

statement regarding the necessity for a quiet setting with a visual projection system takes new meaning in the virtual meeting era. Although virtual meetings are not free from distraction, they do allow for easier participation by participants who may not be present every week, such as general pulmonologists or trainees (10). Virtual MDMs could also improve access to specialist diagnosis to patients and hospitals that are far away

from major academic centers; this group of patients with ILD is known to have worse outcomes (11).

Multidisciplinary meetings have long been the gold standard for ILD diagnosis, but evaluation and standardization of this diagnostic process is essential to promptly and accurately care for patients. This well-done study is a necessary advancement, but a future statement or guideline is urgently

needed to further emphasize which components are necessary and which are conditional. As the authors emphasize, the ILD community has to balance a minimum standard of care while maintaining equity and feasibility across centers; we are up for this gargantuan task. ■

Author disclosures are available with the text of this article at www.atsjournals.org.

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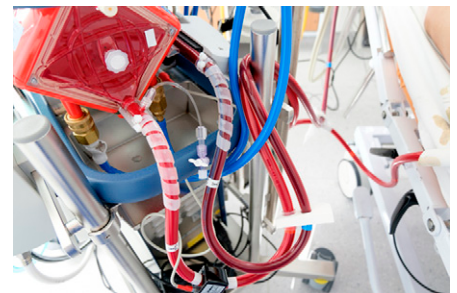
Is Active Mobility the Most Underdelivered Care Component for Patients on Extracorporeal Membrane Oxygenation?

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Physical activity is arguably the most underdelivered component of medical care

for patients who are on extracorporeal membrane oxygenation (ECMO). Patient mobility and physical therapy have certainly increased in use among critically ill patients over the last 30 years. The value of physical mobility, despite inconsistent trial data (1, 2), is qualitatively appreciated by providers, patients, and family (1, 2), if underdelivered. Mobility feasibility during critical illness is also established; images of patients working with resistance bands and bed biking—even walking—while ventilated are common. Overall, in 2021, physical mobilization is a broadly used



component of multidisciplinary critical care endorsed by societies and intuitively beneficial during injury and illness. Against

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Figure 1. Playing basketball with a therapy team while on venovenous extracorporeal membrane oxygenation for acute respiratory failure. Patient consented to photography.

this backdrop, patients on ECMO, nevertheless, stand out.

The care of patients on ECMO is so specialized that of the 6,900 U.S. hospitals registered with the American Hospital Association, only ~4% submit ECMO case data to the Extracorporeal Life Support Organization. This observed care restriction may be appropriate though, as patients on ECMO have the unique combination of cardiopulmonary failure that is refractory to inotropic medications and/or ventilatory support, plus a medical device that actively circulates their entire blood volume every 1–2 minutes extracorporeally through large-bore cannulas that are more akin to garden hoses than to intravenous tubing; the risk of rapid death from unplanned decannulation is significant.

Although the ability of physical activity to minimize muscle atrophy, deconditioning, and long-term impairment for critically ill patients is not questioned, the ease of providing therapy, especially active mobility that includes being out of bed and walking, is much more elusive. To this point, recent studies have demonstrated that the goals of physical therapy during ECMO vary widely (3). Although small series have demonstrated the feasibility of ambulation on ECMO, therapy goals for most patients on ECMO, even recently, remain “bed bound” (3). In few other patients in the intensive care unit (ICU) is the mobilization goal during their ICU stay ever “stay in bed.” Addressing this potential underdelivery of care, in this issue

of *AnnalsATS*, Abrams and colleagues (pp. 90–98) elegantly describe a large cohort of patients who actively mobilize on ECMO from a high-volume ECMO center experienced in patient mobility (4). Their analysis identifies factors associated with intensity of treatment and describes a high level of therapy for most patients, including ambulation, and a low rate of safety events.

