PATIENT INFORMATION

Kevin K. Nunnink
Extracorporeal Membrane Oxygenation Program

A family’s guide to understanding this specialized treatment for cardiac and pulmonary complications

Saint Luke’s Mid America Heart Institute
Recommended Visiting Hours

8:30 a.m. – 6:30 p.m.; 8:30 – 10:30 p.m.
We have a flexible and open visitation, but in general we recommend patients and family sleep from 10:45 p.m. to 8:30 a.m.

We ask that only two people visit at a time. Children under the age of 12 are not allowed in the ICU.

Shift changes
6:30 – 8:30 a.m.; 6:30 – 8:30 p.m.
Please refrain from visiting or calling during these times.

Please note:
Depending upon medical conditions and risk factors, visitation might be limited or restricted. Your family member’s well-being is our first priority. This might delay your visitation or getting answers to your questions until it is safe to do so.

Important numbers

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<tr>
<th>NAME</th>
<th>SPECIALITY</th>
<th>NUMBER</th>
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<tbody>
<tr>
<td>Saint Luke’s Hospital main desk</td>
<td></td>
<td>816-932-2000</td>
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<td>CVICU</td>
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<td>816-932-3672</td>
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A Family’s Guide to ECMO

Saint Luke’s Kevin K. Nunnink ECMO Program

Having a loved one in the intensive care unit can be overwhelming. This booklet will answer some of your questions about ECMO and what your family member will experience. Please know we are here to answer any questions and listen to your concerns. You have our full support during this difficult time.

Thanks to ongoing support and generosity from the Kevin K. Nunnink Foundation, Saint Luke’s has been able to expand our program with additional ECMO machines—saving even more lives.

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8 Glossary

Boldfaced words within the text appear in the Glossary. The Glossary contains additional words you might hear frequently.
What is ECMO?

ECMO is a treatment that brings oxygen into the body when the heart and/or lungs are not working well. ECMO stands for extracorporeal membrane oxygenation and is a form of extracorporeal life support (ECLS). It serves as an artificial lung to assist in breathing and also can support the heart when the heart is not working as it should.

Many lung diseases or heart problems can improve over time with ECMO. This healing process can take a few days or can take many weeks.

Who needs ECMO?

ECMO is a temporary treatment for a person who is critically ill with a failing heart and/or lungs. ECMO is not a cure. Rather, it lets the organs rest, heal, and recover. It might be needed when there is:

- Respiratory failure caused by trauma, pneumonia, flu, or other infection
- Heart failure that could occur after a heart attack or surgery or before a device is implanted
How does the ECMO circuit work?

One or two **cannulae** (tubes) are placed into the body, either the neck, chest, and/or groin. Blood leaves the body through a cannula and moves through the ECMO tubing to a blood pump.

The pump pushes the blood through an artificial lung, called a **membrane oxygenator**. The oxygenator puts oxygen into the blood and gets rid of carbon dioxide. After passing through the artificial lung, the blood returns to the body through a cannula.

**Veno-venous**  
**VV ECMO**  
supports lungs

**Veno-arterial**  
**VA ECMO**  
supports both heart and lungs
What does a person on ECMO look like?

The cannulae in the body and the large amount of tubing in the ECMO circuit can be upsetting to see. Your family member will have a breathing tube in the mouth or neck that is attached to a breathing machine, which helps keep the lungs inflated. There will be other monitoring equipment as needed.

Your family member might look puffy. The puffiness (edema) can appear shortly after the start of ECMO and will improve in a few days. After a short time on ECMO your family member might look better, but this doesn’t mean he or she has reached a healthy state.

Is ECMO painful?

No. Your family member’s disease and certain treatments might cause some pain, but ECMO is not painful after the cannulae are in place. Your family member will receive continuous sedation for comfort and to prevent restlessness.
Who will care for my family member?

Your loved one will have an ECMO team of caregivers, led by a critical care physician called an intensivist. Each day, your family member’s team will meet bedside to develop the daily care plan. These meetings are called rounds, and you are welcome to be present at this time.

We expect you to have questions about your family member’s care, and we want to hear them. If you are unable to attend rounds, a team member will give you an overview and answer any questions.

