

primary studies - published RCT

## **Effects of treadmill exercise versus Flutter(R) on respiratory flow and sputum properties in adults with cystic fibrosis: a randomised, controlled, cross-over trial.**

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### **Study design (if review, criteria of inclusion for studies)**

Randomised, controlled, cross-over study.

### **Participants**

24 adults with mild to severe CF lung disease (FEV1 28-86% predicted)

### **Interventions**

Treadmill exercise and airway clearance with the Flutter(R) device; 20 min of resting breathing (control), treadmill exercise at 60% of the participant's peak oxygen consumption and Flutter(R) therapy.

### **Outcome measures**

Respiratory flow was measured during the interventions. Sputum properties (solids content and mechanical impedance) and subjective responses (ease of expectoration and sense of chest congestion) were measured before, immediately after the interventions and after 20 min of recovery.

### **Main results**

Treadmill exercise and Flutter(R) resulted in similar significant increases in peak expiratory flow, but only Flutter(R) created an expiratory airflow bias (i.e. peak expiratory flow was at least 10% higher than peak inspiratory flow). Treadmill exercise and Flutter(R) therapy resulted in similar significant reductions in sputum mechanical impedance, but only treadmill exercise caused a transient increase in sputum hydration. Treadmill exercise improved ease of expectoration and Flutter(R) therapy improved subjective sense of chest congestion.

### **Authors' conclusions**

A single bout of treadmill exercise and Flutter(R) therapy were equally effective in augmenting mucus clearance mechanisms in adults with CF. Only longer term studies, however, will determine if exercise alone is an adequate form of airway clearance therapy that could replace other airway clearance techniques.

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### **See also**

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### **Keywords**

non pharmacological intervention - devices OR physiotherapy; Adolescent; Adult; Respiratory Tract Diseases; Airway clearance technique; Chest physiotherapy; High Frequency Chest Wall Oscillation -HFCWO-; VEST Airway Clearance System; oscillating devices; Acapella; flutter; Intrapulmonary Percussive Ventilation; Vibration; exercise;