

ROLE OF COMMUNITY PHARMACIST IN COUNSELLNG ASTHMA PATIENT

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Abstract

Pharmacist plays an important role in patient healthcare. Asthma is a disease that affects the breathing passages of the lungs. Pharmacist now more patient oriented and have brought many changes in life of patients. Patient counseling is considered the most important parameter for insuring better health care, because here the pharmacist interacts with patients directly. Asthma is caused by chronic inflammation of these passages. This makes the breathing passages, or airways, of the person with asthma highly sensitive to various "triggers." When the inflammation is "triggered" by any number of external and internal factors, the passages swell and fill with mucus. Muscles within the breathing passages contract, causing even further narrowing of the airways. This narrowing makes it difficult for air to be breathed out from the lungs. This resistance to exhaling leads to the typical symptoms of an asthma attack. Because asthma causes resistance, or obstruction, to exhaled air, it is called an obstructive lung disease. The medical term for such lung conditions is chronic obstructive pulmonary disease or COPD. COPD is actually a group of diseases that includes not only asthma but also chronic bronchitis and emphysema. Like any other chronic disease, asthma is a condition you live with every day of your life. You can have an attack any time you are exposed to one of your triggers. Unlike other chronic obstructive lung diseases, asthma is reversible. Asthma cannot be cured, but it can be controlled. You have a better chance of controlling your asthma if it is diagnosed early and treatment is begun right away. With proper treatment, people with asthma can have fewer and less severe attacks. Without treatment, they will have more frequent and more severe asthma attacks and can even die. Asthma is on the rise in the United States and other developed countries like India. We are not sure exactly why this is, but these factors may contribute. We grow up as children with less exposure to infection than did our ancestors, which has made our immune systems more sensitive. We spend more and more time indoors, where we are exposed to indoor allergens such as dust and mold. The air we breathe is more polluted than the air most of our ancestors breathed. The frequency and severity of asthma attacks tend to decrease as a person ages. Asthma is the most common chronic disease of children. Asthma has many costs to society as well as to the individual affected. Many people are forced to make compromises in their lifestyle to accommodate their disease.

