Welcome to the Basel Cardiothoracic Anaesthesia Fellowship Programme

Aim of the Fellowship

We are offering a Cardiothoracic Anaesthesia Fellowship at the University Hospital Basel for a duration of two years. One person per year can start the fellowship programme.

Aim of the Fellowship Programme is to train anaesthesiologists who have finished their residency training to become proficient in cardiothoracic and vascular anaesthesia.

The candidates must be board certified or board eligible according to standards of Swiss / European residency programmes, and must be proficient in the German language.

The fellows will have the opportunity to gain extensive experience in the fields of cardiac, thoracic and vascular anaesthesia and intensive care medicine. After completion of the programme, they will be able to work independently as consultants in cardiac, thoracic and vascular anaesthesia.

The fellowship programme in Basel is organised and directed by the head of cardiothoracic anaesthesia, Dr. Joachim M. Erb, DEAA, as programme director, and officially acknowledged by the European Association of Cardiothoracic Anaesthesia (EACTA). At completion of the programme, the fellow will receive a joint certificate signed by EACTA and the Department of Anaesthesia and Intensive Care at the University Hospital Basel.

Obligation of the Fellow

The Programme includes pre-, intra- and postoperative care of patients undergoing cardiac, vascular or thoracic surgery. The fellow takes part in the clinical routine as well as in clinical conferences with the Department of Cardiology, Department of Cardiac Surgery and the Division of Intensive Care Medicine. The fellow receives training in transesophageal

echocardiography by formal courses and teaching in the operating room. The fellow takes part in preparation and presentation of case conferences. We provide a didactic curriculum through lectures and conferences and allow the fellow to acquire the knowledge to care for the patients. In addition, academic projects including preparation and publication of review articles, book chapters and manuals for teaching or clinical practice, clinical research or other academic activities can be taken up by the fellow. To provide an insight into cardiac and lung transplantation, the fellow will stay for one month in a high volume cardiac centre performing heart and lung transplantations, usually during the first year of the fellowship. The fellow is responsible for the documentation of the cases and TEE examinations done during the fellowship.

Evaluation

The fellow's progress will be evaluated and discussed with the fellow every 3 to 6 months by the programme director and the faculty memebers. The fellow's professional attitude, fund of knowledge and clinical judgment will be assessed as well as his/her practical skills, social competence and efficiency for patient management and critical analysis in all relevant clinical situation. The fellow is involved in programmes of quality assurance and risk management. At the end of the training period, the fellow will receive a testimonial.

Faculty

The division head and programme director as well as the senior faculty have a large experience in cardiothoracic and vascular anaesthesia. Dr. Erb is responsible for the fellowship programme and directs it in accord with the department head Prof. Luzius Steiner. He devotes sufficient time to provide substantial leadership to the programme and supervision for the trainees. Dr. Erb is also the primary coach of the fellow; further senior members of the cardiothoracic and vascular anaesthesia team serve as clinical teachers and coaches for the fellows in daily clinical practice. The Faculty of the Division of Cardiothoracic and Vascular anaesthesia consists of 7 consultants who are specially trained in cardiothoracic and vascular anaesthesia as well as in perioperative transesophageal echocardiography.

Resources

The University Hospital Basel is the exclusive cardiac surgical centre and the major thoracic and vascular surgical centre in Basel and northwestern Switzerland, a region with a population of approximately 1 million people. There exists a high level of medical care with a twenty-four-seven emergency department, operating rooms which are all adequately designed and equipped for the management of cardiothoracic and vascular surgery patients and intensive care units for surgical (26 beds) and nonsurgical cardiothoracic patients (19 beds). Staff physicians are all board certified in their medical specialty and have profound experience in cardiovascular and pulmonary disease, echocardiography including transesophageal echo, clinical cardiac electrophysiology and cardiac, thoracic and major vascular surgery. The monitoring and advanced life support equipment is representative of current levels of technology. There are facilities which are readily available at all times to provide prompt laboratory measurement pertinent to the care of cardiothoracic and vascular surgical patients as well as prompt non-invasive and invasive diagnostic and therapeutic cardiothoracic procedures. These include but are not limited to echocardiography, cardiac stress testing, cardiac catheterization, electrophysiological testing and therapeutic intervention, cardiopulmonary scanning procedures and pulmonary function testing.

Cardiac Surgery

The Department of Cardiac Surgery at the University Hospital Basel performed 1061 adult cardiac procedures in 2017. Details can be taken from the table on the following page.

