

Application for Hosting EACTA Cardiothoracic and Vascular Anaesthesia Fellowship Programme

1. Fellowship Information

2. Institution Name
 Harfield Hospital, Royal Brompton and Harfield Hospitals Care Group, Guy's & St Thomas' NHS Foundation Trust.
 Address: Hill End Road, Harfield, UB9 6JH, UK
 Website: www.rbht.nhs.uk
 Country: United Kingdom City: Uxbridge

3. Chair Name
 First name: JERRY Last name: Mitchell
 Email: j.mitchell@rbht.nhs.uk Phone: 4478796886085

4. Programme Directors
 First name: Nandor Last name: Marcin
 First name: Katarina Last name: Lenartova
 Board Certification(s): Anaesthesia and Intensive Care (Hungary)
 Board Certification(s): Critical Care
 Title/Affiliation: Consultant in cardiothoracic anaesthesia (Clinical Senior Lecturer)
 Title/Affiliation: Consultant in anaesthesia and critical care medicine
 Number of original publications: See Appendix
 EACTA membership: Yes Certificate attached: KLN/M 2375
 ESA membership: Yes If yes, membership's number: NM
 Societies membership: Yes If yes, membership's number: NM
 Email: n.marcin@rbht.nhs.uk, n.marcin@imperial.ac.uk Phone: 447940473935
 Email: k.lenartova@rbht.nhs.uk Phone: 447445525303
 Mailing Address: Harfield Hospital
 Street: Hill End Road
 Country: United Kingdom Region: Uxbridge
 Zip code: UB96JH

Will the Programme director devote sufficient time to provide substantial leadership to the programme and supervision for the fellow?
 Yes
 No

Will the Programme director review the fellow's clinical experience logs at least quarterly and verify completeness and accuracy?
 Yes
 No

Does the national/international regulatory authority(ies) recognize the institutional CTVA Fellowship Programme?
 Yes
 No, 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
 No

Language requirements: level Comments: DET level B1/B1S7.5
 Specific requirements towards the attending fellow: Completed training program in the core specialty - anaesthesia and critical care medicine in the home country. Eligible for GMC registration including English test (IELTS), working visa if applicable. Interested in cardiothoracic anaesthesia, passionate, enthusiastic. Good interpersonal and communications skills. Willing to participate in additional clinical or research training in the specialty or subspecialty; teaching activities. For advanced fellowship we require one year cardiothoracic experience.

6. General Programme Information

Aims, goals and objectives of the Fellowship Programme

Introduction: Harfield Hospital has been a unique specialist cardiothoracic centre uniting with the Royal Brompton sister hospital to represent a world leading centre of excellence in London. In 2021 we became part of Guy's and St Thomas' NHS Foundation Trust in order to create a brand-new centre of excellence, which will be the global leader in the research into and treatment of heart and lung disease.

The Royal Brompton and Harfield Clinical Group provides first-rate clinical services and exceptional research output. Several of our clinical services have been formally designated as national services by the Department of Health: Heart and Lung transplantation, Ventricular Assist Devices (LVAD), Pulmonary Hypertension and Primary Ciliary Dyskinesia. We have an outstanding research and development pedigree, with over 500 active research projects across 10 R&D programmes. Every one of these programmes has been consistently given the top rating by the NHS R&D Directorate. The table below illustrates the inter-relationship between our R&D activity and clinical services. Our closest academic partners are the Departments of Surgery and Cancer and the National Heart and Lung Institute in the Faculty of Medicine Imperial College London, and the Harfield Heart Science Centre. Through our clinical research studies we also have active collaborations with hospital and universities across the UK and Europe. The EACTA programme director holds primary appointment at Imperial College and serves in major subcommittee and leadership committees at EACTA, ESAAC and ISHLT providing direct links to these programs and clinical academic networks.

We provide care for people with heart and lung disease encompassing the entire spectrum of routine care to the most specialised and advanced and experimental medical and surgical treatments. It is one of the largest and most experienced centres in the world for heart and lung transplants and mechanical support. In 1983, a team of doctors led by the eminent Prof Sir Magdi Yacoub performed Britain's first heart-lung transplant. More recently, we have improved work in the development of 'artificial hearts' (also known as left ventricular assist devices or LVADs). At our dedicated Heart Attack Centre, we deal with heart attack emergencies from outer north-west London. Our arrival to treatment time of 23 minutes is the fastest in the country and amongst the fastest in Europe. The hospital is a major centre for the treatment of lung cancer, chest cancer and other chest surgery. We have more than 900 staff, five operating theatres and four catheter laboratories. The hospital has 149 beds including 44 dedicated to cardiac and thoracic surgery, 30 in the transplant unit, 42 for cardiology and 31 for adult intensive care.

Goals: Successful candidates will become proficient at providing routine cardiothoracic anaesthesia as per EACTA curriculum, first 12 months will focus on training in cardiothoracic anaesthesia, including minimally invasive procedures and critical care. The second year will be devoted to advance cardiothoracic training encompassing the entire spectrum of cardiothoracic surgery and intensive care as a senior fellowship level incorporating anaesthesia for heart and lung transplantation, and management of mechanical circulatory support. Transoesophageal echocardiography training will be provided throughout the whole duration of the fellowship, with strong recommendation for passing EACV/EACTA TOE Certification exam as a desirable criteria for the exit fellowship interview and it is the only TOE exam recognised under EACTA fellowship. Candidate will have access to the regular teaching session in department and will be expected to provide teaching as well. Research will be integral part of the fellowship and candidate will have a great opportunity to get involved in research project running at our centre.

Objectives: Our proposed EACTA Fellowship program aims to host two fellows positions every year including one fellow in the basic training year and one in the advanced training year. Anaesthesia. We perform around 1000 cardiac surgery cases per year: on and off pump coronary artery bypass, minimally invasive aortic and mitral valve procedures. While the proposed fellowship is focusing on cardiac and thoracic anaesthesia accreditation and not a formal vascular fellowship, Harfield offers major vascular experience with major aortic surgery, including minimally invasive approaches and a busy aortic dissection service. Specifically, Harfield is one of 3 specialised centres providing emergency admissions for West London. In addition, Harfield was the single designated centre in West London to provide the service. Finally, as part of a busy ECMO and mechanical assist service there is frequent vascular operations for reconstructions and repairs. As part of the interventional cardiology service Harfield Hospital offers all electrophysiology procedure and invasive electrophysiology and pacing therapy, TAVI program with more than 300 cases per year and Mitral Clip procedure. There is an advanced program for mechanical support devices, including left and right ventricular assist device, VA-ECMO and Impella. As part of the interventional cardiology service Harfield Hospital offers all electrophysiology procedure and invasive electrophysiology and pacing therapy, TAVI program with more than 300 cases per year and Mitral Clip procedure. The hospital is a major centre for the treatment of lung cancer, chest cancer and other chest surgery among the most advanced procedure there are 30 VATS for lung resection and CT-guided radiofrequency ablation of lung lesion. Harfield Hospital is currently one of the UK leading centre for cardiothoracic transplantation with more than 60 double-lung and more than 20 heart transplants per year. There is the opportunity to develop perioperative skills, attending anaesthetic preoperative clinic and different MDT with specific focus on mitral valve, aortic valve and transplantation. Intensive care: 24 bedded departmental referral cardiothoracic intensive care unit, with an additional seven recovery beds. The unit is staffed with 12 consultants, 33 junior doctors (registrars and CMT grade posts from both anaesthesia and intensive care). There are 3-7 registrars/fellows scheduled at operating room/cath lab area each day during the week. The current operating room allocation indicates that nearly every day there is at least one theatre activity that is covered by consultant only, providing opportunities for the basic training fellow to be allocated to these lists. As the advanced fellow replaces one of our current clinical fellows rather than increasing the numbers of fellows, this rotation fits into current departmental schedules and fully protected.

Staff care for a variety of cardiology, heart and lung transplantation and cardiothoracic surgical patients. Patients are admitted to the unit from theatre, the primary angioplasty service and from other hospitals.

The unit a world-renowned center-of-excellence in the implantation and management of patients on:
 -Extra corporeal membrane oxygenation (VA-ECMO)
 -Other short-term Mechanical Circulatory Support Devices (ABP, Impella)
 -Durable Ventricular Assist Devices (VAD)
 -Complex respiratory support (ECOR2, VV-ECMO)
 -Total Artificial Heart (TAH)

The unit is well equipped with state-of-the-art advanced haemodynamic monitoring equipment (Pulmonary artery catheter, PiCCO etc) and is a recognized hosting center for the haemodynamic monitoring fellowship of the European Society of Intensive Care Medicine (ESICM). It also has internationally renowned expertise in the practice, research and education in Echocardiography and Point of Care ultrasound and our trainees are supported with opportunities for training and accreditation on Trans-thoracic and Trans-oesophageal Echocardiography and Lung Ultrasound for all levels of accreditation of various national and international associations (Focused and Comprehensive accreditation of the Intensive Care Society, European Society of Intensive Care Medicine, European Association of Cardiovascular Imaging, British Society of Haemodynamics and the American Board of Echocardiography).

TOE/TTE training

The successful candidate will have an opportunity to learn and advance her/his transoesophageal as well as transthoracic echo skills both practical and theoretical under the direct supervision of accredited and experienced senior colleagues.

There is a HeartWorks dual echo simulator accessible on site at the hospital, along with weekly echo teaching sessions held in the anaesthetic department as well as cross-specialty input from cardiology colleagues. The syllabus is built with the aim of successful passing of EACV/EACTA TOE accreditation exam for the European diploma. The vast majority of open-heart surgery (800-1000/year that is excluding transplant and MCS surgeries) will utilize perioperative transoesophageal echocardiogram examination in theatre, as well as the majority of ablation procedures and complex heart failure patients in the cathlab and emergency situations in the intensive care unit. This ensures the candidate has the best opportunity of collecting and finalising an echo logbook for certification during their stay. All machines used within the department (theatre, ICU, HDU) are Philips machines, ranging from high end Epic 7, EPIC CVA, Philips i33, etc. There is also the opportunity to learn and improve focused echo examination as well as learning in the echolab from experienced echocardiographers as per individual needs.

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: August End: May

Number of Positions Per Year: 1 Basic, 2 advanced Type of fellowship training available: Clinical / Clinical Research

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

Comments: The fellow will work under direct supervision, 1:1 of highly skilled and qualified consultant at our department for the first three months. Depending on the progression in his/her clinical abilities and communication skills, the fellow can gain permission to work under indirect supervision with the opportunity to guide local trainees during their cardiothoracic anaesthetic rotation. Involvement in our will be discussed at the beginning of the fellowship, with transplantation service at our centre, it is highly advisable to get involved in on-call duties, to gain full experience.

Offered Advanced Training: Yes

7. Faculty: CVT 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
Dr. Christopher Walker (CW)	Yes	Cardiothoracic	Critical care medicine	c.walker@rbht.nhs.uk	Hill End Road, Harfield, UB96JH, UK
Dr. Marco Scaranzuzi (MS)	Yes	Cardiothoracic	TOE accreditation	m.scaranzuzi@rbht.nhs.uk	Hill End Road, Harfield, UB96JH, UK
Dr. Saria Morozova (SM)	Yes	Cardiothoracic	TOE accreditation	s.morozova@rbht.nhs.uk	Hill End Road, Harfield, UB96JH, UK
Dr. Husein Soliman (HS)	Yes	Critical care medicine	TOE accreditation	h.soliman@rbht.nhs.uk	Hill End Road, Harfield, UB96JH, UK
Dr. Ana Hurtado (AH)	Yes	Critical care medicine	TOE accreditation	a.hurtado@rbht.nhs.uk	Hill End Road, Harfield, UB96JH, UK
	Yes / No				
	Yes / No				
	Yes / No				
	Yes / No				
	Yes / No				
	Yes / No				
	Yes / No				
	Yes / No				

Publications: lists of the faculty's members in PubMed
 see appendix

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

Resources	Yes/No	Days per week open	Number
Total cardiothoracic and vascular ward beds	Yes	7	44
Number of ICU beds dedicated to CTVA patients	Yes	7	29 level 3, 14 level 2
Is there an emergency department in which cardiothoracic patients are managed 24 hours a day?	Yes	7	
Are adequately equipped and equipped post-anaesthesia care unit for cardiothoracic patients located near the operating room suite?	Yes	7	7
Is there monitoring and advanced life support equipment representative of current levels of technology?	Yes	7	

Hybrid Operating Rooms	No	Days/week	
Cardiac Operating Rooms	Yes	7	3
Thoracic Operating Rooms	Yes	7	2
Vascular Operating Rooms	Yes	7	only emergency procedures
Catheterisation Labs	Yes	7	5
Electrophysiology Labs	Yes	7	2
Pulmonology Labs	Yes	5	1
Interventional Vascular Suite	No	Days/week	
Separate CIVICU Facility	No	Days/week	
Animal Laboratory for research purposes	No	Days/week	
Outpatient Clinic for postoperative evaluation of patients undergoing cardiothoracic and vascular procedures	Yes	5	1
24-hour acute pain service available for patients undergoing cardiac, thoracic and vascular procedures	Yes	7	1
Meeting Rooms	Yes	7	3
Classrooms with visual and other educational aids	Yes	7	2
Study areas for fellows	Yes	7	2
Office space for faculty members and fellows	Yes	7	1
Diagnostic facilities	Yes	7	
Therapeutic facilities	Yes	7	
24-hour laboratory services available in the hospital	Yes	7	
Cardiac ethics testing	Yes	5	
Cardiothoracic scoring procedures	Yes	7	
Pulmonary function testing	Yes	5	
Computers and IT support	Yes	7	
Appropriate on-call facilities for men and women	Yes	7	

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? YES

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.