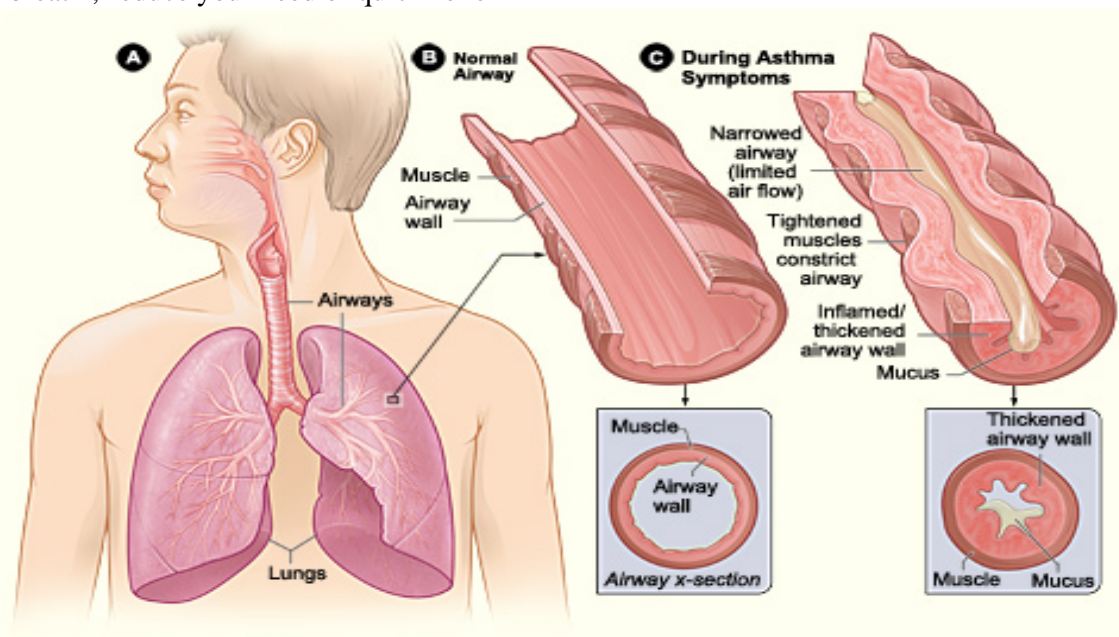
Introduction

Asthma cannot be cured, but it can be controlled with proper asthma management. The first step in asthma management is environmental control. Asthmatics cannot escape the environment, but through some changes, they can control its impact on their health. There are two major groups of medications used in controlling asthma - anti-inflammatories (corticosteroids) and bronchodilators. Anti-inflammatories reduce the number of inflammatory cells in the airways and prevent blood vessels from leaking fluid into the airway tissues. By reducing inflammation, they reduce the spontaneous

spasm of the airway muscle. Anti-inflammatories are used as a preventive measure to lessen the risk of acute asthma attacks. An asthma action plan gives guidance on taking your medicines properly, avoiding factors that worsen you asthma, tracking your level of asthma control, responding to worsening asthma, and seeking emergency care when needed. Asthma is treated with two types of medicines: long-term control and quick-relief medicines. Long-term control medicines help reduce airway inflammation and prevent asthma symptoms. Quick-relief, or "rescue,"

medicines relieve asthma symptoms that may flare up. Your initial asthma treatment will depend on how severe your disease is. Followup asthma treatment will depend on how well your asthma action plan is working to control your symptoms and prevent you from having asthma attacks. Asthma is a long-term disease that can't be cured. The goal of asthma treatment is to control the disease. Good asthma control will prevent chronic and troublesome symptoms such as coughing and shortness of breath, reduce your need of quick-relief

more boys have asthma than girls. But among adults, more women have the disease than men. It's not clear whether or how sex and sex hormones play a role in causing asthma. Most, but not all, people who have asthma have allergies. Some people develop asthma because of exposure to certain chemical irritants or industrial dusts in the workplace. This is called occupational asthma.



medicines, let you maintain your normal activity levels and sleep through the night, prevent asthma attacks that could result in your going to the emergency room or being admitted to the hospital for treatment.

FIGURE-MECHANISM OF ASTHMA

Risk of asthma

Asthma affects people of all ages, but it most often starts in childhood. Young children who have frequent episodes of wheezing with respiratory infections, as well as certain other risk factors, are at the highest risk of developing asthma that continues beyond 6 years of age. These risk factors include having allergies, eczema (an allergic skin condition), or parents who have asthma. Among children,

Role of pharmacist care of asthma patient

Asthma is a long-term disease that can't be cured. The goal of asthma treatment is to control the disease. Good asthma control will prevent chronic and troublesome symptoms such as coughing and shortness of breath. To reach this goal, you should actively partner with your doctor and pharmacist to manage your asthma or your child's asthma. Children aged 10 or older and who are able also should take active role in their asthma care. Taking an active role to control your asthma involves

working with your doctor and other pharmacist on your health care team to create and follow an asthma action plan. It also means avoiding factors that can make your asthma flare up and treating other conditions that can interfere with asthma management. An asthma action plan gives guidance on taking your medicines properly, avoiding factors that worsen you asthma, tracking your level of asthma control, responding to worsening asthma, and seeking emergency care when needed. Pharmacological therapy alone will not give a good control of asthma. Mattress and pillow covers should be free of mites. Removal of carpeting and vacuuming of furniture helps. Animal pets at times are the offending allergens and may have to be removed from home. Asthma education is an important but often neglected aspect of asthma management in our country . It is not only the patient and their family members but also the general practitioners at the peripheral care levels who need to continuously keep themselves updated on asthma . There is little doubt that efforts to improve the implementation of evidence based guidelines by clinicians will increase the quality of patient care. Most of the known cases of Asthma keep 'inhalers' with them, these are devices which ensure direct delivery of the drugs to the lungs and thereby bringing about a rapid relief. Avoiding known triggers which bring about an attack helps, like avoiding strenuous exercises, going out in the cold, etc. Asthma affects all ages, although it is more common in younger people. The frequency and severity of asthma attacks tend to decrease as a person ages. Asthma cannot be cured, but it can be controlled. You have a better chance of controlling your asthma if it is diagnosed early and treatment is begun right away. With proper treatment, people with asthma can have fewer and less severe attacks. Without treatment, they will have more frequent and more severe asthma attacks and can even die.

