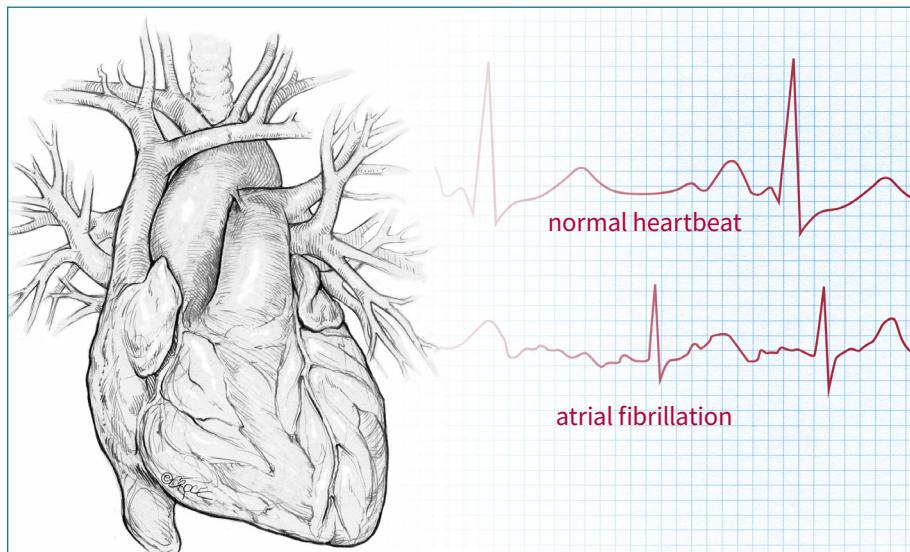


# Hybrid Cardiac Ablation & Minimally Invasive Cox Maze Procedure



**Stanford**  
HEALTH CARE



*Atrial fibrillation is an irregular heart beat originating from the top chambers of the heart.*

If you have atrial fibrillation, also called AF, your doctor may discuss several treatment options with you. These options may include surgery. Advanced surgical options include hybrid surgical-catheter ablation and minimally invasive Cox Maze procedure.

#### **What is atrial fibrillation (AF)?**

- In atrial fibrillation, also called AF, abnormal electrical signals cause the upper chambers of the heart to quiver instead of beating normally. AF is serious and requires treatment.
- increases the risk of stroke significantly, requiring patients to take blood thinners for the long term.
- can cause heart failure because it interferes with the heart's efficiency as a pump, forcing it to work harder. The heart can become enlarged as a result.
- is, like high blood pressure, a general health risk.

