

Application for Hosting EACTA Cardiothoracic and Vascular Anaesthesia Fellowship Programme

1. Fellowship Information

Basic Fellowship in Cardiothoracic and Vascular Anaesthesia	
Advanced Fellowship in Cardiac Anaesthesia	

2. Institution Name

Dante Pazzanese Institute of Cardiology

Address

Dr. Dante Pazzanese street, 500 - ZIP: 04012-909

Website

www.idpc.org.com.br

Country

Brazil	São Paulo
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3. Chair Name

First name	Mário	Last name	Issa	
Email	drmarioissa@yahoo.com.br		Phone	5.51199E+12

4. Programme Director

First name	Caetano	Last name	Nigro Neto	
Board Certification(s)	Brazilian Society of Anesthesiology			
Title/Affiliation	Ph.D. Collaborator Professor Ph.D Program Dante Pazzanese Institute of Cardiology - University of São Paulo (USP)			
Number of original publications	36			
EACTA membership	Yes	If yes, membership's number	100348	
ESA membership	No	If yes, membership's number		
Societies membership	Yes	If yes, membership's number	SCA 36200	
Email	caenigro@uol.com.br	Phone	5.51199E+12	
Mailing Address	Peixoto Gomide street 502/173-B ZIP:01409-000 - Sao Paulo -Brazil		Fax	5.51133E+11
Street	Dr. Dante Pazzanese street 500 - 11th floor			
Country	Brazil	Region	São Paulo	
Zip code	04012-909			

Will the Programme director devote sufficient time to provide substantial leadership to the programme and supervision for the fellows?

 Yes

Will the Programme director review the fellows' clinical experience logs at least quarterly and verify completeness and accuracy?

 Yes

Does the national/international regulatory authority(ies) recognizes the institutional CTVA Fellowship Programme?

 No

If yes, please explain

Completion of the programme will be acknowledged by the Department of Anaesthesia and Intensive Care at the host centre in junction with European Association of Cardiothoracic Anaesthesia (EACTA) Candidate's requirements

 Yes

5. Candidate's requirements

The candidates must be board certified or board eligible according to European residency programme standards

 Yes

Language requirements

B2

Comments

 Celpe Bras Test
 Since the fellow will be involved with direct patient care, the candidates must be board certified or board eligible according to Brazilian or European residency programme standards, and must be proficient in Portuguese Proficiency Test – CELPE BRAS (B2 level is required).

Preferred Duration

* Of note, the training period should not be interrupted by frequent and/or prolonged periods of secondment to other divisions / departments.

Preferred Programme Training

Start	Month	1	End	February	28
5 basic, 1 advanced	Type of fellowship training available			Clinical / Clinical Research	

Number of Positions Per Year

If clinical, will the fellows be allowed to work with the patients under supervision

Comments: The trainees will have the opportunity for direct patients' care and will have constant supervision during his training. Currently, we have 4 positions offered to EACTA members who intend to be part of the fellowship programme. (02 for Basic and 02 for Advanced Training). So, we hereby kindly request also to increase the number of EACTA fellows' positions in our Centre to at least 6 positions; three (3) in the basic and three (3) in the advanced programme.

Offered Advanced Training

 Yes

7. Faculty

CTVA Anaesthesia Faculty - Research Interest and/or Clinical Expertise. * Please, list at least three names.

Name	EACTA member	Certification in Cardiothoracic and Vascular Anaesthesia	Additional Qualifications	Email address	Contact address
Francisco Jose Lucena Bezerra	Yes	Yes	Cardiac Anaesthesia Consultant	fjb70@yahoo.com	
Marcelo Salgado	Yes	Yes	Ph.D; Intraoperative TEE Specialist / Cardiac Anaesthesia Consultant	mfonsecasalgado@hotmail.com	
Vinicius Nogueira Nascimento	Yes	Yes	Cardiac Anaesthesia Consultant / Intraoperative TEE specialist	nascimento_08@yahoo.com.br	
Gretel Nicolau	Yes	Yes	Cardiac Anaesthesia Consultant / Congenital Heart Diseases Anaesthesia Specialist	gretelolivera@gmail.com	
Leonardo Iquendo	Yes	Yes	Cardiac Anaesthesia Consultant / Intraoperative TEE specialist	saurth_866@hotmail.com	
Renato Semino Amorim	Yes	No	Ph.D; Cardiac Surgeon	ramon@uol.com.br	
Andreas Andrade Vilela	No	No	Ph.D; NBC; Cardiologist/Head of Echo Lab		
Marcelo Alves Gonçalves	Yes	Yes	Cardiac Anaesthesia Consultant	marcelocag@uol.com.br	
Eric Benedict Lineburger	Yes	Yes	Ph.D; FASE; Cardiac Anaesthesia Consultant	lineburger@unesp.net	
Simone Pedra	No	No	Ph.D; NBC; Cardiologist/Head of Congenital Heart Diseases		

Publications lists of the faculty's members in PubMed

*Nigro Neto C, Landoni G and Tardelli MA. A novel antipollution filter for volatile agents during cardiopulmonary bypass: preliminary tests. J Cardiothorac Vasc Anesth 2017; 31(4): 1218-1222.

*Salgado-Filho MF, Morthy SS, Vasconcelos HD, Lineburger EB et al. Consentimento sobre Ecocardiografia Transesofágica Perioperatória da Sociedade Brasileira de Anestesiologia e do Departamento de Imagem Cardiovascular da Sociedade Brasileira de Cardiologia. Rev Bras Anestesiol. 2018;68(1):1-32

8. Resources

Check if each of the following is available at the host centre.

Resources	Yes/No	Working days a week	Numbers
Total cardiothoracic and vascular ward beds	Yes	7	450 beds
Number of ICU beds dedicated to CTVA patients	Yes	7	91 beds
Is there an emergency department in which cardiothoracic patients are managed 24 hours a day?	Yes	7	1
An adequately designed and equipped post-anaesthesia care unit for cardiothoracic patients located near the operating room suite?	Yes	7	1
Is there monitoring and advanced life support equipment representative of current levels of technology?	Yes	7	20
Hybrid Operating Rooms	Yes	5	1
Cardiac Operating Rooms	Yes	7	5
Thoracic Operating Rooms	Yes	2	1
Vascular Operating Rooms	Yes	7	1
Catheterisation Labs	Yes	7	8
Electrophysiology Labs	Yes	5	2
Pulmonology Labs	Yes	5	1
Interventional Vascular Suite	Yes	5	2
Separate CIVICU Facility	Yes	7	4
Animal Laboratory for research purposes	Yes	5	1
Outpatient Clinic for perioperative evaluation of patients undergoing cardiothoracic and vascular procedures	Yes	5	7
24-hours acute pain service available for patients undergoing cardiac, thoracic and vascular procedures	Yes	7	1
Meeting Rooms	Yes	5	5
Classrooms with visual and other educational aids	Yes	6	5
Study areas for fellows	Yes	6	1
Office space for faculty members and fellows	Yes	7	1
Diagnostic facilities	Yes	7	4
Therapeutic facilities	Yes	7	5
24-hour laboratory services available in the hospital	Yes	7	1
Cardiac stress testing	Yes	5	1
Cardiopulmonary scanning procedures	Yes	7	1
Pulmonary function testing	Yes	5	1
Computers and IT support	Yes	7	5
Appropriate on-call facilities for men and women	Yes	7	14

9. Clinical Skills and Responsibilities

Will your Programme offer a 12-24 months of fellowship education in fundamental clinical skills of medicine relevant to the practice of CTVA?

If yes, for each rotation or experience below, specify the duration (in months, four weeks + one month) during the 12-24 months of education in fundamental clinical skills.

Caring for inpatients in	Number of performed produces/year	IDPC	HCOR	HSPE
Cardiac Surgery using CPB	1800		500	
Cardiac Surgery without CPB	400		100	
Minimally-Invasive Cardiac Procedures	100		100	
Interventional Cardiac Catheterization (e.g. TAVI, Mitraclip, ASD)	80		200	
Electrophysiology Lab (e.g. mapping, ablation, pacemakers, ICDs)	800		800	
Robotic Cardiac Surgery	0		0	
Heart, Lung, and Heart/Lung Transplants	30		10	
ECLS, ECMO, VAD Procedures	20		50	
Echocardiography Lab	5000		2000	
Thoracoscopic Surgery	30		20	100
Pulmonary Resection	10		20	200
Esophageal Surgery	0		0	20

Tacheo-Bronchial Surgery	0	0	100
Interventional Pulmonology Procedures	150	100	200
Major Vascular Procedures	300	200	
Neurological monitoring during major vascular surgery	100	50	
Interventional Vascular Procedures	140	100	
Acute and Chronic Pain Management for CTY patients	100	50	
Basic Research	0		
Clinical Research	5		
Rotations in	Number of performed produces/year BASIC	ADVANCED	
Cardiac anaesthesia	120	170	
Thoracic anaesthesia	30		
Anaesthesia for major supra-inguinal vascular procedures	25		
Trans-oesophageal and trans-thoracic echocardiography	100	250	
Medical or surgical Critical Care Rotation	50		
Inpatient or outpatient cardiology	100		
Inpatient or outpatient pulmonary medicine	30		
Extracorporeal perfusion technology (CPB, ECMO, Nova-Lung)	80		
Paediatric cardiothoracic anaesthesia	30	30	
Basic Research			
Clinical Research	2	5	

Will all fellows entering the CTVA Programme complete each of the fundamental clinical skills of requirements?
 If no, explain Yes

In the clinical anaesthesia setting, including nights and weekends, will faculty members at any time direct perioperative CTVA care, involving fellows, for more than two anaesthetizing locations simultaneously?
 If Yes, describe No

Clinical Responsibility
 The fellow takes part in the clinical routine as well as in clinical conferences with the Divisions of Anaesthesiology, Cardiology, Cardiothoracic and Vascular Surgery, Cardiovascular Diagnostic Methods and Interventional Cardiology.
 The fellow also takes part in preparation and presentation of case conferences, and the entire didactic method is provided through lectures and conferences that allow him/her to acquire the knowledge to care for the patients.
 The fellow is required to maintain an accurate procedure logbook.

List any other rotations (along with their duration, in months) offered in the Programme to augment fellows' learning.

An On-line Course for the CTVA Basic Programme is offered to the fellows (duration 10 months): this Theoretical Course includes 10 blocks of classes released monthly to the fellows to watch online, with a total of 120 classes previously recorded and uploaded in our E-learning Platform (classes are update annually, if necessary). At the end of every month, we have a videoconference with fellows and teachers to discuss about the classes released on that month. Every block encompasses a specific topic mostly tailored to the basic training rotations: anaesthesia for cardiac surgery-3 blocks, anaesthesia for vascular surgery, anaesthesia for thoracic surgery, anaesthesia in the Cath-Lab, anaesthesia during CPB, ICU, anaesthesia for congenital heart disease and basic principles of Echo. The teachers are cardiac anesthesiologists, cardiologists, cardiac surgeons and other teachers from different Universities. The fellows make two written exams during the year with questions related to the classes (Theoretical Course Exam). A Certificate approved by the Brazilian Minister of Education is issued in the end of the course observed that the fellow has watched 80% of the online classes and a minimum score of 70% rights in the two written exams

A Complete Workshop Echo Course (duration 6 months): this workshop is made during the weekend every two months and include: online classes and hands-on learning with Simulation, Wet-Lab, Q-station, Q-lab (3D) with expert instructors. The online classes are recorded and uploaded in our E-learning Platform to be watched prior and discussed during the practical learning.

