

Title	Aims and goal	Learning outcomes/objectives
Pitfalls in managing refractory hypoxemia on V-V ECMO	This workshop provides a systematic approach of analyzing patient-ECMO interactions that can lead to severe, refractory hypoxemia on V-V ECMO. This is a review workshop that entail a theoretical part combined with immersive high fidelity simulation with debriefing of refractory hypoxemia during V-V ECMO support.	<ul style="list-style-type: none"> - Define "hypoxemia" on VV ECMO - review the notions of oxygen transport and oxygen delivery - Understand the physiology of hypoxemia on VV ECMO - assess a patient by using a systematic approach for hypoxemia - consider all the possible etiologies of hypoxemia while on V-V ECMO - apply all the potential therapeutic interventions to correct the hypoxemia
Renal Replacement Therapy and Plasmapheresis and ECMO - a practical approach	<p>Through theoretical presentation and simulation provide an understanding of both the theory of CRRT/plasmapheresis and ECMO and practical skills</p> <ul style="list-style-type: none"> • Describe indications for renal replacement therapy and plasmapheresis on ECMO • Demonstrate practical process of connecting and disconnecting CRRT/Plasmapheresis circuit on to ECMO circuit • Discuss complications and challenges of different approaches to CRRT/Plasmapheresis on the ECMO circuit • Discuss prevention and troubleshooting of complications 	<ul style="list-style-type: none"> • Identify indications for connecting CRRT/ Plasmapheresis to the ECMO circuit • Demonstrate safe connection and disconnection of CRRT/Plasmapheresis to the ECMO circuit • Understand prevention and trouble shooting of complications in clinical setting • Understand complications and challenges of different approaches to CRRT/Plasmapheresis on the ECMO circuit and provide solutions to prevent or overcome these
ECPR Cannulation	This workshop provides insights how to perform cannulation via percutaneous vascular access during resuscitation of the arresting patient using mechanical circulatory support system.	<p>High quality CPR use of mechanical chest compression devices</p> <ul style="list-style-type: none"> - percutaneous vascular access - ECMO management - team logistic - team communication
How to debrief during ECMO simulation?	Basic knowledge and skills of debriefing during ECMO simulation. Identifying the difference between feedback and debriefing.	<p>Debriefing structure</p> <ul style="list-style-type: none"> - Debriefing tools - RRAA (reaction, retrospection, analysis, application) or FDAA (feelings, description, analysis, application) - Debriefing or Feedback or THM (take home message)
Ultrasound and echo essentials for ECMO	Basic knowledge and skills with hands-on ultrasound guided ECMO cannulation and cannulas positions with ultrasound and ECHO.	<ul style="list-style-type: none"> - Low-fidelity simulation with Ultrasound - High-fidelity with SP (standardized patient) - Tips and tricks for percutaneous approach - Tips and tricks for basic “windows” for cannulas positions
ECMO Transport	Basic knowledge and skills for ECMO transport and checklist.	<ul style="list-style-type: none"> - How to create team for transportation - How to choose devices needed for transportation - How to care for patient with ECMO device during transport - How to create and work with checklist
Managing complications of V-A ECMO	Participants will achieve a greater understanding of how to run peripheral VA ECMO safely, to recognise when complications	Tutorial on complications of VA ECMO

	<p>are occurring, and how to successfully manage them.</p>	<ul style="list-style-type: none"> - Harlequin syndrome: clinical features, causes, how to diagnose, and management options - LV distension: clinical features, causes, how to diagnose, and management options <p>Simulation scenario using high-fidelity mannekin, Cardiohelp console with HLS circuit, and invasive monitoring to illustrate educational learning points</p> <ul style="list-style-type: none"> - Understanding of peripheral VA ECMO circuit anatomy including retrograde blood flow - Understanding of complications of VA ECMO, specifically Harlequin syndrome and LV distension - Appreciation of clinical features, recognition of complications, symptomatology, and management options - Opportunity to take part in simulation scenario to consolidate learning through direct experience and/or debriefing
<p>Ultrasound-guided cannulation for ECLS/ECMO</p>	<p>The participants should get a good overview of the safe execution of different cannulation strategies using ultrasound guidance</p>	<p>Demonstration, practical guidance and practice (simulation) of ultrasound-guided cannulation for VV- and VA-ECMO with single- and double-lumen cannulas, jugular and inguinal access. A specific focus will be placed on techniques for echocardiographic guidance and further tricks for the implantation of double-lumen cannulas via jugular access. The trainers will show and explain criteria and requirements for successful jugular cannulation. Potential periinterventional complications will be explained and complication management will be practiced during the sessions. Finally, replacement strategies for relocation of dislocated cannulas during ongoing ECMO support will be trained. High-end simulators will allow training close to real-life conditions.</p> <p>All participants should be able to understand benefits, caveats and challenges of different cannulation strategies; participants with prior experience in ECMO cannulation will be able to adopt the strategies for their clinical practice.</p>
<p>Virtual Reality ECMO Scenario</p>	<p>Immersive, three-dimensional experience of ECMO cannulation perceived through a device known as a Virtual Reality and transformation into augmented reality.</p>	<p>The user will perform an ECMO cannulation in a computer-generated ICU environment with scenes and objects that appear in a simulated 3D environment that enables users to explore and interact with a virtual surrounding in a way that approximates reality, as it is perceived through the users' senses.</p>

<p>Mechanical Life Support (MLS)</p>	<p>This is a demonstration of part of the new 1-day Mechanical Life Support (MLS ©) course developed to aid doctors and nurses in the initial management of emergencies in patients with mechanical circulatory support. In this education corner we will give an overview of advanced heart failure and emergency management of patients with LVAD, Impella & ECMO. This will be followed by a practical hands on session with simulation of ECMO & LVAD emergencies.</p>	<ol style="list-style-type: none"> 1. Advanced heart failure overview <ul style="list-style-type: none"> - diagnosis and risk stratification - management arms 2. Mechanical circulatory support overview <ul style="list-style-type: none"> - LVAD - Impella - ECMO 3. Resuscitation strategies including emergency algorithms <ul style="list-style-type: none"> - hands on time with devices - emergency interventions on ECMO and LVAD - simulation in ECMO and LVAD scenarios
<p>“As good as it gets” - Pediatric ECMO</p>	<p>The goal of the training is to 1) acquire basic and advance knowledge and competencies in managing children on ECMO, and 2) develop adequate multidisciplinary teamwork skills to manage children on advanced mechanical life support.</p>	<p>This immersive hands-on workshop and high fidelity simulation provides the latest techniques and technology surrounding the clinical use of ECMO, including novel educational models. Through various multilevel, simple and advanced clinical scenarios, we will apply the knowledge gained in the understanding and managing children supported on ECMO utilizing high fidelity simulation mannequins and educational modalities with international, experienced facilitators. Upon completion of this activity, participants should be able to:</p> <ul style="list-style-type: none"> • Recognize major indications and contraindications of VV and VA ECMO • Identify and illustrate the most effective cannulation strategy • Evaluate the modality of ECMO support most appropriate for the patient • To be able to recognise and address routine and catastrophic ECMO problems • Recognize, identify and assess causes and response to treatment for inadequate oxygen delivery • Differentiate the interaction ECMO has on various patient organ systems • Induction to multidisciplinary teamwork and basic pathway during ECPR in and out of ICU • Basics of ECMO air and road transport • Work and communicate clearly with multi-disciplinary team using closed loop communication

Preliminary details Educational Corners as per February 2023