Chronic Obstructive Pulmonary Disease (COPD) is the sixth leading cause of death worldwide. It affects 2.3 per cent of the population and 7 per cent of people over 60 years of age. COPD results in 60,000 hospitalisations per year and of all major diseases – it presents the fastest increasing health burden. COPD is essentially an inflammatory disease, with emphysema the most widespread as a result primarily of cigarette smoke.

While smoking cessation is the vital first step to managing COPD, other solutions to date have included medical therapies such as anti-cholinergics, long-acting beta agonists, low-dose macrolide therapy, pulmonary rehabilitation and long-term oxygen therapy.

During the 1990s, surgical interventions for COPD saw a rapid increase in bilateral Lung Volume Reduction Surgery (LVRS). The procedure involves surgeons operating on the most destroyed and hyper-inflated part of the lung – typically, the top part of the upper lung – allowing the remaining healthier portions of the lower lung to better ventilate and absorb oxygen.

LVRS has resulted in improved lung function and quality of life in selected patients with advanced emphysema. However, good outcomes have been tempered by high mortality rates of up to 15 per cent, as well as morbidity from the procedure. Follow-up studies have also revealed a more rapid decline in lung health, with the procedure effectively providing a two to three year window of improved quality of life.

Now, a new minimally invasive procedure, recently introduced into Australia – Endoscopic Lung Volume Reduction (ELVR) – is providing enhanced options for emphysema patients.

Associate Professor Alvin Ing – interventional pulmonologist and Associate Professor of Medicine at Macquarie University and the University...
of Sydney — is one of a handful of surgeons performing the operation in Sydney. Working from the Macquarie University Hospital’s Department of Respiratory Medicine, Associate Professor Ing performed the first operation at Macquarie University Hospital in March this year.

“ELVR offers a minimally invasive approach for patients suffering from emphysema, where lungs have lost their elasticity and airways, therefore, collapse, leading to air trapping,” said Associate Professor Ing. “For the first time, the procedure gives us an alternative to open LVR.”

“The procedure involves implanting small, one-way valves into the airway of the most severely damaged lobe of the lung, so that when a patient exhales, air is able to flow through the valve and out of the lobe fed by this airway. However, when the patient inhales, the valve closes and blocks air from entering the lobe. This helps the damaged lobe to deflate, relieving gas trapping. The deflation of the most damaged lobe allows better ventilation of the less damaged lobe and improves matching of ventilation to perfusion in the lung generally. Mucus is also expelled through the valve, helping prevent post-obstructive atelectasis and pneumonia.”

“The valve can be removed if necessary, and the procedure can also be used in the management of broncho-pleural fistulas or air leaks. A key part of the operations success is patient selection.

“This is not for everyone suffering from emphysema,” explained Associate Professor Ing. “Patients must have moderately to severe COPD and they must have stabilised on medical therapy first and undertaken pulmonary rehabilitation. Patients must show gas trapping in the lungs, and they must show heterogeneity of the disease with no communication between the targeted, most damaged lobe and the rest of the lung.”

Associate Professor Ing says that Macquarie University Hospital is one of the few places where ELVR is possible because of the extraordinary imaging facilities and endoscopic equipment.

“This procedure requires extremely high-resolution imaging to be able to determine the most suitable lobe of the lung to be targeted for valve insertion, as well as to ensure that there is no communication between this lobe and the rest of the lung,” said Associate Professor Ing.

“In addition, the endoscopic equipment ideally needs to be agile and dexterous enough to reach certain segments of the lung for valve placement. Normal endoscopic equipment used in bronchoscopies have difficulty with this, but Macquarie University Hospital is the first hospital fortunate enough to have a newer generation of instruments that allows this.”

Associate Professor Ing is one of a large team of endoscopic pulmonologists who work from Macquarie University Hospital. Associate Professor Ing pioneered the use of several minimally invasive techniques in Australia, including helping to establish endobronchial laser resection and stent deployment in the early 1990s in New South Wales. He is one of the few physicians in NSW specialising in new minimally Invasive techniques, and is an active researcher in pulmonary disorders.

“Results we have published from initial research have shown that ELVR patients experience an improved ability to breathe, to exercise and to perform daily duties — all enhancing quality of life,” said Associate Professor Ing.

“We have also shown improvement in objective lung function.”

ELVR has been approved for use by the TGA in Australia.

Michael Osten was diagnosed with emphysema at the age of 60. Since that time, about 15 years ago, he has struggled with medical treatments that were partially effective. Earlier this year, Michael’s respiratory physician, Dr Ruby Brilliante, referred him to Associate Professor Alvin Ing.

Within a week of seeing Associate Professor Ing and after careful assessment, Michael underwent the ELVR procedure — performed by Associate Professor Ing — at Macquarie University Hospital.

“I was in hospital for about a week,” said Michael. “When I got out of hospital, I felt very good. The recovery hasn’t been perfect. Cold air, in particular, affects my breathing, but if it’s sunny and warm, and if there is no breeze, I feel so comfortable that I wouldn’t know I had a problem at all.”

“The major change is that I can fill my chest without feeling as if there is a big weight on it. There is simply more room in my chest cavity, which is really good. And my test results show that the lungs are doing better.”

“Results we have published from initial research have shown that ELVR patients experience an improved ability to breathe, to exercise and to perform daily duties — all enhancing quality of life.”