

Dysphonia in Hospitalized Patients



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KEYWORDS

• Dysphonia • Hoarseness • Frailty • Dysphagia

KEY POINTS

- *Dysphonia affects up to 79% of ICU patients*, impairs communication, and may signal underlying disease, making it clinically significant in hospitalized patients.
- *Diagnosis requires early, targeted evaluation*. Imaging should not be ordered prior to evaluation and should be guided by findings on laryngoscopy and physical examination.
- *Etiologies are diverse*, including postsurgical nerve injury (eg, thyroidectomy and cervical spine surgery), intubation-related trauma, infections, neurologic disease, malignancy, and functional disorders.
- *Treatment is multidisciplinary*, involving specialists and speech therapists; options include voice therapy, medications, injection laryngoplasty, and surgeries like medialization thyroplasty.
- *Early intervention and prompt ENT and speech therapy evaluation reduce aspiration*, shorten hospital stays, and improve voice and swallowing, especially postextubation and postsurgery.

WHAT IS DYSPHONIA AND WHY DOES IT MATTER?

Dysphonia is any impairment of voice quality, pitch, loudness, or vocal effort that interferes with communication or reduces quality of life.¹ In practice, it manifests as hoarseness or difficulty producing voice. Even mild perceived hoarseness can impact a patient's ability to communicate to health care providers, making effective clinical care more challenging. Dysphonia is clinically significant as it not only signals possible underlying pathology but also impacts a patient's psychosocial well-being.¹ Hospitalized patients with dysphonia may experience frustration, isolation, or anxiety due to difficulty speaking, underscoring the need for prompt recognition and management.

Voice disorders are common. Approximately one-third of people will experience dysphonia at some point in their lives. In the United States, about 7% to 8% of adults

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Abbreviations	
ALS	amyotrophic lateral sclerosis
COVID-19	coronavirus disease 2019
CT	computed tomography
ENT	ear, nose, and throat
FEES	fiberoptic endoscopic evaluation of swallowing
GERD	gastroesophageal reflux disease
HPV	human papilloma virus
ICU	intensive care unit
LPR	laryngopharyngeal reflux
MBS	modified barium swallow
MTD	muscle tension dysphonia
PGS	posterior glottic stenosis
RLN	recurrent laryngeal nerve
SLP	speech language pathologist

report a voice problem annually.² Prevalence is higher in certain groups, specifically the geriatric population. Approximately 25% of patients aged over 65 years complain of hoarseness each year.³ Hospitalized populations often have even higher rates of vocal pathology. During the peak of the coronavirus disease 2019 (COVID-19) pandemic, the prevalence of dysphonia in intensive care unit (ICU) patients ranged from 29% to 79%, reflecting both the illness and effects of intensive care treatments.⁴

In critical illness, postextubation dysphonia is associated with longer ICU and hospital stays. One study of ICU patients found that prolonged dysphonia correlated with lengthier mechanical ventilation duration and a significantly prolonged hospital stay.⁴ Severe or persistent dysphonia may also prolong hospitalization if it is accompanied by an increased risk of aspiration.⁵ On a health system level, voice disorders pose a cost burden: direct health care costs for voice problems in the United States are estimated around US\$5 billion annually. This is comparable to major chronic diseases, highlighting that unmanaged dysphonia can consume substantial health care resources.²

Hospitalists are often the initial touchpoint for patients entering the hospital. The following summary of dysphonia in hospitalized patients is written to familiarize hospitalists and the broader medical community with common terminology related to hoarseness, etiologies, and treatments, and to improve communication among hospitalists, otolaryngologists, and other medical specialties.

HOW DO WE DIAGNOSE DYSPHONIA IN HOSPITALIZED PATIENTS?

The vocal folds, or glottis, serve a key role in protecting the lower airway from aspiration and generating voice. The arytenoid cartilages and intrinsic laryngeal muscles are responsible for vocal fold mobility. During inhalation, the vocal folds abduct. When phonating, the vocal fold edges adduct and vibrate to generate a buzzing sound. The pharynx, oral cavity, and nasal passageways shape the sound. A wide variety of pathologies can impact this system and cause voice disturbances. From impaired arytenoid mobility to vocal fold lesions and other upper airway pathology, hoarseness is a complex symptom with several underlying causes.⁶

A thorough history and physical examination can be exceedingly revealing. Clinicians should characterize the voice change and ask about precipitating events or risk factors. Key history elements include recent intubation, surgical procedures involving the neck, chest, or upper airway, history of neck trauma, and the presence of concomitant swallow symptoms.¹ A review of medical comorbidities can be helpful.

