



MASSACHUSETTS

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Medical Policy

Lung Volume Reduction Surgery for Severe Emphysema

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Policy Number: 364

BCBSA Reference Number: 7.01.71 (For Plan internal use only)

Related Policies

- Endobronchial Valves, #[313](#)
- Outpatient Pulmonary Rehabilitation, #[136](#)

Policy

Commercial Members: Managed Care (HMO and POS), PPO, and Indemnity

Lung volume reduction surgery as a treatment for emphysema may be **MEDICALLY NECESSARY** in individuals with emphysema who meet **ALL** of the following criteria*:

- Predominantly upper lobe emphysema with hyperinflation and heterogeneity (i.e., target areas for removal), **AND**
- Forced expiratory volume in one second (FEV-1):
 - For individuals who are younger than 70 years of age, the FEV-1 must be no more than 45% of the predicted value, **OR**
 - For individuals who are 70 years of age or older, the FEV-1 must be no more than 45% of the predicted value and greater than or equal to 15% of the predicted value.
- Marked restriction in activities of daily living despite maximal medical therapy, **AND**
- Age younger than 75 years, **AND**
- Acceptable nutrition status: i.e., 70–130% of ideal body weight, **AND**
- Ability to participate in a vigorous pulmonary rehabilitation program, **AND**
- No coexisting major medical problems that would significantly increase operative risk, **AND**
- Willingness to undertake risk of morbidity and mortality associated with LVRS, **AND**
- Abstinence from cigarette smoking for at least 4 months.

Lung volume reduction surgery is **INVESTIGATIONAL** in all other individuals.

Prior Authorization Information

Inpatient

- For services described in this policy, precertification/preauthorization **IS REQUIRED** for all products if the procedure is performed **inpatient**.

Outpatient

- For services described in this policy, see below for products where prior authorization **might be required** if the procedure is performed **outpatient**.

	Outpatient
Commercial Managed Care (HMO and POS)	This procedure is performed in the inpatient setting.
Commercial PPO and Indemnity	This procedure is performed in the inpatient setting.

CPT Codes / HCPCS Codes / ICD Codes

Inclusion or exclusion of a code does not constitute or imply member coverage or provider reimbursement. Please refer to the member’s contract benefits in effect at the time of service to determine coverage or non-coverage as it applies to an individual member.

Providers should report all services using the most up-to-date industry-standard procedure, revenue, and diagnosis codes, including modifiers where applicable.

CPT Codes

CPT codes:	Code Description
32491	Removal of lung, other than pneumonectomy; with resection-plication of emphysematous lung(s) (bullous or non-bullous) for lung volume reduction, sternal split or transthoracic approach, includes any pleural procedure, when performed

HCPCS Codes

HCPCS codes:	Code Description
G0302	Preoperative pulmonary surgery services for preparation for LVRS, complete course of services to include a minimum of 16 days of services
G0303	Preoperative pulmonary services for preparation for LVRS, 10 to 15 days of services
G0304	Preoperative pulmonary surgery services for preparation for LVRS, 1 to 9 days
G0305	Post-discharge pulmonary surgery services after LVRS, minimum of 6 days of services

ICD-10 Procedure Codes

ICD-10-PCS procedure codes:	Code Description
0BBC0ZZ	Excision of Right Upper Lung Lobe, Open Approach
0BBC4ZZ	Excision of Right Upper Lung Lobe, Percutaneous Endoscopic Approach
0BBD0ZZ	Excision of Right Middle Lung Lobe, Open Approach
0BBD4ZZ	Excision of Right Middle Lung Lobe, Percutaneous Endoscopic Approach
0BBF0ZZ	Excision of Right Lower Lung Lobe, Open Approach
0BBF4ZZ	Excision of Right Lower Lung Lobe, Percutaneous Endoscopic Approach
0BBG0ZZ	Excision of Left Upper Lung Lobe, Open Approach
0BBG4ZZ	Excision of Left Upper Lung Lobe, Percutaneous Endoscopic Approach
0BBH0ZZ	Excision of Lung Lingula, Open Approach
0BBH4ZZ	Excision of Lung Lingula, Percutaneous Endoscopic Approach
0BBJ0ZZ	Excision of Left Lower Lung Lobe, Open Approach
0BBJ4ZZ	Excision of Left Lower Lung Lobe, Percutaneous Endoscopic Approach
0BBK0ZZ	Excision of Right Lung, Open Approach

