

Title	Aims and goal	Learning outcomes/objectives
<b>W1 Emergencies on mechanical circulatory support</b>	<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 &amp; ECMO. This will be followed by a practical hands on session with simulation of ECMO emergencies.</p>	<p>The following curriculum is designed to provide an overview of contemporary advanced heart failure management and mechanical circulatory support with further in depth knowledge around mechanical life support in ECMO patients.</p> <ol style="list-style-type: none"> <li><b>1. Heart failure</b> <ol style="list-style-type: none"> <li>a. Epidemiology</li> <li>b. Diagnosis</li> <li>c. Management</li> </ol> </li> <li><b>2. Advanced Heart failure</b> <ol style="list-style-type: none"> <li>a. Medical and intensive care management</li> <li>b. Temporary mechanical support devices</li> </ol> </li> <li><b>3. Heart Transplantation</b> <ol style="list-style-type: none"> <li>a. Indications for routine, urgent, super-urgent listing</li> <li>b. Perioperative and longer-term care</li> </ol> </li> <li><b>4. Ventricular assist devices</b> <ol style="list-style-type: none"> <li>a. Device types</li> <li>b. Physiological changes</li> </ol> </li> <li><b>5. Mechanical Life Support Algorithm</b> <ol style="list-style-type: none"> <li>a. Algorithm rationale for LVAD, Impella &amp; ECMO</li> <li>b. Common emergency scenarios in ECMO</li> <li>c. Simulation experience in ECMO</li> </ol> </li> </ol>
<b>W2 Managing refractory hypoxemia on V-V ECMO</b>	<p>Despite technical innovations, the most important limitation during V-V ECMO may be refractory hypoxemia. This workshop provides a systematic approach of analyzing patient-ECMO interactions that can lead to severe 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.</p>	<p>Definition of refractory hypoxemia during V-V ECMO  understanding the pathophysiology, review all the possible etiologies, and explore all the potential interventions.</p>
<b>W3 Renal replacement therapy and plasmapheresis and ECMO</b>	<p>To give an understanding of the practical aspects of managing renal replacement therapy (CRRT) and plasmapheresis on ECMO.</p> <ul style="list-style-type: none"> <li>• Describe indications for renal replacement therapy and plasmapheresis on ECMO</li> <li>• Demonstrate practical process of connecting and disconnecting CRRT/Plasmapheresis circuit on to ECMO circuit</li> <li>• Discuss complications and challenges of different approaches to CRRT/Plasmapheresis on the ECMO circuit.</li> </ul>	<ul style="list-style-type: none"> <li>• Describe indications for connecting CRRT/Plasmapheresis to the ECMO circuit</li> <li>• Demonstrate safe connection of CRRT/Plasmapheresis to the ECMO circuit</li> <li>• Demonstrate safe disconnection of CRRT/Plasmapheresis from the ECMO circuit</li> <li>• Describe complications and challenges of different approaches to CRRT/Plasmapheresis on the ECMO circuit and provide solutions to prevent or overcome these.</li> </ul>
<b>W4 How to perform perfect simulation</b>	<p>Simulation may be introduced into practice via different modalities. As many new programs are established, ECLS technology is advancing, and improving team performance is becoming more important. The information provided in this workshop will help participants to extend their knowledge about simulation techniques</p>	<p>Providing almost-real-life scenarios from which teams can practice, debriefing and evaluating what aspects of team performance needs improvement, feedback and conversation from participants.</p>

	and to improve team performance on the life-saving interventions that ECMO can provide.	
<b>W5 Trouble shooting V-V ECMO</b>	The overall goal of respiratory extracorporeal support is to manage respiratory failure-induced hypoxemia and hypercarbia to allow “lung rest” and promote recovery. This workshop will provide an overview about common difficulties that clinicians may encounter while managing patients during V-V ECMO. Scenarios will be demonstrated using high-fidelity simulation.	Common difficulties that a clinician may encounter while managing patients during VV-ECMO support include ventilation problems, refractory hypoxemia, recirculation, low ECMO-flow-to-cardiac-output ratio, malfunctioning critical circuit components, lack of clarity regarding optimal hemoglobin levels, bleeding complications, and right ventricular dysfunction.
<b>W6 ECPR cannulation</b>	This workshop provides insights how to perform cannulation via percutaneous vascular access during resuscitation of the arresting patient using mechanical circulatory support system.	We offer a basic training in advanced vascular access procedure to implement ECLS in order to cardiopulmonary resuscitation both in in-hospital (IHCA) and in out-of-hospital cardiac arrest (OHCA). Team logistics and all requirements for Extracorporeal Cardiopulmonary Resuscitation (ECPR) will be discussed.
<b>W7 Adventure in pediatric ECMO:</b>	<p>Paediatric cardiothoracic intensivists, ECMO specialists, surgeons, cardiologists, anaesthetists, perfusionists, ICU nurses, theatre staff, trainees and other health care professionals.</p> <p>Additional facilitators for this advanced Paediatric EduCorner 2022 utilised from broader EuroELSO 2022 international speaker group.</p>	<p>The goal of the training is to let clinical staff members acquire knowledge and competencies of handling ECMO patients, and adequate teamwork skills in series of simple and complex simulation scenarios during international ECMO conference. This immersive hands-on workshop 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 towards the troubleshooting of ECMO circuit utilizing high fidelity simulation mannequins and educational modalities with international, experienced facilitators.</p> <p>Upon completion of this activity, participants should be able to:</p> <ul style="list-style-type: none"> <li>• Identify the components of the ECMO circuit</li> <li>• Recognize major indications and contraindications of VV and VA ECMO</li> <li>• Identify and illustrate the most effective cannulation strategy</li> <li>• Evaluate the modality of ECMO support most appropriate for the patient</li> <li>• Gain familiarity with physiotherapy on ECMO</li> <li>• To be able to recognise and address routine and catastrophic ECMO problems</li> <li>• Recognize, identify and assess causes and response to treatment for inadequate oxygen delivery</li> </ul>

		<ul style="list-style-type: none"> <li>• Differentiate the interaction ECMO has on various patient organ systems (commencing on CRRT)</li> <li>• Explain and describe appropriate time to start weaning from ECMO including success or failure of weaning</li> <li>• Gain familiarity with the basic steps for successful ECMO transport</li> <li>• Induction to multidisciplinary teamwork and basic pathway during ECPR</li> <li>• Work and communicate clearly with multi-disciplinary team using closed loop communication</li> </ul>
<p><b>W8 Membrane failure and circuit change on ECLS</b></p>	<ul style="list-style-type: none"> <li>• Understanding precipitants and mechanisms of membrane failure.</li> <li>• Practical skills: changing a failing circuit using mannekin, Cardiohelp and simulation scenario</li> <li>• Discussion of functional, mechanical and coagulopathic membrane failure.</li> <li>• Practical scenario with case vignette and simulated membrane clotting</li> <li>• Candidate participation in changing circuit under time pressure</li> </ul>	<ul style="list-style-type: none"> <li>• to understand the mechanisms leading to membrane failure.</li> <li>• to recognise lack of anticoagulation within scenario vignette as cause for patient &amp; circuit problems and call for help.</li> <li>• to demonstrate ability and knowledge of managing flow failure due to membrane thrombosis, including circuit change.</li> <li>• to ensure change of circuit and management of patient by team.</li> <li>• to demonstrate good communication skills and look for feedback from team members.</li> </ul>