Diabetes mellitus can predispose patients to laryngeal neuropathy or to fungal laryngitis, and frailty or deconditioning are linked to poor respiratory support, impairing voice.^{3,7} Medication history may reveal drugs that affect voice—inhaled steroids can cause thrush and sedatives can reduce muscle tone. It is important to also note if the patient is a professional voice user or has significant tobacco or alcohol use. Any “red flag” features warrant expedited laryngeal evaluation by an otolaryngologist.¹

A general head and neck examination should be performed focusing on any visible masses or surgical changes in the neck, palpating the central neck for masses or crepitus (sign of laryngeal fracture), and assesses neurologic function. Presence of gag reflex, palate elevation, and tongue mobility should be documented. Often, simply listening to the patient’s voice and cough provides clues: a breathy voice suggests vocal fold paralysis or glottic gap; a harsh, strained voice may suggest muscle tension dysphonia (MTD) or spasticity; a wet or gurgly voice may indicate pooled secretions and possible aspiration.¹

Visualization of the larynx is the gold standard for diagnosing dysphonia causes. Bedside flexible nasolaryngoscopy allows for inspection of the larynx in an awake patient. This can be done with minimal risk, often by an otolaryngologist or in some cases by a trained speech language pathologist (SLP). Flexible laryngoscopy shows vocal fold mobility, lesions, or swelling. A structurally normal larynx is shown in **Fig. 1** and examples of laryngeal pathology are illustrated in **Fig. 2A–D**. Current guidelines emphasize that laryngeal visualization should be performed early if dysphonia persists beyond 2 weeks or sooner if serious pathology is suspected—do not simply “wait it out.” Importantly, clinicians should not order imaging (computed tomography [CT] or MRI) for a primary voice complaint until a bedside laryngoscopy has been performed, as many causes of hoarseness are mucosal or functional issues that imaging would not capture.¹ **Box 1** summarizes some common indications for otolaryngology consultation.

The workup of a dysphonic, hospitalized patient often benefits from a team involving otolaryngology, SLP, and other specialists. An ear, nose, and throat (ENT) specialist is crucial for performing laryngoscopy and managing anatomic lesions. SLP plays a key role in evaluating voice and oropharyngeal swallow function. Particularly in ICU or postsurgical settings, SLPs evaluate concomitant dysphagia, which can frequently



Fig. 1. Structurally normal larynx seen with flexible nasolaryngoscopy. The larynx is inverted with the anterior glottis at the bottom of the figure and posterior portion at the top.

