

# Extracorporeal Membrane Oxygenation in COVID-19 Patients: More Hype than Substance?

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The hunt for a widely effective therapy in coronavirus disease-2019 (COVID-19) continues. Several therapies from hydroxychloroquine to convalescent plasma were received with great enthusiasm initially but eventually failed to demonstrate any meaningful survival benefit.<sup>1</sup> Of late, extracorporeal membrane oxygenation (ECMO) has gained widespread attention in India as a supposed salvage therapy for severe COVID-19 patients.<sup>2</sup> There are reports of desperate families chasing after ECMO facilities in hospitals, believing that it can cause a dramatic turnaround in the clinical course of their kin. However, this idea is not supported by the available literature or recommendations of international regulatory bodies. Extracorporeal Life Support Organization (ELSO), the international registry of ECMO centers worldwide, clearly recommends ECMO for COVID-19 patients to be offered only in already established ECMO centers.<sup>3</sup> The body emphatically recommends against the setting up of new ECMO centers for the purpose of COVID treatment. Further, the body recommends prioritizing non-COVID ECMO patients over COVID patients, and young patients with a short-expected ECMO run over older, sicker patients.<sup>3</sup> Similarly, the Society for Critical Care Medicine recommends against attempting ECMO in patients after 7–10 days of unsuccessful mechanical ventilation.<sup>4</sup> National Institutes of Health (NIH) guidelines also state that there are insufficient data to recommend the use of ECMO in COVID-19, and even if considered, may be viewed only as a short-term rescue therapy in a selected patient subset.<sup>5</sup> Indeed, Supady et al.<sup>6</sup> argue for curtailing or discontinuing ECMO facilities during COVID crises, so as to divert resources and personnel toward running intensive care units (ICUs), reasoning that ECMO cannot be considered a part of established ICU care, like mechanical ventilation.

These reports, suggesting caution and rationing in the use of ECMO for COVID treatment, come in the background of wide variation in reported outcomes of ECMO use in COVID. Haiduc et al.<sup>7</sup> performed a detailed systematic review of literature on ECMO in COVID. The authors found that some case series reported mortality rates as high as 83–100%, while others reporting low mortality rates failed to take into account patients in coma or those on continuing ECMO at the time of publication. Similarly, Bergman et al.<sup>8</sup> reported a 74% survival rate after ECMO in COVID but noted that 61% (16/26) of the surviving patients required oxygen therapy or mechanical ventilation even after discharge. Barbaro et al.<sup>9</sup> analyzed a large registry of COVID acute respiratory distress syndrome patients undergoing ECMO and reported that only 34% (262/779) of patients were discharged alive to home. It has been

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repeatedly emphasized that benefit is likely in a specific patient subset, i.e., young patients with isolated respiratory failure, poor oxygenation despite the effective use of conventional techniques of mechanical ventilation and prone positioning, and upon early (within 1 week) initiation of ECMO by an experienced team.

One also needs to consider the cost and resources needed to set up and run an ECMO unit in India. An ECMO machine costs over ₹35 lakh, and the procedure can cost ₹1.5 lakh to ₹3 lakh per day.<sup>2</sup> Furthermore, the trained personnel needed for this skill- and labor-intensive procedure is also in short supply. The future may see families going into severe debt, with blind faith in an insufficiently proved modality.

We thus suggest that the idea of ECMO, as the “next big thing” for curing COVID-19, should be viewed skeptically. Experience and skill with this technology are lacking in most parts of the country and when used have modest benefits in a specific patient subset. Its portrayal as a last-ditch rescue therapy capable of salvaging dying patients must also be discouraged as scientifically inaccurate and socially irresponsible.

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