy in the pathophysiology of diabetes mellitus. *Autophagy*. 2011;7(1):2-11.
9. Paal P, Pasquier M, Darocha T, et al. Accidental Hypothermia: 2021 Update. *Int J Environ Res Public Health*. 2022;19(1).
10. Collins KJ, Easton JC, Belfield-Smith H, Exton-Smith AN, Pluck RA. Effects of age on body temperature and blood pressure in cold environments. *Clin Sci (Lond)*. 1985;69(4):465-470.
11. Tipton MJ, Collier N, Massey H, Corbett J, Harper M. Cold water immersion: kill or cure? *Exp Physiol*. 2017;102(11):1335-1355.
12. Tipton MJ, Stubbs DA, Elliott DH. Human initial responses to immersion in cold water at three temperatures and after hyperventilation. *J Appl Physiol* (1985). 1991;70(1):317-322.

The Vanguard: Embarking on a New Chapter

By Monika Kamdar, PA-C, MPH Newsletter Committee Chair

The Society of Physician Assistants in Otorhinolaryngology-Head and Neck Surgery was established in 1991.

The term "Vanguard" is derived from the Anglo-French word "avant-garde." Historically, avant-garde referred to soldiers positioned at the front of an army. In contemporary usage, it signifies a group leading the way in new developments or ideas, which aptly represents the spirit of our online newsletter, The Vanguard.

Content contributions to the Vanguard were previously limited to the Board of Directors. It has been essential to expand the circle of writers for recent editions of the newsletter. Going forward, the objective is to further broaden the pool of contributors to include members of SPAO-HNS, the Board of Directors and guest contributors.

Starting with the summer edition, the aim is to modernize the newsletter and to include content from each ENT subspecialty. This will encompass articles on clinical topics, case presentations and video clips. It is also essential to shine a light on the importance of wellness in each edition, covering topics like mentoring, clinician wellness, the importance of diversity and representation and mental health, among others.

A future objective is to offer CME credits for some of the content in The Vanguard. This will necessitate longer articles, clearly defined learning objectives and self-assessment components.

If you are interested in contributing content for The Vanguard or have suggestions for topics, please feel free to contact me at monikakamdar12@gmail.com.

American Academy of Otorhinolaryngology-Head and Neck Surgery

Summary of Clinical Practice Guideline on the Surgical Management of Chronic Rhinosinusitis

Published 5/27/25

1A The surgeon should verify an existing diagnosis of chronic rhinosinusitis to ensure established guidelines to ensure established diagnostic criteria (signs and symptoms) from clinical practice guidelines are met **(Strong Recommendation)**

1B. The surgeon should assess candidacy for sinus surgery based on symptoms, disease characteristics, quality of life, and prior medical or surgical therapy. **(Strong Recommendation)**

2. Assessment Before Prescribing Antibacterial Therapy: The surgeon or their designee should not prescribe antibiotics to an adult with chronic rhinosinusitis if significant or persistent purulent nasal discharge is absent. **(Strong Recommendation)**

3. No One-size-fits-all Regimen: The surgeon should not endorse or require predefined, one-size-fits all regimen or duration of medical therapy (antibiotics, steroids, antihistamines) as a prerequisite to sinus surgery (Recommendation)

4. Patient Education About Surgery and Long-term Management: The surgeon or their designee should counsel patients before sinus surgery to establish realistic expectations, including the potential for chronicity or relapse, and the likelihood of long-term medical management. (Recommendation)

5. When to Offer Sinus Surgery: The surgeon should offer sinus surgery when the anticipated benefits exceed that of nonsurgical management alone. (Recommendation)

6. Imaging in Candidates for Sinus Surgery: The surgeon or their designee should obtain a CT with a fine-cut protocol for surgical planning. (Recommendation)

7. Education About Postoperative Care Expectations: The surgeon or their designee should provide education for anticipated postoperative care, debridement, medical management, activity restrictions, and the potential for recurrent disease or revision surgery. (Recommendation)

8. Outcome Assessment and Long-term Follow-up: The surgeon or their designee should follow up to assess outcomes of sinus surgery for chronic rhinosinusitis, between 3 and 12 months after the procedure, through history (symptom relief, quality of life, complications, adherence to therapy, need for rescue medications, and ongoing care) and nasal endoscopy. (Recommendation)

Advancements in Thyroid Nodule Evaluation and Interventions

By Tiffany Heikel, PA-C, Director at Large

Thyroid nodule evaluation and interventions have changed remarkably over the last several decades. The American Thyroid Association reports that nearly half of the general population develop a thyroid nodule by age 60.1 The majority are found incidentally on unrelated imaging studies.1 Ultrasonography remains the mainstay imaging modality for evaluation of thyroid nodules as nodule composition, echogenicity, shape, margins, and echogenic foci can be assessed.2

