

ASTHMA CARE

SCOPE OF THE PROBLEM

A. Incidence & Prevalence

1. Asthma is a common disorder that affects 15 to 17 million people in the United States
2. Thought to occur in 6.2% of the US population
3. Most common chronic disease of childhood, affecting an estimated 4.8 million children
4. Causes approximately 100 million days of restricted activities each year.
5. Asthma precipitates more than 2 million adult emergency department visits each year
6. 500,000 hospitalizations occur annually due to exacerbation of asthma symptoms; ranks as the 6th leading cause of hospital admissions
7. More than 5,000 deaths due to asthma occur each year in the United States – most are preventable

B. Costs: Total economic impact of asthma is \$6.2 billion – including hospitalizations, emergency department visits, outpatient visits and lost school and workdays

C. The Asthma Trend

1. Self-reported asthma has increased by 75% from 1980 to 1994
2. Asthma among children is a growing problem with a 72% increase between 1982 and 1994
3. Death and disability related to asthma has increased dramatically over the past 20 years

D. The History of Asthma Management

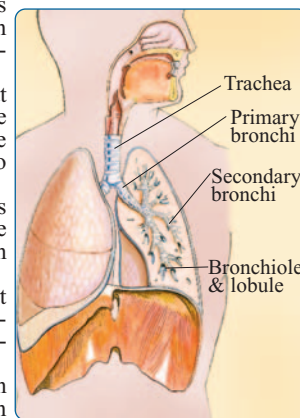
1. Many patients and their physicians underestimate asthma's severity
2. For more than 35 years, asthma was considered to be an episodic, reversible airway constriction
3. Advances in medical research have shown that asthma should be considered a chronic airway inflammatory disease characterized by at least partially reversible airway constriction
4. The severity of symptoms do not often correlate with the objective physical findings
5. Despite the availability of effective anti-asthmatic medications, many people have asthma that is not well controlled
6. Inadequate treatment and inappropriate therapy are the major contributors to asthma illness and death
7. The National Heart, Lung, and Blood Institute published new guidelines in 1997 as a means to improve the detection and treatment of asthma
8. The **four key components** for asthma control in the NHLBI guidelines are:
 - a. Assessment and monitoring (how to detect and watch the trend of asthma)
 - b. Pharmacological therapy (medications used to maintain long-term control of asthma symptoms)
 - c. Control of factors contributing to asthma severity (identifying and removing triggers for asthma)
 - d. Individual education for a partnership in asthma care (developing an individualized care plan written by the patient and physician to help the asthmatic person take control of their disease)

PHYSICAL CHANGES

A. What happens when you breathe?

1. When you breathe in, air travels through your nose and/or mouth through a tube called the **trachea** (also known as the “windpipe”)
2. Air enters a series of smaller tubes that branch off from the trachea; these branched smaller tubes are the **bronchi**, and they divide further into smaller tubes called the **bronchioles**
3. It is in the bronchi and the bronchioles that asthma has its main effects; there are three components that result in difficulty breathing:
 - a. When the airways come into contact with an asthma trigger, the tissue inside the bronchi and bronchioles become inflamed (**inflammation**)
 - b. At the same time, the muscles on the outside of the airways tighten (**constriction** or **bronchospasm**), causing the airways to narrow
 - c. A thick fluid (**mucus**) enters the airways, which become swollen and may be partially or completely plugged by the mucus

RESPIRATORY SYSTEM



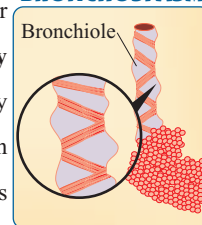
B. Inflammation

1. Inflammation occurs when an exposure to an asthma trigger causes cells within the airways of the lung to release strong substances that result in airway **tissue swelling**
2. Swelling of the airway wall causes it to become more **rigid** and interferes with airflow
3. This inflammation results in a complex interaction within the lung's airways, resulting in **bronchospasm**
4. Inflammation of the airways is an early and persistent component of asthma
5. Persistent, inadequately treated inflammation may lead to **permanent changes** in the airway structure

