UVMMC ECMO and Device Program

ECMO Life Support

A Resource Guide for Patients and Families

University of Vermont Health

Dear Patient and Family,

At the University of Vermont Medical Center we understand that this is a difficult and overwhelming time for you. Our hope is that this guide will help answer some of the questions you may have about ECMO care and what it means for you.

This is just an overview, so if you need more information, please reach out to a member of your ECMO team.

We are here for you in this time of need.

Sincerely and respectfully,

Your ECMO Team

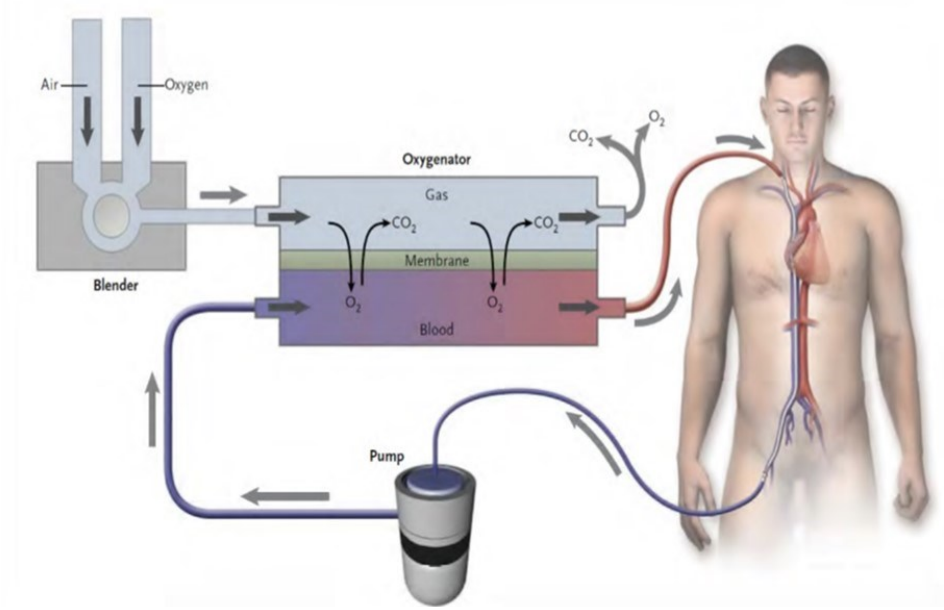
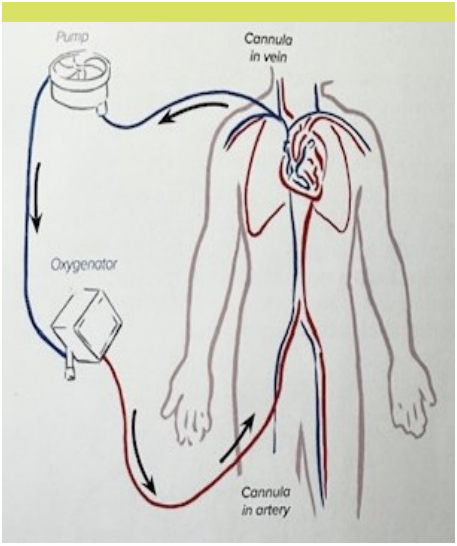


Table of Contents



What is ECMO?

How does it work?

ECMO stands for Extracorporeal Membrane Oxygenation. **Extra** refers to something outside and **corporeal** refers to the body.

ECMO is a form of life support—providing support for the heart and/or lungs outside of a patient's body. ECMO may support the patient's body for a period (days, or sometimes, weeks) to allow the heart and/or lungs time to rest and heal. ECMO does not treat the patient's disease, it only supports the body while it tries to heal.

ECMO uses a pump to do the work of the heart and an oxygenator to do the work of the lungs. The pump and the oxygenator are connected using transparent tubing that connects to the patient's circulatory system through cannulas.