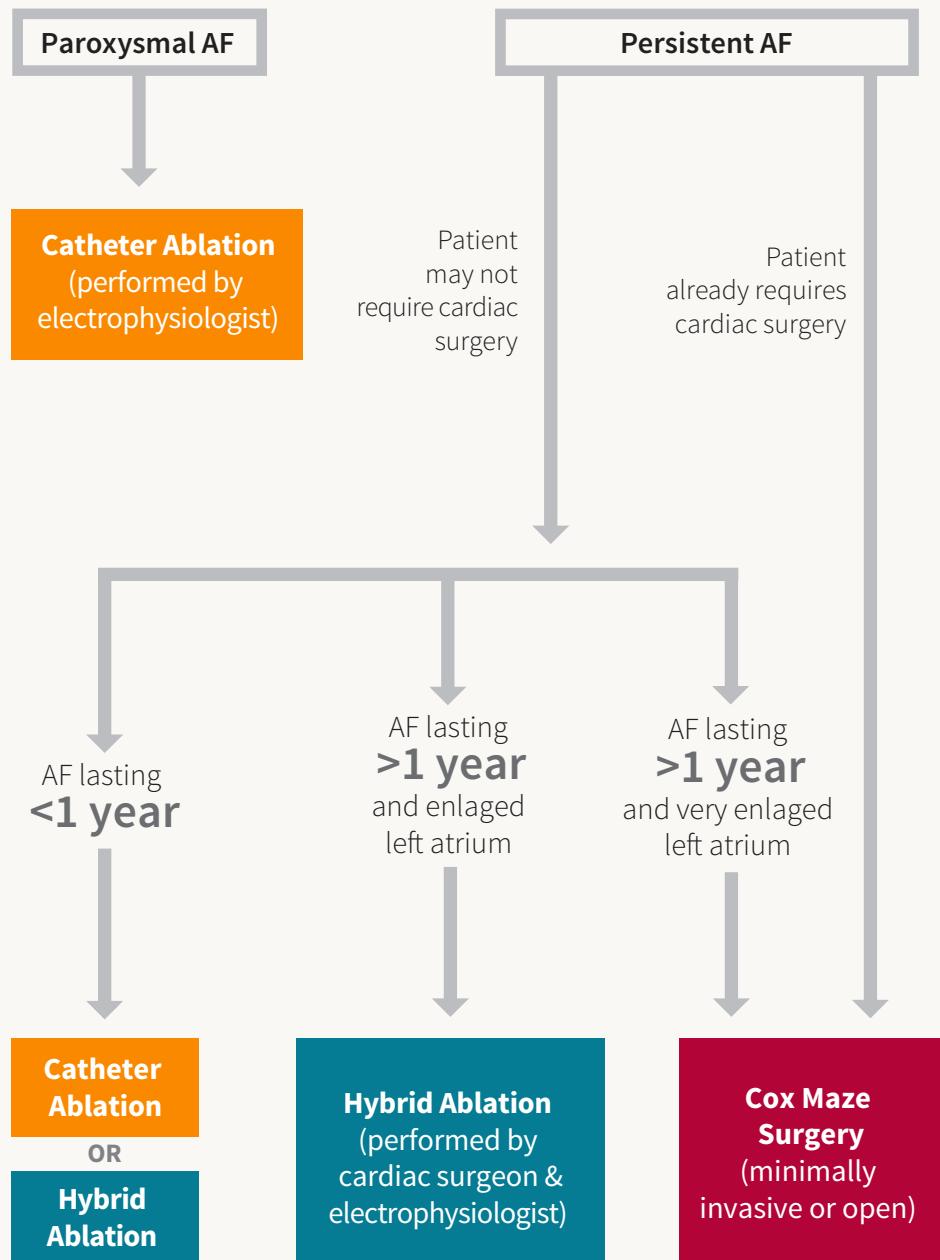
AF patients who don't respond well to medication often require cardiac ablation, a class of procedures that strategically creates lines of scar tissue to block transmission of the abnormal electrical signals that underlie atrial fibrillation. Cardiologists generally direct their AF patients to catheter-based ablations. However, patients with non-paroxysmal (persistent) or chronic AF often require multiple procedures, and the abnormal rhythm frequently comes back.

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*At Stanford, we offer atrial fibrillation patients comprehensive options focused on minimally invasive approaches that provide more durable results than catheter ablation alone.*

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# Recommended Treatments for Atrial Fibrillation Not Responding to Medication



Patients whose AF is persistent or long-standing may therefore require surgical ablation. The Cox Maze procedure has long been considered the “gold standard” treatment, but it is an open-heart surgery that calls for cardiopulmonary bypass.

For patients who already require open-heart surgery, we can perform a Cox Maze procedure at the same time. Patients who aren’t already planning open-heart surgery can opt for either a Cox Maze or a hybrid ablation.

