Factors determining the level of control involve an assessment of the following: daytime symptoms experienced in the last week, limitations in activities of daily living, nocturnal symptoms or awakenings, need for rescue reliever medication during the week, lung function, and number of exacerbations (if any) in the last week and last year.

Stepwise Treatment

The stepwise approach to asthma management incorporates a description of the levels of treatment required to achieve good asthma control.[1] Some patients may experience acute worsening of asthma control, such as those with a concomitant upper respiratory tract infection, and may need to step up more than one step at a time.

Step 1

For all asthma patients, a SABA delivered by a metered-dose inhaler gives relief of acute symptoms. Updates to global strategy documents for the management of asthma and some national country guidelines now incorporate ICS treatment at step 1, recognizing the nature of asthma as chronic inflammatory disease and the need to control (and treat worsening) symptoms with ICS maintenance therapy.[98] The increasing use of a short-acting reliever medication more than three times a week, or triggering of symptoms from exercise, provide indications that controller therapy is needed. Recent studies in the management of mild asthma suggest the use of an ICS with formoterol in combination as a rescue medication, instead of a SABA; however, this approach is as yet unlicensed.[63,64]

An important, but often overlooked, part of asthma management relates to measures to control environmental triggers. Recognized triggers that worsen asthma control, such as aeroallergens or occupational agents, should be avoided, although this is not always possible. Patients with asthma may also have several triggers; therefore, the impact of avoiding a single trigger will vary considerably between patients. However, complete removal from exposure to house dust mite has been shown to reduce asthma severity and airway hyperresponsiveness.

Guidelines recommend that influenza vaccination should be administered in adult asthmatics. However, while studies suggest it is unlikely to induce asthma exacerbations, there is no conclusive evidence regarding the efficacy of vaccination on influenza-related asthma complications or on frequency of exacerbations. Asthmatic patients, especially the elderly or those with comorbid conditions that increase the risk of death from influenza infection, should receive inactivated influenza vaccine if there are no other contraindications. The CDC recommends a single dose of Pneumovax for adults from 19 to 64 who have chronic illnesses, including asthma.

Steps 2–3

When patient symptoms are no longer intermittent, addition of a daily long-term controller medication on a scheduled daily basis is recommended. The treatment of choice for all patients is an ICS to alleviate the underlying airway inflammation. It is usual to start with a low-to-intermediate dose of ICS twice daily (e.g., 200 μg beclomethasone dipropionate [BDP] or equivalent BID), and if symptoms are controlled after 3 months the dose should be stepped down. An alternative option is to prescribe as-needed low-dose ICS/formoterol. However, if symptoms persist and are not controlled, a LABA should be added as a fixed combination drug, with an ICS delivered from a single inhaler device, as studies show a clinical advantage compared with the monocomponents administered using two separate inhalers. Indeed, low-dose ICS in combination with LABA therapy shows complementary molecular action and has been shown to be as efficacious at high-dose ICS treatment.[99] The dose of the ICS should be adjusted up or down based on the need for rescue inhaler use and patient symptoms. Alternative add-on therapies to ICS that can be considered include an antileukotriene or low-dose ICS whenever a SABA is taken; however, these are less effective than the ICS/LABA combination.

Steps 4–5

In patients with worsening symptoms, addition of a long-acting muscarinic antagonist or a leukotriene antagonist to medium-dose LABA/ICS may be helpful. The addition of the inhaled long-acting anticholinergic tiotropium bromide to LABA/ICS treatment in patients with poorly controlled asthma significantly decreases asthma exacerbations and improves lung function.[100,101] For those whose disease remains uncontrolled, stepping up with high-dose ICS/LABA is a follow-on option.

In patients with severe asthma who fail to achieve symptom control, maintenance therapy with a systemic oral CS may be indicated; however, in view of the side-effect profile of oral CS, the clinician should always aim to titrate to the lowest possible daily (or every other day) dose that maintains asthma control.

Anti-IgE therapy with omalizumab may be tried in patients with severe allergic asthma, especially those who are CS-dependent and continue to remain uncontrolled. However, this treatment is only suitable for highly selected patients.

Anti-eosinophil biologic therapies may be considered for patients with uncontrolled severe asthma with increased blood eosinophils; benralizumab is given every 8 weeks, whereas mepolizumab and reslizumab are given by monthly injection. For asthmatics who have severe asthma with increased FeNO, dupilumab is preferred, especially in patients with concomitant nasal polyposis, rhinosinusitis, and atopic dermatitis. Allergen-specific immunotherapy may be considered in this group; however, the risk of severe events, including death, is highest in patients with severe asthma. Biologic therapy is also now indicated in a small proportion of patients.

Step-Down Treatment

Once symptoms of asthma are stable and the patient demonstrates stable peak flow readings, the clinician should slowly decrease therapy to find the optimal dose to control symptoms. Indeed, asthma severity may fluctuate and improve with time, owing to improved disease management, changes in environmental exposure, or the natural history of the disease. Most asthma guidelines recommend a step-down approach once patients are controlled.[1]

Overtreatment of patients, particularly with ICS, can cause significant morbidity and adverse effects, especially in moderate to severe asthmatics. Such treatment may also be unnecessarily costly. Unfortunately, in such patients there is a tendency to maintain a static treatment regimen, even after symptoms are controlled and clinical stability achieved. Studies have now supported the notion that stable asthmatic patients on high-dose ICS may be overtreated, and that reductions in the inhaled dose can be achieved without significant increases in asthma exacerbations, physician visits, or recourse to oral CS use.[102] Indeed, recent studies show that an efficient inhaler device may achieve a successful step-down without worsening symptoms, disease exacerbations, or hospitalizations.[103]

A gradual reduction in medications, starting with the treatment with the greatest toxicity, should be attempted once stability is achieved and sustained for several months. Symptoms should be monitored on a long-term basis using both objective lung function and subjective symptom measures. Most patients should be maintained on an ICS, and this treatment should not be stopped since it provides anti-inflammatory protection. For asthmatic patients who needed admission to hospital or ventilatory support, a longer period of stability on maintenance therapy may be justified before consideration of a step-down treatment approach.