Professor Rukshen Weerasooriya
A Brief Biography

• Studied Medicine at University of Western Australia 1988-1994
• Undergraduate research degree concentrating on cardiac electrophysiology 1992
• Postgraduate training in cardiology at Royal Perth Hospital
• Completed Fellowship of Royal Australian College of Physicians 2001
• Overseas Fellowship in cardiac electrophysiology at Hôpital Cardiologique du Haut Léveque, Bordeaux, France 2001-2003
• Cardiologist, Cardiac Electrophysiologist and Clinical Professor of Medicine with appointments at Royal Perth Hospital, University of Western Australia and Hollywood Private Hospital.

The AF Ablation Clinic
The AF Ablation Clinic comprises a team of dedicated healthcare professionals led by Clinical Professor Rukshen Weerasooriya. We have international recognition in the field of catheter ablation for atrial fibrillation (AF). The team-based approach is the key to our success with each highly trained member of the team playing a critical role in patient care and safety. We pride ourselves on keeping our knowledge at the cutting edge.

Mission Statement
‘Our mission is to provide advanced, safe and effective atrial fibrillation ablation treatment’
AF - What is it?

Atrial fibrillation is a chaotic disorganised heart rhythm localised within the upper pumping chambers of the heart (the left and right atrium) but which affects the overall heart pumping sequence. The most common symptom is fast, irregular palpitation. Other symptoms include tiredness and shortness of breath. Atrial fibrillation may occur as an isolated heart abnormality in which case it is designated ‘lone’ atrial fibrillation by doctors. Alternatively, atrial fibrillation may occur as a consequence of a number of other heart and general medical problems. High blood pressure and sleep apnea are conditions which are frequently associated with atrial fibrillation. Other conditions such as an overactive thyroid gland, heart valve problems and previous heart attack can cause or be related to atrial fibrillation. Being overweight increases the risk of developing atrial fibrillation. Atrial fibrillation can be exacerbated by excess caffeine or alcohol consumption. It is considered a capricious problem and often no clear cause or trigger is identified. Regardless of the causes there are three broad categories of AF:

- Paroxysmal:
  Atrial Fibrillation is intermittent.

- Persistent:
  Cardioversion is required to restore normal rhythm (the AF does not spontaneously go away).

- Permanent:
  Doctors have decided to leave the patient in AF and to just control the heart rate.

AF - How common is it?

One or two percent of the population suffers from atrial fibrillation. The chance of developing atrial fibrillation increases with age (five percent of people over 65 and ten percent of people over 80 have atrial fibrillation).

Is Atrial Fibrillation Dangerous?

In general atrial fibrillation is not particularly dangerous. Atrial fibrillation however is a major risk factor for stroke and in very rare instances can lead to impaired heart pumping function. Atrial fibrillation may significantly affect quality of life but the severity of symptoms does not indicate any danger.
Why does AF start?

No-one knows the answer to this question and there is extensive ongoing research to answer this question. We do know that the rhythm disturbance usually starts as a result of extra beats (ectopic beats) from the pulmonary veins which attach into the back of the left upper chamber of the heart (left atrium). This discovery was made in the Hôpital Cardiologique du Haut Lévêque, Bordeaux, France in the 1990’s. This was a critical discovery as it paved the way for effective catheter ablation treatments which are now commonplace.

Once atrial fibrillation occurs, it may gradually become worse. This is because of a process called atrial remodeling. Atrial remodeling means that the heart muscle gradually becomes ‘addicted’ to atrial fibrillation and begins to prefer this rhythm to normal rhythm. Over time, patients may progress from paroxysmal to persistent then permanent atrial fibrillation. In its early stages, atrial remodeling can be reversed by drugs and catheter ablation to some extent. As remodeling
The CARTO3 *(Biosense Webster, Diamond Bar, CA)* system displays the shape of the heart and greatly increases the accuracy of the procedure. The red dots show the ablated area near the pulmonary veins.

“syngo InSpace EP” technology gives the operator a better understanding of the location of the catheters by selectively choosing different parts of the heart (Left Atrium), while the “syngo iPilot” tool allows the detailed MRI picture to be superimposed on the more basic x-ray image.
progresses, atrial fibrillation can become more difficult to treat by catheter ablation.