Most radiologists utilize the Thyroid Imaging, Reporting, and Data System (TI-RADS) reporting system, which was developed and based on the already established Breast Imaging, Reporting, and Data System reporting system to provide guidance on recommendations for fine aspiration biopsy.2 If biopsy is performed, pathologists typically utilize the Bethesda system for reporting cytopathology. This creates uniform terminology for providing implied risk of malignancy.3

The integration of TI-RADS and the Bethesda systems has standardized the assessment and management of thyroid nodules, improving consistency and clarity in diagnosis and treatment.

Approximately 20-30% of biopsies return indeterminate or as atypia of uncertain significance, which can complicate clinical decision making, as these results do not provide clear malignancy potential.4 Since the 1980s, molecular assays, which use genetic markers, have been emerging as a crucial assessment tool for these unclear pathologies.5

In 2012 and 2013, Afirma and Thyroseq became commercially available for molecular assays.4,5 Initially, Afirma analyzed mRNA expression of a panel of 167 genes, while Thyroseq focused on DNA and RNA gene sequencing for point mutations, deletions, insertions, fusions and abnormal gene mutations.5

These were the forerunners of molecular assays in thyroid malignancy and have been pivotal in addressing the challenges posed by indeterminate biopsy results, offering more insights to aid clinical decision-making, including the avoidance of unnecessary surgery. Both tests are designed as negative predictive value tests, meaning a negative test means there is very low probability of malignancy.4,5

There have been advancements in testing and even more significant changes in interventions for treating benign thyroid nodules for symptomatic patients and those with micropapillary thyroid carcinomas. Surgical intervention involves higher costs, longer recovery periods, cosmetic concerns due to scar formation, and risks associated with general anesthesia. In contrast, thermal and non-thermal ablative techniques, which can be performed in-office, have evolved over the past several decades and have gained patient interest due to their ability to avoid these surgical concerns.

Since the 1990s percutaneous ethanol injection (PEI) has remained a primary treatment option for cystic thyroid nodules.6 Most clinicians utilize 95-98% Ethyl alcohol to cause chemically induced ablation of thyroid tissue following aspiration of cyst fluid.6,7 The alcohol causes cellular dehydration leading to coagulative necrosis and protein denaturation.6,7

PEI has been shown to reduce thyroid nodule volume by 50-98% in cystic nodules, significantly improving symptoms in

Continued on next page...

patients.6 The most common complications include localized pain and discomfort despite local anesthesia, with noted rare occurrences of hoarseness due to recurrent laryngeal nerve irritation or transient vasovagal reactions due to vagal nerve irritation.6,7

Radiofrequency ablation (RFA) is the latest ablative technique approved in the United States, gaining the Food and Drug Administration approval in 2018. 6,7 Initially adapted in Korea in 2002 for thyroid nodules, RFA is also used for treating tumors in the liver, lung, bone, and kidney, as well as for ablating aberrant conduction pathways in the heart. RFA works by passing frictional and conduction heat through an electrode into the tissue. 6,7 The radiofrequency waves (200-1200 kHz) agitate tissue ions, increasing the temperature and causing thermal damage. 6-8 This results in the reabsorption of ablated tissue and a reduction in nodule volume. 6-8

The procedure is performed in the outpatient setting with ultrasound guidance to ensure precise needle placement. Patients receive local anesthesia using Lidocaine to the skin as well as the thyroid gland capsule to maximize patient comfort throughout the procedure.7 Clinicians typically employ the trans-isthmic approach, entering the gland through the thyroid isthmus during ablation.6,7,10 This method minimizes electrode migration during swallowing and prevents leakage of heated fluid from the target nodule. 6,7,10

Additionally, the "moving shot technique" involves continuous repositioning of the needle, creating a necrotic area within the nodule.10 During ablation, clinicians can visualize a hyperechoic change in thyroid tissue, known as "blooming," indicating successful ablation. Once blooming is observed, the clinician adjusts the needle to ablate other areas within the nodule.

