

Asthma

(Adult)

Source Information: Health information provided by healthcare professionals at Geisinger.

Asthma resources

PA state asthma control program
health.pa.gov/My%20Health/Diseases%20and%20Conditions/A-D/Asthma/Pages/default.aspx#.WrBCuRQeQ7S

Asthma Control Program
Bureau of Health Promotion and Risk Reduction Telephone: 717-787-5876
Fax: 717- 425-5373

Allergy and Asthma Network/Mothers of Asthmatics, Inc.
aanma.org

American Academy of Allergy , Asthma and Immunology
aaaai.org

American Lung Association of Pennsylvania
lunginfo.org

Asthma and Allergy Foundation of America
aafa.org

Centers for Disease Control and Prevention (CDC) Asthma Program
cdc.gov/asthma

Global Initiative for Asthma
ginasthma.com

National Asthma Education and Prevention Program
nhlbi.nih.gov/about/naepp/index.htm

Pennsylvania Chapter of the American Academy of Pediatrics
paaap.org

Pennsylvania Environmental Public Health Tracking Program

U.S. Environmental Protection Agency: Asthma and Indoor Environments Age Healthier, Breathe Easier:
Information for Older Adults and their Care Givers

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This patient guide summarizes information and recommendations developed by the National Asthma Education and Prevention Program, National Institute of Health, American Lung Association, American Academy of Allergy, Asthma and Immunology, Asthma and Allergy Foundation of America, Asthma and Allergy Network-Mothers of Asthmatics.

How to use a nebulizer

A **nebulizer** is a device that uses forced air to turn medication into a fine mist that can easily be breathed into the lungs. Doctors often prescribe nebulizers for children and for people who may not be able to breathe in deeply enough to use an inhaler.

1. Fill the medication cup with the prescribed amount of medication.
2. Connect the tubing.
3. Screw the mouthpiece (or facemask) on top of the medication cup.
4. Sitting up straight and holding the medication cup upright, put the mouthpiece into your mouth (or the mask over your mouth).
5. Turn the machine on.
6. Breathe deeply and slowly through your mouth.

Holding the mask or tubing *near* the face does not work! Mask must be *on* face or mouthpiece in mouth for effective treatment!

Treatments typically last about 10 minutes.

The parts of the nebulizer need regular cleaning and inspection. Follow the instructions that come with your nebulizer.

Care of your nebulizer

Cleaning and disinfecting your equipment is simple, yet very important. Cleaning should be done in a dust- and smoke-free area away from open windows. Here is how to clean your equipment:

After each treatment, rinse the nebulizer cup with warm water, shake off excess water and let it air dry.

At the end of each day, the nebulizer cup, mask or mouthpiece should be washed in warm, soapy water using a mild detergent, rinsed thoroughly, and allowed to air dry.

[illegible]

What is asthma?

Asthma is an airway disease that makes it harder to move air in and out of your lungs. It is a chronic, or life long, disease that can sometimes be life threatening. The good news is that it can be managed very well so you can live a normal, healthy life. The more you can learn about asthma, the better you and your loved ones can manage living with this disease, making the most of every day, and maintaining the quality of life that is important to you.

There are three things that you should know about asthma:

1. Asthma is chronic. In other words, you live with it every day.
2. It can be serious – even life threatening.
3. There is no cure for asthma, but it can be managed so you live a normal, healthy life.

What causes asthma?

The exact cause of asthma is not known. Asthma tends to run in families and may be inherited, but environmental factors may also play a key role.

Factors that play a role in the development of asthma:

1. **Genetics.** Asthma tends to run in families. Genetics plays an important role in causing asthma. If your parents have asthma, then you are more likely to have asthma, too.
2. **Allergies.** Some people are more likely to develop allergies than others, especially if your parents had allergies. Certain allergies are linked to people who get asthma.
3. **Respiratory infections.** As the lungs develop in infancy and early childhood, certain respiratory infections have been shown to cause inflammation and damage the airway tissue. The damage that is caused in infancy or early childhood can impact lung function long-term.
4. **Environment.** Exposure to certain allergens, irritants, or viral infections in infancy or early childhood when the immune system is developing have been linked to developing asthma. Irritants and air pollution may also play a significant role in adult-onset asthma.

