REPORT ON APHRS-EHRA IMMERSION PROGRAM

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It was a true privilege and honour to be awarded the APHRS-EHRA Immersion Program award this year. With the support of this award, I had the opportunity to spend two weeks with the clinical electrophysiology team at the Hanover Medical School in Hanover, Germany. This was one of the most rewarding experiences of my career so far and I am excited to share my experience at this wonderful centre with the APHRS community.

The electrophysiology unit at Hannover Medical School is named the Hannover Herzrhythmus Centrum (HHC) and is led by Professor David Duncker. The city of Hannover is the capital of the German state of Lower Saxony and is home to 1.6 million people. The team led by Professor Duncker is among the most highly respected teams in all of Europe and handles the full breadth of EP and device-related procedures.





Professor David Duncker (right), head of the Hannover Heart Rhythm Centre

I arrived in Hannover in early September immediately following ESC 2026 in Munich. I was fortunate enough to meet Professor Duncker at ESC in Munich as he was chairing a variety of sessions at the conference. He greeted me warmly and was able to introduce me to the schedule at the hospital to ensure a smooth transition. Following ESC, I travelled by train to Hannover: it is a beautiful and historic city with an incredible story and local culture. I was fortunate enough to spend some time exploring the city in the evening and would highly recommend it to anyone traveling to Germany.





Left: The 'Rathaus' (Town Hall). Right: Hannover Medical School and Hospital (MHH)

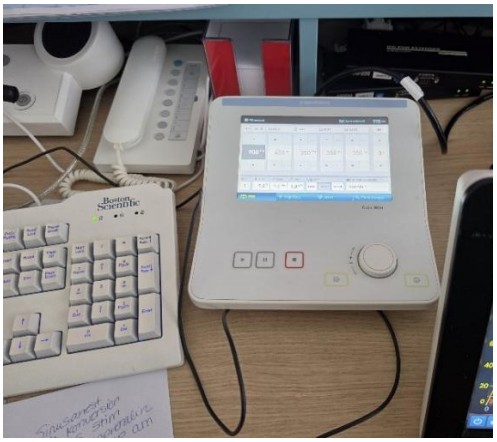
On my first day, I was introduced to the whole EP team, including three consultant electrophysiologists, three clinical EP fellows and a team of 5-6 dedicated EP nurses in the cathlab (the German for cathlab is 'Herzkatheterlabor': quite the mouthful!). The team informed me that the EP lab in Hannover is definitely a beautiful space: it is modern, spacious and the control room is very bright with very large windows. I changed into the hospital green scrubs and was given some bright green laboratory clog shoes and I was immediately thrown into the busy schedule of the EP lab.

Perhaps the most striking aspect of my observership was the ability of the Hannover EP team to function without an anaesthesiologist. In the two weeks I spent in the lab, I only saw an anaesthesia team once: every other day the lab functioned smoothly with EP-led sedation alone. This approach is used for almost every case: PFA AF ablation, radiofrequency AF ablation, atrial flutter ablation, ventricular tachycardia ablation and even subcutaneous ICD implantation. The approach relies on the EP nurses titrating a propofol infusion and providing simple airway support with a Guedel tube.




EP nurses setting up the lab without scrubbing. Right: EP nurses titrating propofol for sedation from the end of the bed.

This approach has a number of important advantages. Most importantly, it streamlines the procedural team substantially. The time required for intubation and extubation is eliminated, and patients move in and out of the lab much faster. As there is no anaesthesia team, the number of people in the lab for the case is very small (one fellow, one consultant, two nurses). As it's the same small team of people for almost all cases, everyone knows their part and the procedures become very streamlined. This really helps efficiency as well as comradery in the lab. Hannover certainly had the happiest and friendliest EP team I've ever met!

In Hannover, the EP recording software and stimulator are run by the EP doctors.

There are some important things to note about performing procedures without anaesthesia. For PFA cases where diaphragmatic stimulation occurs, this does require quite a deep level of sedation with propofol and can cause some minor apnoeic episodes. Also for VT cases with marked hemodynamic lability, it places more responsibility on the electrophysiologist to manage vasopressor support. However, I think there are some really valuable lessons to be learned from this workflow.