Rotations in	Number of performed procedures/year	Number of performed procedures/advanced year fellowship
Cardiac Surgery using CPB	900-1000	
Cardiac Surgery without CPB	300	
Minimally Invasive Cardiac Procedures	60	
Interventional Cardiac Catheterization (e.g. TAVI, Mitraclip, ASD)	300	
Electrophysiology Lab (e.g. mapping, ablation, pacemakers, ICDs)	300	
Robotic Cardiac Surgery	0	
Heart, Lung, and Heart/Lung Transplants	30	
ECLS, ECMO, VAD Procedures	70	
Echocardiography Lab	LVAD 50 ECMO 10 Adults	
Thoracoscopic Surgery	300	
Pulmonary Resection	150	
Diaphragmatic Surgery	0	
Tracheo-Bronchial Surgery	40	
Interventional Pulmonology Procedures	500	
Major Vascular Procedures	40	
Neurological monitoring during major vascular surgery	Yes	
Interventional Vascular Procedures	Only as emergency cases	
Acute and Chronic Pain Management for CTV patients	Yes	
Basic Research	Yes	
Clinical Research	Yes	
Rotations in	Number of performed procedures/basic year fellowship	Number of performed procedures/advanced year fellowship
Cardiac anaesthesia	7 months (200 cases)	Optional 3-6 months in advanced cardiac surgery including minimally invasive valve surgery (150 cases), OPCAB and 3-6 months in transplantation, mechanical support
Thoracic anaesthesia	1.5 months (60 cases)	3 months (60 cases)
Anaesthesia for major supra-inguinal vascular procedures	0	0
Trans-oesophageal and trans-thoracic echocardiography	2 weeks + during cardiac anaesthesia rotation (125 cases)	essential part of cardiac anaesthesia rotation (60 cases)
Medical or surgical Critical Care Rotation	1 month (80 cases)	3 month (160 cases)
Inpatient or outpatient cardiology	2 weeks (50 cases)	There are 3-7 registrars/fellows scheduled at operating room/cath lab area each day during the week, EACTA fellow will be allocated to operating room or cath lab according rotation with direct consultant level (one trainee per operating theatre) cover during the advanced year of EACTA fellowship.
Inpatient or outpatient pulmonary medicine	2 weeks (50 cases) optional	The advanced fellow will have an opportunity to engage with clinical or translational research throughout the fellowship.
Extracorporeal perfusion technology (CPB, ECMO/Novo-Lung)	2 weeks (15 cases)	
Paediatric cardiothoracic anaesthesia	0	
Basic Research	YES	
Clinical Research	YES	

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

If no, explain Yes but - No vascular anaesthesia provided electively

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 anesthetizing locations simultaneously?

If yes, describe NO during the basic year YES during advanced year

Clinical Responsibility On call cover is provided as 12 hours shifts during the week and weekend. Number of hours is averaged over the period of 6 weeks, and compliance with EWT (European Working Time Directive) is reassured. Clinical area covered during on call depends on type of rotation. Anaesthesia on call covers operating room area, PACU with up to 7 postoperative patients - cardiac, thoracic (ventilated/non ventilated), outreach service (anaesthetic cover services required within the hospital, including acute pain services). Critical care on call duty covers 29 level 3 ICU beds, there are minimum 2 registrars and 2 SHOs on duty at any time. Senior consultant level on call cover is reassured 24 hours at each clinical area.

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

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

Maximum Time in Non-Clinical Activities

10. Financial Statement
An employment contract will be signed with the candidate Yes No
Accommodation options are provided Yes No There is accommodation on hospital site, subject to availability.
Transportation/travel options are provided

Monthly Salary Amount annually Currency
This opportunity is not funded by the centre Yes No Source of financial support for the candidate:
Others

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 conference? Check all that apply.	Yes / No
Anaesthesiology faculty members from this department	Yes
Anaesthesiology faculty members from other sites	Yes
Non-anesthesiologists from the primary clinical site	Yes
Non-anesthesiologists 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 (i.e., journal club)	Yes	No	No	No	No	Yes
Quality improvement (MAM, QA)	No	No	Yes	No	No	Yes
Board review (e.g., oral exams, keywords)	No	No	Yes	No	No	No
Grand rounds	No	No	Yes	No	No	No

Other (specify) Click here to enter text.

TOE teaching Weekly/ And Anaesthesia teaching Weekly

Formal Course Work Available in

Extra-Institutional Educational Conference Support:

In the Previous 5 Years, Fellows were 1st or 2nd Author On:

Abstracts Peer-Reviewed Journal Articles
Book Chapters Other Publications

Dedicated Research Time Yes No
In the Previous Year, Fellows present an oral or poster presentation in a national or international meeting Yes No
The Opportunity for Exchange with other training facilities No

Competency Area / Skills	Settings/ Activities	Assessment Method(s)
1. Basic Training		
1.1. 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	Clinical and formal teaching session	As per our competency based assessment booklet and EACTA curriculum
Score evaluation, e.g., physical status in accordance with American Society of Anesthesiologists (ASA). Level D	Clinical and formal teaching session	As per our competency based assessment booklet and EACTA curriculum
Airway evaluation. Level C	Clinical and formal teaching session	As per our competency based assessment booklet and EACTA curriculum
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	Clinical and formal teaching session	As per our competency based assessment booklet and EACTA curriculum

Selection and planning of the individual anesthesia technique. Level C	Clinical and formal teaching session	As per our competency based assessment booklet and EACTA curriculum
Postponement or cancellation of surgery decision making. Level C	Clinical and formal teaching session	As per our competency based assessment booklet and EACTA curriculum
Participation in multi-disciplinary (morbidity) conferences. Level C	Clinical and formal teaching session	As per our competency based assessment booklet and EACTA curriculum
Pre-operative fasting, pre-medication and adaptation of pre-operative drug therapy. Level C	Clinical and formal teaching session	As per our competency based assessment booklet and EACTA curriculum
I. II. Anesthesia management – cardiac surgery		
Workplace preparation following environmental safety measures and checklists. Level C	Clinical and formal teaching session	As per our competency based assessment booklet and EACTA curriculum
Use of technical and medical equipment, inclusive advanced hemodynamic monitoring, neuromonitoring, coagulation monitoring and basic peri-operative TEE. Level C	Clinical and formal teaching session	As per our competency based assessment booklet and EACTA curriculum
Provision of safe induction, maintenance, and emergence from anesthesia. Level C	Clinical and formal teaching session	As per our competency based assessment booklet and EACTA curriculum
Defibrillation, cardioversion. Level D	Clinical and formal teaching session	As per our competency based assessment booklet and EACTA curriculum
Transvenous pacemaker insertion and modes of action, use of a temporary pacemaker. Level C	Clinical and formal teaching session	As per our competency based assessment booklet and EACTA curriculum
Central and peripheral venous (ultrasound-guided) access and peripheral arterial catheterization, pulmonary artery catheterization, arterial blood gas collection, and gastric tube insertion. Level D	Clinical and formal teaching session	As per our competency based assessment booklet and EACTA curriculum
Blood salvage and transfusion. Level D	Clinical and formal teaching session	As per our competency based assessment booklet and EACTA curriculum
Organ systems and hemostasis homeostasis maintenance throughout cardiac surgery procedures. Level C	Clinical and formal teaching session	As per our competency based assessment booklet and EACTA curriculum
Interpretation of point-of-care coagulation monitoring such as rotational thrombelaetometry (ROTEM) and thrombelaetography (TEG). Level C	Clinical and formal teaching session	As per our competency based assessment booklet and EACTA curriculum
Management of patients on cardiopulmonary bypass. Level C	Clinical and formal teaching session	As per our competency based assessment booklet and EACTA curriculum
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, -diaphragm atrophy, -intra-operative blood gas and electrolyte disturbances, -intra-operative awareness, -adverse blood product transfusion reaction, -coagulopathy and excessive bleeding, -systemic inflammatory response syndrome (SIRS) / postoperative vasoplegic syndrome (PVS).	Clinical and formal teaching session	As per our competency based assessment booklet and EACTA curriculum
Management of patient transport to and from the intensive care unit (ICU). Level C	Clinical and formal teaching session	As per our competency based assessment booklet and EACTA curriculum
Consideration of ethical and medico-legal aspects. Level C	Clinical and formal teaching session	As per our competency based assessment booklet and EACTA curriculum
I. 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 bronchi. Level C	Clinical and formal teaching session	As per our competency based assessment booklet and EACTA curriculum
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	Clinical and formal teaching session	As per our competency based assessment booklet and EACTA curriculum
Management of most common peri-operative critical incidents and complications including: Level C -bronchospasm, -hypoxemia, hypercapnia, -pneumothorax, -pulmonary hypertension.	Clinical and formal teaching session	As per our competency based assessment booklet and EACTA curriculum
One-lung ventilation with a double-lumen tube. Level C	Clinical and formal teaching session	As per our competency based assessment booklet and EACTA curriculum
One-lung ventilation with other techniques (e.g., Arndt blocker, EZ blocker). Level B	Clinical and formal teaching session	As per our competency based assessment booklet and EACTA curriculum
Postoperative pain management, including epidural and paravertebral analgesia. Level C	Clinical and formal teaching session	As per our competency based assessment booklet and EACTA curriculum
Additional techniques in pain management (e.g., epidural analgesia, truncal blocks, multimodal analgesic techniques). Level B	Clinical and formal teaching session	As per our competency based assessment booklet and EACTA curriculum
I. IV. Anesthesia management – major vascular surgery		
Pre-operative assessment, risk stratification and medical management of vascular patients. Level D		
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		
Management of the most common perioperative critical incidents and complications including level C: -acute kidney injury, -neurological insults, -paraplegia, -renal-vascular dysfunction		
Management of elective and emergency open abdominal aortic aneurysm (AAA) and AAA repair. Level D		
Management of carotid endarterectomy, angioplasty, or stenting. Level D		
I.V. Post-operative care/Critical care		
Physical examinations and patient assessment (e.g., respiratory and peristaltic sounds, temperature gradient capillary refill). Level D	Clinical and formal teaching session	As per our competency based assessment booklet and EACTA curriculum
Applying sedation, general anesthesia, multimodal analgesia. Level D	Clinical and formal teaching session	As per our competency based assessment booklet and EACTA curriculum
Management of the airways, inclusive of emergency intubation. Level D	Clinical and formal teaching session	As per our competency based assessment booklet and EACTA curriculum
Central venous, peripheral venous, arterial catheters, and pleural drains insertion using aseptic techniques. Level D	Clinical and formal teaching session	As per our competency based assessment booklet and EACTA curriculum
Gastrointestinal tube insertion. Level D	Clinical and formal teaching session	As per our competency based assessment booklet and EACTA curriculum
Airway maneuvers inclusive of suction of endotracheal secretions, tracheotomy (percutaneous), bronchoalveolar lavage and sampling. Level D	Clinical and formal teaching session	As per our competency based assessment booklet and EACTA curriculum
Invasive ventilation including prone position ventilation and weaning strategies. Level D	Clinical and formal teaching session	As per our competency based assessment booklet and EACTA curriculum
Delivery of continuous positive pressure ventilation and non-invasive ventilation. Level D	Clinical and formal teaching session	As per our competency based assessment booklet and EACTA curriculum
Hemodynamic stabilization and management, inclusive of pacing, cardioversion, defibrillation, advanced and basic life support, vasoactive and inotropic therapy, advanced cardio-vascular monitoring. Level B	Clinical and formal teaching session	As per our competency based assessment booklet and EACTA curriculum
Volemia management and fluids administration. Level D	Clinical and formal teaching session	As per our competency based assessment booklet and EACTA curriculum
Management of blood product transfusion and coagulopathies correction. Level D	Clinical and formal teaching session	As per our competency based assessment booklet and EACTA curriculum
Renal replacement therapy and acute renal failure. Level B	Clinical and formal teaching session	As per our competency based assessment booklet and EACTA curriculum
Identification of relevant pre-existing co-morbidities. Level D	Clinical and formal teaching session	As per our competency based assessment booklet and EACTA curriculum
Responding to trends in physiological variables. Level D	Clinical and formal teaching session	As per our competency based assessment booklet and EACTA curriculum
Patient transportation inter- and intra-hospital. Level B	Clinical and formal teaching session	As per our competency based assessment booklet and EACTA curriculum
Arterial and central venous line cannulation (ultrasound-guided). Level D	Clinical and formal teaching session	As per our competency based assessment booklet and EACTA curriculum
Myocardial infarction, pulmonary embolism, tamponade, hypovolemia. Level D	Clinical and formal teaching session	As per our competency based assessment booklet and EACTA curriculum
Assessment of intravascular volume status. Level C	Clinical and formal teaching session	As per our competency based assessment booklet and EACTA curriculum
Recognition of substantial pericardial or pleural effusion. Level B	Clinical and formal teaching session	As per our competency based assessment booklet and EACTA curriculum
I. VI. Basic peri-operative echocardiography		
Basic levels of peri-operative TEE and lung and vessel ultrasonography as performed in the operating room. Level C	Clinical and formal teaching session	As per our competency based assessment booklet and EACTA curriculum
Performance of the recommended number of peri-operative echocardiography exam according to EACV/ EACTA certification guidelines. Level D	Clinical and formal teaching session	As per our competency based assessment booklet and EACTA curriculum
I. 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	Clinical and formal teaching session	As per our competency based assessment booklet and EACTA curriculum
Sedation for invasive procedures in cardiology. Level D	Clinical and formal teaching session	As per our competency based assessment booklet and EACTA curriculum
Sedation and anesthesia outside the operating theatre, also considering the local organization and the specific patients and procedures. Level D	Clinical and formal teaching session	As per our competency based assessment booklet and EACTA curriculum
I. VIII. Extracorporeal perfusion management		
Providing the theoretical background of extracorporeal circulation and associated subject areas, including: -Anticoagulation monitoring and management, -Cardiovascular measures (arrhythmias, hypothermia), -Acid-base management (alpha-stat vs. pH-stat), -Management of coagulopathy, e.g., vis-à-vis FFP failure	Clinical and formal teaching session	As per our competency based assessment booklet and EACTA curriculum