Your airways

Your lungs are made up of miles and miles of tiny airways, from the large airway of the windpipe (trachea) to the tiny air sacs (alveoli) deep inside the lungs where oxygen moves into the bloodstream.

Your airways bring in oxygen and push out carbon dioxide, but when you have asthma it is harder to do this because:

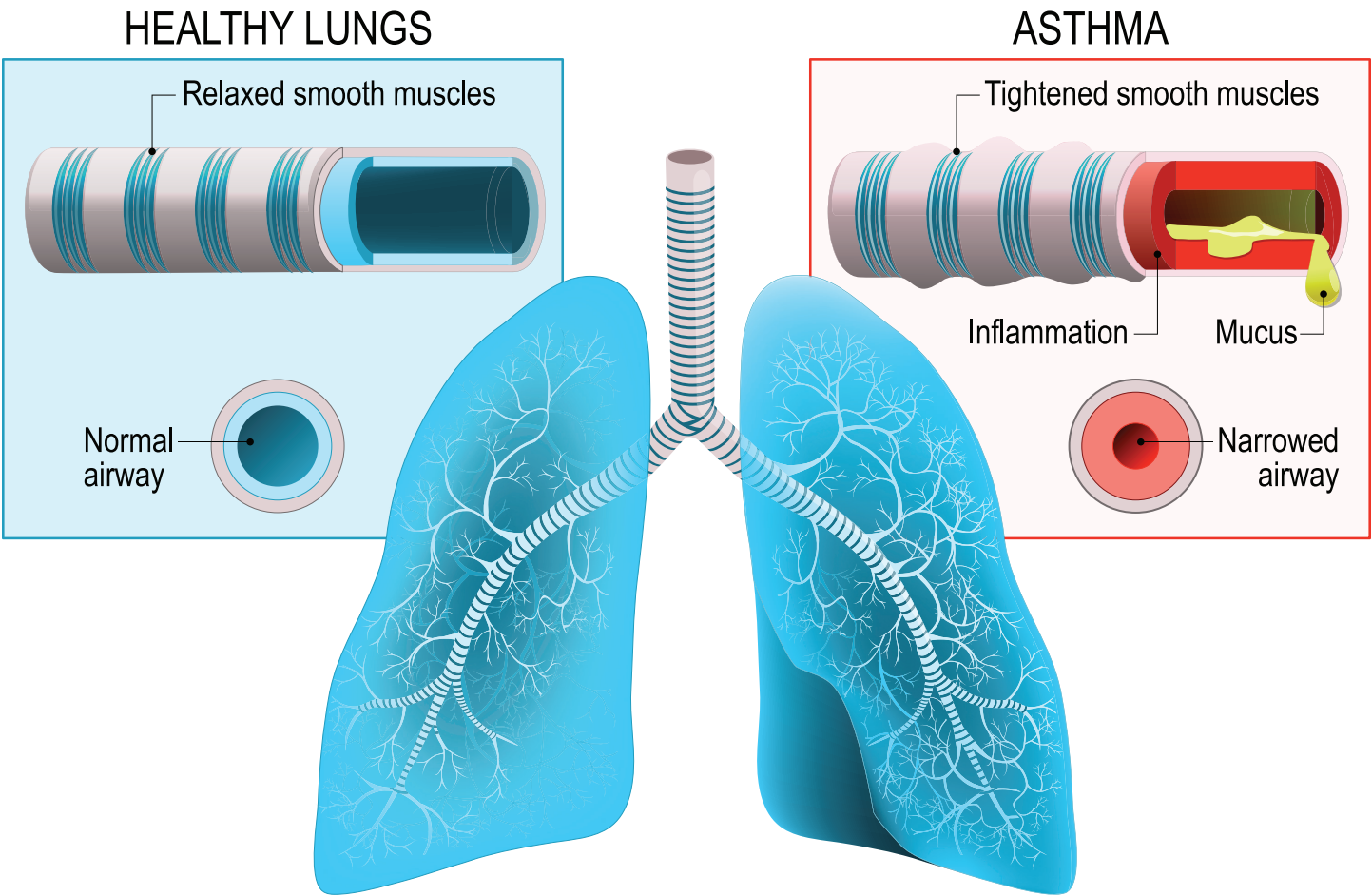
- 1. The linings of the airways swell due to inflammation.
- 2. Your body makes too much mucus, which clogs the airways.
- 3. Muscles around the airways get tight, making them narrow, with less room for air to pass through.

