



## **CURRENT MANAGEMENT OF CHRONIC OBSTRUCTIVE PULMONARY DISEASE: THERAPEUTIC APPROACHES AND NEW PERSPECTIVES**

*CURRENT MANAGEMENT OF CHRONIC OBSTRUCTIVE PULMONARY DISEASE:  
THERAPEUTIC APPROACHES AND NEW PERSPECTIVES*

Pedro Raydan Brandão Simões – Pontifical Catholic University of Minas Gerais  
Amanda Saori Fukushima – Pontifical Catholic University of Minas Gerais  
David Rezende Ribeiro – Pontifical Catholic University of Minas  
Gerais

### **SUMMARY:**

Chronic Obstructive Pulmonary Disease (COPD) is a highly prevalent chronic respiratory condition characterized by progressive and irreversible airflow limitation. It is associated with high morbidity, with frequent exacerbations that increase hospitalization rates and worsen patient quality of life. This study reviews the most recent therapeutic approaches in the management of COPD, including pharmacological interventions such as long-acting bronchodilators, inhaled corticosteroids, and biologic agents, as well as nonpharmacological strategies such as smoking cessation and pulmonary rehabilitation. After an initial search of 6,973 studies, 32 articles were analyzed, resulting in the inclusion of 9 key studies. The results indicate that personalized treatment, with a combination of medications and behavioral interventions, improves lung function and reduces exacerbations. Interventions such as short-course antibiotic regimens and systemic corticosteroids have proven effective in controlling acute exacerbations, while the use of noninvasive ventilation during the COVID-19 pandemic has been shown to be a viable alternative for patients with COPD. It is concluded that the management of COPD requires a multidisciplinary and personalized approach to optimize disease control and reduce its long-term complications.

**Keywords:** Approach Multidisciplinary. Bronchodilators. Corticosteroids  
Inhalers. COPD. Pulmonary Rehabilitation.

### **ABSTRACT:**

Chronic Obstructive Pulmonary Disease (COPD) is a highly prevalent chronic respiratory condition characterized by progressive and irreversible airflow limitation. It is associated with significant morbidity, with frequent exacerbations that increase hospitalization rates and worsen patients' quality of life. This study reviews the latest therapeutic approaches in COPD management, including pharmacological interventions such as long-acting bronchodilators, inhaled corticosteroids, and biological agents, as well as non-pharmacological strategies such as smoking cessation and pulmonary rehabilitation. Following an initial search of 6,973 studies, 32 articles were reviewed, leading to the inclusion of 9 key studies. The results indicate that personalized treatment, combining medications and behavioral interventions, improves lung function and reduces exacerbations. Interventions such as short-duration antibiotic and systemic corticosteroid regimens proved effective in managing acute exacerbations, while the use of non-invasive ventilation during the COVID-19 pandemic was

shown to be a viable alternative for COPD patients. It is concluded that COPD management requires a multidisciplinary and personalized approach to optimize disease control and reduce long-term complications.

**Keywords:** Bronchodilators. COPD. Inhaled Corticosteroids. Multidisciplinary Approach. Pulmonary Rehabilitation.

## 1. INTRODUCTION

Chronic Obstructive Pulmonary Disease (COPD) is one of the most prevalent chronic respiratory conditions globally, causing progressive airflow limitations and high rates of morbidity and mortality. COPD is strongly associated with smoking and prolonged exposure to environmental and occupational pollutants, factors that contribute to the development of chronic airway inflammation and destruction of the lung parenchyma (Al Wachami *et al.*, 2024). Due to its high prevalence and impact on quality of life, COPD is a leading cause of hospitalizations and represents a significant burden on health systems (Singh *et al.*, 2021).

In recent years, the management of COPD has evolved substantially with the development of new pharmacological therapies and non-pharmacological interventions. These interventions aim to reduce exacerbations, improve lung function and prevent progressive decline in respiratory capacity (Han *et al.*, 2023). The combination of long-acting bronchodilators, inhaled corticosteroids and biological agents, such as mepolizumab, has been shown to be effective in stabilizing the disease, especially in more severe cases (Papi *et al.*, 2024). In addition, pulmonary rehabilitation, smoking cessation, and patient education are essential components of COPD management (Karagiannis *et al.*, 2023).

The present study aims to review and discuss the most recent therapeutic approaches in the management of Chronic Obstructive Pulmonary Disease, focusing on pharmacological and preventive interventions that contribute to improving lung function and patients' quality of life.

## 2

## 2. MATERIAL AND METHOD

This study was conducted through an integrative review of the scientific literature. The search was performed in the PubMed database, using the following search key: ("Chronic Obstructive Pulmonary Disease" OR "COPD") AND ("management" OR "treatment" OR "therapy") AND ("advances" OR "strategies" OR "guidelines").