Interventional Cardiology

The Division of Cardiac and Thoracic Anaesthesia at the University Hospital also covers the interventional cardiology theatre, where about 130 transfemoral aortic valve implantations are performed each year. The fellow is involved and trained in these procedures.

Year	**2017**	**2016**	**2015**
Operative interventions total	1061	1098	1031
Cardiac surgery total	**867**	**850**	**864**
Cardiac operations with CPB	535	533	568
Cardiac operations without CPB	99	121	101
Pacemaker, ICDs, etc.	233	196	195
Combined Cardiac surgery with CPB	229 (43%)	198 (37%)	254 (45%)
CABG	**319**	**311**	**347**
Isolated CABG surgery with CPB	165	168	208
Off-pump CABG surgery	20	27	29
Combined surgeries (CABG +)	134	116	110
Aortic valve surgery	**220**	**233**	**227**
Aortic valve replacement biological valve	107	127	119
Aortic valve replacement mechanical valve	28	35	34
Aortic valve and root replacement ("Composite")	30	13	23
Aortic valve reconstruction Ozaki technique	10	15	8
Aortic valve reconstruction other techniques	29	24	25
Transapical aortic valve implantation (without CPB)	16	19	18
Mitral valve surgery	**121**	**121**	**133**
Mitral valve replacement via sternotomy	26	43	40
Mitral valve replacement minimal invasive	6	3	3
Mitral valve repair via sternotomy	53	33	43
Mitral valve repair minimal invasive	32	40	44
Other	4	2	3
Reconstruction rate	97%	98%	97%
Tricuspid- und pulmonic valve surgery	**26**	**12**	**16**
Tricuspid valve repair	24	11	16
Pulmonary valve replacement	2	1	0
Thoracic Aortic surgery	**105**	**82**	**87**
Miscellaneous	51	48	50
Atrial and pummonary venous ablation	15	10	16
ASD and PFO	36	38	32
CPB	**535**	**533**	**568**
Minimal extracorporal circulation (MECC)	145	146	196
Deep Hypothermic cardiac arrest (DHCA)	90	74	71
Cardiac Assist Devices	**51**	**52**	**63**
IABP	21	28	42
ECMO	22	21	19
LVAD	8	3	2
Elective cardiac surgery	577	567	504
Urgent cardiac surgery	122	154	135
Emergent cardiac surgery	77	129	141

Thoracic Surgery

Part of the fellowship programme is the anaesthetic management of adult patients undergoing thoracic surgery. The Department of Thoracic Surgery performs around 800 thoracic operations per year which includes video-assisted thoracoscopic surgery and open procedures as well as roboter - assisted surgical procedures.

Vascular Surgery

The Department of Vascular Surgery covers all major vascular procedures in the descending thoracic and the abdominal aorta and has an ever growing programm in complex endovascular treatments (EVAR and TEVAR). An additional focus of the department is the bypass surgery on the lower extremity and the renal transplant surgery.

Anaesthesia

Cardiac Anaesthesia

Fellows are trained to provide perioperative anaesthetic management for patients with severe cardiopulmonary pathology. The cardiac surgeries are the following: coronary artery bypass surgery (CABG) both on cardiopulmonary bypass as well as on a beating heart, heart valve surgery, aortic reconstruction requiring deep hypothermic arrest, thoracic aortic aneurysm repair, aortic dissection repair, implantation of ventricular assist devices.

Adequate exposure and experience is provided in the management of adult patients for cardiac pacemaker and automatic implantable cardiac defibrillator placement and surgical treatment of cardiac arrhythmias. There also is exposure to techniques such as percutaneous aortic valve replacement, mitral valve intervention and aortic valve bypass.

Fellows also gain experience in perioperative medical (anaesthetic) management of the cardiac patient, including management of intra-aortic balloon pumps (IABP) and ventricular assist devices (VAD), post-operative ICU care, point-of-care coagulation testing, blood transfusion medicine, electrophysiology, and transthoracic echocardiography.

Fellows will receive proper theoretical and practical training both for basic and advanced TEE. Each patient undergoing cardiac surgery will have a pre- as well as a postsurgical transesophageal examination. The fellow will perform and document the TEE examinations with increasing independence and review each examination with a senior echocardiographer.

