

# Catheter Ablation for Atrial Fibrillation (Pulmonary Vein Ablation)

A PATIENT HANDBOOK



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# Introduction

You have been told that you have an arrhythmia called **atrial fibrillation (AF)**. Your doctor or nurse practitioner has referred you to the arrhythmia clinic to discuss an ablation procedure to get rid of your atrial fibrillation.

This patient handbook will review the heart's electrical system. It will discuss atrial fibrillation, how and why it happens. It will focus on the management of atrial fibrillation. The last portion of the book will provide information about **atrial fibrillation ablation procedure**.

## Your Heart's Electrical System

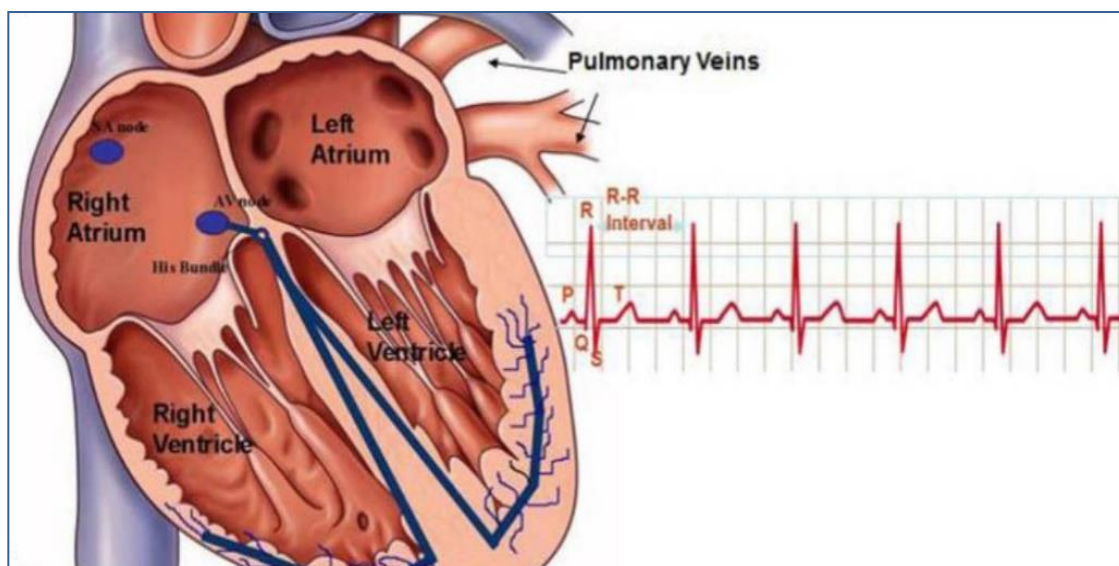
Your heart has an "electrical system". It causes it to beat and pump blood and nutrients throughout your body.

The sinoatrial (SA) node is the electrical control centre of the heart. It is found in the top right chamber of your heart. The SA node sets the pace or rhythm of the heart. The SA node starts the electrical stimulation of the heart muscle. Then the signal spreads across the heart's upper chambers (atrias). This causes them to pump.

The electrical signal then travels to the atrioventricular (AV) node found in the middle of the heart. The signal is then sent to the heart's lower chambers (ventricles). This causes the ventricles to pump. This pumping action is felt as your pulse on your wrist or neck. Once the ventricles finish pumping, the SA node begins the cycle again.

*The SA node is referred to as the "natural pacemaker".*

*The AV node is referred to as the "gate keeper" controlling the heartbeat.*



## What is an Arrhythmia?

Usually, a healthy heart beats 60-100 times per minute during rest. However, some people have an irregular heartbeat. This is called arrhythmia.

An "arrhythmia" is a disturbance in the rhythm of your heart beat. It may result from "short circuits" in the SA node, AV node or anywhere in the electrical pathways of the heart.

Arrhythmias can cause the heart to beat too fast, too slow, or irregularly. This irregular beating causes the heart to pump poorly. This can lead people to feel irregular heartbeats (palpitations). They can also feel dizzy or fatigue. Some arrhythmias can put you at risk for heart attack, heart failure, stroke, or cardiac arrest.

