Quick Study® HEALTH

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

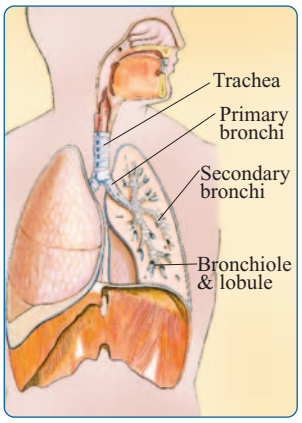
1. Many patients and their physicians underestimate asthma's severity
2. For more than 35 years, asthma was considered to be an episodic, reversible airway constriction
3. Advances in medical research have shown that asthma should be considered a chronic airway inflammatory disease characterized by at 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



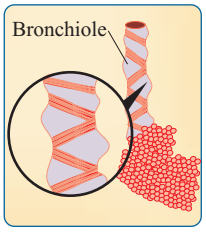
B. Inflammation

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

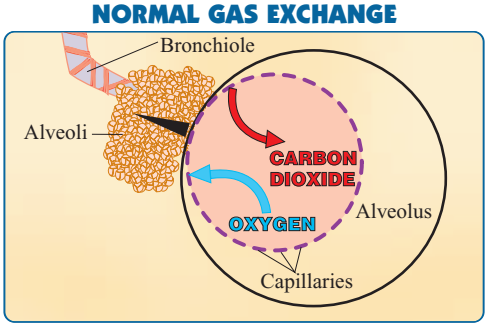
E. During an asthma episode, you may feel like you cannot catch your breath and you may cough, **wheeze** or **feel chest tightness**

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