Cardiac Electrophysiology Studies and Ablation Procedures for the Treatment of Abnormal Heart Rhythms:

A Patient and Family Guide

Winnipeg Regional Health Authority
Caring for Health
Office régional de la santé de Winnipeg
À l'écoute de notre santé

Cardiac Sciences Program
Programme des sciences cardiaques

Hôpital St-Boniface Hospital

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Introduction

This purpose of this booklet is to help you prepare for your cardiac electrophysiology study/ablation. Please bring this booklet with you to your appointment. Write down any questions you may have so you can discuss with the nurse.

Name: _____

Notes

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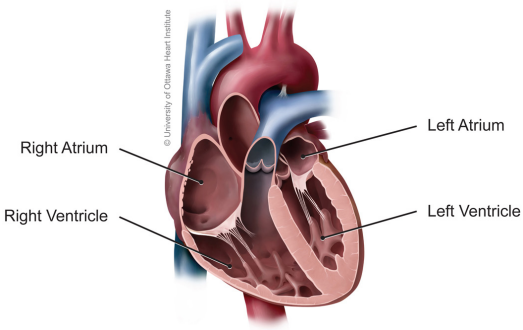
IMPORTANT

If you are waiting for your electrophysiology study and you have questions about the procedure including how to prepare, please contact the cardiac clinic nurses at: 204-258-1409.

If you are pregnant: Please notify the cardiac electrophysiology clinic immediately at 204-258-1409. The procedure will not take place until after your pregnancy (X-rays may harm the unborn child)

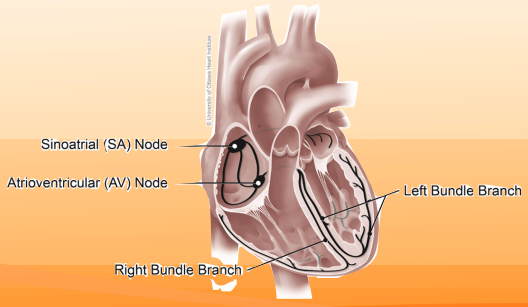
A Review of Your Heart's Electrical System

Your heart is a muscle that works like a pump. The main job of your heart is to pump blood throughout your body. The heart is divided into a right and left side. Each side has an upper chamber (atrium), which collects blood returning to the heart, and a muscular lower chamber (ventricle), which pumps the blood away from the heart*.



The pumping of your heart is regulated by an electrical current or impulse, much like a spark plug in a car. The electrical impulse starts in the sinoatrial (SA) node, often called the body's natural pacemaker, and then spreads throughout both atria, like ripples in a pond. This causes both atria to contract, which squeezes blood into the ventricles*.

The impulse then travels down to the atrioventricular (AV) node which is like a wire that connects it to the ventricles. The AV node splits into two branches, allowing the electrical signal to spread evenly to both ventricles at the same time. This is what causes your heart to beat effectively*.



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Images Credit: University of Ottawa heart Institute (used with permission)

Definitions

Heart arrhythmias: 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: Is an abnormal heart rhythm that begins in the upper chambers of the heart (atrium) and are usually very fast. Some people may feel dizzy or light-headed, have chest tightness, and feel that their heart is racing, or have no symptoms at all*.

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

Types of Supraventricular arrhythmias

Atrial fibrillation: Is an irregular heart rhythm that occurs when the SA node does not generate normal electrical impulses. Instead, the atria (upper chambers of the heart) start to trigger rapid and disorganized electrical signals, causing the atria to quiver rather than pump normally. These abnormal impulses randomly pass through to the ventricles (lower chambers of the heart), resulting in an irregular and inefficient heartbeat*.

Atrial Flutter: Atrial flutter is similar to atrial fibrillation but less common. In atrial flutter, the electrical impulse that starts in your atria is altered. This creates a rapid heartbeat. Patients with atrial flutter can often have atrial fibrillation*.

Supraventricular tachycardia: Is a rapid heart rhythm that occurs when there is a disruption in the abnormal electrical pathways. There are various types of supraventricular tachycardia:

- **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*.

- **AV Node Re-entrant Tachycardia:** 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*.

- **AV Re-entrant Tachycardia /Wolff-Parkinson-White Syndrome:** People with AV Re-entrant Tachycardia /Wolff-Parkinson-White 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*.

Ventricular arrhythmias: Ventricular arrhythmias occur in the lower part of the heart and can be a bit more dangerous. 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*.

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Diagnosing and Treating Heart Arrhythmias

Electrophysiology Study (EP Study)

A problem may occur at any point of the heart's electrical system and cause an abnormal heart rhythm (arrhythmia) or heart rhythm disturbance. An EP study is done to understand and map the electrical activity of the heart and to pinpoint the source of the abnormal heart rhythm.

The information from the study will provide important information to know what is causing the problem and to select the best possible treatment.

EP studies and ablation procedures are fairly safe*.

