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ASTHMA

WHAT IS ASTHMA?

Asthma is a condition of the lungs characterized by inflammation and reversible narrowing of the airways. Airway narrowing occurs due to constriction of the smooth muscles surrounding the airways. Secretions of mucous into the airways and inflammation of airway lining causes wheezing, shortness of breath, cough and chest tightness.

Asthma is very common (one in four persons have a history of wheezing). It is often associated with hay fever, eczema, or a family history of asthma or allergy. Most children have fewer, less severe attacks as they grow older. In almost all cases, we expect normal growth and development and no permanent damage to the lungs as a result of asthma.

WHAT CAUSES ASTHMA?

Causes of recurrent, reversible airway narrowing include:

1. Allergy – 80 to 90% of children with asthma have allergic asthma.
2. Infections – viral infections are the major trigger of acute asthma in children especially young children.
3. Changes in temperature, humidity, or barometric pressure
4. Irritants such as cigarette smoke, air pollution, dust and chemical odors
5. Exercise – Albuterol is often given prior to exercise to prevent exercise induced narrowing of the airways.
6. Emotional upset

WHAT TESTS ARE DONE?

Pulmonary function tests are needed to determine how much narrowing or obstruction of the airway is present. Pulmonary function is measured with a Spirometer or Peak Flow Meter. Children usually have to be four or five years of age in order to cooperate in pulmonary function tests. Pulmonary function tests help us to determine response to medication and also to judge the severity of asthma. These are invaluable tools in regulating medication. Skin tests may also be needed to determine which allergens may be causing wheezing.



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WHAT DO I DO FOR AN ASTHMA ATTACK?

In the event of an asthma attack including coughing, breathing hard, wheezing and complaining of shortness of breath or tightness of the chest, you should take the following steps:

1. Stay calm and quiet.
2. Take slow, deep breaths and exhale very slowly.
3. Use of bronchodilator via inhaler or nebulizer at intervals that have been prescribed
4. Call us if problems do not ease.
5. Patients with asthma should not use aspirin for fever as this may aggravate the symptoms in 10 to 15% of patients. Acetaminophen (Tylenol, Datril, etc.,) should be used in the appropriate dose for the patient.

WHAT ARE THE TREATMENTS FOR ASTHMA?

Since asthma has no cure, the aim of treatment is to control symptoms of asthma and to normalize lung function so the patient can lead a full life. When a particular substance or situation brings on an attack, it should be avoided. Medication should be taken prior to exercise to prevent exercise induced asthma if this is a problem. The treatment of asthma may include a variety of medications taken by injection, inhalation, or orally. Several medications may be tried before the right combination and dosage of medication is determined for each individual. The medications used to treat asthma include:

- I. Bronchodilators
 - A. Theophylline
 - B. Beta-Agonist (short acting)
 - a. Epinephrine (Adrenalin)
 - b. Metaproterenol (Alupent)
 - c. Pirbuterol (Maxair)
 - d. Albuterol (Ventolin, Proventil)
 - e. Levalbuterol (Xoponex)
 - C. Beta-Agonist (long acting)
 - a. Salmeterol (Serevent)
 - b. Formoterol (Foradil)
 - D. Anticholinergic
 - a. Ipratropium (Atrovent)
 - b. Tiotropium (Spiriva)



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- II. Cromolyn Sodium (Intal)/Nedocromil (Tilade)

- III. Steroids
 - A. Oral (Prednisone, Prelone, Medrol, Orapred)
 - B. Inhaled (Qvar, Asmanex, Azmacort, Flovent, Pulmicort)

- IV. Leukotriene Modifiers (Singulair, Accolate, Zflo)

BRONCHODILATORS

- A. Theophylline: Theophylline relaxes smooth muscles around the airways and thereby relieves airway constriction. Depending on the frequency and severity of symptoms, theophylline may be taken either regularly or on an intermittent basis. It is often combined with Beta-Agonist medications to relieve asthma symptoms. Side effects may occur which include nervousness, headache, irritability, palpitations, nausea and vomiting. These symptoms may be decreased by taking medications with a snack and usually go away or become lessened after the drug is taken for several days. If this does not occur, it may be necessary to adjust the dosage of the drug in order to avoid the side effects. It is possible, and often it is valuable, to measure the level of theophylline in the blood in order to maximize the benefit and minimize the side effects.
- B. Beta-Agonist: Also are given to relax airway smooth muscles. The beta-Agonist may be given by mouth, injection, or by inhalation. Side effects that may occur include: nervousness, rapid heart rate and muscle tremor. Side effects are usually dose related and may be minimized with dosage adjustments. Overuse of inhaled preparation can cause irregularities in the heart beat. If symptoms cannot be controlled with prescribed frequency of use, it is important to contact the care provider for adjustment of therapy. These drugs are most effective when given via inhalation.
 - a. Anticholinergic: Bronchodilator that may be helpful in some asthma in some asthma patients. This drug may be combines with Beta-Agonist.

CROMOLYN SODIUM (INTAL)/NEDOCROMIL (TILADE)

These drugs are non-steroidal airway stabilizers and are used to prevent wheezing by blocking the allergic reaction and stabilizing the airways. They have no value in the treatment of an acute attack of asthma and must be taken on a daily basis to be effective. Both drugs may be helpful in preventing exercise induced asthma.

STEROIDS



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- A. Oral Steroids (Prednisone, Prelone, Medrol, Orapred): Steroids work to decrease airway swelling and to improve the response to bronchodilator medications. Steroids are the most feared and misunderstood of asthma medications. Actually Cortisone (Prednisone) is a natural hormone made daily by the body's adrenal gland. Problems only occur when large doses are administered daily over many weeks. A one week course of Prednisone is safe. Prednisone taken every other morning is another safe and effective method of controlling patients with severe asthma. However, this must be done with careful physician supervision.
- B. Inhaled Steroids (Qvar, Asmanex, Flovent, Pulmicort): Administered directly into the airways by inhalation of an areolized steroid. The powder works topically to reduce airway swelling and to powder works topically to reduce airway swelling and to stabilize the airway. During acute attacks, prednisone may be temporarily substituted for the inhaled steroid. The mouth must be rinsed with water after using inhaled steroids to prevent local oral infections and decrease systemic absorption.

LEUKOTRIENE MODIFIERS: This class of drugs block the effect of leukotriene mediators which cause both airway inflammation and bronchospasm. These medications are given orally. Athmatics who experience symptoms with cold air exposure, exercise and aspirin are often helped with this class of drugs.

Although asthma is not a "curable" disease, it can be controlled with an appropriate medication program and with specific allergy therapy when indicated. Do not hesitate to ask other questions you might have because only with a more complete understanding of asthma will a treatment program be most effective.

Technique for Metered Dose Inhaler:

1. Start slow inhalation after a normal breath is finished.
2. A holding chamber or spacing device should be used to improve drug delivery.
3. Breathe hold for 10 seconds after inhalation to allow for better airway deposition of the drug.
4. If multiple inhalers are used, the bronchodilator inhaler should be used first.

Peak Flow Meter:

Use of a peak flow meter to monitor lung function at home can be a very important tool for adjustment of your medication and monitoring your progress. Changes in your lung function (peak flow) reading can indicate the early onset of asthma problems and can help guide you and your health care provider in your optimal asthma care plan.