Will advanced subspecialty rotations reflect increased responsibility and learning opportunities? Yes

Maximum Time in Non-Clinical Activities
 fellows will have opportunity to do research during all the programme

10. Financial Statement
 An employment contract will be signed with the candidate Yes
 Accommodation options are provided No
 Transportation/travel options are provided No
 Monthly Salary Amount 10000.00 Currency Brazilian Reals
 This opportunity is not funded by the centre No Source of financial support for the candidate: Educational grant
 Others The Anesthesia Company CASP (Clinica de Anestesia São Paulo) will pay a Educational Grant to the fellows monthly

11. Educational and Academic Programme

Didactic Sessions

Will faculty members' attendance be monitored?	Yes
Will fellows' attendance be monitored?	Yes
Will attendance be mandatory for faculty members?	Yes
Will attendance be mandatory for fellows?	Yes
Who of the following will provide content at conferences? Check all that apply.	Yes
Anaesthesiology faculty members from this department	Yes
Anaesthesiology faculty members from other sites	Yes
Non-anaesthesiologists from the primary clinical site	Yes
Non-anaesthesiologists from the participating sites	Yes
Visiting faculty members	Yes
Drug/industry representatives	Yes
Fellows	Yes
Others (specify): Click here to enter text.	

What will be the frequency of the following educational topics in the programme's schedule?

	Weekly	Bi-weekly	Monthly	Quarterly	Semi-annually	Annually
Critical care appraisal of the literature (e.g., journal club)	No	No	Yes	No	No	No
Quality improvement (M&M, QA)	No	No	Yes	No	No	No
Board review (e.g., oral exams, keywords)	No	No	Yes	No	Yes	No
Grand rounds	Yes	No	No	No	No	No
Other (specify) Click here to enter text.						

Formal Course Work Available in <https://www.anestex.com>; <https://lead.anestex.com>; [instagram: anestex_z](https://www.instagram.com/anestex_z)

Extra-Institutional Educational Conference Support: N/A

In the Previous 5 Years, Fellows were 1st or 2nd Author On:
 Abstracts 10 Peer-Reviewed Journal Articles 10
 Book Chapters 2 Other Publications
 Dedicated Research Time 4 weeks

In the Previous Year, fellows present an oral or poster presentation in a national or international meeting Yes
 The Opportunity for Exchange with other training facilities Yes

Patient Care CanMEDS competency framework

Competency Area / Skills	Settings/ Activities	Assessment Methods
1. Basic Training		
1. I. General patient assessment and risk estimation		
Assessment of patients based on physical examination and history with use of appropriate laboratory tests and examinations. Level C	Pre-anaesthetic visit rounds	Pre-anaesthetic visit under supervision and discussion / Perioperative Check List / protocols review and discussion
Scores evaluation, e.g., physical status in accordance with American Society of Anesthesiologists (ASA). Level D	Pre-anaesthetic visit rounds	Pre-anaesthetic visit under supervision and discussion / Perioperative Check List / protocols review and discussion
Airway evaluation. Level C	Pre-anaesthetic visit rounds	Pre-anaesthetic visit under supervision and discussion / Protocols review and discussion
Interpretation and limitations of peri-operative monitoring, including invasive and non-invasive cardiac function tests, pulmonary function tests, blood gas analysis, common radiological imaging, coagulation tests, liver and renal function tests, endocrine function tests, and drug monitoring. Level C	Pre-anaesthetic visit rounds	Pre-anaesthetic visit under supervision and discussion / Protocols review and discussion
Selection and planning of the individual anesthesia technique. Level C	Pre-anaesthetic visit rounds	Pre-anaesthetic visit under supervision and discussion / Protocols review and discussion
Postponement or cancellation of surgery decision making. Level C	Pre-anaesthetic visit rounds	Pre-anaesthetic visit under supervision and discussion / Protocols review and discussion
Participation in multi-disciplinary (morbidity) conferences. Level C	Multi-disciplinary Hospital Forum	Friday morning meetings
Pre-operative fasting, pre-medication and adaptation of pre-operative drug therapy. Level C	Pre-anaesthetic visit rounds	Pre-anaesthetic visit under supervision and discussion / Protocols review and discussion
1. II. Anesthesia management - cardiac surgery		
Workplace preparation following environmental safety measures and checklists. Level C	OR cardiac surgery rotations	OR surgeries rotations under supervision / Daily discussion of scheduled clinical case
Use of technical and medical equipment, inclusive advanced hemodynamic monitoring, neuromonitoring, coagulation monitoring and basic peri-operative TEE. Level C	OR cardiac surgery rotations	OR surgeries rotations under supervision / Daily discussion of scheduled clinical case
Provision of safe induction, maintenance, and emergence from anesthesia. Level C	OR cardiac surgery rotations	OR surgeries rotations under supervision / Daily discussion of scheduled clinical case
Defibrillation, cardioversion. Level D	OR cardiac surgery rotations / ACLS training	OR cardiac surgeries rotations under supervision / ICU unit rounds / ACLS Course
Transvenous pacemaker insertion and modes of action; use of a temporary pacemaker. Level C	OR cardiac surgery rotations / ICU unit rotation / Emergency room	OR surgeries rotations under supervision / ICU unit rounds / Procedures in Emergency Room under supervision
Central and peripheral venous (ultrasound-guided) access and peripheral arterial catheterization, pulmonary artery catheterization, arterial blood gas collection, and gastric tube insertion. Level D	OR cardiac surgery rotations / ICU unit rotation / Emergency room	OR cardiac surgeries rotations under supervision / ICU unit rounds
Blood salvage and transfusion. Level D	OR cardiac surgery rotations	OR cardiac surgeries rotations under supervision / ICU unit rounds / Theoretical Course exam
Organ systems and hemostasis homeostasis maintenance throughout cardiac surgery procedures. Level C	OR cardiac surgery rotations / ICU unit rotation / Emergency room	OR cardiac surgeries rotations under supervision / ICU unit rounds / Theoretical Course exam

Interpretation of point-of-care coagulation monitoring such as rotational thromboelastometry (ROTEM) and thromboelastography (TEG). Level C	OR cardiac surgery rotations / ICU unit rotation / Emergency room	OR cardiac surgeries rotations under supervision / ICU unit rounds / Theoretical Course exam
Management of patients on cardiopulmonary bypass. Level C	OR CPB rotation	OR CPB management rotation under supervision / daily discussion of scheduled clinical cases / Theoretical Course exam
Diagnosis and management of intraoperative critical incidents including: Level C - allergic reactions, anaphylaxis, - gas embolism, aspiration pneumonia and pneumothorax, - hypoxia, hypercarbia, hypoventilation, hyperventilation, high ventilator peak inspiratory pressures, - hypertension (systemic / pulmonary), hypotension, arrhythmias, myocardial ischemia, cardiac failure, cardiopulmonary resuscitation, - oliguria, anuria, - intra-operative blood gas and electrolyte disturbances, - intra-operative awareness, - adverse blood products transfusion reaction, - coagulopathy and excessive bleeding, - systemic inflammatory response syndrome (SIRS) / postoperative vasoplegic syndrome (PVS).	OR cardiac surgery rotations / ICU unit rotation / Emergency room	OR cardiac surgeries rotations under supervision and discussions / ICU unit rounds / Theoretical Course exam
Management of patient transport to and from the intensive care unit (ICU). Level C	OR cardiac surgery rotations / ICU unit rotation	OR cardiac surgeries rotations under supervision and discussions / ICU unit rounds / Theoretical Course exam
Consideration of ethical and medico-legal aspects. Level C	Pre Anesthetic Visit Rounds / OR surgeries rotations	OR cardiac surgeries rotations under supervision and discussions / ICU unit rounds / Theoretical Course exam
1. III. Anesthesia management – thoracic surgery		
Bronchoscopic examination to verify the position of a lung-separation device and to confirm the correctness of the bronchus to be stapled and the patency of the other bronchus. Level C	OR Thoracic Surgery rotation	OR thoracic surgeries rotations under supervision / Daily discussion of scheduled clinical cases / Theoretical Course exam
Provision of safe induction, maintenance, and emergence from anesthesia in patients undergoing thoracic surgery of varying complexity, including airway management, the decision of which drug to use, one-lung ventilation technique, and management of intraoperative adverse events. Level C	OR Thoracic Surgery rotation	OR thoracic surgeries rotations under supervision / Daily discussion of scheduled clinical cases / Theoretical Course exam
Management of most common peri-operative critical incidents and complications including: Level C - bronchospasm, - hypoxemia, hypercapnia, - pneumothorax, - pulmonary hypertension.	OR Thoracic Surgery rotation / ICU unit rotation	OR thoracic surgeries rotations under supervision / Daily discussion of scheduled clinical cases / Theoretical Course exam/ICU rounds
One-lung ventilation with a double-lumen tube. Level C	OR Thoracic Surgery rotation	OR thoracic surgeries rotations under supervision / Daily discussion of scheduled clinical cases / Theoretical Course exam
One-lung ventilation with other techniques (e.g., Arndt blocker, EZ blocker). Level B	OR Thoracic Surgery rotation	OR thoracic surgeries rotations under supervision / Daily discussion of scheduled clinical cases / Theoretical Course exam
Postoperative pain management, including epidural and paravertebral analgesia. Level C	OR Thoracic Surgery rotation / ICU unit rotation	OR thoracic surgeries rotations under supervision / Daily discussion of scheduled clinical cases / Theoretical Course exam/ICU rounds
Additional techniques in pain management (e.g., epidural analgesia, truncal blocks, multimodal analgesic techniques). Level B	OR Thoracic Surgery rotation / ICU unit rotation	OR thoracic surgeries rotations under supervision / Daily discussion of scheduled clinical cases / Theoretical Course exam/ICU rounds
1. IV. Anesthesia management – major vascular surgery		
Pre-operative assessment, risk stratification and medical management of vascular patients. Level D	OR Vascular Surgery rotation	OR vascular surgeries rotations under supervision / Daily discussion of scheduled clinical cases / Theoretical Course exam
Provision of safe induction, maintenance, and emergence from anesthesia in patients undergoing vascular surgery of varying complexity, including airway management, the decision of which drug to use, hemodynamic management, and management of intraoperative adverse events. Level C	OR Vascular Surgery rotation	OR vascular surgeries rotations under supervision / Daily discussion of scheduled clinical cases / Theoretical Course exam
Management of the most common perioperative critical incidents and complications including Level C - acute kidney injury, - neurological insult, - paraplegia, - renal replacement therapy	OR Vascular Surgery rotation / ICU unit rotation	OR vascular surgeries rotations under supervision / Daily discussion of scheduled clinical cases / Theoretical Course exam/ICU rounds
Management of elective and emergency open abdominal aortic aneurysms (AAA) and AAA repair. Level D	OR Vascular Surgery rotation	OR vascular surgeries rotations under supervision / Daily discussion of scheduled clinical cases / Theoretical Course exam
Management of carotid endarterectomy, angioplasty, or stenting. Level D	OR Vascular Surgery rotation	OR vascular surgeries rotations under supervision / Daily discussion of scheduled clinical cases / Theoretical Course exam
1.V. Post-operative care/ Critical care		
Physical examinations and patient assessment (e.g., respiratory and peristaltic sounds, temperature gradient capillary refill). Level D	ICU rotation	ICU rounds / Theoretical Course exam
Applying sedation, general anesthesia, multimodal analgesia. Level D	ICU rotation	ICU rounds / Theoretical Course exam
Management of the airways, inclusive of emergency intubation. Level D	ICU rotation	ICU rounds / Theoretical Course exam
Central venous, peripheral venous, arterial catheters, and pleural drains insertion using aseptic techniques. Level D	ICU rotation	ICU rounds / Theoretical Course exam
Gastrointestinal tube insertion. Level D	ICU rotation	ICU rounds / Theoretical Course exam
Airway maneuvers inclusive of suction of endotracheal secretions, tracheotomy (percutaneous), bronchoalveolar lavage and sampling. Level D	ICU rotation	ICU rounds / Theoretical Course exam
Invasive ventilation including prone position ventilation and weaning strategies. Level D	ICU rotation	ICU rounds / Theoretical Course exam
Delivery of continuous positive pressure ventilation and non-invasive ventilation. Level D	ICU rotation	ICU rounds / Theoretical Course exam
Hemodynamic stabilization and management, inclusive of pacing, cardioversion, defibrillation, advanced and basic life support, vasoactive and inotropic therapy, advanced cardio-vascular monitoring. Level B	ICU rotation	ICU rounds / Theoretical Course exam
Volemia management and fluids administration. Level D	ICU rotation	ICU rounds / Theoretical Course exam
Management of blood product transfusion and coagulopathies correction. Level D	ICU rotation	ICU rounds / Theoretical Course exam
Renal replacement therapy and acute renal failure. Level B	ICU rotation	ICU rounds / Theoretical Course exam
Identification of relevant pre-existing co-morbidities. Level D	ICU rotation	ICU rounds / Theoretical Course exam
Responding to trends in physiological variables. Level D	ICU rotation	ICU rounds / Theoretical Course exam
Patient transportation inter- and intra-hospital. Level B	ICU rotation	ICU rounds / Theoretical Course exam
Arterial and central venous line cannulation (ultrasound-guided). Level D	ICU rotation	ICU rounds / Theoretical Course exam
Myocardial infarction, pulmonary embolism, tamponade, hypovolemia. Level D	ICU rotation	ICU rounds / Theoretical Course exam
Assessment of intravascular volume status. Level C	ICU rotation	ICU rounds / Theoretical Course exam
Recognition of substantial pericardial or pleural effusion. Level B	ICU rotation	ICU rounds / Theoretical Course exam
1. VI. Basic peri-operative echocardiography		
Basic levels of peri-operative TEE and lung and vessel ultrasonography as performed in the operating room. Level C	Perioperative Echocardiography with Simulation Practice / OR TEE rotation	Simulation and OR cardiac surgeries with TEE monitoring under supervision and TEE discussion of the tests results
Performance of the recommended number of peri-operative echocardiography exam according to EACVI / EACTA certification guidelines. Level D	Perioperative Echocardiography Surgeries / OR TEE rotation / Echo Lab	OR cardiac surgeries with TEE monitoring under supervision and Echo Lab under supervision
1. VII. Anesthesia management – interventional procedures in cardiology		
Safe induction of, maintenance of, and emergence from anesthesia in patients undergoing interventional cardiac procedures, including the decision of which drug to use, ventilation techniques, management of airways and management of intraoperative adverse events. Level C	Interventional Cardiology Department Rotation	Interventional Cardiology Department Rotation under supervision / Theoretical Course exam / Daily discussion of scheduled clinical cases
Sedation for invasive procedures in cardiology. Level D	Interventional Cardiology Department Rotation	Interventional Cardiology Department Rotation under supervision / Theoretical Course exam / Daily discussion of scheduled clinical cases
Sedation and anesthesia outside the operating theatre, also considering the local organization and the specific patients and procedures. Level D	Interventional Cardiology Department Rotation	Interventional Cardiology Department Rotation under supervision / Theoretical Course exam / Daily discussion of scheduled clinical cases
1. VIII. Extracorporeal perfusion management		
Providing the theoretical background of extracorporeal circulation and associated subject areas, including: Level D - Anticoagulation monitoring and management. - Cardioprotective measures (for-isoplegia, hypothermia). - Acid-base management (alpha-stat vs. pH-stat). - Management of complications, e.g., air entry, CPB failure.	CPB rotation	CPB rotation under supervision / Theoretical course exam / Daily discussion of scheduled clinical cases
2. Advanced training		
In cooperation with the local Program Director, after the completion of the basic training, the fellow can design the advanced training to include any or a combination of the following options.		
2. I. Anesthesia management – cardiac surgery		

