

# Oxford Lasers

This advanced laser systems specialist has teamed up with a Canadian ultrasound company to produce a high-resolution disposable endoscope that could soon be saving lives as well as costs.

Minimally invasive (or keyhole) surgery allows surgeons to operate on their patients without having to open their chests or cut a large slit in their abdomens. Squeamishness aside, there are [other reasons](#) for opting for a minimally invasive procedure over open surgery. For the patient there is less pain after the operation, fewer complications, reduced scarring and faster recovery. Health care providers gain from shorter hospital stays (so less demand for beds) and, for some procedures, reduced cost and operating times.

But even minimally invasive surgery is not without its risks. For example, serious complications occur in [one out of every 1,000 cases](#) of laparoscopic surgery (where incisions are made in the abdomen). Damage to an organ or major artery could result in the patient needing further surgery to repair the damage.

[Oxford Lasers](#), which specialises in laser imaging and micromachining, hopes that an endoscope it has helped to develop with Canadian product development company [Daxsonics](#) will reduce the risks of keyhole surgery and offer surgeons a greatly improved view of our insides.

The endoscope uses ultrasound to produce a high-resolution image of the various types of tissue that make up the inside of the human body. Although it's not the first to use ultrasound, Daxsonics' endoscope produces a much more detailed image as a result of using higher

frequencies. Unlike the cameras that are typically used for keyhole surgery, ultrasound allows surgeons to see not only the surface of tissues but inside the tissues themselves.

Dr Dimitris Karnakis is Oxford Lasers' Technical Manager for R&D Projects. He said: "Real-time assessment by surgeons and higher precision brain surgery from better navigation mean lower mortality rates, especially in developing countries."

A further advantage is that this endoscope is disposable, mirroring a market trend towards single-use surgical instruments. Being able to dispose of an endoscope after each use will get rid of the risk of contamination associated with cleaning and sterilisation.

The product is designed for American neurosurgeons where the market for brain and spine surgical tools is worth [around \\$10 billion per annum](#). Sales are expected to increase by millions of dollars per year over the next three to five years. This will allow Oxford Lasers to create 10 new full-time roles for their role in the development.

The project that led to so much commercial potential started when Daxsonics contacted Oxford Lasers to find out if Karnakis and his colleagues could use their lasers to help make a prototype of the ultrasound endoscope. It was funded by Innovate UK (which awarded £199,000), and the National Research Council of Canada's Industrial Research Assistance Program through the joint funding competition [UK and Canada: Enhancing Industrial Productivity](#). As the UK looks to open up trade with new international partners, projects like this one could serve as a paradigm.