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	Clinical and formal teaching session	As per our competency based assessment booklet and EACTA curriculum
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	Clinical and formal teaching session	As per our competency based assessment booklet and EACTA curriculum
2. II. Anesthesia management – thoracic surgery (as described previously, as well as the following)		
Alternative ventilation techniques in thoracic surgery (e.g., jet ventilation). Level D	Clinical and formal teaching session	As per our competency based assessment booklet and EACTA curriculum
Principles of postoperative chronic pain management. Level D	Clinical and formal teaching session	As per our competency based assessment booklet and EACTA curriculum
2. III. Anesthesia management – major vascular surgery (as described previously, as well as the following)		
The use of rapid ventricular pacing (RVP) during deployment of the stent for TEVAR. Level B	no elective vascular procedures performed at our centre, so training in anaesthesia for major vascular surgery can not be provided	
Pain management for patients undergoing vascular procedures. Level B	no elective vascular procedures performed at our centre, so training in anaesthesia for major vascular surgery can not be provided	
Anesthesia for peripheral vascular procedures. Level C	no elective vascular procedures performed at our centre, so training in anaesthesia for major vascular surgery can not be provided	
Care of patients undergoing limb amputation. Level D	no elective vascular procedures performed at our centre, so training in anaesthesia for major vascular surgery can not be provided	
Pain management, with particular reference to critical limb ischemia. Level B	no elective vascular procedures performed at our centre, so training in anaesthesia for major vascular surgery can not be provided	
2. IV. Post-operative management/ Critical care (as described previously, as well as the following)		
Interpretation of invasive and non-invasive cardiovascular monitoring. Level D	Clinical and formal teaching session	As per our competency based assessment booklet and EACTA curriculum
Use of inotropes and vasodilators. Level D	Clinical and formal teaching session	As per our competency based assessment booklet and EACTA curriculum
Management of intra-aortic balloon counter pulsation and other mechanical circulatory support devices. Level C	Clinical and formal teaching session	As per our competency based assessment booklet and EACTA curriculum
Detection of problems occurring with extracorporeal circulation management. Level C	Clinical and formal teaching session	As per our competency based assessment booklet and EACTA curriculum
Anesthesia for procedures in intensive care, including emergency re-intubation, re-intubation, tracheostomy or cardioversion. Level D	Clinical and formal teaching session	As per our competency based assessment booklet and EACTA curriculum
Principles and management of chest drains. Level D	Clinical and formal teaching session	As per our competency based assessment booklet and EACTA curriculum
2. V. Advanced perioperative echocardiography (as described previously, as well as the following)		
2. VI. Heart and/or lung transplantation		
Central venous pressure invasive arterial monitoring, pulmonary artery catheter insertion and interpretation. Level D	Clinical and formal teaching session	As per our competency based assessment booklet and EACTA curriculum
TEE for monitoring of left and right ventricular function and diagnosis of primary graft dysfunction / failure. Level C	Clinical and formal teaching session	As per our competency based assessment booklet and EACTA curriculum
Insertion and management of thoracic epidurals. Level D	Clinical and formal teaching session	As per our competency based assessment booklet and EACTA curriculum
2. VII. Organizational module		
Communicating effectively with patients and their families. Level D	Clinical and formal teaching session	As per our competency based assessment booklet and EACTA curriculum
Communicating effectively with surgical colleagues. Level D	Clinical and formal teaching session	As per our competency based assessment booklet and EACTA curriculum
Communicating with the intubated patient. Level D	Clinical and formal teaching session	As per our competency based assessment booklet and EACTA curriculum
Recognizing the need for senior help. Level D	Clinical and formal teaching session	As per our competency based assessment booklet and EACTA curriculum
Maintaining accurate clinical records. Level D	Clinical and formal teaching session	As per our competency based assessment booklet and EACTA curriculum
Presentations at departmental meetings. Level D	Clinical and formal teaching session	As per our competency based assessment booklet and EACTA curriculum
Participation in multi-disciplinary clinical audits. Level C	Clinical and formal teaching session	As per our competency based assessment booklet and EACTA curriculum
Commitment to continued professional development. Level D	Clinical and formal teaching session	As per our competency based assessment booklet and EACTA curriculum
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	Clinical and formal teaching session	As per our competency based assessment booklet and EACTA curriculum
Ability to help complete an ethics application. Level C	Clinical and formal teaching session	As per our competency based assessment booklet and EACTA curriculum
Ability to discuss basic statistical approaches. Level C	Clinical and formal teaching session	As per our competency based assessment booklet and EACTA curriculum
Ability to consent, recruit, and follow up research participants according to regulatory frameworks. Level C	Clinical and formal teaching session	As per our competency based assessment booklet and EACTA curriculum
Ability to help analyze data. Level C	Clinical and formal teaching session	As per our competency based assessment booklet and EACTA curriculum
Ability to contribute to disseminating study results in abstracts, presentations and publications. Level C	Clinical and formal teaching session	As per our competency based assessment booklet and EACTA curriculum

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)
I. Basic Training		
I.1. 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.	Clinical and formal teaching session	As per our competency based assessment booklet and EACTA curriculum
Pre-operative invasive and non-invasive assessment of cardiac diseases and interpretation of results including electrocardiogram (ECG), chest X-ray, echocardiography, cardiac stress testing, coronary angiography, cardiac magnetic resonance imaging (CMR), and computer tomography (CT).	Clinical and formal teaching session	As per our competency based assessment booklet and EACTA curriculum
Pre-operative pulmonary evaluation and interpretation of the results, including arterial blood gas and acid-base analysis, pulmonary function tests, oximetry and thoracic imaging.	Clinical and formal teaching session	As per our competency based assessment booklet and EACTA curriculum
Patient information and informed consent including medico-legal aspects, appraisal of discernment and consent capacity.	Clinical and formal teaching session	As per our competency based assessment booklet and EACTA curriculum
Principles of risk and outcome assessment and relevant scoring systems (e.g., EuroSCORE).	Clinical and formal teaching session	As per our competency based assessment booklet and EACTA curriculum
I. II. Anesthesia management – cardiac surgery (Level A)		
Knowledge of anesthetic agents and their effects on cardiac function and in patients with cardiac diseases.	Clinical and formal teaching session	As per our competency based assessment booklet and EACTA curriculum
Principles of intraoperative pharmacology and relevant medication, including positive inotropes, chronotropes, vasoconstrictors, vasodilators, and anti-arrhythmic agents.	Clinical and formal teaching session	As per our competency based assessment booklet and EACTA curriculum
Principles of patient blood management, including specific diagnostic tools, application of relevant medication and blood products.	Clinical and formal teaching session	As per our competency based assessment booklet and EACTA curriculum
Principles of basic hemodynamic monitoring and relevant techniques, such as arterial pressure measurement, central venous pressure.	Clinical and formal teaching session	As per our competency based assessment booklet and EACTA curriculum
Principles of relevant neuro-monitoring techniques (e.g., processed electroencephalography (EEG), near-infrared sonography (NIRS), somato-sensory evoked potentials (SSEP), motor evoked potentials (MEP)).	Clinical and formal teaching session	As per our competency based assessment booklet and EACTA curriculum
Principles of conventional cardiopulmonary bypass techniques. Principles of myocardial preservation. Effects of cardiopulmonary bypass on human physiology, organ function, and pharmacology.	Clinical and formal teaching session	As per our competency based assessment booklet and EACTA curriculum
Basic principles of common procedures in cardiac surgery, such as coronary artery bypass grafting (CABG).	Clinical and formal teaching session	As per our competency based assessment booklet and EACTA curriculum
I. 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.	Clinical and formal teaching session	As per our competency based assessment booklet and EACTA curriculum
Knowledge of the bronchial anatomy.	Clinical and formal teaching session	As per our competency based assessment booklet and EACTA curriculum
Knowledge about relevant anesthetic agents and their effects in patients with lung diseases.	Clinical and formal teaching session	As per our competency based assessment booklet and EACTA curriculum
Principles of intraoperative pharmacology and relevant medication, including bronchodilators and steroids.	Clinical and formal teaching session	As per our competency based assessment booklet and EACTA curriculum
Basic principles of common procedures in thoracic surgery (mediastinoscopy, video-assisted thoracoscopic surgery (VATS), open lung resection, pneumonectomy).	Clinical and formal teaching session	As per our competency based assessment booklet and EACTA curriculum
Basic principles of endoscopic pulmonary procedures, such as bronchial stenting and endoscopic lung volume reduction (ELVR).	Clinical and formal teaching session	As per our competency based assessment booklet and EACTA curriculum
I. IV. Anesthesia 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.	Clinical and formal teaching session	As per our competency based assessment booklet and EACTA curriculum
Basic principles of the peri-operative management of lumbar drainage for aortic interventional procedures.	Clinical and formal teaching session	As per our competency based assessment booklet and EACTA curriculum
Basic principles of spinal cord protection during surgical and interventional aortic procedures.	Clinical and formal teaching session	As per our competency based assessment booklet and EACTA curriculum
Basic principles of neuro-monitoring.	Clinical and formal teaching session	As per our competency based assessment booklet and EACTA curriculum
I. 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)).	Clinical and formal teaching session	As per our competency based assessment booklet and EACTA curriculum
Etiology, pathophysiology, diagnosis and treatment plans / bundles according to international standards for specific critical conditions in cardiothoracic and vascular surgery patients.	Clinical and formal teaching session	As per our competency based assessment booklet and EACTA curriculum
Circulatory failure (heart failure, shock, cardiorespiratory arrest), cardiac arrhythmias, ischemic heart disease, pulmonary embolism, bleeding complications, vasoplegia).	Clinical and formal teaching session	As per our competency based assessment booklet and EACTA curriculum
Anaphylaxis.	Clinical and formal teaching session	As per our competency based assessment booklet and EACTA curriculum
Respiratory failure, including adult respiratory distress syndrome (ARDS), pulmonary edema, pneumothorax, pneumonia.	Clinical and formal teaching session	As per our competency based assessment booklet and EACTA curriculum

Acute kidney injury and failure.	Clinical and formal teaching session	As per our competency based assessment booklet and EACTA curriculum
Gastrointestinal failure, peritonitis, pancreatitis, liver failure, non-occlusive mesenteric ischemia (NOMI)	Clinical and formal teaching session	As per our competency based assessment booklet and EACTA curriculum
Neurological failure (bellrium and coma, cerebral ischemia and bleeding).	Clinical and formal teaching session	As per our competency based assessment booklet and EACTA curriculum
Airway and chest injuries.	Clinical and formal teaching session	As per our competency based assessment booklet and EACTA curriculum
Aortic injuries.	Clinical and formal teaching session	As per our competency based assessment booklet and EACTA curriculum
Infectious diseases (systemic inflammatory response syndrome (SIRS) and sepsis, including sepsis bundle strategy)	Clinical and formal teaching session	As per our competency based assessment booklet and EACTA curriculum
Coagulation disorders (disseminated intravascular coagulopathy (DIC), heparin resistance, heparin-induced thrombocytopenia, severe bleeding, transfusion reaction).	Clinical and formal teaching session	As per our competency based assessment booklet and EACTA curriculum
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).	Clinical and formal teaching session	As per our competency based assessment booklet and EACTA curriculum
Indication, contraindication, drug selection, complications: sedation, anesthesia, analgesia, neuromuscular relaxation, nutrition.	Clinical and formal teaching session	As per our competency based assessment booklet and EACTA curriculum
Multimodal and pre-emptive analgesia concepts.	Clinical and formal teaching session	As per our competency based assessment booklet and EACTA curriculum
Weaning and extubation criteria.	Clinical and formal teaching session	As per our competency based assessment booklet and EACTA curriculum
Transfer and discharge criteria.	Clinical and formal teaching session	As per our competency based assessment booklet and EACTA curriculum
Indications for and application of extracorporeal circulation in intensive care patients for cardiac and / or respiratory support (e.g., ECMO)	Clinical and formal teaching session	As per our competency based assessment booklet and EACTA curriculum
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.	Clinical and formal teaching session	As per our competency based assessment booklet and EACTA curriculum
1. VII. Anesthesia 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.	Clinical and formal teaching session	As per our competency based assessment booklet and EACTA curriculum
Procedural isolation guidelines from the European Board of Anaesthesiology (EBA) / European Society of Anaesthesiology (ESA)	Clinical and formal teaching session	As per our competency based assessment booklet and EACTA curriculum
Monitoring and capnography use according to the safety recommendations from ESA.	Clinical and formal teaching session	As per our competency based assessment booklet and EACTA curriculum
1. VIII. Extracorporeal perfusion management (level A)		
Basic principles of extracorporeal perfusion.	Clinical and formal teaching session	As per our competency based assessment booklet and EACTA curriculum
Types of extracorporeal circuits, e.g., cardiopulmonary bypass (CPB), extracorporeal membrane oxygenation (ECMO).	Clinical and formal teaching session	As per our competency based assessment booklet and EACTA curriculum
Types, composition and mechanisms of cardioplegic solutions.	Clinical and formal teaching session	As per our competency based assessment booklet and EACTA curriculum
Cardioprotective measures.	Clinical and formal teaching session	As per our competency based assessment booklet and EACTA curriculum
Safety recommendations for extracorporeal circulation from the European Board of Cardiovascular Perfusion (EBCP).	Clinical and formal teaching session	As per our competency based assessment booklet and EACTA curriculum
2. Advanced training		
2. I. Anesthesia 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.	Clinical and formal teaching session	As per our competency based assessment booklet and EACTA curriculum
Principles of modified cardiopulmonary bypass (minimized CPB, left heart CPB) and the off-pump revascularization technique.	Clinical and formal teaching session	As per our competency based assessment booklet and EACTA curriculum
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.	Clinical and formal teaching session	As per our competency based assessment booklet and EACTA curriculum
Principles and state of the art of mechanical support including intra-aortic balloon pumps, and extracorporeal membrane oxygenation.	Clinical and formal teaching session	As per our competency based assessment booklet and EACTA curriculum
Current state of temporary and long-term mechanical circulatory support (ventricular assist devices, total artificial hearts).	Clinical and formal teaching session	As per our competency based assessment booklet and EACTA curriculum
Principles of use of inhaled pulmonary vasodilators (nitric oxide (NO), prostaglandin).	Clinical and formal teaching session	As per our competency based assessment booklet and EACTA curriculum
Principles of fast-track surgery.	Clinical and formal teaching session	As per our competency based assessment booklet and EACTA curriculum
2. II. Anesthesia 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).	Clinical and formal teaching session	As per our competency based assessment booklet and EACTA curriculum
Principles of diagnostic and interventional bronchoscopic surgery (lung volume reduction, bronchopulmonary lavage, endoscopic, rigid fiber optic and laser resection; bronchial stenting and sealing).	Clinical and formal teaching session	As per our competency based assessment booklet and EACTA curriculum
Principles of peri-operative management of esophageal surgery for varices, neoplastic, colon interposition, foreign body, stricture, and tracheoesophageal fistula.	Clinical and formal teaching session	As per our competency based assessment booklet and EACTA curriculum
2. III. Anesthesia management – major vascular surgery (level A)		
Knowledge of perioperative management of TEVAR and EVAR.	Clinical and formal teaching session	As per our competency based assessment booklet and EACTA curriculum
Knowledge of the principles of perioperative management of lumbar drainage for aortic interventional procedures.	Clinical and formal teaching session	As per our competency based assessment booklet and EACTA curriculum
Excellent knowledge of the principles of spinal cord protection during surgical and interventional aortic procedures.	Clinical and formal teaching session	As per our competency based assessment booklet and EACTA curriculum
Excellent knowledge of the principles of cerebral function monitoring.	Clinical and formal teaching session	As per our competency based assessment booklet and EACTA curriculum
2. IV. Post-operative management/ Critical care (level A)		
Knowledge of cardiac and thoracic physiology.	Clinical and formal teaching session	As per our competency based assessment booklet and EACTA curriculum
Postoperative cardiac critical care, including analgesia, sedation and ventilation.	Clinical and formal teaching session	As per our competency based assessment booklet and EACTA curriculum
Postoperative care and analgesia after thoracic surgery.	Clinical and formal teaching session	As per our competency based assessment booklet and EACTA curriculum
An understanding of the management of cardiac pacing modes.	Clinical and formal teaching session	As per our competency based assessment booklet and EACTA curriculum
An understanding of extracorporeal membrane oxygenation and other devices used for mechanical circulatory support.	Clinical and formal teaching session	As per our competency based assessment booklet and EACTA curriculum
2. V. Advanced perioperative echocardiography (level A)		
Advanced level of knowledge in peri-operative cardiac echocardiography according to the EACVI EACTA process of certification guidelines.	Clinical and formal teaching session	As per our competency based assessment booklet and EACTA curriculum
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.	Clinical and formal teaching session	As per our competency based assessment booklet and EACTA curriculum
Understanding of the principles of heart transplantation and clinical management of affected patients.	Clinical and formal teaching session	As per our competency based assessment booklet and EACTA curriculum
Knowledge of current limitations of organ transplantation and efforts to increase the suitable donor pool.	Clinical and formal teaching session	As per our competency based assessment booklet and EACTA curriculum
Understanding of the multidisciplinary nature of patient evaluation and listing for transplantation.	Clinical and formal teaching session	As per our competency based assessment booklet and EACTA curriculum
Knowledge of the principles of donor optimization, management and allograft retrieval.	Clinical and formal teaching session	As per our competency based assessment booklet and EACTA curriculum
Knowledge of the principles of ex vivo heart and lung perfusion.	Clinical and formal teaching session	As per our competency based assessment booklet and EACTA curriculum
Understanding of the physiology of the denervated organ.	Clinical and formal teaching session	As per our competency based assessment booklet and EACTA curriculum
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.	Clinical and formal teaching session	As per our competency based assessment booklet and EACTA curriculum
Understanding of primary graft dysfunction and indications for mechanical circulatory support.	Clinical and formal teaching session	As per our competency based assessment booklet and EACTA curriculum
Understanding of the surgical options for lung transplantation, including minimally invasive lung transplantation and various intraoperative extracorporeal support mechanisms.	Clinical and formal teaching session	As per our competency based assessment booklet and EACTA curriculum
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.	Clinical and formal teaching session	As per our competency based assessment booklet and EACTA curriculum
Knowledge of the principles of primary lung dysfunction and conservative and extracorporeal treatment options, including indications for and techniques of ECMO.	Clinical and formal teaching session	As per our competency based assessment booklet and EACTA curriculum