Causes of asthma

The exact cause of asthma is not known.

- ❖ What all people with asthma have in common is chronic airway inflammation and excessive airway sensitivity to various triggers.
- ❖ Research has focused on why some people develop asthma while others do not.
- ❖ Some people are born with the tendency to have asthma, while others are not. Scientists are trying to find the genes that cause this tendency.
- ❖ The environment you live in and the way you live partly determine whether you have asthma attacks.

An asthma attack is a reaction to a trigger. It is similar in many ways to an allergic reaction.

- ❖ An allergic reaction is a response by the body's immune system to an "invader."
- ❖ When the cells of the immune system sense an invader, they set off a series of reactions that help fight off the invader.
- ❖ It is this series of reactions that causes the production of mucus and bronchospasms. These responses cause the symptoms of an asthma attack.
- ❖ In asthma, the "invaders" are the triggers listed below. Triggers vary among individuals.
- ❖ Because asthma is a type of allergic reaction, it is sometimes called reactive airway disease.

Each person with asthma has his or her own unique set of triggers. Most triggers cause attacks in some people with asthma and not in others. Common triggers of asthma attacks are the following:

- ❖ exposure to tobacco or wood smoke, breathing polluted air,

- ❖ inhaling other respiratory irritants such as perfumes or cleaning products,
- ❖ exposure to airway irritants at the workplace,
- ❖ breathing in allergy-causing substances (allergens) such as molds, dust, or animal dander,
- ❖ an upper respiratory infection, such as a cold, flu, sinusitis, or bronchitis,
- ❖ exposure to cold, dry weather,
- ❖ emotional excitement or stress,
- ❖ physical exertion or exercise,
- ❖ reflux of stomach acid known as gastroesophageal reflux disease, or GERD,
- ❖ sulfites, an additive to some foods and wine, and
- ❖ menstruation: In some, not all, women, asthma symptoms are closely tied to the menstrual cycle.

Risk factors for developing asthma:

- ❖ hay fever (allergic rhinitis) and other allergies - this is the single biggest risk factor;
- ❖ eczema: another type of allergy affecting the skin; and
- ❖ genetic predisposition: a parent, brother, or sister also has asthma.

Asthma symptoms

Early Asthma Symptoms

Early warning signs are changes that happen just before or at the very beginning of an asthma attack. These asthma attack symptoms may start before the well-known symptoms of asthma and are the earliest signs that your asthma is worsening.

In general, these signs are not severe enough to stop you from going about your daily activities. But by recognizing these signs, you can stop an asthma attack or prevent one from getting worse. Early warning signs include:

- Frequent cough, especially at night
- Losing your breath easily or shortness of breath
- Feeling very tired or weak when exercising
- Wheezing or coughing after exercise
- Feeling tired, easily upset, grouchy, or moody
- Decreases or changes in lung function as measured on a peak flow meter
- Signs of a cold, or allergies (sneezing, runny nose, cough, nasal congestion, sore throat, and headache)
- Trouble sleeping

If you have early warning signs or symptoms, you should take more asthma medication as described in your asthma action plan.

When the breathing passages become irritated or infected, an attack is triggered. The attack may come on suddenly or develop slowly over several days or hours. The main symptoms that signal an attack are as follows:

- ❖ wheezing, breathlessness,
- ❖ chest tightness,
- ❖ coughing
- ❖ difficulty speaking.

Symptoms may occur during the day or at night. If they happen at night, they may disturb your sleep.