**Invasive treatments**

Surgical or catheter ablation of atrial tissue are the only invasive treatments for atrial fibrillation (AF). The major goal of catheter ablation of AF is restoration of normal sinus rhythm without the need for medications to relieve symptoms associated with AF, and minimisation or suppression of the associated risks of blood clot formation and cardiac failure. Radiofrequency energy is delivered via an intracardiac catheter to create lesions that eliminate the sources (ectopic foci) triggering/initiating the episodes of AF, usually in the pulmonary veins.

**Pulmonary Vein Ablation**

Ablation of the triggers alone – mainly consisting in isolation of pulmonary veins – suppresses the paroxysmal (intermittent) form of AF in 85% of patients (without medications and sometimes needing multiple procedures).

A variety of tools are used to improve the accuracy of the procedure. All of the mapping tools enable clearer understanding of the size and shape of the pulmonary veins and an understanding of the location of catheters within the heart during the ablation procedure. Professor Weerasooriya uses the following tools:

- CARTO3 * (Biosense Webster, Diamond Bar, CA)
- “syngo InSpace EP” and “syngo iPilot” (Siemens Ltd. Australia and New Zealand)
- Tacticath, Endosense SA, Geneva, Switzerland, Distributed by Biotronik, Berlin, Germany
- Ensite NavX (St. Jude Medical, Inc)
Testing is performed after ablation to try to reduce the risk of the pulmonary veins recovering over time.

**Left Atrial Substrate Ablation**

During ablation of more complex cases where the atrial fibrillation is more established (so called persistent or alternatively permanent AF) additional linear and complementary ablation is required. This is collectively referred to as left atrial substrate ablation. Linear ablation involves the delivery of segmenting lesions within the left and occasionally the right atrium. The success rates of persistent and permanent AF are significantly lower than for paroxysmal AF. After multiple procedures, the success rate for persistent AF is approximately 70% and the success rate for permanent AF is approximately 60% (depending on the size of the left atrium). The success rate is also importantly dependant on the size of the left atrium. Atrial fibrillation as well as certain disease conditions (eg: high blood pressure) can cause dilation (increased size) of the left atrium. Professor Weerasooriya will use a recent ultrasound scan of the heart-called an echocardiogram (within 6 months is ideal) to assess left atrial size. The ideal patient for AF ablation has a normal or near normal left atrial size. Repeat procedures are more often required in patients with persistent or permanent AF and in those patients with larger left atrial size.

**Pre-ablation management**

A cardiac MRI scan (or rarely a cardiac CT scan) will be arranged before the procedure to determine the size and number of pulmonary veins as well as to confirm the absence of clot, notably in the left atrial appendage which if present would postpone the date of
instructions are individualised according to the clinical judgment of Professor Weerasooriya in discussion with the patient. Generally, antiarrhythmic drugs are interrupted either one week before the procedure or on the day of the procedure. Professor Weerasooriya may prescribe subcutaneous Clexane which is an injectable form of anticoagulation for the 2 days prior to the procedure.

Day of the procedure

On the day of the procedure the patient will be asked not to eat or drink for 6 hours. The patient will be admitted to hospital by a nurse and will be asked to change into a surgical gown in preparation for the procedure. Patients wait for the procedure in the Day of Surgical Admission (DOSA) ward. A patient service assistant will wheel the patient to the cardiac catheterization laboratory (accompanied by the ward nurse) where the procedure will take place. The patient will then meet the team of people who will care for the patient during the procedure including Professor Weerasooriya, an anaesthetist, an anaesthetic technician, a radiographer (assists the cardiologist to use the X-ray equipment), a nurse, an assistant physician and a cardiac technician.
A team approach is required and all of these individuals greatly assist Professor Weerasooriya during the procedure. Technicians and the assisting physician sit in the ‘control room’ during the procedure and they help to interpret and record electrical signals from the patient’s heart.

The cardiac technician will place ECG dots on the chest and occasionally a large adhesive pad onto the back (this is used by the navigation system). The nurse will wash the right groin with antiseptic. The patient will then be covered with sterile drapes. The level of anaesthesia for the procedure is individualised according to the patient’s requirements. The majority of procedures performed in the private hospital setting are performed with the assistance of an anaesthetist and are performed under general anaesthetic. You should discuss your anaesthetic needs with Professor Weerasooriya during the first consultation.

