



## Effects of chest physiotherapy on patient with Chronic Obstructive Pulmonary Disease (COPD)

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### **Abstract,**

Symptoms including shortness of breath, sputum clearing, and activities to increase strength and fitness can all be managed and controlled with the aid of physiotherapy. encouraging the opening of airways, enhancing mobility, encouraging rehabilitation, and helping to deliver efficient non -invasive ventilation services. . In the case of obstructive bronchiolitis, the airways' interiors are smaller than usual due to ongoing inflammation and swelling. The ability of the lungs to efficiently and quickly expel air is hindered by this constriction. The lung's alveoli suffer damage and lose some of their flexibility in emphysema. As a result, they are challenging to empty. Airway narrowing is also a result of emphysema. The combination of non-stretchy alveoli due to emphysema and narrowed airways due to both obstructive bronchiolitis and emphysema prevents the lungs from emptying normally. This causes air to become trapped in the lungs. “Air trapping,” or the inability to fully exhale, leads to abnormal expansion or hyperinflation of the lungs.

### **Introduction,**

A preventable and treatable condition known as chronic obstructive pulmonary disease (COPD) is characterized by recurrent respiratory symptoms and reduced airflow. It was the fourth-leading cause of mortality in the US in 2017 after ranking third globally in 2016 and the



third-leading cause of death in the world overall. In 2017, it was predicted that 300 million individuals worldwide have COPD. In the upcoming years, the burden of COPD is anticipated to increase as the population ages and is exposed to more COPD risk factors, such as tobacco smoke, occupational dust and chemicals, biomass fuel, and air pollution (1).

Tobacco avoidance or early stopping, for example, can reduce exposure to these risk factors and help prevent COPD. The most typical respiratory symptoms associated with COPD include dyspnea, coughing, and/or sputum production. Exacerbations, which may occur in addition to the regular symptom load, are events of abrupt exacerbation of respiratory symptoms that account for the majority of the overall COPD burden on healthcare systems. Although patients may advance at varying rates, COPD can be progressive as evidenced by decreases in spirometry measures such forced expiratory volume in 1 second (FEV1) with time(2).

## **Subjects and Methods,**

Physical therapy sessions were started on the second day the patient was admitted to the hospital and continued twice daily for five days, for a total of 10 sessions, lasting between 30 and 1 hour each.

**Pursed lip breathing .** It is preferable to train yourself to breathe through pursed lips until it comes naturally. Lay down or take a straight seat. Breathe in through your nose for two seconds, feeling the air enter your abdomen

### **Percussion.**

The lung segments that require the secretions to be evacuated are pounded with cupped hands alternately in rhythm. This facilitates the passage of the lung walls' thick, viscous secretions into the bigger airways when paired with related gravity placement.



## **Inhibition of accessory muscles**

Chest expansion, dyspnea, and exercise tolerance are all considerably improved in COPD patients by respiratory accessory muscle inhibition. Release and stretching were utilized as inhibitory strategies

## **Active cycle of breathing**

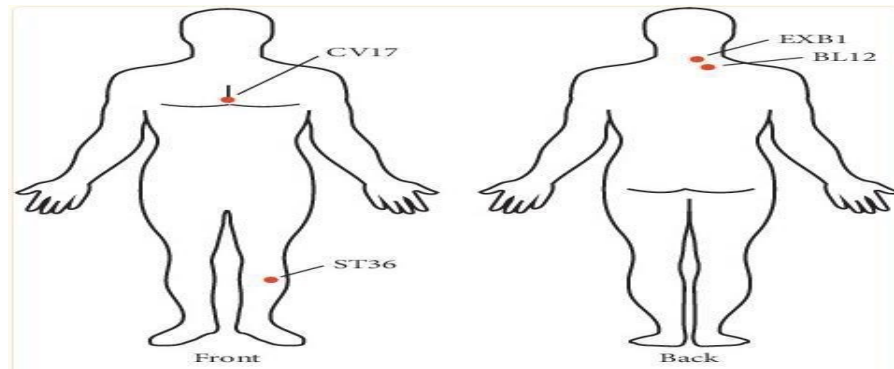
Breathing management. When breathing is managed, the airways can relax. Breathe in through your nose and out through your mouth effortlessly. Breathing normally and gently from the lower chest, relax the shoulders and upper chest. One hand on your stomach while you breathe is a helpful technique to accomplish this. Keep in mind to breathe slowly to open up your airways. When you exhale, purse your lips to create back pressure in the airways, which keeps the airway open for a longer period of time(3).

**Postural drainage.** Postural drainage is the positioning of a patient with an involved lung segment such that gravity maximizes the drainage of broncho-pulmonary secretions from the tracheobronchial tree

Proprioceptive neuromuscular facilitation (PNF) stretching coupled with aerobic training effectively reduced the symptom of dyspnea and improved some pulmonary function measures as well as neck/shoulder mobility in COPD patients, according to a study about the effects of PNF on pulmonary function in COPD patients that was published in 2021. By repeatedly stretching their respiratory muscles, patients with COPD can extend their range of motion in their joints and improve their lung function. PNF stretching has been shown to increase muscle activation and improve motor coordination more than static stretching. Actin and myosin filament overlap



decreased with increased myofiber length, enhanced muscle viscoelasticity, more effective muscular contraction, decreased motor nerve excitability, and decreased energy expenditure when muscles were stretched once more. Information will also be provided for all of these.



### **Diaphragmatic release.**

The patient was lying on his back with his limbs immobilized. By gently pulling the points of contact in the direction of the head and somewhat laterally with both hands, the therapist helped raise the ribs during the inspiratory phase. The therapist maintained resistance while increasing contact depth toward the inner costal margin. The therapist steadily increased the contact depth inside the costal margin during the successive breathing cycles. (6).

### **Results,**

Since the admission, physiotherapy treatment sessions were conducted twice a day for five days (till the time of discharge). The patient showed significant improvement in respiratory function, evidenced by improvement of oxygen saturation from 81% to 93%, and respiratory rate from 30/minute to 23/minute. Before physical therapy intervention, chest expansion measured 103 in quiet



breathing and 106 in deep breathing: this measured 107&112, respectively, after a week of physiotherapy treatment.

	Admission	Discharge
Oxygen saturation	81%	93%
Respiratory rate	30	23
Chest expansion (ins.)	107	103
Chest expansion (exp.)	112	106

## **Discussion,**

Chronic obstructive pulmonary disease (COPD) is a preventable and treatable slowly progressive respiratory disease of airflow obstruction .

In this case, the history of extensive smoking, persistent cough, short breath, hyper inflated lungs in x-ray, reduced FVC and FEV1/FVC suggests COPD. After applying a pulmonary rehabilitation program the patient reveals an improvement in breathing capacity and quality of life.

The 5 patients ranged from 47 to 64 years old. All techniques used were well tolerated by patients. There were no significant differences in Sao<sub>2</sub> and FEV1 during treatments and until 1 hour after either treatment.

In this study, all treatments resulted in a substantial , immediate improvement in mucus clearance by patients with chronic bronchitis exacerbation.

## **Conclusion,**

Exercise prescription is a key component of pulmonary rehabilitation programmes, part of the non- pharmacological approach to managing COPD.



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