CHAPTER 4
SECTION 8.2

LUNG VOLUME REDUCTION SURGERY (LVRS)

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I. CPT[1] PROCEDURE CODE

32491

II. HCPCS PROCEDURE CODES

G0302, G0303, G0304, G0305

III. DESCRIPTION

Lung volume reduction surgery (LVRS), also referred to as reduction pneumoplasty, lung shaving or lung contouring, is a palliative surgical procedure for late-stage emphysema. Surgeons remove a large volume (approximately 20% to 30%) of tissue from one or both lungs simultaneously or sequentially. This reduces the volume of the chest cavity occupied by the lungs, enabling the patient to ventilate the remaining lung tissue more effectively. The surgery can be performed either by video-assisted thorascopic surgery (VATS) or by open incision (median sternotomy), and the lung volume can be reduced, using a stapler.

IV. POLICY

A. LVRS is covered for patients with severe upper lobe predominant emphysema or severe non-upper lobe emphysema with low exercise capacity. Patients must meet the following selection criteria:

1. History and physical exam consistent with emphysema; and

2. Patient has not smoked for 4 or more months; and

3. For patients with cardiac ejection fraction less then 45%, there is no history of congestive heart failure or myocardial infarction within six months of consideration for surgery; and

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4. The patient has all of the following on pre-operative workup:

a. Forced expiratory volume (FEV_1) (maximum of pre- and post-bronchodilator values) less than or equal to 45% of predicted and, if age 70 or older, FEV_1 15% of predicted or more; and

b. Post-bronchodilator total lung capacity (TLC) greater than or equal to 100% of predicted value and residual volume (RV) greater than or equal to 150% or predicted value; and

c. Resting partial pressure of oxygen (PaO_2) 44 mm Hg or greater; and

d. Resting partial pressure of carbon dioxide ($PaCO_2$) less than or equal to 60 mm Hg on room air; and

e. CT scan evidence of bilateral emphysema; and

f. Plasma cotinine less than or equal to 13.7 ng/ml (if not using nicotine products) or carboxyhemoglobin less than or equal to 2.5% (if using nicotine products); and

g. Six-minute walk test greater than 140 meters.

B. LVRS is limited to bilateral excision of a damaged lung with stapling performed via median sternotomy or video-assisted thorascopic surgery.

C. LVRS is not covered if the patient has either of the following contraindication:

1. Post-bronchodilator FEV_1 is 20% or less than its predicted value and patient has either:

a. A homogenous distribution of emphysema on CT scan; or

b. A carbon monoxide diffusion capacity (DL_{CO}) is 20% or less than its predicted value.

2. Patients with predominantly non-upper lobe emphysema and a high maximal workload.

a. A high maximal workload is defined as a maximal workload (on cycle ergometry with an increment of 5 or 10 W per minute after three minutes of pedaling with the ergometer set at 0 W and the person breathing 30% oxygen) above the sex-specific 40th percentile (25 W for women, 40 W for men).

b. Predominantly non-upper lobe predominance of emphysema is defined to exclude disease on CT that is judged by the radiologist as affecting primarily the upper lobes of the lung, and to include disease that is judged to be predominantly lower lobe, diffuse, or predominantly affecting the superior segments of the lower lobes.

D. Patients should have none of the following exclusion criteria:

1. Previous LVRS.

2. Pleural or interstitial disease which precludes surgery.

3. Giant bulla (greater than 1/3 the volume of the lung in which the bulla is located).

4. Clinically significant bronchiectasis.

5. Pulmonary nodule requiring surgery.

6. Previous lobectomy.

7. Uncontrolled hypertension (systolic greater than 200 mm Hg or diastolic greater than 100 mm Hg).

8. Oxygen requirement greater than 6 liters per minute during resting to keep oxygen saturation greater than or equal to 90%.

9. History of recurrent infections with clinically significant production of sputum.

10. Unplanned weight loss greater than 10% within 3 months prior to consideration for surgery.

11. Pulmonary hypertension, defined as mean pulmonary artery pressure of 33 mm Hg or greater on right-heart catheterization or peak systolic pulmonary artery pressure of 44 mm Hg or greater.

12. Resting bradycardia (less than 50 beats per minute), frequent multifocal premature ventricular contractions (PVCs) of complex ventricular arrhythmia or sustained supraventricular tachycardia (SVT).

13. Evidence of systemic disease or neoplasia that is expected to compromise survival.

E. LVRS must be preceded and followed by a program of diagnostic and therapeutic services consistent with those provided in the National Emphysema Treatment Trial (NETT) and designed to maximize the patient's potential to successfully undergo and recover from surgery. The program must include a 6 to 10 week series of at least 16, and no more than 20 preoperative sessions, each lasting a minimum of two hours. It must also include at least 6 and no more than 10, postoperative sessions, each lasting a minimum of two hours, within 8 to 9 weeks of the LVRS.

F. LVRS must be performed at facilities that were identified by the National Heart, Lung and Blood Institute (NHLBI) to meet the threshold for participation in the NETT or at sites that have been approved by Medicare or TRICARE as lung transplant facilities.

NOTE: CMS is developing accreditation standards for facilities to perform LVRS. When LVRS facility accreditation standards are completed and implemented, LVRS will only be covered at accredited facilities.

V. EXCLUSION

Thorascopic laser bullectomy.

VI. EFFECTIVE DATE March 22, 2004.

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