Clinical management of patients with pericardial diseases. Level D	Cardiac Surgery in Complex Cases rotation	OR complex cardiac surgeries rotations discussions / Case reports and journal club for Cardiac Complex Cases (monthly) / lectures and seminars, emphasizing topics related to complex cardiovascular procedures (every two weeks)
Management of cardiomyopathy patients and of those with congenital and acquired valvular heart disease, electrophysiological disturbances, congenital heart disease, heart failure, infectious and neoplastic cardiac diseases. Level D	Cardiac Surgery in Complex Cases rotation	OR complex cardiac surgeries rotations discussions / Case reports and journal club for Cardiac Complex Cases (monthly) / lectures and seminars, emphasizing topics related to complex cardiovascular procedures (every two weeks)
2. II. Anesthesia management – thoracic surgery (as described previously, as well as the followings)		
Alternative ventilation techniques in thoracic surgery (e.g., jet ventilation). Level D	N/A	N/A
Principles of postoperative chronic pain management. Level D	N/A	N/A
2. III. Anesthesia management – major vascular surgery (as described previously, as well as the followings)		
The use of rapid ventricular pacing (RVP) during deployment of the stent for TEVAR. Level B	N/A	N/A
Pain management for patients undergoing vascular procedures. Level B	N/A	N/A
Anesthesia for peripheral vascular procedures. Level C	N/A	N/A
Care of patients undergoing limb amputation. Level D	N/A	N/A
Pain management, with particular reference to critical limb ischemia. Level B	N/A	N/A
2.IV. Post-operative management/ Critical care (as described previously, as well as the followings)		
Interpretation of invasive and non-invasive cardiovascular monitoring. Level D	N/A	N/A
Use of inotropes and vasodilators. Level D	N/A	N/A
Management of intra-aortic balloon counter pulsation and other mechanical circulatory support devices. Level C	N/A	N/A
Detection of problems occurring with extracorporeal circulation management. Level C	N/A	N/A
Anesthesia for procedures in intensive care, including emergency resection, re-intubation, tracheostomy or cardioversion. Level D	N/A	N/A
Principles and management of chest drains. Level D	N/A	N/A
2. V. Advanced perioperative echocardiography (as described previously, as well as the followings)		
2. VI. Heart and/or lung transplantation		
Central venous pressure invasive arterial monitoring, pulmonary artery catheter insertion and interpretation. Level D	N/A	N/A
TEE for monitoring of left and right ventricular function and diagnosis of primary graft dysfunction / failure. Level C	N/A	N/A
Insertion and management of thoracic epidurals Level D	N/A	N/A
2.VII. Organizational module		
Communicating effectively with patients and their families. Level D	N/A	N/A
Communicating effectively with surgical colleagues. Level D	N/A	N/A
Communicating with the intubated patient. Level D	N/A	N/A
Recognizing the need for senior help. Level D	N/A	N/A
Maintaining accurate clinical records. Level D	N/A	N/A
Presentations at departmental meetings. Level D	N/A	N/A
Participation in multi-disciplinary clinical audits. Level C	N/A	N/A
Commitment to continued professional development. Level D	N/A	N/A
2.VIII. Research module		
Ability to help design a clinical or basic science research project or part of it as a member of the investigative team. Level D	Research rotation	Statistics and Methodological Research Course (20 hours online) / Supervisor meeting Monthly / Support of the Statistics Department
Ability to help complete an ethics application. Level C	Research rotation	Statistics and Methodological Research Course (20 hours online) / Supervisor meeting Monthly / Support of the Statistics Department
Ability to discuss basic statistical approaches. Level C	Research rotation	Statistics and Methodological Research Course (20 hours online) / Supervisor meeting Monthly / Support of the Statistics Department
Ability to consent, recruit, and follow up research participants according to regulatory frameworks. Level C	Research rotation	Statistics and Methodological Research Course (20 hours online) / Supervisor meeting Monthly / Support of the Statistics Department
Ability to help analyze data. Level C	Research rotation	Statistics and Methodological Research Course (20 hours online) / Supervisor meeting Monthly / Support of the Statistics Department
Ability to contribute to disseminating study results in abstracts, presentations and publications. Level C	Research rotation	Statistics and Methodological Research Course (20 hours online) / Supervisor meeting Monthly / Support of the Statistics Department

Medical Knowledge

Indicate the activity(ies) (lectures, conferences, journal clubs, clinical teaching rounds, etc.) in which residents will demonstrate knowledge in each of the following areas. Also indicate the method(s) used to assess competence.

Area of Knowledge	Settings/ Activities	Assessment Method(s)
1. Basic Training		
1.I. General patient assessment and risk estimation (Level A)		
Physiology of the heart, the circulatory system and the respiratory system. Basic knowledge of embryological development of cardiac, thoracic and vascular structures.	Pre anesthetic rounds / OR Anaesthesia for Cardiac Surgery Rotations / CTVA Theoretical Course / Journal club / conferences / ICU rounds	CTVA Theoretical Course exam / Fellow evaluation during OR's Anaesthesia for Cardiac Surgery Rotations / Intraday Debrief
Pre-operative invasive and non-invasive assessment of cardiac diseases and interpretation of results including electrocardiogram (ECG), chest x-ray, echo-cardiography, cardiac stress testing, coronary angiography, cardiac magnetic resonance imaging (CMR), and computer tomography (CT).	Pre anesthetic rounds / OR Anaesthesia for Cardiac Surgery Rotations / CTVA Theoretical Course / Journal club / conferences / ICU rounds	CTVA Theoretical Course exam / Fellow evaluation during OR's Anaesthesia for Cardiac Surgery Rotations / Intraday Debrief
Pre-operative pulmonary evaluation and interpretation of the results, including arterial blood gas and acid-base analysis, pulmonary function tests, oximetry and thoracic imaging.	Pre anesthetic rounds / OR Anaesthesia for Cardiac Surgery Rotations / CTVA Theoretical Course / Journal club / conferences / ICU rounds	CTVA Theoretical Course exam / Fellow evaluation during OR's Anaesthesia for Cardiac Surgery Rotations / Intraday Debrief
Patient information and informed consent including medico-legal aspects, appraisal of discernment and consent capacity.	Pre anesthetic rounds / OR Anaesthesia for Cardiac Surgery Rotations / CTVA Theoretical Course / Journal club / conferences / ICU rounds	CTVA Theoretical Course exam / Fellow evaluation during OR's Anaesthesia for Cardiac Surgery Rotations / Intraday Debrief
Principles of risk and outcome assessment and relevant scoring systems (e.g., EuroSCORE).	Pre anesthetic rounds / OR Anaesthesia for Cardiac Surgery Rotations / CTVA Theoretical Course / Journal club / conferences / ICU rounds	CTVA Theoretical Course exam / Fellow evaluation during OR's Anaesthesia for Cardiac Surgery Rotations / Intraday Debrief
1. II. Anesthesia management – cardiac surgery (Level A)		
Knowledge of anesthetic agents and their effects on cardiac function and in patients with cardiac diseases.	OR Anaesthesia for Cardiac Surgery Rotations / CTVA Theoretical Course, lectures, conferences, OR Clinical teaching rounds	CTVA Theoretical Course exam / Fellow evaluation during OR's Anaesthesia for Cardiac Surgery Rotations / Intraday Debrief / CSE and Log-book evaluations
Principles of intraoperative pharmacology and relevant medication, including positive inotropes, chronotropes, vasoconstrictors, vasodilators, and anti-arrhythmic agents.	OR Anaesthesia for Cardiac Surgery Rotations / CTVA Theoretical Course, lectures, conferences, OR Clinical teaching rounds	CTVA Theoretical Course exam / Fellow evaluation during OR's Anaesthesia for Cardiac Surgery Rotations / Intraday Debrief / CSE and Log-book evaluations
Principles of patient blood management, including specific diagnostic tools, application of relevant medication and blood products.	OR Anaesthesia for Cardiac Surgery Rotations / CTVA Theoretical Course, lectures, conferences, OR Clinical teaching rounds	CTVA Theoretical Course exam / Fellow evaluation during OR's Anaesthesia for Cardiac Surgery Rotations / Intraday Debrief / CSE and Log-book evaluations
Principles of basic hemodynamic monitoring and relevant techniques, such as arterial pressure measurement, central venous pressure.	OR Anaesthesia for Cardiac Surgery Rotations / CTVA Theoretical Course, lectures, conferences, OR Clinical teaching rounds	CTVA Theoretical Course exam / Fellow evaluation during OR's Anaesthesia for Cardiac Surgery Rotations / Intraday Debrief / CSE and Log-book evaluations
Principles of relevant neuro-monitoring techniques (e.g., processed electro-encephalography (PEEG), near-infrared sonography (NIRS), somato-sensibile evoked potentials (SSEP), motor evoked potentials (MEP).	OR Anaesthesia for Cardiac Surgery Rotations / CTVA Theoretical Course, lectures, conferences, OR Clinical teaching rounds	CTVA Theoretical Course exam / Fellow evaluation during OR's Anaesthesia for Cardiac Surgery Rotations / Intraday Debrief / CSE and Log-book evaluations
Principles of conventional cardiopulmonary bypass techniques. Principles of myocardial preservation. Effects of cardiopulmonary bypass on human physiology, organ function, and pharmacology.	OR Anaesthesia for Cardiac Surgery Rotations / CTVA Theoretical Course, lectures, conferences, OR Clinical teaching rounds	CTVA Theoretical Course exam / Fellow evaluation during OR's Anaesthesia for Cardiac Surgery Rotations / Intraday Debrief / CSE and Log-book evaluations
Basic principles of common procedures in cardiac surgery, such as coronary artery bypass grafting (CABG).	OR Anaesthesia for Cardiac Surgery Rotations / CTVA Theoretical Course, lectures, conferences, OR Clinical teaching rounds	CTVA Theoretical Course exam / Fellow evaluation during OR's Anaesthesia for Cardiac Surgery Rotations / Intraday Debrief / CSE and Log-book evaluations
1. III. Anesthesia management – thoracic surgery (Level A)		
Principles of pulmonary evaluation as described previously, and basic knowledge in the interpretation of results from pulmonary function tests, lung perfusion testing and CT.	OR Anaesthesia for Thoracic Surgery Rotations at HSPE / CTVA Theoretical Course, lectures, conferences, OR Clinical teaching rounds	CTVA Theoretical Course exam / Fellow evaluation during OR's Anaesthesia for Thoracic Surgery Rotations / Intraday Debrief / CSE and Log-book evaluations
Knowledge of the bronchial anatomy.	OR Anaesthesia for Thoracic Surgery Rotations at HSPE / CTVA Theoretical Course, lectures, conferences, OR Clinical teaching rounds	CTVA Theoretical Course exam / Fellow evaluation during OR's Anaesthesia for Thoracic Surgery Rotations / Intraday Debrief / CSE and Log-book evaluations
Knowledge about relevant anesthetic agents and their effects in patients with lung diseases.	OR Anaesthesia for Thoracic Surgery Rotations at HSPE / CTVA Theoretical Course, lectures, conferences, OR Clinical teaching rounds	CTVA Theoretical Course exam / Fellow evaluation during OR's Anaesthesia for Thoracic Surgery Rotations / Intraday Debrief / CSE and Log-book evaluations
Principles of intraoperative pharmacology and relevant medication, including bronchodilators and steroids.	OR Anaesthesia for Thoracic Surgery Rotations at HSPE / CTVA Theoretical Course, lectures, conferences, OR Clinical teaching rounds	CTVA Theoretical Course exam / Fellow evaluation during OR's Anaesthesia for Thoracic Surgery Rotations / Intraday Debrief / CSE and Log-book evaluations

