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## **Hot Summer Days Can Make Sick People Sicker Extreme heat can affect anyone, but you don't have to become a victim.**

Most people know that extreme heat can make us sick. But we may think of heat-related illness as something that only affects people who are overdoing it -- like overheated marathon runners, professional athletes, or new recruits doing drills on military bases.

But most people who die from heat stroke in the U.S. -- about 400 every year, and possibly more -- don't get it from overexerting themselves on a muggy day. In certain people during high temperatures, it's all too easy to develop heat stroke while sitting perfectly still on the couch.

Heat stroke occurs when the body is unable to regulate its temperature. The body's temperature rises rapidly, the sweating mechanism fails, and the body is unable to cool down.

"People just don't understand the risks of extreme heat," says Michael McGeehin, PhD, MSPH, director of the division of Environmental Hazards and Health Effects, at the CDC's National Center for Environmental Health. "They aren't aware how quickly they can get into trouble."

And while heat-related illness can be a problem for anybody, the risks aren't equal. People who have certain medical conditions or who take some medications to treat those conditions are at a greater risk of having problems in hot weather.

"Any chronic disease lowers your threshold to heat injury," says James Knochel, MD, from the Presbyterian Hospital of Dallas. "There's no question that people with medical conditions are at higher risk, although they may not know it."

"If you go to the ER of a hospital and look at the people who are there for heat stroke," Knochel states, "most of them are going to be older and have cardiovascular disease, or diabetes, or another chronic condition."

But these illnesses and deaths can be prevented. If you are at risk, then you can learn how to protect yourself.

## Heat and Disease

In order to work well, the body has to stay at a normal temperature. If it heats up even by a few degrees, your body starts to cool itself. The most obvious and familiar reaction is that you start to sweat. As the hot perspiration evaporates off your skin, you're cooled down.

The body reacts to heat in many other, less obvious ways. For instance, hot temperatures make your heart beat faster. That's not only if you're exercising. Even if you're sitting perfectly still, your heart will be beating harder when you're hot. That's because the heart is working harder to push blood to the skin and muscles. Getting blood closer to the surface of the body gets it to cool down and helps with sweating.

While this system works pretty well in a healthy person, it may not work so well in people with chronic illnesses.

"Anything that interferes with our natural cooling system could lead us to heat exhaustion and heat stroke faster," McGeehin states. "A lot of medical conditions can do that."

When the body can't get rid of excess heat fast enough, the cooling system eventually breaks down, and the organs begin to overheat. If they get hot enough, they'll stop working. Confusion, seizures, permanent disability, and even death can occur if treatment isn't provided. That's heat stroke and it's a medical emergency.

## Medical Conditions and Heat Stroke

A number of common health conditions raise the risk of heat stroke including:

- **Heart disease.** One of body's responses to heat is to make the heart beat faster. But in many people with heart disease, the damaged heart may not be able to pick up the pace. If the heart can't beat quickly enough, your body won't be able to cool off as well.

People with heart conditions sometimes take medications called diuretics commonly known as water pills -- which reduce the amount of fluid in the body. When people take water pills, they may become dehydrated easily. The typical advice for people in hot weather "to drink lots of fluids" may not be all that safe for people with heart failure, whose hearts have difficulty handling excess fluid. This can result in backup of fluid in the lungs which can impair breathing.

Other drugs that are sometimes used for heart problems, such as beta-blockers,

can also cause problems. Beta-blockers (such as Toprol, Tenormin, and Lopressor) can prevent the heart from beating as quickly as it needs to during hot weather. This can prevent the body's natural cooling system from lowering the body temperature.

- **High blood pressure.** "Hypertension affects the body's ability to keep itself cool," says McGeehin. "It also places greater stress on the heart." In addition, many people with hypertension are on low-salt diets. Not having enough salt in the system can lower the threshold to heat stroke.
- **Diabetes.** People with diabetes can be dehydrated when their blood sugars are not under control, says Knochel, and dehydration can prevent the body from sweating normally. Unfortunately, many people with diabetes may not even be aware that they're dehydrated and don't take extra precautions.
- **Obesity.** Doctors have come to recognize that obesity is a serious health problem in America. It poses a number of risks, including an increased danger of having a heat-related illness. Part of the problem is simple physics. The bigger the person, the harder it is to lose excess heat. The body's natural cooling systems can't work quickly enough. Obesity also puts extra pressure on the heart, so when hot weather requires that the heart beats even harder, it may not be up to the task, Knochel says.

## Signs of Heat-Related Illness

It's important to know the signs of trouble. Excessive heat can first cause heat exhaustion -- especially in people who are working or exercising outside. The symptoms include:

- Dizziness or fainting
- Heavy sweating
- Muscle cramps
- Cold or clammy skin
- Headaches
- Rapid heartbeat
- Nausea

If you have these symptoms, get out of the heat, drink water, juice or sports drinks (unless your doctor tells you otherwise), and get medical attention.

