The Management of Asthma
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Introduction
Asthma is a chronic lung disease that involves the inflammation and constriction of the airways. It is characterized by recurring periods of wheezing, chest tightness, shortness of breath, and coughing. The exact cause of asthma is not known. However, researchers believe a combination of factors interact to cause asthma to develop, most often early in life. These factors include: atopy or an inherited tendency to develop allergies; family history of asthma; and contact with airborne allergens or exposure to viral infections, including respiratory syncytial virus and parainfluenza virus, in infancy or in early childhood when the immune system is developing. Different factors may be more likely to cause asthma in some people than in others.

Epidemiology
Asthma affects people of all ages, but it most often starts in childhood. In the United States, more than 22.9 million people are estimated to have asthma. Nearly 9.1 million of these people are children based on 2007 estimates. Moreover, asthma prevalence is highest among blacks (10.2 percent), followed by whites (7.6 percent), and Hispanics (6.8 percent) including Puerto Ricans (14.1 percent) and Mexican/Mexican-Americans (5.8 percent).

In 2007, asthma accounted for 3,447 deaths in the United States. Moreover, asthma deaths were higher among adults than among children, and higher among women than men. According to 2007 data, asthma costs the United States more than $30 billion every year.

According to 2006 data, an estimated 444,000 hospital discharges related to asthma were recorded with an average length of stay of 3.2 days. Additionally, asthma accounted for 1.1 million hospital outpatient visits and 1.6 million emergency department visits. Also, an estimated 10.6 million asthma-related visits were made to physician offices.

Treatment of Asthma
The diagnosis of asthma is based on a patient’s medical history, physical exam, and results from pulmonary function tests (spirometry can be utilized in children ≥ 5 years of age as long as they are physically able). Asthma is then further classified by level of severity: intermittent, mild persistent, moderate persistent or severe persistent. The severity level determines the treatment plan.

The goal of asthma management is to achieve control of the disease. Asthma control is defined by 1) preventing chronic and troublesome symptoms such as coughing during the day and night, and shortness of breath; 2) reducing the need of quick-relief medicines; 3) maintaining lung function; 4) maintaining normal activity levels; and 5) preventing asthma exacerbations that could result in patient emergency room visits or hospitalization. To reach these goals, patients and/or their parents should actively partner with their healthcare providers to manage their asthma. This involves the creation of and following an asthma action plan. An asthma action plan gives guidance on taking medications properly, avoiding factors that worsen asthma, tracking levels of asthma control, responding to worsening asthma, and seeking emergency care when needed.
Asthma is considered "well controlled" if the patient: 1) has symptoms no more than 2 days a week and the symptoms do not wake the patient from sleep more than one night a month for children 0 to 11 years of age or more than 2 nights a month for youth and adults; 2) can carry out all normal activities; 3) uses their SABA no more than 2 days a week; 4) has no more than one asthma attack a year that requires corticosteroids to be taken by mouth; and 5) readings from their peak flow meter is greater than 80 percent of their predicted/personal best number.1

Asthma medications are generally categorized as long-term control or quick-relief rescue medications. Controllers may help reduce airway inflammation and prevent asthma symptoms and include corticosteroids, immunomodulators, leukotriene modifiers, long-acting bronchodilators, mast cell stabilizers, and methylxanthines. Quick-relief or "rescue" medications relieve asthma symptoms that may flare up, such as short-acting bronchodilators and anticholinergics.1

Scheduling follow-up visits to continually assess the level of asthma control is essential to disease management. Medication adjustments help achieve maximum control with the minimum effective dose. Of note, asthma treatment for certain groups of people, such as children, pregnant women, or those for whom exercise brings on asthma symptoms or for those for whom will undergo surgery, will need to be adjusted to meet their special needs.1

It is also important that all asthma patients, or their caregiver, collaborate with their healthcare provider to develop a personalized, written action plan. The asthma action plan shows the patient’s daily treatment, such as what type of medicines to take and when to take them. It also explains when to call the doctor or go to the emergency room. If a child has asthma, all persons who care for the child should know about the child's asthma action plan. This includes babysitters and workers at daycare centers, schools, and camps. These caregivers can help the child follow their action plan. A sample asthma action plan that can be viewed at: http://www.nhlbi.nih.gov/health/public/lung/asthma/asthma_actplan.pdf.1

Identifying asthma triggers and comorbidities that can exacerbate asthma is another key component of asthma management. Once a patient knows what these factors are, they can take steps to control many of them. Additionally, there are several comorbid conditions can make asthma more difficult to manage that may need to be treated. These conditions include rhinitis, sinusitis, gastroesophageal reflux disease, obesity, psychological stress, and obstructive sleep apnea.1

**Asthma Pharmacotherapy**

In general, pharmacologic therapy is used to prevent and control the symptoms of asthma, improve quality of life, reduce the frequency and severity of exacerbations, and reverse airway obstruction. Since an inhaler allows the medication to go directly to patient’s lungs, most asthma medications are delivered by an inhaler. However, not all inhalers are used the same way. Thus patients must be instructed in proper inhaler technique prior to starting inhaled therapy and then assessed at each visit.1