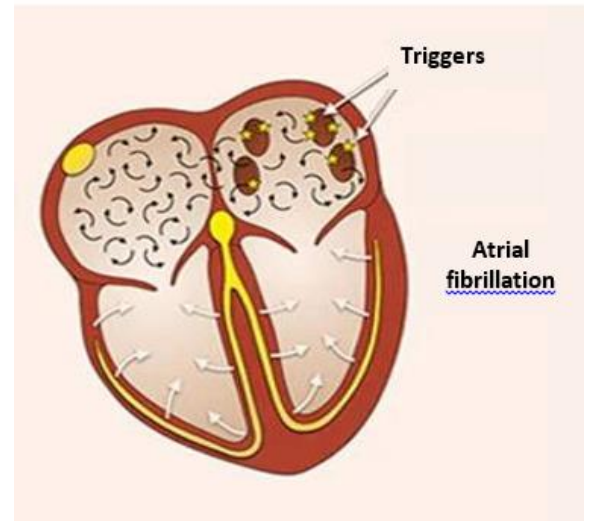
Arrhythmias can be sorted according to whether the heartbeat is too slow, too fast, and where the arrhythmia starts in the heart.

# What is Atrial Fibrillation?

AF is the most common type of arrhythmia. It is found in more than 1% of all Canadians.

AF is a disorganized heartbeat that occurs in the atria. A normal heart beats about 60-100 times per minute. During AF, the atria beat between 350-600 times per minute in a random, irregular way. This can cause your ventricles to beat irregularly and sometimes quickly – up to 150-200 times per minute. This is what causes many people to have symptoms. They can feel dizziness, fatigue, chest pain and shortness of breath.

AF can occur in isolated episodes. It can occur for longer periods of time (hours, days, weeks, even months). It may stay all the time. Often, people start by having rare episodes (once a year, once a month). Over time, episodes become more frequent. Sadly, AF almost never goes away on its own. Once you start having AF episodes, they almost always come back. They also become worse over time.



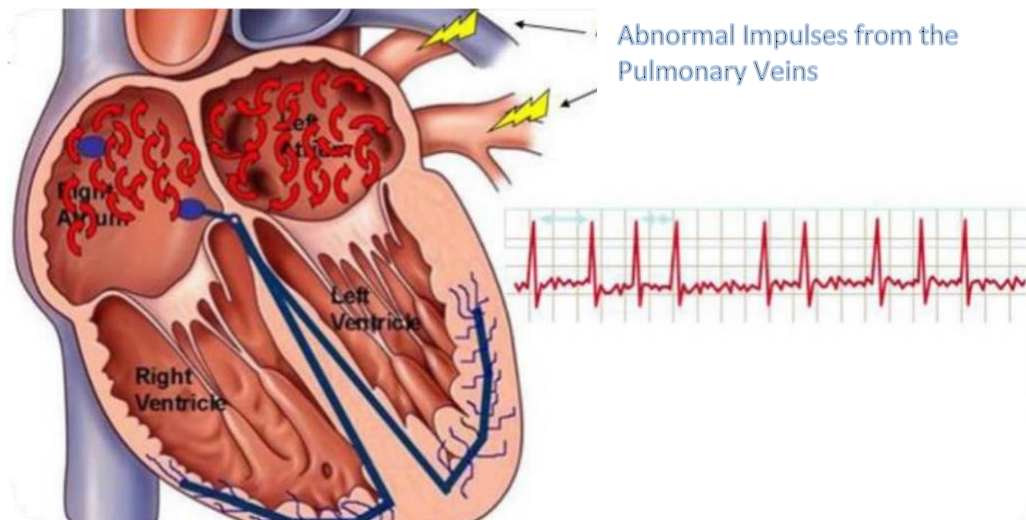
*Atrial fibrillation (AF) is an uncontrolled, irregular heart rhythm. The upper chambers of the heart quiver and do not pump effectively.*

# Types (Patterns) of Atrial Fibrillation

**Paroxysmal:** refers to AF that comes and goes on its own. The AF may last seconds, minutes, hours, or days before the heart returns to normal rhythm. Often people with this type of AF feel more palpitations. This is because of sudden changes in heart rate from AF to normal rhythm.

**Persistent:** is when the AF does not stop on its own. People may not feel as many palpitations. They may still feel fatigue and shortness of breath. Medications or an electrical shock are used to reset the heart to normal rhythm. This electric shock is called cardioversion.

**Permanent:** this is when the AF cannot be fixed. Medications and electrical shock do not restore the heart to normal rhythm.



