

NIH...Turning Discovery Into Health

Progress in Heart, Lung, and Blood Research

Arrhythmias

The human heart is an amazing biological machine controlled by an internal electrical system that produces about 100,000 beats a day. When abnormal electrical activity causes the heart to beat too quickly, too slowly, or erratically, the condition is called an arrhythmia. Although most arrhythmias are harmless, some can interfere with the heart's ability to pump blood.

Atrial fibrillation, the most common type of serious arrhythmia, affects more than 2 million people in the United States. "A-fib" occurs when the upper chambers of the heart (the atria) beat chaotically and out of sync with the lower chambers of the heart (the ventricles). This irregularity can cause blood clots to form in the atria. The clots may then dislodge and travel to the brain, where they can block blood flow and cause a stroke. A-fib can also weaken the heart over time and lead to heart failure. The National Heart, Lung, and Blood Institute (NHLBI) funds research that is pointing the way toward much-needed new treatments to help control A-fib.

Another type of arrhythmia, ventricular fibrillation, or "V-fib," is less common but more life-threatening. V-fib occurs when the ventricles, suddenly start quivering rather than beating, and the heart stops pumping blood to the brain and other vital organs. It can cause sudden death if not halted immediately with an electric shock to the heart called defibrillation.

Research on arrhythmias has been life-saving. Nearly two decades ago, a landmark study funded by the NHLBI tested whether a particular class of anti-arrhythmia drugs could prevent sudden cardiac arrest in people with asymptomatic or mild ventricular arrhythmia who had recently had a heart attack. The study showed that the drugs actually increased the likelihood of death due to arrhythmia.



NHLBI-funded research has also contributed to the widespread use of automated external defibrillators, or AEDs. These computerized devices can recognize serious heart-rhythm abnormalities and send electric shocks to correct them. With AEDs now prevalent in public places including airports and office buildings, bystanders with minimal training can help save lives when trained personnel are not available.

Imagine the Future...

Stem cell therapies deliver natural "pacemakers" that restore rhythm to damaged or defective heart tissue.

Real-time, MRI-guided surgery removes tiny sections of heart tissue that beat abnormally.

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