

Developing a new electrophysiology service and training platform - narrowing the gap

Jane Moses and Anton Doubell

*Division of Cardiology, Department of Medicine, Stellenbosch University and Tygerberg Hospital, Bellville, South Africa

Address for correspondence:

Dr Jane Moses
 Division of Cardiology
 Department of Medicine
 Stellenbosch University and Tygerberg Hospital
 Francie van Zijl Avenue
 Bellville
 7505
 South Africa

Email:

drjanemoses.ep@gmail.com

South Africa has a population of more than 58 million people,^(1,2) of which only 9.4 million have private health insurance, and 71.5% would preferentially visit a public sector primary healthcare clinic as their first point of contact when seeking medical assistance.⁽³⁾ In addition, non-communicable diseases, including cardiovascular disease, are on the rise in South Africa and currently form a significant portion of the burden of disease in our population.^(4,5) Arrhythmias make up a significant portion of cardiac consultations (in the range of 40%),⁽⁶⁾ and arrhythmia management has changed significantly over time to a point where catheter ablation is being recom-

mended as the standard of care in many circumstances.^(7,8) Device therapy has also evolved from pacing for bradycardias to more sophisticated device therapies such as improving heart failure and the prevention of arrhythmic death.^(9,10) Up until 2019, there was only one full-time specialist electrophysiology (EP) service in the state health care sector, situated at Groote Schuur hospital in Cape Town, which bore the brunt of invasive arrhythmia management for the state sector of the Western Cape Province.

The reasons for this lack of specialist EP services in the state sector are likely to be multifactorial. There are a limited number of consultant cardiology posts available, and until recently, no local training opportunities, with reliance on 2-year training fellowships abroad. Prof Doubell, Head of Division, Cardiology, Department of Medicine at Stellenbosch University, realised that these obstacles could only be overcome by expanding the EP service in the state sector, thereby expanding the local training platform and reducing the dependency on EP training programmes abroad. The formation of SUNHEART (a centre of the Division of Cardiology, Department of Medicine, Stellenbosch University) provided a platform for collaboration with important role players from industry to establish what has become the "SUNHEART Electrophysiology program," and was fundamental in achieving this vision.

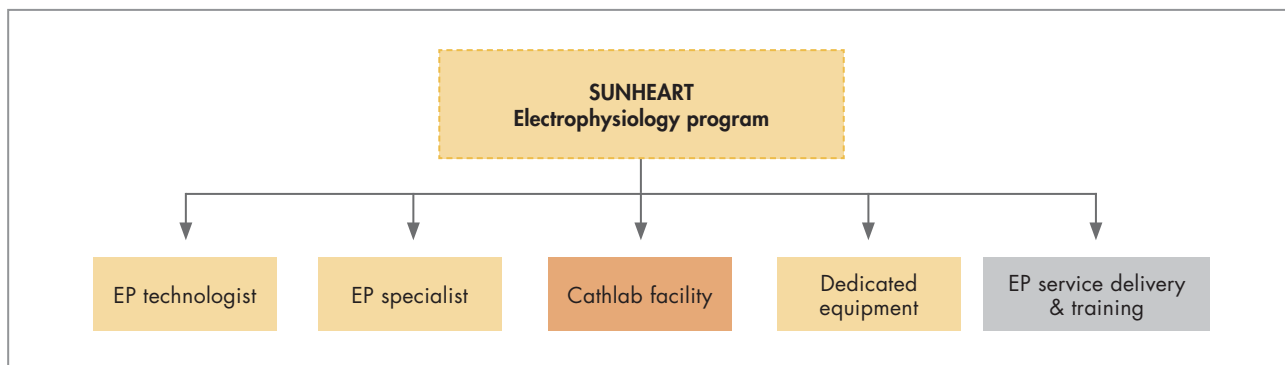


FIGURE 1: Outline of the components of the SUNHEART Electrophysiology programme. EP = Electrophysiology. Orange block: the starting point, an existing cardiac catheterisation laboratory. Grey block: the goal, an EP service delivery and training platform. Yellow block: the 3 key gaps that needed to be filled.