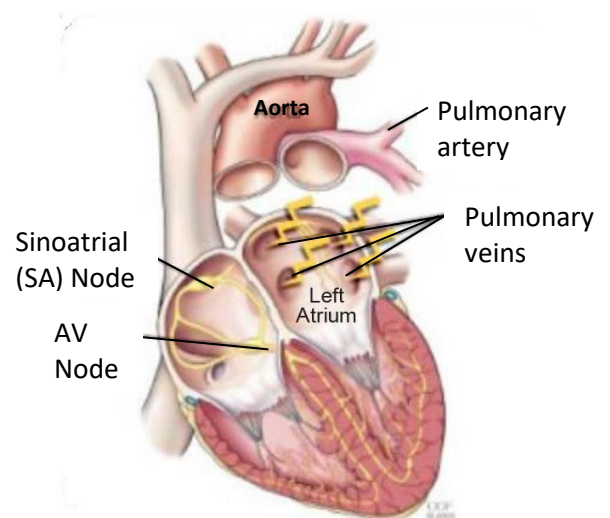
<https://www.washingtonhra.com/wp-content/uploads/2015/05/AFib.jpg>

# What causes Atrial Fibrillation?

Inside the heart, AF is caused by electrical “short circuits”. It fires off electrical impulses in a rapid and irregular way. In AF, there are a lot of these short circuit regions (more than 50-100). Most of these short circuits are found in the left atrium.

In the left atrium there are 4 pulmonary veins. They bring blood back from the lungs into the heart. Most of the AF short circuits are found around the pulmonary veins.

AF most often occurs in adults over age 60, but it can occur in younger people. AF may be linked with other heart or lung conditions. Those include high blood pressure, coronary artery disease, heart valve disease, heart failure, chronic lung disease or sleep apnea. Being overweight is a common risk factor as well. In some cases, AF is inherited, and research is ongoing in this field. In many cases, AF occurs in completely normal hearts.



Excessive alcohol, binge drinking, caffeine intake or specific drugs can make AF worse. Electrolyte or hormonal imbalances, stress, and weight gain can lead to more AF symptoms. Sadly, removing these factors may not get rid of AF. There is no specific diet that seems to make AF worse or better.

# Is Atrial Fibrillation Dangerous?

In the short term, AF is usually not a life-threatening problem. Some people can be in AF for hours. Some are even in AF all the time. However, in the long term, AF can have some serious effects.

During AF, blood does not empty properly from the upper chambers of your heart. The blood can pool and sometimes clot. If this clot breaks off and goes to the brain, it can cause a stroke. People with AF are five to seven times more likely to have a stroke, compared to those who do not have atrial fibrillation. Clots can also travel to other areas of the body and damage other organs (kidneys, bowels, heart etc.).

Over time, AF can cause the heart to become abnormally large (dilate). This can decrease the heart's pumping function by 25 percent. It can even lead to heart failure.

AF symptoms can stop people from living a normal lifestyle. For many people, AF interferes with their quality of life. Many people can become disabled from the symptoms and feel like they have "aged" by many years because of the tiredness.

*AF is not a life-threatening condition. It requires careful management to ensure you don't suffer complications.*



# How is Atrial Fibrillation Treated?

## Manage and change your risk factors:








- A healthy lifestyle is important to reduce AF symptoms, reduce AF burden and decrease the risk of medical problems associated with AF.
- Lifestyle changes will not eliminate AF but they can help increase your long term success of an ablation procedure.
- There is no specific diet that can fix AF. No multivitamin, herbal therapy, or dietary supplement (like fish oil) has been shown to reduce AF.
- Keep yourself hydrated. Drink at least 6 - 8 glasses of water. This may reduce symptoms of dizziness and light-headedness related to AF or your medications.
- Refer to the next page outlining the risk factors that you can manage to reduce your symptoms and AF burden.

*There are AF risk factors that you can change to reduce your AF burden and symptoms before your ablation.*

*Continue with the changes after the ablation to improve your success.*



**Risk factors which you can change to reduce your AF burden and symptoms before and after your ablation procedure.**

	In overweight or obese (BMI > 27 kg/m <sup>2</sup> ) patients, 10% weight loss reduces AF symptoms, burden, recurrence, and progression to persistent AF.
	Moderate to vigorous exercise training to a target of 210 minutes per week reduces AF symptoms, AF burden, increases maintenance of Sinus Rhythm (SR), increases functional capacity and improves Quality of Life.
	Patients seeking a rhythm control strategy should minimize or eliminate alcohol consumption to reduce AF recurrence and burden.
	Cigarette smokers should quit smoking and consider treatment for tobacco cessation. Stopping smoking is important to reduce the increased risks of AF-related cardiovascular complications and other adverse outcomes.
	It is reasonable to screen for Obstructive Sleep Apnea (OSA), as it is very common in patients with AF. Treatment of OSA <u>may</u> help maintain SR and will reduce AF recurrence.
	Optimal blood sugar control reduces cardiovascular adverse events. Good blood sugar control before your ablation <u>may</u> reduce the risk of AF recurrence after your ablation.
	Optimal blood pressure control reduces AF recurrence and AF-related cardiovascular events.

