

# Heart Disease



## Yesterday

- In the 1960s, it was not uncommon for Americans to die of heart attacks in their 50s or 60s.
- The effects of smoking, cholesterol, high blood pressure, and obesity on the development of heart disease were unknown. Following a heart attack there were limited treatments for the damage suffered by the heart. Those patients who did not die from their heart attack remained severely debilitated.
- The U.S. death rate for coronary heart disease rose steadily during the first half of the 20<sup>th</sup> century, reaching a peak in 1968.
- Had this rate of coronary heart death continued to rise, today, more than 1.7 million lives each year would be lost to heart disease.

## Today

- Fortunately, the toll is much less — there are about 425,000 deaths each year from heart disease. In addition, the death rate from stroke, the third most common cause of death, has declined by about 75 percent since the early 1960s.
- The gain in longevity has been remarkable! Between 1970 and 2005, the life expectancy of the average American increased by 6.6 years; 4.7 years—over 70%—of the increase is due to reductions in deaths from cardiovascular disease. We can attribute this remarkable improvement, in large part, to NIH research.
- The concept of *risk factors* for heart disease—which include high blood pressure, elevated serum cholesterol, smoking, obesity, diabetes, and physical inactivity—is well established. Findings from the Framingham Heart Study and subsequent studies have been translated into messages for health care professionals, patients, and the public, and have guided prevention and treatment for many years.
- Public health campaigns are helping people control their risk factors. For example, The Heart Truth, an NIH-sponsored national awareness campaign about women and heart disease, provides tools to help

women reduce their risks of heart disease

(<http://www.nhlbi.nih.gov/educational/hearttruth/>).

- Advanced technologies are dramatically improving diagnosis and treatment. For example, if a heart attack is detected early, procedures to open blocked blood vessels can be performed to stop the heart attack before the heart muscle is severely damaged. In addition, implantable cardiac defibrillators significantly reduce sudden cardiac death in those who survive a heart attack but sustain extensive heart muscle damage.
- Following angioplasty to widen a blocked section of an artery of the heart, the artery often re-clogs even when a small mesh stent is inserted to hold it open. NIH scientists were instrumental in the development of a stent embedded with a drug that is slowly released and inhibits artery-closing scar formation. Although careful follow-up and anti-clotting medications are required, use of this drug-device combination has been shown to decrease the need for repeated procedures on the same blockage.

## Tomorrow

- Consortia of individual studies that collectively include tens of thousands of participants are helping scientists identify genetic markers of disease risk. Data from these consortia are being analyzed to pinpoint genetic variations that predispose to the development of high blood pressure, high cholesterol, diabetes, obesity, and heart disease. This knowledge will lead to early detection and improved treatments tailored to an individual's risk profile.
- The NIH has launched a large clinical trial—Systolic Blood Pressure Intervention Trial (SPRINT)—to test whether intensive lowering of systolic blood pressure to a goal that is lower than the current recommended level will further reduce risk of heart disease and stroke.
- The NIH-supported Cardiovascular Cell Therapy Research Network is exploring the use of bone marrow stem cells to repair acute or chronic heart damage

(<http://ccct.sph.uth.tmc.edu/cctrn/Public/PublicHome.aspx>). Network researchers are investigating the types of cells suitable for therapy, optimal numbers of cells to use, and methods for cell delivery, and they are testing for improvement in heart muscle function after treatment in patients with heart disease.

- The NIH supports comparative effectiveness research to assess commonly used therapies to determine which of them provide better patient outcomes so that doctors and patients can choose the most appropriate treatments. One such study, the Catheter Ablation vs. Antiarrhythmic Drug Therapy for Atrial Fibrillation (CABANA) trial, is comparing outcomes in patients with atrial fibrillation (a common type of heart arrhythmia) who are receiving medication versus outcomes in patients who undergo a procedure to alter the heart's pathways that initiate or sustain the abnormal heart rhythm.
- Another clinical study, the Aldosterone Antagonist Therapy for Adults with Heart Failure and Preserved Systolic Function (TOPCAT) trial, is testing whether a drug in common use for other purposes is effective in treating heart failure with preserved systolic function, a type of heart failure that often results from high blood pressure. Results are expected to help doctors and patients make treatment decisions.
- The "obesity epidemic" experienced by the United States over the past several decades threatens to reverse important progress against heart disease. The NIH has undertaken several efforts to prevent or reduce obesity in children and young adults, including a set of randomized trials to identify effective approaches in individuals and a large project to evaluate community approaches to reduce obesity in children.

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