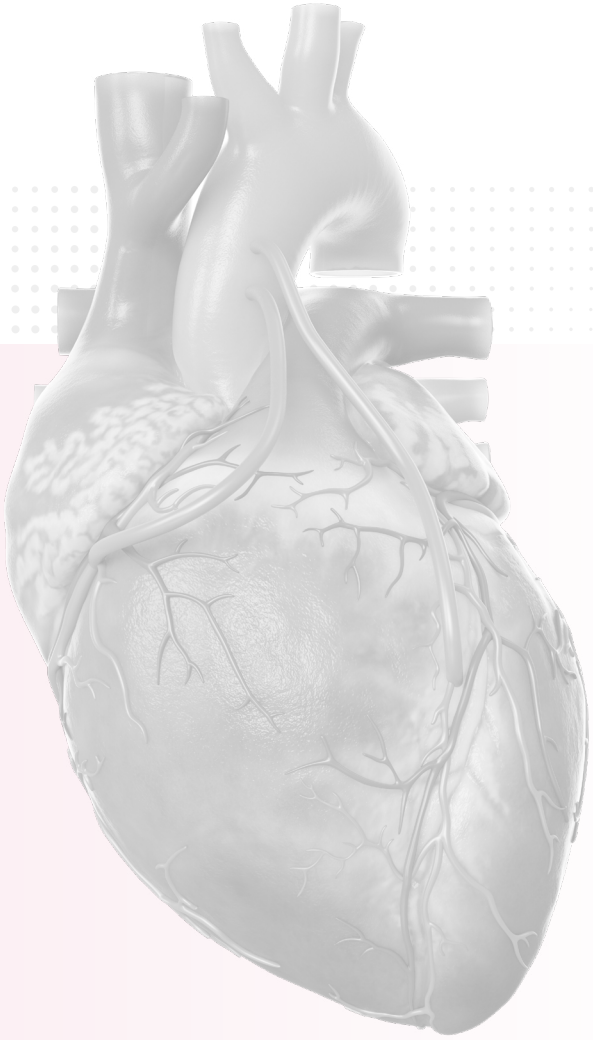
IHH Healthcare

# Catheter Ablation for Atrial Fibrillation (AFib)

## KEY PROCEDURE HIGHLIGHTS



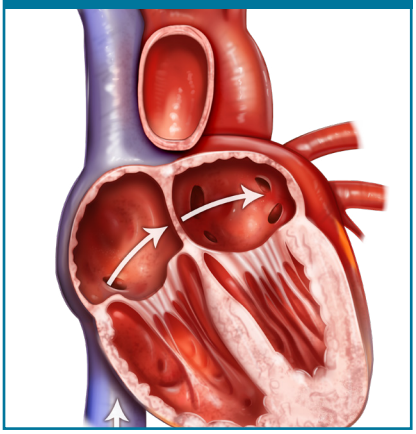
1. **Higher rate of being symptom free** at 4-year for patients who underwent catheter ablation, compared with patients who received drug therapy.[5]

2. Advanced 3D mapping systems lend **higher accuracy, speed and predictability** to the procedure, resulting in higher success rate.[1]

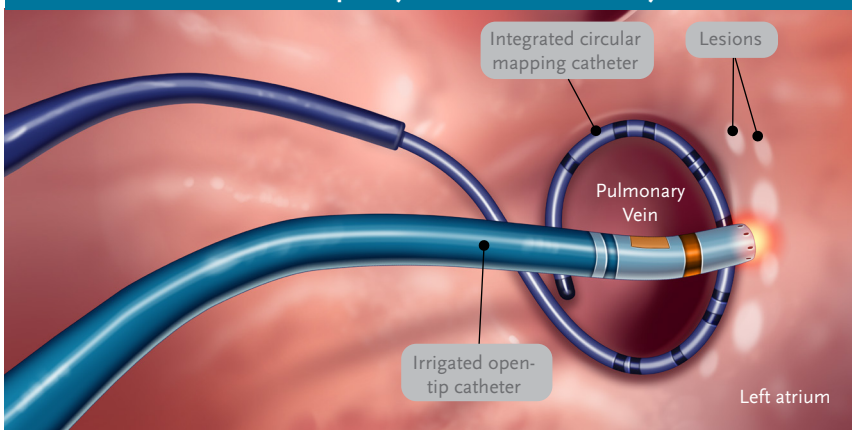
# CATHETER ABLATION FOR AFIB

The basis of catheter ablation therapy for the treatment of atrial fibrillation (AFib), when medicines are not tolerated or effective, is **pulmonary vein (PV)** isolation. It is performed by electrically encircling the PVs individually via **circular radiofrequency ablation** - an established technique using radiofrequency energy source.

