

# Chronic Obstructive Pulmonary Disease: Outpatient Management

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Chronic obstructive pulmonary disease has become one of the more common problems which face physicians both in inpatient and outpatient settings. The incidence of the disease and increase in mortality have been documented in a number of studies as have other lung diseases, indicating a general rise in pulmonary disorders over the past several decades.<sup>1-3</sup> Two types of disease are classified under the heading of chronic pulmonary disease: chronic bronchitis and pulmonary emphysema. Chronic bronchitis is defined as a clinical syndrome of cough and sputum production for three consecutive months over two consecutive years, and pulmonary emphysema is defined as the histological expansion and destruction of the terminal respiratory units, with loss of structural elements. The etiologies associated with these diseases probably are multiple and are beyond the scope of this discussion; however, two of the causal factors are a hereditary predisposition such as is seen in alpha<sub>1</sub>-antitrypsin deficiency and the continued irritation of respiratory tissues by various air pollutants including tobacco smoke.<sup>4</sup>

The following discussion of a therapeutic program for those who suffer from chronic obstructive pulmonary disease is directed toward the possibility of maintaining a patient in an outpatient status because of the need to minimize health care costs.<sup>1-6</sup>

The pathogenetic mechanisms of respira-

tory distress associated with chronic obstructive pulmonary disease share several common denominators (Fig 1). The primary problem is airways or bronchial obstruction, thus the physician should attempt to relieve this condition to prevent the cascade of effects that may occur later in the course of the illness. Obviously, bronchial irritation and infection lead to bronchial edema, spasm and hypersecretion with resulting bronchial obstruction. This can cause a number of difficulties the more important of which are problems of pulmonary infection and atelectasis, ventilation-perfusion disturbances with consequent hypoxemia, hypercapnea, and ultimately cardiovascular death, primarily from arrhythmias. The series of steps that can be taken to avoid the natural progression of these problems to mortality are outlined in the Table.

A major concern for patients with chronic pulmonary illness is the necessity of being reassured that their physician is taking an active interest in the treatment and follow-up care of their case. While there is no total cure for people with chronic pulmonary disease, a reasonable lifestyle can be maintained in most cases where the physician is ready to present an optimistic outlook and offer encouragement in those aspects of treatment that require the patient's cooperation. Such guidance is an important therapeutic factor in combating this illness and provides significant satisfaction to the physician for the time and interest expended.

Patients with chronic pulmonary disease must avoid respiratory irritants; first of all they must stop smoking. There is ample evidence that while people who have pulmonary impair-

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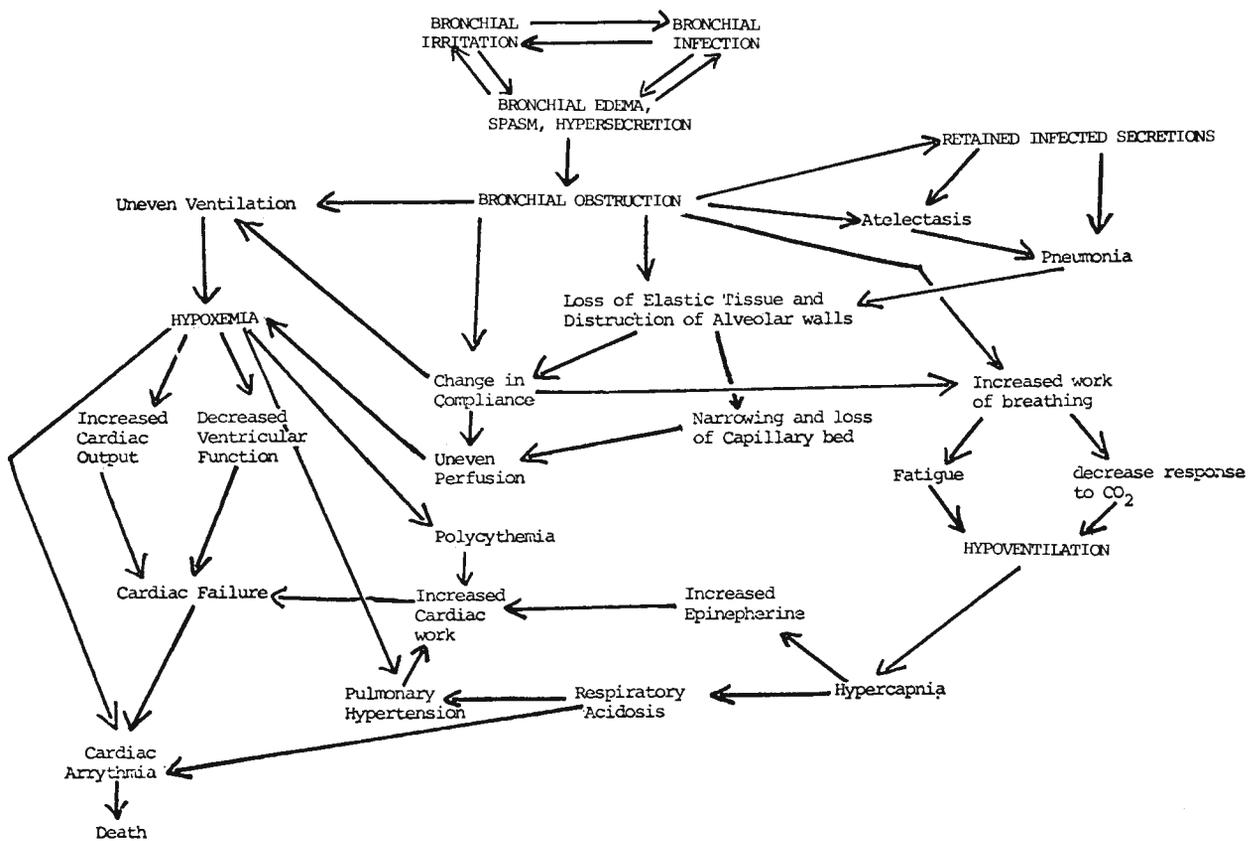


