Extracorporeal Membrane Oxygenation (ECMO)

Your loved one needs extracorporeal membrane oxygenation, or ECMO. They have a serious health problem that is affecting their heart or lungs. As a result, their heart, lungs, or both may not be working well.

ECMO provides life support care. The ECMO machine takes over the work of the heart, lungs, or both. It has a pump that works like a heart. It also has a device called an oxygenator. This device works like the lungs. While your loved one is on ECMO, their heart and lungs can rest. Their healthcare providers also have more time to treat any underlying health problems.

When you see your loved one, you will notice lots of tubes connected to them. These are called cannula. The tubes may be running from your loved one's upper leg, neck, or chest. They help carry blood from your loved one's body to the ECMO machine. Once in the machine, the blood goes through the oxygenator. This artificial lung removes carbon dioxide from the blood and adds oxygen. The oxygen-rich blood is then pumped back into the body.

Why is ECMO done?

ECMO may be done when the heart can't pump enough blood to the whole body. The heart may be weakened for many reasons, such as a heart attack, heart failure, or an infection.

ECMO may also be done when the lungs aren't able to add enough oxygen to the blood or remove enough carbon dioxide from it. Many things can lead to this lung failure. These include:

- Chronic lung diseases like chronic obstructive pulmonary disease (COPD)
- Severe illnesses like pneumonia, the flu, or COVID-19
- Smoke inhalation
- Drowning

In some cases, ECMO is done after heart surgery to help a person recover. Or it may be done before a heart or lung transplant. It may also be used before implanting a ventricular assist device.

What happens before ECMO?

If your loved one needs ECMO, a healthcare provider will tell you what to expect. Talk with the provider if you have any questions or concerns.

What happens during ECMO?

ECMO is done only in a hospital. Your loved one will be in the intensive care unit (ICU). They will be connected to monitors that keep track of their heart rate, blood pressure, and oxygen levels.

For ECMO:

- A healthcare provider first makes small incisions in the upper leg (groin), neck, or chest. These are where the tubes, or cannula, are put into the body. The location of these entry sites depends on whether your loved one needs support for their heart, lungs, or both.
- A healthcare provider then puts the tubes into the body. They are put into certain blood vessels. These are arteries or veins.
- The tubes are then connected to the ECMO machine.
- The ECMO machine is turned on. Blood is pumped through the tubes from the body to the machine. As the blood flows through the oxygenator, carbon dioxide is taken out and oxygen is added.

- The blood is then pumped back to the body through the tubes.

While your loved one is on ECMO, a healthcare provider may give them medicines to prevent blood clots from forming. They may also get other medicines like antibiotics or pain relievers. They may get nutrition through an IV. They may need blood transfusions, too.

Your loved one may be awake or asleep during ECMO. It depends on their condition. Healthcare providers will closely watch your loved one. They will do regular blood tests. These check the levels of oxygen and carbon dioxide in the blood.

How long does ECMO last?

Your loved one will have ECMO until their heart and lungs are strong enough to work by themselves again. They may need ECMO for a few hours, a couple days, or several weeks. It depends on their condition.

What happens after ECMO?

The healthcare providers will talk with you every day about your loved one's condition. They will decide when it's best to stop ECMO. In some cases, ECMO may not help.

If your loved one's condition starts to get better, they will slowly be taken off the ECMO machine. Once the machine is turned off, the tubes will be removed.

If you have any questions or concerns, talk with a healthcare provider.

Risks of ECMO

Most procedures have risks. ECMO has these risks:

- Bleeding
- Blood clots
- Infection
- Kidney failure
- Stroke
- Leg injury if a tube is placed in a blood vessel there