## AF Treatment Goals:

- Reduce the risk of blood clot formation and stroke with the use of blood thinners (anticoagulants).
- Control your heart rate with medications. These medications help slow the heart rate during AF. This will not prevent AF from happening.
- Restore a normal heart rhythm:
  - With medications. These medications will try to convert and keep your heart rhythm out of atrial fibrillation.
  - With an electrical cardioversion. During this procedure, you are given a short-acting anesthetic to make you sleep. Once asleep, an electrical shock is given to try and restore normal heart rhythm.
  - With catheter ablation. This is a procedure used to eliminate the short circuits that cause AF.

*The rest of this booklet will review AF catheter ablation*

## What is Catheter Ablation?

Catheter ablation is a procedure used to remove the short circuits that cause AF. During the procedure, small wires are put into the heart. They are threaded through veins in your legs and sometimes your neck. These wires map the electrical activity of the heart. This helps locate the problematic areas. These problem areas are burned away (cauterized) or frozen (cryotherapy). This process is called an “**ablation**”. Ablation is usually offered to people who have a lot of symptoms from their AF.

# How is Catheter Ablation Performed?

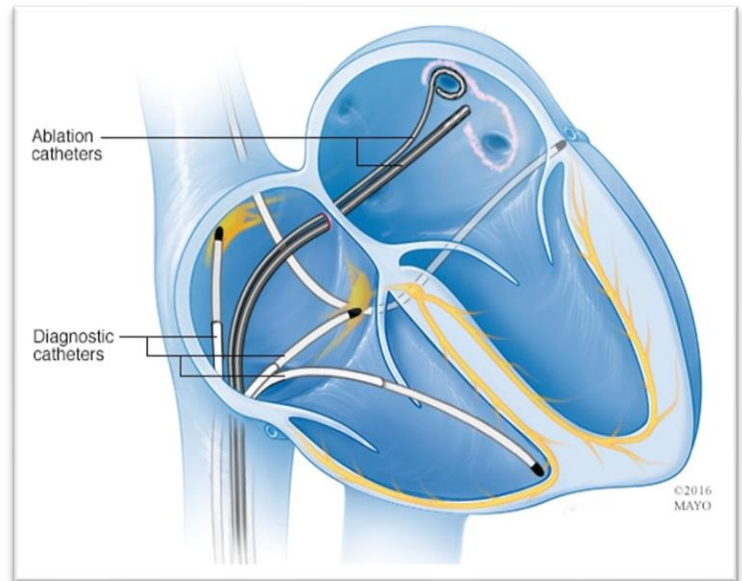
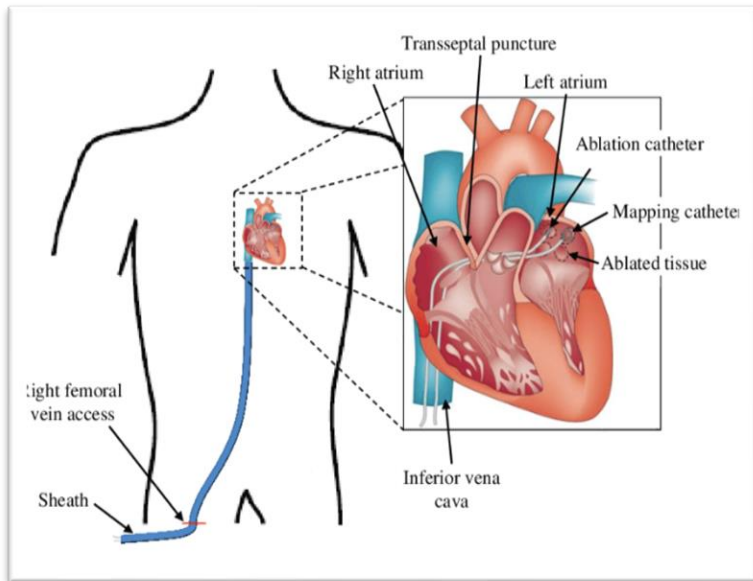
Catheter ablation procedure is performed in a room with specialized equipment. This room is called the Electrophysiology (EP) suite. General anaesthesia is required for this procedure. This means you will be asleep during the procedure. You will have a breathing tube in your mouth and throat. You may also have a small probe in your mouth to monitor the temperature in your food pipe (esophagus). The esophagus lies behind the left atrium. These tubes will be taken out after the procedure.



