

Airway Clearance Devices

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Introduction

This guideline addresses airway clearance devices.

Health Equity Consideration

Health equity is the highest level of health for all individuals; health inequity is the avoidable difference in health status or distribution of health resources due to the social conditions in which individuals are born, grow, live, work, and age. Social determinants of health are the conditions in the environment that affect a wide range of health, functioning, and quality of life outcomes and risks. Examples include the following: safe housing, transportation, and neighborhoods; racism, discrimination, and violence; education, job opportunities, and income; access to nutritious foods and physical activity opportunities; access to clean air and water; and language and literacy skills.

Criteria

High Frequency Chest Wall Oscillation Devices

A high frequency chest wall oscillation system is considered medically necessary for an individual with excessive mucus production and difficulty clearing secretions when **both** of the following conditions are met:

- There is documentation of **any** of the following:
 - The individual has a nerve or muscle disease that limits their ability to cough.
 - The individual has cystic fibrosis.
 - The individual has bronchiectasis confirmed on computed tomography (CT) imaging and **either** of the following:
 - The individual has developed a chronic cough.
 - The individual has needed frequent antibiotics over the last year to treat lung infections.
- The individual has tried chest physiotherapy and other treatments (e.g., manual techniques, positive expiratory pressure devices, oscillatory devices, breathing techniques, or pharmacologic adjuncts) that were ineffective or intolerable, or these treatments are contraindicated for the individual.

Oscillatory Positive Expiratory Pressure Devices

An oscillatory (vibratory) positive expiratory pressure device is considered medically necessary for an individual with excessive mucus production and difficulty clearing secretions when **both** of the following conditions are met:

- There is documentation of **any** of the following:
 - The individual has Chronic Obstructive Pulmonary Disease (COPD).
 - The individual has bronchiectasis confirmed on CT imaging and **either** of the following:
 - The individual has developed a chronic cough.
 - The individual has needed frequent antibiotics over the last year to treat lung infections.
 - The individual has cystic fibrosis.
- The individual has tried chest therapy and other treatments that were ineffective or intolerable, or these treatments are contraindicated for the individual.

Mechanical Insufflation-Exsufflation Devices

A mechanical insufflation-exsufflation device) is considered medically necessary for an individual with a nerve or muscle disease that limits their ability to cough who has excessive mucus production and difficulty clearing secretions.

Intrapulmonary Percussive Ventilation Devices

An intrapulmonary percussive ventilation (IPPV) device (HCPCS E0481) is considered experimental, investigational, or unproven.

Background and Supporting Information

Bronchiectasis is a chronic illness characterized by permanent and abnormal dilation of bronchi. This condition presents with symptoms of chronic or recurrent cough, purulent sputum, dyspnea, and hemoptysis. Bronchiectasis is common in individuals with cystic fibrosis and chronic obstructive pulmonary disease. Noncontrast chest CT has become the definitive study to confirm the diagnosis of bronchiectasis (Pan et al., 2023)

Cystic fibrosis (CF) is a chronic and progressive genetic disease. Inflammation in the airways of individuals with CF causes a breakdown of cellular products, producing thick and difficult to expectorate secretions leading to airway obstruction. This process is exaggerated by frequent bacterial infection and ineffective mucociliary clearance. Treatments to improve symptoms, reduce complications, and enhance quality of life may include pharmacological therapy, airway clearance techniques, and pulmonary rehabilitation (Cystic Fibrosis Foundation, 2025).

Chronic obstructive pulmonary disease (COPD) is characterized by airflow obstruction with narrowing of airways which may close prematurely, trap gas, reduce expiratory air flow, and limit the effectiveness of a cough, thus diminishing the body's ability to clear secretions. Chronic cough and hypersecretion of sputum in individuals with COPD are associated with frequent exacerbations and an increased hospitalization risk (Cleveland Clinic, 2025).

A **high frequency chest wall oscillation (HFCWO) device** consists of a nonstretchable, inflatable vest connected by hoses to a small air-pulse generator that provides external high frequency chest wall oscillation. Small volumes of air are injected into and withdrawn from the vest at a rapid rate, creating vibrations that are transmitted across and through the chest wall of the person wearing the device. This changed or disrupted airway pattern may assist in loosening retained secretions, thus moving mucus towards the larger airways where it can be cleared by coughing. High frequency chest wall compression can be used by patients independently, without the need for an assistant or caregiver.

