
Critically Ill Flu Patients Saved With Artificial Lung Technology Treatment Normally Used For Lung Transplant Patients

In recent weeks the intensive critical care units at University Health Network's Toronto General Hospital have used Extra Corporeal Lung Support (ECLS) to support five influenza (flu) patients in their recovery from severe respiratory problems. ECLS systems are normally used at the hospital as a bridge to lung transplantation but increasingly, the hospital is using ECLS on patients where the usual breathing machines (ventilators) cannot support the patient whose lungs need time to rest and heal.

The ECLS systems are essentially artificial lungs that oxygenate the patient's blood outside the body, which gives lungs the chance to rest and heal. This method of oxygenation means that a ventilator is not used to help the patient breath and also means that the patient is not exposed to the possibility of further lung injury, which can happen to ventilated patients. The use of ECLS system requires expertise in its use to avoid other problems such as clots, bleeding problems and infections related to use of the device.

The lung is the only organ that, even when injured, is required to support the life of the patient while it is enduring the injury and trying to recover. The ventilators routinely used in this setting can actually add further injury to the lung on top of the original injury caused by the flu or pneumonia. This is where ECLS can play an important role by taking over the job of the lung so that the lung has a chance to be treated, rest and recover.

"ECLS is an important part of our ability to bridge patients to lung transplantation and we have a great deal of experience in its use," said Dr. Shaf Keshavjee, who directs the ECLS Program as part of the Toronto Lung Transplant Program. Dr. Keshavjee is a thoracic surgeon and the Surgeon in Chief at University Health Network. "As the technology has improved over the years, we are now able to offer this life-saving therapy to the small percentage of patients with influenza that get into severe trouble with acute lung injury.

This is part of our strategy to be prepared should we have a serious flu epidemic. The past few weeks have illustrated that our planning and training of our team has paid off. When several Ontario hospitals called us for help with their patients in serious lung failure, we were able to transfer those patients in and provide this life-saving therapy. All five patients survived to be weaned off the ECLS machines."

The use of ECLS requires insertion of a tube to remove blood from a large vein, which then has oxygen added to it and carbon dioxide removed. The blood is then pumped back into the patient through a second tube in another vein or artery. These patients are taken care of by a team of thoracic surgeons, intensivists, perfusionists and specially trained nurses in the Intensive Care Unit at TGH.

"Earlier this year, a patient arrived for urgent lung transplantation," said Dr. Eddy Fan, Intensivist and Medical Director of the ECLS Program at UHN's Toronto General Hospital. "After using ECLS, the patient's lungs healed themselves and we avoided a lung transplant. This is a remarkable outcome and our experience with flu patients is particularly rewarding for the Intensive Care Unit because we avoid the use of a ventilator which is very difficult for patients and can lead to further lung injury."

30 Years Since the World's First Successful Single-lung Transplant Happened in Toronto

The world's first successful single-lung transplant was performed at Toronto General Hospital in 1983. Since that time, the Multi-Organ Transplant Program at UHN has led the development of cutting-edge innovations, many of which have transformed how patients with all forms of lung disease and lung failure are treated.

About University Health Network

University Health Network consists of Toronto General and Toronto Western Hospitals, the Princess Margaret Cancer Centre, and Toronto Rehabilitation Institute. The scope of research and complexity of cases at University Health Network has made it a national and international source for discovery, education and patient care. It has the largest hospital-based research program in Canada, with major research in cardiology, transplantation, neurosciences, oncology, surgical innovation, infectious diseases, genomic medicine and rehabilitation medicine. University Health Network is a research hospital affiliated with the University of Toronto.

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