Rare Complications:

- Excess bleeding where the catheters were placed
- Bruising or swelling where the catheters were placed

Very Rare Complications:

- A hole could be poked (puncture) in the heart or lung
- A change to the heart's electrical system which may result in the need for a pacemaker
- Blood clot in the vein
- Heart attack or stroke

During the procedure and throughout your hospital stay you will be checked closely

Catheter Ablation

An EP study is done to see the cause of your abnormal heart rhythm. The catheter ablation is done to fix the problem. This procedure is usually done when medications to control the abnormal heart rhythm do not work or when the medications cause too many side effects. Usually, the EP study and ablation procedures are pre-planned to occur at the same time. The main benefit of catheter ablation is relief of symptoms.

Conditions treated with Catheter ablation include:

- Atrial fibrillation
- Atrial flutter
- AV re-entrant tachycardia (AVRT)/Wolff-Parkinson-White Syndrome
- AV node re-entrant tachycardia
- Supraventricular tachycardia
- Ventricular tachycardia
- Atrial or ventricular ectopic beats

Types of catheter ablation include:

- Atrial flutter ablation
- Pulmonary vein isolation for atrial fibrillation
- Supraventricular tachycardia ablation
- AV Node ablation
- Ventricular tachycardia ablation
- Ablation of atrial or ventricular ectopic beats

*Content developed and provided by the University of Ottawa heart Institute

Getting Ready for Your EP Study

You will receive a telephone call from the EP Clinic Nurse with a date and time to meet with the nurse before your procedure and a date and time for your procedure. A letter will be sent to remind you of these dates and times.

Your appointment with the nurse will take place approximately 3 weeks before your procedure. At this visit you will learn about the procedure and will be given any special instructions. Bring all medications with you to this appointment as the nurse will tell you what medications you can or cannot take before your procedure. You will also have a heart tracing and blood work done.

Please review the letter you receive and call the EP Clinic Nurse if you have any questions (contact information is on the letter). Plan to be at the hospital for this teaching appointment with the nurse for about two hours. You may bring a family member or someone close to you to the nurse visit.

***Note: once you have had your procedure** you will need a ride home and to have someone stay with you for the first 24 hours after you leave the hospital. If you live more than 1.5 hours away from St. Boniface Hospital please arrange to stay in Winnipeg for the 24 hours after leaving the hospital. It is important to make these arrangements before the procedure.

Procedure Day: What to Expect

- The hair in your groin area will be clipped, as this is the area used to place the catheter
- You will have a needle put into a vein (intravenous) to give any fluids or medications
- The doctor will explain the risks and benefits of the procedure. After your questions have been answered, you will be asked to sign a consent form

The EP study will be done in the EP lab at St. Boniface Hospital. You will be given medications to help you relax. If you are feeling anxious at any time tell the nurse. The nurse will monitor your comfort. All staff will be wearing gowns, masks and special lead aprons.

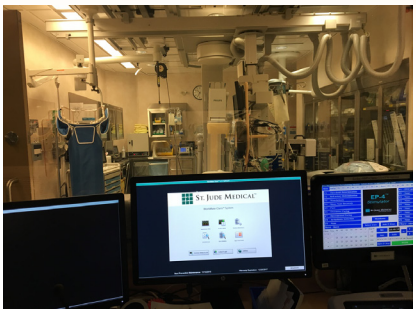
You may be put under general anesthesia in certain cases such as pulmonary vein ablations for atrial fibrillation. This means that you will be asleep for the procedure, with a breathing tube inserted to help control your breathing. You may also have a special ultrasound probe inserted to carefully watch the heart during the ablation.

The doctor will numb the area around your groin. Once the area is numb, small special catheters (flexible tubes) will be inserted there. Anywhere from three to five soft catheters will be inserted through the tubes and threaded up to your heart. X-rays will be taken during the procedure to help make sure the tubes are in the right place. During the placement of the tubes, you may feel some pressure in your groin and some palpitations*.

When the catheters are properly placed, recordings and measurements of the electrical activity in your heart will start. The doctor will pace your heart at different speeds to try and start your abnormal heartbeat. You may also receive medications to start the abnormal heartbeat*.

The goal is to learn about the exact nature and location of your abnormal heartbeat. This will help the doctor to decide the best way to treat it. The EP study on its own will take up to 45 minutes*

Catheter ablation may take an extra 1-4 hours. A special ablation catheter is placed in your groin. The tip of the catheter is directed to the part of your heart that is causing the abnormal heart beat. This treats the abnormal tissue in your heart that is causing the abnormal heart beat. Once the procedure is done the catheters are removed and the doctor or the nurse will apply pressure to your groin until there is no bleeding from the puncture sites*.



EP Lab

Immediately After Your EP Study/Ablation

You will be brought to a special area to recover. You will be on bed rest for 3-4 hours after your procedure. It is important that you lay flat and keep your leg(s) straight. The nurse will remind you to do these things to reduce the chance of bleeding at the groin site. Someone will help you to stand the first time you get up. The nurse will give you a snack when the sedation has worn off.