**Catheter approaches**

3 catheters are typically introduced through the right femoral vein for mapping and ablation. A transseptal puncture is usually required to access the left atrium. During transseptal puncture a hole is created between the top chambers of the heart to enable passage of the catheters. This hole will then usually heal over the subsequent 4 postoperative weeks.
Many highly trained individuals are involved during the procedure. They work together to ensure optimal catheter positioning and to ensure proper collection, analysis and interpretation of intracardiac signals. Catheter ablation is performed at the opening of pulmonary veins with a low level of energy to avoid narrowing of the vessel. Blood thinning medications are administered to reduce the risk of stroke and is carefully monitored. A temperature probe is inserted into the oesophagus (food pipe) and is continuously adjusted during the procedure to reduce the risk of damage to the oesophagus during ablation. Venous isolation (a complete firebreak) is successfully performed in almost 100% of cases.

**Implanted Loop Recorders**

Implanted loop recorders are medical devices which comprise a battery and electrical circuit. They are surgically implanted under the skin and are considered the ‘gold standard’ method for monitoring heart rhythm. The device is small: 62mm x 19mm x 8mm. The battery life is approximately 3 years. The device automatically records and logs episodes of AF (analogous to a black box recorder in commercial aircraft). The device is able to send remote transmissions from a home telephone line so that Professor Weerasooriya can ‘remotely’ monitor the patient’s heart rhythm. When the battery becomes depleted, the device is removed (explanted) in a simple 10-20 minute day case procedure. Professor Weerasooriya may suggest implantation of a loop recorder at the time of AF ablation.

**Duration of operation & hospital stay**

The procedure duration varies from one to
four hours depending on individual conditions. Patients are hospitalised overnight. They return to the cardiac ward after ablation. They are monitored by telemetry (continuous ECG recording) during the admission when any recurrence of arrhythmia is most likely to occur. The likelihood of atrial fibrillation recurrence decreases over the next month. Patients return home after an overnight stay in hospital and gradually resume normal activities thereafter. It is recommended that patients limit time spent on their feet for one week. Anticoagulant medications are recommended for at least one month (occasionally three months) after ablation and then can be interrupted in the absence of AF and other risk factors such as a history of previous stroke. Those patients with a previous history of stroke related to the atrial fibrillation should never cease oral anticoagulant medication (warfarin, pradaxa or xarelto). The reason for this is that one cannot be 100% certain that the AF will not return at a later date.

Repeat Procedures

A repeat procedure may be needed for consolidation of the ablation usually due to partial recovery of ablated tissue. The likelihood of repeat procedures depends on individual clinical circumstances and will be discussed by Professor Weerasooriya. In difficult cases particularly patients with left atrial enlargement or other associated cardiac conditions (eg: hypertrophic cardiomyopathy, heart failure, valve disease), left atrial substrate ablation comprising linear ablation or ablation targeting fractionated atrial signals may be required. When left atrial substrate ablation is undertaken there is a 10%-20% risk of the patient developing left atrial flutter in the longer term. If left atrial flutter develops it may be more symptomatic than atrial fibrillation and almost always requires an additional ablation procedure or alternatively a pacemaker followed by ablation of the atrioventricular node.

Reported success rate

Catheter ablation of AF has been performed since 1994. The reported success rate of ablation is as high as 90% in centres with a large experience and in selected patients with episodic symptoms who have been able to stop taking medications. The greatest advantage of catheter ablation for atrial fibrillation is the abolition of symptoms and a markedly improved quality of life. In paroxysmal AF, ablation is better than drugs for controlling symptoms.

Risks associated with AF catheter ablation

Catheter ablation of AF is a low risk procedure when undertaken in a high volume centre by an experienced operator. Professor Weerasooriya has undertaken over 2000 AF ablation procedures as a sole operator and has a low complication rate compared with the published literature. The risk of death is 1 in 5000. The risk of serious complications is 1 in 200.
Serious complications can be summarised as follows:

1. Stroke.
2. Bleeding in the pericardial sac surrounding the heart (cardiac tamponade).
3. Pulmonary vein narrowing (vein stenosis).
4. Damage to the oesophagus (food pipe).
5. Damage to heart valves.

Less serious complications occur 1 in 100 cases and include the following:

1. Nerve injury causing temporary breathing difficulty.

The most common complication is pain, and bruising at the site of the groin surgery. This resolves without specific treatment and has no long-term consequences.

The above risks compare very favourably to the reported complication rates associated with AF itself, and long-term use of antiarrhythmic drug and anticoagulation medications.

