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A COMPREHENSIVE REVIEW ON CHRONIC OBSTRUCTIVE PULMONARY DISEASE

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ABSTRACT

A rising global health concern, chronic obstructive pulmonary disease is predicted to get worse as people age and usage of tobacco products rises. Quitting smoking is the only effective way to avoid harm. Employers have a special opportunity to assist staff members in quitting smoking. Lung function nevertheless declines during the protracted asymptomatic phase; as a result, many patients wait to seek medical care until the condition is advanced or they have had an acute exacerbation. Clinicians must correctly identify the disease and treat patients throughout the course of their protracted illness in order to assist maintain patients' quality of life and lower healthcare expenses associated with this chronic illness. The present strategy for patient management is covered in this article.

Keywords: chronic obstructive pulmonary, Quitting smoking, Clinicians, healthcare

INTRODUCTION

The lung condition known as chronic obstructive pulmonary disease (COPD) is highly irreversible and is among the leading causes of illness and mortality globally. It ranks as the fourth most common cause of mortality in the US, behind cancer, heart disease, and cerebrovascular illness.^{1, 2} It is predicted to rise to the third most common cause of death globally by 2020.¹ The frequency and death from COPD have increased over time, defying trends seen in other major chronic diseases in the US.³ Between 1970 and 2002, the death rate doubled; ⁴. In 2000, women's mortality rates overtook men's for the first time.^{2,5} Currently, 12 million people in the US have a COPD diagnosis, although there are thought to be at least an equivalent number of unidentified people with compromised lung function suggestive of chronic pulmonary disease (Six Since smoking is the primary cause of COPD cases, the disease is largely averted.

The majority of COPD patients are older or middle-aged. 16 million clinic visits in 2000 were linked to COPD-related conditions⁷; as the population ages, it is anticipated that the caseload

will rise. COPD cannot be cured. Real therapeutic advances, especially in the form of disease-modifying medications, have been hard to come by. Quitting smoking is the only known method to lower the disease's incidence. The direct and indirect expenses of COPD-related healthcare are estimated to be close to \$18 billion and \$14 billion, respectively.^{2,8} About 40% of direct costs are related to hospitalizations, which frequently follow acute exacerbations; 20% are related to prescription medicines. A total of 1.5 million visits to emergency rooms were made for COPD in 2000. According to some estimates, the inpatient death rate from acute exacerbation is 10%, and at one year, it is about 60%.

In spite of these alarming statistics, COPD is still primarily ignored as a public health issue. In 1997, the World Health Organization, the National Institutes of Health, and the National Heart, Lung, and Blood Institute collaborated to launch the Global Initiative for Chronic Obstructive Lung Disease (GOLD), which aimed to raise awareness of COPD by disseminating information on the disease's causes and providing management guidelines.¹¹ Government, healthcare professionals, and public health officials must work together to undertake more multidisciplinary initiatives in order to lessen the disease burden of COPD, which includes losses to patients and their families due to progressive disability and reduced quality of life in addition to financial and systemic

DEFINATION

The clinical symptoms that make up COPD are varied, but they are all characterized by a restriction in expiratory airflow.¹² Emphysema and chronic bronchitis are the terminologies used by the American Thoracic Society to define COPD. Thirteen Excessive coughing and sputum production are the hallmarks of chronic bronchitis, while emphysema is the term for persistent dyspnoea brought on by increased air gaps and lung tissue deterioration. COPD is described as "a disease state characterized by airflow limitation that is not fully reversible" by the GOLD initiative. The restriction of airflow is typically progressive and linked to an atypical inflammatory reaction of the lungs to harmful particles or gases.¹⁴ In addition to airflow obstruction and inflammation, asthma also entails the airways' hyperresponsiveness to stimuli; as a result, the reversibility of functional deficits in asthma differentiates it from COPD.¹³