There are many things to consider when selecting asthma medications. In general, a stepwise approach to treatment, taking into consideration asthma severity and control and current medication regimen, is recommended.1 These stepwise approaches to therapy for both children and adults can be found in the National Education and Prevention Program Expert Panel report 3 or accompanying summary report located at: http://www.nhlbi.nih.gov/guidelines/asthma/index.htm.1

Most patients will require a long-term control medication daily to help prevent symptoms. The most effective long-term control medications reduce airway inflammation. Inhaled corticosteroids (ICS) are the preferred medicines for long-term control of asthma and are the most effective long-term control medications used to relieve airway inflammation. ICS therapy is generally safe when taken as prescribed; however, side effects can occur. However, the benefits of ICS therapy and preventing asthma attacks far outweigh the risks of side effects.1

One common side effect from ICS therapy is oral candidiasis. A patient can use a spacer or holding chamber to avoid the development of this adverse effect. Additionally, patients should rinse their mouth out with water after using an ICS to further prevent the risk of thrush and/or systemic absorption.1

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Systemic corticosteroids may be needed to control severe asthma symptoms. However, when used for long periods, these medicines raise the risk for cataracts and osteoporosis. If a patient is still experiencing asthma symptoms while on an ICS, another long-term controller may need to be added. Long-acting beta₂-agonists (LABAs) are one of the preferred adjunctive therapies to low-dose ICS in patients ≥12 years of age needing a step-up in therapy.

Due to safety concerns, the FDA announced in February of 2010 changes to LABAs place in asthma therapy. These changes are based on the analyses of studies showing an increased risk of severe exacerbation of asthma symptoms, leading to hospitalizations in pediatric and adult patients as well as death in some patients using LABAs for the treatment of asthma. These new recommendations include the following:

- The use of LABAs alone is contraindicated.
- The addition of LABAs should only be used long-term in patients whose asthma cannot be adequately controlled on asthma controller medications.
- LABAs should be used for the shortest duration of time required to achieve control of asthma symptoms and discontinued, if possible, once asthma control is achieved. Patients should then be maintained on an asthma controller medication.
- Pediatric and adolescent patients who require the addition of a LABA to an inhaled corticosteroid should use a combination product containing both an inhaled corticosteroid and a LABA, to ensure compliance with both medications.
- LABAs should not be used in patients adequately controlled on low or medium dosed ICS.

Moreover, the FDA is requiring a Risk Evaluation and Mitigation Strategy (REMS) for LABAs which will include a revised Medication Guide written specifically for asthma patients, and a plan to educate healthcare professionals about their appropriate use. Additionally, the FDA is requiring the manufacturers to conduct additional clinical trials to further evaluate the safety of LABAs when used in combination with inhaled corticosteroids. However, the FDA did not request the withdrawal of LABAs from the market because their benefits in improving asthma symptoms when used appropriately with a controller outweigh the potential risks. These new recommendations led to class-labeling revisions to all LABA-containing products, including Dulera® (mometasone furoate/formoterol fumarate dehydrate) which is the newest LABA-containing product approved for the treatment of asthma in patients 12 years of age and older.

Other long-term controllers include leukotriene modifiers, which can be useful in patients that also have allergic rhinitis, mast cell stabilizers, or methylxanthines. Immunomodulators, such as omalizumab (anti-IgE) may be used as adjunctive therapy in patients ≥12 years of age that have allergies and severe persistent asthma that is inadequately controlled with the combination of high-dose ICS and LABA therapy.

All patients who have asthma need a quick-relief medication to help relieve asthma symptoms. Inhaled short-acting beta₂-agonists (SABAs) are the first choice for quick relief. These medications cause bronchodilation when the patient is having an exacerbation. SABAs should be used at the first observation of asthma symptoms. Patients should be reminded to always carry a quick-relief inhaler with them at all times in case it is needed. Because quick-relief medications do not reduce inflammation, patients with asthma should understand that quick-relief medicines should not be used in place of their long-term control medicines. If this medication is used more than two days a week, asthma control should be reassessed. If the patient’s asthma is not adequately controlled, changes to the patient’s asthma treatment regimen and action plan should be made.

**Conclusion**

Asthma is a chronic lung disease that affects many people and has a large impact on healthcare costs. Several medications can be used to control asthma and the symptoms associated with it. However, for successful, comprehensive, and ongoing treatment, patients with asthma should take an active role in managing their disease and build strong partnerships with their doctor and other healthcare providers.
For additional information on Asthma and patient education materials, please visit the following websites:

American Academy of Family Physicians [www.familydoctor.org](http://www.familydoctor.org)

References

To report medical fraud, contact the Medicaid Quality Assurance Bureau. NMMedicaidFraud@state.nm.us or (505) 827-3100 or (505) 827-3185.

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