C. Bronchospasm

1. Bronchospasm is an exaggerated **tightening** of the airways resulting in a smaller sized opening for air to pass in and out of the lungs during breathing
2. Bronchospasm is also referred to as **airway hyperresponsiveness**
3. The propensity for airways to narrow too easily and to “mush” is a major feature of asthma
4. Bronchospasm may result from exposure to an **asthma trigger**
5. The level of airway narrowing usually correlates with the severity of the asthma attack

BRONCHOSPASM



D. Mucus Production

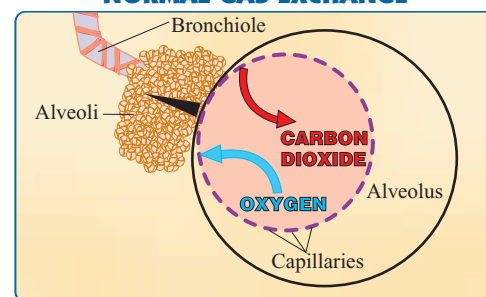
1. Increased mucus production results when glands within the airways release an excess of thick mucus during an attack
2. Although this is meant to protect the lung from a trigger, this thick, abundant mucus results in further narrowing of the airways, even to the point that the mucus actually clogs a small airway completely

WHAT IS ASTHMA?

- A. Asthma is a life-long disorder of the lungs and airways
- B. It is characterized by **airway inflammation** or swelling combined with excessive airway tightness, resulting in a restriction of airflow into and out of the lungs
- C. Asthma has a **recurring pattern** of periodic episodes of difficult breathing alternating with periods of relief
- D. Asthma involves many **cells** and **cellular elements** within the body that play a role in its long-term effects
- E. During an asthma episode, you may feel like you cannot catch your breath and you may cough, **whoeze** or **feel chest tightness**
- F. Symptoms occur more frequently at **night** or in the **early morning**
- G. Characterized by sudden periodic episodes of difficulty
 1. Often referred to as “attacks,” they are usually related to exposure to a **trigger** (a certain substance that a person's airways are sensitive to)

2. The most common triggers include:
 - a. Strong emotional expression (laughing or crying hard)
 - b. Aspirin and other medications
 - c. Smoke (tobacco, wood)
 - d. Changes in weather
 - e. Pollen
 - f. Dust
 - g. Animal fur and dander
 - h. Feathers
 - i. Molds
 - j. Grass
 - k. Viruses
 - l. Cold air
 - m. Exercise

NORMAL GAS EXCHANGE



INDICATIONS

(Correlates to Measurement and Monitoring of the NHLBI 1997 Recommendations)

A. Initial Assessment: When your physician is considering the possibility you may have asthma, he will most likely take the following steps:

1. Obtain a detailed **medical history** from you, looking for the following indicators:
 - a. **Wheezing:** High-pitched whistling sounds when breathing out.
 - b. A recurrent history of **cough** (that is worse at night), **difficulty breathing** and **chest tightness**
 - c. Symptoms that occur or worsen in the presence of any of the triggers listed on previous page
 - d. **Family history:** The doctor may ask if any of your family members have problems with asthma or allergies
 - e. Your physician may ask you many questions about your **home**, including how old it is, how it is heated and cooled, whether you have carpet or concrete and if you have any pets
 - f. He/she will also ask if anyone **smokes** in your home or around you
 - g. Your doctor will ask you about your **job** or **school** to determine if there are exposures outside the home that may trigger asthma
2. **Perform a physical examination**
 - a. Physical examination focuses on the upper respiratory tract, chest and skin
 - b. The physician will look for over-expansion of the chest with the appearance of hunched shoulders and chest deformity
 - c. Assessment of the number of chest, neck and abdominal muscles used to breath in and out
 - d. He/she will listen for the sounds of wheezing and for prolonged time spent breathing out (exhalation)
 - e. An asthmatic person may have increased nasal secretions and swelling of the mucous membranes of the nose and mouth
 - f. The physician will also look for any signs of an allergic skin condition, such as dermatitis or eczema