Fig 1—Pathogenesis of respiratory failure in chronic obstructive pulmonary disease. Remediable aspects in capitals.

ment and stop smoking continue to have an FEV<sub>1</sub> that is less than predicted for their size and age, the rate of decline in lung function is significantly slowed.<sup>7</sup> This is one of the more difficult aspects of treatment to accept and many patients deny that not smoking is of value. It is important that the physician continue to encourage these people not to smoke, and to maintain follow-up of those who will not stop. In addition to cigarette smoking, patients should avoid other known environmental respiratory irritants as well as any inhaled allergens if they are known and can be documented. One of the most important aspects of a therapeutic program is to provide these patients with a home that is as free from irritants and allergens as possible: pets should be kept outdoors; dust generators should be removed from the bedroom, as this is where the patient spends the most time; nonallergenic pillows and bedclothes should be purchased; and all animal and cotton products should be removed from the bedroom if possible and only synthetic, nonallergenic fibers used in rugs, upholstered furniture, draperies, and other items. Consideration should be given to purchasing an air filter for the bedroom

as well as one for the entire home if simpler measures are ineffective.

The atmospheric environment should be controlled at between 40% and 60% relative humidity. In addition to this, patients with chronic pulmonary disease should drink large quantities of liquid each day to assist in liquefying the great amount of thickened secretions that their lungs produce; a good rule of thumb is 12 to 14 glasses of water daily or an adequate amount of water to dilute urine to the point that it looks like water. A vaporizer at times of increasing respiratory secretions such as with an upper respiratory infection may also be useful.

Bronchial drainage measures should be practiced using a simple four-position technique; three of these positions are illustrated in Figure 2.<sup>5</sup> The patient lies with hips elevated above the shoulders in each position (in addition to face-up) for 5 minutes twice daily. If a family member can be taught chest percussion and/or vibration, this can assist in the removal of the increased tenacious secretions. The next procedure is to teach the patient pursed-lip breathing which requires that the patient exhale through

pursed lips as though he or she were whistling. This will slow respiratory rate and may maintain airways in an open position for a longer time during exhalation, thus decreasing air-trapping and improving ventilation-perfusion relationships.

Since many severe pulmonary difficulties begin with upper respiratory infections, these chronically-ill patients should be instructed to keep antibiotics such as tetracycline or ampicillin in their home, and to start on these drugs as they develop either an upper respiratory infection or a change in sputum color or quantity which suggests an increase in infection. The patient's physician should then be called and, depending upon the degree of difficulty the patient is having, the physician should have a Gram stain and/or culture done of the patient's sputum.<sup>3</sup>

The regular use of bronchodilators is a cornerstone of therapy for chronic pulmonary disease.<sup>3,5,6</sup> Patients must be encouraged to take their drugs daily even though their condition is quiescent. The newer anhydrous aminophyllin preparations are generally the best available. The addition of sympathomimetics such as terbutaline or metaproterenol is appropriate if further bronchodilation is needed. Inhaled bronchodilators are also helpful, but they should be used infrequently, as these drugs are easily overused. Patients taking inhaled drugs must be given careful instructions with a demonstration of their proper use. The nebulizer is positioned just distal to the open mouth and a deep breath, followed by complete exhalation, is accomplished to time appropriately the introduction of the medication at the beginning of the next inspiration; at the onset of this inspiration the medication is nebulized via the open mouth. The patient holds his or her breath for as long as possible following a maximal inspiration and slowly exhales through pursed lips. This process should be repeated two to three times with two to three puffs of bronchodilator each time. Patients should be taught to monitor their pulse rate and rhythm when taking this type of medication and to discontinue its use if they develop any arrhythmia or tachycardia.

