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Subject: Total Body Plethysmography

THIS MEDICAL COVERAGE GUIDELINE IS NOT AN AUTHORIZATION, CERTIFICATION, EXPLANATION OF BENEFITS, OR A GUARANTEE OF PAYMENT, NOR DOES IT SUBSTITUTE FOR OR CONSTITUTE MEDICAL ADVICE. ALL MEDICAL DECISIONS ARE SOLELY THE RESPONSIBILITY OF THE PATIENT AND PHYSICIAN. BENEFITS ARE DETERMINED BY THE GROUP CONTRACT, MEMBER BENEFIT BOOKLET, AND/OR INDIVIDUAL SUBSCRIBER CERTIFICATE IN EFFECT AT THE TIME SERVICES WERE RENDERED. THIS MEDICAL COVERAGE GUIDELINE APPLIES TO ALL LINES OF BUSINESS UNLESS OTHERWISE NOTED IN THE PROGRAM EXCEPTIONS SECTION.

DESCRIPTION:

Total body plethysmography, also referred to as whole-body plethysmography, is a pulmonary function study for determining thoracic gas volume (VTG) and airways resistance (Raw).

During body plethysmography, the individual is enclosed in a chamber equipped to measure pressure, flow, or volume changes. The most common measurements made using body plethysmography are VTG and Raw. Airways conductance (Gaw) is also commonly calculated as the reciprocal of Raw. Specific airways conductance (i.e., conductance/unit of lung volume) is routinely reported as sGaw. Other tests that can be administered in body plethysmography include spirometry, bronchial challenge, diffusing capacity (DLCO), single-breath nitrogen (N2), multiple-breath N2 washout, pulmonary compliance, and occlusion pressure. These are not discussed as part of this guideline.

Body plethysmography can be performed in pulmonary function laboratories, cardiopulmonary laboratories, or clinics and physician's offices.

Summary and Analysis of Evidence: The “gold standard” for the measurement of lung volume and airway resistance (Raw) in all subjects is the whole-body plethysmograph, and has been for close to 50 years. This method is based on Boyles law, which states that in an enclosed gaseous system under isothermal conditions (i.e., with negligible temperature changes) the multiplication of pressure by the volume remains constant. In practical terms, by measuring the ratio of mouth pressure to chamber pressure swings during a brief occlusion of the airway opening, it is possible to measure true resting lung volume. The added benefit of plethysmography is that Raw can also be measured during tidal breathing. Thus, by using a simple and short procedure, with fairly simple equipment and little subject coaching and cooperation, very important information can be attained (Ephraim Bar-Yishay, 2009).

Whole-body plethysmography is considered the "gold standard" for intrathoracic gas volume measurements and the measurement of specific airway resistance. These parameters are essential to assess a restrictive impairment, overinflation of the lungs and airflow obstruction (Criée, 2010).

Body plethysmography is a well-established technique of lung function determination. Body plethysmography provides measures of the lung that reflect a multitude of functional and structural aspects. These measures have been demonstrated to confer clinical information that is independent from other functional information, especially in obstructive airway diseases. Body plethysmography allows to assess functional residual capacity (FRC(pleth)) and specific airway resistance (sRaw) as primary measures. In combination with deep expirations and inspirations, total lung capacity (TLC) and residual volume (RV) can be determined. Airway resistance (Raw) is calculated as the ratio of sRaw to FRC(pleth). Raw is a measure of airway obstruction and indicates the alveolar pressure needed to establish a flow rate of 1 L s(-1). In contrast, sRaw can be interpreted as the work to be performed by volume displacement to establish this flow rate. These measures represent different functional aspects and should both be considered. The measurement relies on the fact that generation of airflow needs generation of pressure. Pressure generation means that a mass of air is compressed or decompressed relative to its equilibrium volume. This difference is called "shift volume". As the body box is sealed and has rigid walls, its free volume experiences the same, mirror image-like shift volume as the lung. This shift volume can be measured via the variation of box pressure. The relationship between shift volume and alveolar pressure is assessed in a shutter maneuver, by identifying mouth and alveolar pressure under zero-flow conditions. These variables are combined to obtain FRC(pleth), sRaw and Raw (Criée, 2011).

POSITION STATEMENT:

Total body plethysmography **meets the definition of medical necessity** when performed for determining thoracic gas volume (TGV or VTG), airway resistance (Raw), and Specific airways conductance (sGaw) for any of the following indications:

- Diagnosis of restrictive lung disease;
- Measurement of lung volumes to distinguish between restrictive and obstructive processes;
- Evaluation of obstructive lung diseases, such as bullous emphysema and cystic fibrosis, which may produce artifactually low results if measured by helium dilution or N2 washout. With simultaneously determined volumes, an index of trapped gas (i.e., FRCplethysmograph/ FRCHe dilution) can be established;
- Measurement of lung volumes when multiple repeated trials are required or when the member is unable to perform multi-breath tests;
- Evaluation of resistance to airflow;
- Determination of the response to bronchodilators, as reflected by changes in Raw, sGaw, and VTG;
- Determination of bronchial hyper-reactivity in response to methacholine, histamine, or isocapnic hyperventilation as reflected by changes in VTG, Raw, and sGaw;
- Following the course of disease and response to treatment.

Total body plethysmography, using any method, is considered **experimental or investigational** for all other indications. There is insufficient clinical evidence published in the peer-reviewed literature regarding the effect of total body plethysmography on health outcomes.

