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## Introduction

Pulmonary complications are one of the most important sources of postoperative morbidity and mortality after surgery. After cardiac surgery, complications arise that require specialized care, especially in the respiratory system. These complications increase the hospitalization time of patients, increasing the cost of hospitalization and end up being a serious cause of morbidity and mortality. Recent related studies focus on the training of the respiratory muscles, which seems to effectively reduce respiratory complications and length of hospital stay

## Purpose

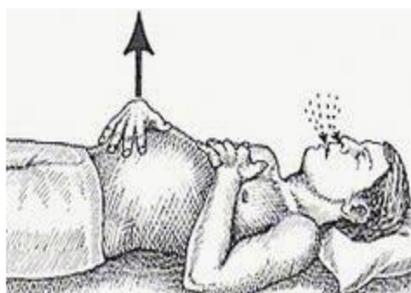
The individual research questions of the research are: 1. The effect of postoperative respiratory exercise on lung function and endurance in patients undergoing cardiac surgery. 2. The effect of postoperative respiratory exercise on the incidence of postoperative complications in the lungs and length of stay in hospital, as well as on inspiratory muscle strength and endurance in these patients.

## Methods

Primary endpoints were: Respiratory function, endurance, inspiratory muscle strength, post-operative complications in the respiratory system. Secondary endpoints will be: quality of life, postoperative hospital stay. This systematic review was carried out in accordance with the prisma (Custom Reference System Guidelines for Systematic Review-Analysis). The data source for this systematic review was the Pubmed data search engine. The search was conducted using the "PICO: Patients, Intervention, Comparison, Outcome" methodology. Specifically, the search was conducted with keywords organized into three (3) groups (participants, interventions, results)



Inhalation, exhalation practice with manual resistance adjustment



Diaphragmatic breathing



Respiratory exercise



Device connected to endotracheal tube



## Results

- Respiratory function statistically significant increase in 8 from 10 studies
- Respiratory muscle dynamics statistically significant increase in 6 from 10 studies
- Length of stay in hospital statistically significant reduction in 2 and 1 not significant from 3 studies
- Quality of life statistically significant increase in 3 from 4 studies
- Postoperative pulmonary complications statistically significant reduction in 2 and not significant in 2 from 4 studies

## Discussion

This systematic review has shown that respiratory exercise after cardiac surgery improves lung function and endurance in patients with increased inhalational muscle strength. In addition, it appears to reduce respiratory post-operative complications, hospitalization time and contribute to improving the quality of life of patients. Due to the small sample size and the heterogeneity of species and duration of intervention between studies, future studies are needed to further document the results

## References

- Cordeiro ALL, de Melo TA, Neves D, Luna J, Esquivel MS, Guimarães ARF, et al.,(2016).“Inspiratory Muscle Training and Functional Capacity in Patients Undergoing Cardiac Surgery”, *Braz J Cardiovasc Surg.*;31(2):140–4
- . Kodric M, Trevisan R, Torregiani C, Cifaldi R, Longo C, Cantarutti F, et al.,(2013). “Inspiratory muscle training for diaphragm dysfunction after cardiac surgery”, *The Journal of thoracic and cardiovascular surgery.*;145(3):819–23.
- Crisafulli E, Venturelli E, Siscaro G, Florini F, Papetti A, Lugli D, et al.,(2013). “Respiratory muscle training in patients recovering recent open cardiothoracic surgery: a randomized-controlled trial”, *Biomed Res Int.*;2013:354276
- . Ellenberger C, Sologashvili T, Bhaskaran K, Licker M.,(2017 Aug). “Impact of intrathecal morphine analgesia on the incidence of pulmonary complications after cardiac surgery: a single center propensity-matched cohort study”, *BMC Anesthesiol.* 22;17(1):109.
- Gomes Neto M, Martinez BP, Reis HF, Carvalho VO.,(2017 Apr). “Pre- and postoperative inspiratory muscle training in patients undergoing cardiac surgery: systematic review and meta-analysis”, *Clin Rehabil.*;31(4):454–64.