RISK FACTOR

The main cause of COPD risk is cigarette smoking. But one in six Americans who have COPD has never smoked.¹⁵ 15% to 20% of cases are related to occupational and environmental exposures to dusts, fumes, and other lung irritants.¹⁵ People who have severe lung infections as children are at an increased risk of developing COPD. Although a rare cause of COPD, 15 alpha-1 antitrypsin deficiency should be investigated in individuals whose emphysema appears before the age of 40 or in those who do not meet the usual risk factors.¹⁶

CLINICAL COURSE

Lung function continues to deteriorate during the protracted asymptomatic phase of COPD, a disease that advances slowly. One common symptom is persistent cough, especially when there is mucus production. Wheezing, chest tightness, and dyspnoea, particularly during activity, may also be present. Patients frequently arrive at an advanced stage of COPD with their initial severe exacerbation. Forced expiratory volume in 1 second (FEV1) is usually not indicative of symptoms until it is roughly 50% of the expected normal value.¹⁷ Life-threatening complications may arise and exacerbations may become more frequent as the condition worsens. Severe airway restriction, significantly impaired function, and systemic consequences are the hallmarks of end-stage COPD.¹⁸ Patients frequently pass away from lung infections or respiratory insufficiency. Muscle atrophy, improper nutrition, and weight loss are extrapulmonary consequences linked to COPD.

KEY POINTS

- There is now no known cure for COPD, which is becoming more and more common in the US and around the world. It is typified by an irreversible restriction of expiratory airflow.
- Since smoking is the primary cause of this illness, it is imperative that smokers give up. Employers have a special opportunity to help staff members give up smoking.
- It is anticipated that COPD will cost US healthcare systems \$18 billion in direct expenses and \$14 billion in indirect costs.
- The cornerstone of treatment is the consistent use of inhaled bronchodilators to both prevent and relieve symptoms.
- While long-acting inhaled bronchodilators are more convenient and effective than short-acting inhalers, mixing inhalers is frequently advised. Short-acting inhalers offer instant symptom alleviation.

PATHOGENESIS

Small airway disease and parenchymal damage are caused by an inflammatory process that is induced in the lungs and bronchial tree airways by cigarette smoking or exposure to toxic substances.²⁰

Emphysema is characterized by the alveolar attachments' loss of flexibility or disintegration. Dyspnoea during exertion is a symptom of air trapping and hyperinflation caused by the lungs' inability to empty. This may result in the rib cage expanding and the diaphragm flattening over time. Hypoxemia arises in the latter stages of COPD. A bad prognosis is indicated by pulmonary hypertension, which is a result of thickening of the vascular smooth muscle and intima.

Reduced expiratory flow rate and increased resistance to airflow are the overall effects of the pathophysiologic processes underlying COPD. Eliminating the trigger for inflammation (such as quitting smoking) does not slow down the inflammatory process.

Although the inflammatory process in asthma and COPD differs significantly, some pathologic characteristics may coexist because 10% of COPD patients also have asthma.²¹

Comorbid Conditions: a study of comorbidities in COPD shows the following relative risk of COPD patients for pneumonia (16.00), osteoporosis (3.14), respiratory infection (2.24), myocardial infarction (1.75), angina (1.67), fractures (1.58), and glaucoma (1.29).²² The disease has also been linked to depression.^{23, 24}

DIAGNOSIS

Early symptom assessment and identification enables the administration of therapy intended to maintain lung function and impede the course of the illness. The majority of patients receive a primary care diagnosis, which is predominantly clinical in nature (25). Dyspnoea, persistent cough, and high sputum production are suggestive signs. These symptoms are particularly concerning if they are accompanied by a history of cigarette smoking or frequent exposure to chemicals or pollutants from the workplace or environment. Patients with these findings must be closely monitored, and we must think about additional testing sooner than in the past. As part of the usual examination of systems, screening for the history of smoking, cough, sputum, dyspnoea, and exposures should be done. If any of these findings are found, more evaluation may be necessary. To validate the diagnosis, spirometry is utilized. As part of the usual examination of systems, screening for the history of smoking, cough, sputum, dyspnea, and exposures should be done. If any of these findings are found, more evaluation may be necessary. When a case of COPD is suspected, spirometry is used to confirm the diagnosis.