**Will AF disappear after my ablation?**

The aim of the procedure is to suppress AF and enable patients to cease all medications. Some patients have no AF following the procedure while others have some episodes (usually less severe afterwards). In some cases the AF becomes worse before becoming better-going away completely. It is unfortunately impossible to immediately predict an individual patient’s response to the ablation procedure and the success or failure of the procedure can only really be determined after at least one month (usually three months). If
arrhythmia is troublesome during the post-operative period antiarrhythmic drugs can be recommenced temporarily.

It is imperative that you contact Professor Weerasooriya if there are any concerns or queries in the post-operative period. If Professor Weerasooriya cannot be contacted then you should present to the nearest hospital emergency department. Professor Weerasooriya travels occasionally to undertake teaching and research commitments. If Professor Weerasooriya is away he will arrange for a cardiologist to cover him during this period. All private and public hospitals where Professor Weerasooriya works will be informed of his cover arrangements.

Post operative care

Almost all patients develop pericarditis following the procedure. Pericarditis is inflammation of the lining around the heart and is caused by the cauterization (ablation). The pericarditis usually settles after 4 - 7 days. Pericarditis is characterised by pain on breathing and moving as well as some shortness of breath. If these symptoms become severe, you should contact Professor Weerasooriya or present to hospital. The management of pericarditis is rest and simple pain killers such as panadol. Anti-inflammatory are sometimes used.

The bruising of the groin will usually disappear after 4 – 6 weeks. If ooze, swelling or pain of the groin site occurs, please contact Professor Weerasooriya.

It is important to rest for at least 1 week following ablation. This means no strenuous physical activity and it is preferable to take a week off work to recover. Exercise should then be gradually re-commenced after the second postoperative week.

Frequently asked questions:

- Do you use cryo ablation?

  Professor Weerasooriya does not use cryo ablation for AF procedures.

- Can I stop blood thinning medications by having an ablation for AF?

  No. The decision regarding the use of blood thinning medication depends upon risk factor and is not related to the procedure.

- Does catheter ablation cure AF?

  No. Catheter ablation is a highly effective treatment in selected patients but it is not a cure.
Discharge Information

Professor Weerasooriya’s patients who have undergone
PULMONARY VEIN ISOLATION

This information is provided to ensure that your transition from hospital to home is as smooth as possible.

1. You must not drive a car on the day of your procedure, and for 24 hours post procedure. It will be necessary to arrange for someone to drive you home from hospital. We prefer that you are not alone the night following your procedure.

2. Rest for one week after discharge – avoid weight bearing. If you walk or stand too much, there is a risk of bleeding at the groin puncture site.

3. Some mild chest pain, or feelings of tightness in the chest is to be expected after the procedure and this should settle after one week. Please notify Professor Weerasooriya if the pain is severe, or has not resolved after one week.

4. You may also experience atrial fibrillation. This is to be expected during the first month and does not indicate that the procedure has failed. If you experience atrial fibrillation, it is not necessary to present to hospital unless the symptoms are distressing you, or if the atrial fibrillation does not resolve after 12 hours.

5. You remove the groin dressing the following morning after the procedure. It is normal for the right groin to appear extensively bruised. This should not be painful. Also, a small ‘pea’ sized lump is often felt under the skin and is not of concern. (It is due to a blood clot). Any severe groin pain is of concern and you should contact Professor Weerasooriya urgently.

6. In most cases, Professor Weerasooriya will prescribe Pradaxa (Dabigatran) or Xarelto (Rivaroxaban). When taking these blood thinning medications, you should not take Aspirin, Clexane or Warfarin.

7. If Professor Weerasooriya has prescribed Warfarin please visit your General Practitioner 3 days after the procedure to have your INR level checked. You should continue to take Clexane twice daily until your INR is over 2.0.

8. Please make an appointment to see Professor Weerasooriya in three (3) month’s time.

9. If you experience any of the following symptoms:
   • Severe chest pain
   • Increased swelling around the wound
   • Excessive bleeding (anything more than a slight ooze)
   • A change in sensation or feeling in your leg

   Rest quietly and contact Professor Weerasooriya on (08) 9386 4782 or, Hollywood Private Hospital on (08) 9346 6000 and ask for the Clinical Nurse of the Angiography Suite, or the After Hours Clinical Nurse Manager for assistance and advice.

   If you have any non-urgent concerns, please email Professor Weerasooriya on rukshen@afablationclinic.com.au
The AF Ablation Clinic

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