

## Elastic Chest Compression Reduced Hyperinflation in People with Chronic Obstructive Pulmonary Disease

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**RATIONALE:** In Chronic Obstructive Pulmonary Disease (COPD), expiratory flow limitation and gas trapping cause an increase in FRC, known as hyperinflation. Hyperinflation impedes diaphragm function, causes breathlessness and reduces exercise capacity. In healthy people, elastic chest compression reduced FRC. Therefore, we investigated whether elastic chest compression could reduce hyperinflation in patients with COPD. **METHODS:** Eight patients with COPD and gas trapping ( $RV > 120\%$  predicted) performed body plethysmography at baseline and with elastic chest compression placed at the Xiphisternum and over the abdomen. Participants then underwent two magnetic resonance imaging scans of the thorax without and with elastic chest compression to measure the height, length and angle of the diaphragm at FRC. Data are presented as mean  $\pm$  SD. **RESULTS:** COPD participants were  $66 \pm 7.9$  years old with moderate to severe airflow obstruction ( $FEV_1 = 48.2 \pm 19\%$  predicted). Elastic chest compression reduced FRC ( $148.7 \pm 25$  vs  $138.9 \pm 22\%$  predicted,  $p = 0.002$ ) but did not alter TLC or RV ( $p = 0.25$  and  $0.58$ , respectively). This led to an increase in inspiratory capacity with elastic chest compression of  $0.22 \pm 0.24$  L ( $2.35 \pm 0.85$  vs  $2.57 \pm 0.92$  L,  $p = 0.04$ ). This was accompanied by an increase in the height and length of the diaphragm as well as a decrease in the angle of the diaphragm ( $p < 0.01$  for all). **CONCLUSION:** In patients with COPD, elastic chest compression reduced hyperinflation and improved the curvature of the diaphragm. This suggests that an elastic chest compression may be a novel strategy in patients with COPD to improve breathing mechanics, and hence breathlessness and exercise capacity.

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