Understanding of immunosuppressive regimens and the role of postoperative infections and sepsis.	Clinical and formal teaching session	As per our competency based assessment booklet and EACTA curriculum
2. IX. Research module (level A)		
Principles of clinical trials, including design, end points, inclusion / exclusion criteria, reporting requirements.	Clinical and formal teaching session	As per our competency based assessment booklet and EACTA curriculum
Understanding of Good Clinical Practice (GCP) requirements for clinical research involving patients.	Clinical and formal teaching session	As per our competency based assessment booklet and EACTA curriculum
Understanding of European and specific national ethics frameworks, including research ethics applications, clinical regulatory frameworks and hospital site-specific assessment.	Clinical and formal teaching session	As per our competency based assessment booklet and EACTA curriculum
Principles of sample size and study power determinations and basic statistical evaluation	Clinical and formal teaching session	As per our competency based assessment booklet and EACTA curriculum
Principles of patient and data confidentiality agreements.	Clinical and formal teaching session	As per our competency based assessment booklet and EACTA curriculum
Understanding tools for data collection, analysis and reporting.	Clinical and formal teaching session	As per our competency based assessment booklet and EACTA curriculum
Principal international basic science priorities in the field of cardiac anaesthesia.	Clinical and formal teaching session	As per our competency based assessment booklet and EACTA curriculum
Ethics and practicalities of biological sample collection, storage and biobanking	Clinical and formal teaching session	As per our competency based assessment booklet and EACTA curriculum
Principles and ethics of scientific publishing.	Clinical and formal teaching session	As per our competency based assessment booklet and EACTA curriculum

12. Assessment

The Programme Director will evaluate each fellow every 3 months

Yes

Assessment tools

360-degree evaluations

Yes

Clinical skills evaluations

Yes

Personal reports from the faculty

Yes

Self-assessment by Fellow

Yes

Learning goals for the next three months

Yes

Feedback from Fellows

Yes

A logbook will be available

Yes

Reports of Evaluation will be available

Yes

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

Yes

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.

Yes

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

Yes

External evaluation / assessment will be held as per EACTA regulations

Yes

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

Yes

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

Yes

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.

Yes

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

Yes

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

Yes

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

Yes

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).

The fellow will have allocated appraiser and will get appraised every year which will give him/her opportunity to reflect all aspects mentioned above

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.

Audit will be substantial part of the fellowship not only as QIP but also as GMC requirements for annual appraisal. The fellows will have full access to our sophisticated patient electronic records and the hospitals unique data mining tools including the Clinical Data Warehouse. Current audit projects include analysis of vasoplegia in Lung transplantation, practice of mechanical ventilation, practice and outcomes of inhaled pulmonary vasodilators, audit on DCD transplantation

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

Debriefing is part of each theatre session. Formal and Informal assessment will be provided regularly by all faculty members and formal assessment will be also done by director of the program every 6 months. Appraisal is performed annually.

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:

There are regular teaching sessions nearly every day: anaesthetic teaching, critical care teaching, journal club, TOE theoretical sessions. The fellow will be asked to choose relevant topic and participate in teaching program.

5. Briefly describe how fellows will participate in the education of patients, families, students, fellows, and other health professionals.

There are regular teaching sessions nearly every day: anaesthetic teaching, critical care teaching, journal club, TOE theoretical sessions. The fellow will be asked to choose relevant topic and participate in teaching program. There are various courses running at our institution and fellow can become a faculty member in some (Vascular access course, ECMO training day, TOE simulation etc.)

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.

Preoperative anaesthetic review of the patient on the ward, or in preadmission clinic, where effective communication with nursing staff, patients and their relatives and other surgical specialities will be observed and feedback will be provided.

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.

In daily practice whether during the theatre sessions or critical care rotation, effective work, team playing and leadership skills will be demonstrated.

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.

With more experience, fellow will be allowed to work under distant supervision, with adequate support reassured.

4. Briefly describe how fellows will be provided with opportunities to maintain comprehensive, timely, and legible medical records, if applicable

Electronical records in the theatre suite and critical care with individual login will be provided.

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.

Electronical records in the theatre suite and critical care with individual login will be provided, all relevant training for prescribing Pre-operative medicine, keeping anaesthetic record, as well as medical notes in critical care will be provided at the begging of the fellowship and ongoing support will be available.

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.

Preoperative assessment of the patients on the ward, preadmission clinic. Family meetings during critical care rotation.

15. Professionalism

Briefly describe the learning activity(ies), other than lectures, 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

All clinical fellows have to be 100% compliant in all mandatory training. This training encompasses all of the above. These skills will also be learnt as part of the daily clinical care of patients going to theatre or being cared for in the ITU. In addition, successful appraisal and 360 multisource feedback will demonstrate these skills.

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

Cardiac anaesthesia and ITU requires all of these skills. Time in theatre and ITU is used as a platform for fellows to learn and develop these skills whilst under the direct supervision of a consultant.

2. Describe an activity that fulfils the requirement for experiential learning in identifying system errors and implementing potential systems solutions.

Monthly morbidity and mortality meeting review all areas of concern within the clinical setting in terms of outcomes and possible solutions are described and then implemented. There is a hospital wide adverse incident reporting system – DATIX. Fellows are encouraged to be pro-active in this when the care for one of their patients is deemed sub-optimal, attendance on monthly Governance day is mandatory.

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

Other comments
The basic fellowship will be provided as a self funded supernumerary post in addition to our current clinical fellows. The advanced fellowship will be fully funded by Harefield Hospital and this post will replace one of our current senior fellowship posts.

To be completed by the Head of department or the authorized deputy.

Please fill in all required fields and send to eacta@aimgroup.au

Checklist for Hosting the EACTA Cardiothoracic and Vascular Anaesthesia Fellowship Programme

Institution Name

Address

Preferred Duration 12 months 24 months

Type of fellowship training available:

- Clinical only
- Clinical / Basic Research
- Clinical / Clinical Research
- Basic Research only
- Clinical Research only

Legal statement

- ** The fellow will have signed authorisation from the hospital or the national authorities to provide direct patient care during his/her training programme, under supervision from the legal representative of the hosting institute. "i.e. hands-on practice"**
 Yes No
- ** The applying trainee should be either a licensed anaesthesiologist or have a completed certificate of training in anaesthesia.**
 Yes No
- ** The programme is approved by the head of department of the hosting centre.**
 Yes No

Declaration of financial sources

- ** The financial support of the EACTA Fellowship will be regulated by an individual agreement between the hosting centre and the fellow.** Yes No
- ** The financial sources policy should be declared by the hosting centre.** Yes No

EACTA will divide the hosting centres into two categories as follows; **Category (A):** The hosting centres which can offer monthly salary payments and **Category (B):** The hosting centres which cannot offer salary payments, instead, the candidates may be supported by an educational grant, scholarship, or are self-sponsoring, etc.

- ** Preferred Fellowship Category:** **Category B for Basic Fellowship**
 Category A for Advanced Fellowship
- ** The candidates are free to choose between the hosting centres in the two categories.** Yes No
- ** A signed consensus between the hosting centre and trainee regarding the financial arrangement and responsibilities for both parties will be delivered to EACTA.** Yes No
- ** Accommodation options will be provided** Yes No
- ** Transportation/travel options will be provided** Yes No
- ** Source of financial support for the candidate:**

- Hosting centre (monthly salary), if yes; Amount Currency
- Candidate 's centre/country
- Scholarship
- Educational grant
- Award
- Candidate's own expenses
- Others

Please, describe

Programme Training and facilities of the hosting centre

Introduction:Harefield Hospital is one of the largest and most experienced centres in the world for heart and lung transplants. In 1983, a team of doctors led by the eminent Prof Sir Magdi Yacoub performed Britain's first heart-lung transplant. More recently, we have improved work in the development of 'artificial hearts' (also known as left ventricular assist devices or LVADs). At our dedicated Heart Attack Centre we deal with heart attack emergencies from outer north-west London. Our arrival-to-treatment time of 23 minutes is the fastest in the country and amongst the fastest in Europe.The hospital is a major centre for the treatment of lung cancer, chest cancer and other chest surgery. We have more than 900 staff, five operating theatres and four catheter laboratories. The hospital has 149 beds including 44 dedicated to cardiac and thoracic surgery, 30 in the transplant unit, 42 for cardiology and 31 for adult intensive care.

Objectives:Successful candidates will become proficient at providing cardiothoracic anaesthesia as per EACTA curriculum, first 12 months will focus on training in cardiothoracic anaesthesia, including minimally invasive procedures and critical care. Second year will focus on anaesthesia for heart and lung transplantation, anaesthesia for mechanical circulatory support. Transoesophageal echocardiography training will be provided throughout the whole duration of the fellowship, with recommendation for passing EACVI/EACTA TOE Certification exam. Candidate will have access to the regular teaching session in department and will be expected to provide teaching as well. Research will be integral part of the fellowship and candidate will have a great opportunity to get involved in research project running at our centre.

1. The training will be continuous for a minimum of 12 to a maximum of 24 months.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
2. The <i>programme director</i> and a <i>minimum of two faculty members</i> declare in writing that they will dedicate sufficient time (i.e. minimum 10% of working time) to attend to his or her responsibilities. 08 hours per week	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
3. At least one of the faculty needs to be transesophageal echocardiography (TOE) certified (e.g. EACVI-EACTA joint accreditation, Association of Cardiothoracic Anaesthesia and Critical Care (ACTACC) or National Board of Echocardiography (NBE)).	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
4. A documentary evaluation process will be undertaken at least once every 6 months.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
5. The candidate will keep records of all Clinical and Educational activities in a monthly portfolio or logbook.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
6. The hosting centres should have an:	
6.1 Available intensive care unit (ICU) for cardiothoracic and vascular patients.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
6.2 Available emergency room (ER) 24 hrs. a day (7/24).	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
6.3 Operating rooms (ORs) to be adequately equipped for cardiothoracic and vascular procedures (advanced haemodynamic monitoring, TOE, neuromonitoring, coagulation monitoring, blood saving (salvage) devices).	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
6.4 Designed and equipped post-anaesthesia care unit (PACU), high-dependency unit (HDU), or an ICU incorporating a PACU.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
6.5 Volume of cases.	
6.5.1 Minimum of 150 cardiac cases using cardiopulmonary bypass (CPB) will be available per fellow per year.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="text"/>
6.5.2 30% of the cases are non-coronary artery bypass grafts (CABG).	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="text" value="Click here to"/>
6.5.3 A programme director should perform a minimum of 100 cardiac anesthesia cases per annum personally.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
6.5.4 Training in the management of patients who have mechanical support in situ e.g. intra-aortic balloon pump (IABP), extracorporeal membrane oxygenation (ECMO) and ventricular assist device (VAD).	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
6.5.5 Training in anaesthesia for interventional catheterisation laboratory procedures.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
6.5.6 Basic training in TOE will be available.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
6.5.7 Advanced training in TOE will be available.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
6.5.8 Training in electrophysiology study (EPS) procedures (pacemakers, implanted cardioverter/defibrillator (ICDs), mapping, ablations, etc.).	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
6.5.9 Training in any of the following;	
6.5.9.1 Cardiothoracic and vascular surgical critical care in the ICU (minimum 2 months per year).	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
6.5.9.2 Extracorporeal perfusion technology (e.g. CPB, VAD) with a perfusionist (minimum 2 weeks).	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
6.6 Training in thoracic anaesthesia.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
6.7 Training in supra-inguinal vascular anaesthesia.	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
6.8 Training in interventional vascular (TEVAR, EVAR) and neuromonitoring.	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
6.9 These requirements will be applied for all new fellows	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
7. The applying hosting centres outside Europe:	
7.1 The country of the applying centre will have <i>at least five full active EACTA members</i> throughout the accreditation period to host the EACTA CTVA Fellowship Programme.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
7.2 The applying centre has <i>at least 3 peer reviewed publications</i> related to the field of cardiothoracic or vascular anesthesia or intensive care <i>within the last 5 years</i> .	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
7.3 The programme director or at least one of the faculty members should be either the elected RC member for their country or an active EACTA officer (director, subspecialty committee chair, delegate at one of the three permanent committees, or member of the subspecialty committees).	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
7.4 For countries that have no accredited centers yet, EACTA reserves the right to initially limit accreditation to only one centre per applying country for a period of one-to-two years. (I agree on behalf of the applying centre).	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No

<p>7.5 The department that has applied for accreditation of the EACTA CTVA Fellowship Programme will be subject to a peer review visit organized by EACTA. ** ** The visiting committee will screen the centre’s compliance with the published criteria (10.7) and provide an extensive evaluation report to EACTA’s board of directors.</p>	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
<p>7.6 For reaccreditation procedures, fellows' evaluation reports will be reviewed.</p>	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
<p>7.7 Here, I/we agree about all of the EACTA Guidelines for Site Visits as shown in 10.7 in the White Paper of the Board of Directors [click here]</p>	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
<p>7.7.1 International travel expenses, costs incurred within the country for the two visitors and the cost of an independent interpreter will be covered by the visited institution.</p>	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
<p>7.7.2 Alternatively, the visited institution would pay the fees as shown in 10.7.5. in the White Paper of the Board of Directors [click here]</p>	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
<p>7.7.3 The Role of the programme director at the applying centre:</p>	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
<p>7.7.3.1 Facilitates the visiting process.</p>	
<p>7.7.3.2 Translates the interviews with staff members and the residents during the visit, if necessary.</p>	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
<p>7.7.3.3 If required for the interviews a professional interpreter will be provided by the host centre.</p>	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
<p>7.7.3.4 Participates in the final debriefing meeting and facilitates all communication between parties.</p>	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No

Decision Approve Reject

Conditions Yes No

If yes, please define

Click here to enter text.

