



Acute CardioVascular Care School 2023

17-18 November

Barcelona, Spain



About the Association for Acute CardioVascular Care - ACVC

The Association for Acute CardioVascular Care (ACVC) of the ESC represents the growing community of specialists involved in the process of managing acute cardiac diseases from the event itself to initial treatment and patient stabilization. As such, it is the first and unique home for specialists from various disciplines, including amongst others, paramedics, emergency physicians, intensivists, cardiologists, nurses and interventionalists.

One ongoing major goal of ACVC is the creation of a comprehensive educational programme, including dedicated sessions at the yearly ESC Acute CardioVascular Care congress, the *ESC Textbook on Intensive and Acute Cardiovascular Care (IACC)*, webinars, a core curriculum, the ESC e-learning platform as well as the possibility for a certification exam.

The ACVC School

Cardiovascular diseases are the leading cause of death in developed countries.

Faced with such a prevalent disease and in which many decisions and actions are made in critical patients in a short space of time, it is essential that doctors in training in Cardiology learn in the most appropriate way, with the participant being the centre of learning.

In Cardiology there is a need for this learning, teaching into account the increasingly complex patients and the exponential growth of new medical technologies.

In this context, the need arises for training in simulation techniques, which lead to acquiring technical and non-technical skills in the process of caring for acute cardiac patients, and which at the same time result in reinforcing patient safety.

This need has been published at European level in the following article by members of the ACVC, highlighting the training needs in critical patient cardiology, offering the ACVC school a response to these learning needs:

Czerwińska-Jelonkiewicz K, Montero S, Baths J, et al.

[Current status and needs for changes in critical care training: the voice of the young cardiologists. Eur Heart J Acute Cardiovasc Care.](#)





The ACVC School consists of two days of practical hands-on sessions, focused both on technical and non-technical skills, with the objective promoting learning and training of young doctors in the field of acute cardiovascular care.

The school will employ blended learning and interactivity on the most important topics and problems encountered when working within the field thus creating a unique educational opportunity for young doctors.

Of note, the unique programme is constantly evolving and aims at offering an exclusive learning experience in a state-of-the-art simulation laboratory with the most modern equipment available, led by a team of experienced advanced simulation experts.

Objectives

The goal of the ACVC School is to give participants the required theoretical knowledge and practical skills for their daily work in acute cardiovascular care.

Medical students will significantly increase their ability to acquire competencies after completion of the ACVC School which should translate into improved medical care in qualified doctors.

A further aim of the school is to boost interest in the practical certification process ACVC offers.

Participants' Preparation

Participants will be asked to review the existing literature: the ESC e-learning platform, the updated version of the *ESC Textbook of Intensive and Acute Cardiovascular Care* (IACC) and the ACVC literature.

Programme Overview

There will be seven groups of 10 participants rotating through eight modules. The two-day course includes the following topics:

- Echo-guided Vascular access & Pericardial drainage
- Difficult airway management
- Clinical Simulation - Communication
- Clinical Simulation – Leadership
- VA- ECMO management & trouble shooting





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- Comprehensive evaluation of congestion in acute heart failure
- Invasive Mechanical Ventilation
- Patients in Shock – The Importance of ECMO Unloading

Venue

Vall d'Hebron Center for Advanced Clinical Simulation

Barcelona Spain

<https://www.vallhebron.com/en/map>

Course Directors

- Alessandro Sionis
- Jordi Baneras Rius





TIMETABLE

17 November

Hour	Group 1	Group 2	Group 3	Group 4	Group 5	Group 6	Group 7	Group 8
09:00	Welcome							
10:00 12:00	The Importance of ECMO Unloading	Simulation - Communication	Simulation - Leadership	Echo Guided Vascular Access & Pericardial drainage	VA- ECMO management & trouble shouting	Comprehensive evaluation of congestion in acute heart failure	Mechanical Ventilation	Difficult Airways Management
12:00	Lunch							
13:00 15:00	Difficult Airways Management	The Importance of ECMO Unloading	Simulation - Communication	Simulation - Leadership	Echo Guided Vascular Access & Pericardial drainage	VA- ECMO management & trouble shouting	Comprehensive evaluation of congestion in acute heart failure	Mechanical Ventilation
15:00 17:00	Mechanical Ventilation	Difficult Airways Management	The Importance of ECMO Unloading	Simulation - Communication	Simulation - Leadership	Echo Guided Vascular Access & Pericardial drainage	VA- ECMO management & trouble shouting	Comprehensive evaluation of congestion in acute heart failure
17:00	Break							
17:30 19:30	Comprehensive evaluation of congestion in acute heart failure	Mechanical Ventilation	Difficult Airways Management	The Importance of ECMO Unloading	Simulation - Communication	Simulation - Leadership	Echo Guided Vascular Access & Pericardial drainage	VA- ECMO management & trouble shouting
19:30	Departure to dinner							

