



CENTRE DE RECHERCHE
INSTITUT UNIVERSITAIRE
DE CARDIOLOGIE
ET DE PNEUMOLOGIE
DE QUÉBEC

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News release

THE AUTOMATED OXYGEN THERAPY, FULLY DEVELOPED AT THE QUEBEC HEART AND LUNG INSTITUTE – LAVAL UNIVERSITY: A WORLDWIDE BREAKTHROUGH

Quebec City, on September 20, 2019 — The Quebec Heart and Lung Institute – Laval University (the Institute) innovates one more time thanks to the work of Dr. François Lellouche, an internist and intensivist, researcher at the Institute, and professor at the Laval University's Faculty of Medicine. Dr. Lellouche co-developed and assessed with Dr. Erwan L'Her, Head of the Medical Reanimation Department and an INSERM researcher at the CHU of Brest in France, as well as the respirologists of the Institute a new device for optimizing oxygen therapy, one of the most-used treatments in hospital centre.

Oxygen is a multi-component gas that, out of adjustment, leads to complications going up to an increased risk of death. The innovative system of automatic oxygen titration, named FreeO₂, was developed in collaboration with the engineers of Laval University, then assessed at the Institute with the respirologists. This unique apparatus aims to improve the security, the monitoring and the quality of life among users who are receiving oxygen. FreeO₂ allows for innovative patient management of our users to optimize care and to contribute to the effort in reducing costs to the healthcare system. Following a lot of approaches, **this revolutionary apparatus in the medical field has just received positive approval by Health Canada and is already being commercialized particularly in Europe.**

More than ten clinical studies were undertaken to assess FreeO₂ among over 800 users hospitalized in Canada and in France. This innovative device was compared with a float-ball flowmeter, used for the past century in all hospitals around the globe for providing oxygen. The results demonstrated the benefits with FreeO₂ for several adult and pediatric populations. This work was presented at numerous conferences in Europe and North America. The studies demonstrate an improved efficiency, security and monitoring of treatment:

- Better adjustments in oxygen flow (oxygenation target achieved in 80% to 90% of the time to limit the risks of toxicity) which also allow to optimize the tracking by medical personnel from the users;
- A decrease in the duration of hospitalization from 30% to 50%;
- A reduction in costs of 20%.

“The results that we obtained are very promising. This technological advance will certainly have a major positive impact on the user, the medical personnel and the hospitals,” said Dr. Lellouche, co-founder of OxyNov, the corporation that is commercializing the FreeO₂ device.

Partners of OxyNov since its creation in 2009, the Institute’s Research Centre as well as the Laval University support the development of incubating companies in order to help innovative projects to emerge and that they established themselves in their respective markets. OxyNov was in fact temporarily based within the Institute, allowing for innovation through a daily contact with clinicians and future users. “We are proud to have contributed here in Quebec City, to the start-up and the success of OxyNov by providing the assistance and resources needed to develop FreeO₂. OxyNov is truly a local company that contributes tangibly to improving the care provided to the population here and elsewhere in the world for the greater benefit of all. FreeO₂ constitutes a major worldwide innovation in practice in oxygen therapy and targets, as a first step, the respirology, cardiology, neurology, pediatric, and emergency services from public and private hospital centres. There is something to be happy about,” said Dr. Denis Richard, Director of the Institute’s Research Centre.

“The Institute innovates one more time thanks to this new device unique in the world. Indeed, since 1910, oxygen is administered via a float-ball oximeter that requires a manual adjustment and does not allow any monitoring. Improve the security of users requiring oxygen or a respiratory support, in addition to reducing the length of stay in a hospital setting and generating significant savings to the health network, that’s a major advance. So our specialists contributed in a concrete way to advance the science and technology,” noted Mr. Denis Bouchard, President and Chief Executive Officer of the Institute.

“The Faculty of Medicine is proud to have Dr. François Lellouche, a specialist in the development of automated medical ventilation systems at Université Laval, as a member of its faculty. Professor François Lellouche’s expertise in the field of medical technologies greatly enriches the training of medical students he mentors in doctoral and master’s degrees,” said the Dean of the Faculty of Medicine of Université Laval, Julien Poitras.

“Today’s announcement is a concrete example of the positive impact and the leverage effect the IUCPQ Foundation can have in the financial support to projects that aim directly improving care to users. Therefore, I am very proud to see what this innovative initiative has accomplished, which also allows the Institute to position itself among the best specialized hospital centres in the world,” said M^{rs}. Josée Giguère, Executive Director of the IUCPQ Foundation.



Float-ball oximeter that requires a manual adjustment



FreeO₂ : The Automated Oxygen Therapy

ABOUT THE INSTITUTE – IUCPQ.qc.ca

Every year, 16,346¹ people are hospitalized and 129,008 visits were made on an outpatient basis for 45,072 users. The service area is more than two million people, which represents approximately 30% of Quebec's population. Affiliated with the Laval University, the institution counts on the cooperation and the dedication of over 3,500 employees, physicians, professionals, researchers, managers as well as volunteers for providing quality care and services to both hospitalized and outpatient clientele. In particular, the Institute offers programs of specialized and ultraspecialized care and services to treat cardiovascular and respiratory diseases as well as those related to obesity. The Institute's physicians as well as health professionals have extensive expertise and contribute advancing the science of medicine. It also has as its mission to assess technologies and intervention methods in health. The Institute's Research Centre is recognized internationally for the quality of its science.

ABOUT THE RESEARCH CENTRE

The Research Centre's vision is to play an international significant role in the fight against societal chronic diseases through its model of integrated science in cardiology, in respirology as well as in obesity–type 2 diabetes–metabolism. It counts on the cooperation of 177 researchers and physicians scientists, many of whom are recognized as being leaders in their field. These world-class researchers are among the most productive in Quebec. In addition, the perfect correspondence of the research components to the Institute's specializations ensures a synergy between clinicians and researchers, thereby allowing a rapid knowledge transfer to the care.

ABOUT LAVAL UNIVERSITY

Driven by innovation and the pursuit of excellence, Laval University is one of Canada's leading research universities, ranking 8th with \$356 million in research funding last year. It has 3,730 professors, lecturers and other academic and research staff who share their knowledge with over 43,000 students, 25% of whom are enrolled in graduate studies. The oldest francophone university in North America, Laval University has so far trained more than 312,000 people who each contribute in their own way to the advancement of society. www.ulaval.ca

ABOUT OXYNOV

OxyNov is a young Canadian company with a focus on clinical innovation and specializing in the design and commercialization of innovative medical devices in the field of oxygen therapy and airway management. OxyNov was founded in 2009 by two physician-researchers, D^{rs}. Erwan L'Her (Head of the Medical Reanimation Department and an INSERM researcher at the CHU of Brest) and François Lellouche (intensivist and researcher at the IUCPQ-UL), following a clinical research project aimed at the development of a device to automate administration of the oxygen therapy (FreeO₂) and improving the implementation of this treatment on a day-to-day basis. The design of FreeO₂ and its manufacturing were done in Quebec. The first sales were made in Europe, the Middle East, Asia and North Africa.

www.OxyNov.com

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¹ 2018–2019 financial data

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