

# Stadtspital Triemli

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### What type of hospital is your EP program a part of?

The Stadtspital Triemli is a tertiary, university-affiliated hospital. With 467 acute beds, it is the bigger of the two city-owned hospitals in Zurich, Switzerland.

### Where is the EP lab in relation to the catheterization department?

The EP lab and two cath labs are adjacent and connected through a vestibule.

### What is the number of staff members? What is the mix of credentials at your lab?

We have three EP-trained, EHRA-certified physicians; in August 2019, we also added an EP fellow. As our lab employees are cross trained to work in both the EP and cath labs, it is difficult to give an exact number for our EP nursing staff. The core EP team consists of 7–8 registered nurses, some who are also an ICU or anesthesiologist nurse. All of our EP nurses work in the cath lab, but not all cath lab nurses work in the EP lab. Our next goal is to train two of our very motivated staff members as cardiovascular technologists.

### Who manages your EP lab?

Dr. Andreas Müller is the medical director of our EP lab. Nadja Campisi Vollenweider, RN is the manager of our cath and EP labs.

### What types of procedures are performed at your facility? What types of complex ablations are performed?

We perform all EP procedures (except for epicardial ablation), including diagnostic EP studies, SVT ablation (AV



**Figure 1:** EP Team (from left to right): Dr. Andreas Müller; Alfonso Conde Martinez, RN; Dr. Roger Dillier; Brigitte Frech, RN; Dr. Christine Franzini; Andreas Möllers, RN.

nodal reentrant tachycardia, accessory pathway, focal atrial tachycardia), ablation of typical and atypical atrial flutter, ablation of paroxysmal and persistent atrial fibrillation, PVC ablation, and endocardial VT ablation. The majority of our ablations are pulmonary vein isolations.

We also implant pacemakers, implantable cardiac defibrillators (ICDs), cardiac resynchronization devices (CRTs), and leadless pacemakers. All of our new implanted devices are MR conditional. The implantation of subcutaneous ICDs, epicardial leads, and lead extractions are performed in collaboration with our cardiac surgeons. Approximately 7% of all our pacemakers are leadless devices; subcutaneous ICDs are implanted very rarely.

### Approximately how many catheter ablations (for all arrhythmias), device implants, lead extractions, and LAA closures are performed each week?

Over the last few years, we have performed approximately 300 ablations, implanted 450–500 devices, and closed 25 LAAs per year. Since opening our dedicated EP lab in August 2019, we have already noted a slight upswing in ablation procedures as we were able to increase our lab time from 3 to 5 days a week. We previously used one of the cath labs for ablations two days a week, and an interventional radiology lab to do implants once a week.

### What types of EP equipment are most commonly used in the lab?

### What imaging technology do you utilize?

- Azurion Clarity IQ biplane system, including EP Navigator image integration (Philips Healthcare)
- MicroPace EPS320 Cardiac Stimulator (Boston Scientific)
- LABSYSTEM PRO EP Recording System (Boston Scientific)
- SMARTABLATE System (Biosense Webster, Inc., a Johnson & Johnson company)
- CARTO 3 System (Biosense Webster, Inc., a Johnson & Johnson company)
- CryoConsole Cardiac Cryoablation System (Medtronic)

### What new initiatives have recently been added to the EP lab, and



**Figure 2:** EP Team (from left to right): Marcel Felber, RN; Nadia Campisi Vollenweider, RN; Jana Oldorff, RN; Rebecca Stibbe, RN; Francesca Randazzo, RN.



**Figure 3:** Our new EP lab.

### how have they changed the way you perform procedures?

We are very proud of our brand-new dedicated EP lab. With this lab, we are able to increase our lab time each week, which helps us deal with the growing number of patients as well as simplify procedural scheduling, especially for urgent or more complex cases. Having more lab time also gives us the opportunity to perform new procedures and techniques.

### How is shift coverage managed (typical hours)? How does your lab handle call?

Our EP nursing staff is divided into two shifts, and the cath lab nursing staff is divided into three shifts. The first shift is from 7:30 am to 4:30 pm, and the second shift is from 10 am to 7 pm. If we do not manage to finish our cases by 7 pm, we get support from the cath lab staff, since their third shift starts at 1 pm and goes until 8 pm. The third shift is also on call overnight for emergency

cath lab procedures. We do not perform EP procedures at night or on weekends.