3. Diagnostic Testing

- a. Spirometry Measurements
 - 1) A painless breathing test that measures your lung power
 - 2) You may be asked to repeat this breathing test after inhaling some medication; this helps determine whether there is airflow obstruction and whether it is reversible
 - 3) Generally used in adults and children over age 4
 - 4) Typically measures **Forced Vital Capacity** or FVC, the maximal volume of air forcibly exhaled from the peak of inhalation
 - 5) Also measures **Forced Expiratory Volume in 1 second** or FEV₁, the volume of air exhaled during the first second of the FVC
- b. These additional studies are not routine, but may be considered:
 - 1) Further pulmonary function studies: An expansion of the painless breathing test
 - 2) Chest x-ray: A radiographic image of your chest
 - 3) Allergy testing: Skin testing to determine what you are allergic to
- c. The presence of multiple key indicators along with the spirometry measurements are needed to determine the likelihood of asthma

B. Determining the Severity of Asthma: Once your physician has determined that you have asthma, it may be classified into one of the following categories, based upon how asthma is affecting you; this will determine which treatment is best suited for you

1. **Mild intermittent** asthma:
 - a. Symptoms 2 or fewer times a week
 - b. No symptoms between episodes
 - c. Episodes usually brief
2. **Mild persistent** asthma:
 - a. Symptoms more than twice a week, but less than once a day
 - b. Episodes may affect physical activity
3. **Moderate persistent** asthma:
 - a. Daily symptoms
 - b. Asthma episodes 2 or more times a week (some may last days)
 - c. Episodes interfering with physical activity
4. **Severe persistent** asthma:
 - a. Symptoms most of the time
 - b. Physical activity limited
 - c. Frequent asthma episodes

C. All that Wheezes is Not Asthma

1. Although wheezing is a key symptom of asthma, there are other things that must be considered before labeling a person as an asthmatic, or an episode of breathlessness as an asthma attack
2. For instance, if a child in respiratory distress with an audible wheeze is automatically labeled asthmatic, you could miss the presence of a foreign body that has become lodged in the upper airway with detrimental or deadly consequences
3. It is important to consider the history, current symptoms and health examination findings as a whole, not assuming anything without putting these all together

4. Some other conditions may also result in wheezing:
 - a. Foreign body aspiration
 - b. Cystic fibrosis
 - c. Croup, or other viral infections of the upper airway
 - d. Inflammation of the epiglottis
 - e. Tuberculosis
 - f. Habitual cough
 - g. Congestive heart failure
 - h. Chronic obstructive lung disease
 - i. Allergic reaction to an inhaled substance

D. Goals of Asthma Therapy:

1. Prevent chronic and troublesome symptoms
2. Maintain near normal or normal lung function
3. Maintain normal activity levels
4. Prevent recurrent exacerbations of asthma and minimize the need for emergency department visits or hospitalizations
5. Provide optimal medication management with few or no side effects
6. Meet the patient's and family's expectations of asthma care

E. Periodic Assessment and Monitoring:

1. Once your physician has determined that you have asthma and its severity, it is important that you are monitored in an ongoing manner
2. Ongoing monitoring will determine whether the goals of therapy are being met

TAKING CONTROL

Asthma doesn't have to put major limits on your life. There are many things that you can do to take control of your asthma and minimize its impact.