Like most hospitals, Hannover has a high-volume of de novo AF ablation cases performed with PFA. The procedural approach for these procedures was very interesting and different to what we do in Australia. Patients undergo a transesophageal echo on the morning of their procedure prior to arriving in the cathlab to clear the left atrial appendage. Then, the table is prepped by nurses: interestingly they don't scrub but instead set up almost everything while wearing sterile gloves. The procedure is performed with just two venous punctures: one for the coronary sinus catheter and one for the PFA catheter. The transseptal puncture is then performed without echocardiographic imaging, using a combination of fluoroscopy, blood pressure measurement and contrast shots. When the operators drop into the fossa ovalis, they check in RAO to estimate the antero-posterior plane of

to the CS. Then, a contrast shot is performed in LAO with the needle tented onto the septum where a faint triangular contrast outline confirms this tented position. Finally, the puncture occurs with pressure monitoring to show that LA pressure rather than aortic pressure is shown, and a second contrast injection confirms the needle is in the LA. This is an elegant approach that was safe, fast and effective in all the cases I observed. The operators had intimate familiarity with this approach and maneuvered very efficiently to the LA in every case I observed. Certainly, this is a valuable workflow that I will remember should I require this in Australia.

One of the highlights of my experience was observing three extravascular ICD implants in one day. Professor Duncker is one of the foremost experts in the EV-ICD system and has performed around 60 implants to date. At this centre, they perform a full day of EV ICD implants once a month. At our centre in Australia, we are the beginning of the learning process around EV ICDs and so this was definitely an incredible opportunity to learn close-up with an expert in the field. Reflecting on my experience, there are several important steps that may seem minor but are paramount to procedural success. Assessment of pre-operative imaging (CT, ECG and echo) is an essential planning step which was done the day prior to the procedures. The CT in particular examines the retrosternal space available for the device, the proximity of the lungs at each level and the height of the right atrial appendage (to estimate the risk of P wave oversensing).

Procedural preparation and draping is crucial: the operators first mark the sternal border, ziphoid process, height of the carina and plane of the left lateral heart border with a marker on the skin and drape to encompass a wide area with additional drape overhang to cover the C-arm in the RAO 90o position. These are the only cases in Hannover that require routine anaesthetic support. I learned about the subxiphoid incision, the technique to finger dissect to the retrosternal space, the tunnelling tool to advance to the height of the carina, the optimal sensing parameters, the special ‘constrictor’ knot to secure the lead to the rectus sheath, the lateral incision for the generator and finally the second tunnelling tool to deliver the lead from the subxiphoid incision to the lateral intercostal incision. Seeing three cases back-to-back was a wonderful way to reinforce the learning points. The operations were extremely streamlined and, again, the small focused cathlab team knew the procedure from start to finish.

A couple of small tricks I learned that I will document here partially for my own learning. First, flipping between AP and RAO 90 while tunnelling is crucial to ensure you are in the correct plane at all times. Second, asking the anaesthetist to deflate the lungs during tunnelling can help to minimize the risk of pneumothorax. Third, removing as much air as possible by pushing down on the chest with high PEEP from the ventilator can improve R wave sensing and lead impedance prior to defibrillation threshold testing. Fourth, the day 1 post implant check is meticulously performed including testing in five positions to determine the best sensing lead. These small tips and tricks will greatly help me in my first foray into EV-ICD implantation in Australia.

Documenting the lessons I learned in Hannover could probably fill many more pages but these were the most memorable and valuable experiences. I would like to sincerely thank Prof. David Duncker and the entire team at the Hannover Heart Rhythm Center for their generosity in hosting me and for so openly sharing their cases, workflows, and clinical reasoning over the two weeks. I am equally grateful to APHRS and EHRA for creating and supporting this Immersion Program. Opportunities like this, that let physicians cross continents to learn directly from one another, are exactly what our field needs more of, and I sincerely hope the program continues to grow in the years ahead.



Me (Jeremy William) after a rewarding experience with Professor David Duncker and the entire EP team at Hannover.