Our physicians normally start around 7:15 am, and work until all procedures are finished and patients are discharged.

### Tell us what a typical day might be like in your EP lab.

With a new five-day service, we are defining what a typical day looks like. We try to plan separate implant and ablation days, but on most days, it's not entirely possible. We normally bring the first patient into the lab by 8 am and plan to finish in the lab by 6 pm. That timeframe allows us to perform 3-4 cases a day depending on the complexity of the case. We generally start the day with an outpatient procedure and then continue with the most complex case of the day. If we need to perform a case in general anesthesia (we mostly do our cases in conscious sedation), we get support from our colleagues from the anesthesiology department on Thursday mornings.

### Who handles procedural scheduling? Do they use particular software?

We have 5 excellent and very hardworking secretaries (some are part-time) who schedule all cardiac procedures, including all EP procedures (devices and ablations) and cardiac inpatients and outpatients, as well as in the device clinic.

Polypoint is the software used in the entire hospital to plan inpatients and outpatients, procedures, rosters, etc.

### How is inventory managed at your EP lab? Who handles the purchasing of equipment and supplies?

For every EP case, we record all used equipment. The EP purchasing team checks the equipment inventory on a daily basis, and if the minimum inventory threshold is reached, they order additional supplies.

*continued on page 18*

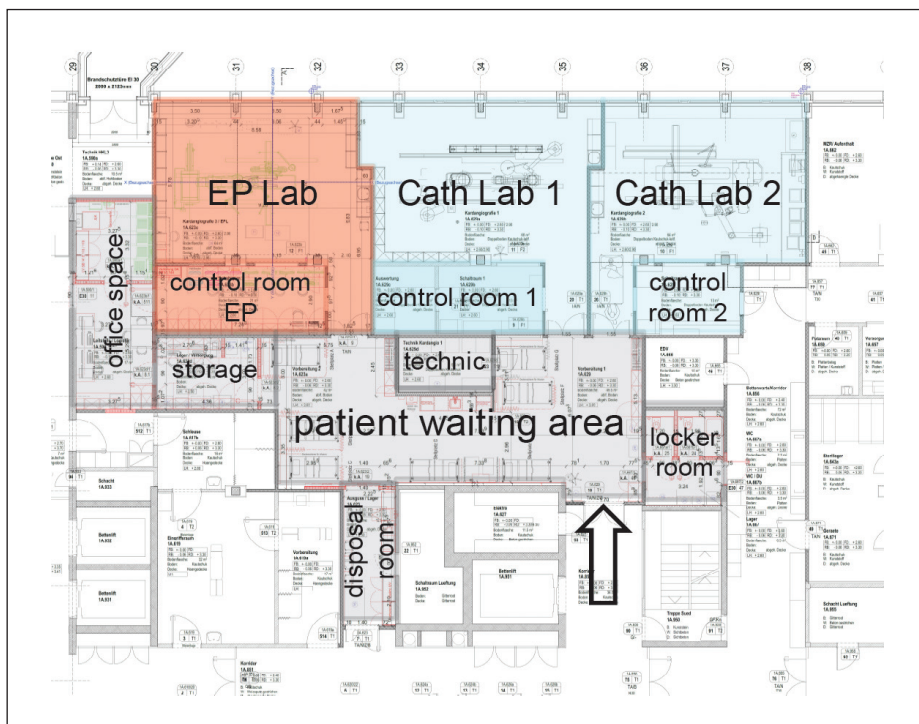
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**Figure 4:** Cath and EP lab blueprint.

## Spotlight

Continued from page 17

For capital or new acquisitions, there is a defined process to receive funding approval. Once the contracts are finalized by the hospital material management team, our EP purchasing team orders the new equipment.