18 November

Hour	Group 1	Group 2	Group 3	Group 4	Group 5	Group 6	Group 7	Group 8
09:00 11:00	VA- ECMO management & trouble shouting	Comprehensive evaluation of congestion in acute heart failure	Mechanical Ventilation	Difficult Airways Management	The Importance of ECMO Unloading	Simulation - Communication	Simulation - Leadership	Echo Guided Vascular Access & Pericardial drainage
11:00 13:00	Echo Guided Vascular Access & Pericardial drainage	VA- ECMO management & trouble shouting	Comprehensive evaluation of congestion in acute heart failure	Mechanical Ventilation	Difficult Airways Management	The Importance of ECMO Unloading	Simulation - Communication	Simulation - Leadership
13:00 14:00	BREAK							
14:00 16:00	Simulation - Leadership	Echo Guided Vascular Access & Pericardial drainage	VA- ECMO management & trouble shouting	Comprehensive evaluation of congestion in acute heart failure	Mechanical Ventilation	Difficult Airways Management	The Importance of ECMO Unloading	Simulation - Communication
16:00 18:00	Simulation - Communication	Simulation - Leadership	Echo Guided Vascular Access & Pericardial drainage	VA- ECMO management & trouble shouting	Comprehensive evaluation of congestion in acute heart failure	Mechanical Ventilation	Difficult Airways Management	The Importance of ECMO Unloading
18:00	Plenary open question							





Invasive Mechanical Ventilation

Faculty: Teresa Lopez and Carlos Roca

Educational Objectives

- ✓ To Learn how to set the ventilator avoiding ventilation lung injury.
- ✓ To solve the most frequent pulmonary patterns.
- ✓ To optimize the patient-ventilator adaptation.

Learning Format

Review of invasive mechanical ventilation indications, ventilator modalities, parameters in ventilation. Practical workshop with a simulated ventilated patient, frequent pulmonary clinical patterns and how to solve them by adjusting the ventilator.

Step-by-step description of the technique:

- ✓ Listen to a theoretical explanation on indications, objectives, modes and settings of the ventilator. Solve any doubts.
- ✓ Hands-on workshop with a real ventilator, interpret the curves and values, set parameters
- ✓ Clinical simulated cases with different ventilatory patterns and problems associated to mechanical ventilation. Learn how to solve them.

Available Material

- ✓ IngMar ASL5000 pulmonary function Simulator.
- ✓ Ultrasound gel
- ✓ high efficiency bacterial filters
- ✓ Test Lung

What do you expect participants to do in this station/skill?

- ✓ Attend to a brief theoretical explanation on indications, objectives, modes and settings of the ventilator.
- ✓ Learn how to set the ventilator parameters, interpret the curves and values,
- ✓ Learn how to solve different clinical situations (obstructive, restrictive, asynchrony...).
- ✓ Learn how to perform recruiting maneuvers.





Echo-Guided Vascular Access & Pericardial drainage

Faculty: Walter Bragagnini and Alessandro Sionis

Educational Objectives

- ✓ To learn how to make a safer puncture.
- ✓ To know how to choose an echo-guided vascular access with a special focus on central venous access.
- ✓ To integrate anatomical landmarks and echo imaging.
- ✓ To learn the technical fundamentals of vascular access
- ✓ To understand the potential complications of vascular access cannulation and learn how to avoid them.
- ✓ To learn the six-step strategy for successful vascular access cannulation.
- ✓ To develop and practice the skills necessary to gain proficiency using ultrasound for guiding catheter insertions in the internal jugular vein, subclavian vein and axillary vein.
- ✓ To practice the technique of pericardiocentesis guided by echocardiography.