**Left Atrium Access Route**



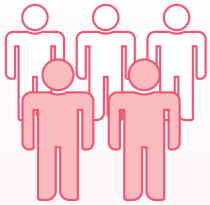
**Circular Radiofrequency Ablation of Pulmonary Vein**




# CHALLENGES OF CATHETER ABLATION: PV RECONNECTION

PV reconnection is often the cause of the recurrence of atrial tachyarrhythmia.[2-4]

## Prevalence of PV Reconnection



Up to **40%** of patients have recurrent AFib after catheter ablation.[1,2]

Frequent acute reconnection ranges between **33-93%**[5,6]

# OVERCOMING PV RECONNECTION WITH OPTIMAL CONTACT FORCE

PV reconnection can be overcome with an optimal catheter contact force (CF) that improves long-term success rate of ablation.[3,8,9]

## Impact of Contact Force (CF) Blinded Ablation on PV Reconnection

CF is the force in catheter tip-tissue contact. PV and residual PV reconnection were associated with lower CF values achieved during CF-blinded ablation:

- 7 out of 10 patients had a PV reconnection[3]
- Residual PV may be found post-ablation[1]

### Optimal CF

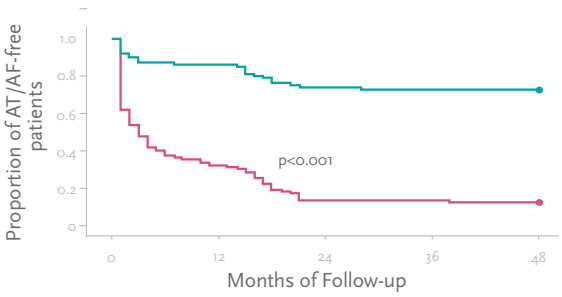

**Availability of real-time CF information** during PVI enables achievement of optimal CF, and was associated with a **significantly lower acute PV reconnection rate.**

### PV Reconnection Rate


with real-time CF information

without CF information[3]

# CLINICAL OUTCOMES




**7 out of 10 patients**
who underwent catheter ablation are **more likely to be symptom free at 4 years,** compared with patients who received drug therapy.[5]

- RFA = Radiofrequency ablation
- AADs = Anti-Arrhythmia Drugs

# WHY PARKWAY HOSPITALS SINGAPORE

**Radiofrequency Ablation Success Rate***

Up to

95%

With our skilled electrophysiologists and advanced technological capabilities, we are able to improve the safety and outcome of the procedure for paroxysmal AFib, achieving up to 95%^ success rate*.

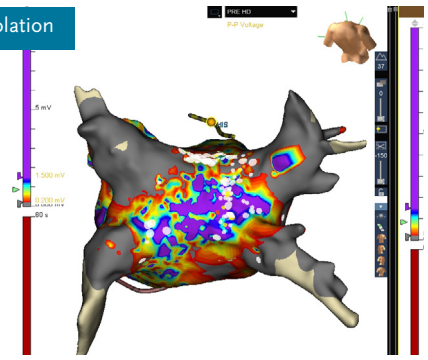
## Advanced Technological Capabilities

Mount Elizabeth Hospitals Singapore is equipped with the latest EP systems - CARTO® 3 System and EnSite Precision™ - that comes with advanced 3D mapping and navigation system.

- **Real-time CF sensing** measures and displays CF information
- **Automation of point collection process** enables mapping of multiple morphologies or non-sustained tachycardias in a relatively short amount of time.
- **Time-voltage data** is visualized on 3D models where colours and dimensions change according to the time-voltage relationship that is time-gated to preselected electrograms.

### Voltage Map: Ablation of Permanent AFib

Pre PV isolation



AF terminated using HD grid after carina area ablation

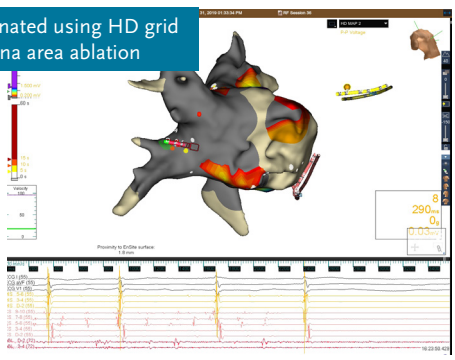


Image Credit: Abbott

These capabilities enables electrophysiologists to achieve higher contact force, and accurately pinpoint the critical sites and orientation of the catheter to facilitate ablation. This helps to **shorten the time and improve the accuracy of the procedure, resulting in lower acute PV reconnection rate**.

# EXPERT CONSENSUS ON AFIB ABLATION

Catheter ablation has emerged as a practical and rational approach for AFib. Its feasibility has been demonstrated across the entire spectrum of patients with AFib, from paroxysmal to permanent:[11]

### Patient with heart failure

\+ Strong evidence that AF ablation improves quality of life and reasonable evidence that it improves left ventricular function.

### Symptomatic paroxysmal AF

\+ If there has not been an acceptable response to ≥1 rhythm-control drug and is reasonable prior to drug therapy.

### Symptomatic persistent AF

\+ Reasonable whether or not the patient has been treated with a rhythm-control drug.

### Longstanding persistent AF

\+ Reasonable whether or not the patient has been treated with a rhythm-control drug.

