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**Title:** Comparison of CPAP and others lung expansion techniques on thoracoabdominal mechanics after abdominal surgery: A randomized trial

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**Body:** Several respiratory techniques are widely used to promote lung expansion after surgery and recent studies showed that deep breaths and incentive spirometer promote significant increase in lung volumes; however, the effects of continuous positive airway pressure (CPAP) on thoracoabdominal mechanics remain poorly known. Objective: To compare the effect of CPAP versus other lung expansion techniques on thoracoabdominal mechanics after abdominal surgery. Methods: This clinical trial study enrolled 56 consecutive patients undergoing abdominal surgery. Patients were randomized with concealed allocation in 4 treatment groups: flow-oriented incentive spirometry (FIS, n=13; 60±15yrs), volume-oriented incentive spirometry (n=15; 55±12yrs), deep breathing (n=15; 55±6yrs) and CPAP with expiratory pressure by 10cmH<sub>2</sub>O (n=13; 49±17yrs). The outcomes measured were the chest wall, upper and lower ribcage and abdominal volume (optoelectronic plethysmography) measured simultaneously with the muscular activity of the sternocleidomastoid and intercostal muscles (electromyography). One-way repeated measures ANOVA with post hoc Student Newman Keuls test were used and significance level was set at 5%. Results: There were no differences in pulmonary volume as well the regionalization of ventilation during the use of CPAP compared to other techniques (p>0.05), however, FIS showed increase in sternocleidomastoid and intercostal muscular activity compared to others (p<0.05). Conclusion: CPAP does not promote additional effect on thoracoabdominal mechanics compared to other techniques after abdominal surgery. In addition, FIS promoted greater inspiratory muscular activity.