While you are sleeping, several long, flexible tubes called “catheters” are placed into your heart. They are inserted through your veins. Once the catheters have been placed in the heart, one or two small punctures are made in the wall of the heart that divides the left and right atria. This is called transeptal puncture and allow for the catheter to be placed inside the left atrium.

X-ray, ultrasound, and an advanced computer system are used to make a three-dimensional model of your heart safely and accurately. You do not need to be in AF to do the mapping.

Most of the short circuits causing AF are found around the pulmonary veins. This is where most of the ablation is performed. The goal is to ablate around the pulmonary veins, and this is why the procedure is referred to as a “pulmonary vein isolation” ablation procedure. Other areas with abnormal electrical signals may also be targeted. The ablation procedure usually takes 1 hour to perform.



*Special catheters are used to ablate problem heart tissue causing AF.*

# Atrial Fibrillation Ablation Success Rates

For Paroxysmal AF, the first ablation without any antiarrhythmics, has an 80% success rate. 20% of the people may need a second procedure. The success rate after that is over 90%.

For Persistent AF, the success rate is lower. It's around 70% after one procedure. After two procedures it's 80%. However, some people have partial success. For those patients, the arrhythmia is not eliminated but may be reduced. Some people may find that antiarrhythmic medications that did not work before, are now effective in eliminating AF. The decision to stay on medication, or to have a second procedure is part of the treatment plan. Your EP doctor or heart rhythm nurse practitioner (NP) will discuss this with you in follow-up appointments.

# Atrial Fibrillation Ablation Complications

There are risks you need to know about. The overall risk of something happening is less than 1%.

## **You may experience a small amount of:**

- Bruising or swelling at the insertion site
- Chest discomfort which resolves in 1-3 days

## **Rare complications include:**

- Hole in your heart. This could require a chest tube or surgery
- Heart attack or stroke
- Bleeding at insertion site which may require surgery

- Pericarditis – inflammation of the heart sack which causes chest pain
- Narrowing of pulmonary veins. Can lead to breathing problems
- Phrenic nerve injury which can cause shortness of breath. It is rarely permanent.
- Collapsed lung, requiring chest tube
- Damage to your normal conduction system. Can result in permanent pacemaker

**Extremely rare complications include:**

- Damage to esophagus (food pipe). Extremely rare, 1 in 1000. Generally seen 2-3 weeks after the ablation.
- Risk to your life is extremely small, 1 in 10000

## Preparing for Atrial Fibrillation Ablation

You and your EP doctor and/or Heart Rhythm NP have decided that an AF ablation is right for you. Next, the Heart Rhythm coordinator will put you on a wait list. Before the procedure you may require a special CT scan, blood work, echocardiogram, and a consultation with an anesthesiologist. The coordinator will arrange these appointments closer to the time of your ablation.



You will need to be on a blood thinner (anticoagulant) for at least one month before the ablation procedure. Sometimes we ask you to stop anticoagulants, anti-arrhythmic, and rate control medications before the procedure. These instructions will be given to you once the procedure is booked. All other medications can usually be taken as prescribed, with a sip of water the morning of your procedure.

*All jewelry needs to be removed prior to the procedure. Please leave it at home.*

## **After Your Atrial Fibrillation Ablation**

The catheters will be removed once the procedure is done. You will be moved and watched closely in the recovery area. You will be on strict bedrest after your procedure. The length of bedrest depends on how you recover. The nurse will check you often to make sure there is no bleeding or swelling at the insertion sites in your groin. Your nurse will also instruct you when it is safe for you to sit up and start moving around. You will be able to go home on the same day. Please ensure you have a responsible adult to stay with you overnight. If a medical reason requires you to stay in hospital overnight, please have a ride arranged for an early morning discharge.

Before you go home your doctor and nurse will go over the procedure. You will receive a letter explaining the ablation procedure and providing you with instructions on your arrhythmia and anticoagulant medications.

