

Adult Cardiothoracic and Vascular Anaesthesia Fellowship Programme
Department of Anaesthesiology and Pain Medicine
Inselspital, University of Bern, Switzerland

2017



Aim and Objectives

The Cardiothoracic and Vascular Anaesthesia (CTVA) Fellowship Programme of the Department of Anaesthesiology and Pain Medicine (KAS) at Inselspital, the University Hospital of Bern, Switzerland, has been established with the aim of providing a solid clinical and academic experience that produces anaesthesiologists who will become experts in the perioperative management of patients undergoing complex cardiothoracic and vascular procedures.

Upon completion of the CTVAF Programme the Fellow will have

- a) acquired the knowledge and skills required for consultant anaesthesiologists with subspecialty expertise in cardiothoracic and vascular anaesthesiology;
- b) developed advanced expertise in adult perioperative transoesophageal echocardiography, including pertinent EACVI certification, in intraoperative neuromonitoring techniques, and in point-of-care coagulation testing;
- c) participated actively in clinical and basic research activities in the Division of Cardiothoracic and Vascular Anaesthesiology, acquired the ability to critically interpret published literature and to make significant contributions to research projects in the field.

Sponsoring Institution

The University Department of Anaesthesiology & Pain Medicine (KAS) manages an anaesthesiology residency training programme accredited by the Swiss Society of Anaesthesiology and Reanimation (SGAR/SSAR). As an additional part of postgraduate medical education, KAS will assume responsibility for the CTVA Fellowship Programme and ensure that the Programme Director has sufficient protected time and financial support for his educational and administrative responsibilities to the Programme.

Organization

The institutional CTVAF Programme is organised and directed by PD Dr. med. Gabor Erdoes, Ph. D, DESA, EDIC, FASE, FESC, FCCP Consultant and Lecturer, as programme director, and Prof. Dr. med. Balthasar Eberle, Senior Consultant and Associate Professor of Anaesthesiology, as supervisor and faculty. Completion of the programme will be recognized by the University Department of Anaesthesiology and Pain Medicine, Inselspital, University Bern, in conjunction with the European Association of Cardiothoracic Anaesthesiology (EACTA). Criteria for EACTA certification will be determined and communicated prior to the start of the Fellowship and their fulfilment will be mandatory to receive the joint certification.

Programme Duration

The CTVA Fellowship is offered for a duration of 24 months, which includes a 3-6-month rotation in the Department of Intensive Care Medicine (depending on pre-Fellowship ICU qualifications and experience). A maximum of one applicant per year may be accepted into the programme.

Programme Structure

Fellowship Year 1, Month 1

- Introduction to the clinical CTVA division, mentored primarily by the programme directors.
- Planning of
 - attendance at medical education programmes in the field of CTVA (e.g., 40-hour course in cardiovascular anaesthesia, e.g., in accordance with the Scientific Working Group in Cardiac Anaesthesia of the German Society of Anaesthesiology and Intensive Care Medicine DGAI).
 - attendance at echocardiography courses (e.g. in-house TTE/TEE simulator training; Annual EACTA ECHO meeting; Annual Courses in Perioperative TEE by the Task Force of the Swiss Society of Anaesthesia and Reanimation SGAR)
 - participation in national/international cardiac/thoracic conferences (e.g., Annual EACTA, SCA, DGAI meetings),
 - research activities

Participation in continuous in-house educational activities and clinical case conferences, as well as in research activities should begin in Month 1 and continue throughout the entire Fellowship period.

Fellowship Year 1, Month 2-7

- Clinical work as a CTVA team member, supervised by a consultant/faculty, performing
 - cardiac/vascular patient preoperative evaluation and optimization based on risk indices and cardiovascular / pulmonary diagnostics,
 - anaesthesia care for standard cardiac surgical (e.g., CABG, valve surgery) and vascular procedures (carotid, abdominal aortic, peripheral vascular surgical, endovascular procedures, intraaortic balloon pump)
 - post-anaesthesia care and pain management (including fast track anaesthesia).
- Advanced cardiac life support training in the in-house simulator.
- Acquisition of knowledge, skills and practice in advanced haemodynamic monitoring (e.g., PAC, CCO, O₂ balance, LA Pressure, sonographic vascular access, multiple arterial pressure measurements, jugular bulb catheter, CSF/ CPP monitoring, partial CPB, ECMO, LVAD).
- Acquisition of basic TEE skills in the in-house TTE / TEE simulator and in the OR.
- Acquisition of knowledge, skills and practice of neuromonitoring techniques and interpretation of results.
- Acquisition of knowledge, skills and practice of point-of-care coagulation testing and interpretation of results.
- Continuous evaluation of the Fellow's progress by the programme directors, including regular meetings with the Fellow, discussion of the evaluation and mutual feedback.

