
Breathe Easy is dedicated to providing helpful information to those with breathing difficulties

Weather and Breathing

Every person with a breathing problem knows that the weather can impact how they feel on any given day. Why does weather impact our breathing? More importantly, can we do anything to counteract it?

Very little information is available to this phenomenon. A computer search of leading medical journals revealed a few articles on weather and asthma, and one article on COPD.

The articles on weather and asthma focused on outbreaks of asthma flare-ups during periods of thunderstorms, especially in the late spring and early summer. These studies did seem to find a correlation between spring storms and increased problems with asthma. Researchers speculate the phenomenon may have two possible causes. The most likely is related to the downdrafts of cold air that occur with these storms. These strong wind currents stir up more grass pollen, which can cause problems for those with allergies to the pollen.

A second theory relates to the weather itself. Researchers found a correlation between the temperature drop that occurs during these storms and asthma flare-ups. Previous research had noted possible association between asthma and rainfall, high humidity, high pressure, high and low temperature, and lightning strikes.

Since there is a shortage of published information on weather and COPD, let's take a "common sense" approach to the question based upon our knowledge of airflow dynamics, physics, and



physiology. One thing is certain—perception of the effects of environment varies greatly from patient to patient. While one patient feels best in a hot, dry environment, another may feel a humid environment is preferable.

Temperature

Changes in temperature seem to affect the level of **dyspnea** (the sensation of shortness of breath). How could temperature have an effect?

Extreme hot or cold conditions stress the entire body. In an effort to maintain a constant body temperature (98.6 degrees Fahrenheit), you expend additional energy to warm or cool your body. This additional energy requirement also increases the amount of oxygen your body is using.

Breathing hot or cold air can also have a drying or irritating effect on the airway causing **bronchospasm** (contraction of the smooth muscle that surrounds the airway). Bronchospasm decreases the size of the airway

and thus makes it more difficult to get the air in and out of the lung, increasing shortness of breath.

Many patients notice increased wheezing or shortness of breath when going out into cold air. This is especially true in asthmatic patients where “cold air-induced bronchospasm” is well documented. Many COPD patients also experience a similar response to cold air.

One study demonstrated that exposure of the body to cold air had a more deleterious effect on breathing than just breathing cold air. Although breathing cold air through a mask while in a warm room did decrease lung function, placing the patient in a cold environment further reduced airflow.

Humidity

High humidity is also a cause of increased complaints of shortness of breath. There are a couple of possible explanations for this phenomenon. First, as humidity increases, the density of the air increases. More dense air creates more resistance to airflow in the airway resulting in an increased work of breathing (i.e., more shortness of breath).

Another possible explanation is that as humidity increases, the prevalence of many known airborne allergens increases. Dust mites and molds both increase in high humidity. My wife never experienced any breathing symptoms in her life until we moved to an old house with a damp, moldy basement.

Barometric Pressure and Elevation

As barometric pressure drops, less oxygen is available in the air. This is the same principle that causes a decrease in oxygen level as you travel to higher elevations. The total pressure is less and so the oxygen component is less.

When barometric pressure drops, as when a storm front passes, barometric pressure can change 30-40 millimeters of mercury (ie, The units are in mm of mercury [abbreviated mmHg] or “torr” when measuring air pressure). Although

the effect on the partial pressure of oxygen that reaches the air sacs in the lungs is small (maybe 5-10 mmHg), a change of just a few points could increase shortness of breath.

Some patients express relief of their shortness of breath by having air circulating. Many patients will run a fan all of the time. Some patients feel this does not help and a few have even said it made them worse. For example, a lady in a pulmonary rehab program had difficulty exercising on a “fan resistance” bicycle because it generated too much air movement.

Control Your Environment

It is not possible for people to control their weather conditions. Control your environment by following these steps:

1. Be committed to using all medications and oxygen exactly as ordered by your doctor.
2. During very hot or cold weather, arrange your schedule to go out during times with more moderate temperatures.
3. Use an air conditioner to control indoor temperature. A second benefit of the air conditioner is that it removes a great deal of humidity from the air as it cools it. If an air conditioner is not available, use fans and open windows to circulate the air during hot days. Special programs are available in many communities to offset the cost of fans, air conditioners, and even the cost of electricity for the elderly or those with health problems. Check with your area agencies for the elderly for resources in your area.
4. When going outside during the winter, wear a scarf over your nose and mouth to trap warm air and prevent inhaling cold-air. Breathing through your nose is more effective than your mouth in warming the air before it reaches your airways.
5. Many people go as far as to travel to more favorable climates during periods of difficult weather. If you are considering moving, try going to the new area for an extended period before making a permanent move.

While we can't control the weather, there are many things that we can do to better control symptoms, allowing you to **Breathe Easy**.