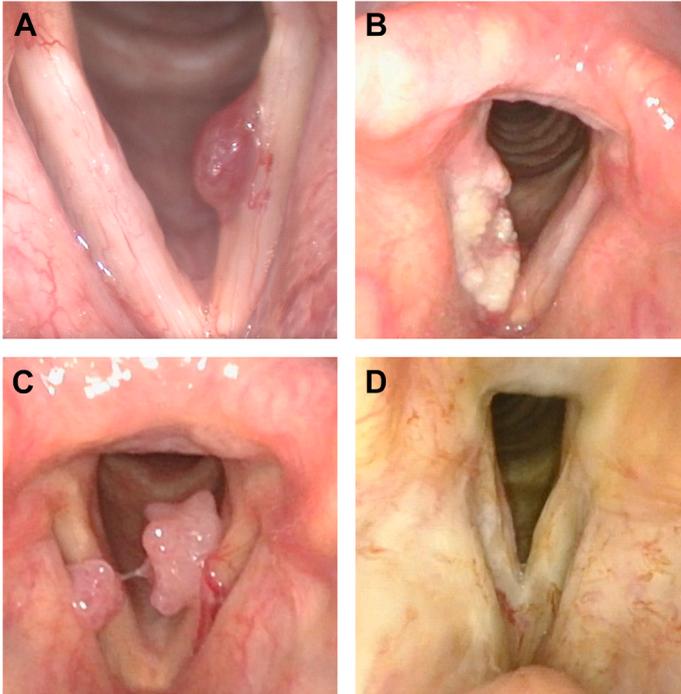


Fig. 2. Laryngeal pathology visualized using flexible nasolaryngoscopy: (A) left vocal fold hemorrhagic polyp, (B) right vocal fold squamous cell carcinoma, (C) bilateral vocal fold HPV-related, benign recurrent respiratory papillomatosis, and (D) bilateral chronic postradiation therapy changes.

occur with dysphonia, particularly after prolonged intubation. In postextubation patients with COVID-19, 66% had dysphonia and 59% had dysphagia, with 37% still dysphonic at discharge. These patients may benefit from a modified barium swallow (MBS) study or fiberoptic endoscopic examination of swallowing (FEES) performed by an SLP.⁵ Diagnosing dysphonia in hospitalized patients is a collaborative effort: the primary team identifies the problem, and ENT/SLP confirm the diagnosis with

Box 1

Common indications to consult otolaryngology in hospitalized patients with dysphonia

Indications for Otolaryngology Consultation

- Hoarseness lasting longer than 2 mo.
- Voice changes accompanied by respiratory or swallow difficulty.
- Postoperative hoarseness after head and neck, esophageal, cervical spine, or cardiothoracic procedure.
- Recent intubation or tracheostomy placement with new onset hoarseness.
- New voice changes in the setting of a cancer diagnosis.
- Hoarseness in patients with neurologic disease (Parkinson's disease, ALS, myasthenia gravis, and stroke).

Abbreviation: ALS, amyotrophic lateral sclerosis.

laryngoscopy and specialized assessments, all while addressing related issues like swallowing and pulmonary status.⁸

CAUSES OF DYSPHONIA IN HOSPITALIZED PATIENTS

Dysphonia in hospitalized individuals can result from a broad range of etiologies. It is useful to think in terms of symptom onset as well as specific categories of causes common in the hospital setting. Below are major causes, grouped by category, with notes on typical time course. This information is summarized in [Table 1](#).

Postsurgical and Procedure-Related Causes

Thyroidectomy is a well-known cause of acute dysphonia due to the risk of damaging the recurrent laryngeal nerve (RLN). Even in high-volume centers, transient vocal fold paralysis can occur in approximately 2% to 5% of thyroidectomies and permanent paralysis in less than 1%.⁹ Patients typically present with a weak, breathy voice immediately after surgery if the RLN was injured. Another injury in thyroid or neck surgery is to the superior laryngeal nerve, which causes loss of high pitch and vocal fatigue (sometimes subtle and detected only in singers). Dysphonia after thyroidectomy is significant enough that current practice often includes preop and postop laryngoscopy to document fold mobility.¹⁰

Anterior cervical spine surgery

Operations on the cervical spine (anterior approach for discectomy/fusion) put the RLN at risk due to retraction near the tracheoesophageal groove. Hoarseness may appear immediately postop. The incidence of vocal fold mobility impairment after anterior cervical spine surgery ranges from approximately 2% to 16%. Mechanisms include nerve stretch or compression by retractors, or less commonly, direct nerve trauma.¹¹

Cardiothoracic and esophageal surgery

Surgery in the mediastinum or around the aortic arch can injure the left RLN because the left RLN loops around the arch. For example, hoarseness after open heart surgery or patent ductus arteriosus ligation is not uncommon, especially in pediatric patients.

Category	Examples	Timeline
Postsurgical/Procedural	Thyroidectomy, cervical spine surgery, and intubation injury	Acute onset
Infectious/Inflammatory	Viral/bacterial laryngitis, fungal infections, LPR, and radiation effects	Acute to subacute
Neurologic/Neuromuscular	Stroke, Parkinson's, ALS, and critical illness neuropathy	Acute, subacute, and chronic
Neoplastic	Laryngeal carcinoma and metastatic lung cancer affecting RLN	Chronic and progressive
Functional	MTD	Acute to chronic

Abbreviations: ALS, amyotrophic lateral sclerosis; LPR, laryngopharyngeal reflux; RLN, recurrent laryngeal nerve.