Placing a patient on ECMO involves inserting one or two cannulas in the patient's neck and/or groin. Based on the patient's illness, the ECMO team will decide what type of ECMO to use, the number of cannulas needed, and where they will be placed.

The cannulas are tubes large enough to allow blood to circulate through the pump and oxygenator and return to the patient's circulatory system through the tubing that connects these pieces together.

Veno-Venous ECMO (VV)

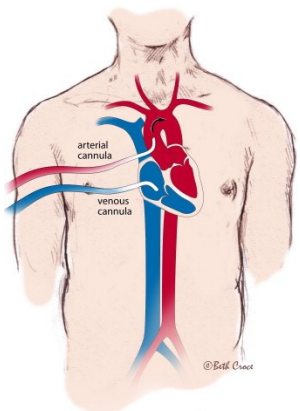
Supporting only the lungs

VV ECMO provides lung support only, so the patient's heart must still function well enough to meet the body's needs. Two cannulas are placed into veins in spots close to or inside the heart.

With VV ECMO, the surgeon or doctor performing the cannulation has an option of using a special type of cannula with two lumens (pathways inside the tubing). This allows for blood to leave and return to the body in one place. This allows for blood to leave and return to the body in one place, creating only one entry instead of two. Blood from the ECMO system returns to the body before the heart, and the patient's own heart pumps the blood throughout the body.

Veno-Arterial ECMO (VA)

Supporting the whole body



VA ECMO provides support for the patient's heart and lungs by allowing most of a patient's blood to move through the circuit without going through the patient's heart. This type of ECMO takes blood out of a large vein and returns it into a large artery, allowing oxygen-rich blood to circulate through the body even if the heart is too weak to pump it. This requires two cannulas, placed either in the neck or groin.

In some circumstances, the patient may require VA ECMO after having heart surgery. The Cardiac Surgeon has the option of placing the cannulas inside of the heart and aorta.

What are the risks of ECMO?

Bleeding

Bleeding is the most common complication of ECMO. This is because a medication to prevent clotting in the ECMO circuit is given to the patient.

Bleeding most often occurs around the ECMO cannula sites or other surgical sites. However, it is possible for bleeding to occur anywhere in the body. The most dangerous bleeding may happen in or around the brain. Because of this, the ECMO team is constantly monitoring and assessing for signs of bleeding.

Stroke

A patient may have a stroke from either bleeding or a lack of blood flow to the brain.

Patients on ECMO are extremely sick and other organs may start to fail. Patients may need other life saving machines such as dialysis during ECMO.

Infection

Problems with the ECMO machine

This can occur, but your ECMO team is trained in handling these rare emergency situations.

Death

The risk of dying without ECMO is significantly higher than the risk of dying with ECMO.

Coming off ECMO

ECMO can only be used for a short time. The ECMO team will evaluate the patient every day and watch for any improvements. When the patient gets to a point where little help is needed from the ECMO machine, the ECMO team will do a trial to see how the patient does without ECMO support. This may be done differently depending on whether the patient is on VV or VA ECMO. During this trial period, the cannulas will remain in place and will only be removed once the entire ECMO team is confident that your loved one will do well without help from the ECMO machine.

What happens if the organs do not heal?

ECMO is only used on extremely sick patients, and there is a chance that you or your loved one may not improve. In the case of VA ECMO, the patient may be considered by a larger hospital that can offer advanced therapies such as a durable heart pump or organ transplant.

It is possible that your ECMO team may determine that your loved one's heart and lungs are not improving despite the ECMO treatment and your loved one is not a good transplant candidate. At this point, ECMO can be considered inappropriate, as it will no longer help with the patient's well-being or agreed upon goals of care. At all times, we will seek to provide compassionate care and UVMMC has a team of professionals to provide emotional, spiritual and physical support.

Who Makes Up Your ECMO Care Team?

