



WICCEM

World Institute of
**CRITICAL CARE &
EMERGENCY MEDICINE**

Cardiac Critical Care
Fellowship program

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Cardiac Critical Care
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ADULT CARDIAC CRITICAL CARE MEDICINE FELLOWSHIP PROGRAM

An international online
educational program

Launch: Sept. 2025

Program Duration: 1 Year

Structure: 3 modules

Module Duration: 16 Weeks

**Module Outline: Didactic Lectures, MCQ,
Case Discussion, Journal Club**



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On behalf of the World Institute of Critical Care & Emergency Medicine (**WICCEM**), we welcome you to the Adult Cardiac Critical Care Fellowship.

This handbook explains the program's design and provides an overview to help you understand what to expect. Additionally, it outlines how we will support you during your study and serves as an educational roadmap for your journey with us. While the handbook is not a substitute for communication with the program staff and faculty, it serves as a valuable guide to the rules and regulations you will follow during your fellowship.

The program resources include a dedicated staff member whose role is to assist you throughout your journey. Close interaction with the program staff and faculty is essential for you to gain the maximum benefit from the fellowship.

Please read this handbook before joining the program and refer to it as needed during your fellowship.

We wish you all the best in your career.

President of the WICCEM

Foreword by the Program and Academic Directors

Welcome to the **Cardiac Critical Care Fellowship (CCCF) program**. This unique flagship educational program is offered entirely online and is structured into five modules, each worth 30 credits.

We are delighted that you have chosen to advance your education with this program, which represents a valuable investment in your future. Our aim is to provide you with curated resources and guided learning, delivered by a panel of highly qualified international clinicians. Our expert panel ensures that the curriculum is current, evidence-based, and connected to the latest research.

Your learning journey is a partnership between us, as tutors, and you, as a learner. This fully online program includes peer support, learning through online discussion groups, and periodic journal clubs. It fosters a learning environment that caters to individual needs, promotes knowledge acquisition, and facilitates the internalization of concepts.

We view teaching as a process of guided empowerment, tailored to your level as a learner and your unique learning style, to help you achieve your goals.



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Program Scope:

This program requires the participants to take 'ownership for their studies.' Enrollment is encouraged for highly motivated, autonomous students, who can manage the challenges of maintaining a work/life balance with their ongoing education. Additionally, this program is delivered wholly online. Participants are expected to engage and contribute to the activities in each 7-day cycle. Therefore time-management will be of utmost importance. Rest assured; however, the program's academic, clinical, and professional services staff are here to support you. We will be working collaboratively to ensure an optimal learner experience.

This on-line educational program is intended to provide learners with the essential clinical knowledge in the field of Cardiac Critical Care. It can be used to guide learning for their formative exams. It does not, however, replace clinical fellowship training programs undertaken in hospital settings. Clinical experience gained by patient encounters in a clinical fellowship setting is essential for achieving competence as a cardiac critical care provider. This on-line program only aims to provide you with the foundational knowledge in this growing field.

If you have any questions, concerns or problems, we would appreciate it if you raised them at an early stage with the Program Board. We sincerely hope that you will enjoy your time studying with us and wish you a very fruitful learning experience.

Ashwaq Mahdaly
Program Director
Cardiac Critical Care Consultant



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Admission is open for **All International Students** in a **Part-time Capacity**. The program is delivered in 3 modules, each module will be delivered over a 16-weeks period and will comprise: Asynchronous audio-video lectures

- Recorded synchronous tutorials
- Student-led teaching
- Reflective practice on national and international guidelines
- Real-life clinical scenarios
- Group discussion of complex cases
- Critical appraisal of scientific peer-reviewed publications
- Critical appraisal of the available evidence with reflection on local practice
- MCQs with answers and explanations
- Facilitated online discussion boards
- Live webinars

The total number of scheduled learning and teaching hours is 20 hours per module, divided into 6 hours of directed student activities and 14 hours of self-directed learning activities.

Students are expected to dedicate 12-14 hours of study per topic over the 16 weeks of the module. Additional time will be allocated to guide students during assessments (both formal and informal). Materials will be released on a 7-day cycle (refer to the timetable provided for each module). The program emphasizes developing effective clinical reasoning strategies through appraisal of the best evidence and critical reflection on practice.