Inform your nurse right away if you notice any swelling or bleeding in your groin, back discomfort, chest discomfort or difficulty breathing. Please note that there may be bruising or discoloration at the groin site. A certain amount of bruising, stiffness, soreness, numbness at the groin is expected. A small bruise or lump is normal and will likely go away on its own (do not massage or rub it). You are more likely to have bruising if you were on a blood thinner before your procedure.

You may be discharged the same day of your procedure or the doctor may decide you need to stay overnight in the hospital.

*Content developed and provided by the University of Ottawa heart Institute
Image Credit: A. Harman

Going Home

Before you leave the hospital the staff will go over the next steps with you. A responsible adult must be available to meet you at the hospital, drive you to your home, and stay with you for a minimum of 24 hours after you leave the hospital.

Care After Sedation

Sedation is the medication that was given to you to help you relax and to manage pain during your procedure. You are considered impaired for 24 hours.

DO NOT

- Make important decisions or sign legal documents
- Go to work or do business
- Consume alcohol, take recreational drugs, anti-anxiety or sleeping pills
- Travel alone by public transport
  example taking the bus alone
- Take responsibility for the care or supervision of another person
  example: baby, person in poor health

Care of the Access (Puncture) Site

- Bandage: Any bandages should be removed in 24 hours
- Hygiene: You may shower after taking the bandage off (24 hours). Showers are advised until the groin site is healed
- Do not take a bath, swim, or go into a hot tub for seven days
- Bleeding: The groin site(s) should not bleed but sometimes this does happen. If bleeding occurs, lie down right away and try to relax. Either you (or someone else) should press down on the site with your hand for 5 to 10 minutes; you should use a clean cloth. If the bleeding has stopped stay lying for 1 hour.

Comfort

- Acetaminophen (Tylenol®) may be needed for discomfort at the access (puncture) site. After an ablation procedure some patients notice a burning discomfort in their chest that can increase with a deep breath. This may last for a couple of days and is due to irritation of the lining of the heart by the ablation catheter. Acetaminophen (Tylenol®) usually relieves it.

Activity

- Driving: You may resume driving 48 hours after your procedure unless you are told otherwise. If you are traveling for long periods, stretch your legs for 10 minutes after each hour. If you drive a commercial vehicle please contact your doctor for direction.
- Air travel: You may resume air travel 48 hours after your procedure. Please refer to driving section for recommendations.
- Lifting: You should avoid lifting heavy objects greater than or equal to 10 pounds for 1 week to allow your groin to heal. This includes grocery bags, children, exercise weights, etc. You should avoid kneeling or crouching for 72 hours.
- Stair climbing: You should avoid stair climbing for 24 hours. If necessary (example to get to the bedroom or bathroom) climb the stairs slowly.
- Sitting: Avoid sitting for long periods of time.
- Exercise: Avoid exercise except walking for the first two days. If tolerated, walking at a leisurely pace is fine. Generally, exercise can start one to two weeks after your procedure.
- Sexual activity: You may resume sexual activity after 48 hours.
- Returning to work: Please talk with your doctor about when you should return to work. Sedentary work can usually be resumed in 2-3 days. Strenuous or stressful work may require 5-7 days off. This is a general guideline and your doctor will make the final decision.

When to Seek Medical Help

Your recovery should be uneventful. However, if any of the following occur please go to your local nursing station or Emergency Department

- If the bleeding from the groin does not stop after 10 minutes call '911' or your local emergency number and KEEP FIRM PRESSURE ON THE SITE until help arrives
- The groin site(s) becomes hot and swollen or if any discharge is noted
- Severe pain or swelling at the groin site(s), your lower abdomen area, or in your back
- A painful, cold, discolored, swollen or numb leg
- Fever, unusual tiredness, chest pain/discomfort or sudden shortness of breath

If you have had a pulmonary vein ablation

If you have any of the following seek medical help immediately. Make sure you bring the wallet card that you were given with you and show this card to the medical staff.

- Signs of a stroke think **FAST**

  F = Facial drooping

  A = Arm weakness

  S = Speech difficulties

  T = Call emergency services
- Severe chest pain
- Trouble swallowing
- Fever higher than 38°C
- Cough
- Bloody sputum
- Heart burn

Follow-up Appointment

The doctor doing your procedure will inform you regarding the need for a follow up appointment. There are some patients who will not require a follow up appointment. The doctor who referred you for this procedure will be informed of the results.

Suggested places to stay in the area: Please call for room and rates.

Hotels		
Radisson Hotel	288 Portage Avenue	204-956-0410
Sheraton Hotel	161 Donald Street	204-942-5300
Inn at the Forks	75 Forks Market Road	204-942-6555
Norwood Hotel	78 Marion Street	204-233-4475
Canad Inn	1034 Elizabeth Road	204-253-2641
Travelodge	20 Alpine Avenue	204-255-6000
Bed and Breakfast		
Gite de la Cathederal	581 Langevin Street	204-233-7792
Gospel Guest House	271 Archibald Street	204-997-4003