0BBK4ZZ	Excision of Right Lung, Percutaneous Endoscopic Approach
0BBL0ZZ	Excision of Left Lung, Open Approach
0BBL4ZZ	Excision of Left Lung, Percutaneous Endoscopic Approach
0BBM0ZZ	Excision of Bilateral Lungs, Open Approach
0BBM4ZZ	Excision of Bilateral Lungs, Percutaneous Endoscopic Approach

Description

Emphysema

Emphysema is an anatomically defined condition characterized by the destruction and enlargement of lung alveoli. It is one of the conditions considered as a chronic obstructive pulmonary disease along with chronic bronchitis and small airway disease. The pathogenesis of emphysema is primarily related to cigarette smoking leading to inflammation and recruitment of immune cells to the terminal air spaces of the lung. The resultant extracellular matrix proteolysis damages the lung. Destruction of the gas exchanging air spaces and ineffective repair of the extracellular matrix results in airspace enlargement. Emphysema can be characterized into distinct pathologic subtypes. Centriacinar emphysema is most frequently associated with cigarette smoking, is usually most prominent in the upper lobes and superior segments of the lower lobes and is focal. Panacinar emphysema is characterized by abnormally large air spaces evenly distributed across acini in the lower lobes. It is associated with α_1 -antitrypsin deficiency. Key pulmonary function parameters are the volume of the first forced expiratory volume in 1 second (FEV₁) and the total volume of air exhaled during the spirometry (forced vital capacity [FVC]). Airflow obstruction related to chronic obstructive pulmonary disease is characterized by the reduced ratio of FEV₁/FVC, and reduction in FEV₁ correlates with long-term mortality risk.¹

The 2022 Global Initiative for Chronic Obstructive Lung Disease (GOLD) report states that chronic obstructive pulmonary disease is 1 of the top 3 causes of death globally and 90% of these deaths occur in low- and middle-income countries.² Evidence exists that the prevalence of the disease is appreciably higher in smokers and ex-smokers compared to non-smokers, in those ≥ 40 years of age compared to those < 40 , and in men compared to women. Although in developed countries with less smoking, the prevalence is approximately equal between men and women. The COPD Genetic Epidemiology (COPDGene®) study aimed to determine the influence of race, gender, and GOLD stage on prevalence of prior COPD diagnosis at enrollment.³ Results revealed that African-Americans had increased odds of not having a prior COPD diagnosis at all GOLD stages of airflow obstruction versus non-Hispanic whites ($p < .0001$). Women had higher odds of having a prior COPD diagnosis at all GOLD stages versus men ($p < .0001$).

Lung Volume Reduction Surgery

Lung volume reduction is a surgical treatment for individuals with severe emphysema. The procedure involves the excision of peripheral emphysematous lung tissue, generally from both upper lobes.

The mechanism of clinical improvement for individuals undergoing lung reduction surgery has not been firmly established. However, it is believed that mechanical factors such as elastic recoil and diaphragmatic function are improved by reducing the volume of the hyperinflated diseased lung. In addition to changes in the chest wall and respiratory mechanics, the surgery is purported to correct ventilation-perfusion mismatch and improve right ventricular filling.

Complications from the surgical procedure include death, reintubation, arrhythmias, mechanical ventilation for more than 2 days, pneumonia, wound infection, and persistent air leak.

Research on lung volume reduction surgery has focused on defining the subgroup of individuals most likely to benefit from the procedure. Potential benefits of the procedure (eg, improvement in functional capacity and quality of life) must be weighed against the potential risks of the procedure (eg, the risk of postoperative mortality).