Fellowship Year 1, Month 8-12

- Clinical work as a CTVA staff member; under focused supervision also including care for advanced cardiac and interventional cardiology procedures (e.g., aortic and minimally invasive mitral valve repair; emergency, re-do and combined cardiac surgery; thoracic aortic surgery with hypothermic circulatory arrest; transcatheter aortic valve implantation, TEVAR, hybrid procedures; procedures in the electrophysiology lab).
- Independent performance and diagnostic interpretation of standard TEE exams in the OR, supervised by accredited consultants; acquisition of basic 3-D TEE skills; maintaining procedural fellowship logs and TEE case logbook for Adult TEE accreditation.
- Completion of the EACVI exam in Adult TEE (or advanced PTEeXAM of the NBE)
- On-call duties, with support of CV anaesthesia consultants.

Fellowship Year 2

- Rotation in the Division of Thoracic Anaesthesia for a 2-month period (optional, depending on pre-Fellowship thoracic anaesthesia qualifications and experience) with focus on the management of high risk patients (e.g., CHD, pulmonary hypertension, use of TEE).
- Clinical work as a CTVA staff member and under focused supervision caring for increasingly complex cardiovascular procedures (e.g., cardiac transplantation, implantation of mechanical circulatory support (MCS) / assist systems, thoracoabdominal aortic aneurysm repair).
- Rotation in the Department of Intensive Care Medicine for a 3 to 6-month period (optional, depending on pre-Fellowship ICU qualifications and experience). The goal of this rotation focuses on the post-operative care of CV patients, especially those requiring ECMO or MCS, under supervision by ICU consultants.
- Completion of TEE case logbook for Adult TEE accreditation and European accreditation in TEE by EACVI.
- Completion of a research project and presentation at a national or international cardiovascular medicine meeting.

Requirements for Selection as a Fellow

Candidates must be board-certified in Anaesthesiology in accordance with the European residency programme standards, and must be proficient in both the German and English languages (B2 LEVEL). If applicable, candidates should have completed their Doctorate of Medicine (MD, Dr. med.).

Tasks and Responsibilities of the Fellow

The CTVA Fellowship provides education and training in the perioperative care of adult patients undergoing cardiac, vascular and thoracic surgeries, as well as interventional cardiology procedures. The Fellow will provide routine clinical patient care and participate in clinical conferences and defined postgraduate educational activities. The Fellow will be trained in transoesophageal echocardiography through attendance of formal courses, utilizing the in-house TTE / TEE simulator, and during bedside teaching in ORs and ICU. The Fellow should assume an active part in the preparation and presentation of case conferences.

The didactic curriculum is provided through lectures and conferences and assists the Fellow in acquiring the knowledge to care for CTVA patients. In addition, academic projects, e.g., preparation and publication of original or review articles, book chapters, manuals for teaching or clinical practice, and participation in clinical research or other academic activities are offered and strongly encouraged.

Evaluation

The Fellow's progress will be evaluated and discussed with the Fellow every 3 to 6 months by the programme directors. The Fellow is required to maintain an accurate procedure logbook. The Fellow's professional attitude, fund of knowledge, and clinical judgment will be assessed, as well as his/her practical skills, social competence, efficiency of patient management and performance in critical clinical scenarios. The fellow will be involved in quality assurance and risk management programmes.

Faculty

Both the programme director and the supervisor are board-certified in Anaesthesiology (Germany/Switzerland), have the requisite specialty expertise in cardiothoracic and vascular anaesthesiology, subspecialty certifications in intensive care medicine and in adult perioperative TEE (EACVI). Both are current members of the anaesthesiology faculty with educational, academic and administrative experience (CVs and diplomas attached). Both have more than 8 years of postgraduate experience in clinical CTVA anaesthesiology, devote at least 80% of their working time to CTVA, and have demonstrated ongoing academic achievement in the field (research and publication lists attached). Both will devote sufficient time to provide leadership to the programme, as well as guidance and education to the Fellows.