We strongly encourage fellows in this program to submit their outstanding work for presentation at national and international conferences and to pursue publication in peer-reviewed journals. Guidance and mentorship for these endeavors may be provided upon request and will be considered on a case-by-case basis.



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Introduction to WICCEM

The World Institute of Critical Care & Emergency Medicine (WICCEM) is a non-commercial institution conceptualized and developed by critical care and emergency medicine professionals with proven expertise in distance education. WICCEM fosters live interactions between expert professionals in critical care and emergency medicine from around the world and hosts asynchronous global ward rounds to bridge gaps in clinical practice.

There is an urgent need to help, guide, mentor, and support colleagues dedicated to working in low- and middle-income settings. WICCEM strives to address this need by establishing a worldwide educational forum.

The institution emphasizes the practical application of all educational tools to the care of critically ill patients. WICCEM focuses on equipping clinicians with evidence-based knowledge in a learning environment that encourages questioning current practices and developing a reasoning-based approach to optimize patient care.

WICCEM is your institution, enriched by your knowledge and active participation. It fosters self-directed learning by connecting you with experienced colleagues worldwide, enabling you to share challenges and gain their support.

Let me know if any further edits are needed!

Communication with Learners

Email: Communication with learners is conducted through the WICCEM email account created upon joining the CCC Fellowship Program. It is essential to check your inbox daily during term time and periodically during vacation periods.

Other Communication Tools:

Other communication tools are utilized to enhance interaction with students and facilitate engagement. These include Zoom, Microsoft Teams, direct telephone calls, WhatsApp, Telegram, and Messenger.



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Learning Management System (LMS)

The LMS is a digital learning platform used for delivering the program educational materials through an easy-to-use system. It allows interactive discussion and engagement of the students and provides an excellent learning experience.

For further information on the LMS visit:

https://en.wikipedia.org/wiki/Learning_management_system#Characteristics

Administration and Technical Support

ICOM Group is the official business and management company in charge of the Fellowship Project. Administration, students' admission, LMS Management and technical support are provided by ICOM.

Fellows' Admission

Admissions are open on a four-month cycle. Dates and deadlines for the application process will be announced in due course. Early applications are encouraged to allow sufficient time for review. Once the program reaches full capacity, further applications will no longer be considered.

Cost Information

The Fellowship is a **non-commercial program**; however, it requires fees to cover administrative expenses, technology, and educational materials. Registration fees will be announced when the call for applications is opened. Payment will only be requested after your application has been reviewed and confirmed to meet all admission requirements.



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Patient Anonymity

Patient confidentiality must be maintained in all clinical discussions. Throughout your coursework and discussion forums, avoid any reference to patient names, identification numbers, medical record numbers, or any other information that could potentially identify a patient. Ensuring this is your responsibility. Any disclosure of information that could lead to patient identification will be considered a serious professional breach of trust.

Although the program is not subject to local health authority regulations, it will adhere strictly to their guidance on patient confidentiality.

Any breach of the statements outlined by the guiding regulations may result in referral to an academic integrity investigation by the Program Director, which in turn may result in removal from the module or failure of an assessment.

Accreditation

The fellowship is accredited by the **American Association of Continuing Medical Education® for 30 credits for each module (90 total credits)**



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Program Director

Ashwaq Mahdaly MD MBBS , CPHQ, EDIC,ERS

Pulmonary Critical Care Consultant, King Fahad Medical City , Riyadh , KSA.

Quality Chair person KFMC, Program Co director of Cardiac Critical Care fellowship

Academic Director

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Associate Professor, Critical Care Medicine and Anesthesiology, University of Western Ontario, Canada.

Academic Co-Director

Dr.Ahmad Al Ghamdi

Cardiac Critical Care Consultant, Head of Department, Cardiac Surgical ICU, King Fahad Medical City, Riyadh, KSA.