Basic principles of common procedures in thoracic surgery (mediastinoscopy, video-assisted thoracoscopic surgery (VATS), open lung resection, pneumonectomy).	OR Anaesthesia for Thoracic Surgery Rotations at HSPE / CTVA Theoretical Course, lectures, conferences, OR Clinical teaching rounds	CTVA Theoretical Course exam / Fellow evaluation during OR's Anaesthesia for Thoracic Surgery Rotations / Intraday Debrief / CSE and Log-book evaluations
Basic principles of endoscopic pulmonary procedures, such as bronchial stenting and endoscopic lung volume reduction (ELVR).	OR Anaesthesia for Thoracic Surgery Rotations at HSPE / CTVA Theoretical Course, lectures, conferences, OR Clinical teaching rounds	CTVA Theoretical Course exam / Fellow evaluation during OR's Anaesthesia for Thoracic Surgery Rotations / Intraday Debrief / CSE and Log-book evaluations
1. IV. Anaesthesia management – major vascular surgery (Level A)		
Knowledge of peri-operative management for vascular patients undergoing vascular interventions, including anesthetic choices, perioperative monitoring, and risk identification	OR Anaesthesia for Vascular Surgery Rotations / CTVA Theoretical Course, lectures, conferences, OR Clinical teaching rounds	CTVA Theoretical Course exam / Fellow evaluation during OR's Anaesthesia for Vascular Surgery Rotations / Intraday Debrief / CSE and Log-book evaluations
Basic principles of the peri-operative management of lumbar drainage for aortic interventional procedures.	OR Anaesthesia for Vascular Surgery Rotations / CTVA Theoretical Course, lectures, conferences, OR Clinical teaching rounds	CTVA Theoretical Course exam / Fellow evaluation during OR's Anaesthesia for Vascular Surgery Rotations / Intraday Debrief / CSE and Log-book evaluations
Basic principles of spinal cord protection during surgical and interventional aortic procedures.	OR Anaesthesia for Vascular Surgery Rotations / CTVA Theoretical Course, lectures, conferences, OR Clinical teaching rounds	CTVA Theoretical Course exam / Fellow evaluation during OR's Anaesthesia for Vascular Surgery Rotations / Intraday Debrief / CSE and Log-book evaluations
Basic principles of neuromonitoring.	OR Anaesthesia for Vascular Surgery Rotations / CTVA Theoretical Course, lectures, conferences, OR Clinical teaching rounds	CTVA Theoretical Course exam / Fellow evaluation during OR's Anaesthesia for Vascular Surgery Rotations / Intraday Debrief / CSE and Log-book evaluations
1. V. Post-operative care/ Critical care (Level A)		
Scoring systems in the ICU (e.g. the Sequential Organ Failure Assessment (SOFA), the Simplified Acute Physiology Score (SAPS), the Confusion Assessment Method (CAM-ICU).	ICU Clinical Teaching rounds / Lectures / Conferences / CTVA Theoretical Course	CTVA Theoretical Course exam / Fellow evaluation during ICU Rotation
Etiology, pathophysiology, diagnosis and treatment plans / bundles according to international standards for specific critical conditions in cardiothoracic and vascular surgery patients.	ICU Clinical Teaching rounds / Lectures / Conferences / CTVA Theoretical Course	CTVA Theoretical Course exam / Fellow evaluation during ICU Rotation
Circulatory failure (heart failure, shock, cardiorespiratory arrest, cardiac arrhythmias, ischemic heart disease, pulmonary embolism, bleeding complications, vasoplegia).	ICU Clinical Teaching rounds / Lectures / Conferences / CTVA Theoretical Course	CTVA Theoretical Course exam / Fellow evaluation during ICU Rotation
Anaphylaxis.	ICU Clinical Teaching rounds / Lectures / Conferences / CTVA Theoretical Course	CTVA Theoretical Course exam / Fellow evaluation during ICU Rotation
Respiratory failure, including adult respiratory distress syndrome (ARDS), pulmonary edema, pneumothorax, pneumonia.	ICU Clinical Teaching rounds / Lectures / Conferences / CTVA Theoretical Course	CTVA Theoretical Course exam / Fellow evaluation during ICU Rotation
Acute kidney injury and failure.	ICU Clinical Teaching rounds / Lectures / Conferences / CTVA Theoretical Course	CTVA Theoretical Course exam / Fellow evaluation during ICU Rotation
Gastrointestinal failure, peritonitis, pancreatitis, liver failure, non-occlusive mesenteric ischemia (NOMI).	ICU Clinical Teaching rounds / Lectures / Conferences / CTVA Theoretical Course	CTVA Theoretical Course exam / Fellow evaluation during ICU Rotation
Neurological failure (delirium and coma, cerebral ischemia and bleeding).	ICU Clinical Teaching rounds / Lectures / Conferences / CTVA Theoretical Course	CTVA Theoretical Course exam / Fellow evaluation during ICU Rotation
Airway and chest injuries.	ICU Clinical Teaching rounds / Lectures / Conferences / CTVA Theoretical Course	CTVA Theoretical Course exam / Fellow evaluation during ICU Rotation
Aortic injuries.	ICU Clinical Teaching rounds / Lectures / Conferences / CTVA Theoretical Course	CTVA Theoretical Course exam / Fellow evaluation during ICU Rotation
Infectious diseases (systemic inflammatory response syndrome (SIRS) and sepsis, including sepsis bundle strategy).	ICU Clinical Teaching rounds / Lectures / Conferences / CTVA Theoretical Course	CTVA Theoretical Course exam / Fellow evaluation during ICU Rotation
Coagulation disorders (disseminated intravascular coagulopathy (DIC), heparin resistance, heparin-induced thrombocytopenia, severe bleeding, transfusion reaction).	ICU Clinical Teaching rounds / Lectures / Conferences / CTVA Theoretical Course	CTVA Theoretical Course exam / Fellow evaluation during ICU Rotation
Equipment and apparatus (equipment design, physics, standards, limitations; e.g. non-invasive and invasive postoperative ventilation, continuous renal replacement therapy devices, non-invasive and invasive hemodynamic monitoring).	ICU Clinical Teaching rounds / Lectures / Conferences / CTVA Theoretical Course	CTVA Theoretical Course exam / Fellow evaluation during ICU Rotation
Indication, contraindication, drug selection, complications: sedation, anesthesia, analgesia, neuromuscular relaxation, nutrition.	ICU Clinical Teaching rounds / Lectures / Conferences / CTVA Theoretical Course	CTVA Theoretical Course exam / Fellow evaluation during ICU Rotation
Multimodal and pre-emptive analgesia concepts.	ICU Clinical Teaching rounds / Lectures / Conferences / CTVA Theoretical Course	CTVA Theoretical Course exam / Fellow evaluation during ICU Rotation
Weaning and extubation criteria.	ICU Clinical Teaching rounds / Lectures / Conferences / CTVA Theoretical Course	CTVA Theoretical Course exam / Fellow evaluation during ICU Rotation
Transfer and discharge criteria.	ICU Clinical Teaching rounds / Lectures / Conferences / CTVA Theoretical Course	CTVA Theoretical Course exam / Fellow evaluation during ICU Rotation
Indications for and application of extracorporeal circulation in intensive care patients for cardiac and / or respiratory support (e.g., ECMO).	ICU Clinical Teaching rounds / Lectures / Conferences / CTVA Theoretical Course	CTVA Theoretical Course exam / Fellow evaluation during ICU Rotation
1. VI. Basic peri-operative echocardiography (Level A)		
Principles of basic theory of peri-operative cardiac echocardiography according to the European Association of Cardiovascular Imaging (EACVI) / EACTA process of certification for TEE.	Workshop Echo Course of Perioperative Echocardiography / Lectures / CTVA Theoretical Course / Echo seminars	Fellow evaluation at the Echo Lab / Fellow evaluation and discussion during OR's TEE rotation
1. VII. Anaesthesia management – interventional procedures in cardiology (Level A)		
Basic principles of common procedures in interventional cardiology, such as coronary angiography, ablation, transcatheter aortic valve replacement (TAVI), and mitral / tricuspid clipping with relevant complications.	Interventional Cardiology Department Rotations / CTVA Theoretical Course, lectures, conferences, OR Clinical teaching rounds	CTVA Theoretical Course exam / Fellow evaluation during Interventional Cardiology Rotation / Intraday Debrief
Procedural sedation guidelines from the European Board of Anaesthesiology (EBA) / European Society of Anaesthesiology (ESA).	Interventional Cardiology Department Rotations / CTVA Theoretical Course, lectures, conferences, OR Clinical teaching rounds	CTVA Theoretical Course exam / Fellow evaluation during Interventional Cardiology Rotation / Intraday Debrief
Monitoring and capnography use according to the safety recommendations from EBA.	Interventional Cardiology Department Rotations / CTVA Theoretical Course, lectures, conferences, OR Clinical teaching rounds	CTVA Theoretical Course exam / Fellow evaluation during Interventional Cardiology Rotation / Intraday Debrief
1. VIII. Extracorporeal perfusion management (Level A)		
Basic principles of extracorporeal perfusion.	OR CPB Rotation / CTVA Theoretical Course, lectures, conferences, OR Clinical teaching rounds	CTVA Theoretical Course exam / Fellow evaluation during OR's Anaesthesia for Cardiac Surgery Rotations / Intraday Debrief
Types of extracorporeal circuits, e.g., cardiopulmonary bypass (CPB), extracorporeal membrane oxygenation (ECMO).	OR CPB Rotation / CTVA Theoretical Course, lectures, conferences, OR Clinical teaching rounds	CTVA Theoretical Course exam / Fellow evaluation during OR's Anaesthesia for Cardiac Surgery Rotations / Intraday Debrief
Types, composition and mechanisms of cardiopulmonary solutions.	OR CPB Rotation / CTVA Theoretical Course, lectures, conferences, OR Clinical teaching rounds	CTVA Theoretical Course exam / Fellow evaluation during OR's Anaesthesia for Cardiac Surgery Rotations / Intraday Debrief
Cardioprotective measures.	OR CPB Rotation / CTVA Theoretical Course, lectures, conferences, OR Clinical teaching rounds	CTVA Theoretical Course exam / Fellow evaluation during OR's Anaesthesia for Cardiac Surgery Rotations / Intraday Debrief
Safety recommendations for extracorporeal circulation from the European Board of Cardiovascular Perfusion (EBCP).	OR CPB Rotation / CTVA Theoretical Course, lectures, conferences, OR Clinical teaching rounds	CTVA Theoretical Course exam / Fellow evaluation during OR's Anaesthesia for Cardiac Surgery Rotations / Intraday Debrief
2. Advanced training		
2.1. Anaesthesia management – cardiac surgery (Level A)		
Principles of advanced hemodynamic monitoring and relevant techniques, such as use of the pulmonary artery catheter, continuous cardiac output monitoring and measurement.	OR Complex Cardiac Surgery discussions / lectures / Case report / Journal club	CSE evaluations / Log-Book evaluations (every 3 months)
Principles of modified cardiopulmonary bypass (minimized CPB, left-heart CPB) and the off-pump revascularization technique.	OR Complex Cardiac Surgery discussions / lectures / Case report / Journal club	CSE evaluations / Log-Book evaluations (every 3 months)
Principles of advanced procedures in cardiac surgery and clinical management of affected patients (valve surgery and thoracic aortic surgery, including ascending, transverse, and descending aortic surgery with circulatory arrest).	OR CPB Rotation / CTVA Theoretical Course, lectures, conferences, OR Clinical teaching rounds	CSE evaluations / Log-Book evaluations (every 3 months)
Principles and state of the art of mechanical support including intra-aortic balloon pumps, and extracorporeal membrane oxygenation.	OR Complex Cardiac Surgery discussions / lectures / Case report / Journal club	CSE evaluations / Log-Book evaluations (every 3 months)
Current state of temporary and long-term mechanical circulatory support (ventricular assist devices, total artificial hearts).	OR Complex Cardiac Surgery discussions / lectures / Case report / Journal club	CSE evaluations / Log-Book evaluations (every 3 months)
Principles of use of inhaled pulmonary vasodilators (nitric oxide (NO), prostaglandins).	OR Complex Cardiac Surgery discussions / lectures / Case report / Journal club	CSE evaluations / Log-Book evaluations (every 3 months)
Principles of fast-track surgery.	OR Complex Cardiac Surgery discussions / lectures / Case report / Journal club	CSE evaluations / Log-Book evaluations (every 3 months)
2.II. Anaesthesia management – thoracic surgery (Level A)		
Principles of common procedures in thoracic surgery (open and thoracoscopic lung resections, robotic lung resection, lung volume reduction surgery, mediastinoscopy, pneumonectomy).	N/A	N/A
Principles of diagnostic and interventional bronchoscopic surgery (lung volume reduction, bronchopulmonary lavage; endoscopic, rigid fiber optic and laser resection; bronchial stenting and sealing).	N/A	N/A
Principles of peri-operative management of esophageal surgery for varices, neoplasm, colon interposition, foreign body, stricture, and tracheoesophageal fistula.	N/A	N/A
2. III. Anaesthesia management – major vascular surgery (Level A)		
Knowledge of perioperative management of TEVAR and EVAR.	N/A	N/A
Knowledge of the principles of perioperative management of lumbar drainage for aortic interventional procedures.	N/A	N/A
Excellent knowledge of the principles of spinal cord protection during surgical and interventional aortic procedures.	N/A	N/A