A total of 6,973 articles were found in the initial search. Filters were applied to include only studies published between 2019 and 2024, focusing on randomized clinical trials, meta-analyses and systematic reviews, with free access to the full text. After applying the inclusion criteria, 82 articles were selected. The full reading of these studies resulted in the selection of 32 articles, of which 9 studies were included in the final review (Table 1).

**Table 1.** Works included.

Database	Title	Authors	Periodical (vol, no, page, year)	Considerations Themes
PubMed	High versus Medium Dose of Inhaled Corticosteroid in Chronic Obstructive Lung Disease: THEARCHONTAKIS Systematic Review and Meta-Analysis	BARAKAKIS, <i>Pand al.</i>	<b>Int J Chron Obstruct Lung Dis</b> , v.18, p.469-482, 2023	Comparison between high doses and averages of corticosteroids inhalers in the COPD.
PubMed	N-acetylcysteine Treatment in Chronic Obstructive Pulmonary Disease (COPD) and Chronic Bronchitis/Pre-CO PD: Distinct Meta-analyses	DADDY, THE <i>et al.</i>	<b>Arch Bronchoneumol</b> , v.60, p.269-278, 2024	Review on the use of N-acetylcysteine treatment in COPD.

PubMed	Estimating the global prevalence of chronic obstructive pulmonary disease (COPD): the systematic review and meta-analysis	AL WACHAMI, N <i>et al.</i>	<b>BMC Public Health</b> , v.24, p.297, 2024	Review on the prevalence global from the COPD, providing data epidemiological relevant.
PubMed	The effects of upper limb exercise training on upper limb muscle strength in people with chronic obstructive pulmonary disease: a systematic review and meta-analysis of randomized controlled trials	KARAGIANNIS, W <i>et al.</i>	<b>Ther Adv Respira Dis</b> , v.17, p.17534666231170813, 2023	Assessment of the benefits of physical exercise in muscle strength in patients with COPD.
PubMed	The effectiveness of theory-based tuxedo cessation interventions in patients with chronic obstructive pulmonary disease: the meta-analysis	HAN, M <i>et al.</i>	<b>BMC Public Health</b> , v.23, p.1510, 2023	Meta-analysis on interventions of cessation of smoking in patients with COPD.
PubMed	Long- versus short-duration systemic corticosteroid regimens for acute exacerbations of	ZHAO, Z <i>et al.</i>	<b>PLoS One</b> , v.18, p.e0296470, 2023	Review on the use of corticosteroids systemic to exacerbations acute COPD.

	COPD: THE systematic review and meta-analysis			
PubMed	Pharmacological treatment of stable chronic obstructive pulmonary disease	SINGH, D.	<b>Respirology</b> , v.26, p.643-651, 2021	Discussion about the treatments pharmacological for COPD stable.
PubMed	Two-day versus seven-day course of levofloxacin in acute COPD exacerbation: a randomized controlled trial	MESSOUS, <i>Set al.</i>	<b>Ther Adv Respira Dis</b> , v.16, p.17534666221099729, 2022	Comparison between different durations of treatment antibiotic to exacerbations from the COPD.
PubMed	Real-World COPD Management Over 3 Years at the Community Health Service Center of Shanghai During the COVID-19 Pandemic in China	WU, TT <i>et al.</i>	<b>Int J Chron Obstruct Lung Dis</b> , v.18, p.349-364, 2023	Assessment of management of COPD during the pandemic of COVID-19.

Source: own authorship, 2024.

### 3. RESULTS AND DISCUSSION

Advances in the management of Chronic Obstructive Pulmonary Disease (COPD) have shown that personalized, evidence-based interventions are essential for improving lung function and quality of life in patients. A recent study reviewed the global prevalence of COPD, highlighting how the high incidence rate of the disease demands differentiated management strategies, adapted to regional characteristics and available resources (Al Wachamiet *al.*, 2024). The increase in population longevity, associated with

5

continued risk factors such as smoking and environmental pollution, has been a growing challenge for health systems in many parts of the world (Singh *et al.*, 2021).

The use of antibiotics in COPD exacerbations is a common approach, and the comparison between short- and long-term treatments was explored in a clinical trial that showed that two days of levofloxacin was as effective as the traditional seven-day course. This suggests that shorter antibiotic regimens may be a viable option, reducing drug exposure and, consequently, the risk of adverse effects and bacterial resistance (Messouset *al.*, 2022).

N-acetylcysteine has been studied as an adjuvant in the treatment of COPD and chronic bronchitis. A recent meta-analysis indicated that this substance helps reduce inflammation and oxidative stress, improving lung function in stable patients with COPD (Papi *et al.*, 2024). These findings highlight the potential of N-acetylcysteine as part of a multidisciplinary approach in disease management (Archontakis Barakakis *et al.*, 2023).