Studies have shown that RFA significantly improves compressive symptoms and reduces nodule volume with relatively low adverse effects.9, 11 RFA can achieve volume reduction rates of 70-90% within 6-12 months post-procedure.11

The success of RFA varies with nodule composition, with spongiform and mixed nodules responding better than solid nodules.6 Smaller nodules typically show better volume reduction, while larger nodules may require multiple treatments.7-11 Compared to other minimally invasive procedures, RFA is the most effective for reducing the size of solid, mixed and spongiform benign nodules and alleviating patient symptoms.6 RFA has similar efficacy to PEI for cystic nodules.6 Research on RFA's effectiveness for hyperfunctioning nodules continues to emerge, showing promising results, especially for smaller nodules.10

Compared to surgery for benign thyroid nodules, RFA has fewer overall complications.6,7,9 The most common adverse effect is post-procedural localized pain, which is typically managed with ice and over-the-counter analgesics.7 Rare, but more severe, complications include hematoma, nodule rupture, nerve irritation leading to hoarseness, hypothyroidism and transient vasovagal response.6,7

Due to the minimal and low-risk nature of these complications, patients can return home the same day after a brief observation period and resume work without restrictions the next day.7 As of 2025, RFA has its own CPT code (60660) for billing purposes, and the procedure is often covered by insurance and generally incurs lower out-of-pocket expenses compared to surgery.

Surgery remains the primary intervention for treating primary and recurrent thyroid cancers.7 However, for micropapillary carcinomas and recurrent papillary thyroid carcinomas where surgery is contraindicated or declined, RFA is emerging as a viable treatment option.7

Continued on next page...

According to the international multidisciplinary consensus, candidates for RFA should have unifocal microcarcinoma confined to the thyroid gland, pathology confirming papillary thyroid cancer without aggressive subtypes, and no evidence of metastatic lymphadenopathy, in addition to contraindications to surgery or patient refusal.7

Conclusion

In conclusion, the evaluation and treatment of thyroid nodules have significantly evolved over the past several decades. Ultrasonography remains the primary imaging modality, with the TI-RADS and Bethesda systems providing standardized reporting and guidance for biopsy recommendations.

Despite the challenges posed by indeterminate biopsy results, molecular assays like Afirma and Thyroseq have become crucial tools, offering genetic insights that aid clinical decision-making.

Interventions for thyroid nodules have also advanced, with thermal and non-thermal ablative techniques gaining popularity due to their minimally invasive nature and ability to avoid surgical concerns.

Compared to surgery, RFA offers fewer complications and quicker recovery, making it an attractive option for patients. While surgery remains the primary intervention for thyroid cancers, RFA is emerging as a viable alternative for micropapillary carcinomas and recurrent papillary thyroid carcinoma in cases where surgery is contraindicated or declined.

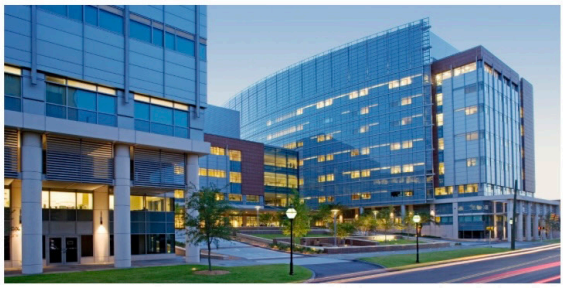
Overall, the advancements in evaluation and treatment options for thyroid nodules have greatly improved patient outcomes and provided more effective and less invasive alternatives to traditional surgical management.

References

1. Thyroid nodules. Patient brochure. *American Thyroid Association*. Accessed 6/12/2025. www.thyroid.org/thyroid-nodules/.
2. Kobaly K, Kim CS, Mandel SJ. Contemporary Management of Thyroid Nodules. *Annu Rev Med*. 2022;73:517-528. doi:10.1146/annurev-med-042220-015032
3. Liu X, Medici M, Kwong N, et al. Bethesda Categorization of Thyroid Nodule Cytology and Prediction of Thyroid Cancer Type and Prognosis. Thyroid. 2016;26(2):256-261. doi:10.1089/thy.2015.0376
4. Kumar N, Gupta R, Gupta S. Molecular testing in diagnosis of indeterminate thyroid cytology: Trends and drivers. *Diagn Cytopathol.* 2020;48(11):1144-1151. doi:10.1002/dc.24522
5. Alzumaili B, Sadow PM. Update on Molecular Diagnostics in Thyroid Pathology: A Review. *Genes (Basel)*. 2023;14(7):1314. Published 2023 Jun 22. doi:10.3390/genes14071314
6. Jasim S, Patel KN, Randolph G, et al. American Association of Clinical Endocrinology Disease State Clinical Review: The Clinical Utility of Minimally Invasive Interventional Procedures in the Management of Benign and Malignant Thyroid Lesions. *Endocr Pract.* 2022;28(4):433-448. doi:10.1016/j.eprac.2022.02.011
7. Orloff LA, Noel JE, Stack BC Jr, et al. Radiofrequency ablation and related ultrasound-guided ablation technologies for treatment of benign and malignant thyroid disease: An international multidisciplinary consensus statement of the American Head and Neck Society Endocrine Surgery Section with the Asia Pacific Society of Thyroid Surgery, Associazione Medici Endocrinologi, British Association of Endocrine and Thyroid Surgeons, European Thyroid Association, Italian Society of Endocrine Surgery Units, Korean Society of Thyroid Radiology, Latin American Thyroid Society, and Thyroid Nodules Therapies Association. *Head Neck*. 2022;44(3):633-660. doi:10.1002/hed.26960
8. Kuo JH, McManus C, Lee JA. Analyzing the adoption of radiofrequency ablation of thyroid nodules using the diffusion of innovations theory: understanding where we are in the United States?. *Ultrasonography.* 2022;41(1):25-33. doi:10.14366/usg.21117