Academic Board (alphabetical by surname):

Dr. Thamer Alaifan: Critical Care Consultant, National Guard Hospital, Jeddah, KSA

Dr. Mirvat Alasnag: Director of Cardiac Catheterization Laboratory, SCAI International Chair, TCT
Middle East Regional Director, KSA

Dr. Aws Alherbish: King Saud University, KSA. Associate Professor, University of Alberta, Canada

Dr. Daniel Bainbridge: Professor, Western University. Cardiac Surgical ICU Director, LHSC, Canada

Dr. Paul Cameron: Critical Care Western Program Director, Assistant Professor, Division of Critical
Care Medicine, Department of Medicine, Western University, Canada



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Dr. Aravind Chandrasekaran: Critical Care Medicine & Anesthesiology Consultant, Director of ECMO Program, Chennai, Tamil Nadu, India

Dr. Ali Ait Hssain: Consultant Intensivist at Hamad Medical Corporation, Professor of Clinical Medicine, at Weill Cornell Medicine, Qatar

Dr. Manu Malbrain: MD PhD Professor of Internal Medicine – Intensive Care, Belgium

Dr. Giles Peek: Professor, Chief of Pediatric Cardiothoracic Surgery, Children's Hospital at Montefiore, UK

Dr. Agya Prempeh: MB CHB Assistant Clinical Professor, Cardiac Anesthesiology, UCS, California, USA

Dr. Osama Sefein: Anesthesia Fellowship Director, CSICU Education Director, Assistant Professor, Department of Anesthesia & Perioperative Medicine, Western University, Canada

Dr. Jeffrey Scott: MBA, FCCM, Director Transplant Critical Care Miami Transplant institute .USA.

Dr. Ahmed Zaki: MD, FICM, EDIC. Consultant Cardiac ICU, Manchester Foundation Trust, UK

International Guest Speakers

The scientific committee will invite international speakers to have life-presentations and discussion with students using zoom videoconferences.



Program Structure

Aims and Objectives

This course is the first of its kind to deliver up-to-date knowledge and evidence-based clinical experience in **Adult Cardiac Critical Care Fellowship**. The program is offered entirely online through an interactive electronic platform, providing a high-quality interface for learning and teaching. It includes keynote lectures, a variety of interactive discussion boards, and a series of parallel journal clubs. The program consists of 3 modules, each worth 30 credits (200 hours of directed and self-directed learning – see Table 1).

- English language examination is NOT required for those who studied medicine in English; others need to demonstrate evidence of a good command of English.

Directed (Virtual Classroom) Learning	
The expected number of hours for each student per week engaged in the virtual classroom in the discussion, dedicated to task group work and individual assignment.	6 hours
Total number of hours per module	72 hours
Self-directed (Non-virtual Classroom) Learning	
The expected number of hours for each student per week reading to support engagement in discussion board and individual assessment.	11 hours
Total number of hours per module	128 hours



Table 1: Breakdown of directed and self-directed learning.

This program teaches both basic and advanced clinical knowledge in Adult Cardiac Critical Care Fellowship. While the program is not a substitute for practical clinical training, it enhances practice and boosts clinical experience by providing reflective learning and clinical-based training.

Program Description, Overview and Philosophy

The Fellowship Program is delivered by cardiac critical care experts from various reputable national and international programs to enhance candidates' exposure to diverse clinical experiences and practices. The education is provided through online lectures, case-based discussions, critical appraisal of scientific papers, and problem-solving exercises. Clinical scenarios and real-life practical experiences are discussed online (asynchronously) by experts in the field. The lectures are delivered asynchronously to overcome challenges posed by time zone differences and maximize mutual engagement.

- **Teaching and Learning Methods**

This program emphasizes the practical implementation of ADULT CARDIAC CRITICAL CARE FELLOWSHIP knowledge and fosters analysis, questioning and reasoning of the current practice, and compares it with the recent best available scientific evidence (table 2).

Teaching and Learning Methods	
1	On-line delivery using pre-recorded, asynchronous keynote lectures, on-line tutorials, videos, podcasts, case studies: supported by facilitated discussion boards, journal club and facilitation of group interaction.
2	Evidence based learning and practice. Critical appraisal of scientific papers and professional documents.
3	Critical reflection on practice in the workplace through the on-line platform.
4	Implement the best available evidence to tailor the treatment within the boundaries of the local resources
5	Individual (formal and informal) tutorial support to prepare for assessment as required.
6	Individual tutorial support of underperforming students.



Table 2: Teaching and Learning Methods.