Abrams and Madahar examined more than 500 patients on ECMO, of whom about two-thirds were bridge to recovery (BTR) (e.g., acute respiratory failure) and one-third bridge to transplant (BTT). Of these, 177 patients achieved active therapy while on ECMO. Of this group, the vast majority (88%) were BTT. This predominance may reflect the BTT population being less acutely ill than the BTR group, or the longer duration of BTT ECMO, allowing for more therapy opportunities. Furthermore, many of these 177 patients (78%) achieved standing on ECMO—a huge proportion—which speaks to the team’s skill and expectations. Indeed, previous studies that have used an experienced therapy team dedicated to early physical mobility for critically ill patients have consistently shown high rates and levels of physical activity (5, 6), suggesting that effective and safe mobility for patients on ECMO may be best achieved with knowledgeable, dedicated mobility teams.

Abrams and Madahar also demonstrated that although ambulation with femoral cannulation (including arterial) is possible, femoral cannulation was unsurprisingly associated with decreased out-of-bed activity. More important is the validation that patients with femoral ECMO cannula can walk. This has been previously described (7), and in fact, the value of mobilization during ECMO support is so important as to be integrated into the decision making for cannulation approaches during venovenous ECMO in the 2021 Extracorporeal Life Support Organization Adult Venovenous ECMO Guideline (8). The study’s relatively high rate of ambulation with femoral cannulation suggests that the visceral response many experienced ECMO and promobility clinicians have may need tempering (Figure 1).

A second important finding from the study is that more than 60% of patients ambulated. Although this population was

largely BTT (88%), it remains a great example that therapy during ECMO *can and should* target high levels of activity, including standing and ambulation. If we expect patients to return to an active life after critical illness, their therapy should approach and eventually approximate those activities. That 78% of mobilized patients achieved standing at this experienced and high-volume center further supports the observation that high-volume ECMO centers have better outcomes for patients on ECMO than lower-volume centers (variously described as >20 per year by age and type, or >12 per year for extracorporeal cardiopulmonary resuscitation–specific cannulation) (9, 10) and suggests the benefit of regionalization for superspecialized care like ECMO.

It is worth noting the reported safety events. The most important may be that not a single decannulation occurred with more than 1,200 ambulation sessions (among 2,706 active therapy sessions). There were a few episodes of bleeding from femoral cannulation, but none of them were serious. There were two reported cerebrovascular accidents and one cardiac arrest attributed to a pulmonary embolus. In sum, although these are serious complications, and there may be causality, these events were rare; self-limited bleeding occurred at a rate of <1%, and strokes at 0.16% of sessions. The balance of risk versus benefit is difficult to assess on a population level, and certainly more so for an individual patient, but these numbers should be reassuring for clinicians interested in mobilizing their patients. Again, this should be done within the context of a multidisciplinary and experienced therapy team to minimize harm and maximize benefit, as has been described (11).

The greatest limitation in extrapolating these data may be the patient population, which, as discussed, included <15% patients with acute respiratory failure. As an example, among the BTT population, only 32% of patients were mechanically ventilated before ECMO initiation. Interestingly, 15% of the BTR patients were also not intubated at the time of ECMO initiation, adding further evidence to the idea that there may be a role for managing acute respiratory failure with ECMO alone. Given the potential for ECMO to support patients without invasive mechanical ventilation (12, 13), and the observed and potentially harmful effects of

ventilation even during ECMO (14, 15), there is a need for further study of this potential therapeutic application during both acute and chronic respiratory failure.

In summary, in this issue of the journal, Abrams, Madahar, and colleagues elegantly demonstrate patients' remarkable ability to get out of bed, stand, and even walk while both critically ill and on ECMO, and with

what is one of the largest mobility populations so far published. Their findings add further evidence that being supported by a continuous life support device, such as continuous renal replacement therapy, is in no way a hard stop for ambulation (16), and ambulation is achievable for many patients on ECMO. The low rate of complications and the high levels of achieved mobilization

among patients who participated in active physical therapy establishes this as a foundational study for centers wishing to ambulate patients on ECMO as an example of what can be achieved, and in whom to focus treatment. ■

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