When someone has asthma, their airways are “twitchy” and overly responsive.

Two things cause your airways to narrow:

- 1. The bands of muscle which surround your airways contract.
- 2. Airway walls become inflamed, swell and produce mucus.

ASTHMA



Peak flow measurement

Peak flow meters measure how fast you can force your breath out.

Value is measured in liters per second.**

Measuring your peak flow can help you and your healthcare team to better manage your asthma by:

- Detecting early stages of increased airway inflammation
- Measuring your response to medications when performed before and after therapy
- Identifying allergens, irritants and activities that make your asthma worse
- Indicating when you need to see your doctor or when to seek emergency care

Peak flows should always be compared to your personal best.

How to determine your personal best

- ✓ Measure your peak flow at the same time each day for a two to three week period when your asthma is well controlled.
- ✓ Record the results on the chart located on the back of this page.

The single best recorded value is your personal best.

How to measure peak flow

1. Move the sliding indicator to the bottom of the numbered scale.
2. Stand up straight.
3. Take a deep breath and fill your lungs completely.
4. Place the mouthpiece in your mouth and close your lips around it. Be sure to keep your tongue out of the way.
5. Blow out as hard and fast as you can in a single blow. The first burst is the most important so there is no need to blow out for a long time. Move the marker back to the bottom and repeat 2 more times. The highest is your peak flow number.

Asthma action plan

Along with learning to control your triggers, your healthcare team will work with you to develop an asthma action plan. But, it is up to you to put the plan into action. Day-to-day control of the inflammation or swelling in your lungs is important to remember. These are life-long tasks which will make you feel better and help you to stay in control of your asthma symptoms. Asthma symptoms that are not controlled will cause you to miss work and other activities you enjoy, as well as can cause permanent damage to your lungs.

The below action plan will be created based on your current symptoms to assist you to take the proper steps when needed.

Patient’s name:	Doctor’s name: Doctor’s phone:
Green zone: Doing well <ul style="list-style-type: none">Breathing is good without coughing or wheezingNo problems when working/playingSleeping all night	Plan: Take daily controller medications for prevention: <ul style="list-style-type: none">Controller(s):Quick relief: Contact your physician if using quick relief more than two times per week.For exercise: Notes:
Yellow zone: Having problems <ul style="list-style-type: none">Some problems breathing: coughing, wheezing and/or a tight chestProblems working and/or playingWaking up at nightFirst sign of a cold	Plan: Continue controller medications and take your quick relief medication every four hours as needed. Restart your green zone medications if you have stopped taking them. For the next seven days, be sure to: <ul style="list-style-type: none">Take your quick relief medication (2 to 4 puffs via inhaler or 1 vial via nebulizer) every four hours.Call your physician within 3 to 5 days. Notes:
Red zone: Get help <ul style="list-style-type: none">Medicine is not helpingHeart rate or pulse is very fastNostrils open wide when breathingHard to walk or talk in sentencesRibs or neck muscles show when breathingLips or fingernails turn gray or blue	Plan: Continue controller medications, take quick relievers and seek help. <ul style="list-style-type: none">Call your physician today.Increase your quick relief medication to every 20 minutes, three times and then every four hoursGo to the hospital or call 911 if red zone medicines do not help, if you have not been able to reach your physician, if you have trouble walking/talking due to shortness of breath and/or your lips or fingernails are blue
Avoid the following triggers:	Trigger avoidance measures <ul style="list-style-type: none">Be sure to get an annual flu shot and keep up to date on immunizationsKeep humidity level below 50 percent in home.Do not allow smoking in your home or car.

