Queen's University Belfast leads bid to save lives of people suffering respiratory failure

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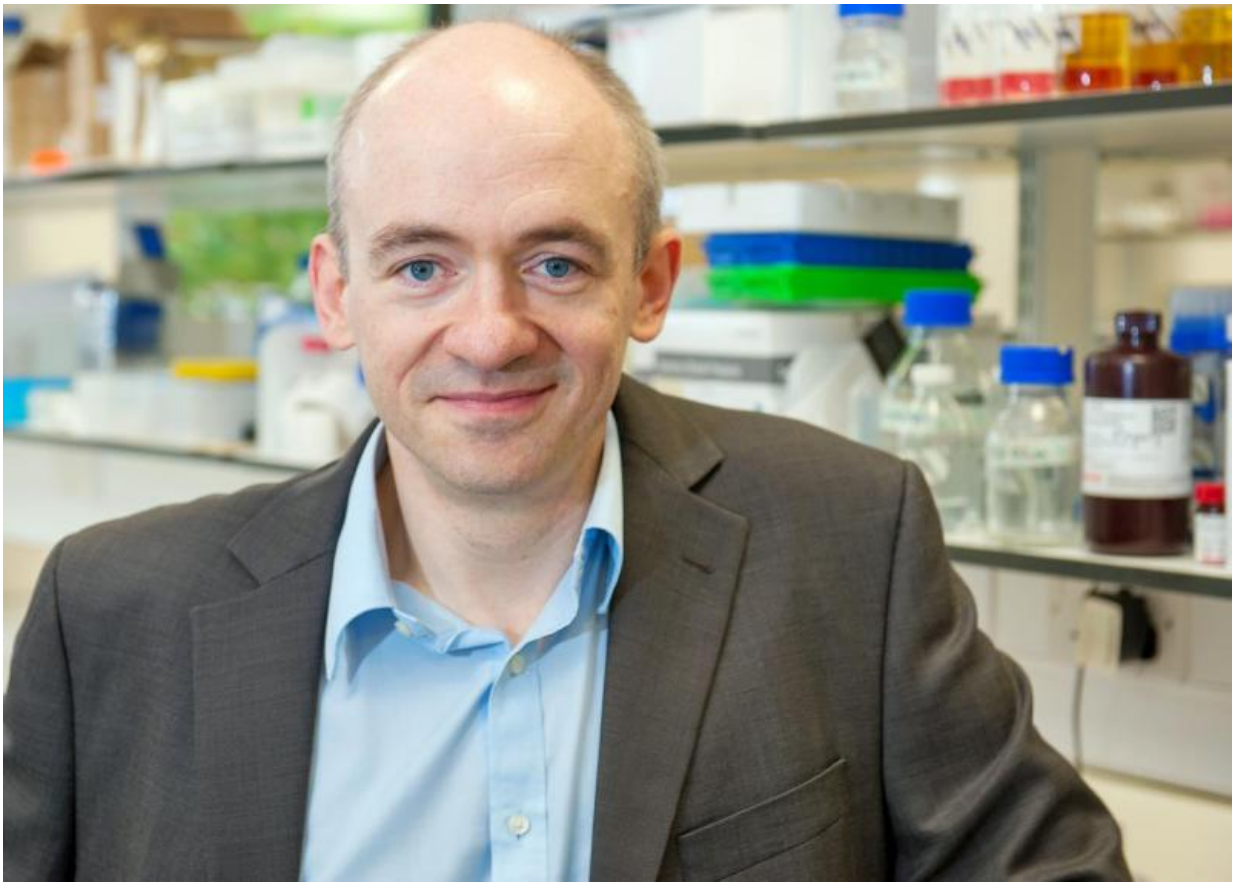

Professor Danny McAuley, lead researcher, Queen's University Belfast, Northern Ireland, UK. Credit: Queen's University Belfast

A potentially revolutionary new technology - that could saves thousands

of lives in Intensive Care Units around the world - is being trialled in a UK study co-led by Queen's University Belfast.

Covering 1,120 critically ill patients in 40 different sites in Britain and Northern Ireland over five years, the research project will test a new strategy designed to minimise damage to the lungs caused by mechanical ventilation - commonly referred to as 'ventilators'. The study will be one of the largest clinical trials in the world, to date, involving patients with respiratory failure.

The National Institute for Health Research (NIHR) has funded the £2.1 million research which will be jointly led by Queen's and Belfast Health and Social Services Trust.

Respiratory failure is common in the UK; about 100,000 people each year require the assistance of ventilators in ICUs and up to 40 per cent of these patients die. The number of deaths exceeds that from road traffic accidents or from prostate cancer and leukaemia combined.

Although there is evidence that ventilators save lives, they can also be associated with damage to the lungs, because of the mechanical pressure exerted on the organs.

Now, a new type of technology called 'extracorporeal carbon dioxide removal', which aims to facilitate a gentler type of ventilation, offers the hope that more lives could be saved, but only a clinical trial, such as the one being co-led by Queen's, will provide definitive results.

Professor Danny McAuley, Professor of Intensive Care Medicine at the Centre for Infection and Immunity at Queen's University Belfast, explained: "A mechanical ventilator acts like bellows as air is forced into the lungs under pressure. If the pressure is too high, this can cause lasting damage. But we are hoping that this new technology will help us

ventilate the lungs more gently. That is because these new devices have been designed to help remove carbon dioxide from the patient's blood - in a process quite similar to kidney dialysis - which is one of the main functions of the lungs.

"The new technology involves a catheter being inserted into the patient's vein. Blood from the patient then passes through a device where it is 'washed' to remove carbon dioxide before being returned to the patient. By temporarily removing some of this function from the lungs, it means they do not have to do as much work as usual, and so a gentler ventilation may be sufficient, easing the pressure on them."

Dr James McNamee, from Belfast Health and Social Care Trust said: "In our study, there will be two groups of people admitted to ICUs with respiratory failure. One will receive the best level of care within current NHS guidelines while the other group will have the additional, new treatment to artificially remove the carbon dioxide from their blood. At the end, we should know whether the new technology can impact on mortality rates.

"We can also begin to look at the long-term survival and quality of life for patients treated with this technology, as well as the cost implications. The fact is, even patients who survive respiratory failure often suffer long-term health problems. As well as impacting on quality of life, these knock-on problems are a significant drain on resources in the NHS so anything we can do to improve outcomes would be a win-win situation."

The extracorporeal CO_2 removal device to be used in the study, called the Hemolung Respiratory Assist System, is manufactured by US-based ALung Technologies. Peter DeComo, Chief Executive Officer of ALung said: "We are honoured to have been chosen by the study team as the technology partner for this very important project. This study promises to provide the most robust evidence yet regarding the impact of

minimally invasive extracorporeal CO_2 removal technology to reduce mortality through facilitation of an 'ultraprotective' ventilation strategy. We thank Professor McAuley and his team for their efforts to organise this landmark study and look forward to its commencement."

Dr Janice Bailie, Assistant Director of the Public Health Agency's Health and Social Care R&D Division in Northern Ireland, which has provided long-term support to help this team secure the award said: "I am delighted that Northern Ireland will lead this UK-wide research study that has the potential to improve the management of patients in critical care worldwide. The prestigious National Institute for Health Research offers the opportunity for local researchers like Professor McAuley and his team to bring major research income to Northern Ireland, to support this type of study. The results of this study will be of interest at an international level and will highlight the capability of Northern Ireland researchers to lead globally significant healthcare research".

More information: www.nets.nihr.ac.uk/projects/hta/1314302

Provided by Queen's University Belfast