The programme director and supervisor will be supported by other senior anaesthesiologists of the Inselspital CTVA team, who will function as supervisors and educators in daily clinical practice. The Division of Cardiothoracic and Vascular Anaesthesia currently has a clinical staff of 11 consultant anaesthesiologists with special expertise in cardiothoracic and vascular anaesthesia (full- or part-time, approx. 5.5 FTE in total), with a majority certified in perioperative transoesophageal echocardiography (EACVI, NBE) and/or intensive care medicine.



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Application Process

Applications are welcome throughout the year. The applicant should email a cover letter to the programme director stating her/his interest in the position, together with the following documents:

- 1) Letter of motivation
- 2) Current Curriculum Vitae (CV)
- 3) National Board Certification in Anaesthesiology (and other (sub-)specialties, if applicable)
- 4) Residence / Employment Permit for Switzerland (if applicable)
- 5) List of Publications/Presentations (if applicable)

For further information please contact:

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Fellowship Contract and Financial Agreement

The fellowship contract consists of the employment contract for full-time staff anaesthesiologists (board certified by the Swiss Medical Association FMH or foreign boards acknowledgement by MEBEKO) as offered by the InselGruppe AG, University Hospital Bern, Freiburgstrasse, CH-3010 Bern. The salary and benefits are according to Swiss, cantonal (Canton of Bern) and institutional standards (Gesamtarbeitsvertrag GAV der InselGruppe AG, 2016) for licensed physicians with a board certification in anaesthesiology. The minimum effective duration of such full-time contract must be three years from the beginning of the Fellowship.

Appendix

➤ In-House Resources

Inselspital is the University Hospital of Bern. It is one of the leading medical research and teaching institutions in Switzerland and a high-volume tertiary referral hospital. In close cooperation with the Faculty of Medicine of Bern University, the ARTORG Centre for Biomedical Engineering Research, and several affiliated hospitals (the InselGroup), Inselspital is a highly active centre for clinical medicine, medical education, research and development.

The Swiss Cardiovascular Centre (SHGZ) at Inselspital consists of the University Departments of Cardiovascular Surgery, Cardiology, Angiology and the Centre for Congenital Heart Disease. SHGZ is the largest centre for cardiovascular care in Switzerland. Specialized anaesthesia and critical care services are provided by the Departments of Anaesthesiology and Pain Medicine (Division of Cardiovascular Anaesthesia), Intensive Care Medicine and Paediatric Intensive Care Medicine. Presently located throughout several buildings in the Inselspital Complex, the Swiss Cardiovascular Centre will be consolidated in a new Cardiovascular Building, currently under construction with scheduled completion in 2020.

The Division of Cardiovascular Anaesthesia has provided specialized anaesthesia care to SHGZ since 2003, as well as specialized postgraduate training to anaesthesiologists. Faculty and consultant staff have extensive experience in anaesthesia care for surgical and interventional treatment of all types of cardiovascular pathologies. Non-invasive and invasive diagnostic and therapeutic modalities are readily available, which include, but are not limited to, transoesophageal and transthoracic echocardiography, cardiovascular, thoracic and neuro-imaging (CT, MRI, PET), cardiac stress testing, cardiac catheterization and catheter-based interventions, electrophysiology lab and interventions, intraoperative neuromonitoring and interventional neuroradiology.

The Fellow will have the opportunity to work in the surgical core facility's three cardiac surgery operating rooms, one hybrid OR, one vascular surgery OR, one thoracic surgical OR, one emergency surgical OR, one electrophysiology lab, three cardiac catheterization labs, and in the ICU / IMC which consists of 46 beds.