Common symptoms

Symptoms can vary over time in both frequency and severity.

The sooner you begin treating your asthma and maintaining control, the lesser damage to your lungs in the long run.

Asthma symptoms can differ for each person, but here are some of the most common:

- Wheezing: you may notice a whistling, squeaky, high-pitched sound when you breathe. Sometimes this happens only when you exercise or have a cold.
- Frequent cough: coughing may be more common at night. You may or may not cough up mucus.
- Shortness of breath: this is the feeling you can’t get enough air into your lungs. It may occur only once in a while, or often.
- Chest tightness: your chest may feel tight, especially during cold weather or exercise. This can also be the first sign of a flare-up.

Asthma control test

Asthma is one of the most common causes of preventable hospitalizations.

- A quick test that provides a numerical score to assess asthma control
- Recognized by the National Institutes of Health (NIH) in its 2007 asthma guidelines.
- Clinically validated against spirometry and specialist assessment.

- Patients: 1. Answer each question and write the answer number in the box to the right of each question.
2. Add your answers and write your total score in the **total** box shown below.
3. Discuss your results with your doctor.

					Score
In the <i>past four weeks</i> , how much time did your <i>asthma</i> keep you from getting as much done at work, school or home?					
5	4	3	2	1	
None of the time	A little of the time	Some of the time	Most of the time	All of the time	
During the <i>past four weeks</i> , how often have you had shortness of breath?					
5	4	3	2	1	
Not at all	Once or twice a week	3 to 6 times a week	Once a day	More than once a day	
During the <i>past four weeks</i> , how often did your asthma symptoms (coughing, wheezing, shortness of breath, chest tightness or pain) wake you up at night or earlier than usual in the morning?					
5	4	3	2	1	
Not at all	Once or twice	Once a week	2 or 3 nights a week	4 or more nights a week	
During the <i>past four weeks</i> , how often have you used your rescue inhaler or nebulizer medication (such as Albuterol)?					
5	4	3	2	1	
Not at all	Once a week or less	2 or three times per week	1 or 2 times per day	3 or more times per day	
How would you rate your asthma control during the past four weeks?					
5	4	3	2	1	
Completely controlled	Well controlled	Somewhat controlled	Poorly controlled	Not controlled at all	
					Total: _____

If your score is 19 or less, your asthma may not be under control.

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Night time symptoms

Pay attention to these as asthma could get worse at night due to:

1. Your biological clock: Lesser levels of anti-inflammatory substances are present
2. Heart burn or GERD: Stomach acid bothering your throat
3. Post nasal drip

Frequent night time awakenings indicates that your asthma is not well controlled!

The asthma flare

For people with asthma things such as respiratory infections, allergens, chemicals, odors, physical activity, emotions, seasonal changes and smoking can irritate the lungs. ***It is important to identify your triggers!*** These “triggers “cause changes in the airways. ***Understanding the things that trigger your asthma will help you manage your disease.*** Work with your healthcare provider to help find the triggers that cause your asthma symptoms. Once you have identified the triggers that cause your asthma symptoms, work on ways to avoid the trigger entirely or limit your exposure to it.

Early warning signs and symptoms

Asthma flares almost ***always*** have warning signs. They may be mild and may seem unrelated to asthma. ***Warning signs usually occur 24 to 48 hours prior to a flare and should be treated early!***

- A cough that doesn’t go away, especially at night
- Itchy chin
- Itchy, scratchy sore throat
- Dark circles under the eyes
- Eczema flare
- Runny or stuffy nose
- Increased tiredness
- Mood changes
- Itchy, watery eyes
- Sneezing
- Fever
- Restlessness
- Headache
- Stomach ache
- Pale or flushed face
- Throat clearing
- Decreasing peak flows

Everyone’s warning signs are different. Know your early signs and treat early.

Two main things happen:

- Muscles tighten around the airways.
- Airways become inflamed and swollen which increase mucus.