Evidence, however, does not support the screening use of spirometry in people without respiratory symptoms.²⁶ It takes a high index of suspicion to diagnose a patient early. Individuals with limited airflow, symptomatic of COPD, are defined as those whose forced vital capacity (FVC) ratio is less than 70% and whose FEV₁ is less than 80% of expected value following inhalation of a short-acting bronchodilator. Prior to diagnosis confirmation, the ratio of FEV₁/FVC should be evaluated with age-related standards because it often decreases.

TABLES

Table 1
staging of COPD

Stage	Description	Findings (postbronchodilator FEV ₁)
0	At risk	Risk factors, chronic symptoms, but normal spirometry
1	Mild	FEV ₁ /FVC ratio <70%
		FEV ₁ at least 80% of predicted value
		May have symptoms
2	Moderate	FEV ₁ /FVC ratio <70%
		FEV ₁ 50% to <80% of predicted value
		May have chronic symptoms
3	Severe	FEV ₁ /FVC ratio <70%
		FEV ₁ 30% to <50% of predicted value
		May have chronic symptoms
4	Very severe	FEV ₁ /FVC ratio <70%
		FEV ₁ <30% of predicted value
		OR
		FEV ₁ <50% of predicted value plus severe chronic symptoms

COPD indicates chronic obstructive pulmonary disease; FEV₁ forced expiratory volume in 1 second; FVC, forced vital capacity. Adapted with permission from Rabe KF, Hurd S, Anzueto A, et al. Global strategy for the diagnosis, management, and prevention of chronic obstructive pulmonary disease: GOLD executive summary. *Am J Respir Crit Care Med*. 2007; 176:532–555. *Am J Respir Crit Care Med* is an official publication of the American Thoracic Society. Asthma should be ruled out in the differential diagnosis. Unlike COPD, asthma onset is generally early in life and its symptoms vary from day to day, tending to worsen at night or in the early morning. Asthma is often associated with allergy, rhinitis, or eczema and tends to be present in the family history.²⁷ The degree of reversibility of airflow limitation also differentiates the 2 conditions.²⁵

TREATMENT OF COPD

SMOKING CESSATION

In addition to counseling,^{30,31} Most smokers should be treated with varenicline as a first-line agent. Smoking-cessation rates are highest when medical management is combined with counselling.

Relapse is common, and patients need to be coached and realize that multiple attempts at quitting are often required before quitting permanently.

Acupuncture and hypnosis are often advertised as smoking cures; however, a meta-analysis of 22 studies comparing acupuncture with sham acupuncture or with other methods of smoking cessation found no differences in outcome.³² In addition to counseling,^{30,31} Most smokers

should be treated with varenicline as a first-line

EMPLOYERS AS MODIVATORS

Employers have a special opportunity to inform, counsel, and support staff members who smoke. Some see it as a chance to lower healthcare costs and maintain the health of their staff. In Lewisburg, Pennsylvania, Evangelical Community Hospital is one instance of an organization that has taken a very proactive approach to helping people quit smoking. They created a scheme whereby employees receive free nicotine replacement and counselling through the respiratory therapy department. With a strong success rate, the program provides continuous support to those who choose not to give up. In November 2007, the hospital was tobacco-free, which resulted in more staff members quitting. Since June 2007, employees and their spouses have been able to receive free nicotine replacement patches and vinylidene; to date, 24 spouses and 55 employees have taken advantage of this offer. Since June 2007, employees and their spouses have been eligible to receive free nicotine replacement patches and venipuncture; 24 spouses and 55 employees have taken advantage of this offer. An illustration of the influence an employer can have on workers' health is this program.