Here's the corrected version of your text:

Candidates will be encouraged to formalize treatment plans for routine, challenging, and complex clinical cases. The platform offers an extensively equipped electronic library (e-library) that facilitates access to critical scientific papers and textbooks covering a wide range of Adult Cardiac Critical Care Fellowship topics. Candidates are also encouraged to write scientific articles for publication in peer-reviewed journals and present abstracts at international conferences. This approach maximizes their learning experience and improves their employability prospects.

This mixed pedagogy is particularly effective when students bring valuable knowledge and expertise to the online classroom. The learning and teaching strategy is designed to guide students through a reflective learning environment in a structured manner over a 16-week period. This approach uses case-based examples to demonstrate how foundational knowledge and understanding can be applied across the theory-clinical interface. It will be supported by a robust, current evidence base.

- **Underperforming Students**

Underperforming students are identified by the module lead and reported to the program director. The reason for underperformance is investigated by the program director and rectified. Individual tutorial support for underperforming students is delivered by the module leads/program director (table 2).

- **Eligibility**

1. Medical graduates.
2. Has worked or currently working in Adult Cardiac Critical Care Fellowship dealing with adult & Cardiac Critical patient
3. Those who have the opportunity to work in Adult Cardiac Critical Care Fellowship
4. Fellows have to submit summative assignments. These assignments are in the form of MCQs, clinical case scenarios, and critical appraisal of scientific papers. The fellows have the option to submit a draft for review (formative assessment) before the final submission. A regular informal formative assessment during the course is known to drive learning and, thereby, will enrich the learning process with a resultant long-lasting educational outcome. By employing various assessment strategies, the faculty aims to negate each technique's limitations and, thereby, make the assessment process more robust. Senior clinicians supervise the assessment in the relevant fields to ensure achieving the planned learning objectives.



Students should contribute to more than **66%** of the discussion scientific materials and journal club to be eligible to take the exam.

- **Marking**

Marking criteria for each assessment will be available on the module's online space. Each assignment is marked by examiners. A random sample of the marked assignments is ratified by an external examiner assigned by the program managers before submitting the results to the exam board for approval.

- **Re-sit**

One resubmission of any unsatisfactory assignment is allowed generally within one month of the date of the release of the results (after approval by the exam board).

- **Exit Awards**

The ADULT CARDIAC CRITICAL CARE FELLOWSHIP (90 credits) is awarded after successfully completing the 3 modules (16 weeks each).

- **Extensions**

Extensions to coursework submission deadlines are only available on written agreement from the Board of Examiners and after submitting evidence of extenuating circumstances.

Extenuating Circumstances

Fellows are allowed to delay their assignment submission and apply for extension in case of unforeseen circumstances affecting their performance before or during the assessment process. Fellows must submit evidence to support their claim of their right for extension and consider their eligibility for extenuating circumstances to the Board of Examiners.

Academic Integrity Policy and Academic Writing

Here's the corrected version of your text:

The Adult Cardiac Critical Care Fellowship is committed to delivering a high standard of education in the field of adult cardiac critical care and maintaining the value of its awards. Therefore, all fellows are required to complete a compulsory short module taught by experienced members of the scientific committee. This module covers the principles of evidence-based medicine, presentation skills, academic integrity, plagiarism, the principles of academic writing, and the impact of academic misconduct on the integrity of science. The tutorial is supported by practical exercises to ensure a thorough understanding of these important academic principles.



Spectrum of Offences and Penalties Applied

Fellows must produce their own work, understand the principles of proper referencing, respect the copyrights and expect to practice intellectual honesty.

The Fellowship Program employs a plagiarism software checker for any submitted work. Any academic misconduct will be taken seriously and may lead to a penalty which could be up to termination of the study.

The following code of practice on assessment (figure 1) will be explained to the students at the beginning of their study:

Category A

- Minor error (missing quotation mark, minor mistakes in referencing).
- Mark penalty (up to 10% of maximum mark), as laid out in the marking scheme, with detailed feedback on how to avoid error in the future.

Category B

- Poor academic practice (poor paraphrasing and inadequate referencing).
- Assignment mark is capped at the minimum pass grade for assignment (50%).
- Advice is given to avoid any future poor academic practice.