Signs of a flare:

- Coughing
- Wheezing
- Chest tightness
- Shortness of breath
- Decreasing peak flows
- Worsening of symptoms despite use of quick-relief medications
- Night time awakenings
- Increased mucus

Seek emergency help if:

1. It’s difficult to talk or walk due to shortness of breath
2. Heart rate and breathing are fast
3. Lips and fingernails are blue
4. Quick relief medication is not helping
5. Peak flow readings are in the red zone

Emergency care

1. Relax and stay calm
2. Call for help
3. Follow your asthma action plan
4. Go to emergency room or be seen by your provider.

Inhaled quick-relief medications

Quick-relief medications work fast to relax the smooth muscles that surround your airways to dilate them open.

Examples:

Albuterol, Atrovent, Ventolin, Proventil, ProAir, Xopenex, Atrovent, Combivent Respimat, Duoneb

Everyone with asthma ***must*** have a quick-relief (rescue) inhaler ***and*** carry it with them at all times.

- Work very quickly to relax the muscles around the airways which make it easier to breathe.
- Are used for wheezing, coughing, chest tightness, and shortness of breath.
- May be used 15 to 30 minutes before exercise to prevent symptoms.
- Typically have a normal dose of 2 to 4 puffs every four hours as needed.
- May need to be taken more often during an asthma flare.
- Can cause a fast heart rate and shakiness which will get better with time.

Goals of asthma care

While the treatment of asthma varies over time, the goals of therapy remain the same.

1. **Prevent chronic and troublesome symptoms.**
You should ***not*** experience symptoms or need to use rescue medications more than twice each week.
2. **Maintain normal activity levels.**
You should ***not*** have any limitations on exercise, work, or school.
3. **Prevent recurrent symptoms or flares.**
The need for emergency room visits or hospitalizations should be minimal.
4. **Maintain normal or near-normal lung function.**
Loss of lung function should be prevented.
5. **Provide optimal medication therapy with little or no adverse side effects.**
Your medications may be changed as the severity of your asthma improves or worsens.
6. **Meet patient’s expectations of asthma care.**
You should be satisfied that your asthma is well-controlled.

- Keep follow up appointments
- Avoid triggers
- Learn about asthma
- Medications adjusted according to symptoms

It is important that you have follow up appointments so your provider can assess asthma control and determine when medications need to be increased or can be safely decreased. It is equally important to avoid things that make your asthma worse and also to learn ways to effectively manage your asthma.

Asthma medications

There are two main types of medications used to treat asthma:

Controller medications and quick-relief medications

Many of these medications can be taken with an inhaler or a nebulizer.

Controller medications work on the inflammation inside your airways.

Quick relief (rescue) medications (bronchodilators) work fast to relax the muscles that surround your airways.

Oral controller medications

Singulair is a prescription medicine that blocks substances in the body called leukotrienes. This may help to improve symptoms of asthma and allergic rhinitis. Singulair does not contain a steroid.

Singulair is used to:

1. Prevent asthma attacks and for the long-term treatment of asthma in adults and children ages 12 months and older.
2. Prevent exercise-induced asthma in people 6 years of age and older.
3. Help control the symptoms of allergic rhinitis (sneezing, stuffy nose, runny nose, itching of the nose). Singulair is used to treat:
 - Outdoor allergies that happen part of the year (seasonal allergic rhinitis) in adults and children ages 2 years and older, **and**
 - Indoor allergies that happen all year in adults and children less than 6 months old.

Important: Always take anti-allergy and anti-reflux medication as prescribed by your provider as they may help reduce/prevent flares.

Inhaled controller medications

Most people with asthma need one or more controller medications.

These medications are:

1. Steroids
2. Long-acting bronchodilators
3. Steroid and long-acting bronchodilator combinations

They should be used every day, even when you’re feeling well.

Examples:

Flovent, Pulmicort, Budesonide, Qvar, Asmanex, Alvesco, Arnuity, Alvesco (steroids)
Symbicort, Dulera, Advair, Breo (combination medications)

- Reduce inflammation and swelling inside the airways.
- Most often used twice each day.
- Often reduce the number of flare-ups and help minimize chronic symptoms.
- Go directly to your airways and have fewer side effects of oral steroids.
- Can cause thrush which is a white, patchy yeast infection in your mouth that is often prevented by thoroughly rinsing your mouth with water or mouthwash following use. Must spit water out and never swallow rinse!

