ICU
MANAGEMENT & PRACTICE

Better Use of ECMO Saves Lives

A life-support technology called ECMO that takes over for the failing hearts and lungs of critically ill patients saves lives. However, a new study has found that adults treated with ECMO were less likely to die when they were treated at hospitals caring for more ECMO patients per year.

That is the key finding of the first large study in patients of all ages on the use of ECMO, short for extracorporeal membrane oxygenation. The study, published in the *American Journal of Respiratory and Critical Care Medicine*, stops short of recommending a cutoff point for the minimum number of ECMO cases a hospital should have in order to warrant offering ECMO as an option.

Researchers at the University of Michigan Medical School analysed data from 56,222 ECMO patients treated at 290 hospitals around the world over 25 years. They found tremendous variation in survival rates between centers, even though for children and newborns those variations did not map neatly to the number of ECMO patients treated.

At some hospitals, 18 percent of newborn ECMO patients died, at others it was 50 percent. For children, death rates ranged from 25 percent to 66 percent, and for adults, they ranged from 33 percent to 92 percent.

The use of ECMO to treat adults has risen exponentially in the last decade, and grown steadily in children, the researchers noted. Though ECMO has existed since the 1970s, its use has grown as technology has improved and its potential to save lives became known.

“As use of ECMO rises, it will be very valuable to understand how best to provide this care, because it’s resource-intensive and carries a high risk of complication and death,” said the study's lead author Ryan Barbaro, MD, a paediatric critical care specialist and clinical care lecturer at the U-M Medical School.

ECMO is a complex treatment option that requires a team of doctors, nurses, specialists and respiratory therapists working together around the clock for days or weeks to keep a patient alive. Given its complexity and risk, ECMO is most often used as a last resort in patients suffering massive heart failure, lung failure, the effects of massive infection such as sepsis or pneumonia, trauma, or in newborns with major congenital defects.

Used only in intensive care units, the bedside ECMO machine or “circuit” pumps the patient’s blood out of the body through specialised tubes, and into a system that oxygenates and removes carbon dioxide from it before returning it to the body with enough force to keep it circulating. The treatment team must constantly guard against clots, infections and over-thinning of blood that could kill the patient.

Most of the hospitals that provide ECMO around the world contribute data to a database maintained by the nonprofit Extracorporeal Life Support Organization, or ELSO, based in Ann Arbor and with an academic tie to U-M. The researchers analysed the ELSO database to produce the new paper.

“As more and more hospitals offer ECMO, we need to ensure that we apply the same rigour to studying and improving care that we do to other services for which volume and experience matter for patient survival and other outcomes,” said Matthew M. Davis, MD, MAPP, co-senior author of the study. “By sharing what we learn about best practices, we can do our best as a healthcare system to achieve the best results for critically ill patients.”

For patients and their families, the new findings mean that it is important to ask about ECMO as a possibility early in an intensive care stay that requires mechanical ventilation. That might mean asking to be transferred to a hospital that offers it, while transport is still possible, and asking about the experience levels of the hospital.

Source: University of Michigan Health System
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