Mechanical percussion in respiratory care

Evidence for clinicians and equipment buyers

CLINICAL EVIDENCE | UPDATED 26 OCTOBER 2026

Research supports secretion clearance with percussion-containing care and a mechanical alternative to manual percussion in selected patients. G5-specific studies, other mechanical devices and broader airway-clearance programs contribute different evidence. This summary keeps their patient groups, treatments and measured outcomes visible so clinicians and equipment buyers can assess relevance.

Mechanical and manual percussion in cystic fibrosis

In the cystic fibrosis populations studied, mechanical and manual chest percussion generally produced similar measured outcomes, supporting mechanical percussion as an alternative selected according to patient needs and preferences. The evidence does not establish equivalence across all respiratory conditions, treatment settings or long-term outcomes. [1,2]

Bauer and colleagues randomized 51 hospitalized patients with acute CF exacerbations; 22 also received the other treatment during a later admission. Improvements in measured spirometry did not differ significantly. The mechanical arm used Vibracare or Model 9000, as documented in the Cochrane study description. This supports the mechanical option, although equal outpatient effectiveness and an isolated result for today's VC24B were not established. A separate 14-patient study by Maxwell and Redmond reported comparable sputum and lung-function outcomes with mechanical or manual percussion plus gravity-assisted drainage. The broader 2023 Cochrane comparison evidence was rated very low certainty; comparable results are not formal equivalence proof. [1,2,9]

Direct G5 findings on secretions and cough

A 2024 trial of 50 mechanically ventilated adults with organophosphorus poisoning found a greater reduction in its measured secretion quantity when G5 percussion was added to conventional physiotherapy. Between-group compliance, oxygenation and dead-space differences were not significant; a companion report did not find earlier extubation. Both publications share registration CTRI/2018/07/015074 and are counted as one trial. The collected secretion measure does not measure all mucus retained in the lungs. [3,4]

Lee and Eccles used G5 Variko chest percussion in 29 people with upper respiratory infection and 15 healthy volunteers, finding a greater induced-cough response in the infection group. Jones and colleagues also elicited cough with G5 Variko in 23 of 27 people with idiopathic pulmonary fibrosis versus 5 of 30 controls. These studies support a cough-induction mechanism; they did not measure a therapeutic benefit for dry IPF cough or faster viral recovery. The historical Variko settings are not operating instructions for current Vibracare. [17,18]

Additional evidence for secretion clearance

In nine patients with copious sputum, Gallon found that adding fast percussion to postural drainage and forced expiration increased sputum-production rate from 0.831 to 1.231 g/min ($p<.05$). May and Munt's study in 35 adults with stable chronic bronchitis reported more sputum with percussion/drainage than sham treatment, 5.5 versus 1.4 mL. These are favorable secretion outcomes; airflow and gas-exchange benefits were not demonstrated in those studies. [10,11]

Neonatal and pediatric research

Finer and Boyd's controlled study of 20 neonates found an arterial oxygen-tension increase of 14.5 mm Hg following drainage plus percussion. Etches and Scott's six-neonate study found more secretions removed after CPT than suction alone; its correction addresses suction pressure. In an observational study of 60 preterm neonates, Mehta and colleagues reported physiological improvements following monitored multimodal CPT. These positive findings concern the studied neonatal techniques and do not identify a Neocussor-specific effect. [12,13,24,26]

In 30 children aged five months to five years with lower respiratory infection, LEGA-Kid mechanical percussion reduced respiratory rate by 16.5% versus 8% with manual CPT (between-group p=.024). Both groups improved distress scores, with no adverse events observed in the small, short study. The pathway included nebulised hypertonic saline; LEGA-Kid is another manufacturer's device. [14]

Adult ICU research

Chen and colleagues randomized 95 ventilated adults and found greater sputum clearance and better lung-collapse measures when an external mechanical vibration pad was added to positioning. Pattanshetty and Gaude's randomized 101-patient study reported mortality of 24% versus 49% (p=.007) and lower pulmonary infection scores when positioning and chest-wall vibration were added to manual hyperinflation and suctioning. These are positive findings for specific adult ICU programs, not isolated G5 or neonatal-device effects. [15,16]

A separate 60-patient controlled study by Ntoumenopoulos and colleagues reported ventilator-associated pneumonia in 8% of the CPT group versus 39% of controls. Allocation was systematic rather than randomized, and ventilation duration, length of stay and mortality benefits were not demonstrated. [23]

Broader airway clearance evidence and guidance

The ACCP review describes short-term secretion-clearance benefits, particularly in CF, and similar measured manual/mechanical percussion outcomes. The 2025 ERS guideline strongly recommends airway-clearance techniques for most adults with bronchiectasis. These support the care category without selecting a particular G5 device. AARC recommends considering therapy in selected COPD patients with symptomatic secretion retention, while not recommending routine CPT for uncomplicated pneumonia or every hospitalized COPD patient. [5,6,19]

In bronchiectasis, Murray's 20-patient trial reported better cough-related quality of life, sputum volume and exercise capacity with oscillatory PEP. Muñoz's 44-patient year-long trial found fewer exacerbations and better quality of life with ELTGOL; its correction concerns figure allocation counts. In 40 adults with severe COVID-19, Javaherian's tailored physiotherapy program improved oxygen saturation and walking capacity; airway-clearance techniques were applied when excessive secretions were present, alongside breathing and walking work. These outcomes belong to the named techniques and programs, rather than an isolated powered-percussion effect. [20–22,25]

What this means when choosing G5 equipment

The clinician determines suitability, device, applicator, positioning and treatment plan. Equipment selection can consider corded or cordless operation, handpiece format, controls and compatible applicators. Current FDA listings identify the listed Vibracare family as Class I under ISA and Neocussor as Class II under BYI. Classification is not a comparative-effectiveness rating. Follow the matching model instructions. [7,8]

Compare equipment at https://g-5.com/applications/respiratory-therapy/ or contact sales@g-5.com for configuration and ordering help. Please leave patient names and medical histories out of product inquiries.

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