Please fill in all required fields and send to eacta@mci-group.com

Submit

Harefield Hospital

Hill End Road
Harefield
Middlesex
UB9 6JH

T: +44 (0)1895 823 737

Professor Mohamed R El Tahan
Professor of Cardiothoracic Anaesthesia & Surgical Intensive Care, Mansoura University,
Mansoura, Egypt
Associate Professor of Cardiothoracic Anaesthesia, Imam Abdulrahman Bin Faisal
University, Dammam, Saudi Arabia
P.O: 40289 Al Khubar 31952
Saudi Arabia

25th May 2021

Dear Professor El Tahan

Application to provide EACTA fellowship

Harefield Hospital would like to host an EACTA fellowship.

We propose offering both the basic and advanced fellowship programme incorporating a self-funded supernumerary basic anaesthesia training and a fully integrated hospital funded advanced clinical fellowship.

We have a dedicated clinical subgroup (lead by Dr Nandor Marczin and Katarina Lenartova and including consultants in both cardiothoracic anaesthesia and intensive care) who will host, administer and monitor this EACTA educational project.

The Royal Brompton & Harefield Clinical Group is now part of Guys & St Thomas's NHS Foundation Trust, and comprises one of the largest heart and lung centres in the UK. Both the Royal Brompton and Harefield have a strong reputation for their clinical expertise, standard of care, and research output.

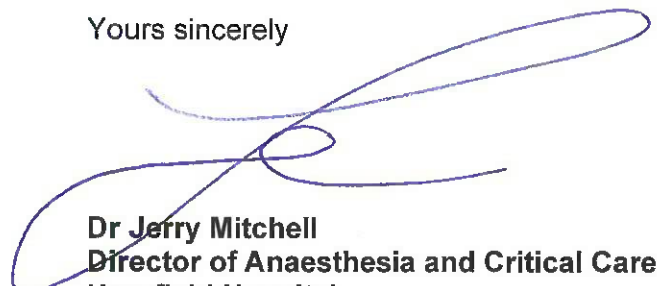
Harefield Hospital is a regional centre for cardiology and cardiothoracic surgery, and a national centre for adult heart and lung transplantation. It is one of a small number of UK cardiac centres assisting in the development of implantable mechanical ventricular assist devices in the management of end-stage heart failure. It also provides a primary intervention service for patients with acute coronary syndrome in west London and the home counties. It has approximately 1,185 staff, 200 beds, 5 operating theatres, and 4 catheter laboratories.

Our department has several decades of clinical training experience. Currently, we have 35 funded junior posts in anaesthesia & critical care at Harefield. There are 22 juniors at registrar grade and 13 Core Medical Training and CT1/2 posts. EACTA fellows will join a vibrant trainee community.

I believe that the co-operation between our hospital and the EACTA education committee and wider EACTA will have mutual benefits to our organisations and a London-based programme would provide a suitable opportunity to expand your education portfolio.

Thank you for considering our application.

Yours sincerely



Dr Jerry Mitchell
Director of Anaesthesia and Critical Care
Harefield Hospital

Appendix:

List of publications

NM

Akhtar MI, Gautel L, Lomivorotov V, Neto CN, Vives M, El Tahan MR, **Marczin N**, Landoni G, Rex S, Kunst G. Multicenter International Survey on Cardiopulmonary Bypass Perfusion Practices in Adult Cardiac Surgery. *J Cardiothorac Vasc Anesth.* 2020 Aug 24:S1053-0770(20)30838-7. doi: 10.1053/j.jvca.2020.08.043.

Mohite P, Garda R, Umakumar K, Kaul S, **Marczin N**, Zych B, Garcia-Saez D, Monteagudo-Vela M, Mahesh B, Stock U, De Robertis F, Simon A. Use of oxygenator with short-term ventricular assist devices *Artif Organs.* 2020 Sep 3. doi: 10.1111/aor.13813.

Şentürk M, El Tahan MR, Szegedi LL, **Marczin N**, Karzai W, Shelley B, Piccioni F, Granell Gil M, Rex S, Sorbello M, Bence J, Cohen E, Gregorio GD, Kawagoe I, Globokar MD, Jimenez MJ, Licker MJ, Mourisse J, Mukherjee C, Navarro R, Neskovic V, Paloczi B, Paternoster G, Pelosi P, Salaheldeen A, Stoica R, Unzueta C, Vanpeteghem C, Vegh T, Wouters P, Yapici D, Guarracino F. Thoracic Anesthesia of Patients With Suspected or Confirmed 2019 Novel Coronavirus Infection: Preliminary Recommendations for Airway Management by the European Association of Cardiothoracic Anaesthesiology Thoracic Subspecialty Committee.

J Cardiothorac Vasc Anesth. 2020 Sep;34(9):2315-2327. doi: 10.1053/j.jvca.2020.03.059.

Cummings IG, Lucchese G, Garg S, Soni M, Majid AF, **Marczin N**, Panoulas V, Raja SG. Ten-year improved survival in patients with multi-vessel coronary disease and poor left ventricular function following surgery: A retrospective cohort study

Int J Surg. 2020 Apr;76:146-152. doi: 10.1016/j.ijsu.2020.03.008.

Erdoes G, Vuylsteke A, Schreiber JU, Alston RP, Howell SJ, Wouters PF, Guarracino F, Unic-Stojanovic D, Martinez AH, Vives M, Gaudard P, Burtin P, Bettex D, Granell M, Szekely A, van der Maaten J, Antoniou T, Jiménez MJ, Szegedi L, Seeberger M, Erb JM, Singh R, von Dossow V, Matute P, Rosseel P, **Marczin N**, Landoni G, Wilkinson K, Diprose P, Mukherjee C, Paternoster G, El-Tahan MR; Education and Subspecialty Committees of the European Association of Cardiothoracic Anesthesiology (EACTA). European Association of Cardiothoracic Anesthesiology (EACTA) Cardiothoracic and Vascular Anesthesia Fellowship Curriculum: First Edition

J Cardiothorac Vasc Anesth. 2020 May;34(5):1132-1141. doi: 10.1053/j.jvca.2019.12.014.

Raja SG, Garg S, Soni MK, Rochon M, **Marczin N**, Bhudia SK, De Robertis F, Bahrami T. On-pump and off-pump coronary artery bypass grafting for patients needing at least two grafts: comparative outcomes at 20 years. *Eur J Cardiothorac Surg.* 2020 Mar 1;57(3):512-519. doi: 10.1093/ejcts/ezz261.

PMID: 31549144

Kiss T, Wittenstein J, Becker C, Birr K, Cinnella G, Cohen E, El Tahan MR, Falcão LF, Gregoretta C, Granell M, Hachenberg T, Hollmann MW, Jankovic R, Karzai W, Krassler J, Loop T, Licker MJ, **Marczin N**, Mills GH, Murrell MT, Neskovic V, Nisnevitch-Savarese Z, Pelosi P, Rossaint R, Schultz MJ, Neto AS, Severgnini P, Szegedi L, Vegh T, Voyagis G, Zhong J, de Abreu MG, Senturk M; PROTHOR investigators and the Research Workgroup PROtective VEntilation Network (PROVEnet) of the European Society of Anaesthesiology (ESA). Correction to: Protective ventilation with high versus low positive end-expiratory pressure during one-lung ventilation for thoracic surgery (PROTHOR): study protocol for a randomized controlled trial.

Trials. 2019 May 8;20(1):259. doi: 10.1186/s13063-019-3371-y.

Kiss T, Wittenstein J, Becker C, Birr K, Cinnella G, Cohen E, El Tahan MR, Falcão LF, Gregoretta C, Granell M, Hachenberg T, Hollmann MW, Jankovic R, Karzai W, Krassler J, Loop T, Licker MJ, **Marczin N**, Mills GH, Murrell MT, Neskovic V, Nisnevitch-Savarese Z, Pelosi P, Rossaint R, Schultz MJ, Serpa Neto A, Severgnini P, Szegedi L, Vegh T, Voyagis G, Zhong J, Gama de Abreu M, Senturk M; PROTHOR investigators; Research Workgroup PROtective VEntilation Network (PROVEnet) of the European Society of Anaesthesiology (ESA). Protective ventilation with high versus low positive end-expiratory pressure during one-lung ventilation for thoracic surgery (PROTHOR): study protocol for a randomized controlled trial.

Trials. 2019 Apr 11;20(1):213. doi: 10.1186/s13063-019-3208-8.

Ampatzidou F, Boutou AK, Karagounis L, **Marczin N**, Gogakos A, Drossos G. Noninvasive Ventilation to Treat Respiratory Failure After Cardiac Surgery: Predictors of Application and Outcome. *Respir Care*. 2019 Sep;64(9):1123-1131. doi: 10.4187/respcare.06062. Epub 2019 Apr 2.

PMID: 30940723

de Waal EEC, van Zaane B, van der Schoot MM, Huisman A, Ramjankhan F, van Klei WA, **Marczin N**. Vasoplegia after implantation of a continuous flow left ventricular assist device: incidence, outcomes and predictors. *BMC Anesthesiol*. 2018 Dec 8;18(1):185. doi: 10.1186/s12871-018-0645-y. PMID: 30526494

Romano R, Cristescu SM, Risby TH, Marczin N. Lipid peroxidation in cardiac surgery: towards consensus on biomonitoring, diagnostic tools and therapeutic implementation. *J Breath Res*. 2018 Feb 6;12(2):027109. doi: 10.1088/1752-7163/aa9856. PubMed PMID: 29104182.

Paardekooper LM, van den Bogaart G, Kox M, Dingjan I, Neerincx AH, Bendix MB, Beest MT, Harren FJM, Risby T, Pickkers P, Marczin N, Cristescu SM. Ethylene, an early marker of systemic inflammation in humans. *Sci Rep*. 2017 Jul 31;7(1):6889. doi: 10.1038/s41598-017-05930-9. PubMed PMID: 28761087; PubMed Central PMCID:PMC5537290.

Fisher A, Andreasson A, Chrysos A, Lally J, Mamasoula C, Exley C, Wilkinson J, Qian J, Watson G, Lewington O, Chadwick T, McColl E, Pearce M, Mann K, McMeekin N, Vale L, Tsui S, Yonan N, Simon A, Marczin N, Mascaro J, Dark J. An observational study of Donor Ex Vivo Lung Perfusion in UK lung transplantation: DEVELOP-UK. *Health Technol Assess*. 2016 Nov;20(85):1-276. PubMed PMID: 27897967; PubMed Central PMCID: PMC5136735.

Ananiadou O, Schmack B, Zych B, Sabashnikov A, Garcia-Saez D, Mohite P, Weymann A, Mansur A, Zeriouh M, Marczin N, De Robertis F, Simon AR, Popov AF. Suicidal hanging donors for lung transplantation: Is this chapter still closed? Midterm experience from a single center in United Kingdom. *Medicine (Baltimore)*. 2018 Apr;97(14):e0064. doi: 10.1097/MD.000000000010064. PubMed PMID: 29620623; PubMed Central PMCID: PMC5902298.

Tomasi R, Betz D, Schlager S, Kammerer T, Hoechter DJ, Weig T, Slinger P, Klotz LV, Zwißler B, Marczin N, von Dossow V. Intraoperative Anesthetic Management of Lung Transplantation: Center-Specific Practices and Geographic and Centers Size Differences. *J Cardiothorac Vasc Anesth*. 2018 Feb;32(1):62-69. doi: 10.1053/j.jvca.2017.05.025. Epub 2017 May 17. PubMed PMID: 29174123.

von Dossow V, Costa J, D'Ovidio F, Marczin N. Worldwide trends in heart and lung transplantation: Guarding the most precious gift ever. *Best Pract Res Clin Anaesthesiol*. 2017 Jun;31(2):141-152. doi: 10.1016/j.bpa.2017.08.001. Epub 2017 Aug 9. Review. PubMed PMID: 29110788.

Zeriouh M, Sabashnikov A, Patil NP, Schmack B, Zych B, Mohite PN, García Sáez D, Koch A, Mansur A, Soresi S, Weymann A, Marczin N, Wahlers T, De Robertis F, Simon AR, Popov AF. Use of taurolidine in lung transplantation for cystic fibrosis and impact on bacterial colonization. *Eur J Cardiothorac Surg*. 2018 Mar 1;53(3):603-609. doi: 10.1093/ejcts/ezx359. PubMed PMID: 29048473.

Boshier PR, Knaggs AL, Hanna GB, Marczin N. Perioperative changes in exhaled nitric oxide during oesophagectomy. *J Breath Res*. 2017 Nov 7;11(4):047109. doi: 10.1088/1752-7163/aa9387. PubMed PMID: 29033395.

El Tahan MR, Pasin L, Marczin N, Landoni G. Impact of Low Tidal Volumes During One-Lung Ventilation. A Meta-Analysis of Randomized Controlled Trials. *J Cardiothorac Vasc Anesth*. 2017 Oct;31(5):1767-1773. doi: 10.1053/j.jvca.2017.06.015. Epub 2017 Jun 7. PubMed PMID: 28843606.

Andreasson ASI, Borthwick LA, Gillespie C, Jiwa K, Scott J, Henderson P, Mayes J, Romano R, Roman M, Ali S, Fildes JE, Marczin N, Dark JH, Fisher AJ; DEVELOP-UK Investigators. The role of

interleukin-1 β as a predictive biomarker and potential therapeutic target during clinical ex vivo lung perfusion. *J Heart Lung Transplant.* 2017 Sep;36(9):985-995. doi: 10.1016/j.healun.2017.05.012. Epub 2017 May 12. PubMed PMID: 28551353; PubMed Central PMCID: PMC5578478.

Tatham KC, O'Dea KP, Romano R, Donaldson HE, Wakabayashi K, Patel BV, Thakuria L, Simon AR, Sarathchandra P; Harefield POPSTAR investigators,, Marczin N, Takata M. Intravascular donor monocytes play a central role in lung transplant ischaemia-reperfusion injury. *Thorax.* 2018 Apr;73(4):350-360. doi: 10.1136/thoraxjnl-2016-208977. Epub 2017 Apr 7. PubMed PMID: 28389600; PubMed Central PMCID: PMC5870457.

Padukone A, Sayeed AK, Marczin N, García Sáez D, Zych B, Mohite PN, Zerious M, Smith RD, Simon AR, Sabashnikov A, Popov AF. Salvage myocardial revascularisation in spontaneous left main coronary artery dissection with cardiogenic shock - the role of mechanical circulatory support. *Perfusion.* 2017 Mar;32(2):171-173. doi: 10.1177/0267659116667803. Epub 2016 Sep 24. PubMed PMID: 27625335.