PHARMACOTHERAPY

There is currently no medicine for COPD that has been demonstrated to reverse the disease's characteristic gradual decline of lung function. Therefore, the objectives of treatment are to reduce mortality, enhance exercise performance, avoid or minimize exacerbations and consequences, and relieve symptoms.^{27,33}

The cornerstone of managing COPD is the consistent use of inhaled bronchodilators, either alone or in combination, to prevent and treat symptoms. While short-acting inhaled medicines are frequently utilized for quick symptom alleviation, particularly in mild cases of COPD, long-acting inhaled bronchodilators are more convenient and more effective.^{27,33} When two bronchodilators with distinct durations and modes of action are used together, the likelihood of side effects is decreased and bronchodilation can be increased compared to when one agent is used alone.

The cornerstone of managing COPD is the consistent use of inhaled bronchodilators, either alone or in combination, to prevent and treat symptoms. While short-acting inhaled medicines are frequently utilized for quick symptom alleviation, particularly in mild cases of COPD, long-acting inhaled bronchodilators are more convenient and more effective.^{27,33} Combining two bronchodilators with distinct durations and modes of action may result in more bronchodilation than using just one agent²⁷. It also lessens the chance of side effects from using a single agent at a higher dose.³³ According to Table 2, the bronchodilators that are most frequently prescribed include methylxanthines, beta2-agonists, and anticholinergics.¹⁴ The patient's response is the primary factor in choosing the appropriate medication.

Table 2
Medications Available for the Treatment of COPD

Drug class Brand (generic)	Inhaler (µg/use)	Solution for NEB (mg/mL)	Maintenance dose	Indications	Side effects (>10%, unless otherwise noted)	Cost of 30-day supply
Beta₂-agonist						
Short-acting						
Xopenex (levalbuterol HCL)		0.1 0.21 0.42	0.63–1.25 mg every 6–8 hrs prn	Asthma	Hyperglycemia, hypokalemia, viral infection, headache	\$\$\$\$\$
ProAir HFA*	90 MDI		2 inhalations	COPD,	Tremor	\$

Drug class Brand (generic)	Inhaler (µg/use)	Solution for NEB (mg/mL)	Maintenance dose	Indications	Side effects (>10%, unless otherwise noted)	Cost of 30-day supply
Proventil HFA* Ventolin HFA* (albuterol)			every 4–6 hrs prn	asthma, EIA		
AccuNeb* (albuterol)		0.21 0.42 0.83	1.25–5 mg every 4–8 hrs prn			\$\$
Long-acting						
Foradil Aerolizer (formoterol)	12 DPI		12 µg every 12 hrs	COPD, asthma, EIA	(≥5%) Palpitation, nausea, headache, diarrhea, bronchitis; asthma exacerbation (age 5–12)	\$\$\$\$
Perforomist (formoterol)		0.01	20 µg bid (am & pm)			\$\$\$\$

Serevent Diskus (salmeterol)	50 DPI		50 µg every 12 hrs	Asthma, COPD, EIA, nocturnal asthma	Headache, pharyngitis, URT	\$\$\$\$
Brovana (arformoterol)		0.0075	15 µg every 12 hrs	COPD, bronchitis, emphysema	(≥5%) Chest pain, back pain, headache, diarrhea, sinusitis	\$\$\$\$

Anticholinergics

Short-acting

Atrovent HFA (ipratropium)	17 MDI		2 inhalations 4 times daily	COPD, bronchitis, emphysema	Bronchitis, URTI, palpitation, dyspnea	\$\$\$\$
Atrovent* (ipratropium)		0.2	500 µg 3–4 times daily			\$\$\$

Long-acting

Spiriva (tiotropium)	18 DPI		18 µg/d	COPD, bronchitis, emphysema	Xerostomia, URTI, sinusitis	\$\$\$\$
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Inhaled corticosteroids

