# Study shows survival advantage for bypass surgery compared with non-surgical procedure

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A new comparative effectiveness study found older adults with stable coronary heart disease (CHD) who underwent bypass surgery had better long-term survival rates than those who underwent a non-surgical procedure to improve blood flow to the heart muscle, also called revascularization.

The National Institutes of Health-supported study compared a type of surgery known as coronary artery bypass graft (CABG) with a non-surgical procedure known as percutaneous coronary intervention (PCI). While there were no survival differences between the two groups after one year, after four years the CABG group had a 21 percent lower mortality.

Principal investigator William Weintraub, M.D., of Christiana Care Health System in Newark, Del., and colleagues will present these findings on Tuesday, March 27, at the American College of Cardiology's annual meeting in Chicago. The findings will appear online today in the New England Journal of Medicine and in the April 19 print issue. Two companion papers that describe the statistical prediction models used to forecast long-term survival rates will also appear in today's print issue of Circulation.

"In the United States, cardiologists perform over a million revascularization procedures a year to open blocked arteries. This study

provides comprehensive, large-scale, national data to help doctors and patients decide between these two treatments," said Susan B. Shurin, M.D., acting director of the NIH's National Heart, Lung, and Blood Institute (NHLBI), which funded the study.

Comparative effectiveness research results provide information to help patients and health care providers decide which practices are most likely to offer the best approach for a particular patient, what the timing of interventions should be, and the best setting for providing care.

In CHD, also called coronary artery disease, plaque builds up inside the coronary arteries that supply blood to the heart muscle. Over time, blocked or reduced blood flow to the heart muscle may occur, resulting in chest pain, heart attack, heart failure, or erratic heart beats. Each year, more than half a million Americans die from CHD.

In CABG, or bypass surgery, the most common type of heart surgery in the United States, blood flow to the heart muscle is improved by using ("grafting") a healthy artery or vein from another part of the body to bypass the blocked coronary artery.

PCI is a less invasive, non-surgical procedure in which blocked arteries are opened with a balloon (also called angioplasty). A stent, or small mesh tube, is then usually placed in the opened arteries to allow blood to continue to flow into the heart muscle.

With NHLBI support, the American College of Cardiology Foundation (ACCF) and the Society of Thoracic Surgeons (STS) came together to compare short- and long-term survival outcomes after CABG versus PCI. The investigators linked medical data available in their ACCF and STS databases with follow-up information in the Medicare Provider Analysis and Review database of the Centers for Medicare and Medicaid Services.

Linking these three datasets from 644 U.S. hospitals allowed researchers to analyze information from the STS database on 86,244 older adults (average age 74) with stable CHD who underwent CABG between 2004 and 2007 and 103,549 older adults (average age 74) with stable CHD from the ACCF database who underwent PCI between 2004 and 2007. Follow-up ranged from one to five years, with an average of 2.72 years.

At one year there was no difference in deaths between the groups (6.55 percent for PCI versus 6.24 percent for CABG). However, at four years there was a lower mortality with CABG than with PCI (16.41 percent versus 20.80 percent). This long-term survival advantage after CABG was consistent across multiple subgroups based on gender, age, race, diabetes, body mass index, prior heart attack history, number of blocked coronary vessels, and other characteristics. For example, the insulin-dependent diabetes subgroup that received CABG had a 28 percent increased chance of survival after four years compared with the PCI group.

"This landmark data-sharing collaboration between the American College of Cardiology Foundation, the Society of Thoracic Surgeons, and the Duke Clinical Research Institute allowed researchers to conduct the most comprehensive real-world observational comparative effectiveness study on this topic to date," said Michael Lauer, M.D., director of the NHLBI Division of Cardiovascular Sciences.

**More information:** www.nhlbi.nih.gov/health/health-topics/topics/cad/

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