Wheezing is the most common symptom of an asthma attack.

- ❖ Wheezing is a musical, whistling, or hissing sound with breathing.
- ❖ Wheezes are most often heard during exhalation, but they can occur during breathing in (inhaling).
- ❖ Not all asthmatics wheeze, and not all people who wheeze are asthmatics.

Current guidelines for the care of people with asthma include classifying the severity of asthma symptoms, as follows:

- ❖ **Mild intermittent:** This includes attacks no more than twice a week and nighttime attacks no more than twice a month. Attacks last no more than a few hours to days. Severity of attacks varies, but there are no symptoms between attacks.
- ❖ **Mild persistent:** This includes attacks more than twice a week, but not every day, and nighttime symptoms more than twice a month. Attacks are sometimes severe enough to interrupt regular activities.
- ❖ **Moderate persistent:** This includes daily attacks and nighttime symptoms more than once a week. More severe attacks occur at least twice a week and may last for days. Attacks require daily use of quick-relief (rescue) medication and changes in daily activities.
- ❖ **Severe persistent:** This includes frequent severe attacks, continue,day time symptoms frequent nighttime symptoms. Symptoms require limits on daily activities.

Drug used treatment of asthma

Long-Term Control Medicines

Most people who have asthma need to take long-term control medicines daily to help prevent symptoms. The most effective long-term medicines reduce airway inflammation. These medicines are taken over the long term to prevent symptoms from starting. They don't give you quick relief from symptoms. Inhaled corticosteroids. Inhaled corticosteroids are the preferred medicines for long-term control of asthma. These medicines are the most effective long-term control medicine to relieve airway inflammation and swelling that makes the airways sensitive to certain substances that are breathed in. Reducing inflammation helps prevent the chain reaction that causes asthma symptoms. Most people who take these

medicines daily find they greatly reduce how severe symptoms are and how often they occur. Inhaled corticosteroids are generally safe when taken as prescribed. They're very different from the illegal anabolic steroids taken by some athletes. Inhaled corticosteroids aren't habit-forming, even if you take them every day for many years. But, like many other medicines, inhaled corticosteroids can have side effects. Most doctors agree that the benefits of taking inhaled corticosteroids and preventing asthma attacks far outweigh the risks of side effects. One common side effect from inhaled corticosteroids is a mouth infection called thrush. You can use a spacer or holding chamber to avoid thrush. A spacer or holding chamber is attached to your inhaler when taking medicine to keep the medicine from landing in your mouth or on the back of your throat. Work with your health care team if you have any questions about how to use a spacer or holding chamber. Rinsing your mouth out with water after taking inhaled corticosteroids also can lower your risk of thrush. If you have severe asthma, you may have to take corticosteroid pills or liquid for short periods to get your asthma under control. If taken for long periods, these medicines raise your risk for cataracts and osteoporosis (OS-te-o-po-RO-sis). A cataract is the clouding of the lens in your eye. Osteoporosis is a disorder that makes your bones weak and more likely to break. Your doctor may have you add another long-term control asthma medicine to lower your dose of corticosteroids. Or, your doctor may suggest you take calcium and vitamin D pills to protect your bones.

Other long-term control medicines. Other long-term control medicines include:

- ❖ Inhaled long-acting beta₂-agonists. These medicines open the airways and may be added to low-dose inhaled corticosteroids to improve asthma control. An inhaled long-acting beta₂-agonist shouldn't be used alone.
- ❖ Leukotriene modifiers. These medicines are taken by mouth. They help block the chain reaction that increases inflammation in your airways.
- ❖ Cromolyn and nedocromil. These inhaled medicines also help prevent inflammation and can be used to treat asthma of mild severity.
- ❖ Theophylline. This medicine is taken by mouth and helps open the airways.