Esophagectomy or upper lung lobe resections can also affect the RLN. These typically cause acute voice changes postop.

Carotid endarterectomy

This vascular neck surgery can lead to vagus or RLN injury, though less frequently than thyroid surgery. Hoarseness in the immediate postoperative period would raise concern for nerve palsy. Again, voice changes are consistent with impaired vocal fold mobility leading to a weak, breathy voice.¹²

Intubation-related laryngeal injury

Endotracheal intubation, a common procedure in hospitalized patients, is a significant cause of acute dysphonia. The endotracheal tube passes between the vocal folds and can cause trauma from pressure or movement of the endotracheal tube. Short-term intubation often leads to transient vocal fold edema. Hoarseness typically lasts a few days following extubation. More prolonged intubation can cause significant injuries: mucosal ulceration over the vocal processes, granuloma formation, or interarytenoid scar. In severe cases, intubation can cause unilateral vocal fold paralysis due to nerve compression, though this is relatively uncommon. These injuries are more common when oversized endotracheal tubes are used. Studies in ICU patients show *postextubation dysphonia* is very frequent—66% of ICU patients with COVID-19 had dysphonia after extubation.⁵ Even in non-COVID-19 critical illness, persistent dysphonia is documented in 13% to 60% of patients.¹³ The most problematic laryngeal injury related to prolonged intubation is posterior glottic stenosis (PGS)—a scar formed in the larynx that tethers the vocal folds. PGS symptoms include stridor, respiratory distress, and dysphonia that usually present days to weeks after extubation while scar matures.

In summary, most postsurgical and intubation injuries present acutely. Hoarseness will be present immediately or within a day of the procedure. Often hoarseness after intubation improves in days. Nerve injuries or scar can cause chronic dysphonia.

Infectious and Inflammatory Causes

Acute viral or bacterial laryngitis

Upper respiratory infections commonly cause acute dysphonia. Hospitalized patients, especially in winter months or in crowded wards, might develop viral laryngitis. Viruses like rhinovirus, influenza, adenovirus, or respiratory syncytial virus (RSV) infect the laryngeal mucosa and cause swelling of the vocal folds. Hoarseness usually occurs over hours to days, often with concurrent URI symptoms, and is typically self-limited. Patients with viral laryngitis can progress to bacterial laryngitis in the context of bronchitis or pneumonia. Infectious epiglottitis or supraglottitis can cause severe dysphonia, but more importantly, will cause odynophagia and potentially life-threatening airway compromise.¹⁴

Fungal laryngitis

Candida laryngitis can cause hoarseness, particularly in immunocompromised patients or those using inhaled corticosteroids. Hospitalized patients on broad-spectrum antibiotics or steroids, or ICU patients colonized with yeast might develop *Candida* infection of the oropharynx and larynx. They may have white patches on the larynx seen on nasolaryngoscopy with a breathy, weak voice. Treating the patient with antifungals usually improves the voice.

Laryngopharyngeal reflux

Although not an “infection”, reflux of acid and nonacid gastric contents onto the larynx can cause dysphonia. Many hospitalized patients are on nasogastric tube feeds,

medications, or dietary changes that predispose them to reflux. Chronic laryngopharyngeal reflux (LPR) can cause hoarseness. While patients cannot be diagnosed with LPR with a physical examination, those with a history of gastroesophageal reflux disease (GERD), throat burning related to meals, globus sensation, and hoarseness are likely to have LPR. Treating reflux with diet changes or proton-pump inhibitors may improve the voice. Reflux is often a cofactor with other causes, like intubation trauma, in causing granulomas.¹⁵

Radiation laryngitis

Patients receiving radiation to the neck can develop radiation laryngitis—a subacute inflammatory reaction causing edema and stiffening of the vocal folds, resulting in hoarseness. This can start during therapy or weeks after. Over the long term, radiation causes fibrosis of laryngeal tissues that can result in chronic dysphonia, dry throat, and decreased vocal loudness.