If it isn't treated, heat exhaustion can lead to heat stroke, which is an emergency. Heat stroke also develops in people who aren't being physically active but are simply in a hot environment. The signs of heat stroke are

- Rapid heartbeat
- Confusion or delirium
- Warm, dry skin (because the body is no longer able to sweat)
- Fever of greater than 104 degrees
- Severe headaches

- Seizure or muscle twitching
- Unconsciousness
- Death

Remember, heat stroke needs immediate attention. Call 911.

## Other Dangers

Heat exhaustion and heat stroke aren't the only risks for people with pre-existing medical conditions. For entirely different reasons, some other conditions are exacerbated by the hot weather of the summer. Some examples are:

- **Asthma.** Heat doesn't make asthma worse, at least not directly. But people with asthma need to be especially careful in summer months, since the air can be filled with all sorts of triggers. Allergens like molds and pollens drift in the wind. Irritants, such as environmental pollution, can hang in the air on hot, humid days and make life miserable for people with asthma. These environmental pollutants can cause plants and molds to boost pollen and spore production. The more pollen in the air the more likely it is to worsen allergic diseases such as asthma. In addition, some medications used to treat asthma may make it harder to sweat, and thus interfere with the body's natural cooling process.
- **Multiple Sclerosis.** Many people with MS find their symptoms are aggravated by heat. In fact, one of the oldest tests for MS was to put a person suspected of having the disease in a hot bath. If neurological symptoms developed, the doctor made his diagnosis. Anyone with MS should take extra precautions to stay cool.
- **Lupus.** About 70% of people with lupus find that exposure to sunlight can cause a flare-up of symptoms, including skin rashes, fatigue, and joint pain. So make sure to cover yourself with long pants and sleeves, wear a hat, and use sunscreen.

## Medication and Heat Stroke Risk

It's not just the medical conditions themselves that can raise the risk of heat-related illness. In many people, it's the medicine that is the problem. We've already seen that some of the medicines used to treat conditions, such as heart failure, can cause trouble.

However, medicines for entirely different conditions can aggravate the effects of heat. For instance, a person with an anxiety disorder might never suspect that he or she was at a higher risk of heat stroke. But if he or she is taking a tranquilizer to treat the condition, the body may not be able to cool itself efficiently. Drugs that can increase the risk of heat-related illness include:

- Some psychotropic medicines, such as Haldol and Thorazine
- Anticholinergics, such as Cystospaz

- Beta-blockers, such as Toprol, Tenormin, or Inderal
- Diuretics, such as Lasix or Maxzide

Not only prescription drugs cause problems -- herbs and other alternative medicines can be risky too.

Alcohol and street drugs also increase the dangers. For one thing, alcohol dehydrates you and can interfere with the body's cooling process. Alcohol and drugs also hinder people's ability to reason clearly, making them more likely to stay in the heat longer than they should.

There are many other factors too. People with low incomes living in cities are usually the hardest hit by heat waves. Older people are especially at risk, partially because they simply can't sense temperature as accurately as they used to, Knochel says.

Many of these risk factors -- medical, social, and economic -- can merge together. For instance, imagine an older woman who lives in a city on a fixed income, doesn't have air-conditioning (or is too worried about the costs to turn it on), and takes medications for heart disease and high blood pressure. She is at a much higher risk of developing heat stroke than the average person. But she -- and her family -- may have no idea.

## **Enjoying the Summer Safely**

Although excess heat can certainly cause problems, we're not trying to dissuade people from getting outside and enjoying themselves during the summer. Getting outside and getting some physical activity is good for just about everybody -- with medical conditions or not.

But if you're at higher risk of having problems from the heat because of a medical condition, just take some extra precautions. Remember, you need to get out of the heat sooner than the people around you.

On the whole, someone with a medical condition should follow the same precautions as anyone else on a hot day. To prevent heat-related illnesses:

- Don't go outside during the hottest times of the day.
- Spend time in a cool place. If you don't have air conditioning, go somewhere that does, such as a friend's home, a mall, or a library.
- Drink extra water (unless your doctor tells you otherwise), and avoid alcohol and drinks with caffeine.
- Wear loose-fitting cotton clothes.
- Pay attention to weather reports and try to plan ahead for hot days.

Also, remember to check on older relatives or friends who might be at higher risk of heat-related illness because of medical conditions. Make sure that they're staying cool on hot days.

The fact is, as Knochel says, *any* kind of chronic health condition can lower the threshold for developing heat-related illness. He suggests talking to your health care provider to find out if you're at higher risk and how to protect yourself. You may just need to take a few extra precautions to have a healthy and happy summer.