



## Comparison of intrapulmonary percussive ventilation and chest physiotherapy. A pilot study in patients with cystic fibrosis.

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**STUDY OBJECTIVE:** To compare the intrapulmonary percussive ventilator (IPV) to chest physiotherapy (P&PD) with respect to acute changes in (1) pulmonary function and (2) sputum physical properties in patients with cystic fibrosis (CF).

**DESIGN:** Randomized crossover.

**SETTING:** Community-based CF referral center.

**PARTICIPANTS:** Nine nonhospitalized person (range, 7 to 40 years; median, 12.4 years) with moderate to excellent Shwachman scores.

**INTERVENTIONS:** Three treatment regimens: (1) 2.5 mg albuterol delivered via IPV (internal percussive component activated); (2) 2.5 mg. albuterol delivered via IPV (internal percussive component inactivated), followed by P&PD; and (3) 2.5 mg albuterol delivered via updraft nebulizer, followed by P&PD.

**MEASUREMENTS AND RESULTS:** Outcome measures included pulmonary function testing (PFTs) and quantitative and qualitative sputum analysis. Among the three treatment groups, there were no significant differences in the change in predicted PFTs 1 h or 4 h after treatment, nor in the volume of sputum expectorated in the first 4 or in the subsequent 20 h. Among patients receiving IPV, more serious disease was associated with greater improvement in FEF25-75 1 h after treatment, but these differences disappeared by 4 h. There were no meaningful differences in viscoelastic characteristics of sputum expectorated after each treatment. Participants reported general satisfaction with no adverse effects while using IPV.

**CONCLUSIONS:** This initial pilot study suggests (1) stable patients with CF tolerated one treatment of IPV without adverse sequelae, and (2) IPV was as effective as standard aerosol and P&PD in improving short-term PFT results and enhancing sputum expectoration.

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