
ELECTROPHYSIOLOGY STUDY (EPS) AND ABLATION



SOUTHLAKE
REGIONAL HEALTH CENTRE

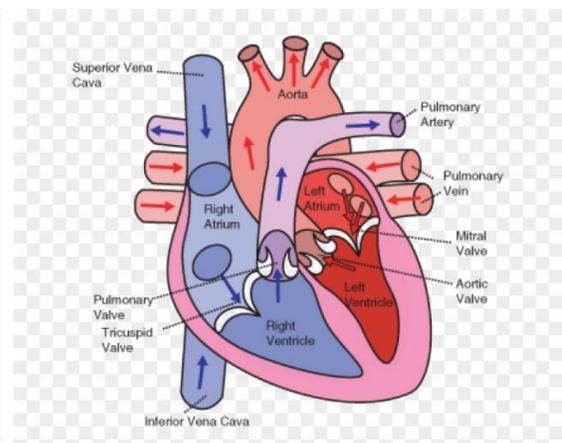
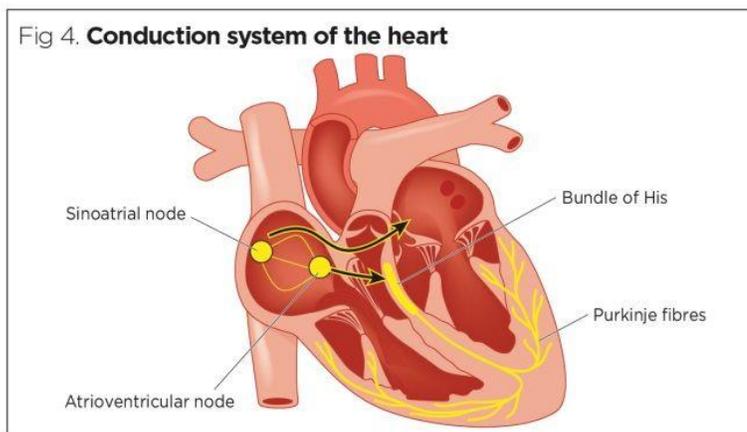
How does the Heart Work?

Your heart works as both a mechanical pump and an electrical organ. It can beat because it produces electrical signals. These signals travel through the electrical pathways of your heart (Figure 1), causing the muscle contraction that pumps blood throughout your body.

Normally these signals come from a small area in your heart called the sinoatrial (SA) node. This area is in the upper right chamber or right atrium.

When the SA node signals reach the two upper chambers of the heart (the atria), they contract at the same time. The atrial contraction fills the two lower chambers (the ventricles) with blood.

As the electrical signal travels through the ventricles, it causes them to contract, which pumps blood out to your body. The contraction of the heart muscle (ventricles) is what you feel as a heartbeat. After a brief rest, the cycle begins again.



What is SVT or VT?

Any disruption in the usual electrical pathways in your heart can cause an abnormality in your heart rhythm. This is called an arrhythmia.

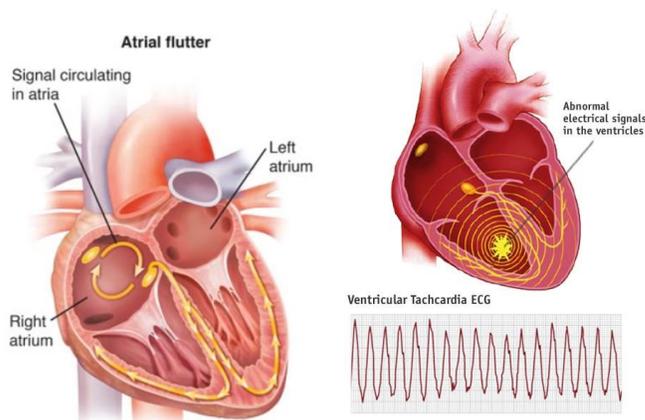
Supraventricular Arrhythmias (SVT)

Abnormal heart rhythms that begin in the upper chambers of the heart are usually rapid. People who experience supraventricular arrhythmias may feel dizzy, light-headed, or have chest tightness or palpitations. Some people do not have any symptoms at all.

Supraventricular arrhythmias can last for only a few seconds or for prolonged periods of time. In general, they are usually not life-threatening. However, they can disrupt the regular flow of blood throughout your body and cause you to feel unwell or have other, more serious, symptoms.

