

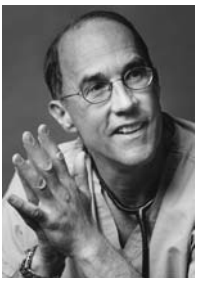
New Era:

Minimally Invasive Coronary Artery Revascularization: Keyhole CABG and Stent: The Hybrid Procedure

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Keyhole CABG is performed via a two fingertip-sized incision under the left breast—a significant improvement over the 10- to 14-inch incision required for traditional heart surgery.



Francis Sutter, DO, FACS

Coronary artery disease (CAD) is a major cause of death and disability in the United States. Conventional surgical treatment of CAD, coronary artery bypass grafting or CABG, is the most frequently performed cardiac surgery procedure. Traditionally, it requires a 10- to 14-inch incision, splitting the sternum, spreading the ribs to provide access to the heart, and use of a heart-lung machine. The procedure, though life-saving, has had limited technological advancements and is associated with considerable pain and post-operative complications.

Today, cardiothoracic surgeons and interventional cardiologists at the Main Line Health Heart Center at Lankenau Hospital are utilizing robotic-assisted technology and advances in percutaneous therapy to offer selected patients a minimally invasive alternative. A new approach, keyhole CABG using the *da Vinci*® Surgical System, allows for complete revascularization of the coronary arteries on the left side of the heart via a two fingertip-sized incision under the left breast. Most often, the left

anterior descending artery (LAD) is bypassed using the left internal mammary artery, which has been shown to provide superior long-term patency and survival benefit when compared to using vein or coronary stents in this position.

In the past, many patients have opted for stenting their blocked arteries because they fear having their chest “cracked open” and the associated long incision and pain. However stenting is not always the best option, and, at times, must be redone.

To bridge this gap between surgery and stenting, physicians at Lankenau Hospital adopted a “hybrid” procedure to treat multi-vessel coronary artery disease. A collaborative effort blending the expertise of cardiothoracic surgery and interventional cardiology to meet patient needs and requests, the hybrid procedure offers patients the best of both worlds. Following cardiac catheterization, patients identified for this procedure will typically have CABG performed first, then angioplasty/stent is performed at a later date to revascularize the remaining vessel.

The surgery employs robotic-assisted technology using the *da Vinci* to minimize patient discomfort and recovery time. Introduced at Lankenau in 2005, the *da Vinci* features three mechanical arms. One contains an endoscope with a camera; the others have interchangeable

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tips to accommodate various surgical tools. The surgeon navigates these mechanical arms using hand and foot controls while seated at a master console. The robot provides a 3-D visual field and a binocular camera with 10 times magnification which reduces eye fatigue and enhances accuracy. The surgical team communicates and provides support to the patient and the surgeon.

Approximately 60 percent of patients are appropriate candidates for this non-sternotomy approach. For the remaining 40 percent, the beating heart/open chest surgical approach is most efficacious. Both approaches negate the neurological and circulatory risks associated with the heart lung machine, however patients who are able to undergo minimally invasive CABG realize additional advantages. These procedures involve minimal blood loss, a low risk of infection and virtually no risk of stroke. Immediately following surgery, patients are alert, speaking with family and staff and getting out of bed within three hours. Patients are discharged from the hospital with remarkable strength and excitement in two to three days. At 10 days, most have returned to normal activities.

Our success with minimally invasive heart surgery is revolutionizing our thinking about the treatment of CAD. We are pleased to be able to offer patients this highly effective, alternative—one that reduces their risk of adverse complications and offers enhanced quality of life through improved comfort, cosmesis, and an early return to normal activities.

Dr. Sutter is board-certified in cardiothoracic surgery and is the busiest cardiothoracic surgeon on the East coast performing minimally invasive robotic assisted coronary revascularization. For more information about keyhole CABG and the hybrid procedure, please go to www.mainlinehealth.org/heart.

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