A. Know Your Asthma Symptoms: Any one of these symptoms may mean you have asthma, or may be having an attack; you can have one or more of these symptoms or even different ones

1. Wheezing
2. Difficulty catching your breath
3. Coughing
4. Tightness in the chest
5. Feeling tired
6. Trouble exhaling
7. Waking up often in the middle of the night
8. Heavy breathing

B. Track Your Triggers: Each case of asthma is unique; learn what can trigger an asthma episode for you; go over the list of common asthma triggers and check off the ones that set off your asthma episode or make them worse

- Air pollution – smoke or fumes
- Aspirin or other medications
- Breathing cold air, air conditioning
- Changes in the weather
- Cockroaches, their feces and dried body parts
- Colds, other respiratory infections
- Dust or dust mites
- Exercise, playing hard or using stairs
- High humidity
- Mold, mildew
- Perfume, body deodorants
- Pet fur or dander
- Pollen
- Stress
- Strong chemical smells – paint, cleaning fumes
- Strong emotional responses – laughing or crying
- Tobacco smoke
- Other

If you are not sure what triggers your asthma, it will help to keep a log of your asthma attacks such as the one below:

DATE & TIME OF ATTACK	WHERE WERE YOU?	WHAT YOU WERE DOING?	SPECIAL DETAILS
12/2/2003 2 PM	IN THE BASEMENT AT HOME	GETTING OUT THE HOLIDAY DECORATIONS	DUSTY, DAMP AND COLD

C. Limit Exposure to Asthma Triggers:

1. **Pets**
 - a. Keep pets away from the bedroom
 - b. Keep pets away from carpets or upholstery
 - c. Have pets bathed weekly
 - d. Keep pets outside
 - e. Find new homes for pets

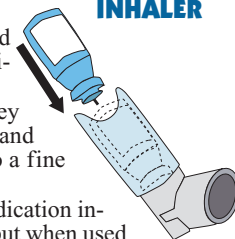
2. **Cockroaches**
 - a. Do not leave food out
 - b. Empty the garbage every night
 - c. Exterminate your home with poison baits or traps rather than chemical agents
3. **Mold and Mildew**
 - a. Reduce indoor humidity by installing a dehumidifier
 - b. Clean tubs, sinks and showers regularly with a bleach containing cleanser
 - c. Avoid damp places, such as basements
 - d. Clean heating and air conditioning ducts regularly
 - e. Replace worn carpet
4. **Dust Mites**
 - a. Encase your bed mattress and pillows in an allergen-impermeable cover
 - b. Wash sheets and blankets weekly in hot water
 - c. Avoid feather pillows and down comforters
 - d. Reduce indoor humidity
 - e. Remove carpet from the bedrooms
 - f. Avoid lying down on a carpeted floor or upholstered couch
 - g. Ask someone to vacuum for you or use a dust mask while vacuuming
 - h. Dust with a damp cloth weekly
 - i. Clean curtains and shades often
 - j. For children, minimize the number of stuffed toys and wash the toys weekly in hot water
5. **For Pollen**
 - a. Limit time spent outdoors during the season in which you have the greatest problem with allergies
 - b. Use air conditioning rather than opening windows
 - c. Stay inside during the midday and afternoon when the pollen count is highest
 - d. Avoid hanging laundry outside to dry
6. **For Allergies**
 - a. Consider allergy testing
 - b. Ask your physician about special treatment for allergies
7. **For Infections**
 - a. Ask your physician about an annual flu shot
 - b. Treat cold symptoms and respiratory infections promptly
8. **For Cold Air**
 - a. Breathe through your nose while outdoors so air is warmed
 - b. Wear a scarf around your face on extremely cold days
9. **For Smoke and other Irritants**
 - a. Avoid tobacco smoke!
 - b. Limit use of wood-burning stoves and fireplaces
 - c. Avoid strong-smelling products and perfumes
10. **Exercise**
 - a. If possible, avoid exertion outside when levels of air pollution or pollen counts are high
 - b. Speak to your physician about pre-medication prior to exercise or exertion
11. **Aspirin Sensitivity**
 - a. Use safe alternative medications in place of aspirin
 - b. Speak to your physician about what over-the-counter medications should be avoided
12. **Occupational Exposure**
 - a. Be aware of the possibility you may be exposed to asthma triggers in your workplace
 - b. Discuss avoidance, ventilation, respiratory protection and tobacco smoke-free environment with on-site health care providers or managers