An **oscillatory positive expiratory pressure (PEP) device** combines positive expiratory pressure with airway oscillation. The device is pipe-shaped with a mouthpiece at one end and a steel ball in a hard plastic housing at the other end. As the individual exhales, the steel ball rolls and vibrates producing oscillations in pressure, which are transmitted throughout the tracheobronchial tree. The angle at which the device is held determines the amount of vibration. The oscillations dislodge mucus from the airway walls and the increased pressure maintains the patency of the airway so that mucus does not become trapped as it moves up the airway (McCool, 2006).

A **mechanical percussor** is used to mimic the manual action of clapping the chest with cupped hands. The device is applied to the chest wall, which vibrates the thorax through deep pulses, promoting secretion mobilization (Flume et al., 2009).

An **intrapulmonary percussive ventilation (IPPV) system** provides high frequency mini-bursts of air through a mouthpiece, face mask, or artificial airway. This device is designed to create internal vibration or percussion in the lung to loosen and mobilize secretions (McCool, 2006).

Chest physiotherapy (CPT) is a treatment program that attempts to compensate for abnormal airway clearance. Available techniques include chest percussion, positive airway pressure, forced expirations, and exercise. Given the lack of clear superiority of any one technique, specific choices should be individualized and guided by a specialist in respiratory therapy (Flume et al., 2009).

Evidence Discussion

A 2023 narrative review by Veldhoen et al. evaluated the role and effectiveness of airway clearance techniques and devices in adults with acute and chronic respiratory conditions associated with impaired secretion clearance. The authors summarized evidence demonstrating that airway clearance interventions were associated with improved mobilization and removal of airway secretions, facilitation of cough, and maintenance of airway patency, particularly in individuals with underlying neuromuscular weakness, bronchiectasis, and critical illness. Device-assisted techniques, including high-frequency chest wall oscillation, positive expiratory pressure devices, and mechanical insufflation-exsufflation, were reported to enable independent or assisted airway clearance when spontaneous cough was ineffective. Across the reviewed studies, airway clearance was incorporated as an adjunctive therapy, with benefits most consistently observed in secretion burden and respiratory mechanics rather than hard clinical endpoints such as mortality or length of stay. The authors concluded that airway clearance techniques and devices represented an important supportive component of respiratory management, particularly when individualized to disease severity and individual capability. Limitations of the reviewed evidence included heterogeneity in study populations and interventions, reliance on physiologic and surrogate outcomes, limited randomized controlled trial data, and variability in outcome measurement, which restricted direct comparisons between techniques and definitive conclusions regarding superiority.

In a 2024 observational study (Spinou et al.) using data from the European Multicentre Bronchiectasis Audit and Research Collaboration registry, airway clearance management practices were evaluated across 28 countries. A total of 16,723 individuals with bronchiectasis were included, with a mean age of 67 years. Use of airway clearance management was more frequently reported among individuals with greater disease severity, higher daily sputum production, and increased symptom burden, suggesting that individuals with more advanced disease were more likely to receive or adopt airway clearance interventions. Study limitations included its observational design, reliance on self-reported airway clearance use, lack of standardized assessment of technique effectiveness, and inability to establish causal relationships between airway clearance management and clinical outcomes.

A 2023 European Respiratory Society statement reviewed the effectiveness of airway clearance techniques in adults with bronchiectasis using systematic literature searches and expert consensus. Evidence from a review of 30 randomized trials demonstrated that airway clearance techniques consistently increased sputum clearance during or immediately after treatment compared with control or usual care. Across studies, these interventions were also associated with reductions in cough impact, improvements in health-related quality of life, and a lower risk of exacerbations, although the magnitude of benefit varied by technique and outcome measure. No single airway clearance

technique was shown to be clearly superior, supporting individualized selection based on preference, tolerance, and feasibility. The statement concluded that airway clearance techniques represented a core component of bronchiectasis management and were biologically and clinically justified for ongoing use, including in unsupervised settings. However, the authors noted limitations across the evidence base, including small sample sizes, short intervention durations, heterogeneity in outcome measures, and risk of bias related to lack of blinding and inconsistent reporting.

Codes

HCPCS Codes	Description
A7025	High frequency chest wall oscillation system vest, replacement for use with patient owned equipment, each
A7026	High frequency chest wall oscillation system hose, replacement for use with patient owned equipment, each
E0480	Percussor, electric or pneumatic, home model
E0481	Intrapulmonary percussive ventilation system and related accessories
E0482	Cough stimulating device, alternating positive and negative airway pressure
E0483	High frequency chest wall oscillation system, with full anterior and/or posterior thoracic region receiving simultaneous external oscillation, includes all accessories and supplies, each
E0484	Oscillatory positive expiratory pressure device, non-electric, any type, each
S8185	Flutter Device

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