

01 Comprehensive Solution for Airway Clearance

Aerosol Delivery—High Frequency Chest Wall Oscillation (HFCWO)—Negative Pressure Secretions Collection

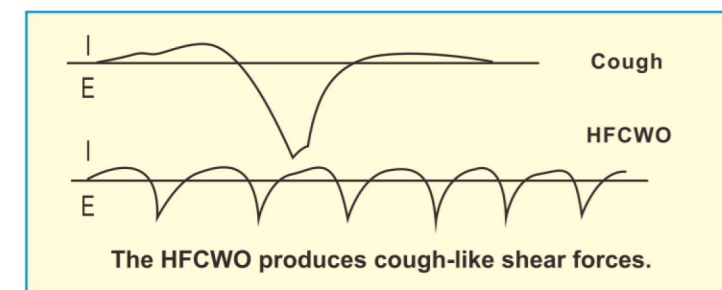
Aerosol Delivery is generated by the compressor, the diameter of atomizing powders can reach 1-5µm to accelerate mucus removing.

High Frequency Chest Wall Oscillation simulates the cough of human by rapidly homogeneously inflating and deflating the vest. Retained secretions will be removed by the shear force of the cough airflow or helped by negative pressure collection. Negative Pressure Secretions Collection is using the vacuum principle to suck the secretions from oral cavity and trachea.



Shear Force of HFCWO

Shear forces are unaligned forces defined by frictional force between airflow and intima of trachea wall which is related to the airflow velocity.



Airflow Velocity Comparison

Type	Flow Rate	Efficiency
Relaxed Breathing	120 mL/sec.	1x
Chest Physical Therapy(CPT)	480 mL/sec.	4x
Hand Flutter	480 mL/sec.	4x
HFCWO	1943 mL/sec.	16x
Cough	3429 mL/sec.	29x

02 Airway Clearance System Indications

Asthma, Bronchiectasis, Lung Infection, Emphysema, Pneumonia, Myasthenia Gravis, bronchitis, Occupational Lung Disease, Cystic Fibrosis, AIDS with CARINI Cystic Pneumonia, Coma, Respiratory Failure, Pulmonary Atelectasis, Spinal Muscular Atrophy and etc.

After Tracheostomy, Post-operative Airway Management, Spinal Cord Damage, Ventilator Dependent patient and etc.

03 Applicable Departments

- Respiration Medicine
- ICU
- Neurology Department
- Gerontology Department
- Oncology Department
- Rehabilitation Department
- Neurosurgery Department
- Cardiothoracic Surgery
- General Surgery Department
- Orthopedics Department
- Emergency Department
- Pediatrics Department



04 Comparison Table among High Frequency Chest Wall Oscillation (HFCWO), Hand Flutter and Chest Physical Therapy(CPT)

	HFCWO	Hand Flutter	CPT
Mechanism	Whole Chest Wall Vibration	Part Chest Wall Vibration	Part Chest Wall Vibration
Airflow Velocity	High	Low	Low
Position Requirement	No (Including Coma-patients)	Prone, Recumbent and Seated	Prone, Recumbent and Seated
Safety	Safe with Soft Mechanism Force to avoid rib or skin hurt	Safe	Safe
Comfort	Yes	No	No
Work Flow	Simple	Complex	Complex
Operator	Easy to Use	professional Required	professional Required





05 Features

Clinical Outcomes

- Improved secretion clearance
- Stabilized or improved pulmonary functions
- Improved exercise tolerance
- Reduced incidence of pneumonia and related hospitalizations
- Higher patient satisfaction and therapy adherence
- Reduced healthcare costs

Ergonomic Design

- Remote one button stop, bring safety and reliability to patients
- Pressure and frequency automatic adjust, improve the patient experience
- Vest: Front V and back cavity design to protect abdomen and spine
- 10-inch TFT touch screen
- 120,000 therapy information storage with patient management



06 References

- Significantly more sputum was expectorated during HFCWO than during CPT/PD as determined by both the wet ($P < 0.001$) and the dry ($P < 0.01$) measurements.
- HFCWO treatment is safe for trauma patients with lung and chest wall injuries.
- HFCWO is well tolerated in adults hospitalized for acute asthma or COPD and significantly improves dyspnea.

1. Janet Kluff: A Comparison of Bronchial Drainage Treatments in Cystic Fibrosis, *Pediatric Pulmonology* 22:271-274
2. Casandra A Anderson: Evaluation of the safety of high-frequency chest wall oscillation (HFCWO) therapy in blunt thoracic trauma patients, *Journal of Trauma Management & Outcomes* 2008, 2:8
3. Amit K Mahajan: High frequency chest wall oscillation for asthma and chronic obstructive pulmonary disease exacerbations: a randomized sham-controlled clinical trial, Mahajan et al. *Respiratory Research* 2011, 12:120



PneuVest-Airway Clearance System

Aerosol Delivery Treatment High Frequency Chest Wall Oscillation (HFCWO) Negative Pressure Secretions Collection

PV-100

HFCWO Module

PV-300

*HFCWO Module
Aerosol Delivery Module*

PV-900

*Aerosol Delivery Module
HFCWO Module
Negative Pressure Module*