MEDICATIONS

- A. **Long-term or maintenance medication** prevent asthma attacks
 1. Used daily as prescribed even if you feel no symptoms
 2. Not used for rescue therapy during an asthma attack
 3. Does not help reverse an asthma attack, but can prevent one
 4. Inhaled steroids are the **mainstay of maintenance** care or prevention
 5. May also use the following medications for maintenance:
 - a. Long-acting bronchodilators – smooth muscle relaxation
 - b. Most cell stabilizers
 - c. Leukotriene modifiers – pills used to prevent airway inflammation
 - d. Methylxanthines – pill or injection through a vein to counteract bronchospasm and inflammation
 - e. Allergy medications - as a pill or injection
- B. **Short-term or Rescue Therapy**
 1. Used to treat acute episodes/attacks
 2. Work by relaxing the muscle around the airways that tighten during an asthma attack, allowing the air tubes to open
 3. Short-acting bronchodilators (3 types)
 - a. Beta₂ agonists
 - 1) Preferred rescue therapy
 - 2) Inhaled agent (MDI [see below] or nebulizer treatment)
 - 3) Side effects include rapid heartbeat, anxiety, and tremors
 - b. Anticholinergic agents
 - c. Combination drugs

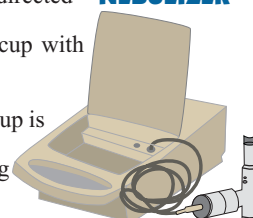
4. **Metered-Dose Inhalers (MDI's)**
 - a. Metered-dose inhalers are a primary means of delivering asthma medications
 - b. Metered-dose inhalers are devices designed to release a premeasured amount of medication into the air
 - c. They are not all alike, but in general they have a chamber that holds the medication and a propellant that turns the medication into a fine mist
 - d. When properly used, the MDI gets the medication into the airways where it is needed quickly, but when used incorrectly, symptoms may persist and worsen, leading to a severe asthma attack
 - e. Using a spacer attached to the MDI results in better delivery of the medication to airways; the spacer holds the discharged, premeasured cloud of medication mist in a chamber until the patient breathes in.
 - f. **How Do I Use a Metered-Dose Inhaler?**
 - 1) Before using any MDI, review the product instructions and ask your physician, nurse or pharmacist for help, if needed
 - 2) Remove the cap and look inside to see that nothing is blocking the mouthpiece
 - 3) Hold the inhaler upright with the mouthpiece at the bottom and shake it
 - 4) Attach to the spacer chamber (if you are using one)
 - 5) Tilt your head back slightly and breathe out fully
 - 6) Place the inhaler or chamber mouthpiece between your lips and seal it around the opening
 - 7) Press down on the inhaler to release the medication as you start to breathe in
 - 8) Breathe in slowly and steadily; take 3 - 5 seconds for each breath
 - 9) Hold your breath for 10 seconds to allow the medication to settle in the lungs
 - 10) Breathe out slowly
 - 11) Repeat puffs as prescribed by your physician
 - 12) If a steroid inhaler is used, rinse your mouth after use