Category C

- Plagiarism, copying, collusion or dishonest use of data.
- Committing category B twice.
- 0% for the assignment and have to resubmit it after the appropriate amendments.
- Written warning.
- Advice is given to avoid any future offences.

Category D

- A second or subsequent category C offence following the first written warning, thereby an intent to deceive.
 - The student fails the whole module
-
- If a student accumulates sufficient modules with 0% due to multiple category D offences, then the Board of Examiners could exercise the right to **terminate** studies due to a lack of satisfactory progress.

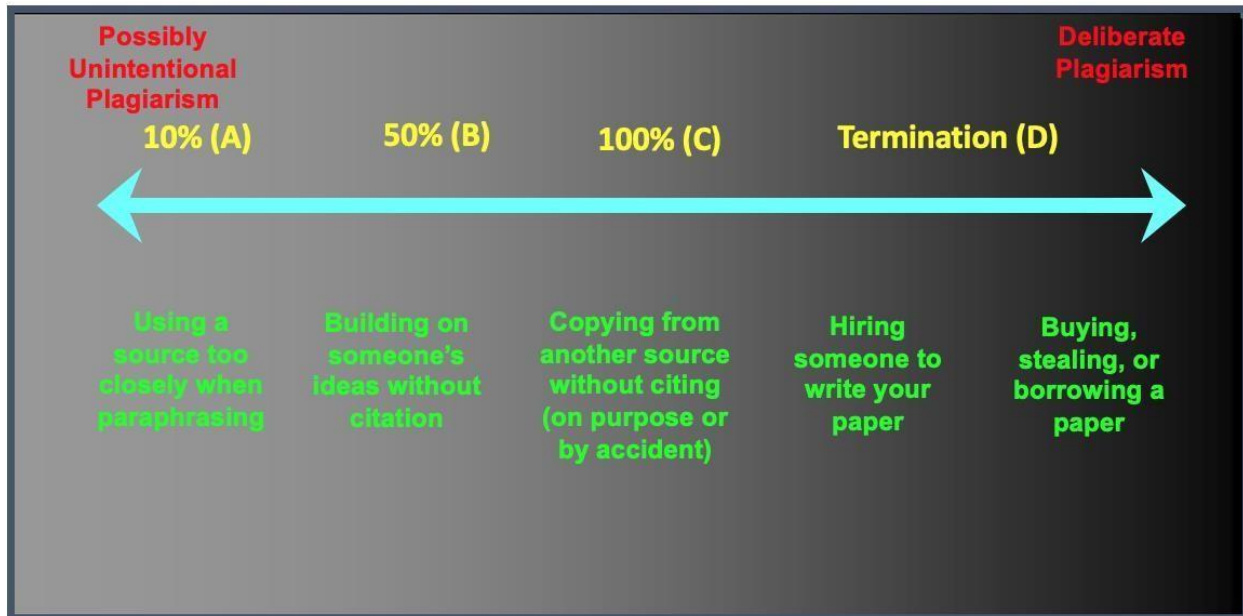


Figure 1: Spectrum of offenses implemented in the program.

Our academic integrity policy is adapted from University of Kentucky Academic Offenses Rules for Undergraduate and Graduate Students:

<https://www.uky.edu/universitysenate/ao>

Board of Examiners

The Board of Examiners is committed to managing and overseeing the education process and ensuring the delivery of intended learning objectives. The panel consists of the following members of staff:

- Program director (chairperson).
- Academic Director
- Academic Co-Directors
- Module leads.



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It has the following responsibilities:

- Endorses the exam results.
- Approves the extenuating circumstances.
- Ratifies the penalty for those students who committed plagiarism and academic dishonesty.
- Making recommendations for underperforming students and suggesting the level of support they require.

Board of Directors:

The Board of Directors is committed to managing and overseeing all aspects of the program including visions, missions, values and promotion of the program. The board sets strategy and structure, shares in decision making and future directions. its overall purpose is to identify any gaps or deficiencies and suggests the necessary changes.

The board meets 2 times/year and when necessary.

