The heart is the center of our circulatory system and its function affects the state of health of the rest of the body. When the movements in the atria (top chambers) becomes erratic, as in atrial fibrillation, the blood is not propelled efficiently, resulting in decreased output and a 5-fold risk of stroke. Atrial fibrillation is a common disease of aging. If you are under the age of 65, there is a 2% risk of developing this conditions. This increases to 1 in 10 persons in those older than eighty. The heart develops changes that increase the risk of being "once and a-fiber, always an a-fiber". This post will detail the condition and how to prevent or mitigate the ongoing process.

**Key points:** Atrial fibrillation increases with ages and certain conditions. Early identification of risk factors or patients at risk can help to mitigate the long-term problems associated with this condition.

An estimated **2.7 million to 6.1 million Americans** are living with atrial fibrillation ("AFib"). The condition causes a rapid or irregular heartbeat that increases the risk of heart failure, stroke, and other heart-related issues. Initially for most people, atrial fibrillation comes and goes. But later, the condition becomes long-lasting and gets to a point where it becomes necessary for medical treatment.
The key to understanding atrial fibrillation is that early identification and reduction of risk factors will reduce long-term problems. If someone has atrial fibrillation or has had a type of stroke associated with a blood clot, they should be evaluated for possible reasons of this condition early. In many ways, atrial fibrillation can be the tip of an iceberg of an underlying process that is putting the heart at risk. The most common identified risk I have found in patients is SLEEP APNEA.

What is Atrial Fibrillation?
The four-chambered human heart normally beats in unison. The atria fill with blood that is received from the periphery (right) or the lungs (left). The blood is then directed to the ventricles in a coordinated fashion prior to being pumped to the lungs (right) and body (left). With each heart beat, the heart’s intrinsic pacer system (shown below), coordinated by specialized muscle cells known as pacer cells, sends a wave from various concentrated areas, or nodes. The contractile signal begins in the sino-atrial (SA) node at the top of the right side; then atrio-ventricular (AV) node at the lowest aspect of the right atrium; then the His Bundle through to the chambers of the ventricle with the Purkinje fibers.

Within the atria, for different reasons, the pathway may become damaged or a new pacer signal is set to lead to dis-synchrony. In atrial fibrillation, one or both of the upper chambers get out-of-sync with the lower chambers. The result is usually weakness, easy fatigue, heart palpitations, and difficulty breathing. Though, sometimes in no symptoms are present.
blood clots form in these chambers, the clots can be propelled by the ventricles and travel to other parts of the body and the brain and hinder blood flow.

Rhythm strip showing Atrial Fibrillation with the irregular nature (look at small spikes (p waves) in between the peaks (QRS)
Source: ECG Academy

A blood clot propelled into the arteries system can lodge in an arterial supply within the brain and cause a stroke. It is estimated that 15 to 20 percent of stroke patients have atrial fibrillation; this increases to 40 percent of causes of stroke, in those older than 85. To reduce the risk of stroke, people with atrial fibrillation are usually placed on blood thinners.

What Contributes to Atrial Fibrillation?
Atrial fibrillation is most often caused by heart abnormalities or damage to the structure of the heart. Some other conditions that may possibly contribute to atrial fibrillation include:

1. **High blood pressure.** This condition, specifically with high systolic (heart contraction) and diastolic (heart relaxation) levels can lead to a dysfunction that weakens the heart and increases the risk of atrial fibrillation.

2. **A heart attack** can cause structural damage to the heart. A heart muscle with scar tissue doesn’t pump as well as a healthy muscle; this can potentially lead to increased work of the heart, atrial dilation (expanding) and atrial fibrillation.

3. **Coronary artery disease.** It causes coronary arteries to become narrow or blocked. The cause is usually a buildup of plaque, which restricts blood flow to the heart muscle.

4. **Intoxicants and other substances.** Examples of these include tobacco, alcohol, caffeine, illicit drugs, specifically cocaine and methamphetamines, can potentially dangerously affect the heart and lead to atrial fibrillation. It is not uncommon for a long-term smoker to develop atrial fibrillation as the lung becomes scarred and leads to increased lung pressures. These pressure lead to a stretching of the atria and atrial fibrillation.