Learning Format

A short theoretical section on the general principles and techniques of echo-guided vascular access and a practical section:

- ✓ Short theoretical lecture
- ✓ Hands-on practice with three stations:
 - Jugular/subclavian
 - Femoral
 - Subxiphoid access for pericardiocentesis

Step-by-step description of the technique:

- ✓ Vascular Access: prepare the sterile field; disinfect with chlorhexidine; administer local anaesthesia; prepare the ultrasound probe with sterile sheath; locate venous pathway with ultrasound; perform echo-guided venous puncture with blood aspiration through the needle; introduce the guide wire; check the correct position of the guidewire in the target vessel, discriminating the artery and vein; introduction of the dilator and its extraction; introduction of the venous catheter, with constant control of the proximal end of the guidewire; removal of the guide wire; check the patency of the catheter by syringe aspiration of each of the lights; secure the line with suture.
- ✓ Pericardiocentesis: preparation of the sterile field; disinfection with chlorhexidine; placement of sterile field drape and sheath on the ultrasound scanner; local





anaesthesia; echocardiography-guided puncture; introduction of the guide wire; check the guide wire with the echography; dilation; placement of the pig-tail catheter.

Available Material

- ✓ Central Venous Access Ultrasound Training Model: Jugulars-Subclavian access
- ✓ Central Venous Access Ultrasound Training Model: Femoral access
- ✓ Ultrasound-Guided Pericardiocentesis Simulator
- ✓ Ultrasound Sterile Gel Envelope
- ✓ Ultrasound sterile cover
- ✓ Sterile gown
- ✓ Sterile cap
- ✓ Sterile gloves size: S/M/L
- ✓ 10 mL syringes
- ✓ 5 mL syringes
- ✓ Central venous line cannulation kit (needle, guide wire, dilator, 2 or 3-lumen catheter)
- ✓ Suture kit
- ✓ Chlorhexidine bottle
- ✓ 3-step keys for venous line.
- ✓ 3 pericardiocentesis kits

What do you expect participants to do in this station/skill?

- ✓ Vascular Access:
 - Ultrasound localization of the venous access.
 - Learning the long and short axes of the blood vessel.
 - Differentiate venous and arterial structures.
 - Familiarization with venous cannulation material: needle, guide, dilator, introducer and venous catheter.
 - Learning antisepsis technique: use of gloves, cap, sterile gown.
 - Venous line cannulation by modified Seldinger technique, using ultrasound to locate the line and perform the puncture, as well as to check the position of the guide in the target vessel.
- ✓ Pericardiocentesis:
 - To know and become familiar with the pericardiocentesis material (puncture kit, guides, pig tail).
 - Perform at least 2-3 times a pericardiocentesis guided by echocardiography.





VA- ECMO Management & Troubleshooting

Faculty: Albert Duran, Santiago Montero and Manel Tauron

Educational Objectives

- ✓ To explain the basics of the VA ECMO configurations, especially peripheral VA ECMO.
- ✓ To be able to see and understand the pathophysiology behind VA ECMO and cardiogenic shock.
- ✓ To acquire practical skills regarding the management of three typical scenarios / complications appearing under VA ECMO.

Learning Format

A high-fidelity, hands-on ECMO simulator allowing the attendant to participate actively and try different options and treatments. Their decisions will have direct effects on the simulated patient. As doing so, the effects of their right or wrong decisions will have a strong impact in their learning process. They will understand and get involved into a real-life situation. First there will be a Simzone 1, explaining VA ECMO characteristics and management. After that, there will be a Simzone 2 simulation, with some clinical cases. This activity will take place in the Simulated Cardiovascular intensive care room.

Available Material

- ✓ Advanced ECMO Simulator - Hybrids VITA
- ✓ Cardiohelp
- ✓ Mannequin CAE Ares
- ✓ Projector for images and laboratory analysis
- ✓ A high fidelity simulated intensive cardiovascular care room

What do you expect participants to do in this station/skill?

- ✓ To understand the physiology of extracorporeal circulation with VA ECMO
- ✓ To interpret the different parameters of the console.
- ✓ To be able to detect the most frequent problems (hypovolemia, Arlequin syndrome for example) and how to solve them.





Difficult Airway Management

Faculty: Tobias Koller and Stefano Italiano

Educational Objectives

- ✓ To learn how to evaluate the airway
- ✓ To understand and integrate algorithms for the predicted and unpredicted difficult airway
- ✓ To focus on airway evaluation management on critically ill patient and ICU environment
- ✓ To know strategies for successful tracheal intubation (including complementary accessories)
- ✓ To practice with alternative devices for airway management

Learning Format

- ✓ Short theoretical instructions based on Power Point presentations
- ✓ “Hands on”: Practice on airway manikins divided in three stations:
 - ventilation and Laryngeal Mask Airway (LMA) station
 - standards tracheal intubation station
 - difficult airway/special devices station.