Fellowship education is provided during

- in-house TTE / TEE simulator training sessions
- daily bed-side teaching and TEE supervision in the OR;
- daily OR scheduling conferences;
- weekly departmental educational lessons and TEE/case rehearsals with staff members;
- monthly morbidity & mortality conferences;
- monthly didactic TEE/TTE teaching sessions;
- yearly attendance of two dedicated Echo courses (national at SGAR, international at EACTA/EACVI or SCA)
- attendance of two dedicated annual Echo courses
- attendance of institutional ECMO course
- attendance of Annual Cardiovascular Anaesthesia Educational and/or Scientific Meetings (DGAI, EACTA, SCA)

I. Summary of surgeries and interventions

a. The Swiss Cardiovascular Centre's clinical activities and caseload as of 2016*:

Total

All cardiac and vascular cases	2764
Surgeries with conventional cardiopulmonary bypass (cCPB)	1022
Surgeries with minimized extracorporeal circulation (MiECC)	301
Surgeries with hypothermic circulatory arrest (HCA)	108
Urgent cases, cardiac surgery (< 24 hrs)	264
Urgent cases, vascular surgery (< 24 hrs)	170
Emergency cases, cardiac surgery (< 12 hrs)	255
Emergency cases, vascular surgery (< 12 hrs)	286

Vascular Surgery

Peripheral arterial revascularization	310
Carotid endarterectomy	42
Open surgical repair of the abdominal aorta	102
Endovascular repair of the abdominal aorta (EVAR)	43
Endovascular repair of the thoracic aorta (TEVAR)	26

Cardiac Surgery

Aortocoronary bypass grafting	487
Aortic valve replacement (prosthetic)	312
Ascending aortic and valve replacement with composite graft	58
Aortic valve repair	15
Transapical aortic valve implantation (TA-TAVI)	14
Mitral valve replacement	62
Mitral valve repair	82
Replacement of the thoracic aorta	158
Replacement of the thoraco-abdominal aorta	39
Surgeries for congenital heart disease (including adults with congenital heart disease)	276
Cardiac transplantation, implantation of ventricular assist devices and ECMO/ECLS	91

Interventional Cardiology and Rhythmology**

Transfemoral aortic valve implantation (TF-TAVI)	282
MitraClip implantation	74
Left atrial appendage (LAA) closure	60
ICD implantation	15
Cardioversion	15
Ablation and cartography	114
Pacemaker implantation (VVI, DDD, BiV)	24
Pacemaker lead explantation (with ECC stand-by)	15

b. Activities of the Division of General Thoracic Surgery, Inselspital, Bern as of 2016*:

Thoracic Surgery

All	457
Segment resection	89
Lobectomy	65
Surgery requiring double lumen tube	278

*(selection of most frequent cases)

** (only interventions requiring cardiovascular anaesthesia services)

II. Cardiac Anaesthesia Exposure

Fellows are supervised and trained to assume graded and progressive responsibility in the perioperative anaesthetic management of adult patients undergoing major cardiovascular surgery. The aim of the programme is to enable them to provide, independently, specialized cardiac anaesthesia care at the consultant level in elective and emergent scenarios.

The training includes education in pre-anaesthesia assessment and anaesthesia management in ORs and catheter suites, in all aspects of cardiopulmonary bypass (conventional and minimally-invasive), of mechanical circulatory support and other ECLS relevant to anaesthesia practice; of anticoagulation and transfusion management; of post-anaesthesia care, pain management and advanced cardiac life support. Adequate exposure is provided to a variety of cardiac and thoracic aortic surgeries performed on- and off-cardiopulmonary bypass, including minimally-invasive cardiac surgery and cardiac transplantation; in addition, the fellow will accumulate a high caseload of transcatheter interventions, pacemaker use and surgical as well as interventional / EP treatment of cardiac arrhythmias.

Fellows will receive in-depth theoretical and practical training and supervision in TEE, with the aim of advanced level proficiency and EACVI certification. In our practice, nearly every adult undergoing cardiac surgery receives a pre- and postsurgical TEE exam. The fellow will perform and document his TEE exams with progressive independence and review each with a senior echocardiographer. Institutional supervisors for collecting EACVI certification credentials are

certified perioperative TEE echocardiographers (PD Dr. G. Erdoes, EACVI; Prof. Dr. B. Eberle, EACVI; Dr. H. Kaiser, EACVI; Dr. Reid, EACVI/NBE Advanced PTEeXAM®; Dr. Starzyk, NBE Advanced PTEeXAM®).

Training will be provided in perioperative coagulation monitoring (laboratory and point-of-care, e.g., ACT, ROTEM, HepCon HMS, MultiPlate) and an algorithm-based perioperative management of coagulation disorders (e.g., factor deficiencies, heparin-induced thrombocytopenia).