Excellent knowledge of the principles of cerebral function monitoring.	N/A	N/A
2. IV. Post-operative management/ Critical care (Level A)		
Knowledge of cardiac and thoracic physiology.	N/A	N/A
Postoperative cardiac critical care, including analgesia, sedation and ventilation.	N/A	N/A
Postoperative care and analgesia after thoracic surgery.	N/A	N/A
An understanding of the management of cardiac pacing modes.	N/A	N/A
An understanding of extracorporeal membrane oxygenation and other devices used for mechanical circulatory support.	N/A	N/A
2. VII. Advanced perioperative echocardiography (Level A)		
Advanced level of knowledge in peri-operative cardiac echocardiography according to the EACVI/ EACTA process of certification guidelines.	Echocardiography Lab and Intraoperative TEE rotation	complete the TEE case logbook for Adult TEE accreditation / discussions during OR TEE rotations and Echo Lab
2. VIII. Heart and/or lung transplantation (Level A)		
Understanding of the physiology and clinical presentations of end-stage heart and lung disease and surgical options for their management.	N/A	N/A
Understanding of the principles of heart transplantation and clinical management of affected patients.	N/A	N/A
Knowledge of current limitations of organ transplantation and efforts to increase the suitable donor pool.	N/A	N/A
Understanding of the multidisciplinary nature of patient evaluation and listing for transplantation.	N/A	N/A
Knowledge of the principles of donor optimization, management and allograft retrieval.	N/A	N/A
Knowledge of the principles of ex-vivo heart and lung perfusion.	N/A	N/A
Understanding of the physiology of the denervated organ.	N/A	N/A
Understanding of the surgical conduct of heart transplantation and knowledge of intra-operative and immediate postoperative care, including stability of induction, ventilation, oxygenation, hemodynamic support, and allograft and noncardiac organ protection.	N/A	N/A
Understanding of primary graft dysfunction and indications for mechanical circulatory support.	N/A	N/A
Understanding of the surgical options for lung transplantation, including minimally invasive lung transplantation and various intraoperative extracorporeal support mechanisms.	N/A	N/A
Knowledge of intra-operative and immediate postoperative care, including protective ventilation, oxygen delivery, hemodynamic support, indications for inhaled NO and other pulmonary vasodilators, allograft and non-pulmonary organ protection.	N/A	N/A
Knowledge of the principles of primary lung dysfunction and conservative and extracorporeal treatment options, including indications for and techniques of ECMO.	N/A	N/A
Understanding of immunosuppressive regimens and the role of postoperative infections and sepsis.	N/A	N/A
2. IX. Research module (Level A)		
Principles of clinical trials, including design, end points, inclusion / exclusion criteria, reporting requirements.	Statistics and Methodological Research Course / Meetings	Meetings with Supervisor monthly
Understanding of Good Clinical Practice (GCP) requirements for clinical research involving patients.	Statistics and Methodological Research Course / Meetings	Meetings with Supervisor monthly
Understanding of European and specific national ethics frameworks, including research ethics applications, clinical regulatory frameworks and hospital site-specific assessment.	Statistics and Methodological Research Course / Meetings	Meetings with Supervisor monthly
Principles of sample size and study power determinations and basic statistical evaluation	Statistics and Methodological Research Course / Meetings	Meetings with Supervisor monthly
Principles of patient and data confidentiality agreements.	Statistics and Methodological Research Course / Meetings	Meetings with Supervisor monthly
Understanding tools for data collection, analysis and reporting.	Statistics and Methodological Research Course / Meetings	Meetings with Supervisor monthly
Principal international basic science priorities in the field of cardiac anaesthesia.	Statistics and Methodological Research Course / Meetings	Meetings with Supervisor monthly
Ethics and practicalities of biological sample collection, storage and biobanking	Statistics and Methodological Research Course / Meetings	Meetings with Supervisor monthly
Principles and ethics of scientific publishing.	Statistics and Methodological Research Course / Meetings	Meetings with Supervisor monthly

12. Assessment

The Programme Director will evaluate each fellow every 3 months

Assessment tools

- 360-degree evaluations
- Personal reports from the faculty
- Learning goals for the next three months
- A logbook will be available

Yes
Yes
Yes
Yes

- Clinical skills evaluations
- Self-assessment by Fellow
- Feedback from Fellows
- Reports of Evaluation will be available

Yes
Yes
Yes
Yes

The Programme Director will give an appraisal for each fellow every 3 months

The faculty and trainee should agree a joint evaluation both fellow's progress and the training programme, and devise a plan for addressing any perceived difficulties or deficiencies.

Training programmes should encourage fellows to provide a written confidential evaluation of the programme.

External evaluation / assessment will be held as per EACTA regulations

The centre will be able to maintain a register of those fellows who have entered and successfully completed a training programme in order to continue its accreditation as a training centre

There will be regular opportunities for Fellows to provide confidential written evaluations of the faculty and program to the EACTA Education Chair

Periodic evaluation of patient care (quality assurance) is mandatory. Subspecialty trainees in cardiac, thoracic, and vascular anaesthesia will be involved in continuing quality improvement and risk management.

Trainees in cardiac, thoracic and vascular anaesthesia will actively participate in the periodic evaluation and reassessment of the Fellowship training goals and objectives

Should unforeseen circumstances arise such as personal conflict between a Fellows and tutors, this should be reported immediately to the Chair of the Education Committee.

At the end of the training period, the centre would acknowledge in writing successful completion of a fellow training.

13. Practice-based Learning and improvement

1. Briefly describe one planned learning activity in which fellows engage to: identify strengths, deficiencies, and limits in their knowledge and expertise (self-reflection and self-assessment); set learning and improvement goals; and identify and perform appropriate learning activities to achieve self-identified goals (life-long learning).

During Cardiac Anaesthesia Exposure, fellows are encouraged to practice evidence-based medicine and be able to utilize resources to optimize patient care and personal growth development. Fellows are trained to assume progressive responsibility in the perioperative anaesthetic management of adult patients undergoing major cardiovascular surgery. As one of example of practice-based learning and improvement, upon choosing Swan-Ganz catheter insertion in a patient before surgery the fellow will have a class in "Swan-Ganz catheter indications and insertion access" where he will learn the main aspects of the subject, followed by training in a simulation scenario and then take that knowledge to the patient in the OR. A checklist sheet will evaluate aspects such, asepsis, antiseptics, table set-up and the use of ultrasound machine. A video will be played before the procedure so the fellow will have the chance to review the main aspects of it. He will be supervised and after the placement of the catheter the checklist sheet will be discussed with him to identify aspects that could be improved and aspects he did well. A discussion will also encourage the fellow to search the best evidence available online in order to further enrich his learning experience.

2. Briefly describe one planned quality improvement activity or project that will allow the fellows to demonstrate an ability to analyse, improve and change practice or patient care. Describe planning, implementation, evaluation and provisions of faculty support and supervision that will guide this process.

Fellows must demonstrate the ability to recognize and improve upon limitations in one's knowledge and clinical skills. Fellows will be motivated to search for scenarios that need to change or to be improved during their daily practice under supervision of a senior staff during the entire process. One example is the evaluation of Perioperative Anaesthesia Quality Indicators data that might show possible recurring mistakes that need to be corrected. The fellow will be encouraged to participate in the critical analysis process of the results for posterior discussion in the Quality Improvement Review Meetings for possible change and implementation.

3. Briefly describe how fellows will receive and incorporate formative evaluation feedback into daily practice

During routinely procedures under supervision, fellows come across difficult situations frequently. They will be stimulated to take decisions, argued how to solve patient's health problems with the best practice-evidence for any clinical case through real time verbal feedback and the intraday debrief at the end of the day.

