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An current scanner in operation. The new scanning method being developed could lead to the earlier detection of diseases.

Picture: Susan Burrell

Scots' MRI scanning breakthrough 'has potential to save thousands'

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A MAJOR breakthrough in scanning technology, which could save thousands of lives by allowing doctors to spot developing diseases such as cancer and multiple sclerosis at a much earlier stage, was announced by Scottish researchers yesterday.

The new scanning device can provide up to 100 different images from inside the body - compared to one from a conventional scanner - and reveal views which are hidden from current equipment.

A blue rectangular advertisement for Continental Airlines. It features a stylized globe on the left. The text reads: "THE WORLD REALLY IS AT YOUR FINGERTIPS. CONTINENTAL.COM." Below this, it says "continental.com." and "Consider it your one-stop travel center." The Continental Airlines logo is at the bottom right.



The scientists behind the technology say it should allow clinicians to make diagnoses and gain important information about diseases at a much earlier stage, developments cancer experts said last night would make a "dramatic" difference to saving lives. It could also be used for detecting other illnesses including Parkinson's disease and Alzheimer's.

The technology has been developed at Aberdeen University where, 25 years ago, scientists were the first in the world to successfully use new magnetic resonance imaging (MRI) to scan the entire body of patient, heralding the dawn of a new area in medical diagnostics.

MRI technology is based on the use of a large magnet to create a magnetic field inside the human body and a scanner which sends out bursts of radio waves to obtain return signals from various tissues to produce images of internal organs.

Current MRI scanners operate on a set magnetic field, but the new equipment will allow patients to be quickly scanned with a range of magnetic fields, allowing clinicians to obtain new information about what is happening in the body.

Two prototypes of the revolutionary new scanner have already been built and the research team has been awarded £2.5 million in funding from the Engineering and Physical Sciences Research Council to perfect the new "fast field-cycling" technology.

David Lurie, professor of biomedical physics at Aberdeen University,

said he and his team were "tremendously excited" about the new system.

He explained: "It is a bit like having at our disposal 100 or more MRI scanners, each one operating at a different magnetic field - but all in the one scanner. The advantage is the new scanner will produce images of the body that will tell clinicians important information about disease processes at a much earlier stage."

He added: "We are going to develop a new technique called 'fast field-cycling MRI' and the main difference is we will be able to switch the magnetic field in about one-twentieth of a second while the patient is in the scanner. We can obtain information about tissues at a whole range of magnetic fields. That will unlock information hidden to the standard MRI.

"The new method will be particularly sensitive to changes in proteins in the tissues in the body and especially changes that arise from disease.

"It will be of use in research and diagnosis into conditions such as Parkinson's disease, Alzheimer's, multiple sclerosis and, potentially, cancer. It will be used in research into what brings about all those conditions and it will, we hope, allow earlier diagnosis of these conditions which will mean better treatment.

"We know it works in principle and we want to perfect the technology to produce a working human-sized scanner."

Prof Lurie said the equipment, the development of which should be completed within four years, had the potential to save "thousands of lives".

Dr Mark Matfield, scientific consultant to the Association for International Cancer Research, said: "This could be an important technological development that could tell us more about how advanced a cancer is, thus helping doctors choose the most appropriate treatments. In general, the earlier a tumour is diagnosed - particularly before it has spread - the easier it is to treat successfully.

"In some cancers, the difference is dramatic. If breast cancer is diagnosed at an early stage - before it has spread - six out of seven patients survive for at least five years. However, if the cancer is only diagnosed when it is advanced, only one in seven patients is alive five years later."

Kate Fearnley, policy director of Alzheimer Scotland, said: "

Initiatives like this are vital if researchers are to understand what goes wrong in the brain and how we might be able to stop it."

And Dr Kieran Breen, director of research and development for the Parkinson's Disease Society, added:

"Any research that can shed more light on the causes and progression of Parkinson's, and lead to a more accurate diagnosis, will help to target new treatments and bring us closer to finding an effective cure."

- AN ELDERLY man from the fishing town of Fraserburgh made history on 28 August, 1980, when he became the first patient in the world to receive a whole-body MRI scan.

The scan, which picked up the tumours on his liver that would eventually claim his life, marked a massive breakthrough in magnetic resonance imaging technology. It was developed by a team of researchers at Aberdeen University, led by Professor John Mallard, who was then head of the medical physics department.

The development of the MRI body scan was hailed at the time as the biggest improvement in medical diagnostics since the discovery of X-rays in 1895.

Dr Francis Smith, who carried out the first scan, said: "We are fiercely proud of what was achieved all those years ago."

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