

**Pumping Action of the Heart
Impulses**

Normal Pathway of Electrical

Arrhythmias

Some people are born with extra electrical connections between the upper and lower chambers of their heart, or within the AV node itself. Other people have short circuits located in the upper chambers or lower chambers, because of these extra electrical connection, the normal heartbeat becomes either too slow or too fast or irregular. This is call an 'arrhythmia'.

Bradycardia

This occurs when the heartbeat is too slow due to a block or delay in the electrical system. Some people may feel lightheaded, dizzy or faint because the heart is not pumping the blood through the heart fast enough.

Tachycardia

Many different areas of the heart may take over the SA node's job as the heart's natural pacemaker. When an area in the bottom of the heart ventricles acts as a pacemaker, the regular electrical pathway is not used. This may cause your heart to beat very slowly.

An abnormal or "irritable pacemaker" outside of the sinus node may cause an unusually fast heart rhythm to occur or a "short circuit". The heart does not pump blood very well when it is in these fast arrhythmias. Some people may feel lightheaded , dizzy or faint.

***Supraventricular
Tachycardia***

This tachycardia (or fast heart rate) uses an area or areas in the atria(upper chamber) to drive the circuit. There are many types of this kind of rhythm, including: atrial fibrillation, atrial flutter and Wolffe Parkison White Syndrome, to name a few. This may be due to an extra electrical connection joining the upper and lower chambers besides the AV note that we all have. This extra connection may be close to or a part of the AV node in AV nodal reentrant tachycardia or distant from it in AV reentrant tachycardia.

***Wolff-Parkinson-
White
Syndrome (WPW)***

A condition where an extra or abnormal pathway connects the atria or upper chambers to the lower chambers (ventricles). Patients with this condition may have episodes of SVT.

Atrial Fibrillation

Is a series of rapid irregular heartbeats in the atria (collecting chambers). When this occurs, the atrial heart muscle(upper chambers of the heart) begins to quiver or fibrillate, instead of contract, and the pumping chambers (ventricles) beat rapidly and irregularly (usually 100-150 beats per minute).On its own, atrial fibrillation is rarely life threatening but precautions must be taken to prevent complications. Eg. Stroke.

Atrial flutter

An extra impulse travels around and around the atria in a circular path rather than along the normal pathway. This causes the atria to “flutter” and contract at a far higher rate than normal. Much of this extra activity is blocked out by the AV node before being transmitted to the ventricles. Atrial flutter is rarely serious.

***Ventricular
Tachycardia (VT)***

A form of tachycardia (or a fast heart rate) that comes from the ventricles or lower chambers of the heart.

***Description of
The Procedure***

A typical EPS and catheter ablation may last from 60 minutes to 4 hours, depending on your diagnosis and the procedure.

When you arrive in the catheterization laboratory, you will be taken to the EP laboratory and be asked to move onto the x-ray table. In the EP laboratory, you will be attached up to several monitoring devices. Electrodes will be put on your chest, back, arms and legs.(like an EKG). If you have a hairy chest, small areas may be shaved.

***Description of the
Test continued***

Your heart rate and blood pressure will be continually monitored. An intravenous (IV) line will be started in your (left or right) arm usually before coming to the EP laboratory. This IV is useful for administering medication through the procedure such as sedation, and also extra fluid if your body needs it. Sedation will be given at the beginning and during the procedure as needed by you. Overall, we do not want you to experience any significant discomfort. If this occurs, please tell us.

The room is darkened so the doctor can watch and guide the catheters on the monitor.

You will need to lie as still and relaxed as possible because movements or tensing of your muscles can interfere with the electrical signals.

The groin and neck areas are first cleansed with antiseptic solutions that is cold and may sting for a few minutes. You will be covered with sterile sheets, exposing only the area where the catheters will be inserted.

The skin is first frozen with a local anesthetic. You may feel some stinging for a brief moment, but once the anesthetic takes effect, you should not feel any discomfort.

After the initial wires are inserted through the skin, where you may feel some pressure initially, there should be no further discomfort. If at any point you are having any significant discomfort, let the staff know.

Two to four electrophysiology catheters are inserted through veins in the groin area and if necessary, on to the side of the neck. When access is needed to the left side of the heart, arteries may also be utilized, as well as veins, through the groin area.

Electrophysiology catheters are small flexible wires that are placed in various locations in the heart and visualized under an x-ray camera for placement in the heart. Because the staff are exposed to x-rays on a daily basis, they will be wearing protective lead aprons. In total, you will only receive a low dose of x-ray exposure.

The electrophysiology catheters are studded with electrodes so they can serve two purposes; 1. To deliver small electrical impulses to stimulate your

***Description of the
Test continued...***

heart (artificial pacing) or, 2. To record your heart's normal electrical impulses. All these electrical signals will be recorded during the study.

You will probably feel some extra beats as the heart is stimulated during the study. As well, it is likely that your rapid rhythm problem will be produced. You may feel the same symptoms you have experienced in the past. If you feel any pain, nausea, dizziness or palpitations tell the staff. Although you may not look forward to this sensation, you can help the medical team by describing what you feel.