5. **Obstructive sleep apnea.** Sleep apnea is a breathing disorder, but it affects the cardiovascular system. The condition causes blood oxygen levels to drop. If this happens often enough, the low oxygen level can lead to remodeling of the right atria of the heart which leads to atrial fibrillation. These conditions are closely tied together: as many as 50% of those with atrial fibrillation have sleep apnea, and those with sleep apnea have a fourfold risk of developing a-fib.

6. Other. Any state which expands the atria of the heart (e.g. fluid overload) or taxes the heart in someone at risk (fevers, overactive thyroid) or lead to dysfunction of the heart, including various conditions where the heart contractility is reduced (Takotsubo's cardiomyopathy - "broken heart syndrome")

Options for Treatment
The best treatment for atrial fibrillation depends on three things: how long you’ve had the condition, the severity of the symptoms, and the underlying cause of the condition.

The treatment is two-pronged. One treatment is to either reset the rhythm of the heart (cardioversion) or interrupt the pacer signal (radioablation). Sometimes only the goal of RATE control is possible in long-standing atrial fibrillation, as people with afib generally feel better with a heart rate under 100 beats per minute.
Another treatment is to preventing the development of blood clots. If the cause of the condition is known, then treatment will be directed at the cause. For example, if atrial fibrillation is caused by sleep apnea, then treatment will focus on treating the sleep apnea.

**Cardioversion** is a procedure that allows doctors to reset the heart’s rhythm to normal. Electrical cardioversion uses patches or paddles placed on the chest to deliver a low-level shock to the heart.

The shock interrupts the heart’s rhythm. If the shock is successful, the heart’s rhythm resets and returns to normal. The procedure is quick and a sedative is used to reduce the discomfort.

Cardioversion with drugs is an option as well. This form of cardioversion uses medications to restore normal heart rhythm. The drugs are given by mouth or intravenously and require a short hospital stay. Cardiologists can monitor the effects of the medication to see if it is successful.

If the medications are effective, the doctor might prescribe the same medication to prevent recurrence of atrial fibrillation.

Blood thinners (anticoagulant) are often prescribed several days in advance of the cardioversion procedure. The blood thinners reduce the risk of complications, such as strokes and blood clots. Blood thinners are continued for several weeks after the procedure to prevent blood clots. The most common anticoagulant is warfarin. It requires calibration of doses by checking levels (INR), with goal INR for stroke prevention in between 2 and 3. Newer medications do not require levels and are well tolerated, either daily or twice daily.

If cardioversion isn't an option, then a doctor might decide that heart rate control is the best choice. This involves prescribing a medication that controls the rate of the heartbeat and returns it to normal.

Beta-blockers are often used for heart rate control. These medicines slow the heart rate during activity and during times of rest, and can reduce exercise tolerance. Calcium channel blockers also control heart rate but aren’t recommended for people with low blood pressure or heart failure. Digoxin is an old treatment for atrial fibrillation, but doesn't work as well as beta-blockers or calcium channel blockers.

**Reduce Your Risk of Experiencing Atrial Fibrillation**

The best way to lower the risk of atrial fibrillation is to avoid contributing factors and screen for underlying conditions. For example, following a diet that’s good for the heart can possibly prevent a heart attack. Consider getting screened for sleep apnea if you are finding yourself waking up frequently and urinating or noticing heart palpations. Regular exercise can be protective for the rhythm of the heart. If the heart is otherwise healthy, then the chance of developing atrial fibrillation drops considerably.

Managing high blood pressure can also protect the heart. Daily exercise can help keep blood pressure under control. But if exercise isn’t enough, then it’s possible to control it with blood pressure medications.

If you drink coffee, soda or alcohol, do so in moderation. No illicit drug use can be safely taken in moderation. Usually the risk of atrial fibrillation increases excessive amounts of caffeine or alcohol.

Maintaining a healthy weight also lowers the risk of atrial fibrillation. People who are overweight experience atrial fibrillation at varying degrees of risk than those who are within a healthy weight range.
A person who is obese has a higher chance of developing the condition than a person who is slightly overweight. The heart's left atrium is more likely to become enlarged if a person has excessive body weight. And an enlarged left atrium has been linked to the development of atrial fibrillation.

Summary

There are ways that an individual can reduce the risk of potentially chronic heart conditions. Knowledge is power on the journey to health. An early intervention - either by reducing smoking, alcohol or caffeine, quitting drug use, getting your sleep checked and keeping a healthy weight - can prevent the heart from decompensating.

Thanks for reading this and please pass it along if you have found it useful.