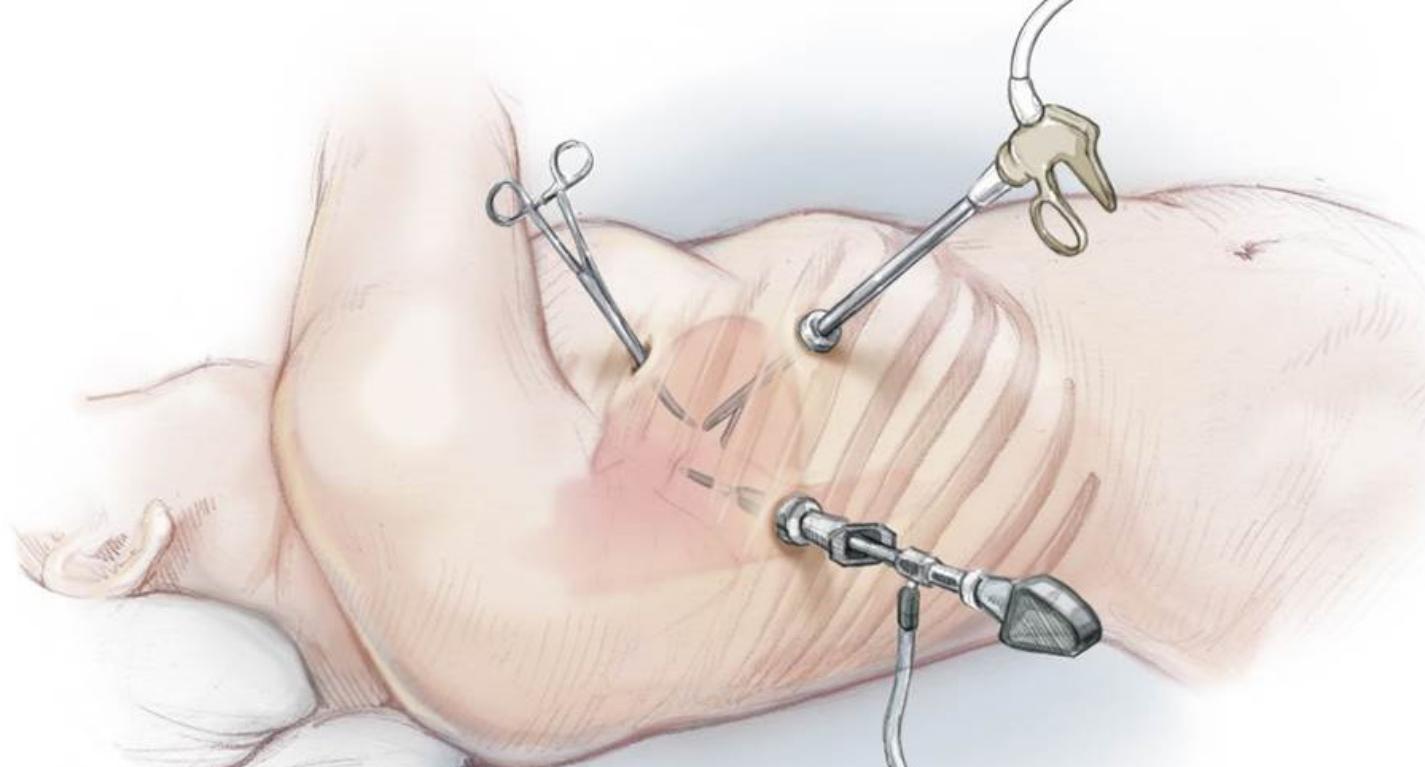
At Stanford, we often perform the Cox Maze procedure with a minimally invasive, 5-centimeter anterior thoracotomy incision.

Hybrid ablation offers an even less invasive alternative for eligible patients. Hybrid ablation combines catheter ablation with a minimally invasive surgical ablation for the best care short of Cox Maze surgery. We perform surgical ablation on the outside of the heart through a video-assisted thoracoscopic (VATS) technique. There’s no need to spread the patient’s ribs with this technique, reducing pain and speeding healing. We combine this with a catheter ablation, which targets the inside of the heart. Early results suggest this combination is nearly as effective as the open heart Cox Maze procedure.

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*For patients who require or prefer the Cox Maze procedure, Stanford is a leading provider. We can often use a minimally invasive approach, with a 5-centimeter incision rather than a median sternotomy.*

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Hybrid ablation combines minimally invasive surgical ablation for the outer (epicardial) surface of the heart, with catheter ablation of the inner (endocardial) part of the heart.