Lees NJ, Rosenberg A, Hurtado-Doce AI, Jones J, Marczin N, Zerious M, Weymann A, Sabashnikov A, Simon AR, Popov AF. Combination of ECMO and cytokine adsorption therapy for severe sepsis with cardiogenic shock and ARDS due to Pantone-Valentine leukocidin-positive *Staphylococcus aureus* pneumonia and H1N1. *J Artif Organs.* 2016 Dec;19(4):399-402. Epub 2016 Jul 19. PubMed PMID: 27436098.

Korovesi I, Kotanidou A, Papadomichelakis E, Livaditi O, Sotiropoulou C, Koutsoukou A, **Marczin N**, Orfanos SE. Exhaled nitric oxide and carbon monoxide in mechanically ventilated brain-injured patients. *J Breath Res.* 2016 Mar 2;10(1):017107.

Marczin N, Popov AF, Zych B, Romano R, Kiss R, Sabashnikov A, Soresi S, De Robertis F, Bahrami T, Amrani M, Weymann A, McDermott G, Krueger H, Carby M, Dalal P, Simon AR. Outcomes of minimally invasive lung transplantation in a single centre: the routine approach for the future or do we still need clamshell incision? *Interact Cardiovasc Thorac Surg.* 2016 May;22(5):537-45. doi: 10.1093/icvts/ivw004. Epub 2016 Feb 10.

Mohite PN, Sabashnikov A, Patil NP, Garcia-Saez D, Zych B, Zerious M, Romano R, Soresi S, Reed A, Carby M, De Robertis F, Bahrami T, Amrani M, **Marczin N**, Simon AR, Popov AF. The role of cardiopulmonary bypass in lung transplantation. *Clin Transplant.* 2016 Mar;30(3):202-9. doi: 10.1111/ctr.12674. Epub 2016 Jan 8.

Thakuria L, Davey R, Romano R, Carby MR, Kaul S, Griffiths MJ, Simon AR, Reed AK, **Marczin N**. Mechanical ventilation after lung transplantation. *J Crit Care.* 2016 Feb;31(1):110-8. doi: 10.1016/j.jcrc.2015.09.021. Epub 2015 Oct 5.

Benedetto M, Romano R, Baca G, Sarridou D, Fischer A, Simon A, **Marczin N**. Inhaled nitric oxide in cardiac surgery: Evidence or tradition? *Nitric Oxide*. 2015 Sep 15;49:67-79. doi: 10.1016/j.niox.2015.06.002. Epub 2015 Jul 14. Review.

Fletcher ME, Boshier PR, Wakabayashi K, Keun HC, Smolenski RT, Kirkham PA, Adcock IM, Barton PJ, Takata M, **Marczin N**. Influence of glutathione-S-transferase (GST) inhibition on lung epithelial cell injury: role of oxidative stress and metabolism. *Am J Physiol Lung Cell Mol Physiol*. 2015 Jun 15;308(12):L1274-85. doi: 10.1152/ajplung.00220.2014. Epub 2015 Apr 10. PubMed PMID: 26078397.

Boshier PR, **Marczin N**, Hanna GB. Pathophysiology of acute lung injury following esophagectomy. *Dis Esophagus*. 2014 Oct 20.

Boshier PR, Mistry V, Cushnir JR, Kon OM, Elkin SL, Curtis S, **Marczin N**, Hanna GB. Breath metabolite response to major upper gastrointestinal surgery. *J Surg Res*. 2015 Feb;193(2):704-12.

Cristescu SM, Kiss R, Hekkert St, Dalby M, Harren FJ, Risby TH, **Marczin N**; Harefield BIOSTRESS study investigators. Real-time monitoring of endogenous lipid peroxidation by exhaled ethylene in patients undergoing cardiac surgery. *Am J Physiol Lung Cell Mol Physiol*. 2014 Oct 1;307(7):L509-15.

Mohite PN, Sabashnikov A, Patil NP, S^oez DG, Zych B, Popov AF, Weymann A, Wahlers T, **Marczin N**, DeRobertis F, Bahrami T, Amrani M, Simon AR. Short-term ventricular assist device in post-cardiotomy cardiogenic shock: factors influencing survival. *J Artif Organs*. 2014 Sep;17(3):228-35.

Vives M, Wijeyesundera D, **Marczin N**, Monedero P, Rao V. Cardiac surgery-associated acute kidney injury. *Interact Cardiovasc Thorac Surg*. 2014 May;18(5):637-45.

Kovacs V, Gasz B, Balatonyi B, Jaromi L, Kisfali P, Borsiczky B, Jancso G, **Marczin N**, Szabados S, Melegh B, Nasri A, Roth E. Polymorphisms in glutathione S-transferase are risk factors for perioperative acute myocardial infarction after cardiac surgery: a preliminary study. *Mol Cell Biochem*. 2014 Apr;389(1-2):79-84.

Mohite PN, Zych B, Popov AF, Sabashnikov A, S^oez DG, Patil NP, Amrani M, Bahrami T, DeRobertis F, Maunz O, **Marczin N**, Banner NR, Simon AR. CentriMag short-term ventricular assist as a bridge to solution in patients with advanced heart failure: use beyond 30 days. *Eur J Cardiothorac Surg*. 2013 Nov;44(5):e310-5.

Balatonyi B, Gasz B, Kov^ocs V, Lantos J, Jancs[≥] G, **Marczin N**, R^ëth E. The role of the inhibition of glutathione-S-transferase in the protective mechanisms of ischemic postconditioning. *Can J Physiol Pharmacol*. 2013 Aug;91(8):625-32.

Boshier PR, Hanna GB, **Marczin N**. Exhaled nitric oxide as biomarker of acute lung injury: an unfulfilled promise? **J Breath Res**. 2013 Mar;7(1):017118.

Kuppuswamy M, Popov AF, Carby M, Redmond KC, Zych B, **Marczin N**, Mohite PN, Krueger H, Simon AR. Bilateral lobar lung transplantation using H1N1-positive lungs in the presence of anti-HLA antibodies. **Am J Respir Crit Care Med**. 2012 Jul;186(1):108-9.

Zych B, Popov AF, Stavri G, Bashford A, Bahrami T, Amrani M, De Robertis F, Carby M, **Marczin N**, Simon AR, Redmond KC. Early outcomes of bilateral sequential single lung transplantation after ex-vivo lung evaluation and reconditioning. **J Heart Lung Transplant**. 2012 Mar;31(3):274-81.

Rõth E, **Marczin N**, Balatonyi B, Ghosh S, Kovács V, Alotti N, Borsiczky B, Gasz B. Effect of a glutathione S-transferase inhibitor on oxidative stress and ischemia-reperfusion-induced apoptotic signalling of cultured cardiomyocytes. **Exp Clin Cardiol**. 2011 Fall;16(3):92-6.

Potapov E, Meyer D, Swaminathan M, Ramsay M, El Banayosy A, Diehl C, Veynovich B, Gregoric ID, Kukucka M, Gromann TW, **Marczin N**, Chittuluru K, Baldassarre JS, Zucker MJ, Hetzer R. Inhaled nitric oxide after left ventricular assist device implantation: a prospective, randomized, double-blind, multicenter, placebo-controlled trial. **J Heart Lung Transplant**. 2011 Aug;30(8):870-8.

Korovesi I, Papadomichelakis E, Orfanos SE, Giamarellos-Bourboulis EJ, Livaditi O, Pelekanou A, Sotiropoulou C, Koutsoukou A, Dimopoulou I, Ekonomidou F, Psevdi E, Armaganidis A, Roussos C, **Marczin N**, Kotanidou A. Exhaled breath condensate in mechanically ventilated brain-injured patients with no lung injury or sepsis. **Anesthesiology**. 2011 May;114(5):1118-29.

Boshier PR, Priest OH, Hanna GB, **Marczin N**. Influence of respiratory variables on the on-line detection of exhaled trace gases by PTR-MS. **Thorax**. 2011 Oct;66(10):919-20.

Bertok S, Wilson MR, Dorr AD, Dokpesi JO, O'Dea KP, **Marczin N**, Takata M. Characterization of TNF receptor subtype expression and signaling on pulmonary endothelial cells in mice. **Am J Physiol Lung Cell Mol Physiol**. 2011 May;300(5):L781-9.

Boshier PR, Cushnir JR, Priest OH, **Marczin N**, Hanna GB Variation in the levels of volatile trace gases within three hospital environments: implications for clinical breath testing **J BREATH RES** 4(3): Article number 031001 Sep 2010

PR Boshier , **N Marczin**, GB Hanna. Repeatability of the measurement of exhaled volatile metabolites using selected ion flow tube mass spectrometry **Journal of the American Society of Mass Spectrometry** 21(6):1070-1074 Jun 2010

Varga T, Kovesi T, Gal J , **N. Marczin** Endogenous and nitroglycerin-induced release of nitric oxide in end stage cystic fibrosis. **European Respiratory Journal**, 2010 Sep;36(3):682-3.

RE. Bundy, B Falusi, **N Marczin**. Influence of thiopental on MAPK and NF- κ B activation in A549 cells. **Interventional Medicine and Applied Science** 2 (1): 27-30, Mar 2010

Gosh S, J Gal, **N. Marczin**. Carbon Monoxide: endogenous mediator, potential diagnostic and therapeutic target for lung disease: a focus on critical illness." *Ann Med.* 2010;42(1):1-12.

B Zych, **N. Marczin**, M Carby, M McCurry, M Burke, A Rice, P Dalal, A Hall, M Amrani, K Redmond 'Ex-vivo lung perfusion - a way to salvage lungs for transplantation? Initial experience at a single Institution' **British Journal of Transplantation**, 2009; 4(3) 10-16

Gal J, Kovesi T, Royston D, **N. Marczin**. Dynamics of Nitroglycerin-induced Exhaled Nitric Oxide After Lung Transplantation: Evidence of Pulmonary Microvascular Injury? **J. Heart Lung Transplantation**. 2007 Dec;26(12):1300-5.

Farkasfalvi K, Stagg MA, Coppens SR, Siedlecka U, Lee J, Soppa GK, **Marczin N**, Szokodi I, Yacoub MH, Terracciano CM. Direct effects of apelin on cardiomyocyte contractility and electrophysiology. **Biochem Biophys Res Commun.** 2007 Jun 15;357(4):889-95.

Hoare GS, Birks EJ, Bowles C, **Marczin N**, Yacoub MH. In vitro endothelial cell activation and inflammatory responses in end-stage heart failure. **J Appl Physiol.** 2006 Nov;101(5):1466-73.

Marczin N. The biology of exhaled nitric oxide (NO) in ischemia-reperfusion-induced lung injury: a tale of dynamism of NO production and consumption. **Vascul Pharmacol.** 2005 Dec;43(6):415-24. Epub 2005 Nov 14.

Kovesi T, Szabo A, Royston D, **Marczin N**. Correlation between pulmonary gas exchange and basal and nitroglycerin (GTN)-induced exhaled nitric oxide (eNO) in patients undergoing cardiac surgery. **Vascul Pharmacol.** 2005 Dec;43(6):434-40. Epub 2005 Nov 8.

Germann P, Braschi A, Della Rocca G, Dinh-Xuan AT, Falke K, Frostell C, Gustafsson LE, Herve P, Jolliet P, Kaisers U, Litvan H, Macrae DJ, Maggiorini M, **Marczin N**, Mueller B, Payen D, Ranucci M, Schranz D, Zimmermann R, Ullrich R. Inhaled nitric oxide therapy in adults: European expert recommendations. **Intensive Care Med.** 2005 Aug;31(8):1029-41. Epub 2005 Jun 23.

Ghosh S, Wilson MR, Choudhury S, Yamamoto H, Goddard ME, Falusi B, **Marczin N**, Takata M. Effects of inhaled carbon monoxide on acute lung injury in mice. **Am J Physiol Lung Cell Mol Physiol.** 2005 Jun;288(6):L1003-9. Epub 2005 Jan 28.

Bundy RE, Hoare GS, Kite A, Beach J, Yacoub M, Marczin N. Redox regulation of p38 MAPK activation and expression of ICAM-1 and heme oxygenase-1 in human alveolar epithelial (A549) cells. **Antioxid Redox Signal.** 2005 Jan-Feb;7(1-2):14-24.

Marczin N. Tiny wonders of tiny impurities of nitrous oxide during anaesthesia. **British J. Anaest.** 2004 Nov;93(5):1-5 (Invited editorial)

Marczin N, El-Habashi, G. Hoare, R. Bundy, M. Yacoub Antioxidants in myocardial ischemia-reperfusion injury: therapeutic potential and basic mechanisms. **Archives of Biochemistry and Biophysics** 420/2 pp. 222-236, 2003

Marczin N, El-Habashi, Royston D Free radicals and cardiac arrhythmias following coronary surgery: Actors of the drama or bystanders of the spectacle? (Invited editorial) **Acta Anaesthesiol Scand.** 2003 Jul;47(6):639-42.

N Marczin, Exhaled Nitric oxide and cardiac surgery with extracorporeal circulation **J. Thoracic Cardiovasc.Surg** 126/5 pp. 1673-1674, **2003**

S Al-Ruzzeh, G Hoare, **N Marczin**, G Asimakopoulos, S George, K Taylor, M Amrani. Off-Pump Coronary Artery Bypass Surgery Is Associated with Reduced Neutrophil Activation as Measured by the Expression of CD11b: A Prospective Randomized Study. **The Heart Surgery Forum** #2002-10208; 6 (2), 2003

D Royston, T Kövesi and **N Marczin**, The Unwanted Response to Cardiac Surgery; Time for a Reappraisal? (Invited Editorial) **J. Thoracic Cardiovasc.Surg.** **2003**, Jan;125(1):32-5.

T Kövesi, D Royston, M H. Yacoub, and **N Marczin**. Basal and nitroglycerin-induced exhaled nitric oxide in cardiac surgery utilising cardiopulmonary bypass. **British J. Anaest.** 2003 May;90(5):608-616

M. Yacoub, **Marczin**, N Overview. **Coron Artery Dis**. 2003 Apr;14(2):99

Marczin, N, R. Bundy, G. Hoare, M. Yacoub. Role of oxidant stress in vascular cell proliferation, inflammation and death. **Coron.Artery Dis**, 2003 Apr;14(2):123-33

Marczin N, Kovesi T, Royston D, Cuthbertson BH, Stott SA, Webster NR. Exhaled nitric oxide as a marker of lung injury in coronary artery bypass surgery. **Br J Anaesth**. 2003 Jan;90(1):101-5.

Hoare GS, Chester AH, Yacoub MH, **Marczin N**. Regulation of NF-kappaB and ICAM-1 expression in human airway epithelial cells. **Int J Mol Med**. 2002 Jan;9(1):35-44.