Quick-Relief Medicines

All people who have asthma need a quick-relief medicine to help relieve asthma symptoms that may flare up. Inhaled short-acting beta₂-agonists are the first choice for quick relief. These medicines act quickly to relax tight muscles around your airways when you're having a flare up. This allows the airways to open up so air can flow through them. You should take your quick-relief medicine when you first notice your asthma symptoms. If you use this medicine more than 2 days a week, talk with your doctor about how well controlled your asthma is. You may need to make changes in your asthma action plan. Carry your quick-relief inhaler with you at all times in case you need it. If your child has asthma, make sure that anyone caring for him or her and the child's school has the child's quick-relief medicines. They should understand when and how to use them and when to seek medical care for your child. You shouldn't use quick-relief medicines in place of prescribed long-term control medicines. Quick-relief medicines don't reduce inflammation.

Use a Peak Flow Meter

This small, hand-held device shows how well air moves out of your lungs. You blow into the device and it gives you a score, or peak flow number. Your score shows how well your lungs are working at the time of the test. Your doctor will tell you how and when to use your peak flow meter. He or she also will teach you how to take your medicines based on your score. Your doctor and other clinicians on your health care team may ask you to use your peak flow meter each morning and keep a record of your results. It may be particularly useful to record peak flow scores for a couple of weeks before each medical visit and take the results with you. When first diagnosed with asthma, it's important to find out your "personal best" peak flow number. To do this, you record your score each day for a 2- to 3-week period when your asthma is under good control. The highest number you get during that time is your personal best. You can compare this number to future numbers to make sure your asthma is under control. Your peak flow meter can help warn you of an asthma attack, even before you notice symptoms. If your score falls to a number that shows that your breathing is getting worse, you should take your quick-relief medicines the way your asthma action plan directs. Then you can use the peak flow meter to check how well the medicine worked.

Asthma treatment for children

It's hard to diagnose asthma in children younger than 5 years old. Thus, it's hard to know whether young children who wheeze or have other asthma symptoms will benefit from long-term control medicines. (Quick-relief medicines tend to relieve wheezing in young children whether they

have asthma or not.) Doctors will treat infants and young children who have asthma symptoms with long-term control medicines if the child's asthma health assessment indicates that the symptoms are persistent and likely to continue after 6 years of age. Inhaled corticosteroids are the preferred treatment for young children. Montelukast or cromolyn are alternative options. Treatment may be given for a trial period of 1 month to 6 weeks. The treatment usually is stopped if benefits aren't seen during that time and the doctor and parents are confident the medicine was used properly. Inhaled corticosteroids can possibly slow the growth of children of all ages. If this slowed growth occurs, it usually is apparent in the first several months of treatment, is generally small, and doesn't get worse over time. Poorly controlled asthma also may reduce a child's growth rate. Most experts think the benefits of inhaled corticosteroids for children who need them to control their asthma far outweigh the risk of slowed growth.

Asthma treatment for older adults

Doctors may need to adjust asthma treatment for older adults who take certain other medicines, such as beta blockers, aspirin and other pain relievers, and anti-inflammatory medicines. These medicines can prevent asthma medicines from working properly and may worsen asthma symptoms. Be sure to tell your doctor about all of the medicines you take, including over-the-counter medicines. Older adults may develop weak bones from using inhaled corticosteroids, especially at high doses. Talk to your doctor about taking calcium and vitamin D pills and other ways to help keep your bones strong.

Asthma treatment for pregnant women

Pregnant women who have asthma need to control the disease to ensure a good supply of oxygen to their babies. Poor asthma control raises the chance that a baby will be born early and have a low birth weight. Poor asthma control can even risk the baby's life. Studies show that it's safer to take asthma medicines while pregnant than to risk having an asthma attack. Talk to your doctor if you have asthma and are pregnant or planning to get pregnant. Your level of asthma control may get better or it may get worse while you're pregnant. Your health care team will check your asthma control often and adjust your treatment as needed.

People whose asthma symptoms occur with physical activity

Physical activity is an important part of a healthy lifestyle. Adults need physical activity to maintain good health. Children need it for growth and development. In many people, however, physical activity may set off asthma symptoms. If this happens to you or your child, talk to your doctor about the best ways to control asthma so you can stay active.