Other long-acting controller medications:
Anoro, Arcapta, Incruse, Serevent, Spiriva, Stiolto, Striverdi, Tudorza

Identify triggers and avoid exposure

Medical conditions

1. **Upper respiratory infections**, such as a **cold, flu or sinus infection**, are the most common cause of asthma symptoms leading to an asthma flare-up. **Frequent hand washing** and **avoiding people who are sick** will help to reduce your exposure to cold and flu. **It is advisable to get a flu vaccine every year.**
2. **Acid reflux** can also worsen asthma symptoms.

Food and medicine

Asthma can be triggered by food allergies as well as medicines. Discuss any over-the-counter or prescription medicines you take such as **aspirin, fever-reducers or anti-inflammatory drugs** along with any **alternative therapies or herbal remedies** with your health care provider. Common food allergies include milk, egg, wheat, soy, peanut, fish, shellfish and tree nuts.

Weather, pollen and air pollution

Sudden temperature changes, high humidity, cold air, air pollution and pollen from trees, grass, flowers and weeds are all common triggers of asthma symptoms. **Be prepared before you leave your home by checking the *weather and the pollen count.***

- Limit your time outdoors during high pollen times of the year such as spring and fall and during the day between 10:00 a.m. – 2:00 p.m.
- Use air conditioners instead of opening windows in your home and car.
- Dry clothes in the dryer instead of hanging them outside.
- Shower and wash your hair before going to bed.

Smoke

Smoke from cigarettes, wood burning fireplaces, burning leaves all make it hard to breathe. **If you smoke, you should make a plan to quit.** If you don’t smoke, but live with someone who does, discuss ways to avoid or limit your exposure to tobacco smoke. Don’t burn strong smelling candles or use kerosene heaters in your home.

Pets

Animal dander, saliva, fur or feathers can be an allergen for some and can cause asthma symptoms. Decrease your exposure and **do not allow pets in the bedroom** or other rooms where you spend a lot of time. Reduce allergens by vacuuming and dusting with a damp cloth often. Wash hands and clothes after handling pets.

Mold

Mold is an allergen that can trigger asthma symptoms. You can reduce your exposure to mold by cleaning visible mold, throwing away moldy items, running a **dehumidifier** and using the exhaust fan when taking a shower. Clean mold with mild soap, hot water and a strong brush.

- Keep humidity below 50 percent and do not use humidifiers or vaporizers
- Repair water leaks
- Avoid wet leaves, stacked wood and damp basements

Exercise

Staying active is very important to your overall health and wellbeing, especially for those with asthma. Deep, fast breathing during exercise delivers cool, non-humidified air to your airways which induce symptoms. If asthma is well controlled, symptoms with exercise will be less likely.

- If exercise causes asthma symptoms, use your quick-relief medicine 15 to 30 minutes before physical activity.
- Always warm-up before exercise and end with cool-down period.
- Avoid any environmental triggers you may have while exercising.

Emotions

Every day comes with its ups and down emotionally. It’s important to remember that **strong emotions** can increase rapid breathing and trigger asthma symptoms. **Stress**, both personal and work-related, can be a major trigger as well. Try to control strong emotions with relaxation techniques such as slow, deep breathing.

Examples:

- Laughing or crying hard
- Feeling stressed or anxious
- Anger/yelling
- Fear

Strong odors

Scents from perfumes, deodorants and cleaning supplies can affect a person with asthma. When possible, choose cleaning and personal care products that are odor and fragrance-free. Use a mixture of water and white vinegar or baking soda to clean. Avoid aerosol sprays, perfumes, powders and hairspray.

Dust mites, cockroaches and rodents

Some people are allergic to the droppings of household pests. To reduce your exposure to these triggers:

Dust mites

- Wash bedding weekly in hot water (130° Fahrenheit).
- Use allergen-proof pillow and mattress covers.
- Remove stuffed animals from bed.
- Keep indoor humidity below 50 percent with an air conditioner or dehumidifier.
- Vacuum using a HEPA-filter vacuum and dust weekly.
- Change air conditioner and heater filters regularly.
- Replace wall-to-wall carpeting with wood, tile or linoleum.
- Avoid horizontal blinds by using pull-down shades or vertical blinds.

