TerranearPMC Safety Share

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The heart is really amazing. It pumps oxygen and nutrient-rich blood throughout the body to sustain life. This fist-sized powerhouse beats (expands and contracts) 100,000 times per day, pumping five or six quarts of blood each minute, or about 2,000 gallons per day!

Your heartbeat is triggered by electrical impulses that travel down a special pathway through the heart. The impulse starts in a small bundle of specialized cells called the sinoatrial node, located in the right atrium (upper right chamber). This node is known as the heart's natural pacemaker. The electrical activity spreads through the walls of the atria and causes them to contract. A cluster of cells in the center of the heart between the atria and ventricles, the atrioventricular node, is like a gate that slows the electrical signal before it enters the ventricles (two lower chambers that transport blood away from the heart: the right ventricle sends blood to the lungs for oxygenation, while the left ventricle sends the oxygenated blood to the rest of the body). This delay gives the atria time to contract before the ventricles do. It is the *His-Purkinje* network (which is a pathway of fibers), that sends the impulse to the muscular walls of the ventricles, causing them to contract. Blood is transferred from one chamber to the next (ex, right atrium to right ventricle) when the first chamber contracts, thus forcing blood into the next chamber. Between each chamber is a one-way valve which only allows flow in one direction; therefore, blood cannot flow back into the first chamber.

For the average person, a typical heart rate ranges from 60 beats per minute (bpm) to 100 bpm. Of course if you are exercising, or performing any kind of activity, your heart rate will be beating faster than normal. This is what allows your heart to pump more blood throughout your body that is demanding a greater amount of oxygen. People who are experiencing fear or a certain level of anxiety or stress will also experience an increased heart rate. However, under “non-stress conditions,” if one’s heart rate is greater than 100 bpm, this condition is referred to as tachycardia. Conditions that may cause tachycardia include an infection in the lung (such as pneumonia), infection in the blood, which may cause a fever, anemia, low blood pressure, dehydration, drinking alcohol and caffeine, taking over the counter decongestants, and appetite suppressants, thyroid disorders and heart disorders, including irregular heartbeats (aka arrhythmias).

Electrical signals are designed to prompt the heart to beat in a steady rhythm. But pulses don’t always fire off as they should. This creates what’s called arrhythmias, or abnormal heartbeats. This might not cause a problem for some people. But it could be a clue that you have an issue with the electrical system in your heart. You need to see a doctor who can figure out why it’s beating in an irregular fashion.

And while some conditions cause the heart to beat too fast or to flutter, another condition, known as bradycardia, is when the heart rate is less than 60 bpm. This means that the electrical signals in the heart slows down the time in between heartbeats. Having a slower-than-normal heart rate does not necessarily mean that a person has a condition that should cause concern; you simply may have a slower-than-normal heart rate – and typically doesn’t result in any adverse health effects. The electrical activity may be working fine, just a little slower than it does in most people. In many cases this could even be a result of having a strong heart as each beat has the ability to transfer a greater amount of blood (oxygen and nutrients) than normal; typical of many athletes.

However, bradycardia may be the indication that the heart isn't doing well enough at pumping blood to all the organs and tissues that need it. This, in turn, would result in a reduced amount of oxygen being distributed in the body. When this happens, effects such as lightheadedness, or dizziness, confusion or a hard time concentrating, fainting, and shortness of breath (with or without chest pain) can occur.

And even with bradycardia, you may never notice any symptoms or need treatment. But that's not always the case. If you have no other symptoms, you probably don't need to see a doctor right away. You may exercise a lot, and a slow heart rate could be a sign of how fit you are. But, it is still prudent to mention this to your next doctor.

The chances of getting bradycardia increase as you get older, though that's true of most heart conditions. Smoking, drug abuse, and high blood pressure also make it more likely. The causes of bradycardia can vary greatly from one person to the next.

The abnormal rhythm can show up after a heart attack or as a side effect of heart surgery. Certain medications**,** such as those to treat high blood pressure and other arrhythmias, or abnormal heartbeats can cause bradycardia. Hypothyroidism – a condition where the thyroid gland is underactive – can be a typical cause. This is because the thyroid produces certain hormones: T_3 and T_4. These hormones regulate the overall metabolism in the body. They are created from the protein, thyroglobulin, in which iodine is an essential component in thyroglobulin's production. Therefore, bradycardia may be the result of a low production of thyroglobulin, which, in turn may be due to low iodine concentrations. If the cause is hypothyroidism, or low thyroid function, treatment may take care of the heart rate issue.

If there is no clear physical cause, your doctor may change medications that might be slowing your heart. Beta blockers (class of medications that are particularly used to manage abnormal heart rhythms by blocking receptor sites for materials known to increase the heart rate) are sometimes prescribed to relax your heart muscle. But if they cause you to have a really slow heart rate, your doctor might lower the dosage or give you a different drug.

Bradycardia can also be a congenital defect, or problem you're born with. In recent years, obstructive sleep apnea (a condition when your breathing pauses many times throughout the night) has been seen as an influential factor.

There are no surefire ways to stop bradycardia from happening, but if you are active and eat well and maintain your sodium intake, you may reduce your chances of getting it. And as with most preventative measures – regardless of one's condition, maintaining your weight, managing your blood pressure, cholesterol levels and blood sugar are key to a healthful life. This includes regular exercise and not smoking!

If there were no bad people, there would be no good lawyers – Charles Dickens