QVAR (beclomethasone)	40, 80 MDI		40–320 µg bid	Asthma	Hoarseness, thrush, yeast infection in the mouth	\$\$\$\$
Pulmicort Flexhaler (budesonide)	90, 180 DPI		180–720 µg bid			\$\$\$\$
Flovent HFA (fluticasone)	44, 110, 220 MDI		88–440 µg bid			\$\$\$\$

Azmacort (triamcinolone)	75 MDI	40	150 µg 2–3 times daily, or 300 µg bid			\$\$\$\$
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Combination short-acting beta₂-agonist + anticholinergic in 1 inhaler

Combivent MDI (albuterol) + ipratropium	103/18 MDI		2 inhalations 4 times daily	COPD (for asthma patients requiring a 2nd bronchodilator)	Ipratropium: Bronchitis, URTI	\$\$\$\$
DuoNeb SOLN* (albuterol) + ipratropium		0.83/0.17	One 3-mL vial via NEB 4		Albuterol: Tremor, sinus tachycardia, anxiety	\$\$\$\$

			times daily			
Combination long-acting beta2-agonist + corticosteroid in 1 inhaler						
Advair (salmeterol fluticasone)	Disk's + 50 + 100, 50 + 250, 50 + 500 DPI		250/50 µg bid	Asthma, COPD	URTI, headache pharyngitis	\$\$\$\$
Symbicort (formoterol budesonide)	+ 4.5 + 80, 4.5 + 160 DPI		2 inhalations bid	COPD†	Headache, URTI, nasopharyngitis	\$\$\$\$
Methylxanthines	Oral tablets/capsules					
Many brands* (theophylline)	12 h: 100, 125, 200, 300, 450 mg 24 h: 100, 200, 300, 400, 600 mg		Initial >45 kg: 10 mg/kg/d titrate to max 800 mg/d in divided doses every 6–8 hrs	Asthma, COPD, neonatal apnoea	Tachycardia, nausea. vomiting, nervousness, restlessness	\$\$\$
Systemic corticosteroids						
Prednisone*	1, 2.5, 5, 10, 20, 50 mg tablets		5–60 mg/d single or divided dose	COPD acute exacerbations, asthma, many others	Short-term: Insomnia, indigestion, increased appetite, nervousness, Long- term: Cataracts, hypertension, thinning bones, easier bruising, slower wound healing, muscle weakness	\$
Prednisolone*	5 mg tablets				\$	
Medrol* (methyl- prednisolone)	4, 8, 16, 32 mg tablets		4–48 mg/d in 4 divided doses		\$–\$\$	

COPD stands for chronic obstructive pulmonary disease; *Generic available; pending approval; EIA stands for exercise-induced asthma; HFA stands for hydrofluoroalkane; MDI stands for metered-dose inhaler; NEB stands for nebulizer; and URTI stands for upper respiratory tract infection.

Information about costs (\$): \$, 0–25; \$\$, 26–50; \$\$\$, 51–100; \$\$\$\$\$, 101–200; \$\$\$\$\$\$, >200 dollars.

The US Food and Drug Administration (FDA) informed patients and doctors on May 30, 2008, about the need to switch by December 31, 2008, from inhalers containing chlorofluorocarbons (CFCs) to ozone-friendly hydrofluoroalkane (HFA) inhalers.³⁴ The CFC inhalers will no longer be obtainable in the US after that date. According to the FDA,³⁴ these inhalers are being phased out "because they are harmful to the environment." The FDA has authorized ProAir, Proventil, and Ventolin as the three HFA albuterol inhalers. Levalbuterol is the active ingredient of the fourth HFA inhaler, Xopenex.³⁴ Although they might not feel or taste the same as the CFC inhalers, these four inhalers are a safe and reliable substitute for CFC inhalers.³⁴

A review of published RCTs using a variety of aerosol devices (such as nebulizers, dry powder inhalers, and metered-dose inhalers) for the outpatient treatment of COPD did not find any variations in the responses of the lung function between the different delivery systems. Therefore, while selecting the mode of delivery, factors like cost, convenience, and the patient's capacity to use the device correctly are crucial.³⁵ Nebulized medication may lead to more dependable drug delivery in people who struggle to use inhalers properly.