Ventricular Arrhythmias (VT) or Premature Ventricular Beats (PVCs)

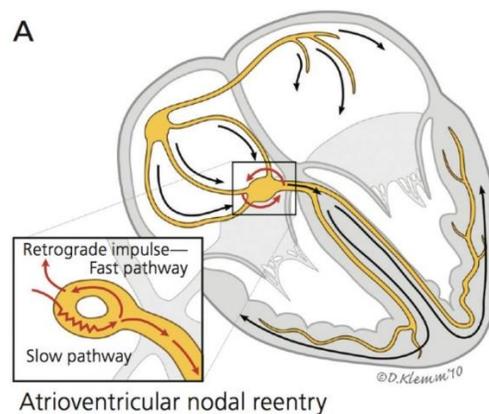
Ventricular arrhythmias occur in the lower part of the heart and can be a bit more dangerous. If there are just extra beats, these are called PVCs. If you have a lot of PVCs, this can negatively affect your heart function or can cause dizziness, palpitations, and fatigue. During ventricular tachycardia, the heart beats so fast that it cannot properly pump blood to the rest of the body. This can cause extreme dizziness, fainting, or sometimes a complete collapse.



What are the different types of SVT?

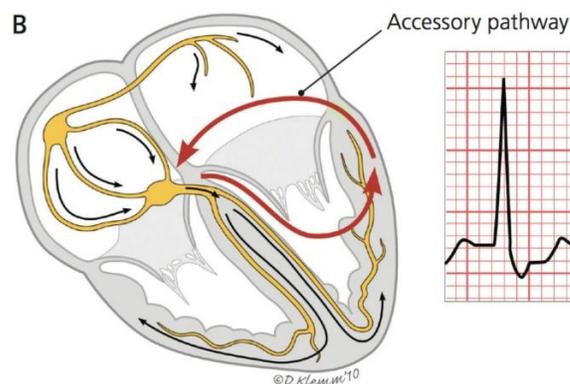
AV NODAL RE-ENTRY TACHYCARDIA (AVNRT)

AV node re-entrant tachycardia occurs when the electrical impulse gets caught up in extra fibers around the AV node and starts to rapidly circle the AV node. This causes a rapid heart rate. You may feel a pounding sensation in your neck.



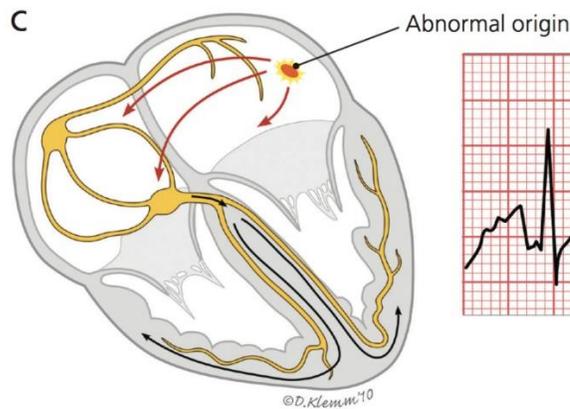
AV RE-ENTRANT TACHYCARDIA (AVRT) or WOLFF-PARKINSON WHITE (WPW) SYNDROME

People with AVRT/WPW syndrome were born with an extra electrical pathway in their heart that connects the atria and the ventricles but completely bypasses the normal AV node pathway. When the electrical impulse goes through the extra pathway, it can cause periods of very rapid heartbeats.



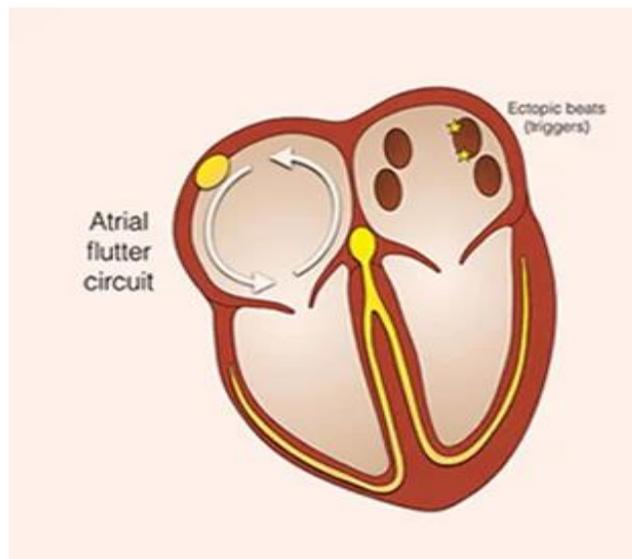
ATRIAL TACHYCARDIA

With atrial tachycardia, the electrical impulse starts somewhere in the atria other than the SA node. This causes an abnormally rapid heart rate.