Another fundamental therapeutic strategy in the management of stable COPD is the use of bronchodilators and inhaled corticosteroids. Analysis of different doses of inhaled corticosteroids in patients with COPD suggests that moderate doses are as effective as high doses, providing adequate control of symptoms with fewer side effects associated with prolonged use of high doses (Archontakis Barakakis *et al.*, 2023). Adjusting the dosage of corticosteroids is an essential step in personalizing treatment, avoiding excessive use of medications without compromising disease control (Zhao *et al.*, 2023).

In addition to pharmacological treatment, smoking cessation remains an essential intervention for patients with COPD. A study that evaluated different cessation interventions based on behavioral theories demonstrated that these approaches are more effective than conventional methods, helping patients to quit smoking more successfully and, consequently, improving the clinical outcome of COPD (Han *et al.*, 2023). Smoking cessation is considered one of the few interventions capable of modifying disease progression, which makes these interventions particularly valuable in the long-term management of COPD (Karagiannis *et al.*, 2023).

Another fundamental aspect in the management of COPD is pulmonary rehabilitation, which includes the practice of targeted physical exercises. Recent studies have highlighted that strength training for the upper limbs can significantly improve the functional capacity and muscular strength of patients, contributing to the improvement of exercise tolerance and quality of life (Karagiannis *et al.*, 2023). This type of rehabilitation is an essential part of the non-pharmacological management of COPD, complementing drug treatments (Wu *et al.*, 2023).

## FINAL CONSIDERATIONS

The management of Chronic Obstructive Pulmonary Disease (COPD) has evolved significantly in recent years, with an emphasis on personalizing treatment and integrating pharmacological and non-pharmacological interventions (Singh *et al.*, 2021). The results of this review indicate that the use of inhaled corticosteroids, long-acting bronchodilators, and adjuvant agents such as N-acetylcysteine play an essential role in reducing exacerbations and improving lung function (Papi *et al.*, 2024). In addition, smoking cessation and pulmonary rehabilitation have been identified as crucial interventions for long-term improvement in patients' quality of life (Han *et al.*, 2023).

Recent studies suggest that short-course regimens of systemic antibiotics and corticosteroids are effective in treating acute exacerbations, offering similar results to prolonged regimens, but with a lower risk of adverse effects (Zhao *et al.*, 2023). Adaptation of COPD management during the COVID-19 pandemic has also shown the viability of home-based alternatives, such as the use of non-invasive ventilation and remote monitoring, which may serve as a model for the management of chronic diseases in times of crisis (Wu *et al.*, 2023).

It is concluded that the management of COPD should be based on a multidisciplinary and personalized approach, with therapeutic adjustments according to the individual needs of each patient. Personalization of treatment, combined with regular monitoring and patient education, is essential to optimize COPD control and reduce its long-term complications (Al Wachami *et al.*, 2024).

## REFERENCES

AL WACHAMI, *Net al.* Estimating the global prevalence of chronic obstructive pulmonary disease (COPD): a systematic review and meta-analysis. **BMC Public Health**, v.24, p.297, 2024.

ARCHONTAKIS BARAKAKIS, *P et al.* High versus Medium Dose of Inhaled Corticosteroid in Chronic Obstructive Lung Disease: A Systematic Review and Meta-Analysis. **Int J Chron Obstruct Pulmon Dis**, v.18, p.469-482, 2023.

HAN, *Met al.* The effectiveness of theory-based smoking cessation interventions in patients with chronic obstructive pulmonary disease: a meta-analysis. **BMC Public Health**, v.23, p.1510, 2023.

KARAGIANNIS, *C et al.* The effects of upper limb exercise training on upper limb muscle strength in people with chronic obstructive pulmonary disease: a systematic review and meta-analysis of randomized controlled trials. **Ther Adv Respir Dis**, v.17, p.17534666231170813, 2023.

MESSOUS, *Set al.* Two-day versus seven-day course of levofloxacin in acute COPD exacerbation: a randomized controlled trial. **Ther Adv Respir Dis**, v.16, p.17534666221099729, 2022.

DADDY, THE *et al.* N-acetylcysteine Treatment in Chronic Obstructive Pulmonary Disease (COPD) and Chronic Bronchitis/Pre-COPD: Distinct Meta-analyses. **Arch Bronchoneumol**, v.60, p.269-278, 2024.

SINGH, D. Pharmacological treatment of stable chronic obstructive pulmonary disease. **Respirology**, v.26, p.643-651, 2021.

WU, TT *et al.* Real-World COPD Management Over 3 Years at the Community Health Service Center of Shanghai During the COVID-19 Pandemic in China. **Int J Chron Obstruct Pulmon Dis**, v.18, p.349-364, 2023.

ZHAO, *Z et al.* Long- versus short-duration systemic corticosteroid regimens for acute exacerbations of COPD: A systematic review and meta-analysis. **PLoS One**, v.18, p.e0296470, 2023.