In patients with severe to very severe COPD who experience recurrent exacerbations, inhaled glucocorticosteroids are advised in addition to bronchodilators.²⁷ In the Towards a Revolution in COPD Health (TORCH) trial, it was demonstrated that the combination of a long-acting beta₂-agonist (salmeterol) and an inhaled glucocorticosteroid (fluticasone propionate) was significantly more effective than either agent alone or placebo in lowering the number of moderate or severe exacerbations and improving health status over the course of the 3-year study.³⁶ When compared to a placebo, the combo regimen did not, however, significantly lower the chance of mortality. According to the researchers, the study's lack of power to identify a mortality impact was most likely the cause.³⁶ The types of medication that are acceptable for each stage of COPD are listed in Table 3.³³

Table 3 lists the types of pharmacotherapy appropriate at each stage of COPD.³³ Choosing a specific medication within the class of short- or long-acting beta₂-agonists, inhaled steroids, methylxanthines, or combination agents is a decision that is based on provider preference, local standards of care, and formulary availability. Several novel therapies are being investigated; many of them target inflammatory-signalling pathways.³⁷

Table 3
Stepwise Approach to the Management of COPD

4 Stages of COPD	Pharmacologic intervention
Mild	
FEV ₁ /FVC <70%	Add a short-acting bronchodilator when needed (anticholinergic or beta ₂ -agonist)
Moderate	
FEV ₁ ≥80%	Prescribe an annual influenza vaccination
FEV ₁ /FVC <70%	Add 1 or more long-acting bronchodilators on a scheduled basis
50% FEV ₁ <80%	Consider pulmonary rehabilitation
Severe	
FEV ₁ /FVC <70%	Add inhaled glucocorticosteroids if repeated exacerbations occur
30% FEV ₁ <50%	
Very severe	
FEV ₁ /FVC <70%	Evaluate for adding oxygen
FEV ₁ <30%	Consider surgical options

COPD signifies chronic obstructive pulmonary disease; FEV₁, forced expiratory volume in 1 second; FVC, forced vital capacity. Permission to adapt from Hanania NA, Donohue JF granted. Bronchodilators are one type of medication used to treat chronic obstructive pulmonary disease. Am Thorax Soc Proc. 2007; 4:526–534. The American Thoracic Society's official journal is called Proc Am Thorax Soc. While the right antibiotics should be used to treat bacterial lung infections, long-term antibiotic prophylaxis has not been demonstrated to be beneficial in preventing bacterial infections or exacerbations of COPD.

MANAGING EXACERBATIONS

An exacerbation is generally defined as an acute increase in symptoms beyond normal day-to-day variation in COPD.²⁷ Symptoms of an exacerbation range from increased dyspnoea with cough and sputum production in mild COPD to life-threatening dyspnoea in severe COPD.³¹ The frequency and severity of exacerbations correlate with the severity of the patient's underlying disease. Air pollution can also cause exacerbations; however, in approximately one-third of severe cases, the cause remaining unknown.

Acute exacerbations of COPD can usually be treated at home with the following strategies: creating a plan, teaching patients how to follow it during an exacerbation; increasing the dose and/or frequency of the short-acting bronchodilator (administered by nebulizer, if necessary); adding an anticholinergic agent; if the patient's FEV1 is less than 50% of predicted value, a systemic glucocorticosteroid should also be considered in order to restore lung function and expedite the healing process. If an infection is suspected—for example, in the event of fever and/or purulent sputum—antibiotic therapy should be started.

Patients experiencing acute exacerbations of chronic illnesses can schedule same-day appointments with acute care visits offered by many primary care providers. Urgent care facilities may be used if a same-day appointment with the patient's primary care physician is not available. Home health firms can be very helpful in getting the right medical services to patients who are confined to their homes quickly.