4. Briefly describe one example of a learning activity in which fellows engage to develop the skills needed to use information technology to locate, appraise, and assimilate evidence from scientific studies and apply it to their patients' health problems. The description should include:

Fellows are invited to participate in clinical trials, multicentre studies, helping on writing papers under supervision with discussion with the faculty research members that will help improve knowledge for later practical application.

5. Briefly describe how fellows will participate in the education of patients, families, students, fellows, and other health professionals.
Fellows are motivated participate in multidisciplinary committee or groups that include fellows from other areas and local humanization groups that involves health professionals, patients and families. The local hospital humanization committee and support group offer all these events routinely.

14. Interpersonal and Communication Skills
1. Briefly describe one learning activity in which fellows demonstrate competence in communicating effectively with patients and families across a broad range of socioeconomic and cultural backgrounds, and with physicians, other health professionals, and health-related agencies.

During the pre-anesthetic visit, the fellows are oriented to inform patients and family the best way possible, of all the risks that patient will be submitted and the alternative treatments that may occur as a result of adverse events. The fellow will also be oriented to use the language that will be adapted according to the patient's social level and cultural backgrounds. The patient or family will be encouraged to repeat back with their own words their understanding of the situation that was discussed.

2. Briefly describe one learning activity in which fellows demonstrate their skills and habits to work effectively as members or leaders of a health care team or other professional group. In the example, identify the members of the team, responsibilities of the team members, and how team members communicate to accomplish responsibilities.
Fellows are informed that the best practices before any procedure recommends using a checklist. For example, the so-called "central line bundle" of best practices recommends using a checklist when inserting a central venous catheter. If the fellow is observing a resident placing a central line catheter, he will be encouraged to communicate when elements of the bundle are not executed (for example, a breach in sterility has occurred).

3. Briefly describe how fellows will be provided with opportunities to act in a consultative role to other physicians and health professionals related to clinical information systems.
Fellows will have the opportunity to communicate with other physicians in a consultative role when required to assess epidural catheters for postoperative analgesia, for helping monitoring lumbar pressure, for difficult airway assessment, for sedation in the image lab, for sedation and helping other physicians in different situations in the ER or in the ICU (ex, peripheral venous access, post punctural headache).

4. Briefly describe how fellows will be provided with opportunities to maintain comprehensive, timely, and legible medical records, if applicable.
During the first OR visits the fellow will be oriented how to thoroughly fill out our Anaesthesia Record in a timely and legible fashion.

5. Briefly describe how fellows will maintain a comprehensive anaesthesia record for each patient, including evidence of pre- and post-operative anaesthesia assessment, an ongoing reflection of the drugs administered, the monitoring employed, the techniques used, the physiologic variations observed, the therapy provided as required, and the fluids administered.
Fellows are required to fill as complete as possible the anaesthesia record during any surgical procedure and maintain an accurate procedure logbook. This includes the main points of the Pre-Anaesthetic Evaluation Form and the Anaesthesia Record. Every procedure with anaesthesia is also included in the hospital anaesthesia database, which the fellow has open access to review.

6. Briefly describe how fellows will create and sustain a therapeutic relationship with patients, engage in active listening, provide information using appropriate language, ask clear questions, provide an opportunity for comments and questions, and demonstrate sensitivity and responsiveness to cultural differences, including awareness of their own and their patients' cultural perspectives.
During pre-anesthetic visit, fellows have to demonstrate sensitivity and responsiveness to patients' cultural differences. Jehovah's witness patients are examples that fellows have to effective and appropriate listening to reach the best agreement between the parties about blood components transfusions. This will help to create and sustain a specific therapeutic and a properly conduct to be followed during surgery.

15. Professionalism
Briefly describe the learning activity(ies), other than lecture, by which fellows demonstrate a commitment to carrying out professional responsibilities and an adherence to ethical principles, including: compassion, integrity, and respect for others; responsiveness to patient needs that supersedes self-interest; respect for patient privacy and autonomy; accountability to patients, society, and the profession; and sensitivity and responsiveness to a diverse patient population, including to diversity in gender, age, culture, race, religion, disabilities, and sexual orientation

Fellows are encouraged to apply ethical decision making in all aspects of professional practice pertaining to the provision or withholding of clinical care, confidentiality of patient information, informed consent and medical practice. Fellows are motivated to seek internal assessment, and apply external critical observation of professional performance during the pre and post anaesthetic visit or in any form of interaction with the patient or with his/her family.

15. Systems-based Practice
1. Describe the learning activity(ies) through which fellows achieve competence in the elements of systems-based practice: working effectively in various health care delivery settings and systems, coordinating patient care within the health care system; incorporating considerations of cost-containment and risk-benefit analysis in patient care; advocating for quality patient care and optimal patient care systems; and working in inter-professional teams to enhance patient safety and care quality

Fellows will participate in grand rounds to familiarize them with the overall anaesthesia economic climate. They will also be encouraged to search our hospital intranet or pharmaceutical staff in order to get information focused specifically on drug costs. One example is the necessity of an specific drug to treat a perioperative complication, such as acute bleeding: first fellow will be faced with the question if the drug is well indicated for the case during discussion with the team (staff and surgeon regarding the use of PCC, etc.). Second, the fellow has to get information on how he can find the drug in the system (in this case the local pharmacy). Third, how much the drug costs and compares it with other possible treatments (like, fresh frozen plasma). During this whole process, the fellow will assess if the use of the drug on the risk-benefit analysis will bring a better quality of care for the patient.

2. Describe an activity that fulfills the requirement for experiential learning in identifying system errors and implementing potential systems solutions.
During the M&M sessions the fellows will have the opportunity to review challenging cases and to discuss with staff members, other fellows and physicians to identify errors and to present solutions that may change their practice and ultimately improve patient care quality.

16. EACTA Site Visit (for 1-day)
Dates proposed for the visit (at least 3) or or
I hereby accept the regulations of the Hospital Visiting especially to take in charge the travel costs and the hotel accommodation of the 2 reviewers on the most reasonable base
Yes
Other comments We are very welcome to accept and offer a site visit if it is required. Therefore, as we had the site visit performed only 2 years ago and further as we are now facing this unprecedented COVID-19 pandemic, I guess there is no need for a site visit at this moment.

To be completed by the Head of department or the authorised deputy.
Please fill in all required fields and send to eacta@aimgroup.eu

**Cardiothoracic and Vascular Anaesthesia Fellowship Programme
(CTVA) – Basic and Advanced
Division of Surgery and Anaesthesiology Section
Dante Pazzanese Institute of Cardiology, São Paulo, Brazil**



**Fundação Adib Jatene / Clínica de Anestesia São Paulo
Education Center – Aneste-Z®**

2020

AIM AND OBJECTIVES

The Cardiothoracic and Vascular Anaesthesia Fellowship Programme (CTVA) at Dante Pazzanese Institute of Cardiology (IDPC) Brazil, has been established with the aim of providing a solid clinical and academic experience to specialize anesthesiologists who will become experts in the perioperative management of adult patients undergoing basic and complex cardiovascular procedures.

ORGANIZATION

The CTVA is organized and directed by the local head of Anaesthesia Section, Dr. Caetano Nigro Neto together with Aneste-Z[®] – Education Center. Dr Caetano Nigro Neto is the Brazilian EACTA representative, member of EACTA Education Committee, EACTA Subcommittee of Anesthesia and Cardiopulmonary Bypass, and Scientific Director of the Education Center Aneste-Z[®].

Recently, the IDPC and Aneste-Z[®] have signed an agreement of technical-educational cooperation for the practical training of anaesthesiologists in the field of cardiothoracic, vascular and heart transplant areas.

Dr. Caetano Nigro will also have the support of the hospital head of Surgery Division (Dr. Mario Issa, MD, PhD), the head of Cardiovascular Surgery Section (Dr. Paulo Chacur, MD), the head of Congenital Heart Diseases Division (Dra. Simone Pedra, PhD, NBE), the head of Non-invasive Diagnosis in Cardiology Department (Dr. Jorge Eduardo Assef, PhD, MD, NBE), the head of Post-Doctoral Program (Dr. Amanda GMR Sousa, Prof., PhD, MD) as program collaborators.

The Anaesthesia Section of the hospital together with EACTA will acknowledge completion of the program. In particular, criteria for EACTA certification will be determined and communicated prior to the start of the fellowship and their fulfilment will be mandatory in order to receive the joint certification (IDPC and EACTA). A logbook for all clinical activities and a final examination exit, which includes research activities, are mandatory and planned.

REQUIREMENTS FOR SELECTION AS A FELLOW

The candidates must be board certified or board eligible according to Brazilian or European residency programme standards, and must be proficient in Portuguese Proficiency Test – CELPE BRÁS (Intermediate Superior Level is required). It is also strongly recommended that candidates be proficient in the English language (B2 level).

PROGRAMME DURATION

Cardiothoracic and Vascular Anaesthesia Fellowship Programme at Dante Pazzanese Institute of Cardiology in São Paulo-Brazil is offered to anaesthesiologists from Brazil and worldwide. They can apply for one year of Basic Programme and an optional second year of Advanced Programme. The program begins on March 1st and finishes at the end of February next year.

PROGRAMME STRUCTURE

The CTVA programme is in according to the Brazilian Minister of Education (MEC) rules for post-graduate courses and includes the six core competencies required for medical residency programs to

deliver high quality medical care: patient care, medical knowledge, practice-based learning and improvement, interpersonal and communication skills, professionalism and systems-based practice.

FIRST YEAR

During the first year of the fellowship, the fellows are directly supervised and gets a 1:1 supervision with a senior cardiac consultant and they will have on – call duties, under supervision.

The content curriculum of the fellowship is divided in:

- Theoretical and Scientific Programme
- Clinical Practice Programme

Theoretical and Scientific Programme (approximately 500 hours): The fellow will have a continuous medical education in the field of cardiac, thoracic and vascular anaesthesia offered by the Education Center Aneste-Z[®], including:

- An On-line Course for the CTVA Basic Programme is offered to the fellows (duration 10 months): this theoretical course includes 10 blocks of classes released monthly, with a total of 120 classes previously recorded and uploaded in our E-learning Platform (classes are update annually, if necessary). At the end of every month, we have a videoconference with fellows and teachers to discuss about the classes released on that month. Every block encompasses a specific topic mostly tailored to the basic training rotations: anesthesia for cardiac surgery - 3 blocks, anesthesia for vascular surgery, anesthesia for thoracic surgery, anesthesia in the Cath-Lab, anesthesia during CPB, ICU, anesthesia for congenital heart disease and basic principles of Echo. The teachers are cardiac anesthesiologists, cardiologists, cardiac surgeons and other teachers from different Universities. The fellows make two written exams during the year with questions related to the classes. A Certificate approved by the Brazilian Minister of Education is issued in the end of the course observed that the fellow has watched 80% of the online classes and a minimum score of 70% rights in the two written exams (complete course available at: www.eadanestez.com)

- A Complete Workshop Echo Course (duration 6 months): this workshop is made in one weekend every two months and include: online classes and hands-on learning with Simulation, Wet-Lab, Q-station, Q-lab (3D) with expert instructors. The online classes are recorded and uploaded in our E-learning Platform to be watched prior and discussed during the practical learning. (complete course available at: www.eadanestez.com)

- Fellows will also have seminars and lectures (once a month), emphasizing the conduction of anaesthesia, clinical cases presentations, main conducts, protocols, preferred anaesthetic techniques and medications used during the surgical procedure.

- The fellow will be motivated to participate in clinical trials, multicentre studies, helping on writing papers, participate of national/international cardiothoracic conferences planning presentations. Moreover, the fellow is encouraged to participate in the European Association of Cardiothoracic Anaesthesiology (EACTA) Annual Meeting and to achieve the European accreditation in TEE by EACTA.

All these benefits are part of our CTVA Programme with free-access and no cost to the fellows.

The fellow is also to encourage making the Advanced Cardiovascular Life Support (ACLS) course. (charges may apply)

Clinical Practice Programme (approximately 1800 hours): Initially, the fellows will have supervised pre-anaesthetic visits, as well as rounds through different sections of the hospital for better familiarization and ambiance. During the program, the fellow will follow all the activities in rotations to different areas of hospital according to the last EACTA curriculum of cardiovascular anaesthesia. For every rotation, there will be a senior anaesthetist (Coordinator) responsible for the fellow activities and interactions with all other team members.

