

Treating Dyspnea

Is Oxygen Therapy the Best Option for All Patients?



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KEYWORDS

- Dyspnea • Breathlessness • Hypoxia • Supplemental oxygen • End-of-life care
- Palliative care

KEY POINTS

- There is a high prevalence of dyspnea at or near the end of life that is associated with significant health and economic burden.
- The mechanism of dyspnea is complex and varies among disease entities and patient experience, making assessment and management challenging.
- Given the anxiety, social isolation, and poor quality of life associated with dyspnea, management is essential and should be tailored to individual patients and their disease.
- Oxygen therapy has been shown to improve survival in patients with COPD with severe hypoxemia, but further research is needed to understand the role of oxygen in moderate and exertional hypoxemia.
- No clear role for supplemental oxygen in the treatment of dyspnea in patients with no hypoxemia has been established, and providers should consider the negative effects of oxygen supplementation. In some instances, symptom control with medications (especially opioids), exercise, behavioral therapy, treatment of associated anxiety, and even the use of fans may be more effective and less costly than oxygen therapy.

INTRODUCTION

In 1999, the American Thoracic Society defined dyspnea as “a subjective experience of breathing discomfort that consists of qualitatively distinct sensations varying in intensity. The experience derives from interactions among multiple physiologic, psychological, social, and environmental factors.”¹ This complex sensation of breathlessness is common among many disease entities and is not limited to pulmonary, cardiac, or neuromuscular diseases.

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Many patients in the advanced stages of disease suffer from dyspnea; its prevalence and intensity increase as death approaches.² Dyspnea affects many dimensions of a patient's life, reduces activity levels and functional capacity, and causes distress and discomfort. The breathlessness that characterizes many advanced diseases often remains untreatable, adding significant distress to patients and caregivers. It is often associated with depression, anxiety, fear, and social isolation.³

More than half a million patients in the United States die annually from diseases that cause dyspnea, and some patients suffer for many years with this symptom.⁴ A total of 94% of patients with chronic obstructive pulmonary disease (COPD), 50% of patients with heart failure, and 90% of patients with lung cancer experience dyspnea.⁵ Advancing treatments of chronic diseases may often delay, but do not prevent, the onset of dyspnea. As patients live longer, the prevalence and economic burden increases.

It is difficult to determine the exact costs associated with dyspnea. However, a 2011 study found that the average annual all-cause medical costs per patient with COPD and cardiovascular disease was \$22,755.⁶ Per data from 2010, use of supplemental long-term oxygen therapy (LTOT) by patients with COPD is common, with more than 1 million Medicare recipients using oxygen annually at a cost of more than \$2 billion.⁷ Despite medical advances in treating chronic diseases and the amount of money spent on patients with these diseases, the ability to treat the accompanied breathlessness has been limited.

PATHOPHYSIOLOGY OF DYSPNEA

Dyspnea is a complex individual experience, and the mechanism is poorly understood, especially when compared with the sensation of pain.⁸ Both pain and dyspnea are clearly associated with negative emotions,⁹ which can then worsen symptoms, creating a vicious cycle. This perception of dyspnea can vary considerably among patients and is often not explained by disease severity. Previous experiences with dyspnea and a patient's expectations can worsen symptoms.¹⁰

Mechanism of Dyspnea

There are many causes of the perception of dyspnea in patients. One of the first relates to true airflow obstruction and an increase in mechanical impedance.¹¹ This resistance to airflow can be related to obstruction and hyperinflation as seen in patients with COPD, effusions, endobronchial lesions, or parenchymal infiltrates. Respiratory muscles that allow chest wall expansion and lung inflation may also not be able to match the input they receive from their own mechanical receptors, vagal receptors in the airways and lungs, or extrathoracic receptors on the face or in the central nervous system.

Other causes of dyspnea include increased ventilatory demand causing increased minute ventilation, such as during physical activity. In patients with COPD, a disruption of physiologic balance, such as increased CO₂ production or lactic acidosis, increases their drive to breathe. Respiratory muscle function itself may also decrease in patients with lung hyperinflation and neuromuscular disease. Anxiety can also provoke dyspnea through increased central perception, perhaps explaining why past experience and memory can trigger symptoms for patients.¹¹

Symptoms of Dyspnea

Patients describe dyspnea in various ways, including a sensation of being suffocated or of impending death. Patients may describe an inability to get in enough air or chest

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