BILLING/CODING INFORMATION:

CPT Coding

94726	Plethysmography for determination of lung volumes and, when performed, airway resistance

ICD-10 Diagnosis Codes That Support Medical Necessity

D86.0, D86.2, D86.9	Sarcoidosis (of lung)
E84.0	Cystic fibrosis with pulmonary manifestations
E84.11	Meconium ileus in cystic fibrosis
E84.19	Cystic fibrosis with gastrointestinal manifestations
E84.8	Cystic fibrosis with other manifestations
E84.9	Cystic fibrosis, unspecified
G12.21	Amyotrophic lateral sclerosis
J40	Bronchitis, not specified as acute or chronic
J41.8	Mixed simple and mucopurulent chronic bronchitis
J42	Unspecified chronic bronchitis
J43.0 – J43.9	Emphysema
J44.0 – J44.1	Chronic obstructive pulmonary disease
J44.9	Chronic obstructive pulmonary disease, unspecified
J45.20 – J45.998	Asthma
J47.0 – J47.9	Bronchiectasis
J60	Coal worker's pneumoconiosis
J61	Pneumoconiosis due to asbestos and other mineral fibers
J62.0, J62.8	Pneumoconiosis due to other dust containing silica
J63.0	Aluminosis (of lung)
J63.1	Bauxite fibrosis (of lung)
J63.2	Berylliosis
J63.3	Graphite fibrosis (of lung)
J63.4	Siderosis
J63.5	Stannosis
J63.6	Pneumoconiosis due to other specified inorganic dusts
J64	Unspecified pneumoconiosis
J65	Pneumoconiosis associated with tuberculosis
J66.0	Byssinosis
J66.1	Flax-dresser's disease
J66.2	Cannabinosis
J66.8	Airway disease due to other specific organic dusts
J67.0	Farmer's lung

J67.1	Bagassosis
J67.2	Bird fancier's lung
J67.3	Suberosis
J67.4	Malt worker's lung
J67.5	Mushroom worker's lung
J67.6	Maple bark-stripper's lung
J67.7	Air conditioner and humidifier lung (ventilation pneumonitis)
J67.8	Hypersensitivity pneumonitis due to other organic dusts
J67.9	Hypersensitivity pneumonitis due to unspecified organic dust
J68.0 – J68.9	Respiratory conditions due to inhalation of chemicals, gases, fumes and vapors
J70.1	Chronic and other pulmonary manifestations due to radiation
J84.10	Pulmonary fibrosis, unspecified
J84.111 – J84.117	Idiopathic pulmonary fibrosis
J84.2	Lymphoid interstitial pneumonia
J84.81 – J84.848, J84.89	Other specified interstitial pulmonary diseases
M34.0 – M34.9	Systemic sclerosis (scleroderma)
M35.5	Multifocal fibrosclerosis
R06.00 – R06.09	Dyspnea
Z01.811	Encounter for preprocedural respiratory examination

LOINC Codes

DOCUMENTATION TABLE	LOINC CODES	LOINC TIME FRAME MODIFIER CODE	LOINC TIME FRAME MODIFIER CODES NARRATIVE
Physician history and physical	28626-0	18805-2	Include all data of the selected type that represents observations made six months or fewer before starting date of service for the claim.
Attending physician visit note	18733-6	18805-2	Include all data of the selected type that represents observations made six months or fewer before starting date of service for the claim.
Clinical notes and chart section (i.e., nursing home records, home health agency records, and other health care professional	28650-0	18805-2	Include all data of the selected type that represents observations made six months or fewer before starting date of service for the claim.

REIMBURSEMENT INFORMATION:

Refer to section entitled **POSITION STATEMENT**.

PROGRAM EXCEPTIONS:

Federal Employee Program (FEP): Follow FEP guidelines.

State Account Organization (SAO): Follow SAO guidelines.

Medicare Advantage Products:

No Local Coverage Determination (LCD) was found at the time of the last guideline reviewed date.

The following National Coverage Determination (NCD) was reviewed on the last guideline reviewed date: Plethysmography (20.14) located at cms.gov. No National Coverage Determination (NCD) was found for total body or whole body plethysmography at the time of the last guideline reviewed date.

DEFINITIONS:

No guideline specific definitions apply.

RELATED GUIDELINES:

None applicable.

OTHER:

None applicable.

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COMMITTEE APPROVAL:

This Medical Coverage Guideline (MCG) was approved by the Florida Blue Medical Policy and Coverage Committee on 06/27/24.

GUIDELINE UPDATE INFORMATION:

07/15/12	New Medical Coverage Guideline.
06/15/13	Annual review; position statement unchanged; Program Exceptions section updated.
06/15/14	Scheduled review; position statement unchanged; references updated.
10/01/15	Revision; updated ICD10 coding section.
11/01/15	Revision; ICD-9 Codes deleted.
08/15/16	Revision; added J41.8, J44.9 and J65. Updated references.
02/15/17	Revision; added G12.21, R06.00-R06.09 and Z01.811. Updated references.
06/15/19	Review; no change in position statement. Updated references.
01/01/21	Annual HCPCS code update. Deleted 94750.
07/15/21	Review; revised experimental or investigational statement.
07/15/23	Review; no change in position statement.
07/15/24	Review; no change in position statement. Updated references.