During the daily practice learning in the OR theater, besides senior anesthetists, other expert instructors from Education Center Aneste-Z[®] are always present to assist the fellows on TEE exams and hemodynamic monitoring.

1st Month

- Introduction to the clinical cardiovascular anaesthesia section, mentored primarily by the program directors or division heads
- Anaesthesia management for standard cardiac procedures
- A senior anaesthetist will supervise the fellow during the pre anaesthetic visits
- Participation to intensive care ward rounds and preoperative anaesthesia clinic
- Presentation of the institutional assistance protocols

Rotations

Cardiac Surgery (7 months): clinical duties as a member of the cardiac team for standard cardiac procedures: isolated CABG, valve replacement, combined surgeries, reoperations, emergencies, under supervision. This rotation also includes other procedures, like: management of adult patients for cardiac pacemaker and automatic implantable cardiac defibrillator placement and surgical treatment of cardiac arrhythmias. Moreover, the fellows can follow the cardiac team for standard congenital heart diseases procedures, under supervision. A complement learning of Cardiac Surgery Anesthesia will be made at Hospital do Coração (HCOR), which we have an agreement for each fellow to spend at least 4 weeks for cardiac surgery anesthesia rotation. Minimum cases: 120.

Vascular Surgery (1 month): clinical duties as a member of the cardiac team for all different kinds of major vascular surgeries (ex: aortic bypass and carotid endarterectomy) and endovascular procedures (EVAR), under supervision. A complement learning of Vascular Surgery Anesthesia will be made at Hospital do Coração (HCOR), which we have an agreement for each fellow to spend at least 2 weeks for vascular surgery anesthesia rotation. Minimum major vascular cases: 25.

Thoracic Surgery (1.5 months): clinical duties as a member of the cardiothoracic team for procedures in patients with all types of thoracic surgeries and procedures with and without one lung ventilation, under supervision. A complement learning of Thoracic Surgery Anesthesia will be made at Hospital do Servidor Público Estadual (HSPE), which we have an agreement for our fellows to spend at least 4 weeks for thoracic surgery anesthesia rotation. Minimum major cases: 25

Interventional Cardiology (0.5 month): clinical duties as a member of the cardiac team for standard and advanced interventional cardiac procedures, including transcatheter aortic valve implantation (TAVI) (transapical / transfemoral), mitral valve repairs / replacements, interventions for congenital heart diseases, PCIs, under supervision.

Transoesophageal echocardiography - TEE (0.5 months): Perform basic and intermediate perioperative transoesophageal and transthoracic echocardiography – TEE/TTE with cardiologists in the Echo Lab and anesthetists in the OR, under supervision. Moreover, during the program the fellows will have a Complete Workshop Echo Course and videoconferences with clinical cases discussion, to be able to make a self-consistent TEE examination at the end of the program.

Cardiopulmonary bypass (0.5 months): the fellows will be involved in the management of patients and will have training for cardiopulmonary bypass skills with the CPB team, under supervision.

Intensive Care Unit (1 month): The goal of this rotation is to focus on the post-operative care of cardiovascular patients and pain management. Daily participation on the rounds, under supervision.

During the fellowship fellows also will be exposed (but not necessary) to congenital heart diseases surgeries, as our Centre has a large volume of these surgeries and Cath-lab congenital heart procedures as well.

The last 30 days of the first year of the fellowship, the fellow should be working independently under remote supervision. A senior faculty member is immediately available.

Moreover, fellow must attain European Association of Cardiovascular Imaging (EACVI) /EACTA TEE certification.

At the end of the first year period, the fellow will be able to:

1. Understand normal cardiovascular anatomy and physiology;
2. Perform a comprehensive preoperative evaluation of the patient submitted to cardiothoracic and vascular surgeries, interpreting the cardiovascular function tests in a rational way;
3. To know the pathophysiological changes of the aortic, coronary, valvular diseases as well as their anesthetic implications;
4. To describe changes in the main congenital cardiopathies and their anesthetic implication;
5. Use rationally in the perioperative period the following groups of drugs: antiarrhythmic, inotropic, chronotropic, vasopressors, vasodilators, beta blockers, diuretics, anticoagulants;
6. Understand the fundamental principles of extracorporeal circulation (cardiopulmonary bypass – CPB, extracorporeal membrane oxygenation – ECMO) and other methods of ventricular assistance devices (VADs)
7. Understand the principles of myocardial and brain protection;
8. Know the physiology of coagulation and adequately interpret coagulation tests, as well as critically manage perioperative bleeding using drugs and transfusion therapy;
9. Understand changes in physiology associated with hypothermia;
10. Plan and perform anesthesia for vascular procedures;
11. Plan and perform anesthesia for thoracic procedures;
12. Basic knowledge of how to install, interpret and handle an external pacemaker;
13. To develop an anesthesia strategy for the cardiac patient for non-cardiac surgery and for procedures performed outside the surgical block;
14. Demonstrate ability to install and interpret data from arterial, central venous and pulmonary artery catheters;

15. Perform basic and intermediate perioperative transesophageal and transthoracic echocardiography
– TEE/TTE;
16. Adapt and respond to stress and emergency situations, as well as coordinate actions with other professionals and units involved in the care of the patient;
17. Fellows are expected to act in a respectful, courteous, civil and ethical manner in the best interests of their patients;
18. Participated actively in clinical and basic research activities, acquired the ability to critically interpret published literature and to make significant contributions to research projects in the field.

SECOND YEAR (Optional)

During the second year, the trainee has the option to be include in the Programme of Advanced Cardiac Anaesthesia in Adults. The fellow is expected to be more confident in working independently, always with remote supervision, and be able to deal with complex cardiovascular procedures and will have on – call duties acting as a pre-senior cardiac consultant (a senior faculty member will be immediately available, if necessary).

1. Advanced Cardiac Anaesthesia in Adults

Planning:

1. Develop clinical expertise in anesthesia for complex cardiovascular procedures, including patients with cardiomyopathy, left and right heart failure, aortic arch diseases, pericardial diseases and heart transplantation.
2. Develop clinical expertise in the performance and interpretation of advanced perioperative echocardiograms - transthoracic and transesophageal (3D).
3. Accomplishment of the recommended number of TEE studies according to EACVI.
4. Develop clinical expertise in Advanced hemodynamic monitoring, Mechanical circulatory support (IABP, LVAD, RVAD, Impella, ECMO, etc) and Fast-track heart surgery.
5. The fellow also has the option to participate in clinical studies and research during all the second year of the program. They will have also the opportunity to continue doing research and apply for the PhD programme.

Theoretical and Scientific Programme (approximately 200 hours):

- The fellow will have lectures and seminars, emphasizing topics related to complex cardiovascular procedures (every two weeks).
- The fellow will also be encouraged to present case report and journal club sessions focusing on perioperative period and advanced monitoring during complex cardiac surgery procedures (monthly).
- The fellow should attend IDPC Echocardiography Service meetings, along with cardiologists and cardiovascular surgeons. (every two weeks)
- The fellow will watch a Statistics and Methodological Research Course (20 hours of classes) offered online, learning fundamentals of research design, the interpretation and presentation of data. Monthly will have meetings with the supervisor to be motivated to participate in clinical trials, multicentre studies, helping on writing papers, book chapter and research.
- The fellow will be motivated to attend national/international cardiothoracic conferences and planning presentations. Moreover, the fellow is encouraged to participate in the European Association of Cardiothoracic Anaesthesiology (EACTA) Annual Meeting

Clinical Practice Programme (approximately 1500 hours):

Rotations

Complex Cardiac Surgery (6 months): The fellow will follow the senior cardiac anesthetists specially during procedures that involve patients with cardiomyopathy, right and left heart failure, aortic arch surgery, pericardial diseases, pulmonary hypertension, heart transplantation and

ventricular assistance devices (VADs). The fellow will also follow the “Heart Team” in structural interventional procedures performed at the Cath-Lab: TAVR, EVAR, Mitral and Pulmonary valve interventions, occlusion of the left atrial appendage (LAA), atrial and ventricular septal defect occlusion (ASD and VSD), pulmonary artery stents. A complement learning of Complex Cardiac Surgery Anesthesia will be made at Hospital do Coração (HCOR), which we have an agreement for each advanced fellow to spend at least 6 weeks for complex cardiac surgery anesthesia rotation. Minimum cases: 200

Echocardiography Lab and Intraoperative TEE (3 months): The fellow should complete the TEE case logbook for Adult TEE accreditation and European accreditation in TEE by EACVI. The fellow will have the opportunity to improve his / her skills and knowledge in the perioperative TEE with the supervision of a senior consultant. The fellow will also perform the echocardiographic examination in procedures that require this monitoring for its execution (ablation, TAVI, hybrid procedures, endovascular aneurysm repair, etc.).

Research (3 months): The fellow will plan a research study related to any area of interest in the Cardiothoracic and Vascular Anesthesia. Will have support from the Supervisor and the Statistics Department of the hospital.

During the last 30 days of the second year of the fellowship, the fellow should perform anesthesia for complex cardiovascular procedures and the advanced perioperative echocardiographic examination (TEE and TTE) under remote supervision. A senior faculty member will be immediately available, if necessary. Candidates must succeed in passing the practical part (e-logbook) of the EACVI TEE certification exam. Fellows must pass both parts (theoretical and practical) and completion of the certification process by the end of the advanced program for granting the Advanced CTVA Fellowship certificate.

TASKS AND RESPONSIBILITIES OF THE FELLOW

The fellow takes part in the clinical routine as well as in clinical conferences with the Divisions of Anaesthesiology, Cardiology, Cardiothoracic and Vascular Surgery, Cardiovascular Diagnostic Methods and Interventional Cardiology.

The fellow also takes part in preparation and presentation of case conferences, and the entire didactic method is provided through lectures and conferences that allow him/her to acquire the knowledge to care for the patients. In addition, academic projects including preparation and publication of review articles, book chapters, manuals for teaching or clinical practice, clinical research or other academic activities are offered and strongly encouraged.

The fellow is required to maintain an accurate procedure logbook.

EVALUATION

Fellows’ practice progress in the basic and advanced programmes will be evaluated and discussed monthly by the program’s director and coordinators according to the rotation area that the fellow has completed. Fellow’s professional attitude, 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.

Two written tests will be made according to the classes watched in the Theoretical Course.

A 3-monthly evaluation including 360 degrees, CSE, LOGBOOK, learning objectives for next rotation and performed cases will be done and forward to the EACTA Education Committee.

At the end of the programme, fellow will be also evaluated in an Exit Interview and completion the theoretical and practical EACVI/EACTA TEE exam during the first and second training years, respectively.

FACULTY

The division heads and the programme director have a large experience in cardiothoracic and vascular surgery and anaesthesia, including adults and paediatric patients. Dr Caetano Nigro Neto (details on the attached CVs) is responsible for the fellowship program and will direct it in accord with the local Head of Surgery Division - Dr. Mario Issa, with the Coordinators Advanced Echocardiography for Anaesthesiologists Training – Dr. Marcello Salgado (Brasilin Society of Anaesthetists Perioperative Echo Supervisor) and Dr. Andrea de Andrade Vilela (NBE – Echo certified), the Coordinator Anaesthesia for Congenital Heart Diseases Program – Dr. Gretel Nicolau, Coordinator of the CTVA Practical Programme - Vinicius Nascimento and the Coordinator of the CTVA Theoretical Programme – Dr. Francisco Bezzerra. They will devote sufficient time to provide substantial leadership to the programme and supervision for the trainees. In addition, further senior members of the cardiovascular anaesthesia team serve as clinical teachers and coaches for the fellows in daily clinical practice. Cardiovascular Anaesthesia Section counts on over 15 consultants who are specially trained in cardiovascular anaesthesia and most of them also in perioperative transoesophageal echocardiography.



