When heart rhythm is in disarray, medications can often help. But if they don’t do the trick, other treatments are available.

In novels and poetry, a fluttering heart often signals romance or high drama. In ordinary life, it could be a sign of a heart rhythm disorder called atrial fibrillation (AF)—a condition that occurs when the upper chambers of the heart (the atria) contract abnormally. The symptoms may include lightheadedness and fatigue as well as a fluttering or racing sensation in the chest and sometimes chest pain. AF affects nearly 2.3 million adults in the United States, and the risk rises with age: In our 50s, only 1 in 200 of us has AF, but by the time we reach our 80s, that ratio is 1 in 12. Women tend to develop the condition five to eight years later than men do, but they’re more likely to die prematurely of the disease.

It’s important to distinguish AF—which is not, in the vast majority of cases, life-threatening—from ventricular fibrillation, which is fatal if not treated within minutes. Ventricular fibrillation is a rhythmic dysfunction of the ventricles, the heart’s main pumping chambers. AF doesn’t trigger ventricular fibrillation, and the two arrhythmias have distinctly different causes and consequences.

While AF may not match ventricular fibrillation as an imminent threat, it does increase the risk for stroke and heart disease. Fortunately, there are several treatment options. Medications are the usual first choice and may be taken indefinitely. Other approaches include minimally invasive procedures and conventional surgery.

What is atrial fibrillation?

In a healthy heart, each beat starts with an electrical signal from the sinoatrial node, a bundle of cells located in the upper right chamber (or atrium), which serves as the heart’s natural pacemaker (see illustration). The signal flashes across both atria, causing them to contract. Then it continues to the lower chambers (the ventricles), traveling through a gatekeeper called the atrioventricular node, and prompts the ventricles to contract. The result is the heart’s familiar two-beat rhythm: The atria contract, filling the ventricles with blood, and then the ventricles contract, pumping blood to the body and lungs.

In AF, electrical signals in the atria are erratic and disjointed, which causes them to quiver ineffectually (fibrillate). Since the atria drive the ventricles, the ventricular rhythm (and thus the pulse) also becomes irregular. The heart rate can become much faster than the normal 60–80 beats per minute. Fortunately, the atrioventricular node—which transfers the signals from the atria to the ventricles—filters out most of these “offbeat” rhythms, so the ventricles don’t race nearly as fast as the fibrillating atria.

In some cases, AF “converts” on its own—reverting to a normal, or sinus, rhythm. In others, it’s ongoing. Some people have no distinct symptoms. Others find that fibrillation limits their activities and diminishes their quality of life.

AF may be triggered in some people by rapidly firing muscle cells in the pulmonary veins, which carry blood from the lungs to the left atrium. Pulmonary vein triggers are common in patients who have an intermittent form of arrhythmia known as paroxysmal AF. If the triggers are eliminated by catheter ablation (see “Beyond medications”) or surgery, the problem may not recur.

When the atria do not contract sufficiently as a result of AF, blood can pool and form clots inside the atria. If a clot breaks free, it can travel to the brain and cause a stroke, a potentially life-threatening complication. According to the American Heart Association, AF accounts for almost 150,000 strokes each year. Clots can also wander to other parts of the body, including blood vessels supplying the bowels and legs.

AF often occurs in people who have had a heart attack or recent heart surgery or who have heart failure, heart valve problems, or heart muscle inflammation. It may also exist without any underlying heart conditions—a type called lone AF. More women than men get this type, though it’s not clear why. Other risk factors for AF are high blood pressure, diabetes, and hyperthyroidism. People who smoke or overindulge in alcohol are also at risk.

Over time, fibrillation can weaken the heart muscle and further damage heart function, particularly if the heart rate is not well controlled.

Detecting fibrillation

In people who have no noticeable symptoms, AF is often detected by chance during a routine physical examination or an electrocardiogram done for other reasons. When symptoms suggest AF, an electrocardiogram can help identify irregular electrical impulses. A physician will usually order...
The aim of AF therapy is to treat troublesome symptoms and
minimize the risk of stroke and heart muscle damage. The
approach depends on whether heart rate or heart rhythm
is the target. Controlling heart rhythm normalizes signals
in the atria through medication or electrical jolts. The rate
control strategy seeks to maintain a normal ventricular beat
without addressing the fibrillation in the atria. Studies
generally haven’t favored one strategy over the other, although
rate control may be better suited to someone with minimal
symptoms.

In most cases, treatment starts with medications. Amiodarone (Pacerone, Cordarone), flecaïnide (Tambocor), propafenone (Rythmol), and sotalol (Betapace) help restore and maintain normal electrical rhythms. Beta blockers, such as atenolol (Tenormin), metoprolol (Toprol, Lopressor), and propranolol (Inderal); calcium channel blockers, including diltiazem (Cardizem) and verapamil (Calan); and digoxin (Lanoxin, Digitek) help to regulate heart rate. An anticoagulant—usually warfarin (Coumadin)—is added to help prevent clotting and stroke.