The following medicines may help to prevent asthma symptoms due to physical activity:

- ❖ Short-acting beta₂-agonists (quick-relief medicine) taken shortly before physical activity can last 2 to 3 hours and prevent exercise-related symptoms in most people who take them.
- ❖ Long-acting beta₂-agonists can be protective up to 12 hours. However, with daily use, they will no longer give up to 12 hours of protection. Also, frequent use for physical activity may

be a sign that asthma is poorly controlled.

- ❖ Leukotriene modifiers. These pills are taken several hours before physical activity. They help relieve asthma symptoms brought on by physical activity in up to half of the people who take them.
- ❖ Cromolyn or nedocromil. These medicines are taken shortly before physical activity to help control asthma symptoms.
- ❖ Long-term control medicines. Frequent or severe symptoms due to physical activity may indicate poorly controlled asthma and the need to either start or increase long-term control medicines that reduce inflammation. This will help prevent exercise-related symptoms.

Easing into physical activity with a warmup period also may be helpful. You also may want to wear a mask or scarf over your mouth when exercising in cold weather.

People having surgery

Asthma may add to the risk of having problems during and after surgery. For instance, having a tube put into your throat may cause an asthma attack.

Tell your surgeon about your asthma when you first consult him or her. The surgeon can take steps to lower your risks, such as giving you asthma medicines before or during surgery.

Controller medicines help minimize the inflammation that causes an acute asthma attack.

Medications of asthma

- ❖ Long-acting beta-agonists: This class of drugs is chemically related to adrenaline, a hormone produced by the adrenal glands. Inhaled long-acting beta-agonists work to keep breathing passages open for 12 hours or longer. They relax the muscles of the breathing passages, dilating the passages and decreasing the resistance to exhaled airflow, making it easier to breathe. They may also help to reduce inflammation, but they have no effect on the underlying cause of the asthma attack. Side effects include rapid heartbeat and shakiness. Salmeterol (Serevent) and formoterol (Foradil) are long-acting beta-agonists.
- ❖ Inhaled corticosteroids are the main class of medications in this group. The inhaled steroids act locally by concentrating their effects directly within the breathing passages, with very few side effects outside of the lungs. Beclomethasone (Vancenase, Beclovent) and triamcinolone (Nasacort, Atolone) are examples of inhaled corticosteroids.
- ❖ Leukotriene inhibitors are another group of controller medications. Leukotrienes are powerful chemical substances that promote the inflammatory response seen during an acute asthma attack. By blocking these chemicals, leukotriene inhibitors reduce inflammation. The leukotriene inhibitors are considered a second line of defense against asthma and usually are used for asthma that is not severe enough to require oral corticosteroids.
- ❖ Zileuton (Zyflo), zafirlukast (Accolate), and montelukast (Singulair) are examples of leukotriene inhibitors.
- ❖ Methylxanthines are another group of controller medications useful in the treatment of asthma. This group of medications is chemically related to caffeine. Methylxanthines work as long-acting bronchodilators. At one time, methylxanthines were commonly used to treat asthma. Today, because of

significant caffeine-like side effects, they are being used less frequently in the routine management of asthma. Theophylline and aminophylline are examples of methylxanthine medications.

- ❖ Cromolyn sodium is another medication that can prevent the release of chemicals that cause asthma-related inflammation. This drug is especially useful for people who develop asthma attacks in response to certain types of allergic exposures. When taken regularly prior to an exposure, cromolyn sodium can prevent the development of an asthma attack. However, this medicine is of no use once an asthma attack has begun.
- ❖ Omalizumab belongs to a newer class of agents that works with the body's immune system. In people with asthma who have an elevated level of Immunoglobulin E (Ig E), an allergy antibody, this drug given by injection may be helpful with symptoms that are more difficult to control. This agent inhibits IgE binding to cells that release chemicals that worsen asthma symptoms. This binding prevents release of these mediators, thereby helping in controlling the disease.