Continued on next page...

9. Qian Y, Li Z, Fan C, Huang Y. Comparison of ultrasound-guided microwave ablation, laser ablation, and radiofrequency ablation for the treatment of elderly patients with benign thyroid nodules: A meta-analysis. *Exp Gerontol.* 2024;191:112425. doi:10.1016/j.exger.2024.112425
10. Papini E, Monpeyssen H, Frasoldati A, Hegedüs L. 2020 European Thyroid Association Clinical Practice Guideline for the Use of Image-Guided Ablation in Benign Thyroid Nodules. *Eur Thyroid J.* 2020;9(4):172-185. doi:10.1159/000508484
11. Issa PP, Omar M, Issa CP, et al. Radiofrequency Ablation of Indeterminate Thyroid Nodules: The First North American Comparative Analysis. *Int J Mol Sci.* 2022;23(19):11493. Published 2022 Sep 29. doi:10.3390/ijms231911493



2025 Charleston Vestibular Conference | College of Medicine | MUSC

Conference Webpage for 2025 Vestibular ConferenceNovember 6-8, 2025 Hyatt Place Hotel 560 King Street Charleston, SC 29403

medicine.musc.edu

Unilateral Vocal Fold Paresis and Immobility: A Clinical Review

By Monika Kamdar, PA-C, MPH

Vocal fold paresis is a reduction in mobility of vocal fold(s), vocal fold immobility is near complete or complete lack of mobility of vocal fold(s) without known nerve resection, nerve sacrifice.

The major functions of the larynx are to regulate airflow, protect the airway during swallowing, and voice production. The larynx is located between C3-C7, initially in a higher position in infancy and gradually descends in adolescence. The larynx adducts during phonation, swallowing and abducts during inspiration.

Intrinsic laryngeal muscles include the lateral cricoarytenoid, thyroarytenoid, interarytenoid which are involved with adduction, cricothyroid lengthens and tenses the larynx, and posterior cricothyroid is the sole muscle involved with abduction. Extrinsic laryngeal muscles stabilize the larynx and adjust the height and include the suprahyoid and infrahyoid muscles.

The larynx is innervated by the vagus nerve (CN X), which is a mixed nerve and has 80+% afferent fibers. The vagus nerve originates in the medulla oblongata, exits the skull via the jugular foramen and then travels inferiorly within the carotid sheath, within the neck it has four branches the pharyngeal nerve, recurrent laryngeal nerve (RLN), superior laryngeal nerve (SLN) and superior cardiac nerve. The right RLN loops under the subclavian artery and the left (RLN) loops around the aortic arch.