Monitoring and protection of CNS integrity and function is the focus of core research activities in our division. Fellows will be educated in the regular use and interpretation of an array of neuromonitoring techniques (e.g., EEG/processed EEG, NIRS-based cerebral and tissue oximetry, Transcranial Doppler Ultrasound, supraaortic vessel sonography, Motor-Evoked Potentials), and in the principles of CNS protection via appropriate blood flow, temperature and blood gas management, emboli reduction and antegrade cerebral perfusion techniques.

III. Vascular Anaesthesia Exposure

Fellows will obtain consultant level proficiency in anaesthetic management of adults undergoing major vascular surgery. In FY1 this encompasses all typical vascular surgeries such as carotid endarterectomy in local or general anaesthesia, open repair of the abdominal aorta including ruptured aneurysms, and endovascular repair of the abdominal and thoracic aorta (contained rupture, aneurysms, dissections). TEVAR training includes insertion and use of lumbar CSF drainage, rapid RV pacing, and TEE.

In FY 2, training and clinical care will proceed to more complex procedures (e.g., open surgical repair of thoraco-abdominal aortic aneurysms (Crawford Types II-V) utilizing left heart bypass or other means of distal perfusion, hybrid approaches to repair of the aortic arch, etc.). This includes acquisition of knowledge and skills in invasive techniques and neurophysiologic monitoring (e.g., lumbar CSF drainage, motor-evoked potentials, somatic NIRS).

IV. Thoracic Anaesthesia Exposure

Clinical work and training of fellows includes anaesthetic management of adults undergoing thoracic procedures. This includes video-assisted thoracoscopic surgery (VATS), open thoracotomies, tracheal and robotic surgery. They will achieve expertise at consultant level in lung isolation and single-lung ventilation techniques with the use of double-lumen endotracheal tubes, various types of bronchial blockers, and with associated imaging modalities such as fiberoptic bronchoscopy and continuous integrated endoscopic airway visualization. They will use thoracic epidural and (ultrasound-guided) paravertebral blocks for perioperative anaesthesia and analgesia, and will be trained in indications and use of extracorporeal lung support (veno-venous ECMO).

V. Advanced Monitoring and Invasive Techniques

Fellows are trained to achieve expertise and manual skills in invasive monitoring techniques. These include, but are not limited to, multi-site ultrasound-guided arterial line placement (radial, femoral, axillary, brachial) and central venous cannulation, placement of pulmonary artery catheters, transvenous pacemakers, haemodialysis catheters, ECMO cannulae, thoracic epidural and paravertebral catheters, lumbar CSF drainage catheters etc. In addition, the fellow will acquire expertise and skills in advanced haemodynamic monitoring (e.g., various techniques of cardiac

output measurement, interpretation of right- and left-sided intracardiac pressures, oximetry data, shunt determinations, CSF and spinal perfusion pressure, etc.).

VI. Neuraxial and Regional Anaesthesia Techniques

Fellows are assumed to be already proficient in standard neuraxial and regional block techniques (e.g., brachial plexus, thoracic epidural blocks), and will be trained to expand their skills and expertise to blocks useful in CTVA. Examples include cervical plexus block for carotid surgery, paravertebral block, supraclavicular plexus, sciatic, popliteal, femoral and saphenous nerve blocks. Regional blocks are taught using ultrasound guidance in accordance with institutional standards and guidelines.

VII. Intensive Care Medicine

The Department of Intensive Care Medicine of the University Hospital Bern operates an interdisciplinary adult ICU with 46 beds (plus intermediate care (IMC) units), while the Departments of Cardiovascular Surgery and Cardiology each administer their individual IMC units. The ICU and specialized IMC units manage all cardiac surgical and interventional cardiology patients at Inselspital. During his/her rotation to the ICU, the fellow will preferentially be responsible for the care of CTV patients under the guidance and supervision of ICU consultants. She/he will complete a repertoire of pertinent skills, including but not limited to: management of postoperative hemodynamics, fluids and metabolism; management of pacemakers and chest tubes (including placement); invasive and non-invasive respirator support; fast-track-, sedation and weaning protocols; intermittent/continuous renal replacement therapy; management of ECMO, IABP and other MCS; clinical neurological and delirium assessment, and interpretation of neuro-, chest and vascular imaging.

- **CV, publication list and diplomas of the programme directors**

Please refer to the attachments