Understanding Asthma

Asthma is a disease that inflames and narrows the airways in your lungs. No one is sure what causes asthma. But with the help of your healthcare team, you can keep your asthma under control. This sheet will tell you more about what happens inside your lungs when you have asthma.

Healthy Lungs

Inside the lungs there are branching airways made of stretchy tissue. Each airway is wrapped with bands of muscle. The airways get smaller as they go deeper into the lungs. The smallest airways end in clusters of tiny balloonlike air sacs (alveoli). These clusters are surrounded by blood vessels. When you inhale (breathe in), air enters the lungs. It travels down through the airways until it reaches the air sacs. When you exhale (breathe out), air travels up through the airways and out of the lungs. The airways produce mucus that traps particles you breathe in. Normally, the mucus is then swept out of the lungs to be swallowed or coughed up.

What the Lungs Do

The air you inhale contains oxygen, a gas your body needs. When this air reaches the air sacs, oxygen passes into the blood vessels surrounding the sacs. Oxygen-rich blood then leaves the lungs and travels to all parts of the body. As the body uses oxygen, carbon dioxide (a waste gas) is produced. The blood carries this back to the lungs. Carbon dioxide leaves the body with the air you exhale. The process of getting oxygen into the body and carbon dioxide out is called gas exchange.

When You Have Asthma: Chronic Inflammation

When you have asthma, your airways are more sensitive than those of other people. This means your airways react to certain things called triggers and become inflamed. Inflammation makes the airways swollen and narrowed. This is a chronic (long-lasting or recurring) problem. The airways may not be narrowed enough for you to notice breathing problems. But the inflammation makes the lungs more sensitive: Inflamed airways react to triggers even more easily, causing a flare-up.

Symptoms of chronic inflammation: You may not notice any symptoms. Or, you may have mild symptoms such as:

- A cough
- Chest tightness
- Shortness of breath
- Wheezing (a whistling noise, especially when breathing out)
- Low energy

Effects of chronic inflammation: Over time, chronic mild inflammation can lead to permanent scarring of airways and loss of lung function. This can cause permanent breathing problems. This is one reason asthma needs to be treated even if there are no symptoms.

When You Have Asthma: Moderate Flare-Ups

When sensitive airways are irritated by a trigger, the muscles around the airways tighten (bronchospasm). This squeezes the airways so that they become narrower. The lining of the airways swells. Thick, sticky mucus increases and begins to clog the airways. All of this decreases lung function—that is, it makes emptying the lungs more difficult. You have to work hard to keep breathing and getting needed oxygen into the lungs.

Symptoms of moderate flare-ups: Your symptoms may include the following:
• Coughing, especially at night
• Getting tired or out of breath easily
• Wheezing
• Chest tightness
• Fast breathing when at rest

**When You Have Asthma: Severe Flare-Ups**

A life-threatening flare-up is due to severe muscle spasm, severe swelling, and large amounts of thick, sticky mucus. Together, these block the airway. Lung function is severely decreased. Waste gas is trapped in the alveoli, and gas exchange can’t occur. The body is not getting enough oxygen. Without oxygen, body tissues, especially brain tissue, begin to die. If this goes on for long, it can lead to brain damage or death.

Symptoms of severe flare-ups: Call 911, or have someone call for you, if you have any of these symptoms and they are not relieved right away by taking your quick-relief medication as prescribed:

• Severe difficulty breathing
• Being too short of breath to speak a full sentence or walk across a room
• Lips or fingers turning blue
• Feeling as though you are about to pass out

1. Tightened muscle
2. Swollen lining
3. Increased mucus

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