### Hypertrophic cardiomyopathy

\+ Reasonable in patients with heart failure or age >75 years.

### Tachy-brady syndrome

\+ Reasonable alternative to pacemaker implantation.

### Asymptomatic AF

\+ May be considered, but requires additional discussion with the patient because the benefit of CA in asymptomatic patients is uncertain.

**Patient Spectrum**

**+ CA Feasibility**

^ Clinical outcomes data from Dr Kelvin Wong (Prior to private practice, 2008-2020) and Dr Reginald Liew (Years in private practice, 2013-2020)

\+ 2017-2020 clinical outcomes data from Dr Reginald Liew

* Success is defined by symptomatic relief from AFib or absence of AFib, without the need of anti-arrhythmic drugs lasting at least >12 months

## LENGTH OF STAY

**1 to 2 Days**
including average of
1 day in HDU

# REFERENCES


1. Lin CY, Te ALD, Lin YJ, et al. High-resolution mapping of pulmonary vein potentials improved the successful pulmonary vein isolation using small electrodes and inter-electrode spacing catheter. *International Journal of Cardiology*. 2018 Dec 1; 272: 90–96.
2. Kautzner J, Peichl P. Contact force assessment in catheter ablation of atrial fibrillation. *Journal of Atrial Fibrillation*. 2014 Apr 30; 6(6): 1047. doi:10.4022/jafib.1047
3. Haldar S, Jarman JW, Panikker S, et al. Contact force sensing technology identifies sites of inadequate contact and reduces acute pulmonary vein reconnection: A prospective case control study. *International Journal of Cardiology*. 2012 Dec 6; 16(2): 1160-1166. doi: 10.1016/j.ijcard.2012.11.072.
4. Wilber DJ, Pappone C, Neuzil P, Paola AD, Marchlinski F, Natale A, Macle L, Daoud EG, Calkins H, Hall B, Reddy V, Augello G, Reynolds MR, Vinekar C, Liu CY, Berry SM, Berry DA, For The Thermocool Af Trial Investigators. Comparison of Antiarrhythmic Drug Therapy and Radiofrequency Catheter Ablation in Patients With Paroxysmal Atrial Fibrillation. Jama. 2010;303(4):333. doi:10.1001/jama.2009.2029..
5. Pappone C, Vicedomini G, Augello G, et al. Radiofrequency catheter ablation and antiarrhythmic drug therapy. *Circulation: Arrhythmia and Electrophysiology*. 2011 Sep 23; 4(6): 808-814. doi:10.1161/circep.111.966408.
6. Nademanee K, Schwab MC, Kosar EM, et al. Clinical outcomes of catheter substrate ablation for high-risk patients with atrial fibrillation. *Journal of the American College of Cardiology*. 2008; 51(8): 843-849. doi:10.1016/j.jacc.2007.10.044.
7. Haldar S, Jarman JW, Panikker S, et al. Contact force sensing technology identifies sites of inadequate contact and reduces acute pulmonary vein reconnection: A prospective case control study. *International Journal of Cardiology*. 2012 Dec 4; 168(2): 1160-1166. doi:10.1016/j.ijcard.2012.11.072.
8. Matsuo S, Yamane T, Date T, et al. Reduction of AF recurrence after pulmonary vein isolation by eliminating ATP-induced transient venous reconduction. *Journal of Cardiovascular Electrophysiology*. 2007 May 15; 18(7): 704-708. doi:10.1111/j.1540-8167.2007.00842.x.
9. Wittkampf FH, Nakagawa H. RF Catheter Ablation: Lessons on Lesions. *Pacing and Clinical Electrophysiology*. 2006 Nov 7; 29(11): 1285- 1297. doi:10.1111/j.1540-8159.2006.00533.x.
10. Kuck KH, Brugada J, Fürnkranz A, et al. Cryoballoon or radiofrequency ablation for paroxysmal atrial fibrillation. *New England Journal of Medicine*. 2016 Apr 4; 374(23): 2235-2245. doi: 10.1056/NEJMoa1602014.
11. Calkins H, Hindricks G, Cappato R, et al. "2017 Consensus Statement on Atrial Fibrillation Ablation." *American College of Cardiology*, 26 Sep 2017, www.acc.org/latest-in-cardiology/ten-points-toremember/ 2017/09/26/13/35/2017-hrs-expert-consensus-statement-oncatheter- ablation.
12. Darby AE. Recurrent atrial fibrillation after catheter ablation: Considerations for repeat ablation and strategies to optimize success. *Journal of Atrial Fibrillation*. 2016 Jun 30; 9(1): 1427. doi:10.4022/jafib.1427
13. Chen S, Schmidt B, Bordignon S, et al. Practical Techniques in Cryoballoon Ablation: How to Isolate Inferior Pulmonary Veins. *Arrhythmia and Electrophysiology Review*. Mar 2018; 7(1): 11-17. doi:10.15420/aer.2018;1;2.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