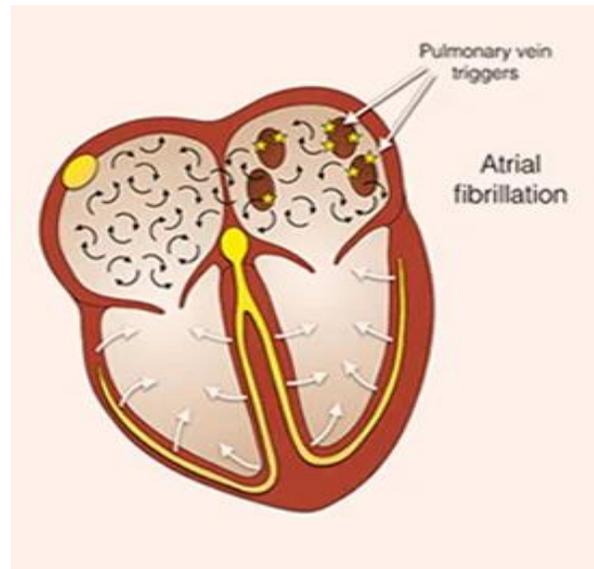
ATRIAL FLUTTER

Atrial flutter is similar to atrial fibrillation but less common. In atrial flutter, the electrical impulse that starts in your atria gets disrupted, interrupting its normal flow to the AV node. This creates a circular feedback loop and sets off a series of rapid-fire impulses, causing your heart to beat quite fast for some time. Patients with atrial flutter often also have atrial fibrillation.



ATRIAL FIBRILLATION

Atrial fibrillation is an irregular heart rhythm that occurs when the SA node does not generate normal electrical impulses. Instead, the atria start to trigger rapid and disorganized electrical signals, causing the atria to quiver rather than contract normally. These abnormal impulses randomly pass through to the ventricles, resulting in an irregular and inefficient heartbeat.



Catheter ablation of atrial fibrillation is covered in a separate pamphlet. Please ask your health care provider to give you this information for atrial fibrillation.



What is an Electrophysiology Study (EPS)?

To fully understand and treat your heart arrhythmia, your doctor may recommend an electrophysiology study (EPS). The purpose of the EPS is to have a detailed look at your heart's electrical system and to diagnose any problems.

Electrophysiology studies use soft catheters with tiny electrodes at their tips to map and evaluate the electrical activity inside your heart. The wires are inserted through veins in your groin or, occasionally, in your neck and threaded up to the inner chambers of your heart. You will not feel the wires in your heart.

During the procedure, your doctor records and measures your heart's electrical pathways and may even use tiny electrical pulses to stimulate the arrhythmia so that it can be fully evaluated. Your doctor may also give you different medications through your intravenous (IV) line to see how they affect the arrhythmia.

You will be gently sedated and be given a local anesthetic to numb the area where the wires go into your vein. However, you may not be completely asleep since the doctor may not be able to trigger your rhythm problem if you are completely asleep.

You may feel yourself go into your arrhythmia during the study. Do not worry, this is normal. Your doctor will have complete control over the arrhythmia and can stop it if required.



What is a Catheter Ablation?

Catheter ablation is done much the same way as an EP study. Most standard catheter ablations are done immediately after the EP study. It involves threading a thin catheter through the veins in your groin up to the areas inside your heart where the abnormal electrical disruptions are occurring.

Once the arrhythmia source is identified and located, heating or freezing energy will be delivered for 30 to 90 seconds at a time through one of the catheters to the abnormal pathway. Sometimes it is necessary to deliver the energy several times to ablate (eliminate) the abnormal pathway. You may feel a little burning in your chest while this is happening. Please let us know if it is uncomfortable and we can give you some more medication.

When it appears that the abnormal pathway has been ablated, the physician will test to be certain your abnormal heart rhythm can no longer be triggered.

Usually, the EP study and ablation procedures are pre-planned to occur at the same time. In other cases, the decision to go forward with ablation is not decided until you have had the EP study and your doctor has determined that an ablation is the best treatment option for you.

The following conditions are often treated with catheter ablation with success rates of 85% or more:

Typical right atrial flutter

AV re-entry tachycardia (AVRT)/Wolff-Parkinson-White (WPW) syndrome

AV nodal re-entry tachycardia (AVNRT)

Atrial tachycardia (AT)

Are there risks to the EPS and/or Ablation?

EP studies and standard ablation procedures are very safe. However, as with any invasive procedure, there can be complications.

