

Aussie doctor invents 'game-changer' device in ICU treatment

EXCLUSIVE

RHIANNON DOWN

An Australian intensive care physician has invented a world-first device that monitors oxygen levels in the brain of ICU patients without the need to cut a hole in their skull.

St Vincent's Hospital Melbourne ICU doctor Barry Dixon said he was driven to invent a new method for medical staff to monitor oxygen levels in a patient's brain after he witnessed first-hand instances of patients sustaining

brain damage while in hospital.

Dr Dixon said the only method available to practitioners previously was to either test a patient's reflexes intermittently for signs of low oxygen supply – known as hypoxia – or to surgically cut a hole in their skull.

"The only option we have apart from checking reflexes is to drill a hole in someone's head and you measure the pressure in their brain but as you can imagine it's not without risks and it's quite costly," he said.

"So there is a strong need to monitor brains and do it in a non-invasive manner and continu-

ously, and at the moment there isn't really anything other than what we're developing."

ICU patients who are recovering from an event like a stroke or a traumatic brain injury – which have a 50 per cent fatality rate and leave 67 per cent of survivors with long-term disability – often suffer further brain damage from hypoxia while in hospital.

"The patients in ICU are at the more severe end of the spectrum; they're on ventilators, they're unconscious and it's quite hard to know if their brain is getting better or getting worse," Dr Dixon said.

"If you're in hospitals with a

bad brain injury, a lot of those patients acquire complications while they're in the hospital which makes their brain worse.

"It's very hard for us to know it's happening because they're unconscious, they can't tell us and all we can do is examine their reflexes which is a very, very blunt way to check. The problem is that as a consequence we don't detect there is a complication until it's quite advanced."

Dr Dixon said the technology, which he developed through a journey of "trial and error" over 15 years, worked by using light to capture a pulsatile signal from the

surface of the brain below the skin.

"This is a unique device, it essentially gives us a brain pulse oximeter," he said.

"Pulse oximeters have been around for 40 years and if you've ever been in hospital or seen someone in hospital, you've seen one – it tells them how much blood oxygen is in their fingers.

"This is the first time we've been able to develop that technology further to tell us what is happening below the skin in the brain so we got a pulse in the brain.

"It's got a lot of potential to improve a lot of patients' outcomes. It has all kinds of potential uses."

Cyban chief executive Brendan Fafiani, who is working with Dr Dixon to commercialise the device, said it was in the process of seeking regulatory approval and could be ready for market by 2024.

"In terms of what is exciting about it is if you compare it to what is done now where a neural physical exam is done every 30 or 60 minutes by a physician or a nurse at the bedside," he said.

Mr Fafiani said two trials had already been published and a third had recently been completed with promising results. The company was working on bringing the machine to market overseas, he said.