Marczin N, Royston D. Nitric oxide as mediator, marker and modulator of microvascular damage in ARDS. (Invited Editorial) **Br J Anaesth** 2001 Aug;87(2):179-83

Marczin, N., D. Royston, M. Yacoub. Lung transplantation should be routinely performed using cardiopulmonary bypass. **J. Cardiothoracic Vascular. Anest.** 14(6): 2000, 739-745

R. Bundy, **N. Marczin**, A. H. Chester, M. Yacoub. A redox based mechanism for nitric oxide (NO)-induced inhibition of DNA synthesis in human vascular smooth muscle cell (HASMC) **Br. J. Pharmacol**, 2000. 129(7):1513-21.

R. Bundy, **N. Marczin**, E. Birks, A. H. Chester, M. Yacoub. Transplant atherosclerosis: Role of phenotypic modulation of vascular smooth muscle by nitric oxide. **Gen. Pharmacol**, 2000. Feb;34(2):73-84.

G. Hoare **N. Marczin**, K. Morrison, A. H. Chester and Magdi Yacoub. Role of oxidant stress in NF-kB activation in human aortic smooth muscle cells. **Am. J. Physiol** 1999 Nov; 277(5 Pt 2):H1975-84.

R. Bundy, **N. Marczin**, A. H. Chester, M. Yacoub. Differential regulation of DNA synthesis inhibition by nitrovasodilators and hydroxyurea in human vascular smooth muscle cells **Am. J. Physiol** 1999 Nov;277(5 Pt 2):H1799-807.

Riedel B., **Marczin N**. Right ventricular dysfunction and pulmonary hypertension after cardiopulmonary bypass: pathophysiology and management. **J. Circ.Supp** 1:, 43-57, 1998

Marczin, N., B. Riedel, D. Royston, M. Yacoub. Exhaled nitric oxide and pulmonary response to iloprost in systemic sclerosis. **Lancet** 352:405-406, 1998

N. Marczin, C.Y. Go, A. Papapetropoulos and J. D. Catravas. Induction of nitric oxide synthase by protein synthesis inhibition in aortic smooth muscle cells. **Br. J. Pharmacol.** 123:1000-1008, 1998

Papapetropoulos A, **Marczin N**, Catravas JD. Cross-tolerance between endogenous nitric oxide and exogenous nitric oxide donors. **Eur J Pharmacol** 344(2-3):313-321, 1998

Marczin, N., B. Riedel, J. Gal, J. Polak, M. Yacoub. Exhaled nitric oxide during lung transplantation. **Lancet** 350, 1681-1682, 1997

Marczin, N., B. Riedel, D. Royston, M. Yacoub. Intravenous nitrate vasodilators and exhaled nitric oxide. **Lancet** 349, 1742, 1997

Marczin, N., Go, C., Jilling T., Papapetropoulos, A. and Catravas, J.D Cytoskeleton-dependent activation of the inducible nitric oxide synthase in cultured aortic smooth muscle cells **British J. Pharmacol.** 118:1085-1094, 1996

Marczin, N., Antonov, A., Papapetropoulos, A., Munn, D.H., Virmani, R., Kolodgie, F.D. Gerrity, R. G. and Catravas, J.D. Monocyte-induced downregulation of nitric oxide synthase in cultured aortic endothelial cells. **Arterioscler. Thromb. Vasc.Biol.** 16:1095-1103, 1996

Papapetropoulos, A., Antonov, A., Virmani, R., Kolodgie, F.D. Munn, D.H, **Marczin, N.**, Ryan, J.W., Gerrity, R. G. and Catravas, J.D. Monocyte- and cytokine-induced downregulation of angiotensin-converting enzyme in cultured human and porcine endothelial cells. **Circ. Res.** 79:512-523, 1996

Papapetropoulos, A; AbouMohamed, G; **Marczin, N**; Murad, F; Caldwell, RW; Catravas, JD. Downregulation of nitrovasodilator-induced cyclic GMP accumulation in cells exposed to endotoxin or interleukin-1beta **British J. Pharmacol.** 118: 1359-1366, 1996.

Miyamoto, Y; **Marczin, N**; Catravas, JD; Del Monte, MA. Cholera toxin enhances taurine uptake in cultures of human retinal pigment epithelial cells **Current Eye Research** 15: 229-236,1996

Hoque AM, **Marczin N**, Catravas JD, Fuchs LC Anesthesia with sodium pentobarbital enhances lipopolysaccharide-induced cardiovascular dysfunction in rats. **Shock** 1996 (5):365-370

Pataki, G., Czopf, L., Jilling T., **Marczin, N.**, Catravas, J., and Matalon, S., Regulation of fluid-phase endocytosis in alveolar macrophages. **Amer. J. Physiol.: Lung Cell. and Mol. Physiol.** 269: L520-L526, 1995

Marczin, N., Tekeres, M; Salzman, A.L. and Szabo, Cs. Methylene blue infusion in septic shock (letter) **Critical Care Medicine.** 23:1936-1938,1995.

Marczin, N. Nitric oxide: physiologic curiosity, pathologic factor or therapeutic possibility in septic shock? (translated from Hungarian), **Aneszteziologia es Intenziv Therapia** (Anaesthesia and Intensive Therapy) 4:195-203, 1995.

Brandsch, M., Ramamoorthy, S., **Marczin, N.**, Catravas, J.D., Leibach, J.W., Ganapathy, V. and Leibach, F.H. Regulation of taurine transport by Escheria Coli Heat-stable enterotoxin and guanylin in human intestinal cell lines. **J. Clin. Invest.**, 96(1): 361-369,1995.

Papapetropoulos, A., **Marczin, N.**, Mora, G., Milici, A., Murad, F. and Catravas, J.D. Regulation of vascular smooth muscle soluble guanylate cyclase activity, mRNA and protein levels by cAMP-elevating agents. **Hypertension** 26: 696-704, 1995.

Papapetropoulos, A., **Marczin, N.**, Snead, M.D., Cheng, C., Milici, A. and Catravas, J.D. Smooth muscle cell responsiveness to nitrovasodilators in hypertensive and normotensive rats. **Hypertension** 23:486-484, 1994.

Marczin, N., Papapetropulos, A. and Catravas, J.D. Tyrosine kinase inhibitors suppress endotoxin- and IL-1-induced NO synthesis in aortic smooth muscle cells. **Am. J. Physiol.** 265 (Heart Circ. Physiol . 34): H1014-H1018, 1993.

Marczin, N., Papapetropulos, A., Jilling T., and Catravas, J.D. Prevention of nitric oxide synthase induction in vascular smooth muscle cells by microtubule depolymerizing agents. **Br. J. Pharmacol** 109:, 603-605, 1993.

Marczin, N., Ryan, U.S. and Catravas, J.D. Sulfhydryl depleting agents, but not deferoxamine, modulate EDRF action in cultured pulmonary arterial cells. **Am. J. Physiol.** 265 (**Lung Cell. Mol. Physiol.** 9): L220-L227, 1993.

Marczin, N., Ryan, U.S. and Catravas, J.D. Effects of oxidant stress on endothelium-derived relaxing

factor-induced and nitrovasodilator-induced cGMP accumulation in vascular cells in culture. **Circ. Res.** 70:326-340, 1992

Marczin, N., Ryan, U.S. and Catravas, J.D. Endothelial cyclic GMP does not regulate basal release of endothelium-derived relaxing factor in culture. **Am. J. Physiol 263 (Lung Cellular & Molecular Physiology 7)** : L113-L121, 1992.

Marczin, N., Ryan, U.S. and Catravas, J.D. Methylene blue inhibits nitrovasodilator-and EDRF-induced cGMP accumulation in cultured pulmonary arterial smooth muscle cells via generation of superoxide anion. **J. Pharmacol. Exp. Ther.** 263:170-179, 1992.

KL

K. Lenartova, N. Palomo-Lopez, M. Hoy, O.Kviatkovske, C. Walker
Intracranial haemorrhage associated with systemic anticoagulation in ventilated COVID-19 Intensive care patients, Journal of Cardiothoracic and Vascular Anesthesia, Volume 34, Supplement 1, October 2020, S57 – S58

K. Lenartova, P. Vila, S. Williamson, S. Moravcova, A.Wypych-Zych, K.Stevens, A. Simon, C. Walker
LVAD, heart failure journey continues, Journal of Cardiothoracic and Vascular Anesthesia, Volume 34, Supplement 1, October 2020, S10

K Lenartova, J Dutton, S Moravcova, D Garcia Saez, A Simon,
DCD heart transplants: Harefield hospital experience, Journal of Cardiothoracic and Vascular Anesthesia, Volume 32, Supplement 1, August 2018, 57-58.

J Dutton, K Lenartova, D Garcia Saez, A Simon, Ch Walker,
Primary graft dysfunction following orthotopic cardiac transplant, a single centre experience, Journal of Cardiothoracic and Vascular Anesthesia, Volume 32, Supplement 1, August 2018, 25-26.

K Lenartova, J Dutton, D Garcia Saez, A Simon, Ch Walker,
Does mechanical circulatory support prior to heart transplant affect the incidence of primary graft dysfunction and postoperative extracorporeal life support, Perfusion, Volume: 33, Supplement 1, May 22, 2018; 87-220, ID 180.

CW

1.

Severe aortic valve regurgitation requiring mechanical aortic valve replacement following Impella device implantation.

Vila P, de Vere F, Simon A, Walker C.

Perfusion. 2021 Apr;36(3):311-314. doi: 10.1177/0267659120941339. Epub 2020 Jul 15.

PMID: 32664788

2.

Acute pancreatitis with long-term celecoxib vs. ibuprofen or naproxen: data from the PRECISION trial.

Yeomans ND, Graham DY, Wang Q, Wolski K, Borer J, Husni EM, Libby P, Lincoff MA, Lüscher T, Wisniewski LM, Bao W, Walker C, Nissen SE.

Am J Gastroenterol. 2018 Jul;113(7):1053-1054. doi: 10.1038/s41395-018-0051-6.

PMID: 29535414 No abstract available.

3.

Thrombin generation and its inhibition: a review of the scientific basis and mechanism of action of anticoagulant therapies.

Walker CP, Royston D.

Br J Anaesth. 2002 Jun;88(6):848-63. doi: 10.1093/bja/88.6.848.

PMID: 12173205 Review. No abstract available.

4.

Ten-year outcome analysis of off-pump sequential grafting: single surgeon, single center experience.

Raja SG, Salhiyyah K, Navaratnarajah M, Rafiq MU, Felderhof J, Walker CP, Ilsley CD, Amrani M.

Heart Surg Forum. 2012 Jun;15(3):E136-42. doi: 10.1532/HSF98.20111087.

PMID: 22698600

5.

Impact of concomitant coronary artery bypass grafting on in-hospital outcome in octogenarians undergoing aortic valve replacement.

Raja SG, Navaratnarajah M, Husain M, Walker CP, Ilsley CD, Bahrami TT, Gaer JA, Amrani M.

J Heart Valve Dis. 2013 Mar;22(2):177-83.

PMID: 23798205

6.

Real-time monitoring of endogenous lipid peroxidation by exhaled ethylene in patients undergoing cardiac surgery.

Cristescu SM, Kiss R, Hekkert St, Dalby M, Harren FJ, Risby TH, Marczin N; Harefield BIOSTRESS study investigators.

Am J Physiol Lung Cell Mol Physiol. 2014 Oct 1;307(7):L509-15. doi: 10.1152/ajplung.00168.2014. Epub 2014 Aug 15.

PMID: 25128523 Free PMC article.

7.

Concomitant off-pump coronary artery bypass grafting results in improved in-hospital outcomes for patients with ischemic mitral regurgitation undergoing surgery.

Raja SG, Husain M, Salhiyyah K, Navaratnarajah M, Chudasama D, Walker CP, Amin F, Amrani M. Heart Surg Forum. 2013 Feb 1;16(1):E15-20. doi: 10.1532/HSF98.20121039.

PMID: 23439351 Clinical Trial.

8.

In-hospital outcomes of pedicled bilateral internal mammary artery use in diabetic and nondiabetic patients undergoing off-pump coronary artery bypass grafting: single-surgeon, single-center experience.

Raja SG, Salhiyyah K, Rafiq MU, Navaratnarajah M, Chudasama D, Walker CP, Amin F, Amrani M. Heart Surg Forum. 2013 Feb 1;16(1):E1-7. doi: 10.1532/HSF98.20121038.

PMID: 23439350

MS

Patient reported outcome of adult perioperative anaesthesia in the United Kingdom: a cross-sectional observational study. Br J Anaesthesia, June 2016

Design and methodology of SNAP-I: a Sprint National Anaesthesia Project to measure patient reported outcome after anaesthesia. Perioperative Medicine, London. April 2015.

Abstract-poster section ESICM Berlin 2011: Performance of two FloTrac-Vigileo™ versions during norepinephrine-driven change in arterial blood pressure in critically ill patients. *Intensive Care Medicine-volume 37-supplement 1-September 2011.*

Abstract-poster section ESICM Berlin 2011: Effects of norepinephrine on four different continuous cardiac output systems using the femoral and radial arterial pressure waveform in critically ill patients. *Intensive Care Medicine-volume 37-supplement 1-September 2011.*

Abstract-poster section ESICM Berlin 2011: Comparison of NiCOM Bioreactance Technology and trans-pulmonary thermodilution during norepinephrine-driven change in arterial blood pressure in critically ill patients. *Intensive Care Medicine-volume 37-supplement 1-September 2011.*

Abstract-poster section ESICM Berlin 2011: Effects of norepinephrine-driven change in arterial blood pressure on four different continuous cardiac output systems in critically ill patients. *Intensive Care Medicine-volume 37-supplement 1-September 2011.*

Effetto della rimozione extracorporea di endotossina (LPS) in pazienti affetti da sepsis indotta da GRAM-: analisi su colture cellulari immortalizzate di epitelio tubulare prossimale (PTEC)- Torino 2007. *Pubblitesi.it*.

SM

1.

Relationship between endotoxin core, staphylococcal and varicella antibody levels and outcome following aortic valve replacement surgery: a prospective observational study.

Smith A, Moravcova S, Treibel TA, Colque-Navarro P, Mollby R, Moon JC, Hamilton-Davies C.

Perioper Med (Lond). 2018 Sep 20;7:20. doi: 10.1186/s13741-018-0101-z. eCollection 2018.

PMID: 30250733 Free PMC article.

2.

Variability of anti-staphylococcal antibodies in healthy volunteers and pre-cardiac surgery patients.

Moravcova S, Kyle B, Shanahan H, Giannaris S, Smith A, Hamilton-Davies C.

Perioper Med (Lond). 2016 May 27;5:13. doi: 10.1186/s13741-016-0039-y. eCollection 2016.

PMID: 27239299 Free PMC article.