Another classification of drugs considered for therapeutic use is the adrenal corticosteroids which may be given either in inhaled or oral forms with the inhaled form producing fewer side effects. The introduction of steroid therapy

**TABLE**  
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1. Physician interest and frequent follow-up
2. Avoidance of respiratory irritants
3. Maintenance of adequate humidity and hydration
4. Practice of bronchial drainage measures
5. Control of infection
6. Regular use of bronchodilators
7. Use of oxygen
8. Use of steroids
9. Control of heart failure
10. Other drugs
11. Active exercise reconditioning
12. Patient and family education

should be based upon indication of failure of the above-mentioned bronchodilators and antibiotic therapy, or evidence of a clear-cut allergic disorder shown by either nasal or sputum eosinophilia or severe irritation by known allergens. The goal of steroid therapy should be to use the drugs in their inhaled form and if that is impossible to use minimal amounts of the oral drugs on alternate days to decrease side effects.<sup>8</sup>

Another drug available for use is cromolyn sodium; patients with definite allergic abnormalities or evidence of allergic-oriented disease are more likely to respond to this drug. There is no place for the use of either sedatives or tranquilizers in the treatment of chronic respiratory dis-

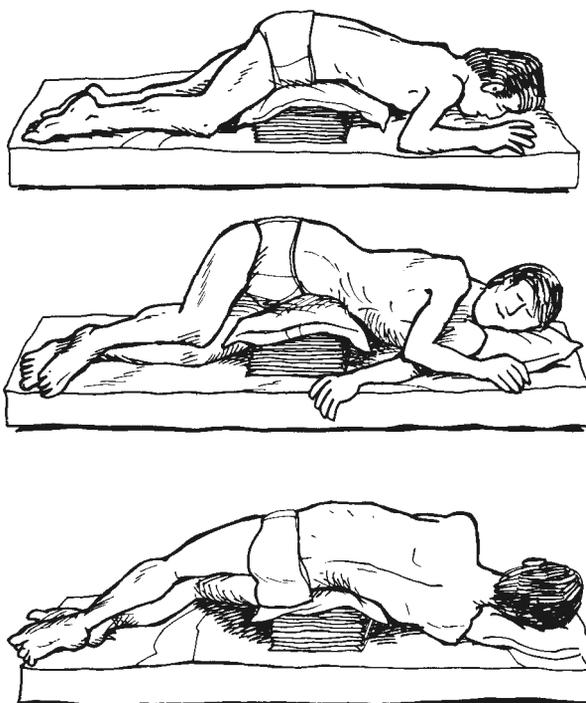


Fig 2—Basic positions for bronchial drainage.

ease. These patients are generally anxious, agitated, and frustrated because of their illness and/or the hypoxemia and/or hypercapnia which are associated with the disease. They are quite sensitive to most tranquilizers, particularly the benzodiazepams (Valium, Librium, among others), and these drugs should be avoided. A possible drug for use is hydroxyzine (Atarax, Vistaril) which at least in parenteral form does have some bronchodilator effect and may be taken as a last resort in small doses (10 mg, t.i.d.) after all other possibilities have been exhausted.

Many patients will have observable evidence of right heart failure or cor pulmonale which should respond to the therapeutic regimen suggested above; if they do not, first, diuretics should be tried, and if they are unsuccessful, digitalis may be used. Digitalis generally does not improve right heart failure as much as left heart failure, although it does have some effect. It is important to avoid drugs which block the effectiveness of beta adrenergic stimulation, particularly propranolol which is a beta 1- and 2-blocker, as they will make the bronchodilators less effective. An effective beta 1-blocker drug may be available in the not-too-distant future which will permit bronchial dilatation while controlling cardiac arrhythmias without producing the kind of problem one regularly sees with beta 1- and 2-blockade.

Active exercise reconditioning is of great importance for patients with chronic pulmonary disease.<sup>1-3,5,6</sup> They should begin with a regular walking program in which goals are set, such as walking a number of blocks (or other measured distance) daily in a specified period of time, with a planned increase in the rate of walking or a decrease in the amount of time it takes to cover a certain distance. In addition to this, having an exercise bicycle for indoor use during inclement weather is of extreme importance. Exercise with nasal oxygen may increase the exercise tolerance of the patient and permit more rapid progress; its use in the outpatient setting has been demonstrated to be of significant value in reducing pulmonary hypertension and improving the

psychological status of chronically hypoxemic patients.<sup>9</sup>

In conclusion, an educational program in which the family as well as the patient is provided with information concerning the etiology of the disease is very important; a similar one which explains the pathogenetic mechanisms involved in the illness, what the course and prognosis are likely to be, as well as the rationale for all therapeutic measures introduced, is also very helpful. This type of approach will assist most patients to improve and function more effectively.

Figure 2 is reprinted with permission from Dr. Irwin Kass.

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