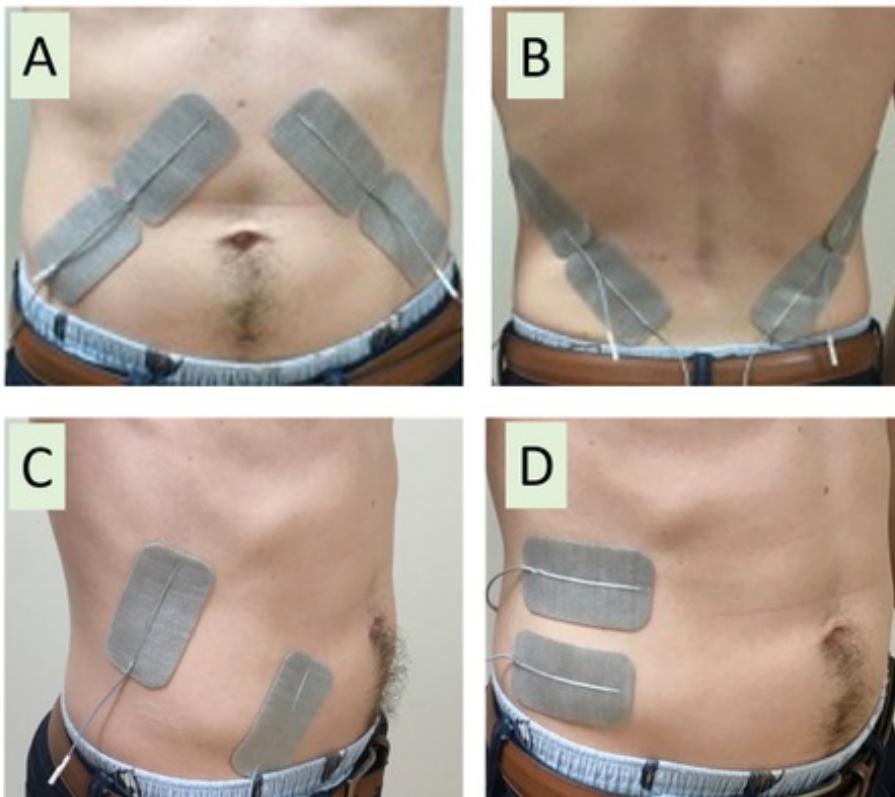


Electrode Positioning During Electrical Stimulation of the Expiratory Muscles

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Introduction: Electrical stimulation of the abdominal wall muscles via anteroposterior electrodes (dorsal portion latissimus dorsi-external obliques) (Fig. 1A, B) can assist breathing (Radovanovic AJRCCM 193:A7656). This electrode configuration is impractical in recumbent patients. To obviate the need for patient turning, we tested an anterolateral (anterior margin latissimus dorsi-external oblique) (Fig. 1C) and a lateral (external oblique) configuration (Fig. 1D). We hypothesized that expiratory muscle recruitment with the anterior and anterolateral configurations would not be inferior to the anteroposterior configuration. **Methods:** Recordings of gastric pressure in 8 participants (4 COPD, 4 healthy), during near-maximally tolerated stimulations delivered with the three electrode configurations in random order. **Results:** There was no difference in the rise in gastric pressure ($P = 0.67$) or in participants' discomfort (Wong Baker Faces Pain Rating Scale, $P = 0.14$) with each of the three configurations. Healthy subjects tolerated a higher amplitude of stimulation during anteroposterior vs. anterolateral stimulation ($P < 0.01$). **Conclusion:** Electrical stimulation of the expiratory muscles using anterolateral and oblique electrode configurations are practical and non-inferior to the posterolateral configuration in healthy subjects and patients with COPD. Figure 1. Electrode configurations tested. (A and B) Anteroposterior; (C) Anterolateral; (D) Lateral



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