Remember too, that you are in an extremely controlled environment. There are trained physicians, nurses and arrhythmia coordinators present at all times to relieve your symptoms immediately. Often, rapid rhythms can be turned on and off like a switch. Whatever rhythms are turned on, can be turned off, usually using the very same pacing techniques that paced you into your rhythm in the first place.

By analyzing the electrical rhythms from inside your heart once they have been turned on, an area maybe identified where catheter ablation maybe useful to prevent a further recurrence.

Catheter Ablation

The energy used for catheter ablation is radio frequency or radio wave energy, which is similar to what is used in dental or other cauterizing devices. During the actual ablation, the energy application is usually from 10 to 60 seconds long. Generally, there are no significant painful feelings during the actual energy application, although sometimes there is a bothersome burning feeling. If you do have any discomfort. Please let us know.

Once the ablation has been performed, we will retest to see if we can still turn on your rapid rhythm problem, the same way as before ablation. During this time, we leave all the wires in place for an extra half hour so after the ablation procedure to make sure that the area was completely destroyed, and not simply "wounded". If the rhythm does not re-occur, this is a good sign that the ablation has been successful.

We may have to give you intravenous medicines to help turn on the rapid rhythm, to be sure that we have truly achieved our goal.

After the test is completed, you will go to the recovery room for about one hour before going to your room on the Cardiology floor for one night. Occasionally, patients may be discharged the same evening after the procedure.

Risks and Benefit

Although catheter ablation is generally very safe, it is important to understand that there are risks associated with this procedure.

Overall, the likelihood of very serious risks such as stroke, heart attack and death, are extremely low (less than 1 in a 1000)

Whenever one moves wires around inside the heart with the goal of ablation it is possible the wires may accidentally perforate (or to make a small hole or pierce) the heart. Should this occur, the wire would be removed and the hole that was created will spontaneously close in most cases. This complication is very rare.

The heart sits inside the chest in a bag call the pericardium. If cardiac perforation occurs, it is possible for fluid to build up inside this bag. In such an event (called cardiac tamponade) it is treated by removing the fluid with a small needle. Cardiac perforation and tamponade are not lethal events, although we certainly do not want to see them occur. The overall likelihood of this complication occurring during an ablation procedure is very low (1 in 100 to 1 in 1000).

Whenever energy is delivered in the heart, there is always a possibility that (by accident) the normal electrical pathway of the heart may be destroyed. While this will generally provide a cure for your rhythm problems, it will also require the use of a permanent pacemaker. The risk of this implication is very low, 1 in 250 to 1 in 1000, depending on the type of procedure. Other risks include bruising and bleeding.

Pacemakers

A pacemaker is a permanent device which is inserted below the skin under The collar bone and connected by wires to the heart.

Its purpose is to make sure that the heart never goes too slow.

In some individuals, ablation procedures are deliberately performed to burn away the junction (AV node) between the upper and lower half of the heart. If this is the goal of your procedure, this will be explained to you. Otherwise, such an occurrence will be considered a complication of your procedure.

If you do end up with a pacemaker, rest assured that many millions of people live normal lives with pacemakers.

The batteries in a pacemaker last anywhere from 6 – 12 years.

Overall

The bottom line is that there is a 90 – 95% chance that your rhythm problem will be successfully managed with ablation techniques and an overall 1% risk of serious complications.

Before your Procedure

Patients living within or close to the greater Toronto area will be given an appointment date and time to come to the hospital to prepare for the EP study. You will have a blood test and an interview with an Arrhythmia Coordinator. You are encouraged to bring a companion of your choice with you on this day. The pre-admission process can take a few hours.

Please bring the following with you:

Any pre-admission information given to you by your doctor

All medications that you are currently taking (in their original bottle)

Your health insurance card

An interpreter who can speak English if you cannot.

An Arrhythmia Coordinator will assist you in filling out a pre-admission questionnaire, will explain the events which will occur on the day of your EP study, and will discuss any concerns and questions you and your companion might have.

If you live out of town, your routine preparation for the EP study may be organized by your family physician, but you must ensure that all blood results are received by Rouge Valley Centenary Site at least two working days before your admission for EPS.

The result must be faxed to the electrophysiologist's office

If you are diabetic, or have any other health problem; please be sure to let the doctors and staff know

You will need to report to the Catheterization Laboratory (short stay unit) on the day of your EPS.

***The Day Before your
EP STUDY***

Please do not eat or drink after midnight. If you are diabetic, please follow your doctor's instructions.

Please remove all jewelry, makeup and nail polish.

If you have not already done so, please arrange transportation home for the day after the EPS. **YOU SHOULD NOT DRIVE.**

Blood thinners or heart medications should not be taken the day of your procedure. However, check with your doctor first before stopping your medication.

\ You will receive special instructions if you are allergic to x-ray dye or have diabetes.