Summary

Lung volume reduction surgery (LVRS) is proposed as a treatment option for individuals with severe emphysema who have failed optimal medical management. The procedure involves the excision of diseased lung tissue to reduce symptoms and improve quality of life.

Summary of Evidence – Intro

For individuals who have upper-lobe emphysema who receive LVRS, the evidence includes randomized controlled trials (RCTs) and systematic reviews of the trials. Relevant outcomes are overall survival (OS), symptoms, functional outcomes, quality of life, and treatment-related mortality. Findings from the National Emphysema Treatment Trial (NETT), a multicenter RCT, have suggested that LVRS is effective at reducing mortality and improving quality of life in select individuals with severe emphysema. In a subgroup analysis, LVRS offered a survival advantage only to individuals not considered at high-risk who had predominately upper-lobe emphysema and low initial exercise capacity. Individuals with upper-lobe emphysema, regardless of initial exercise capacity, experienced significant improvement in exercise capacity and quality of life after LVRS. Other, smaller RCTs have generally had similar findings, though they have tended to be underpowered for some outcomes and did not stratify by the distribution of emphysema. The evidence is sufficient to determine that the technology results in an improvement in the net health outcome.

For individuals who have non-upper-lobe emphysema who receive LVRS, the evidence includes a subgroup analysis of a large RCT. Relevant outcomes are OS, symptoms, functional outcomes, quality of life, and treatment-related mortality. In the subgroup analysis of the NETT, LVRS offered a survival advantage only to individuals who had predominately upper-lobe emphysema. For the subgroup with predominately non-upper-lobe emphysema, the NETT did not find significant mortality advantages or symptom improvement with LVRS. Although the NETT had positive findings for the study population as a whole, given the surgical risks, additional data are needed to confirm the net health outcome in individuals with non-upper-lobe emphysema. The evidence is insufficient to determine that the technology results in an improvement in the net health outcome.

Policy History

Date	Action
8/2022	Annual policy review. References added. Minor editorial refinements to policy statements; intent unchanged.
1/2021	Medicare information removed. See MP #132 Medicare Advantage Management for local coverage determination and national coverage determination reference.
8/2020	Annual policy review. Description, summary, and references updated. Policy statements unchanged.
8/2019	Annual policy review. Description, summary, and references updated. Policy statements unchanged.
7/2018	Annual policy review. Description, summary, and references updated. Policy statements unchanged.
7/2017	Annual policy review. New references added.
7/2016	Annual policy review. New references added.
8/2015	Annual policy review. New references added.
9/2014	Annual policy review. New references added.
6/2014	Updated Coding section with ICD10 procedure and diagnosis codes, effective 10/2015.
2/2014	Coding information clarified.
8/2013	Annual policy review. New references added.
11/2011-4/2012	Medical policy ICD 10 remediation: Formatting, editing and coding updates. No changes to policy statements.
4/2011	Reviewed - Medical Policy Group - Cardiology and Pulmonology. No changes to policy statements.
11/2010	Annual policy review. Changes to policy statements.

3/2010	Reviewed - Medical Policy Group - Allergy and ENT/Otolaryngology. No changes to policy statements.
3/2009	Reviewed - Medical Policy Group - Allergy and ENT/Otolaryngology. No changes to policy statements.
3/2008	Reviewed - Medical Policy Group - Allergy and ENT/Otolaryngology. No changes to policy statements.
3/2007	Reviewed - Medical Policy Group - Allergy and ENT/Otolaryngology. No changes to policy statements.

Information Pertaining to All Blue Cross Blue Shield Medical Policies

Click on any of the following terms to access the relevant information:

[Medical Policy Terms of Use](#)

[Managed Care Guidelines](#)

[Indemnity/PPO Guidelines](#)

[Clinical Exception Process](#)

[Medical Technology Assessment Guidelines](#)

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