#### Benefits of hybrid ablation

- A cardiac surgeon performs the surgical ablation through a Video-Assisted Thoracoscopic Surgery (VATS) incision pattern, which consists of three 1-cm incisions on each side of the chest.
- The smaller incisions reduce the risk of infection and the time required to recover from surgery.
- Patients do not undergo cardiopulmonary bypass, which substantially reduces the risk of the surgery.

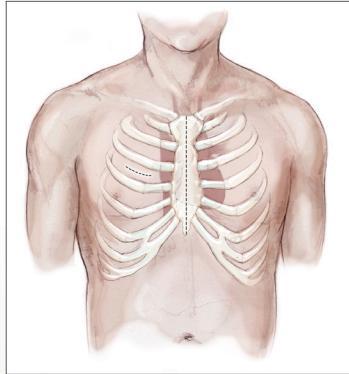
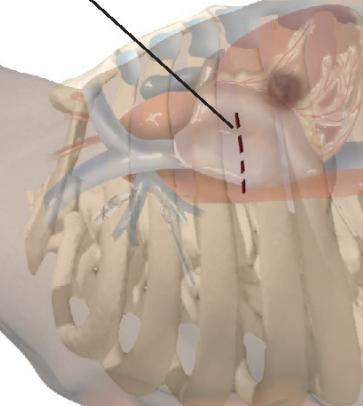
HYBRID ABLATION SURGERY	VS	OPEN HEART PROCEDURES
Patients leave the hospital <b>2-5 days</b>		Patients leave the hospital <b>5-7 days</b>
Patients recover from surgery in about <b>2 weeks</b>		Patients recover from surgery in about <b>4 weeks</b>

• The endocardial ablation, which is performed by an electrophysiologist (or EP), is done separately to minimize patients' time in the operating room. The procedure can be done in the same hospital stay with the VATS surgical ablation or the two procedures can be spaced out over a few weeks or months if necessary.

• Early results show the hybrid procedure to be as effective as Cox Maze.

## Minimally Invasive Cox Maze Procedure

4cm  
incision



*Comparison of the incision used in a minimally invasive Cox Maze procedure vs. an open heart median sternotomy incision.*

Patients with non-paroxysmal (or persistent) atrial fibrillation which has lasted for several years and/or whose left atrium is significantly enlarged are best treated with Cox Maze surgery. Patients whose symptomatic AF returns after other procedures are also referred for Cox Maze surgery.

The Cox Maze procedure is the most effective treatment for atrial fibrillation.

**5 YRS**  
AFTER SURGERY



**4:5**

PATIENTS

continue to have normal sinus rhythm in the heart

At Stanford, we treat many patients with a minimally invasive Cox Maze procedure that shortens recovery time and reduces the risk of infection.

### Benefits of the Minimally Invasive Cox Maze

- Minimally invasive Cox Maze procedures are done through a 5-cm thoracotomy incision. This approach reduces the risk of complications.
- Average hospital stay with the minimally invasive procedure is just 5-7 days, versus 9 days with median sternotomy. Recovery time is also faster.
- Patients who aren't eligible for the minimally invasive procedure can count on Stanford's experience with the traditional "open" Cox Maze. We have specialized expertise in this successful procedure as well.



Whether hybrid cardiac ablation, minimally invasive Cox Maze or traditional Cox Maze surgery is right for you, Stanford provides important advantages.

Stanford Health Care has been identified by *U.S. News & World Report* as one of the top hospitals in the country, year after year. Our cardiac care doctors have adopted newer teamwork approaches. Ablation experts regularly collaborate with other cardiac surgeons to perform surgical ablations when patients are already undergoing more invasive procedures. Our arrhythmia surgeons work closely with our electrophysiologists to provide the best, personalized care for every patient.

*“Patients can get conflicting information on whether they should have a catheter ablation or Cox Maze surgery. Because the Stanford electrophysiology section and I work so closely together, we can help patients find treatment options that balance aggressively treating the disease and conservatively minimizing the patient’s risk.”*

*—Anson Lee, MD*



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Stanford Hospital Named to *U.S. News & World Report's* 2016-17 Honor Roll—one of only 20 hospitals in the nation to earn top honors for exceptional performance in specialized, complex patient care.



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