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Commentary: Extracorporeal membrane oxygenation is associated with longstanding functional limitations

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Rossong and colleagues¹ analyzed institutional data to track long-term outcomes following treatment with extracorporeal membrane oxygenation (ECMO). In doing so, they have attempted to answer the question faced by countless intensivists, surgeons, nurses, ECMO specialists, physical therapists, and others: Now that my patient is off ECMO, what is going to happen to her when she leaves the intensive care unit? Most research on ECMO understandably focuses on survival to decannulation and to discharge from an intensive care unit or from the hospital because the conditions requiring ECMO are still associated with very high mortality rates. Growing recognition of the long-term morbidity following critical illness has prompted investigations into long-term functional outcomes.

Rossong and colleagues¹ followed patients for a substantial duration after ECMO (median contact time from ECMO was 5.7 years for venovenous [VV] ECMO and 4.2 years for venoarterial [VA] ECMO). They found high conditional 5-year survival following discharge among both their VV ECMO and VA ECMO populations (73% and 71%, respectively). They found a lower reported quality of life and poorer functional status after VV ECMO as opposed to VA ECMO, which seems counterintuitive given the well-known complications associated with arterial ECMO cannulation.² Less than one-third of patients treated with VA ECMO reported difficulty with activities of daily life,

Nobel laureate Bob Dylan. Photograph by Vitoria Gasteiz. Licensed for free use under Creative Commons (CC BY 2.0).

CENTRAL MESSAGE

Extracorporeal membrane oxygenation is associated with persistent limitations on functional status years after treatment.

whereas two-thirds did following VV ECMO. A surprising 83% of patients in the VV ECMO cohort reported problems with mobility, compared with 52% of patients treated with VA ECMO.

Obviously, an institutional study has inherent limitations. The other main caveat here is patient heterogeneity: Although the authors have assiduously separated outcomes between VV and VA ECMO, they are still very different in their underlying conditions. Certainly ischemic cardiomyopathy requiring ECMO as a bridge to durable left ventricular assist device will have far different implications for long-term survival than, say, severe influenza requiring VV ECMO in an otherwise healthy person. Still, identifying a common set of long-term functional limitations among patients treated with ECMO would help guide post-ECMO treatment.

These questions are more relevant than ever as larger numbers of patients are being treated with ECMO for COVID-19, and for a longer average duration than described in this article.³ There will be a far larger population of ECMO survivors, and a substantially larger number of otherwise healthy adults treated with ECMO aged in their 20s and 30s with potential for several decades of life ahead of them. The objective and subjective aspects of their long-term recovery must be followed and measured carefully.

Subsequent research will certainly include trying to identify what factors are associated with more functional impairment. For example, does renal failure during

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ECMO therapy portend worse long-term functional status even if it resolves? Or, is there an inflection point along the duration of ECMO therapy after which point long-term functional status is noticeably worse? The narrator of Bob Dylan's song "Mississippi" blames his troubles on the fact that he "stayed...a day too long."⁴ He laments: "You can always come back, but you can't come back all the way."⁴ Is there a number of days of ECMO treatment that is one day too long for good functional recovery to come back all the way? Answers that specific are unlikely, but the overall functional outcomes after ECMO can likely be better anticipated. Rossong

and colleagues¹ have provided a solid foundation for this future work.

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