

Airway Oscillation Device for Preventing Mucus Obstructions in Cystic Fibrosis Patients' Respiratory Tracts

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Technology description

Mouthpiece or Facemask Delivers Vibrations Internally to Dislodge Dangerous Mucus Buildup

This airway oscillation device, a mouthpiece or facemask, delivers vibrations inside a patient's respiratory tract to help remove mucus and prevent dangerous obstructions. Healthy lungs continually produce a small amount of mucus to retain moisture and trap foreign substances, such as bacteria and dust particles. Several conditions, including respiratory tract infections and cystic fibrosis, create too much mucus of abnormal consistency. An inherited disease that shortens life expectancy to less than 40 years, cystic fibrosis clogs vital organs with thick mucus. It affects approximately 30,000 people in the United States alone. Available treatments include physiotherapy and chest percussion therapy, which mechanically break down the mucus. These treatments, however, are not appropriate for patients who have brittle or broken bones, intense pain, asthma, tuberculosis, or injuries to the neck, spine, lungs or chest. University of Florida researchers have created a portable, battery-operated device that clears mucus buildup without the need for a vibrating/percussive vest. The device is safe for children as well as the elderly and clinicians can easily modify its settings to meet specific treatment criteria, which is not possible with conventional external percussion devices.

Technology

Researchers at the University of Florida have designed an oscillatory device that delivers vibrations internally to clear away mucus from patients' airways. It can be formulated as a mouthpiece or facemask connected to a breathing circuit. This high-frequency oscillator applies vibratory air pressure waves superimposed on the normal breath airflow to create turbulence throughout the airway. The resulting vibrations facilitate the movement of mucus towards the mouth for expulsion.

Application area

Oscillatory device that vibrates a patient's airway internally to clear away mucus and makes it easier to obtain sputum samples for diagnosing lung infections

Advantages

Appropriate for patients of any age or health condition, widening the potential market

Can be self-administered as a facemask or mouthpiece, making it less expensive than percussive vests

Runs on batteries, enhancing portability

Allows clinicians to modify frequency and amplitude, increasing treatment flexibility compared to external percussion devices

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