

Internet of Things smart needle probes the brain during surgery

January 20 2017, by Caleb Radford



Professor Robert McLaughlin (right) with the smart needle. Credit: University of Adelaide

A "smart" needle with an embedded camera is helping doctors perform safer brain surgery.

The device was developed by researchers at the University of Adelaide

in South Australia and uses a [tiny camera](#) to identify at-risk blood vessels.

The probe, which is the size of a human hair, uses an infrared light to look through the brain.

It then uses the Internet of Things to send the information to a computer in real-time and alerts doctors of any abnormalities.

The project was a collaboration with the University of Western Australia and Sir Charles Gairdner Hospital where a six-month pilot trial of the smart needle was run.

Research leader and Chair of the University of Adelaide's Centre of Excellence for Nanoscale BioPhotonics Robert McLaughlin said researchers were also looking at other [surgery](#) applications for the device including [minimally invasive surgery](#).

He said surgeons previously relied on scans taken prior to surgery to avoid hitting blood vessels but the smart needle was a more accurate method that highlighted their locations in real-time.

"There are about 256,000 cases of brain cancer a year and about 2.3 per cent of the time you can make a significant impact that could end in a stroke or death," he said.

"This (smart needle) would help that ... it works sort of like an ultrasound but with light instead.

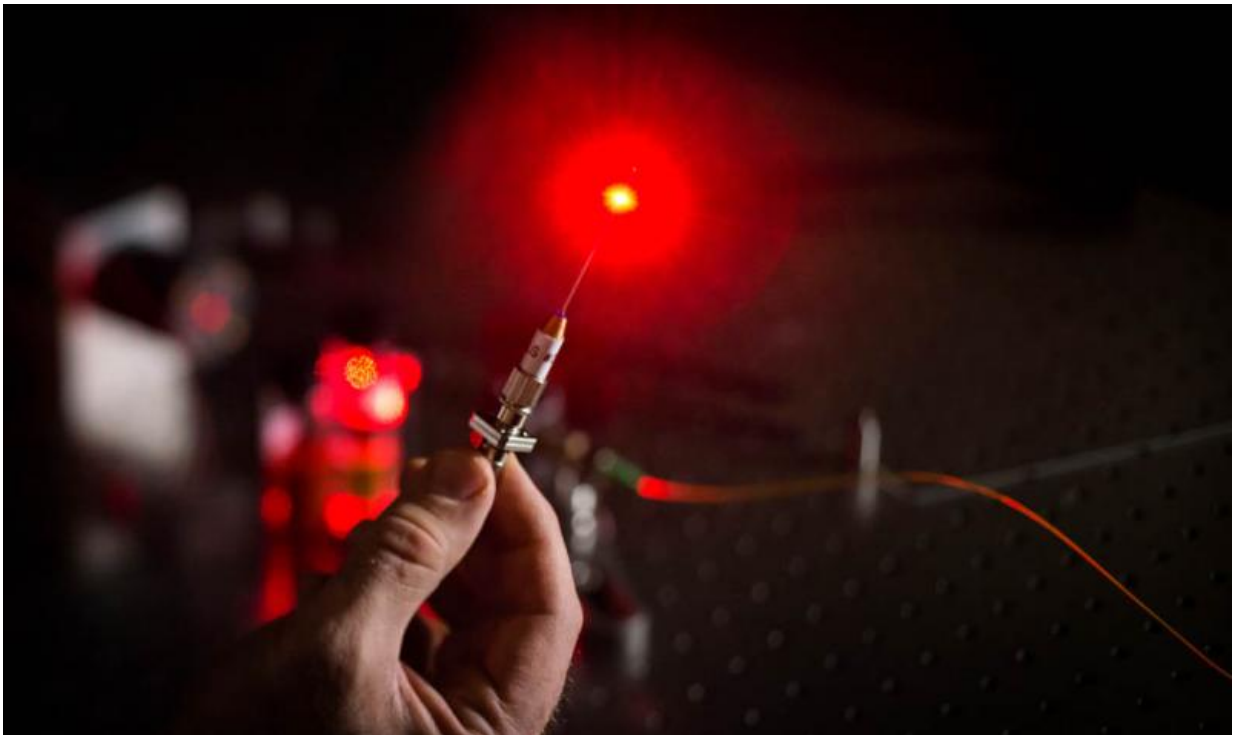
"It also has [smart software](#) that takes the picture, analyses it and it can determine if what it is seeing is a blood vessel or tissue."

The trial at the Sir Charles Gairdner Hospital involved 12 patients who

were undergoing craniotomies.

The needle with a 200-micron wide camera was successfully able to identify blood vessels during the surgery.

Professor Christopher Lind, who led the trial, said having a needle that could see [blood vessels](#) as surgeons proceeded through the brain was a medical breakthrough.



Professor McLaughlin said the smart needle had potential to be used in other surgical procedures. Credit: University of Adelaide

"It will open the way for safer surgery, allowing us to do things we've not been able to do before," he said.

The smart needle will be ready for formal clinical trials in 2018.

Professor McLaughlin said he hoped manufacturing of the smart needle would begin within five years.

Provided by The Lead

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