Cardiothoracic surgeons: Even though you or your loved one may not have had heart surgery, the Cardiothoracic Surgeons will be the primary doctors in charge of your care.
Cardiovascular Intensivists: This is the team that provides the bedside care. These physicians have special training in ECMO patient assessment, management, and care.

ECMO Trained ICU nurses

Perfusionists: Team members that have specialized training and certification in running the heart-lung machine in the operating room and will be involved in managing ECMO at bedside.

Cardiovascular Operating room team
Cardiac Catheterization laboratory team
Cardiology Doctors
Respiratory Therapists
Physical Therapists
Clinical Nutritionists
Case Management and Social Workers

Family And Friends Role in ECMO

The positive effect of having family members visiting a loved one on ECMO is important. The hospital has visiting times and rules to help keep your loved one safe, while also allowing family and friends to provide support.

Many family members feel more comfortable when they can "do something". The following is a list of activities. Please be sure to check with the bedside nurse.

- Bring in some of their items from home, such as pictures.
- Play their favorite music.
- Talk, read, or sing. Patient know the voices of people they love. Hearing your voice may provide comfort.

We encourage family and friends to rest, eat well and take care of yourself. This is a stressful situation, we want to be sure that you stay healthy.

The ECMO team will make rounds with the Critical care team every day. Rounds will occur in the hallway outside of the patient's room. Family is encouraged to join rounds.

From time to time, the ECMO team will hold family conferences to talk about the patient's progress. These meetings may include the ECMO team, a spiritual representative, family and friends, and a Palliative Care Specialist. A Palliative Care Specialist can support patients and their families throughout the ECMO experience, and help clarify goals of care.

Commonly Used ECMO Terms

Activated Clotting Time (ACT): A test that measures how many seconds it takes for the blood to clot.

Acute Respiratory Distress Syndrome (ARDS): A condition where the lungs are damaged and do not properly allow oxygen into the blood.

Antibiotic: A drug that kills bacteria or germs used to prevent or cure an infection.

Aorta: The large artery that carries oxygenated (red) blood from the heart to the body.

Artery: A type of blood vessel that pumps oxygen rich (red) blood to the body's organs.

Bronchoscopy: A procedure to look at the lungs with a fiberoptic camera. Samples of tissue and sputum from this procedure may be sent to the laboratory for testing.

Cannulas: The plastic tubes placed in the blood vessels by the surgeons to drain blood from the body to the ECMO circuit and back to the body.

Cannulation: The process of placing the cannulas into the blood vessels.

Cardiac Catheterization: A procedure where a small catheter is placed into a vein or artery that is threaded up to the heart to allow doctors to look at the function of the heart..

Cardiac ECHO: An imaging ultrasound test that allows doctors to look at the function of the heart from outside the body.

Commonly Used ECMO Terms

Clamped off: A trial period when your loved one is taken off ECMO before the cannulas are removed.

Decannulation: The process of removing the cannulas from the blood vessels.

Extracorporeal Life Support (ECLS): Another name for ECMO.

Extracorporeal Membrane Oxygenation (ECMO): The process by which blood is removed from the body and enters a circuit of tubing where carbon dioxide is removed, and oxygen is added and is then rewarmed and pumped back into the body.

ECMO flow: The measure of how much blood is being pumped through the circuit to support the patient.

Heat Exchanger: A machine connected to the membrane oxygenator that warms the blood before it is pumped back to the patient.

Membrane Oxygenator: A device that removes carbon dioxide from the blood and adds oxygen. This is also known as the “artificial lung”.

Trialing off (Weaning): A period when ECMO support is temporarily stopped or slowed down to evaluate the function of the heart and/or lungs. If improvement is shown, ECMO may be discontinued.

Notes

UVM Health Patients & Visitors Website

University of Vermont Medical Center

Cardiovascular ICU

Location

University of Vermont Medical Center
McClure 3
Burlington, VT 05489

Phone

802-847-2304

Fax

802-847-0028

Healthier Communities.
Healthiest Lives.
Together.

UVMHealth.org