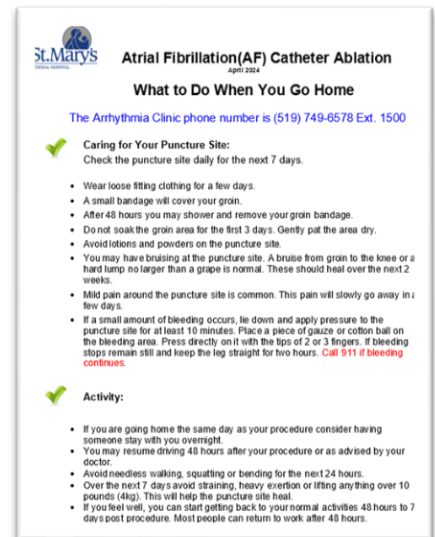
You will receive "AF Catheter Ablation – What to Do When you Go Home" brochure. It will outline the care of your insertion sites. It will also have instructions on when to seek medical help. You will know



when to call the Arrhythmia Clinic or when to go to the Emergency Department (ED).

We will arrange follow-up testing and an appointment with Heart Rhythm NP, about 3 months after your ablation.

You will be referred to a cardiac rehabilitation clinic nearest to you. Exercise programs have shown they can reduce the recurrence of atrial fibrillation. They also improve ablation success rate. You will receive a call from the rehab clinic around 1 month after your ablation.



## Common Things to Expect After Your Atrial Fibrillation Ablation

1. The **recovery time** depends on many factors. The length of time varies from person to person. Most people can return to normal activities within 2-7 days. Resume driving 48 hours after the procedure. Make sure you give your body the chance to recover at its own pace.
2. Your **exercise** ability may go down for weeks to a couple of months after the ablation. We expect it to improve so give yourself time to rest and recover.
3. **General anesthetic** can cause nausea, grogginess, sore throat, or cough for several hours to days after the procedure.

4. **Chest pain** when taking a deep breath or coughing often means the lining of the heart is irritated. The pain level should decrease over the next few days. Some people may require an anti-inflammatory.
5. **Arrhythmia** over the next 2-3 months is common while your heart is recovering. Heart beats may beat early, fast, slow, or go into AF. If AF does not stop on its own, a cardioversion is recommended.
6. Your **resting heart rate** may increase by 10-20 beats per minute. It usually returns to lower rate in the next few months.
7. **Water retention** (swelling) of your hands, feet or legs may occur in the days or weeks after the ablation. This is from an intravenous fluid you received during your procedure. The swelling should go away over 3-4 days.
8. **Digestive problems** such as heart burn, inability to eat large meals and feeling bloated. This will resolve in time. Small meals and a prescribed antacid can help.
9. **Medications** such as anticoagulants, rate control medications, and rhythm control medications will continue for some period of time after the ablation.

# Post AF Catheter Ablation Instructions

Follow the recommendations listed in your “AF Catheter Ablation – What to Do When You Go Home” brochure.

If you go back into AF after your ablation for longer than 24-48 hours, please go to the nearest emergency department for an elective cardioversion. If you have short AF episodes that stop on their own, you do not need to go to ED unless you feel faint or have severe symptoms.

*Episodes of AF are relatively common in the first months after your ablation procedure.*

*This does not mean the ablation did not work.*

*Remember to avoid AF triggers during the first 3 months after you ablation.*

**Continue to manage your AF risks.**



# Patient Resources

St. Mary's General Hospital website: [www.smgh.ca](http://www.smgh.ca) ( search cardiac clinics, then arrhythmia clinic)

Heart rhythm websites:

- Heart Rhythm Society, patient resources  
<http://upbeat.org/>  
<https://upbeat.org/common-treatments/catheter-ablation>
- Heart and Stroke Foundation  
[www.heartandstroke.ca](http://www.heartandstroke.ca) (in the search bar type ablation or arrhythmia)
- Thrombosis Canada  
[www.thrombosiscanada.ca](http://www.thrombosiscanada.ca) (information on blood thinners and AF)
- Mayo Clinic  
[www.mayoclinic.org](http://www.mayoclinic.org) (in search bar type heart arrhythmia or cardiac ablation)
- American Heart Association [www.heart.org](http://www.heart.org)
- Medscape-Atrial Fibrillation Patient Education Centre  
This site includes frequently asked questions, anatomical drawings and information about treatment options. You must be a registered member of Medscape to access this page. Registration is free  
[www.medscape.com](http://www.medscape.com)
- [youtube.com/@DrUjolly/xregexp](https://www.youtube.com/@DrUjolly/xregexp)

## Notes:

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