Chronic inflammatory conditions

Sarcoidosis, granulomatosis with polyangiitis (formerly Wegener's), or amyloidosis can involve the larynx and cause hoarseness, though these are rare. Relapsing polychondritis can affect laryngeal cartilages, leading to voice changes. Rheumatoid arthritis can cause cricoarytenoid joint inflammation, leading to restricted vocal fold movement and hoarseness. Patients may also note painful speech. These typically cause subacute or chronic dysphonia in patients with known systemic disease. In the hospital, an exacerbation of one of these conditions could present with voice changes.¹⁶

Neurologic and Neuromuscular Causes

Vocal fold paralysis (nonsurgical)

Aside from surgical injury, vocal fold paralysis can occur from neurologic events. An ischemic stroke affecting the nucleus ambiguus or its pathways, including a lateral medullary infarct (Wallenberg syndrome), can cause ipsilateral vocal fold paralysis. These patients will also be profoundly dysphagic. Patients in a stroke unit with hoarseness, especially accompanied by dysphagia, should have a cranial nerve examination and possibly laryngoscopy. Hoarseness from stroke is usually acute onset. Viral neuritis of the RLN can also cause paralysis. In many cases of paralysis that are neither surgical nor tumor-related, the cause is labeled idiopathic, which is often thought to be viral. These cases might present while a patient is hospitalized for something else. Idiopathic RLN paralysis can recover spontaneously in up to 30% to 50% of cases within 6 to 12 months but causes hoarseness in the interim.¹⁷

Parkinson's disease

Patients with Parkinson's disease frequently have a characteristic dysphonia—a low-volume, monotone, breathy, or tremulous voice (hypokinetic dysarthria). If a patient with Parkinson's has worsening of their voice, it could be due to disease progression or suboptimal medication dosing. While this is a chronic neurodegenerative cause, it is highly relevant in hospitals as many patients with Parkinson's disease are older and frequently hospitalized for other issues. Patients may also develop dysphagia and become at-risk of aspiration.¹⁸

Other neurologic disorders

Spasmodic dysphonia is a focal dystonia of the larynx (neurologic but not degenerative) that causes strained or breathy voice breaks. These patients are typically managed outpatient with botulinum toxin injections. Severe essential tremor can

also involve the voice, causing a shaky voice. These are usually chronic conditions. Amyotrophic lateral sclerosis (ALS) or other motor neuron diseases often present with dysarthria and dysphonia. In hospitalized patients, especially older men, with progressive voice change and swallowing difficulty, one must keep ALS or other neurological conditions in the differential if no other cause is found.

Neoplasms of the Larynx or Recurrent Laryngeal Nerve

Primary laryngeal tumors

Laryngeal cancers will typically present with hoarseness. Persistent hoarseness is the cardinal warning sign of glottic squamous cell carcinoma.¹ Hospitalized patients, particularly those with risk factors like heavy smoking or drinking, who have greater than 1 month of hoarseness, must be evaluated for malignancy. Benign tumors, like recurrent respiratory papillomatosis, caused by the human papilloma virus (HPV), can also cause chronic dysphonia and may occasionally be encountered in inpatients who have the condition.

Metastatic or secondary tumors affecting the vagus or recurrent laryngeal nerve

Apical lung tumors or mediastinal tumors commonly cause hoarseness by impinging the RLN. Left-sided vocal fold paralysis in a hospitalized patient with known lung cancer or mediastinal lymphoma, for example, likely indicates RLN involvement. Hoarseness can precede cancer diagnosis in such cases. One review of vocal cord paralysis etiologies found that outside of surgical causes, tumors were responsible for about 24% of cases of unilateral vocal cord paralysis. These include not only lung cancer, but also esophageal cancer, thyroid cancer, and Hodgkin's lymphoma.¹⁹ An enlarged left atrium from mitral stenosis (Ortner's syndrome) is a nonneoplastic analog, essentially a mass effect on the RLN causing vocal fold immobility and hoarseness.

