

# Off-pump bypass better for high-risk patients

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Bypass surgery done without a heart-lung machine, known as off-pump, may provide better post-operative outcomes than on-pump bypass surgery for high-risk patients, according to research presented today at the American College of Cardiology's 62nd Annual Scientific Session.

In the first study to look specifically at on-pump versus off-pump bypass surgery among patients deemed to be at high operative risk, researchers examined the primary endpoint of patients' combined outcomes of all-cause death, stroke, heart attack or [renal failure](#) requiring new hemodialysis within 30 days of their procedure. They found significantly better results among patients receiving the off-pump procedure, only half of whom experienced these outcomes compared to on-pump patients (9.2 vs. 20.6 percent,  $p = 0.028$ ).

"Our study shows that surgical revascularization of the heart without using the heart-lung machine can be beneficial for high-risk patients, especially older ones with many other disorders or diseases," said Jan Hlavicka, MD, [heart surgeon](#) and lead author of the PRAGUE-6 study at the Charles University in Prague, Czech Republic.

[Coronary artery bypass graft surgery](#) (CABG) is one of the most commonly performed operations in the U.S. and the world and consumes more resources in [cardiovascular medicine](#) than any other procedure. In on-pump CABG, the patient's heart is stopped and blood is circulated through a heart-lung machine, where it is oxygenated and returned to the patient. In the off-pump technique, the surgeon uses a retractor to lift the

still-[beating heart](#) and perform all coronary artery grafts. Off-pump CABG eliminates the need to insert a tube called a cannula into the aorta (the [main artery](#) distributing blood to the brain and body), cross-clamp the aorta, connect the patient to the heart-lung machine, and stop and restart the heart.

Previous studies comparing the two techniques found similar results for on-pump and off-pump CABG, but these studies used mixed populations of high-, intermediate- and low-risk patients, Dr. Hlavicka said. To specifically focus on high-risk patients, researchers rated patients based on a scale called the EuroSCORE that predicts patients' chances of dying during or shortly after cardiac surgery.

Using this method, 206 high-[risk patients](#), those with a EuroSCORE of six or higher, were randomized to receive on-pump or off-pump CABG. In addition to the primary endpoint, researchers looked at participants' postoperative need for blood transfusions and re-exploration for bleeding. They found that a significantly higher percentage of on-pump patients required a blood transfusion than off-pump patients (80.2 vs. 64.9 percent,  $p=0.017$ .) The study did not find a significant difference in the need for re-exploration for bleeding with 8.5 percent of on-pump patients versus 3.2 percent of off-pump requiring a return to the operating room for excessive bleeding.

Due to the lack of evidence in randomized trials for better outcomes among off-pump patients, off-pump surgery has become less popular during the past decade as it places a higher demand on surgeons' skills.

"Patients, especially the sicker and older ones, should know that there is an option to be operated off-pump with potentially better postoperative outcomes," Dr. Hlavicka said.

"Our study shows the benefits of this technique to a large group of our

patients. Their health care providers should offer this method to them."

Hlavicka notes that his study results are limited to the first 30 postoperative days, so further observation of these [patients](#) should be done to assess the long-term outcomes of the off-pump CABG procedure. He also recommends that a larger, multicenter, randomized study be done to verify the study's conclusions.

The PRAGUE-6 study was supported by the PRVOUK P35 program of the Charles University in Prague, Czech Republic.

**More information:** Dr. Hlavicka will present the study "PRAGUE-6 Trial: Off-Pump Versus On-Pump Coronary Artery Bypass Graft Surgery in Patients with EuroSCORE  $\geq 6$ " on Monday, March 11 at 9:12 a.m., in Moscone Center, South, Esplanade Ballroom.

Provided by American College of Cardiology

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