Rescue medications are taken after an asthma attack has already begun. These do not take the place of controller drugs. Do not stop taking your controller drug(s) during an asthma attack.

- ❖ Short-acting beta-agonists are the most commonly used rescue medications. Inhaled short-acting beta-agonists work rapidly, within minutes, to open the breathing passages, and the effects usually last four hours. Albuterol (Proventil, Ventolin) is the most frequently used short-acting beta-agonist medication.
- ❖ Anticholinergics are another class of drugs useful as rescue medications during asthma attacks. Inhaled

anticholinergic drugs open the breathing passages, similar to the action of the beta-agonists. Inhaled anticholinergics take slightly longer than beta-agonists to achieve their effect, but they last longer than the beta-agonists. An anticholinergic drug is often used together with a beta-agonist drug to produce a greater effect than either drug can achieve by itself. Ipratropium bromide (Atrovent) is the inhaled anticholinergic drug currently used as a rescue asthma medication.

Conclusion

Asthma is a disease of the airways of the lungs which is characterized by increased sensitivity of the airways to a variety of triggers. It is generally an episodic disease, i.e., acute attacks followed by symptom free periods. Though most attacks are generally short lived, sometimes serious conditions occur in which severe Asthma is unrelieved for many hours or even days, like in status asthmaticus. Periodic assessments and ongoing monitoring of asthma are essential to determine if therapy is adequate. Patients need to understand how to use a peak flow meter and understand the symptoms and signs of an asthma exacerbation. Asthma is a chronic (long-term) lung disease that inflames and narrows the airways and makes them more reactive to certain substances breathed in. The exact cause of asthma isn't known. Asthma affects people of all ages, but it most often starts in childhood. Asthma causes recurring periods of wheezing (a whistling sound when you breathe), chest tightness, shortness of breath, and coughing. The coughing often occurs at night or early in the morning. Sometimes symptoms are mild and go away on their own or after minimal treatment with an asthma medicine. Other times, the symptoms continue to get worse. When symptoms get more intense and/or additional symptoms appear, this is an asthma attack. It's

important to treat asthma symptoms when you first notice them. This will help prevent the symptoms from worsening and causing a severe attack.. Severe asthma attacks may require emergency care, and they can cause death. Your doctor will diagnose asthma based on your medical history, a physical exam, and results from tests. Asthma is difficult to diagnose in children younger than 5 years old. There's no cure for asthma. Asthma is a long-term disease that requires long-term care. Successful asthma treatment requires you to take an active role in your care. Learn how to manage your asthma, get ongoing care, and watch for signs that your asthma is getting worse. The goal of asthma treatment is to control the disease by following the asthma action plan you create with your doctor, taking asthma medicines as prescribed, learning what things make your asthma worse and taking steps to avoid exposure to them, tracking your level of asthma control, and responding quickly to worsening symptoms. Asthma is treated with two types of medicines: long-term control medicines and quick-relief medicines. You use a device called an inhaler to take many of these medicines. This device allows the medicine to go right to your lungs. The amounts and types of medicine you need to treat your asthma depend on how well controlled your asthma is when you're closely following your asthma action plan.

[4] Thiadens HA, De Bock GH, Van Houwelingen JC, et al. Can peak expiratory flow measurements reliably identify the presence of airway obstruction and bronchodilator response as assessed by FEV1 in primary care patients presenting with a persistent cough? *Thorax* 1999; 54: 1055-60.

Reference

- [1] Jindal SK, Gupta D. The relationship between tobacco smoke and bronchial asthma. *Indian J Med Res* 2004; 120: 443-53.
- [2] Reddy TS, Guleria R, Sinha S, Sharma SK, Pande JN. Domestic cooking fuel and lung functions in healthy non-smoking women. *Indian J Chest Dis Allied Sci* 2004; 46: 85-90.
- [3] American Thoracic Society. Standardization of spirometry: 1994 update. *Am J Respir Crit Care Med* 1995; 152: 1107-36.