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# ECMO transport simulation

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Transfer and retrieval of extracorporeal membrane oxygenation (ECMO) patients is an aspect of a severe respiratory failure (SRF) service, which has generally low volume and high risk thus necessitating attention to particular safety measures. One of the key aspects in preventing patient safety issues and minimising risks of harm during the transportation of an ECMO patient is to develop a well-prepared multiprofessional team. This is the key area where simulation can play a very important role in various stages of a patient care pathway. There is much more to ECMO patient transfer and retrieval than one may suspect as it involves a referral, a lot of planning regarding activation, tasking, transporting, and disposing of the patient at the receiving facility,[1] all of which should be done collaboratively and maintaining open and high communication standards to prevent mishaps. Simulation is used not only to develop important ECMO-related clinical or teamwork skills, but also to identify potential safety threats.[2] There are several modalities of simulation that can be used to prepare the clinical team and test processes put in place.[3] The modality needs to be selected according to the specific learning objectives expected to be addressed. The full-scale high-fidelity approach is usually the most complex to orchestrate as it would most likely involve the team members, a scenario, a patient simulator or simulated patient (Actor), real clinical equipment, and the patient care setting (ambulance and potentially the referring and/or receiving facility). For this type of simulation to be beneficial to more people than the immediate participants, it requires the scenario to be audio/video recorded with live broadcast into an observation room, where other learners could follow the event and then be engaged in the debriefing with the participants. This does not constitute the ideal starting point of developing an ECMO transport simulation programme but is certainly an objective to achieve to really prepare a team on all aspects of "Mobile ECMO".


**Figure 1. Simulation of ECMO patient loading into the HMCAS Intensive Care Ambulance.**

Our recommendation is to start more simply and gradually increase the level of realism and complexity, so that teething issues can be identified and fixed in a more manageable manner. Process testing, new staff orientation, emergency procedures, and understanding of roles and responsibilities are elements that should initially be addressed in a low-fidelity simulation context such as Visually Enhanced Mental Simulation.[4] It is also important to realise that a scenario, of low or high fidelity, can simply be a snapshot of the Mobile ECMO process, as it helps focus on key pre-identified learning objectives. The starting point might be to simulate how a referral is evaluated via remote patient assessment and how the team is activated. A different phase might involve starting at the point of transferring the newly cannulated patient from the operating table onto the ambulance stretcher and moving through the hospital and loading onto the vehicle (Fig. 1). A whole scenario could take place inside the ambulance during the journey with the ECMO patient. As in real life, the possibilities offered by simulation are endless but need to serve a real educational purpose.

Keywords: extracorporeal membrane oxygenation, ECMO, interhospital transportation, simulation, patient safety, system testing

## COMPETING INTERESTS

The authors declare no conflict of interest.

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