The board consists of the following personnel:

1. The Program Director
2. Academic Director and co-directors
3. The president of the **World Institute of Critical Care & Emergency Medicine (WICCEM)**



Syllabus

Module Topics & Lectures:

I. Module 1: Foundations of Cardiac Critical Care (16 weeks)

- 1. Cardiovascular Anatomy & Pathophysiology (1 week)**
- 2. Cardiovascular Pharmacology (1 week)**
- 3. Hemodynamic Monitoring (2 weeks)**
- 4. Critical Care Management of Cardiovascular Emergencies (2 weeks)**
- 5. Critical Care Ultrasound (6 weeks)**
- 6. Module Exam (3 weeks)**

Module Objectives:

This module introduces basic concepts and covers topics integral to cardiac critical care practice.

1. Cardiovascular anatomy and pathophysiology
 1. Physiology and anatomy of the coronary blood supply
 2. Basic interpretation of coronary angiography, left and right heart catheterization
 3. Frank Starling physiology and the cardiac pressure-volume loop in various disease states
 4. Determinants of cardiac output, systemic vascular resistance, and pulmonary vascular resistance
 5. Pathophysiology of shock states
2. Cardiovascular pharmacology
 1. Pharmacology of inotropes, vasopressors, inodilators, antiarrhythmics, antihypertensives
 2. Pharmacology of anti-failure medications
 3. Pharmacology of anticoagulants and reversal agents



3. Hemodynamics
 1. Invasive and non-invasive arterial pressure and ECG monitoring
 2. Central venous pressure monitoring
 3. Pulmonary artery catheterization and monitoring
 4. Central and mixed venous blood gas interpretation and CO₂ gradients
4. Critical care management of cardiovascular emergencies
 1. Critical care management of decompensated valvular disease
 2. Acute management of acute coronary syndrome
 3. Critical care management of aortic dissection
 4. Critical care management of decompensated heart failure and cardiogenic shock
5. Critical care ultrasound in cardiac perioperative management
 1. Ultrasound of the lung and pleura in critical care
 2. Basic ultrasound physics and modes
 3. Basic transthoracic echocardiography views
 4. Essential transesophageal echocardiography views
 5. Structural heart disease (patent foramen ovale, atrial septal defects, ventricular septal defects)
 6. Assessment of left ventricular size and function (including regional wall motion abnormalities)
 7. Assessment of right ventricular size and function
 8. Perioperative valvular assessment
 9. Pericardial disease and postoperative tamponade
 10. Volume status assessment with ultrasound

I. Module 2: Perioperative Cardiac Care (16 weeks):

1. **Basic Intraoperative and Postoperative Care (3 weeks)**
2. **Postoperative Complication Management Part I (5 weeks)**
3. **Postoperative Complication Management Part II (5 weeks)**
4. **Module Exam (3 weeks)**

Objectives:

This module encompasses core topics in cardiac critical care.

1. Basic intraoperative management:
 - a. Overview of cardiopulmonary bypass (CPB) physiology
 - b. Cannulation strategies for CPB
 - c. Intraoperative cardioplegia and myocardial protection
 - d. Intraoperative anticoagulation and anticoagulation reversal
 - e. Basic surgical steps of coronary artery bypass grafting, valve replacement & repair (via sternotomy versus minithoracotomy), Ross procedure, David procedure,



ascending aortic surgery, atrial septal defect closure, ventricular septal defect closure, cryomaze ablation procedure, hybrid arch frozen elephant trunk repair, and pericardiectomy

f. Weaning from CPB

2. Routine aspects of post cardiac surgery care for coronary artery bypass grafting, valve repair/replacement, ascending aortic surgery
3. Postoperative care of transcatheter aortic valve insertion (TAVI) patients, Ross procedures, hybrid arch frozen elephant trunk repair, and pericardiectomy
4. Cardiac surgery complication management

1. Perioperative bleeding, postoperative tamponade, and pericarditis
2. Postoperative low cardiac output syndrome (LCOS), myocardial infarction and hyperlactatemia
3. Surgical and postoperative management of pulmonary embolism
4. Right ventricular failure management
5. Post cardiac surgery vasoplegic syndrome
6. Cardiac arrest post cardiac surgery (CALS Protocol)
7. Dynamic left ventricular outflow obstruction
8. Arrhythmias post cardiac surgery & pacemaker troubleshooting
9. Post-cardiac and post-lung transplant management
10. Neurologic complications after cardiac surgery with focus on delirium, cerebrovascular events, post bypass cognitive dysfunction, and perioperative visual loss
11. Renal complications of cardiac surgery, protective measures against acute kidney injury, and early versus late continuous renal replacement therapy (CRRT)
12. GI complications of cardiac surgery with focus on Ogilvie syndrome and bowel ischemia
13. Pulmonary complications after cardiac surgery, mediastinitis, sternal dehiscence, and infectious complications
14. Comprehensive critical care of the cardiac surgery patient: routine sedation and ventilation management, physiotherapy, and nutrition

