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The development of a mobile ECMO program

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Rationale: Transport of critically ill patients on extracorporeal membrane oxygenation (ECMO) can be challenging; however, this has been demonstrated to be safe and feasible if undertaken by adequately trained teams,¹⁻³ with appropriate equipment and a platform that can accommodate the team and allows full access to the patient.

The ECMO retrieval service is a key component of the severe respiratory failure (SRF-ECMO) program. The Hamad Medical Corporation (HMC) stakeholders realized the need for this "mobile" program as core to the ECMO program, given the geographical location of the hospital facilities and the complexity of the ECMO program.

The development of mobile ECMO is built on the established multidisciplinary Safe High Acuity Adult Retrieval Program (SHAARP) partnership between the HMC Ambulance Service and Medical Intensive Care Unit (MICU). The service operates on a Hub and Spoke model, whereby patients requiring ECMO are transferred to the MICU ECMO Centre at Hamad General Hospital (HGH). The major factor that influenced the initiation of the mobile ECMO program was the need for a secure and competent transport system to the only Adult ECMO Centre in Qatar with the necessary infrastructure and expertise to handle such complex cases.

Mobile ECMO team: The need for a multidisciplinary, team-based approach to ECMO retrieval and transport was realized early due to the fact that the transport of these high acuity cases needed dedicated expertise. Our team model in Qatar is composed of two ECMO consultants, an ECMO nurse, a perfusionist, a respiratory therapist, and a critical care paramedic from the Ambulance Service, and is also supported by two ambulance paramedics (driver and attendant).

Transport of ECMO patients is a low volume high-risk event and hence there is a need for a specialized team. All team members received training and participated

in retrievals in the UK on mobile ECMO. There is an ongoing training program,⁴ covering emergencies and techniques for safe movement of patients. The team dedication has resulted in the program being a success. To date, 13 retrievals have been successfully carried out including one intercontinental air-transfer, all without adverse outcomes.

Mobile ECMO logistics: The mobile ECMO platform and trolley were custom designed. There was a recognition that a mobile SRF-ECMO service may require the team to transport a patient on ECMO, or to first stabilize on current therapy and then transport the patient to the acute care hospital to perform cannulation at a later time; if required.

As such, the adult Intensive Care Trolleys have been designed to provide ergonomic, safe, and comfortable transportation of high dependency intensive care patients, either on ECMO or on standard intensive care therapy. It is configured to meet the specific needs of the clinical team and designed to accommodate a wide range of medical apparatus. This stretcher carries all the basic intensive care monitoring accoutrements and is suited for pre-hospital, and inter- and intra-hospital transit care. The stretcher can hold a transport ventilator, monitor, infusion pumps, oxygen cylinders, a medication bag, and a miscellaneous pack. The mobile intensive care unit can safely accommodate the whole five-person team and

specialized equipment in an appropriate working environment, with 360-degree access to the patient and equipment, in addition to the two paramedic crew driving the vehicle.

Keywords: mobile ECMO, multidisciplinary team, ECMO platform, intensive care trolley

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