Other cancer-related pathology

Thyroid cancers can invade the RLN or extrinsically compress it. If a hospitalized patient with thyroid nodules becomes hoarse, malignant involvement should be ruled out. Even benign goiter can cause hoarseness via compression.⁹ Though rarer, a jugular foramen tumor (like a glomus jugulare or schwannoma) can cause vagal nerve palsy and hoarseness. A brainstem tumor could affect the nucleus ambiguus. These usually have other cranial nerve signs in addition to hoarseness. In patients previously treated for cancer, new hoarseness could indicate tumor recurrence or could be due to late radiation effects scarring the larynx. Distinguishing these requires laryngoscopy, imaging, and biopsy.¹⁹

Functional Dysphonia

Muscle tension dysphonia

This is a common cause of hoarseness resulting from excessive muscle use around the larynx. It can occur de novo from stress or after an organic injury resolves. The voice in MTD can be strained, high-pitched, or breathy, and patients may complain of throat muscle pain or fatigue when speaking.²⁰ Psychological stress, anxiety, or depression often underlies or exacerbates MTD. Post-ICU patients may develop a hyperfunctional voice as they begin speaking after extubation, a maladaptive compensatory strategy.⁵

TREATMENT OPTIONS FOR DYSPHONIA

Management of dysphonia in hospitalized patients is multifactorial, often requiring a combination of supportive treatment, voice therapy, and sometimes surgical

interventions. Specific treatment plans depend on the underlying cause, severity, and overall health status of the patient. A guiding principle is that treatment should be multidisciplinary, involving otolaryngologists (or subspecialty-trained laryngologists), speech-language pathologists, and other specialists as needed, to address both voice and any co-occurring swallowing or airway issues. Key treatment modalities are listed in **Table 2**.

General Supportive Measures and Cause-Specific Management

First, address any underlying reversible causes. For example, if GERD/LPR is present, elevate the head of bed and start a proton-pump inhibitor or H2 blocker. Ensure the patient has adequate hydration and humidification—a well-hydrated vocal fold vibrates better. Voice rest or voice conservation may be recommended in acute vocal fold hemorrhage or after acute injury—avoidance of irritants, including tobacco smoke or vape pens, as well as vocal abuse. Consider adjustments if medication side effects are suspected (Angiotensin-converting enzyme [ACE] inhibitor causing cough and anticholinergics causing dryness).

Speech-Language Therapy (Voice Therapy)

Voice therapy led by an SLP is a cornerstone for many dysphonia cases and is often the first-line treatment of functional voice disorders and some structural lesions such as vocal fold nodules. The SLP employs exercises and techniques to improve vocal function and efficiency.¹ The timing of therapy is essential; initiating early SLP intervention can improve voice and swallow outcomes. In hospitalized patients, an SLP can start bedside therapy during the hospital stay if the patient is stable. Overall, voice therapy has a high success rate in improving voice-related quality of life in benign dysphonia. Coordination with SLP should be considered standard of care for hospitalized patients with dysphonia.⁵

Treatment Type	Indication	Intervention Examples
Supportive care	Acute laryngitis and general voice strain	Voice rest, hydration, and reflux management
Speech therapy	Functional dysphonia and small benign lesions (nodules)	Vocal exercises and breathing techniques
Swallowing assessment	Dysphonia with dysphagia/ aspiration risk	MBS, FEES, and compensatory swallow therapy
Injection laryngoplasty	Acute vocal fold paralysis and glottic insufficiency	Injection laryngoplasty
Medialization thyroplasty	Chronic vocal fold paralysis and persistent gap	Surgical implant placement and nonselective reinnervation
Microlaryngeal surgery	Vocal fold lesions (polyps, cysts, and papilloma)	Microlaryngeal surgery
Pharmacologic	Inflammation, fungal infections, and spasmodic dysphonia	Corticosteroids, antifungals, and botulinum toxin

Abbreviations: FEES, fiberoptic endoscopic evaluation of swallow; MBS, modified barium swallow.

