

Team develops new method to assess options for heart-disease surgery

April 22 2013

Researchers at the Stanford University School of Medicine have developed a method of predicting which patients with heart disease would benefit more from surgery and which would benefit more from angioplasty.

Drawing on Medicare records of more than 100,000 patients with heart disease, the team demonstrated that the effectiveness of [coronary bypass surgery](#) varied widely based on each individual's characteristics. The data enabled them to predict which type of intervention—coronary [bypass surgery](#) or [coronary angioplasty](#)—increased the chances of an individual patient living longer, based on a half-dozen traits, such as gender, age and diabetes and smoking history.

The study will be published April 23 in the *Annals of Internal Medicine*.

Additionally, lead author Mark Hlatky, MD, professor of medicine and of health research and policy, and his team developed an interactive [online tool](#) to help clinicians precisely predict how much a patient's survival might change by choosing coronary bypass surgery or angioplasty. Currently, clinicians have to "guesstimate" the effectiveness of these procedures based on their interpretation of medical research.

Hlatky said the study results could help doctors make better decisions about the treatments likely to be most effective for individual patients, rather than relying on [medical guidelines](#) that work best for the "typical patient."

"If we could identify the individuals in the population who would benefit the most, and target treatment more precisely, we could have really good outcomes at much lower cost," Hlatky said. He added that this tool can easily be adapted to study other treatments for heart disease, and even treatments for other conditions, such as cancer and stroke.

The research "offers much more refined guidance to clinicians," said Ralph Horwitz, MD, co-chair of an upcoming Institute of Medicine conference on using routine clinical data to improve patient care, where the Stanford researchers will present their findings. Horwitz, who was not involved in the study, added that the Stanford team's novel methods point to a new approach for treatment research. "I think people are looking for efficient ways to understand how variation among patients alters or affects various treatments and procedures," he said. "I think this work very nicely illustrates how to do that."

Coronary bypass surgery and angioplasty are two leading treatments for coronary heart disease, a condition in which the buildup of a waxy, fatty substance called plaque causes a narrowing of arteries, blocking the flow of blood. Over time, the condition can lead to a heart attack and heart failure, sometimes resulting in sudden death.

Heart disease is the No. 1 killer of both men and women in the United States. Coronary heart disease, the most common type of heart disease, claims 385,000 American lives every year, according to the U.S. Centers for Disease Control and Prevention.

Coronary bypass surgery requires a large chest incision to reach the affected arteries, but this approach sometimes is necessary for patients with multiple blocked arteries. Other times, coronary angioplasty (also known as PCI), a less-invasive procedure, can be done instead. PCI involves threading a thin tube called a catheter through the blood vessels to the site of the blockage, inflating a small balloon to widen the artery

and, in most cases, inserting a stent, a small mesh tube, to keep the vessel open.

The study showed that patients with severe heart disease—those who had two or more blocked arteries—lived longer, on average, when treated with coronary bypass surgery instead of angioplasty, but how much longer varied widely. For patients with certain conditions, including diabetes, heart failure, peripheral arterial disease, a history of smoking and a recent heart attack, coronary bypass surgery extended their lives by a few weeks to a few months beyond how long they would have been expected to live had they undergone angioplasty. On the other hand, patients without any of these conditions lived longer if they had angioplasty instead of surgery.

Instead of running a randomized clinical trial, which is considered the gold standard for comparing treatments, the researchers simulated a clinical trial using Medicare patient records from 1992 to 2008. One of the drawbacks of randomized clinical trials is that they tend to be small and limit the type of patients who can participate. Hlatky's method used a much larger and more diverse pool of patients, and the treatments were chosen by patients and their doctors, not assigned by a strict research protocol. The researchers matched patients based on more than three-dozen characteristics, except the kind of coronary [heart disease](#) surgery they received, using a method called propensity score matching.

"We tried to find medical twins—one of whom got [coronary bypass](#) surgery and one of whom got an angioplasty—two people who looked alike medically, but were treated differently," Hlatky said. Any differences in the outcomes of these well-matched patients were presumably due to the treatment they received rather than other factors like their medical condition, age, race or the part of the country they lived in.

There is growing evidence that some patient characteristics, such as age, sex and diabetes history, make a difference in the effectiveness of coronary surgery, but this is the first study to quantify how much those characteristics contribute, and to develop an assessment tool to help doctors decide on a treatment plan for their [patients](#).

Hlatky will present his findings at an Institute of Medicine workshop titled "Observational Studies in a Learning Environment" in Washington, D.C., April 24 and 25.

Provided by Stanford University Medical Center

Citation: Team develops new method to assess options for heart-disease surgery (2013, April 22) retrieved 26 June 2024 from <https://medicalxpress.com/news/2013-04-team-method-options-heart-disease-surgery.html>

This document is subject to copyright. Apart from any fair dealing for the purpose of private study or research, no part may be reproduced without the written permission. The content is provided for information purposes only.