Available Material

- ✓ 3 stations with intubation simulation mannequins.
Next to each one a kit with the material:
 - Endotracheal tube. (standard tube and reinforced tubes 6.0 – 8.0)
 - Endotracheal tube guide
 - Laryngeal mask
 - Guedel and Wendel tubes
 - Ambu type reservoir mask
 - Curved laryngoscope
 - 10ml syringe
 - Gauze type bandage for posterior fixation of the tube
 - Scissors to cut the gauze
 - lubricants
 - Magill plier
 - nasal high Flow oxygen (Optiflow, only tubing)
 - Laryngoscope blade.
 - face mask different sizes
 - balloon resuscitator
 - Gum Elastic Bougie, Stylets, FROVA, Extubation wire COOK

- ✓ Part task trainers:





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- Orotracheal intubation head simulator
- Orotracheal intubation head simulator
- Orotracheal intubation head simulator
- Laerdal - Megacode kelly Advanced

What do you expect participants to do in this station/skill?

- ✓ How to perform an orotracheal intubation, how to foresee a difficult airway, which drugs to use in the anaesthetic induction, and how the intubation technique is developed.
- ✓ How to perform manual ventilation technique with oxygen reservoir and intubation.
- ✓ Simulated practice of manual ventilation and intubation, as well as familiarization with supraglottic devices.





Comprehensive Evaluation of Congestion in Acute Heart Failure

Faculty: Guido Tavazzi & Francesco Corradi

Educational Objectives

- ✓ To assess fluid redistribution in heart failure
- ✓ To understand the evaluation of pulmonary fluids by lung ultrasound.
- ✓ To understand the parameters of static volemia and dynamic volemia
- ✓ To know the different mechanisms to estimate cardiac output.

Learning Format

This is a simzone 1 simulation workshop where different aspects of fluids in heart failure will be addressed. On the one hand, the understanding of invasive pressure monitoring in different cavities will be worked on using a Swan Ganz catheter and its simulator, and on the other hand, pulmonary fluid assessment will be practiced using the CAE Vimedix simulator.

Available Material

- ✓ CAE Vimedix high fidelity simulator. Lung package.
- ✓ App Swan Ganz Simulator
- ✓ Swan Ganz Catheter.

What do you expect participants to do in this station/skill?

- ✓ Lung ultrasound
 - Differentiate the different patterns of lung injury and identify the signs of heart failure.
 - Learn the regulated system for the global assessment of pulmonary fluids
- ✓ Swan Ganz catheter
 - Interpret the different patterns of shock: cardiogenic, distributive, obstructive and hypovolemic.
 - Identify the pressure curves of the different cardiac cavities and their most frequent pathological patterns.





Clinical Simulation Workshop

Communication and Leadership

Faculty: Jordi Baneras, Alicia Pastor, Carlos Alviar, Maria Stratinaki & Agnieszka Tycinska

Educational Objectives

To learn and reflect on the role of non-technical skills in critical cardiological situations, with student-centred learning and in a safe environment where mistakes become learning opportunities, through 4 simulation scenarios, structured with briefing, simulation, and debriefing, with well-defined non-technical skills objectives in each scenario:

- ✓ Arrhythmias scenario-Leadership
- ✓ Acute coronary syndrome-Situation awareness.
- ✓ Cardiogenic shock scenario-Communication
- ✓ Atrial fibrillation ablation-Decision Making

Specific objectives:

- ✓ Learn the qualities of leadership in a medical emergency situation.
- ✓ Train and reflect on situational awareness in crisis situations.
- ✓ Acquire skills for optimal communication in emergency situations.
- ✓ Practice decision-making in cardiological emergencies.

Learning format

Simulation scenarios for non-technical skills are 60 minutes long. Each participant will actively participate in 2 scenarios and passively in 2 scenarios as an observer, with a total of 4 scenarios. Each scenario is made up of 3 phases: briefing 15 minutes, scenario 10 minutes, debriefing 35 minutes. The participating team is made up of 5 people and the observers are also 5 people. In each scenario, the teaching staff is made up of a confederated nurse + 1 facilitator + 1 simulation technician.

In each simulation scenario, a debriefing will be carried out with good judgment. All program facilitators have been trained in this methodology.





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Available Material

The facilities have an operating room, an emergency room and an intensive care room, all of them simulated based high-fidelity structures, equipped with all the equipment of real installations, and with a communication and visual system with a control and debriefing room.

[Vall Hebron Center for Advanced Clinical Simulation Facilities](#)

What do you expect participants to do in this station/skill?

Participants are expected to reach a Kirkpatrick level 3, measured with the validated scale of non-technical skills TEAM, and even, indirectly, a Kirkpatrick level 4 with transfer of safety and quality of care to real clinical practice.