METERED-DOSE INHALER



- g. **The Future of MDI's**
 - 1) Most MDI's deliver premeasured doses of medicine to the lungs using the propellant chlorofluorocarbons, or CFCs
 - 2) Too many CFCs can damage the ozone layer around the earth, so the Environmental Protection Agency has given manufacturers several years to develop alternative ways to deliver medications
 - 3) Several innovations are under way:
 - 4) Hydrofluoroalkane (HFA) propellant is environmentally safe; this form of MDI tastes less bitter and comes in a smaller canister size than the CFC MDI's
 - 5) Dry-powder inhalers (DPI) deliver medication without a propellant
 - This device releases a fine cloud of dry powder when the patient closes his lips around the mouthpiece and breathes in
- h. **Other Guidelines for Using MDI's:**
 - 1) Using an MDI requires some practice initially
 - 2) Over time, you may find your MDI use less precise
 - It is recommended that you practice the steps as outlined above every few months to ensure that you are using this device correctly
 - If you feel the inhaler spray land on your tongue or on the back of your throat, the medication is not reaching your lungs
 - You may want to practice the steps to improve your timing or demonstrate your technique for your physician
 - 3) A 200-puff canister should last 30 days
 - 4) If you use more than one type of MDI, clearly label each so that you use them as indicated; for example, label inhaled corticosteroid MDI's as daily and bronchodilators as quick relief treatment
 - 5) Clean spacers often
 - 6) If you have trouble using an MDI, ask your physician for a spacer device
5. **Using a Nebulizer**
 - a. A nebulizer machine turns medication into a mist, so the mist can be breathed in through a face mask or mouthpiece
 - b. There are many different kinds of nebulizers available, so ask your healthcare provider to show you how your nebulizer works
 - c. Read and follow manufacturer's instructions
 - d. Add medication to the nebulizer cup as directed by your physician
 - e. Attach the mouthpiece or mask to the cup with the medicine in it
 - f. Take deep, slow breaths
 - g. Continue until all the medication in the cup is used up
 - h. Rinse or wash the equipment according to manufacturer's recommendations

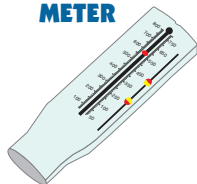
NEBULIZER



PARTNERING WITH YOUR PHYSICIAN

- A. Make an asthma diary** (See *Taking Control*, Page 2)
- B. Monitor Your Asthma with a Peak Flow Meter**
1. A **peak flow meter** measures how well your lungs are able to expel air
 2. Using one on a regular basis is an effective means of monitoring your asthma
 3. Peak flow meters come in many shapes and sizes, but they all work the same way
 - a. Each device consists of a plastic tube, a mouth-piece and a small pointer along a scale
 - b. When you seal your lips around the mouth-piece and exhale, the scale shows the amount of force of the air blown out of the lungs
 - c. This force is measured in liters per minute and is called the **Peak Expiratory Flow**, abbreviated PEF
 4. During an asthma attack, the airways become narrowed, causing symptoms discussed earlier under *Physical Changes*, Page 1
 - a. This narrowing does not occur suddenly, but builds up gradually. Your airways may have begun to narrow before you feel any symptoms of asthma
 - b. Monitoring your peak expiratory flow (PEF) can indicate airway narrowing even before you actually feel any symptoms
 - c. The trend of your PEF numbers can indicate an impending problem, allowing you to adjust your asthma medications accordingly to avoid a severe episode
 5. A peak flow meter can help both you and your doctor by:
 - a. Showing what makes your asthma worse
 - b. Helping to determine whether a particular treatment plan is working well
 - c. Signaling a need for more or different types of medications to add to your treatment plan
 - d. Setting a peak flow level that indicates emergency care is imperative.
 6. Peak flow meters can be used by anyone, including children ages 5 and older; **to use your peak flow meter:**
 - a. Slide the pointer all the way down to the bottom of the scale
 - b. Stand up and take a deep breath
 - c. Place your lips over the mouthpiece, taking care not to allow any gaps. Do not put your tongue inside the mouthpiece hole
 - d. Blow as quickly and as forcefully as you can in a single blow; the idea is not to see how long you can blow, but rather how fast and hard you can push the air out of your lungs
 - e. Take the meter out of your mouth and record the number next to the pointer
 - f. Repeat steps 1 through 6 for two more blows, recording the highest of the three measurements; record this number in your asthma diary
 7. **Charting Your Asthma**
 - a. When you first start using a peak flow meter, you should take PEF readings at least twice per day at various times and record these numbers
 - b. After 2-3 weeks, look over the numbers and pick out the highest reading
 - c. This number is your **personal best peak flow reading** and indicates good asthma control
 - d. Once you have found your personal best, your physician can help you set up three "zones;" these zones are based on percentages of your personal best number and can be used as guidelines for managing your asthma
 - 1) **Green Zone:** More than 80% of your personal best number; this signals good asthma control and that you should take your asthma medications as usual
 - 2) **Yellow Zone:** 50% - 80% of your personal best; this indicates caution; some airway narrowing is present, so you should take your short-acting quick-relief medication right away to prevent asthma symptoms; ask your doctor if you need to change or increase your daily medications and be especially careful to avoid your asthma triggers
 - 3) **Red Zone:** Less than 50% of personal best and indicates a medical alert; significant airway narrowing is present, and you must take your quick-relief medication right away and call your physician, or go directly to a local emergency room
 - 4) Remember these are general guidelines; talk to your doctor