HS

COVID-19 Front Line: Why Focused Lung and Cardiovascular Ultrasound? JACC: Case Report, Volume 2, Issue 14, 18 November 2020, Pages 2275-2277. <https://doi.org/10.1016/j.jaccas.2020.09.030>

Hatem Soliman-Aboumarie and Marcelo Haertel Miglioranza

The Sound of Silence: The Power of Lung Ultrasound in the Interstitial-Alveolar Syndrome. JACC: Case Reports, Volume 2, Issue 10, August 2020, Pages 1550- 1552. <https://doi.org/10.1016/j.jaccas.2020.07.009>

Hatem Soliman-Aboumarie and Marcelo Haertel Miglioranza

Why, when, and how to use lung ultrasound during the COVID-19 pandemic: enthusiasm and caution. June 2020. European Heart Journal - Cardiovascular Imaging. <https://doi.org/10.1093/ehjci/jeaa163>

[<https://javascript:;>]Luna Gargani, [<https://javascript:;>]Hatem Soliman-

Aboumarie, [<https://javascript:;>]Giovanni Volpicelli, [<https://javascript:;>]Francesco

Corradi, [<https://javascript:;>]Maria Concetta Pastore, [<https://javascript:;>]Matteo Cameli

Technologies to Optimize the Care of Severe COVID-19 Patients for Health Care Providers Challenged by Limited Resources. May 2020. Anesthesia and Analgesia. DOI:[10.1213/ANE.0000000000004985](https://doi.org/10.1213/ANE.0000000000004985)

Rubulotta, Francesca; *Soliman-Aboumarie, Hatem*; Filbey, Kevin; Geldner, Goetz; Kuck, Kai; Ganau, Mario; Hemmerling, Thomas M.

Neuromuscular blockade monitoring during the COVID-19 Pandemic. July 2020. Anesthesia & Analgesia

Journal.DOI: [10.1213/ANE.0000000000005121](https://doi.org/10.1213/ANE.0000000000005121)

Rubulotta, Francesca; Soliman-Aboumarie, Hatem; Filbey, Kevin; Geldner, Goetz; Kuck, Kai; Ganau, Mario; Hemmerling, Thomas M.

Usefulness of echocardiography to detect cardiac involvement in COVID-19 patients. *Echocardiography* Journal. 12 July 2020. <https://doi.org/10.1111/echo.14779>

Matteo Cameli, Maria Concetta Pastore, Hatem Soliman Aboumarie, Giulia Elena Mandoli, Flavio D'Ascenzi MD, Paolo Cameli, Elisa Bigio, Federico Franchi, Sergio Mondillo, Serafina Valente

Safe performance of echocardiography during the COVID-19 pandemic: A practical guide. June 2020. *Reviews in Cardiovascular Medicine* 21(2).

DOI: [10.31083/j.rcm.2020.02.90](https://doi.org/10.31083/j.rcm.2020.02.90)

Matteo Cameli, Maria Concetta Pastore, Michael Henein, Hatem Soliman Aboumarie, Giulia Elena Mandoli, Flavio D'Ascenzi, Paolo Cameli, Federico Franchi, Sergio Mondillo, Serafina Valente

Basic and advanced echocardiography in advanced heart failure: an overview. *Heart Failure Reviews* (2019). <https://doi.org/10.1007/s10741-019-09865-3>

Maria Concetta Pastore, Giulia Elena Mandoli, Hatem Soliman Aboumarie, Ciro Santoro, Francesco Bandera, Antonello D'Andrea, Giovanni Benfari, Roberta Esposito, Vincenzo Evola, Regina Sorrentino, Paolo Cameli, Serafina Valente, Sergio Mondillo, Maurizio Galderisi & Matteo Cameli

Treat the others, treat yourself. *J Am Coll Cardiol Case Rep.* 2019 Jun, 1 (1) 79-80. <https://doi.org/10.1016/j.jaccas.2019.05.002>

Hatem Soliman-Aboumarie

Decline in skeletal muscle mass during veno-venous extracorporeal membrane oxygenation. A retrospective cohort study. *Intensive Care Medicine Experimental* 2019, 7(Suppl 3):000958. <https://doi.org/10.1186/s40635-019-0265-y>

S. Patel; F. Liew; H. Soliman; S. Nawab; T. Semple; J. Hine; S. Desai; B. Patel; S. Singh

Management of anticoagulation in VV ECMO for toxic shock syndrome complicated by intracranial hemorrhage and inferior vena cava thrombus. *Perfusion Journal.* Volume 34 Issue 1_suppl, April 2019 <https://doi.org/10.1177/0267659119829686>

Hatem Soliman-Aboumarie, Marco Morosin, Alessia Azzu, Stephane Ledot, Francesca Caetano, Shahana Uddin and Susanna Price.

Echocardiography in the evaluation of sepsis-induced cardiomyopathy managed with venoarterial extracorporeal membrane oxygenation (VA-ECMO). *Journal of the Intensive Care Society*, 20(2_suppl), 1–

253. <https://doi.org/10.1177/1751143719835452>

Hatem Soliman, Marco Morosin, Stephane Ledot, Francisca Caetano, Richard Fisher, Shahana Uddin and Susanna Price

Mechanical Circulatory Support remains a complex tool in the management of acute myocardial infarction with refractory cardiogenic shock. *Journal of the Intensive Care Society*, 20(2_suppl), 1–

253. <https://doi.org/10.1177/1751143719835452>

James Barnacle, Francisca Caetano, Hatem Soliman Aboumarie, Shahana Uddin and Susanna Price

Right ventricular failure as a consequence of a concrete lung and septic shock: mechanical circulatory support. *European Heart Journal - Cardiovascular Imaging*, Volume 20, Issue Supplement_1, January 2019, Pages i1173–i1209, <https://doi.org/10.1093/ehjci/jey275>

A. Gambaro, H. Soliman-Aboumarie, S. Price.

The role of emergency echocardiography in diagnosing septic shock due to infective endocarditis of a bicuspid aortic valve. *European Heart Journal - Cardiovascular Imaging*, Volume 18, Issue suppl_3, 1 December 2017, Pages iii365–iii378, <https://doi.org/10.1093/ehjci/jex291>

Hatem Soliman, Kamesh Pulya, Aisha Al Memari

The role of TTE in predicting the short-term outcome of mechanically ventilated COPD patients with Acute on Chronic Respiratory Failure. *Critical Care Medicine*: December 2008 - Volume 36 - Issue 12 - p A1-A198, <https://doi.org/10.1097/01.ccm.0000341823.62097.1d>

H. Soliman; AM Fayed; A. Alaty; AS Okasha

AH

C Palfreeman, P Vila, J Sokhi, A Hurtado-Doce. Veno-venous extracorporeal membrane oxygenation (ECMO) as a bridge to lung transplant. *Critical Care* 2020, 24(Suppl 1): P070.

J. Dutton, M. Zaleska-Kociecka, M. Morosin, R. Fernandez-Garda, D. Garcia-Saez, A. Simon, T.C. Aw, N. Lees, A. Hurtado-Doce. Heart transplantation outcomes in patients with continuous-flow left ventricular assist devices. *Journal of Cardiothoracic and Vascular Anesthesia*, Volume 33, S128

Dutton J, Morosin M, Fernandez-Garda R, Anikin V, Hurtado-Doce A, Lees N. Lessons of the month 1: Fatal oesophago-pericardial fistula with cerebral air embolism after elective atrial fibrillation ablation. *Clin Med (Lond)*. 2019 Jul;19(4):331-333. doi: 10.7861/clinmedicine.19-4-331

Zaleska-Kociecka M, Fernandez-Garda R, Morosin M, Dutton J, A Hurtado-Doce. Tracheostomy after orthotopic heart transplantation. *European Journal of Heart Failure* 21(Suppl. S1)P363. Doi:10.1002/ehjhf.1488.

Zaleska-Kociecka M, Dutton J, Morosin M, Fernandez-Garda R, Hurtado-Doce A. Levosimendan for primary graft failure treatment after orthotopic heart transplantation European Journal of Heart Failure 21(Suppl. S1) P1091. Doi:10.1002/ejhf.1488.

Dutton J, Morosin M, Fernandez-Garda R, Zaleska M, Hurtado-Doce A. Effect of Early versus Late Tracheostomy Post-Orthotopic heart transplant in patients requiring prolonged mechanical ventilation. Intensive Care Medicine Experimental 2019, 7(Suppl 3): 000661

Dutton J, McLoughlin, Garcia-Saez D, Lees N, Simon A and Hurtado-Doce A. Arrhythmias following lung transplantation. A Single centre experience. Doi.org/10.1016/j.healung.2019.01.811.

Panoulas VF, Monteagudo Vela M, Kalogeras K, Hurtado-Doce A, García Sáez D, Bowles CT, Simon AR. Percutaneous Impella CP exchange with preservation of transfemoral access. Cardiovasc Revasc Med. 2019 Jun 23.doi: 10.1016/j.carrev.2019.06.009.

J Dutton, A Hurtado-Doce, D Garcia-Saez, et al. Severe respiratory failure post- Total artificial heart implantation. Critical Care Medicine 47:75

J McLoughlin, J Dutton, A Hurtado-Doce, et al. Venovenous extracorporeal membrane oxygenation as a bridge to lung transplantation. Critical Care Medicine 47:515

A. Hurtado-Doce, D. Garcia-Saez, N. Lees, B. Zych, F. Riesgo-Gil, P. Mohite, G .Isgro, M. Monteagudo-Vela, F. De Robertis, B. Mahesh, U. Stock, A. Simon. VA ECMO after heart transplantation. Does the SAVE score predict survival? Perfusion, 33(1_suppl), 200. Presented at EuroELSO 2018

B. Zych, D. Garcia-Saez, P. Mohite, F. De Robertis, U. Stock, B. Mahesh, A. Reed, M. Carby, A. Hurtado, N. Lees, A. Rosenberg, A. R. Simon. Extracorporeal membrane oxygenation (ECMO) as a bridge to lung transplantation (LTx) – influence of concomitant invasive mechanical ventilation (iMV) on early and long-term outcomes. Perfusion, 33(1_suppl), 179. Presented at Euro ELSO 2018

N. Lees, A Hurtado-Doce, D. Garcia-Saez. Venovenous ECMO as a bridge to Lung transplantation. Crit Care Med. 2016 Dec;44(12 Suppl 1):319

D. García Sáez, C.T. Bowles, O.K. Maunz, B. Zych, P.N. Mohite, O. Ananiadou, N. Marczin, A. Hurtado Doce et all. Circulatory Death Heart Transplantation with adverse donor and recipient risk profile. Doi: 10.1016/j.healun.2017.01.029N.

Lees, A. Rosenberg, Hurtado-Doce A. et al. Combination of ECMO and cytokine adsorption therapy for severe sepsis with cardiogenic shock and ARDS due to Pantón–Valentine leukocidin—positive Staphylococcus aureus pneumonia and H1N1. Artif Organs. 2016 July 19.

D. García-Saez, C.T. Bowles, P.N. Mohite, B. Zych, O. Maunz, A.F. Popov, A. Hurtado, B. Raj, S.L. Rahman-Haley, N.R. Banner. Heart transplantation following Donor Circulatory Death in patients bridged to transplant with implantable left ventricular assist devices. Doi: 10.1016/j.healun.2016.05.025

J. Burns, A. Hurtado-Doce, N.J. Lees. Carboxyhemoglobin associated with hemolysis as a marker of impending oxygenator failure in VA ECMO. *Critical Care Medicine* 43(12 Suppl 1):38.Nov 2015.

A. Hurtado-Doce, D. Garcia-Saez, D. Hall, C. Hernandez, N. Lees, A. Popov, A. Simon, C. Morgan. Outcome of patients in cardiogenic shock supported with ex- tracorporeal membrane oxygenation. *Critical Care Medicine* 43(12 Suppl 1):27.Nov 2015.

N. Lees, A. Rosenberg, A. Popov, A. Hurtado-Doce, J. Jones, N. Marczin, A. Simon. Combinations ECMO and Cytokine Adsorption therapy for severe sepsis with cardiogenic shock and ARDS. *Critical Care Medicine* 43(12 Suppl 1):311.Nov 2015.

A.I. Hurtado-Doce, D. Garcia-Saez, C. Hernandez-Caballero, N.J. Lees, S. Ledot, P.N. Mohite, D. Hall, A.F. Popov, A.R. Simon, C. Morgan. Extracorporeal life sup- port for refractory cardiogenic shock. Etiology and outcome in a tertiary referral hospital. *Intensive Care Medicine Experimental* 2015, 3(suppl 1):A755

A Hurtado-Doce, C Hernandez-Caballero, P N Mohite, N J Lees, B Zych, A F Po- pov, D Hall, A F Simon, C Morgan. Extracorporeal life support as a bridge to deci- sion in acute or decompensated heart failure. *European Journal of Heart Failure* (2015) **17** (Suppl. 1):198.

A Fort, C Hernandez, A Hurtado, T Tsoutsouras, F Caetano, M Desai, J Mitchell, D Hall, C Morgan, J Farrimon. GTN to increase pulsatility in a patient with VA ECMO for refractory cardiogenic shock. *European Journal of Heart Failure* (2015) **17** (Suppl. 1): 146.

A.I. Hurtado-Doce, T.C. Barnes, C. Hernandez-Caballero, D. Hall. Incidence and outcomes of cardiac surgery-associated acute kidney injury (CSA-AKI) requiring continuous renal replacement therapy (CRRT). *Intensive Care Medicine* 2014; 40 (supp 1): S 259

C. Hernandez-Caballero, A.I. Hurtado-Doce, T.C. Barnes, D. Hall. Timing of con- tinuous renal replacement therapies in acute kidney injury alter cardiac surgery. *Intensive Care Medicine* 2014; 40 (supp 1): S57

T.C. Barnes, C. Hernandez-Caballero, A.I. Hurtado-Doce, D. Hall. Risk factors for acute kidney injury post off pump coronary artery bypass graft (OP-CABG) sur- gery and its impact on short term mortality. *Intensive Care Medicine* 2014; 40 (supp 1): S256

Rotation examples:

1. Non-ITU, non-cardiac rotation

	Monday	Tuesday	Wednesday	Thursday	Friday
	-		-		-
MORNING	Electrophysiology lab	Thoracic surgery	Thoracic surgery Anaesthetic teaching	TAVI	Thoracic surgery
AFTERNOON	Electrophysiology lab	TOE teaching MitraClip	Thoracic surgery	TAVI	

2. Cardiac rotation

	Monday	Tuesday	Wednesday	Thursday	Friday
	-		-		-
MORNING	CABG/OPCABG	Valve surgery	CABG Anaesthetic teaching	Valve surgery	Minimally invasive valve surgery
AFTERNOON	CABG/OPCABG	TOE teaching Valve surgery	MCS	CABG	Valve surgery

3. ITU rotation

	Monday	Tuesday	Wednesday	Thursday	Friday
	-		-		-
MORNING	ICU	ICU	HDU	Recovery area	ICU
AFTERNOON	ICU	ICU	HDU	Critical care teaching	Journal club
				Recovery area	ICU

*Critical care rotation includes level 3 care (ICU, Recovery area), level 2 care (HDU)

All rotations as shown above are examples or variety of clinical practice at operating theatres, angio labs, and critical care unit. On call cover is provided as 12 hours shifts, LD (long day), N (night). When on call activities commences, clinical exposure is reduced in accordance with EWTD.