

# DOES INCENTIVE SPIROMETRY IMPROVE MORTALITY IN COVID -19 PATIENTS?

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## Background

The number of coronavirus (COVID-19) cases reported worldwide is increasing day by day. Literature search revealed that there are no studies relating to the benefits of incentive spirometry (IS) in these patients. We evaluated the effect of incentive spirometry in mortality of COVID 19 patients since it can be a cost-effective treatment strategy.

## Methods

A retrospective case-control study was done in a Community hospital in Pennsylvania with 326 hospitalized patients with a confirmed diagnosis of COVID -19 from January 2020 – June 2020. Inclusion criteria included patients admitted with COVID -19 (RT-PCR positive) and age >18 years. EPIC clarity database was used to obtain the data which was then manually reviewed. Confirmed COVID-19 cases are those with initial test results or repeat test results positive. Patients were divided into cases and controls depending on whether IS was ordered or not.

## Results

- In this study of 326 adult hospitalized patients with COVID 19, the initiation of incentive spirometry showed a significant association with reduction in mortality rate.
- Among the 326 inpatient encounters identified, 37 patients had received treatment with IS at least 10 times every hour while awake. The p-value from the analysis is 0.02 for a Z-score of -2.017. Based on the p-value 0.02, there is statistical evidence that IS reduces the mortality rate in COVID-19 patients with a significance level of 0.05.
- The patients with confirmed COVID-19, who did not have IS have about 1.6 times higher odds of mortality (OR, 1.6; 95% CI, 1.092-2.253; P 0.02 <0.05].
- The mortality rate of patients across the available data was 15% compared to 5% in patients who have used incentive spirometry with a standard deviation of 0.22.

## References

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## Discussion

- Two weeks of training using incentive spirometry provided improvements in pulmonary function and respiratory motion, which suggested that incentive spirometry may be a useful preoperative modality for improving pulmonary function during the perioperative period<sup>1</sup>.
- Literature on lung-expansion interventions with incentive spirometry was effective in reducing pulmonary risk after non-cardiothoracic surgery<sup>2</sup>. The American Association for Respiratory Care (AARC) Clinical Practice Guidelines recommended that IS be used with deep breathing techniques, directed coughing, early mobilization, and optimal analgesia to prevent postoperative pulmonary complications<sup>3</sup>. The IS may measure and assist lung expansion in order to prevent pulmonary complications following thoracic surgery<sup>4</sup>
- Use of early spirometry is well studied to show positive outcomes in post-operative units but is not yet studied in COVID -19 patients. This will be the first study evaluating effect of early initiation of IS in confirmed COVID-19 cases. However, further detailed studies and randomized controlled trials are needed in the future to determine the exact significance of IS in the population and if IS should be included in the management protocols for treatment of COVID 19.