



Precautions in Using Pharmacologic Agents for COPD

Precautions when using β_2 -agonists

Inhaled β_2 -agonists may cause tremor, increased heart rate, insomnia, restlessness, hypokalemia, or a paradoxical reduction in arterial oxygenation

Avoid overuse. Check number of MDIs used per month against number of puffs per MDI (120 to 300+, depending on brand)

Instruct patients on maximum number of puffs per day (usually 8 to 12) and on number allowed during an exacerbation (e.g., 12-24 over 3-4 hours) before additional intervention is required

If a long-acting agent is used for maintenance therapy, educate the patient that only short-acting β_2 -agonists should be used for breakthrough symptoms

Home nebulizers with inhalant solutions providing large dosages are rarely needed. Exceptions generally relate to mechanical inability to use an MDI or other type of inhaler such as a dry powder inhaler (e.g., arthritis)

Precautions when using ipratropium

Inhaled ipratropium may cause dry mouth or increased heart rate, or exacerbate glaucoma, benign prostatic hypertrophy, or other conditions potentially worsened by the drug's anticholinergic activity

Patients should generally use a spacer and should avoid spraying into eyes

Caution patients that onset of effect is relatively slow compared to short-acting inhaled β -agonists and that additional doses should not be taken for acute symptom relief

In general, dose-related systemic side effects of inhaled anticholinergics are less severe when using ipratropium than those produced by inhaled β_2 -agonists

Precautions when using theophylline

Theophylline has dose-related side effects that include insomnia, anxiety, nausea, vomiting, tremor, arrhythmias, delirium, seizures, and death

Drug interactions with theophylline are common, and all changes in a patient's medical regimen should be reviewed for their potential effect on serum theophylline levels

Initiate treatment with a low dose (e.g., 200 mg/day) and adjust after a few days

Aim for a serum level of 5-12 $\mu\text{g}/\text{mL}$; adjust dosage and follow serum level when indicated

Check the serum level of theophylline when symptoms change, acute illness develops, new drugs are added, or symptoms develop suggesting toxicity

Reduce dosage if drug clearance is likely to be impaired because of illness, liver malfunction, or concomitant drugs

Instruct patients not to take additional theophylline preparations

Theophylline should be taken at the same time each day with respect to meals

Attempts to withdraw theophylline, even at lower plasma levels, should be done cautiously because deterioration in pulmonary function and exercise performance may occur

Precautions when using oral corticosteroids

Chronic use of oral steroids is rarely indicated due to the usual poor response and the adverse effects

Adverse effects of oral corticosteroids include hypertension, hyperglycemia, weight gain, personality changes, depression, immunosuppression, glaucoma, cataracts, skin thinning, purpura, osteoporosis, osteonecrosis, and adrenal suppression. In general, side effects are more common with prolonged therapy

Reduce dosage to lowest effective daily dose or to alternate-day dosing as quickly as symptoms allow

Administer stress dose steroid therapy to patients with severe illness or injury who have received prolonged oral corticosteroid treatment. Adrenal insufficiency may extend for up to a year following the discontinuation of steroids

Prevent or treat osteoporosis with calcium, vitamin D, hormone replacement therapy, or other therapies as appropriate for patients on prolonged oral corticosteroid therapy

Precautions when using inhaled corticosteroids

Adverse effects of inhaled corticosteroids include oral candidiasis, hoarseness, and possible adrenal suppression at high doses. Inhaled steroids should be reserved for patients whose symptoms are not controlled on bronchodilators and should be stopped if there is objective or subjective benefit. This may take some time to assess because a reduction in exacerbations is one of the possible benefits

Instruct patients to use a spacer (if not contraindicated) and rinse the mouth after use to decrease the likelihood of local complications

Be aware that systemic effects of corticosteroids may occur in skin, bone, eyes, and other organs, especially with the use of high-dose inhaled corticosteroids

Stress-dose oral or intravenous corticosteroids may be necessary in some patients with severe illness or injury who have been treated with high-dose inhaled corticosteroids

Seek objective evidence of the value of this therapy, because its use may decrease compliance with other aerosol usage

When introducing aerosol steroids in a patient taking an oral steroid, wean slowly off the oral drug

COPD = chronic obstructive pulmonary disease; MDI = metered-dose inhaler.

Adapted from Standards for the diagnosis and care of patients with chronic obstructive pulmonary disease. American Thoracic Society. *Am J Respir Crit Care Med.* 1995;152:S77-121. (PMID: [7582322](#)).

Table adapted from *Physicians Information and Education Resource (PIER)*, COPD module.