Women especially seem to benefit from warfarin. One recent study showed that among adults with AF who were not taking warfarin, women had nearly twice as many clot-related problems as men did. The study, which reviewed data from more than 13,000 patients of both sexes, found that warfarin reduced the risk of stroke by 60% in women and only 40% in men.

Medications are the first-line treatment, but they don’t work for everyone, and many people cannot tolerate the side effects. Amiodarone has a particularly high rate of unacceptable side effects. Anticlotting agents such as warfarin and aspirin must be monitored carefully because they increase the risk of bleeding. In addition, certain health conditions may limit their use.

Beyond medications
When drugs alone aren’t enough, they can be combined with other therapies. For example, a rhythm-control drug that reins in the erratic atrial rhythms may also cause a slow heart rate (known as bradycardia). In such cases, a pacemaker might be added to preserve a normal heartbeat.

Commonly used procedures include the following:

**Cardioversion.** This technique helps the heart reestablish a regular rhythm by interrupting the abnormal one. Cardioversion can be done with an anti-arrhythmic drug or by means of an electrical shock to the chest that synchronizes the signals to the atria. Patients are anesthetized or sedated for the procedure, and anticoagulants are taken before and after. For a person who has had AF for only a year or two, the success rate is high—up to 90% in some studies. Cardioversion is less effective for people with longer histories of AF. The technique is safe and has a low complication rate.

**Catheter ablation.** Sometimes called pulmonary vein isolation, catheter ablation is available for people whose AF is the result of electrical signals emanating from cells in and near the four pulmonary veins that empty into the left atrium. Radio waves are used to ablate (destroy) circles of tissue around the openings of these veins and block the signals. The radio waves are applied with a catheter that’s inserted near the groin and snaked up to the heart and into the left atrium (see illustration). An international trial published in 2005 found that 87% of subjects who underwent the procedure had no AF symptoms after one year.

Implantable atrial defibrillators are nowadays almost never used to treat AF. The repeated shocks sent by the defibrillator are painful, and the device doesn’t prevent fibrillation from recurring, explains Dr. Jeremy N. Ruskin, director of the Cardiac Arrhythmia Service at Massachusetts General Hospital in Boston. “Now that catheter ablation is available at highly experienced centers, anyone with bothersome AF symptoms would be better served by an ablation procedure than an atrial defibrillator.”

**The surgical option**
A more invasive procedure is Cox Maze surgery, named after Dr. James L. Cox, who first performed it in 1987. The surgeon makes a series of small incisions in the atria that interrupt and channel the erratic electrical signals that cause AF. He or she also removes the left atrial appendage, a small
Breathe in deeply to a count of four and out again slowly. There. Don’t you feel calmer?

**Breath control helps quell errant stress response**

Most of us are familiar with the term “fight or flight,” also known as the stress response. It’s what the body does as it prepares to confront or avoid danger. The brain signals hormones that rouse us to action. Breathing quickens to take in more oxygen, the heart beats faster, blood pressure rises, muscles tighten, and senses sharpen. When appropriately invoked, the stress response helps us rise to many challenges. It allows us to avoid an impending accident and help rescue people in a disaster. But trouble starts when this response is constantly provoked by less momentous, day-to-day events, such as money woes, traffic jams, job worries, or relationship problems.

Health problems are one result. A prime example is high blood pressure, a major risk factor for heart disease. The stress response also suppresses the immune system, increasing susceptibility to colds and other illnesses. Moreover, the buildup of stress can contribute to anxiety and depression. Often people try to relieve the pressure by self-medicating with alcohol or drugs, or develop bad habits like smoking or overeating.

We can’t avoid all sources of stress in our lives, nor would we want to. But we can develop healthier ways of responding to them. One way is to invoke the relaxation response, through a technique first developed over 25 years ago at Harvard Medical School by cardiologist Dr. Herbert Benson. The relaxation response is the opposite of the stress response. It’s a state of profound rest that can be elicited in many ways, including meditation, yoga, and progressive muscle relaxation.

In meditation, for example, heartbeat and respiration slow, the body’s rate of oxygen consumption drops steeply, and blood lactate levels, which some researchers believe are linked to panic attacks, decline markedly. Blood pressure stabilizes in healthy people and drops in people with hypertension.

Breath focus is a common feature of several techniques that evoke the relaxation response. The first step is learning to breathe deeply.

**The benefits of deep breathing**

Deep breathing also goes by the names of diaphragmatic breathing, abdominal breathing, belly breathing, and paced respiration, which can be used to help relieve hot flashes (see *HWHW*, August 2005). When you breathe deeply, the air coming in through your nose fully fills your lungs, and the lower belly rises. It’s an inborn skill that often lies dormant. Reawakening it allows you to tap into one of your body’s strongest self-healing mechanisms.

Yet for many of us, deep breathing seems unnatural. There are several reasons for this. For one, body image has a negative impact on respiration in our culture. A flat stomach is considered attractive, so women (and men) tend to hold in their stomach muscles. This interferes with deep breathing and gradually makes shallow “chest breathing” seem normal, which increases tension and anxiety.

Breathing engages the diaphragm, a strong sheet of muscle that divides the chest from the abdomen. As you breathe
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