FACT SHEET: How Micro-X's Brain CT Scanner works

Adelaide company Micro-X is developing a small brain CT scanner that can be fitted in road and air ambulances, effectively turning them into stroke-capable ambulances.

It will allow paramedics or retrieval teams to diagnose and then start treating stroke patients quicker, hopefully within the golden hour – the first hour after a stroke – which has a dramatic impact on recovery outcomes.

Micro-X's Brain CT Scanner takes advantage of the company's patented x-ray technology, which dramatically reduces the size and weight of x-ray systems, to rethink the way "computed tomography", or CT, is performed.

Conventional CT scanners aim a narrow beam of x-rays at a patient and quickly rotate that beam around the body.

The x-ray tube is held by a heavy and bulky gantry.

The images taken in this way are processed by the machine's computer to generate cross-sectional views in "slices" of the body.

Because the process is in three dimensions, these "slices" – called tomographic images – provide a more detailed view than conventional x-rays.

By digitally stacking these slices together the computer forms a three-dimensional image of the patient that provides a detailed image of body structures as well as possible tumours or other abnormalities.

The Micro-X Brain CT Scanner, currently being developed, provides the same "slice" views but gathers them in a different way.

Instead of one x-ray beam revolving around the patient, Micro-X uses a series of individual x-ray tubes arranged in a ring around the patient's body.

Each of these tubes fires a beam of x-rays one after the other around the body.

While the effect is the same as a conventional CT scan - imaging in an arc around the body - the technology means the scanner is much smaller and lighter.

Micro-X's electronic x-ray tube is already tiny compared with conventional x-ray tube, and by not revolving a beam around the patient, no heavy bulky gantry is required.

There are also no moving pieces so the Brain CT Scanner can produce fast high-resolution images of

the brain without any blurring.

Being fully stationary the Brain CT Scanner means reliable imaging even in a moving vehicle.