Novel organ preservation device to reduce transplant waiting list

August 13 2020

Credit: ScubaTx

A novel system that preserves the condition of donor organs for longer, is easy to transport and affordable, has been developed by Newcastle University and Newcastle Hospital Trust spin-out, ScubaTx.

The team has developed a prototype which has already been demonstrated successfully on human organs. Compact and light, the ScubaTx device controls and monitors gas distribution through an organ.

As a result, the device will enable an organ to be transported over greater distances without the need for constant intervention by a medical technician—reducing costs and delays.

Dr. Bill Scott, Scientific Director of the Transplant Regenerative Medicine Laboratory at Newcastle University and ScubaTx CSO, explains: "The concept of what we are doing is relatively simple, but developing a device that can bring this level of precise automation has required years of research and development. Persufflation has historically relied on highly trained technicians to monitor and adjust gas flows during transport. The breakthrough with ScubaTx is the use of state-of-the-art technologies to create an automated device that is simple to use and can be deployed in health services internationally at scale."

The ScubaTx solution

Thousands of people live every day with the impacts of end stage organ failure. Managing these patients is costly and transplantation is often the only treatment; yet despite best efforts, demand for organs far outstrips supply.

Traditionally, donor organs are transported on ice to try and slow the deterioration rate, but this does not allow organs to remain healthy for long. When a possible match is found, highly trained transplant teams have to scramble at any time of the day or night to recover and deliver organs to an awaiting surgeon. Other operations have to be canceled, night-time work increases the risk of mistakes, and the personal toll on healthcare professionals makes recruitment and retention an ongoing challenge.

The technique, persufflation, submerges donor organs in saline solution and gently streams oxygenated air through the vessels of the chilled organs to increase viability from just a few hours to 24 hours or longer.

Current studies with human pancreas have shown that persufflation maintained the quality of donated organs for 24 hours, demonstrating a dramatic increase in islet yield and fourfold increase in islet function. Other studies with persufflation have demonstrated benefits in preserving function in liver, kidney, heart, and even composite tissues such as limbs.

Next steps toward product launch

The company, a spin-out from Newcastle University and Newcastle Hospitals NHS Foundation Trust, has an experienced management team supported by an international network, Newcastle University's Dr. Leo Freitas as its CIO, and has already filed four patents.

While the ScubaTx device will be compatible with multiple organ types, the initial clinical focus will be on pancreas and kidney. Trials are planned for next year and have already received support from Innovate UK and the European Regional Development Fund. The company later intends to develop solutions for liver and heart transplants.

Professor Derek Manas, NICE advisor, Liver and Pancreas Advisory Groups member, past-President of the British Transplant Society, and National clinical governance lead of NHS-British Transplant, says: "It's really encouraging to see ScubaTx adopting this innovative approach to take a proven, but highly complex organ preservation technology system, out of the laboratory and into the real world. I am looking forward to working with the team to deliver what should yield significant advances to the whole transplant community, but most importantly to the patients I work with for whom transplant is frequently the only viable long-term solution."

More information: For more information, see www.scubatx.com/

Provided by Newcastle University