The care team

- Intensivists oversee care
- ECMO Specialists (ICU nurses) provide bedside care and ongoing monitoring
- Cardiothoracic surgeons perform surgical treatment, including cannulation and decannulation, as needed
- Cardiologists monitor heart function
- Cardiac anesthesiologists monitor sedation medications and provide surgical anesthesia as needed
- Perfusionists provide cannulae and intravenous support
- Respiratory therapists monitor lung function and handle rehabilitation
- Pharmacists monitor blood thinner, antibiotics, and other medications
- Nutritionists oversee nourishment and assist in developing a diet plan once your family member no longer needs ECMO
- Additional care providers depending on needs
What treatments will my family member receive while on ECMO?

Your family member will receive an anti-clotting medicine called heparin, which keeps blood from becoming too thick and clotting in the ECMO circuit. A blood test called the Activated Clotting Time (ACT) will be done at the bedside to make sure your family member gets the right amount of heparin.

For patients on VV ECMO, we take chest X-rays to check for improvement; in some cases we perform a bronchoscopy to assess lung function and take tissue samples if needed.

For patients on VA ECMO, we also perform an echocardiogram to check heart function.

What are the risks?

The most common are:
- Bleeding at the cannula site
- Infection at the cannula site; antibiotics lower this risk
- Stroke caused by bleeding in the brain, a blood clot, or air bubble; blood thinner medications reduce this risk
- An ECMO circuit failure is highly unlikely. We follow several safety measures to prevent this. In the rare occasion that the circuit malfunctions or fails, please be assured we will take every step to keep your family member stable until ECMO can resume.

What can I do during this time?

We encourage family members to participate in the direct care of your family member. The unit offers open visiting hours. You can help with such daily living tasks as baths, basic skin care, washing hair, and passive range of movement exercises.

We also welcome you to participate in the multidisciplinary daily rounds even before your family member can actively participate. As recovery advances, you become key support during physical therapy sessions.
When is ECMO removed?

If your family member improves with treatment, the care team will talk with you about stopping ECMO. The ventilator will remain in place until your family member can breathe well without support. He or she will also still need medicines to support heart or lung function.

How long does recovery last?

It will take some time for your family member’s strength to return. Most ECMO patients need skilled nursing or long-term rehabilitation before returning home.

What if my family member doesn’t recover?

ECMO works well most of the time, but sometimes a person does not respond to the treatment. By participating in daily rounds and talking with the ECMO care team, you will be aware if your family member is not recovering. The ECMO care team will discuss end-of-life decisions with you should they be necessary.
ECMO Glossary Guide

**ACT (Activated Clotting Time)**
A blood test that tells us how long it takes for the blood to clot; checked at least once an hour

**Bronchoscopy**
A fiber-optic scope used to examine the lungs and take samples of lung tissue and sputum

**Cannulae (singular cannula)**
The plastic tubes placed into the blood vessels that lead to the heart; the ECMO circuit attaches to these cannulae

**Cannulation**
The process of placing a cannula into the blood vessels, performed surgically or by percutaneous method

**Decannulation**
The process of removing the cannulae—cannulae placed by percutaneous method are pulled out like an IV and pressure held for at least 20 minutes; cannulae placed surgically require a small operation to remove them, performed at the bedside

**ECLS (extracorporeal life support)**
A variation of cardiopulmonary bypass that can be used for weeks or months to support bodies in organ failure

**ECMO (extracorporeal membrane oxygenation)**
A form of ECLS that uses an artificial lung to flood the blood supply with oxygen for patients in respiratory failure; it is also used to support heart failure

**ECMO flow**
The amount of blood moving through the ECMO circuit per minute; relates to how much support the patient is receiving

**ECMO team**
The specially trained nurses, respiratory therapists, and multidisciplinary group of physicians who care for your family member; an ECMO Specialists and a nurse will be at the bedside

**Membrane oxygenator**
The artificial lung that removes carbon dioxide and adds oxygen

**Oxygen challenge**
Conducted when the patient has shown improvement—we temporarily stop the ECMO circuit and monitor how the patient’s heart and/or lungs are functioning

**Percutaneous cannulation**
The cannulae are placed like an IV; there is no surgical incision

**Tracheostomy**
A tube placed directly into the neck that leads to the lungs; used instead of an endotracheal tube placed in the mouth to reduce damage to the larynx and decrease the risk for lung infection
Questions for Your Caregivers
Learn more
saintlukeskc.org/ECMO
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