Cockroaches and rodents

Wash dishes as soon as possible
Use bait stations or traps
Remove garbage from home daily
Store food in plastic containers

Diagnosing asthma

Making a diagnosis of asthma includes obtaining your complete medical history, performing a physical examination and diagnostic testing and excluding alternate diagnosis.

History

- a. **Typical symptoms:** cough, wheeze, chest tightness and shortness of breath occur.
- b. **Triggers:** exposure to things such as cold air, exercise, pollen, etc. Will provoke symptoms.
- c. **Age of onset:** most cases of asthma begin before age 9. An alternate explanation should be sought in people who develop asthma symptoms after the age of 50 years.

The diagnosis of asthma is easy when typical symptoms occur intermittently, are brought on by characteristic triggers, and begin at a young age.

Physical exam

- a. **Wheezing:** high pitched, musical quality heard over all lung fields during exhalation and sometimes both inhalation and exhalation
- b. **“Allergic salute”:** rubbing nose with hand
- c. **Nasal polyps** in patient less than 18 years old (earlier than 18 years may indicate cystic fibrosis)
- d. **“Allergic shiners”:** dark circles under the eyes
- e. **Eczema, allergic rhinitis and/or allergic conjunctivitis, food allergies or anaphylaxis are often also present.**

Breathing tests

Various pulmonary function tests may be used to assist the physician with confirming a diagnosis of asthma.

Spirometry is often the first form of pulmonary function testing that you may encounter. Nose clips are placed on your nose and a you will be asked to place a mouthpiece in your mouth and seal your lips tightly around it. You will then be asked to take a few comfortable breaths, then a big, deep breath in and “blast” it out as hard, fast and long as you can. This process is repeated until three reproducible results are obtained. The best is then accepted as your result.

Spirometry with bronchodilator testing can indicate if you have asthma.

If you have asthma, spirometry will be repeated frequently to determine if your asthma is under control and if your medications need to be adjusted.

Pre- and post-bronchodilator testing may be done to determine if your airways react to an inhaled medication that relaxes the muscles which surround them. After spirometry is performed, you will inhale a bronchodilator, wait for a period of time and then repeat spirometry. If your lung volumes and flow rates improve after you inhale the medication it may then be determined that you have asthma.

Methacholine challenge testing is often performed if your spirometry is normal but you have symptoms of asthma. Spirometry is performed and you are then asked to inhale a solution which may cause your airways to constrict. Spirometry is repeated and if values are unchanged, the dose of solution is increased. If spirometry does not indicate a change after this sequence is repeated a few times, it is determined that you do not have asthma. Patients who show a change in values will be given Albuterol to inhale which will relax your airways.

Controlling your asthma

There are several key steps to help you maintain control of your asthma:

- 1. Learn about asthma.

You should learn and know your signs and symptoms, medications and triggers. Though cough, wheeze and chest tightness are common symptoms of asthma, many people experience just one symptom or even several. It is very important that you learn to recognize early that a flare is beginning.

Cough is the only symptom in twenty percent of asthmatics.

Learn what your medications do and how to properly use them. Remember that two things occur and must be treated: airway narrowing and inflammation. Your medications will treat one or both of these.

Avoid your triggers. Just as everyone has different symptoms, everyone has different triggers. You may have one trigger or many triggers. Learn what makes your asthma worse and avoid it.

- 2. Get your annual flu shot.

Stay up to date on you flu shots. Colds and respiratory illnesses are one of the most common triggers of asthma. You should not only stay immunized, but if colds are a trigger for you, take some common sense precautions. Wash your hands often and avoid crowds during cold and flu season.

- 3. Avoid high humidity and air pollution.

Keep humidity level in your home at 45 percent or less with the use of a dehumidifier and air conditioner. Avoid outdoor activity whenever possible on humid days and days on which air pollution/ozone levels are high.