### How has managed care affected your EP lab and the care it provides patients?

Managed care has not greatly affected our daily work and the care we provide for our patients. But over the last few years, we have experienced increasing regulatory pressure such as the “out-patient before inpatient” dictum that forces us to perform certain procedures as outpatient procedures if the patient does not have specific risk factors.

### Does your EP lab compete for patients?

Yes, in the greater metropolitan area, there are 5 other hospitals performing ablations and even more performing device implantations. Therefore, it is very important to have and maintain a good referral base.

### Have you developed a referral base?

Our cardiology team works very closely with several general hospitals, cardiology offices, and family practitioners/internist in the greater metropolitan area. We have developed a collegial relationship with a lot of the referring cardiologists. In addition, we get a lot of

referrals from our very busy emergency department.

### In what ways have you cut or contained costs and improved efficiencies in the lab and device clinic?

We have improved our efficiency by standardizing all of our processes. Our three EP physicians perform all procedures in the same way with the same equipment, according to our written internal guidelines.

The purchasing department also periodically negotiates with suppliers.

### How are new employees oriented and trained at your facility?

Depending on their previous work experience, new employees get at least 3-4 weeks of on-the-job training in the cath and EP lab. During that time, they are assigned to a supervisor who performs training according to an in-house developed curriculum.

We do not yet have an EP fellowship program, but all of our cardiology residents/fellows (currently we have 1 part-time and 14 full-time residents, as well as 1 interventional fellow) do a rotation at our EP outpatient clinic and device clinic; since August 2019, residents with a special interest in EP also have the opportunity to do an EP lab rotation.

### What types of continuing education opportunities are provided to staff? How many of your staff members attend medical conferences each year?

Every morning, we have a teaching or case discussion session for our residents/

fellows. For the nursing staff, we have a weekly teaching session on a general cardiology topic and one teaching session on a lab-related topic.

As the Swiss Medical Association requires every board-certified member to log 50 hours of accredited courses/conferences in addition to 30 hours of self-studies a year, every physician gets paid time off to attend medical conferences, meetings, or courses. It is up to the individual staff member to choose the courses and organize their participation.

Nurses are encouraged to attend educational courses to maintain/improve their skills and knowledge. The amount of approved paid days off is dependent on the importance of the course topic to their work.

### How is staff competency evaluated? Does staff receive a bonus based on performance?

We have implemented an employee assessment system. Staff competency is evaluated by direct observation of their everyday work. Every employee has at least one (more if considered necessary) assessment interview per year. Employees with an outstanding performance/positive evaluation may receive a bonus or pay raise.

### Approximately what percentage of ablation procedures are done with cryo vs radiofrequency?

Since the availability of contact force sensing technology, nearly all of our ablation procedures are done with radiofrequency. The only exclusion is parahisian ablations, which are done with cryo.

We use contact force sensing catheters for nearly all ablations except for AV node ablations, during which we use a non-contact force irrigated catheter. We use a 4 mm non-irrigated catheter for AVNRTs, and cryo for parahisian ablations.

### What are your techniques for LAA occlusion? Do you have a primary approach?

We use the AMPLATZER Amulet Occluder (Abbott) and the LAMBRE LAA Closure System (Lifetech Scientific).

### What are your thoughts on the use of NOACs in patients with non-valvular atrial fibrillation?

We prefer NOACs in patients with non-valvular atrial fibrillation. Nearly all of our patients are treated with NOACs — warfarin is only used in patients with a contraindication for NOACs or for

patient preference. If a patient is on warfarin, all EP procedures are done on uninterrupted warfarin with a target INR of 2.0-3.0.

### Do you utilize lifestyle modification as therapy for your patients with atrial fibrillation?

Yes, we believe that reducing risk factors in patients with arrhythmias is very important and increases the long-term success rate. Obese patients undergo a 3-month physical training/ambulatory cardiac rehabilitation program and get support from a dietician to reduce their weight. All patients at risk for obstructive sleep apnea are referred to a pulmonologist for a screening test and, if necessary, further treatment. Blood pressure control is achieved before ablation.

### What approaches has your lab taken to reduce fluoroscopy time/dose? What percentage of cases are done without fluoro? What types of radiation protective shielding and technology are used?