Approach to prolonged ventilation and early versus late tracheostomy

III. Module 3: Mechanical Circulatory Support (16 weeks):

- a. **Extra-corporeal membrane oxygenation (6 weeks)**
- b. **IABP, Impella, LVADs, RVADs (6 weeks)**
- c. **Module exam (3 weeks)**



Objectives: Understand the basic tenets of critical care management of patients on mechanical circulatory support

1. Venous-arterial extracorporeal membrane oxygenation (VA ECMO) - 3 weeks
 - Indications including postcardiotomy shock and contraindications
 - Basic ECMO circuit physiology
 - Basic VA ECMO cannulation strategies
 - Initiation and maintenance of VA ECMO
 - Common complications of VA ECMO
 - Left Heart Venting in Patients on VA ECMO (medical & surgical)
 - Troubleshooting
 - Weaning VA ECMO
 - Evidence for VA ECMO utilization and outcomes
 - Extracorporeal cardiopulmonary resuscitation (E-CPR)
 - Anticoagulation on VA ECMO
2. Venous-venous extracorporeal membrane oxygenation (VV ECMO) - 2 weeks
 - Indications and contraindications
 - Basic ECMO circuit physiology
 - Basic VV ECMO cannulation strategies
 - Initiation and maintenance of VV ECMO
 - Common complications of VV ECMO
 - Troubleshooting (including an approach to hypoxia on VV-ECMO)
 - Weaning VV ECMO
 - Evidence for VV ECMO
 - Anticoagulation on VV ECMO
2. The role of echocardiographic assessment in ECMO patients
3. Intra-aortic balloon pumps (IABP)
 - Indications, device components, mechanism, and waveform analysis
 - Complications, contraindications, troubleshooting, weaning, and anticoagulation
 - Evidence for IABP utilization
4. Microaxial flow-pumps left heart support (Impella)
 - Indications, device components, mechanism, and waveform analysis
 - Complications, contraindications, troubleshooting, weaning, and anticoagulation
 - Evidence for Impella utilization
5. Long-term left ventricular assist devices (LVAD)
 - Indications, contraindications, device components, basic postoperative management
 - Complications, troubleshooting, and anticoagulation
 - Evidence for long-term LVAD utilization
6. Right-ventricular assist devices (RVAD)
 - Indications, modalities, and strategies
 - Basic critical care management, troubleshooting and complications



- Weaning and post RVAD outcomes

Final Exam

Comprehensive Final Exam will be released after completing the 3 modules. Eligible candidates will have 3 weeks to finalize their assignments

Module I

I-Foundations of Cardiac Critical Care (16 weeks):

Time	Topic
Sep 2025 Week 1 Sep 1	Discussion Webinar <u>I-Foundations of Cardiac Critical Care (16 weeks):</u> <ul style="list-style-type: none">• Applied cardiovascular physiology• Invasive and non-invasive arterial pressure and ECG monitoring• Central venous pressure monitoring• Pulmonary artery catheterization• Transpulmonary thermodilution
Week 2 8 Sep	<ul style="list-style-type: none">• Applied cardiovascular pharmacology
Week 3 15 Sep	- Hemodynamic Monitoring <ul style="list-style-type: none">• PAC, central and mixed venous blood gas interpretation and CO₂ gradients



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Week 4 22 Sep	Critical care management of cardiovascular emergencies Part I
Week 5 6 OCT	Critical care management of cardiovascular emergencies Part II



