

Paediatric World First - SickKids Team performs lifesaving lung procedure

16-year-old patient back in action at school and soccer field

Toronto, February 18, 2009 - In a world first, doctors at The Hospital for Sick Children (SickKids) performed an innovative operation using an external artificial lung to keep a paediatric patient alive until new donor lungs were available.

Sixteen-year-old Katie Sutherland was temporarily fitted with the Interventional Lung Assist device or Novalung®. For 30 days, Katie's blood circulated externally through a small white box, which enriched her blood with oxygen, removed carbon dioxide and most importantly for Katie, relieved the pressure on her heart caused by her sick lungs.

The SickKids surgical team, led by Dr. Shaf Keshavjee, Director of the Toronto Lung Transplant Program, used the German-made Novalung® device to partially bypass Katie's failing lungs allowing her heart to do less work.

Unlike older artificial lungs which were run by mechanical pumps, Novalung® is powered by the patient's own heartbeat. It is a membrane ventilator that allows oxygen and carbon dioxide to exchange through simple diffusion.

Last summer, Katie, then 15, was diagnosed with pulmonary hypertension. This rare condition constricts veins and arteries within the lungs and forces the heart to work much harder than normal to pump blood to the lungs. As a result Katie's heart was failing. Before the operation her heart had swelled up to four times its regular size and was no longer pumping enough blood.

"Katie was gravely ill and in fact had a short period of cardiac arrest in the operating room," says Keshavjee. "She almost certainly would have died that night. Our procedure helped her stay alive long enough for suitable donor lungs to become available for transplant."

The three-hour procedure at SickKids was performed on July 3, 2008, by a 10-member team led by Dr. Keshavjee, Dr. Marc de Perrot and Dr. Andrew Pierre, SickKids cardiovascular thoracic surgeons. With the artificial lung, Katie remained stable for a month until suitable donor lungs became available for her. During that time she was able to breathe, talk and eat, and do gentle exercises.

The success of Katie's month-long stint on an artificial lung is attributable to the coordinated efforts of health-care professionals from SickKids and Toronto General Hospital (TGH); including respiratory physicians Dr. Mindy Solomon and Dr. Hartmut Grasmann, critical care physicians, anesthesiologists, operating room and critical care nurses, respiratory therapists and cardiovascular perfusionists.

This is the first time in the world that the Novalung® has been used in this way in a paediatric patient, and only the second time the device has been applied in this fashion in North America.

Up to 20 per cent of patients on the lung transplant waiting list die before a matching lung is found, and patients with pulmonary artery hypertension are at the highest risk level.

"We know that Katie's life has been saved, and we are incredibly thankful to the staff," says Paul Sutherland, Katie's father. "To actually experience a technological step forward is very humbling."

Katie, who celebrated her 16th birthday in the Critical Care Unit at SickKids, returned home with a new pair of lungs. She is finally getting back into her routine - just recently returning to school and she has just started playing soccer.

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