

Clinical Trial Overview

High-Frequency Chest Compression: Basic Research/Physiological Effects

This assessment of gas exchange during HFCC demonstrated a clear improvement in ventilation when HFCC is superimposed on tidal breathing. During inspiration, HFCC enhances gas mixing in the lung periphery and during expiration HFCC improves gas mixing in the airways; these actions tend to increase effective alveolar ventilation.

Title	Harf A, Zidulka A, Chang HK. Nitrogen washout during tidal breathing with superimposed high-frequency chest-wall oscillation. <i>Am Rev Respir Dis</i> 1985; 132:350-353.
Objective	To gain further insight into the gas exchange mechanisms (ventilatory effects) shown with HFCC in earlier studies in spontaneously breathing animal and human subjects.
Method	<p>Seven healthy volunteers were recruited for this study:</p> <ul style="list-style-type: none"> • Male non-smokers w/o history of lung disease aged 25-43 years • All test conditions performed in seated position • To maintain regular breathing patterns, subjects breathed synchronously throughout the study with a Harvard ventilator set at an individualized but constant tidal volume and frequency • Nitrogen washout curves were obtained during 3 different maneuvers performed in random order: <ul style="list-style-type: none"> ○ Condition A – Control w/o HFCC ○ Condition B – HFCC superimposed on normal tidal: magnitude of oscillatory tidal volume at airway opening = 20 ml ○ Condition C – HFCC superimposed on normal tidal: magnitude of oscillatory tidal volume at airway opening = 40 ml
Results	<ul style="list-style-type: none"> • Nitrogen washout significantly faster in Condition C than Condition A for each subject • Nitrogen washout showed great inter-individual variability, ranging from values up to or equivalent to those of Condition A or Condition C • Condition than Condition A for each subject • Analysis of the washout curve data suggest that during inspiration HFCC enhances gas mixing in the lung periphery and that during expiration HFCC improves gas mixing in the airways • HFCC effects correlate with increased effective alveolar ventilation

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