Rare complications (<1%) include:

Excessive bleeding where the catheters were put in

Bruising or swelling

Very rare complications (<0.5%) include:

The heart or lung can be punctured.

Blood clot inside the vein

Heart attack or stroke

If we need to perform the ablation near your heart's normal electrical system (like the AV node), there is a risk we could damage your heart's natural pacemaker and you may require implantation of a permanent pacemaker (<0.5%). If a pacemaker is required, you can live a normal life with a pacemaker and it is a relatively minor procedure. However, we will avoid this as much as possible.

During the procedure and throughout the recovery period, we will be monitoring you closely.



How do I prepare for an EPS or Ablation?

Before coming in for your procedure, your health care provider will discuss any special tests or other preparations that may need to be done.

These are general guidelines for you to follow before you have your CRT implanted or a replacement procedure. Be sure to follow any specific instructions from your healthcare provider and the clinic.

Some general instructions will include:

Do not eat or drink anything the night before your surgery (this includes gum, candy, and water).

Medication is usually taken as prescribed in the morning of your surgery with sips of water.

Blood thinners may be stopped one or two doses in advance of the surgery. Check with the CRT Clinic or your physician beforehand for clarification.

If you have your procedure as an outpatient, you will arrive at the ambulatory day care unit either from home or by ambulance from a referring hospital. Although your procedure will take anywhere from one to four hours, expect to be at the hospital for at least 4 to 8 hours. In some cases, you may stay overnight.

Nurses will meet you in the day unit and obtain some medical information and check you in. The preparations for your procedure will start. You will change into a hospital gown. Your groin area will be clipped of hair and cleaned. You may have an intravenous (IV) placed in your arm. You will then be taken to the EP lab (procedure room).

What happens after my EPS and/or Ablation?

You will be on bed rest for up to six hours after your procedure. You must keep your head on a pillow and your affected leg straight. You will be reminded to do these two things to reduce bleeding at the insertion site. If you notice any swelling or bleeding at the insertion site, you must inform your nurse. If you experience any back discomfort, inform the nurse and you can be repositioned with help. Please note that there may be bruising or discoloration at the insertion site. A certain amount of bruising, stiffness, or soreness at the insertion site is expected. A small bruise or lump is normal and will likely go away on its own. You are more likely to experience bruising if you were on a blood thinner before your procedure.

Some numbness or tingling in the affected limb immediately after the test is normal. Such numbness and tingling should disappear by the time you are ready for discharge. You may eat and drink as you normally would upon return to your unit. Your nurse will assist you as needed.

Before you are discharged, your doctor and nurse will go over the procedure and next steps with you. You will also be told if there are any medication changes and how you will follow-up with your doctors.

You will also be provided with instructions on how to care for the insertion site in your groin and/or neck. Generally, we recommend avoiding any strenuous activity, straining, excessive stair climbing, or squatting for 48 hours. We also recommend that you avoid driving for 48 hours.

You may feel mild discomfort in your chest after an ablation. This is normal and should not worry you. Severe chest discomfort is not normal and you should come to the emergency room.

In general, if you are discharged the same day as your procedure, take that day to rest at home.

WHAT TO WATCH FOR AT HOME:

Call the office of the doctor who did your procedure right away if you notice:

- A sudden increase in swelling or bruising around the puncture site
- The puncture site starts to drain pus
- You develop a fever or if your temperature goes higher than 38°C (100°F)

Call 911 if you:

- Have bleeding that does not slow down, even after you press firmly on the site for several minutes
- Any sudden onset of shortness of breath
- Your arm or leg feels numb or tingles
- Your hand or foot feels very cold or changes colour

Caring for Your Puncture Site:

- Keep the area around the puncture site dry for 48 hours after your procedure. Wear loose-fitting clothing for a few days.
- Avoid taking a shower or any activity in which the area may get wet. If the bandage gets wet, replace it with a dry one.
- The bandage can be completely removed 72 hours (three days) after your procedure.
- If there is a small amount of bleeding, lie down, and apply pressure for several minutes to the site where the bleeding is coming from. If the bleeding stops, remain quiet and keep the leg straight and still for two hours.

Activity & Work:

Depending on how you feel, you can start getting back to your normal activities 48 hours after your procedure. Before you go home, talk to your doctor about returning to work. If you have a job that involves mostly sitting, you will probably be able to go back to work within a few days. If your work is more active or involves heavy lifting, you may have to stay home a bit longer.

Where should I contact you?

You can contact us at the PPM clinic:

Southlake Regional Health Centre

596 Davis Drive

Newmarket, Ontario, L3Y 2P9

Phone: 905-895-4521 ext 2572