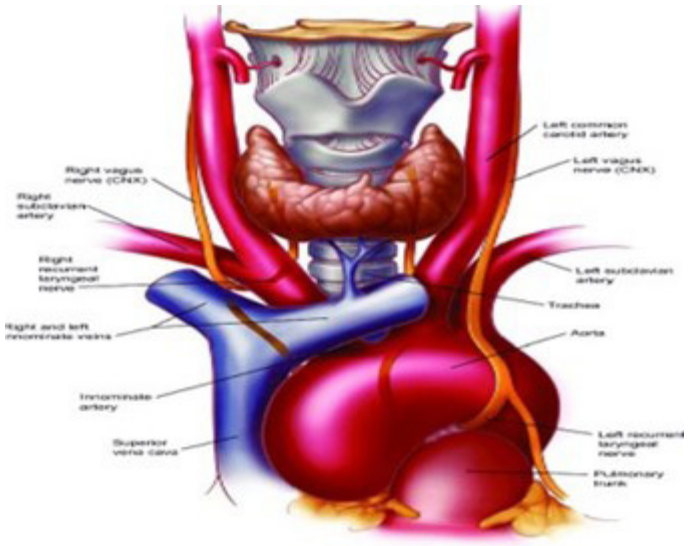


Figure 1 Annals of Cardiothoracic Surgery

Etiology can include idiopathic (viral); iatrogenic most common surgeries include thyroid, ACDF, carotid endarterectomy, cervical esophagectomy, vagal schwannoma resection and intubation complications: prolonged intubation, high cuff pressure or position, large ETT size, neuropraxia secondary to stretching during neck hyperextension, Ortner's syndrome (compression or stretching of left RLN from intrathoracic structure i.e enlarged atrium, aorta, pulmonary artery), laryngeal, esophageal, mediastinal, thyroid tumors and CVA (brainstem, lateral medullary infarct). 2.

Continued on next page...

SLN injury can result in decrease in higher pitch with speaking and singing.

Given the left recurrent laryngeal nerve is longer and has a more tortuous course, left vocal fold paresis/immobility is more prevalent than on the right. Nerve recovery most often occurs within the first six months following nerve injury; however, recovery can still occur within the first year.

Clinical presentation can include dysphonia, vocal fatigue, shortness of breath with prolonged speaking or physical activity, coughing/choking and possible aspiration. Depending on the position of the paretic or immobile vocal fold, symptoms can vary.

Physical exam findings for paresis can include hypomobility, decreased ROM, laryngeal asymmetry and with immobility glottal gap, bowing of the true vocal fold, arytenoid tower level asymmetry and laryngeal asymmetry.

Figure 2 Left vocal fold immobility

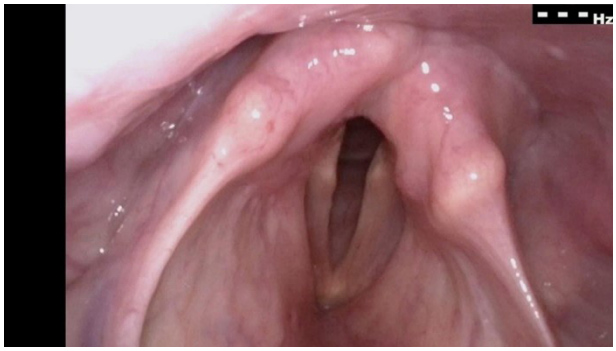


Figure 3 Mild bowing of LTVF, laryngeal asymmetry

CT Neck with contrast should be considered if there is vocal fold immobility to evaluate for possible lesion along the course of the Vagus nerve from skull base to mediastinum. Depending on institution protocols, CT chest and/or MRI Brain may also be recommended.

The vocal folds vibrate hundreds of times per second which is too fast for the eye to perceive. Stroboscopy allows us to visualize the vocal fold vibration or mucosal wave and to assess vocal fold closure. “Microphone(s) are placed next to the larynx and used to estimate the fundamental frequency of the voice. The strobe frequency is synchronized at a rate slightly below the larynx’s fundamental frequency, thus capturing successive phases of the glottic cycle. The image sequences are played in advancing order to produce a “slow-motion” video clip of the vocal folds during phonation. The effect is similar to that of a flipbook, in which a series of images produces the perception of motion. This sampling across successive glottic cycles displays an estimate of the underlying vibratory function.”

Continued on next page...

Vocal fold injections with filler material including carboxymethylcellulose (3 months), hyaluronic acid (6-12 months), calcium hydroxyapatite (18-36 months) can be injected into the true vocal fold(s) to improve vocal fold closure. They have varying lengths of duration and can be performed in the office with local anesthetic or in the OR.

Surgical management for vocal fold immobility or vocal fold paralysis can include medialization laryngoplasty with Gore-Tex, solid implant and fat lipoplasty, which are long-lasting alternatives to vocal fold injections.

References

1. Chao S, Song SA. Videostroboscopy. [Updated 2022 Nov 4]. In: StatPearls [Internet]. Treasure Island (FL): StatPearls Publishing; 2025 Jan-. Available from: https://www.ncbi.nlm.nih.gov/books/NBK567774/
2. Singh JM, Wang R, Winters R, et al. Unilateral Vocal Fold Paralysis. [Updated 2024 Feb 9]. In: StatPearls [Internet]. Treasure Island (FL): StatPearls Publishing; 2025 Jan-. Available from: https://www.ncbi.nlm.nih.gov/books/NBK519060/
3. Furlow, Paul & Mathisen, Douglas. (2018). Surgical anatomy of the trachea. Annals of Cardiothoracic Surgery. 7. 255-260. 10.21037/acs.2018.03.0 Figure 1