Swallowing Evaluation and Therapy

Many hospitalized patients with dysphonia, especially postextubation or postsurgery, have concomitant dysphagia or aspiration risk. Management of the voice cannot be isolated from the management of swallowing. Early assessment of swallowing by an SLP is critical for patients with dysphonia. This includes a bedside swallowing evaluation and, if indicated, an instrumental assessment: MBS study (videofluoroscopic swallow study) or a fiberoptic endoscopic evaluation of swallowing (FEES). These examinations visualize oropharyngeal swallow function and assess airway protection. Swallowing examinations also inform treatment goals with SLP. If the MBS or FEES reveal severe dysphagia, with symptoms such as silent aspiration, the team may recommend refraining from an oral diet. These patients often require nasogastric or gastrostomy tube placement. Swallow management is a critical parallel track in treatment to ensure the patient's nutrition and pulmonary status are safe while the voice issues are addressed.²¹

Pharmacologic Treatments

There is no "pill" for dysphonia in general, but certain medications are used for specific causes. Steroids can be helpful for patients with acute laryngitis, autoimmune conditions, or postextubation hoarseness accompanied by laryngeal edema. The 2018 Clinical Practice Guidelines published by the American Academy of Otolaryngology – Head and Neck Surgery explicitly make a strong recommendation against routine antibiotic use in dysphonia.¹ Antifungal lozenges or systemic fluconazole is prescribed for candida laryngitis. For laryngeal sensory neuropathy causing chronic throat clearing and hoarseness, neuropathic medications like gabapentin or amitriptyline have been shown to improve symptoms.²² Botulinum toxin injections, often performed in the outpatient setting, are the treatment of choice for spasmodic dysphonia.¹

Procedural Interventions for Glottic Insufficiency

When dysphonia is due to unilateral vocal fold immobility or vocal fold atrophy, the vocal folds are unable to meet in the midline. The result is a glottic gap, or incomplete glottic closure, making the voice weak and breathy. Augmentation and reinnervation procedures can significantly improve voice and protect the airway. Augmentation procedures are often grouped into 2 categories: injection laryngoplasty and medialization laryngoplasty.

Injection laryngoplasty is a minimally invasive procedure where a filler material is injected into the paralyzed or atrophied vocal fold to increase volume, permitting complete glottic closure. This is frequently an in-office or bedside procedure but sometimes needs to be done under general anesthesia. In acute inpatient care, injection laryngoplasty is extremely useful for vocal fold paralysis or vocal fold atrophy. Patients benefit from immediate improvement in voice, cough, and swallow safety. Current practices favor early injection within days to weeks of injury if the glottic insufficiency is significant. Studies have shown that early injection improves voice outcomes and patient satisfaction.²³ Early intervention may also prevent complications like pneumonia; literature suggests prompt injection in acute vocal fold paralysis can reduce pulmonary infections and even shorten hospital length of stay in these patients.²⁴ Typically, a temporary material (hyaluronic acid gel or carboxymethylcellulose) is used while awaiting recovery of the nerve. In the case of permanent paralysis, the injection can serve as a bridge until a more permanent solution. Given the low risk, injection laryngoplasty has become a go-to treatment of acute hoarseness due to vocal fold immobility and atrophy. Images captured before and after injection laryngoplasty are shown in **Fig. 3A–D**, with complete glottic closure achieved in panel D.

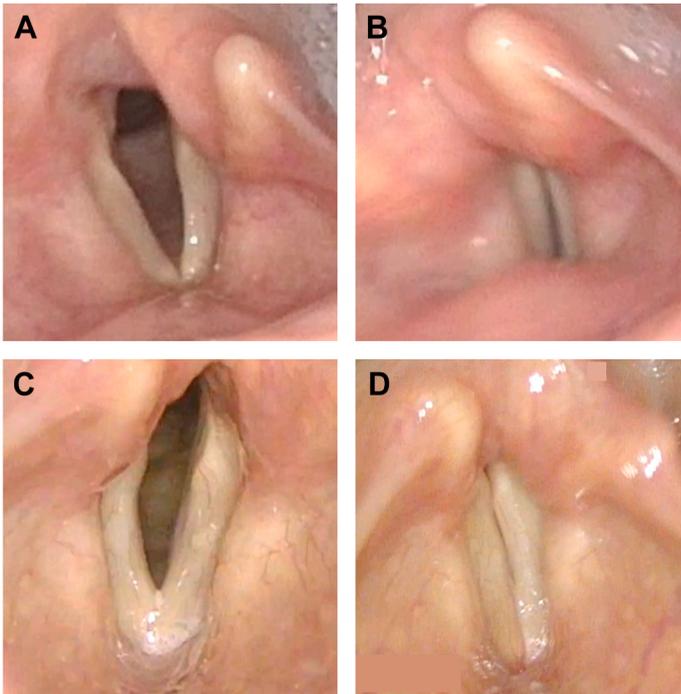


Fig. 3. Before and after injection laryngoplasty. During abduction, the left vocal fold appears bowed (A), and during phonation, there is a persistent gap between the vocal folds (B). After injection, the left vocal fold has increased volume (C) and the vocal fold are able to complete appose (D).