Caetano Nigro Neto MD, PhD

Head of Anaesthesiology Section IDPC

Collaborator Professor Dante Pazzanese - University of São Paulo Post Doctoral Program

Director, CTVA Fellowship Program IDPC

Brazilian EACTA Representative

Member of EACTA Education Committee

Member of the EACTA CPB Subcommittee

Member of SCA International Committee

Scientific Director of the Education Center Aneste-Z[®]

Member of the Board of CASP (Clínica de Anestesia São Paulo)

Dante Pazzanese Institute of Cardiology

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Support Team:

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Dr. Marcelo Alves Gonçalves MD: Cardiothoracic and Vascular Anaesthesia Specialist / President Aneste-Z® Education Center

Dr. Francisco Jose Lucena Bezerra MD: Coordinator of the CTVA Theoretical Programme / Cardiothoracic and Vascular Anaesthesia Specialist / EACTA member

Dr. Vinícius T. N. da Silva Nascimento MD: Coordinator of the CTVA Practical Programme / Cardiothoracic and Vascular Anaesthesia Specialist / Intraoperative TEE Anaesthesia Specialist / EACTA member

Dr. Marcelo Salgado M.D.; PhD.: Coordinator Advanced Echocardiography for Anaesthesiologists Training / EACTA member / Intraoperative TEE Anaesthesia Specialist / EACTA member

Dr. Gretel Oliveira Nicolau MD: Coordinator Advanced Anaesthesia for Congenital Heart Diseases Program / Cardiothoracic and Vascular Anaesthesia Specialist / Congenital Heart Surgery Anaesthesia Specialist / EACTA member

Dr. Simone Pedra MD; PhD; NBE: Vice-Coordinator Advanced Anaesthesia for Congenital Heart Diseases Program / Coordinator of the Pediatric Echocardiography Section IDPC / EACTA member

Dr. Emerson Costa M.D.: Cardiothoracic and Vascular Anaesthesia Specialist / Vice-Coordinator of the CTVA Practical Programme / EACTA member

Dr. Leonardo Izquierdo MD: Vice-Coordinator Advanced Echocardiography for Anaesthesiologists Program Cardiothoracic and Vascular Anaesthesia Specialist / Congenital Heart Surgery Anaesthesia Specialist / Intraoperative TEE Anaesthesia Specialist / EACTA member

Dr. Renato Tambellini Arnoni MD, PhD: Cardiac Surgery Director / EACTA member

Dr. Andrea de Andrade Vilela MD; PhD; NBE: Head of Echocardiography Laboratory / Coordinator Advanced Echocardiography for Anaesthesiologists Training

Dr. João Manuel Silva Junior, MD; PhD: Director of Anesthesia Department HSPE / Coordinator of the Practical Thoracic Rotation Training

Dr. Eric Benedet Lineburger MD; PhD; TSA-SBA; FASE: Cardiothoracic and Vascular Anaesthesia Consultant / EACTA member

Dr. David Le Bihan MD; PhD; NBE: Cardiologist / EACTA member

Dr. Rodrigo Bellio de Matos Barreto MD; PhD; NBE: Cardiologist / EACTA member

Dr. Alexander Takashi Hamada MD: Cardiothoracic and Vascular Anaesthesia Specialist / Intraoperative TEE Anaesthesia Specialist / EACTA member

Dr. Ingrid Caroline Baia Souza MD: Cardiothoracic and Vascular Anaesthesia Specialist / Intraoperative TEE Anaesthesia Specialist / EACTA member

Dr. Flavio Maia Castilho MD: Cardiothoracic and Vascular Anaesthesia Specialist / EACTA member

Dr. Helena Orquídea MD: Cardiothoracic and Vascular Anaesthesia Specialist / EACTA member

RESOURCES

Located in São Paulo, the largest city in Latin America, Dante Pazzanese Institute of Cardiology is recognized as one of the most prestigious institutions specialized in the cardiovascular care (clinical, surgical and interventional procedures) of Latin America. With over 60 years of tradition, the purpose of the IDPC is to provide medical and hospital care, on an outpatient, emergency and inpatient basis in the cardiovascular area, aiming at health promotion, prevention of cardiovascular diseases, as well as diagnosis, treatment and rehabilitation.

Presently, Dr. Fausto Feres is the General Director of the Dante Pazzanese Institute of Cardiology. The healthcare complex has 453 hospital beds and about 100 rooms for outpatient and emergency care. It also has two surgical theatres with a total of 13 modern operating rooms and 1 hybrid room; a cardiac catheterization laboratory with 6 operating rooms and an electrophysiology laboratory with 1 room. Within this structure, approximately 2500 cardiovascular surgical procedures are performed annually, conducted by a highly specialized and qualified staff. Moreover, the hospital has 91 ICU beds, 50 of which are reserved for post-surgical and post-transplant recovery, forming one of the most active centers of cardiovascular surgical interventions in the country.

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 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.

Another important point of the Institution is its strong connection with teaching, being pioneer in Brazil in the creation of formal programs of residency in Cardiology and Cardiovascular Surgery, constituting a strong postgraduate core "*latu sensu*". Currently, several other related areas of Cardiovascular Health (Nursing, Social Assistance, Psychology, Nutrition, Physical Education, Pharmacy, Dentistry and Physiotherapy) are contemplated with similar programs, and approximately 200 professionals study annually at IDPC.

The Institute is distinguished not only by the introduction of numerous diagnostic and therapeutic techniques, but also by pioneering researches, resulting in important techniques. Examples that we can highlight are the Anatomic Correction of Transposition of the Great Vessels (Jatene Surgery) and Geometric Reconstruction of the Left Ventricle Aneurysm, both developed by professor Adib Domingos Jatene and his colleagues. Moreover, professor José Eduardo M. Sousa developed a cardiac interventional technique in the Institution, which was the use of drug-coated stents to prevent restenosis in coronary arteries. In addition, since the beginning of the 1990s, it has been linked to the University of São Paulo, a renowned research institution, allowing the development of "*sensu strictu*" postgraduate activities.

IDPC is also recognized for the pioneering role of the Bioengineering Division, which aims to promote research and development of medical equipment, in vitro and in vivo experiments, production and

marketing of cardiology equipment and accessories, consulting, guidance of students, agreements with universities, as well as funding projects with philanthropic entities to promote research. This unit represents an advance for the technological production of new equipment, systems and processes, such as cardiac valves, pacemakers, cardiopulmonary bypass pumps, artificial heart and implantable centrifugal blood pump.

The Cardiovascular Anaesthesia Section has provided specialized care to IDPC for over 50 years. The new model of the Cardiothoracic and Vascular Anaesthesia Fellowship Programme started in 2004 and since then, almost 100 anesthetists have been trained. In accordance to advances in Cardiovascular Anesthesia, in 2014, the program underwent a broad curricular restructuring in order to provide trainees greater contact with perioperative echocardiography and advanced perioperative monitoring management. In 2018, we became the first non-European Centre to be accredited by EACTA to host the fellowship programme (EACTA/CTVA – São Paulo/ Brazil).

APPLICATION PROCESS

Annually, the application process usually starts on October and ends on December. The candidates should email a cover letter to the program director stating her/his interest in the position, together with the following documents:

- 1) Letter of motivation
- 2) The Candidate should have a Medical Degree from a recognized University – Certified translated Portuguese, Spanish or English copy required
- 3) National Board Certification in Anaesthesiology
- 4) Current *Curriculum Vitae* (CV) - Translated Portuguese, Spanish or English copy required
- 5) Proof of Proficiency in Portuguese - CELPE BRÁS (Intermediate Superior Level is required)
- 6) EACTA member in good standing

The selection process is carried out through a public examination with curricular analysis and interview (SKYPE interview is possible), usually on the second Monday of December.

Currently, we have 2 positions offered to EACTA members who intend to be part of the fellowship programme.

We offer other 8 positions to participate in the same fellowship programme. (06 for Basic and 02 for Advanced). Despite they are not EACTA fellows, they have to be EACTA members to participate in our programme.

For further information please contact:

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Appendix

I. Summary of surgeries and interventions at Dante Pazzanese Institute of Cardiology – São Paulo per year

Total

	2018	2019
All cases	3549*	3577*

*only procedures requiring cardiovascular and thoracic anaesthesia services in the operating room theaters

Type of Surgery

	2018	2019
Isolated Coronary Artery Bypass Grafting (CABG)	524	483
- On-pump CABG	474	443
- Off-pump CABG	50	40
Isolated Valvular	339	358
Combined Surgery (CABG + Valvular)	78	75
Surgery for congenital heart disease (including adults)	273	340
Surgery for correction of aortic aneurysm / dissection	90	78
TVAR, EVAR, Congenital Hybrid procedures	526	398
Cardiac transplantation, implantation of ventricular assist devices and ECMO	20	28
Vascular Surgery	371	357
Thoracic Surgery	38	48
Other cardiac surgeries and procedures: Septal myomectomy, Pericardiectomy, Pericardial effusion drainage, sternum restatement, withdrawal of steel wires, pacemakers, CDI implantation, Ablation, Endomyocardial biopsy	1193	1214
Other non-cardiac surgery procedures in Cardiac Patients	468	555

III. Summary of cardiovascular surgeries and interventions at Hospital do Coração (HCOR) and Thoracic Surgeries and Procedures at Hospital do Servidor Público Estadual (HSPE)

Type of Surgery

HCOR	2019
TVAR, EVAR, Congenital Hybrid Procedures	336
Cardiac Surgery Adults: CABG, Valvular. Combined (CABG + Valvular), Aortic Aneurisms, Cardiac Transplants, VADs	622
Congenital Heart Surgeries - Pediatrics	200
Vascular Surgeries	360
Pacemakers, CDI implantation, Ablation	832
Total	2350
HSPE	
Major Thoracic Surgery	410
Minor Thoracic Procedures	250
Total	660

I. Cardiac Anaesthesia Exposure

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

Training includes education in pre-operative assessment and anaesthesia management in ORs and catheter suites, in all aspects of cardiopulmonary bypass (conventional and minimally-invasive), of mechanical circulatory support 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. The fellow will perform and document his TEE exams with progressive independence and review each with a senior echocardiography. Moreover, a complement learning and training in Cardiac Surgery for the Basic and for the Advanced Programme (only complex cases) will be made at HCOR.

II. Vascular Anaesthesia Exposure

Fellows will obtain consultant level proficiency in anesthetic management of adults undergoing major vascular surgery. Fellows will be exposed to at least 25 cases of vascular procedures and this include all typical vascular surgeries such as carotid endarterectomy in local or general anaesthesia, open repair of the abdominal aorta including ruptured aneurysms, endovascular repair of the abdominal and thoracic aorta (contained rupture, aneurysms, and dissection), open surgical repair of thoracoabdominal aortic aneurysms utilizing left heart bypass or other means of distal perfusion. TEVAR training includes insertion and use of lumbar CSF drainage, rapid RV pacing and TEE. Moreover, a complement learning and training in Vascular Anesthesia for the Basic Programme will be made at HCOR.

III. Thoracic Anaesthesia Exposure

Clinical work and training of fellows includes anesthetic management of adults undergoing exposure to at least 30 cases of thoracic procedures per fellow. This includes video-assisted thoracoscopic surgery (VATS), open thoracotomies and tracheal 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. Moreover, a complement learning and training in Thoracic Anesthesia for the Basic Programme will be made at HSPE.

IV. Intensive Care Medicine

The Division of Intensive Care Medicine of IDPC operates an interdisciplinary adult ICU with 91 beds, 50 of which are reserved for post-surgical and post-transplant recovery. The ICU manages all cardiac surgical and interventional cardiology patients. 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.

Sponsoring Institution

The Clinica de Anestesia São Paulo (CASP), which provides anaesthetic services at Dante Pazzanese Institute of Cardiology will be responsible for the remuneration of the fellow in training (Grant). This payment is based on all services done during the on-call duties under supervision during the year. In the first year, the amount paid will be R\$ 10.000,00 monthly. During the second year of the fellowship the candidate will be paid R\$ 12.000,00 monthly.