PEAK FLOW METER



HELPING A CHILD MANAGE ASTHMA

- A.** The key to a normal childhood with asthma is to keep asthma under control. Be aware that you child may feel:
1. Different from other children
 2. Embarrassed
 3. Depressed
 4. Fearful that an asthma episode may get out of control
 5. Frustrated
 6. Angry
- B.** Help your child feel confident in his ability to keep asthma under control:
1. Help your child prepare for the doctor's appointment
 2. Help your child use the MDI's, nebulizer, and peak flow meter
 3. Watch for changes in your child's breathing
 4. Inform teachers and other responsible adults
 5. Make sure medications are available
 6. Ask that other children learn about asthma
 7. Make an action plan for people who care for your child based upon the 3 asthma zones
 8. Help your child develop an exercise plan by encouraging exercise, taking MDI medications in advance, warming up to exercise and breathing through their nose as much as possible
 9. Consider sending your child to asthma summer camp
 10. Offer praise and love often

THE CONNECTION BETWEEN ASTHMA AND ALLERGIES

- A.** Long regarded as trivial, people are beginning to realize that allergies are serious disorders that may trigger sneezing, wheezing, coughing and itching
- B.** Allergies may also be linked to serious chronic respiratory illnesses, including asthma
- C.** Allergies reflect an overreaction of the immune system to substances
- D.** However, like asthma, allergies can be managed to minimize the effect on your life
- E.** When asthma is diagnosed, it may be important to determine if you also have allergies
- F.** Treating asthma without treating underlying allergies may not result in optimal health

FYI:

SOME VALUABLE SOURCES OF INFORMATION AND SUPPORT:

1. **National Asthma Education and Prevention Program**
NHLBI Information Center
P.O.Box 30105
Bethesda, MD 20824-0105
<http://www.nhlbi.nih.gov>
3. **Asthma and Allergy Foundation of America**
1233 20th St.NW, Suite 402
Washington, DC 20036
1-800-7-ASTHMA
(1-800-727-8462)
<http://www.aafa.org>
E-mail address: info@aafa.org
2. **American Lung Association**
1-800-LUNG-USA
(1-800-586-4872)
<http://www.lungusa.org>

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CREDITS

Author: Jody J. Grahn, MSN, APRN, BS
Layout: Jim Ashley

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ZONE	STATUS	ACTION
Green zone: all clear. Peak flow is from _____ 80% to 100% of (your personal best peak flow reading) to _____ (multiply your personal best times .80)	Doing well: Your asthma is under control	Avoid asthma triggers Continue on currently prescribed therapy
Yellow zone: caution. Peak flow is at 50% - 80%. the peak flow range is from _____ (your personal best multiplied by .80 to _____ (your personal best times .50)	Increase in symptoms: Airways are beginning to narrow; treatment plan may not be working	Adjust your therapy and activities as indicated in personal asthma management plan; take action promptly before a severe attack occurs
Red zone: Medical alert. Peak flow is less than 50%. Peak flow is less than _____ (your personal best times .50)	Danger: No improvement or increasing symptoms	Call your doctor or go to the nearest emergency room. If you have difficulty walking & talking due to shortness of breath or if your lips or fingernails are blue, call 911 immediately

Remember that these are general guidelines, so talk to your doctor. Together you can work as a team to keep your asthma under control