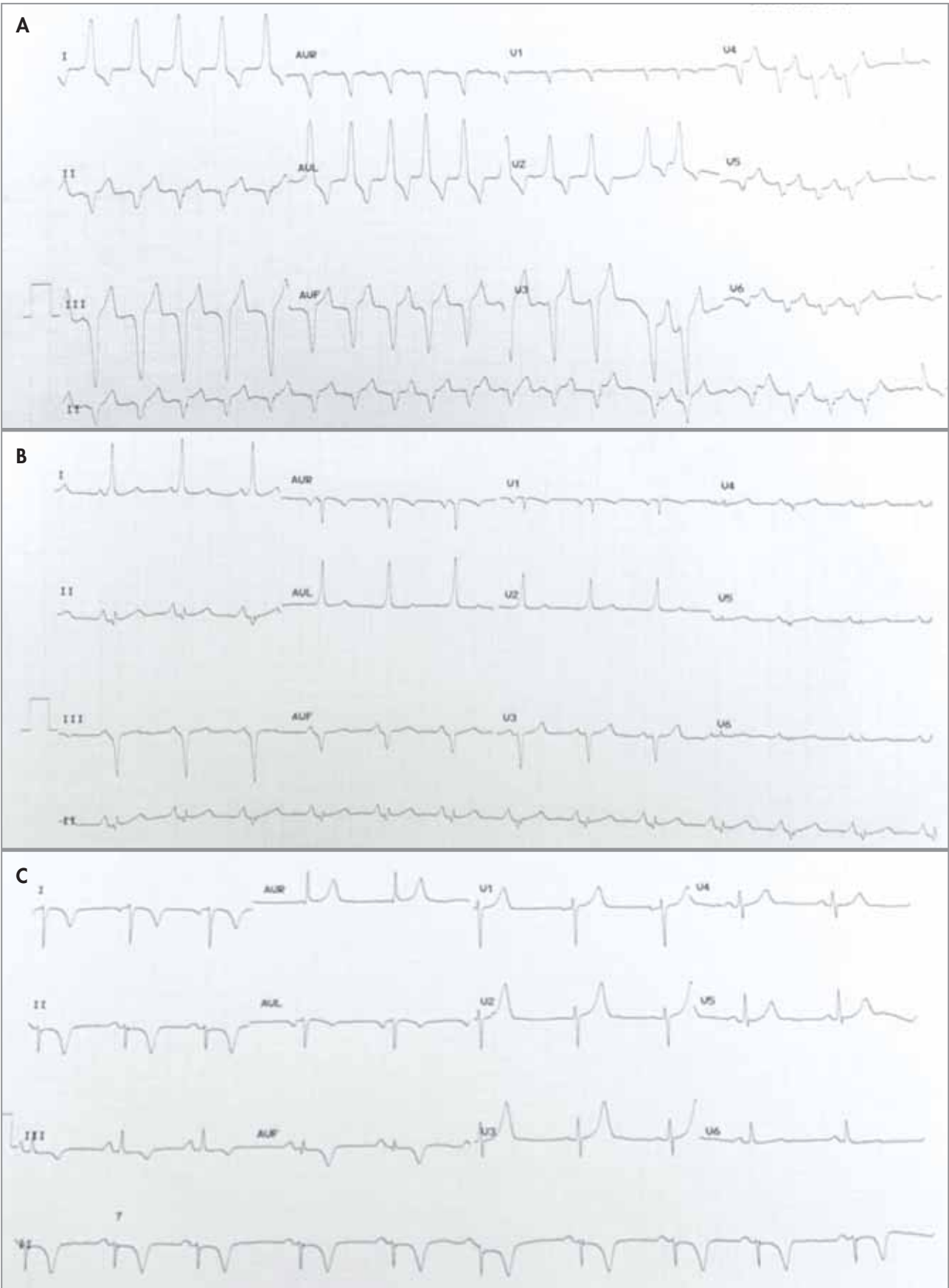


FIGURE 2: ECGs from the index case. A: Pre-excited atrial fibrillation. B: Post cardioversion. C: Post ablation

In 2015, we began the groundwork for the programme based on the 5 pillars illustrated in Figure 1. The starting point was an existing cardiac catheterisation laboratory, with the aim of achieving an EP service delivery and training platform. The means to achieving that goal were to train an electrophysiologist and a cardiac technologist, and to fully equip the catheterisation laboratory. In 2016, the SUNHEART EP fellowship began by way of an institutional collaboration with several centres, funded by industry partners. Prof Ashley Chin's EP programme at Groote Schuur Hospital formed the core of the local training, supplemented by training time in the private sector (Dr Razeen Gopal at Panorama Mediclinic). A further 9 months of training abroad (a 3-month complex device fellowship at the Charité University Hospital in Berlin, and a 6-month invasive EP fellowship at the Oxford Heart Centre, John Radcliffe Hospital in Oxford) ensured a comprehensive training programme leading to success in the European Heart Rhythm Association exams in device therapy and invasive EP. An important part of this training programme was a parallel training programme for a cardiac technologist, who was afforded local training fellowships in the state sector with

Prof Chin at Groote Schuur hospital, and in the private sector (Dr Razeen Gopal, Panorama Mediclinic and Dr Faizel Lorgat, Christian Barnard Memorial Hospital). This was rounded off by a fellowship at the Oxford Heart Centre.

In parallel to the concomitant training of an electrophysiologist and EP technologist, was the important process of upgrading one of our existing cardiac catheterisation laboratories with the necessary equipment to perform invasive EP procedures. Again, industry was instrumental in ensuring that Tygerberg Hospital had full access to state-of-the-art technology.

The SUNHEART EP programme was launched in January 2019, the index case being a patient who had presented with pre-excited atrial fibrillation, and there was much excitement when we were able to successfully ablate the accessory pathway (Figures 2, 3 and 4). Since then, we have done 75 invasive EP cases (24 typical atrial flutter ablations, 19 accessory pathways, 13 slow pathway modifications, 12 diagnostic EP studies, 4 atrial tachycardias/atypical atrial flutters, one ventricular tachycardia and 2 AV node ablations). In addition to this, we have implanted



FIGURE 3: From left to right: Mr Kumeshin Moodley (cardiac technologist) and Dr Jane Moses (electrophysiologist) during the case.



FIGURE 4: From left to right: Mr Kumeshin Moodley (cardiac technologist), Dr Jane Moses (electrophysiologist), Prof Anton Doubell (Head of Division) after the first case.

our first leadless pacemaker and our first subcutaneous implantable cardioverter-defibrillator. We have also established dedicated arrhythmia and complex device outpatient clinics.

While we take pride in what we have achieved thus far, there is still much that needs to be done, particularly in establishing a comprehensive training programme. This reflection has allowed us to share the success we have had in establishing this new EP programme. What we have learned thus far can be summarised as follows:

- There is a great need for specialist electrophysiology services.
- The obstacles we face in a resource-limited society (lack of posts, reliance on training abroad) can be overcome.
- Collaboration between stakeholders (public sector, private sector, industry, not for profit organisations) is key to achieving success.
- The infrastructure needs to be developed in parallel with the personnel.
- Support from colleagues (cardiologists, anaesthetists, cardiothoracic surgeons) is paramount for a comprehensive service.

To sustain this success of improving patient's access to specialist arrhythmia management, it will only be possible if we establish a training platform to produce the electrophysiologists and EP technologists required.

Conflict of interest: none declared.

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