When symptoms are severe, an assessment in the emergency room is required. Inpatient care is frequently necessary for high-risk patients who have co-occurring diseases such as diabetes, heart failure, arrhythmias, pneumonia, chronic renal disease, or liver failure. Among individuals who are frequently admitted are those with deteriorating hypoxemia or hypercapnia, mental status abnormalities, or poor response to initial treatment. Patients whose increasing conditions prevent them from eating, sleeping, or taking care of themselves frequently

In patients who need to be hospitalized, oxygen therapy serves as the cornerstone of care. The target of 90% haemoglobin saturation (PaO₂ of 60–65 mm Hg) should be attained with the application of additional oxygen. In some exacerbation presentations, non-invasive intermittent breathing is better. If the patient has cardiovascular problems, respiratory arrest, or life-threatening hypoxemia, invasive mechanical ventilation can be required. Medication therapy for managing an exacerbation at home and in the hospital are comparable. In addition, if a patient does not respond well to a short-acting bronchodilator, a methylxanthine, such as theophylline, may be necessary.

NORPHARMACOLOGICAL INTERVENATION

The cornerstone of the majority of COPD rehabilitation programs is endurance exercise, which boosts work and exercise capacity. A meta-analysis of six small randomized controlled trials revealed that exercise training significantly improved patients' health-related quality of life and capacity for exercise, and it also reduced the number of unplanned hospital admissions when compared to usual care. All six trials compared the effectiveness of a respiratory rehabilitation program, which includes physical exercise, with standard care in the management of patients following an acute exacerbation of COPD. For every patient included in these trials, baseline FEV1 was $\leq 40\%$ of predicted value.

The American College of Physicians advises doctors to administer oxygen therapy for patients with COPD who have resting hypoxemia, which is defined as a PaO₂ of less than 55 mm Hg, based on clinical evidence. It has been demonstrated that providing additional oxygen to patients with severe airway blockage (FEV1 <30% of projected value) and resting hypoxemia for at least 15 hours per day can promote their life.²⁶

Pneumococcal vaccine should be administered to all COPD patients. For all elderly COPD patients, a yearly influenza immunization is recommended.²⁷ Those 65 years of age and older who receive vaccinations can experience lower hospital and death rates.⁴⁰

SURGICAL MODILITIES:

In patients with upper-lobe emphysema and limited exercise capacity, lung volume reduction surgery (LVRS) has been demonstrated to be superior to medicinal therapy in terms of

improving survival, exercise capacity, and quality of life—but only in a tiny, highly select patient population. LVRS is a costly palliative procedure, thus it should only be used on patients who have been carefully chosen.

The multidimensional BODE index was developed to assess the risk of death from COPD in an individual patient. The index includes 4 variables:

- Body mass index (weight)
- Airway Obstruction (FEV₁)
- Dyspnoea
- Exercise capacity (6-minute walk distance).

The BODE index can be useful in predicting survival after LVRS. A reduced BODE score index postoperatively has been associated with reduced mortality.⁴³

In certain carefully selected individuals with very advanced COPD, lung transplantation is sometimes done to improve quality of life and pulmonary function. Patients with COPD should consider the possible advantages of surgery against its dangers, which include greater airflow restriction and lung infections as postoperative consequences.²⁷

CONCLUSION

For many years to come, COPD will continue to be a major healthcare issue. Early diagnosis and therapy can be achieved by identifying the disease early through primary care screening for typical symptoms in smokers or those exposed to toxins or air pollutants. The advancement of the condition will be significantly impacted by concentrating on quitting smoking. Translating a deeper comprehension of the pathophysiologic mechanisms implicated into disease-modifying therapies will be necessary to advance treatment. Currently, the focus of management efforts is on using carefully chosen therapeutic modalities to improve patients' functional limits and symptoms.

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