Except for diagnostic and cryo procedures, all procedures are performed with an electroanatomical mapping system and image integration (CARTOUNIVU Module, Biosense Webster, Inc., a Johnson & Johnson company). As a result, we have reduced our fluoro dose for SVT ablations by a factor of 5.

In addition, we have reduced our fluoroscopy dose to a minimum, with minimal compromise to image quality, by programming our fluoroscopy system with the help of engineers from Philips.

For personal protection, we use two different lead glass barriers, table-mounted lead shields, a RADPAD protection shield and No Brainer scrub cap (Worldwide Innovations & Technologies, Inc.), and by wearing a lead apron, a thyroid shield, and radiation glasses.

In addition, we hope to introduce a real-time personal dosimetry monitoring system in the near future.

### What are your methods for device infection prophylaxis?

Before every device implantation, all unused equipment is put away or draped with special covers. The room is then cleaned by a special cleaning team, according to our OR standards. After that, everybody who enters the room (including the patient) wears a surgical mask and cap. During the procedure, we reduce the number of persons in the room to a minimum of 4-5 people (including the patient).

Periprocedurally, every patient receives a second-generation cephalosporin (clindamycin or vancomycin to patients with known allergies).

Local hair removal is done on the day of surgery by a nurse on the ward or in the EP lab.

Local disinfection is normally performed with Betaseptic solution.

We use a Garamycin sponge (alternatively, a TYRX Absorbable Antibacterial Envelope [Medtronic]) for all generator changes, for most ICD and CRT implantations, and for patients with an increased infection risk (diabetes, steroids, etc.)

### What are some of the dominant trends you see emerging in the practice of electrophysiology?

Over the last few years, we have observed that patients referred for EP procedures tend to be older, sicker, more obese, and have more comorbidities.

Reducing fluoro time and dose has also been an important topic over the last several years, but today, use of minimal fluoro or even fluoroless ablations have become standard in most labs.

In our opinion, high-power short-duration radiofrequency ablations as well as His bundle and leadless pacing will dominate EP in the future.

### Do you utilize remote monitoring of CIEDs? What clinical and economic benefits have you seen?

As Switzerland is a very small country, most patients travel only very short distances to see their cardiologist. Therefore, remote monitoring has not reached the same importance as in the U.S. or Canada. We mostly use remote monitoring of CIEDs for patients enrolled in studies or for patients with a device with a product advisory, such as for premature battery depletion.

### Do you utilize digital tools or wearable technologies in your treatment strategies for patients?

We use wearable technologies like the ME 90 Bluetooth Mobile ECG device (Beurer) or long-term ECG devices (such as a Holter monitor) to detect suspected arrhythmias, monitor medical treatment success, and follow-up with all patients after atrial fibrillation or VT ablation.

If a patient brings an ECG print from a sport or smartwatch, we try to analyze them in our office. So far, we have not encouraged patients to buy such devices.

### Describe your city or general regional area.



**Figure 5:** Dr. Franzini performing a pulmonary vein isolation in a patient with persistent atrial fibrillation.



**Figure 6:** Ajay Panakal, Clinical Support Specialist at Biosense Webster, assisting with a pulmonary vein isolation.

The Stadtspital Triemli is located near the western border of Zurich. With 432,000 inhabitants (1.83 million in the metropolitan area), Zurich is the biggest city in Switzerland. It is mostly known as a large financial center, but due to its airport and big train station, some international headquarters and most of Switzerland's research and development centers are concentrated here as well. With the ETH Zurich (Swiss Federal Institution of Technology) and the University of Zurich, we have two high-ranked universities in

the city, attracting students from all over the world. Due to its beautiful old town, its location on Lake Zurich, proximity to the Swiss Alps, and its wide range of cultural attractions and vibrant night life, Zurich attracts millions of tourists every year and has uninterruptedly been voted as one of the best cities to live in for the last 10 years.

**Please tell our readers what you consider special about your EP lab and staff.**

We have an amazing EP team that is passionate about providing excellent patient care. Our team members have a wide range of complementary skills, and most have been working here for many years. Without the effort of everyone, it would not have been possible to develop the program that we have today. ■

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