Week 6 13 OCT	Discussion Webinar Left heart & Right heart cath: A case discussion
Week 7 20 OCT	III-Critical Care Ultrasound Basic ultrasound physics and modes Basic transthoracic echocardiography views
Week 8 27 OCT	Essential transesophageal echocardiography views Structural heart disease (patent foramen ovale, atrial septal defects, ventricular septal defects)
Week 9 3 NOV	Assessment of left ventricular size and function (including regional wall motion abnormalities) Assessment of right ventricular size and function
Week 10 10 Nov	Hemodynamic assessment with TEE Pericardial disease and postoperative tamponade
Week 11 17 Nov	Perioperative valvular assessment



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Week 12
24 Nov

Discussion Webinar

- Ultrasound of the lung and pleura in critical care.
- Volume responsiveness assesment



Week 13 1 DEC	IV- Semi-Final assignments and exam

Module II

Perioperative Cardiac Care

Time	Topic
2025 Week 1 8 DEC	I- Preoperative, Intraoperative and Basic Postoperative Care Intraoperative Care <ol style="list-style-type: none">1. Overview of CPB & essential monitoring for CPB2. Cannulation strategies for CPB, anesthetic considerations, intraoperative anticoagulation and anticoagulation reversal, antifibrinolytics, intraoperative myocardial protection, weaning from CPB.



<p>Week 2 15 DEC</p>	<p>Basic surgical steps for CABG, valve replacement/repair (sternotomy or minithoracotomy), aortic surgery, Ross procedures, hybrid arch frozen elephant trunk repair, pericardiectomy, and transcatheter aortic valve insertion (TAVI) patients</p>
<p>Week 3 22 DEC</p>	<p>Discussion Webinar Routine aspects of postoperative care of the cardiac surgery patient.</p>



Week 4 29 DEC	II -Postoperative Management Part I 1- Perioperative bleeding and tamponade
Week 5 5 Jan	2-Postoperative low cardiac output syndrome (LCOS) and hyperlactatemia Postoperative myocardial infarction
Week 6 12 Jan	3-RV failure management
Week 7 19 Jan	4-Post Cardiac surgery vasoplegic syndrome Dynamic LVOT obstruction
Week 8 26 jan	5-Cardiac arrest post cardiac surgery (CALS Protocol)
Week 9 2 Feb	Discussion Webinar Comprehensive critical care of the cardiac surgery patient: routine sedation and ventilation management, physiotherapy, and nutrition
Week 10 9 Feb	III -Postoperative Management Part II 1-Arrhythmias post cardiac surgery & pacemaker troubleshooting.
Week 11 16 feb	2-Post-cardiac and post-lung transplant management
Week 12 23 Feb	3-Neurologic complications after cardiac surgery, EEG monitoring and imaging interpretation
Week 13 2 Mar	4-Overview of management of pulmonary embolism (PE) and postoperative care of surgically treated PE



Week 14 9 Mar	5-Pulmonary, renal (early versus late CRRT), and GI complications of cardiac surgery (Ogilvie's syndrome & bowel ischemia)
Week 15 16 Mar	IV- Semi-Final assignments and exam

Module III

III- Mechanical Circulatory Support:

Time	Topic
2026 Week 1 23 Mar	1- Extracorporeal membrane oxygenation 1- VA overview, indications (including postcardiotomy shock) and contraindications <ul style="list-style-type: none"> ○ Basic ECMO circuit physiology ○ Basic VA ECMO cannulation strategies
Week 2 30 Mar	2- Initiation and maintenance of VA ECMO Common complications of VA ECMO Left Heart Venting in Patients on VA ECMO.
Week 3 6 April	Evidence for VA ECMO utilization and outcomes Extracorporeal cardiopulmonary resuscitation (E-CPR) Anticoagulation on VA ECMO



Week 4 13 April	Focus review on Veno-venous extracorporeal membrane oxygenation (VV ECMO) in cardiac surgery patients
Week 5 20 April	Discussion Webinar / workshop Troubleshooting VA ECMO
Week 6 27 April	1-IABP
Week 7 4 May	2-Impella
Week 8 11 May	3- Durable LVADs
Week 9 18 May	4-RVADS, BiVAD
Week 10 25 May	Discussion Webinar Echocardiography in MCS Patients
Week 11 1 Jun	IV- Semi-Final assignments and exam



WICCEM
World Institute of
**CRITICAL CARE &
EMERGENCY MEDICINE**

Cardiac Critical Care Fellowship program

Graduation Day: 15 Jun, 2026

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