The TEE training will be based on the understanding of the basic principles of ultrasound and learning of basic skills of TEE (physics, standard views for examination, Doppler principles and quantification etc). As soon as the fellows masters the basic skills, TEE training will continue with advanced applications of intraoperative TEE including assessment of valvular function, 3D, AQ for assessment of ventricular function, stress and strain, tissue Doppler). The fellowship will give fellows an ideal training to qualify for accreditation in TEE by the European Association of Echocardiography (EAE) and the European Association of Cardiothoracic Anaesthesiologists (EACTA). Mentors of the fellows are trained and accreditated experts in TEE and have a large experience in teaching TEE and performing clinical echocardiographic research projects. In addition, a TEE simulator including training programmes will be used for training and is at all times accessible to the fellows for independent studying.

Thoracic and Vascular Anaesthesia

Clinical work of fellows includes anaesthetic management of adult patients undergoing thoracic and vascular surgery. Fellows are trained to manage different types of thoracic surgeries, including video-assisted thoracoscopic surgery (VATS), open thoracotomy, and robotic surgery. Fellows achieve expertise in different techniques of lung isolation and ventilation, including the use of double-lumen endotracheal tubes, bronchial blockers, fiberoptic bronchoscopy, and jet ventilation.

Advanced Monitoring and Invasive Techniques

The complex nature of cardiothoracic surgery necessitates extra training to acquire the skills needed to be a cardiothoracic and vascular anaesthesia consultant. Fellows are trained to achieve expertise in the advanced monitoring techniques including invasive blood pressure

measurement, arterial blood gas analysis, cardiac output monitoring, central venous oxygen saturation, jugular venous oxygen saturation, Bispectral Index (BIS) and near infrared spectroscopy (NIRS).

Finally, invasive procedures completed by the cardiothoracic anaesthesiology fellows include arterial line placement (femoral, axillary, brachial, radial), central venous cannulation (internal jugular, subclavian, femoral), pulmonary artery catheter placement, transvenous pacemaker placement, thoracic epidural analgesia, fiberoptic endotracheal tube placement, 2D/3D transesophageal echocardiography and ultrasound guidance of vascular access.

Structure of the Fellowship Programme

During the first year of the Fellowship, the Fellow works under direct supervision on a 1:1 ratio at all times with a senior cardiac consultant.

1st Month

- Familiarisation in cardiothoracic and vascular anaesthesia, coached mainly by the programme director or division head
- Anaesthesia management for standard cardiac procedures
- Daily participation intensive care ward rounds and preop anaesthesia clinic

2nd - 4th Month

- Clinical duties as a member of the cardiac team for standard cardiac procedures (isolated CABG, aortic and mitral valve replacement), under supervision
- Daily participation intensive care ward rounds and preop anaesthesia clinic - Acquisition of basic echocardiographic knowledge (books, media, course, teaching in the OR)
- On – call duties, under supervision
- Evaluation of the educational progress of the fellow by programme director and division head. Meeting with the fellow, discussion of the evaluation, mutual feedback
- Planning of participation in a national or international cardiac and thoracic conference. Participation in the Annual Meeting of EACTA in one of the two fellowship years.

5th – 7th Month

- Clinical duties as a member of the cardiac team for standard and advanced cardiac procedures, including transcatheter aortic valve implantation (transapical / transfemoral), aortic valve bypass and anterolateral mitral valve repairs / replacements), under supervision
- Daily participation intensive care ward rounds and preop anaesthesia clinic
- Acquisition of basic TEE skills. The fellow learns to obtain the 20 standard views
- Planning and presentation of clinical case conference
- On – call duties, under supervision

8th – 10th Month

- Clinical duties as a member of the cardiac team for standard and advanced cardiac procedures, including transcatheter aortic valve implantation (transapical / transfemoral), aortic valve bypass and anterolaterale mitral valve repairs / replacements, under supervision
- Daily participation intensive care ward rounds and preop anaesthesia clinic
- Self consistent TEE examination (Pre - and postoperatively) under bedside Supervision
- On – call duties, under supervision

Starting 11th to 14th Month until end of fellowship (24th month)

During the second year of the fellowship, the fellow work increasingly independent, always having a remote supervision. A senior faculty member is immediately available.

- Self-consistent clinical duties as junior anaesthesia consultant in elective cardiac, thoracic and vascular surgical patients
- Self consistent TEE examination
- On – call duties as a junior consultant, together with a backup senior consultant
- European accreditation in TEE by EACTA / EAE (or shortly after the end of the fellowship)
- Continuous medical education in the field of cardiac, thoracic and vascular anaesthesia
- Presentation of a case at the weekly clinical case conference once every 6 months

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