Medialization thyroplasty and nonselective reinnervation

This is a surgical intervention, usually for longer term management of a permanent unilateral vocal fold paralysis or vocal fold atrophy. A synthetic material or silastic wedge is placed through a window in the thyroid cartilage to push the affected vocal fold medially. The implant functions like an “internal splint” that permanently moves the vocal fold toward the midline for better closure. Thyroplasty is typically done under local anesthesia in the operating room so the patient can phonate during the procedure for fine adjustments.²⁵ Compared to injection, thyroplasty is permanent and often yields robust voice improvement. Another surgical option in select cases is nonselective reinnervation (ansa cervicalis to RLN), which is usually done in younger patients and has a several-month latency for results, probably not addressed during an acute hospital stay, but a consideration for long term.

Microlaryngeal surgery is performed for dysphonia caused by discrete lesions like polyps, cysts, or papillomas. If a vocal fold lesion is suspected of being malignant in a hospitalized patient, direct laryngoscopy with biopsy is both diagnostic and therapeutic; for benign lesions, excision can cure the hoarseness. Removal of lesions generally improves voice once healing occurs, though in the short term, there may be swelling. After surgical removal of lesions, voice therapy is often used to optimize the voice and prevent maladaptive use or lesion recurrence.

The best outcomes in managing dysphonia, especially for complex hospitalized patients, come from coordinated care pathways involving multiple specialties. Many ICUs have implemented automatic SLP consults for patients extubated after more

than 48 hours. Early identification allows for quicker voice and swallow intervention.⁴ Early SLP referral has been shown to reduce pneumonia in postextubation patients and ensure that nearly all high-risk patients receive timely management of dysphagia.²¹ Similarly, some institutions ensure every thyroid or anterior spine surgery patient has a laryngeal examination postop to document vocal fold mobility. Early injection laryngoplasty for patients with acute paralysis has been associated with better swallowing outcomes and reduces the risk of rehospitalization for aspiration.²⁴ While there is substantial variability in practice, developing standardized pathways is an opportunity for quality improvement.

The management of dysphonia in hospitalized patients is proactive and collaborative. Multidisciplinary approach improves patient outcomes and decreases consumption of hospital resources. Interventions range from therapy and medical management to surgery, depending on the specific pathology. Guided by current literature and published guidelines, early identification and intervention for patients with dysphonia strongly correlate with improved outcomes.

CLINICS CARE POINTS

- *Always perform bedside laryngoscopy before imaging for voice complaints.* Many dysphonia causes are mucosal or functional and will not be detected on CT or MRI; unnecessary imaging delays diagnosis and wastes resources.
- *Do not delay treatment of postsurgical vocal fold paralysis.* Early injection laryngoplasty within days to weeks of injury can improve voice, reduce aspiration, and shorten hospital stays.
- *Avoid empiric antibiotics for hoarseness unless there are signs of bacterial infection.* Clinical guidelines strongly advise against routine antibiotic use for dysphonia without evidence of bacterial etiology.
- *Assess for coexisting dysphagia in all dysphonic inpatients, especially postextubation.* Dysphonia and aspiration risk often coexist; a missed swallowing disorder can lead to pneumonia and readmission.

DECLARATION OF ARTIFICIAL INTELLIGENCE AND ARTIFICIAL INTELLIGENCE-ASSISTED TECHNOLOGIES IN THE WRITING PROCESS

During the preparation of this article, the author used ChatGPT (OpenAI) in order to assist in developing the outline, drafting portions of the article, and generating accompanying tables. After using this tool, the authors reviewed and edited the content as needed and take full responsibility for the content of the publication.

DISCLOSURE

The author has nothing to disclose.

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