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Brain 'image' machine called revolutionary

By Marilyn Dunlop Toronto Star

A new method of investigating disease in the brain and spinal cord was described yesterday by a Cleveland doctor speaking in Toronto to the Congress of Neurological Surgeons.

Dr. Benjamin Kaufman, head of neuroradiology at University Hospital, said the new method, called nuclear magnetic resonance, involves no x-rays but "studies obtained of the central nervous system to date are so dramatic that its usefulness is obvious."

Speaking at the Sheraton Centre, Kaufman said this "most exciting new imaging technique" provides images of body structures and reveals differences in chemical composition of the tissue in organs.

Toronto will probably get its first nuclear magnetic resonance unit next year. Princess Margaret Hospital expects delivery in mid-1983 but doctors say it will take them a year or more to be ready to use it to detect cancer.

The unit, a whole body imager, is one of four ordered by Canadian medical centres, three in Ontario and one in Vancouver.

Nuclear magnetic resonance (NMR) involves large magnets — the unit must be housed in a room free of metal structures — and a pulsed radio-frequency current. When the current is turned on, it causes certain nuclei (usually hydrogen nuclei) to spin like tops, realigning themselves in position to the magnet. When the current is shut off, the absorbed energy that caused the nuclei to spin is released and can be measured by computer and displayed on a screen as an image. The signal emitted varies with the density of the tissue. Bone, for example, gives a short signal compared with body fluids. Some studies suggest that a difference between malignant and benign tissue can be detected.

Kaufman has found that for some parts of the brain, NMR gives a better view than the CAT scan (computerized tomography — already used in a number of Ontario hospitals).

It takes about four minutes to produce an image of the brain and 40 minutes for a whole body scan.

Kaufman said so far no ill effects have been reported from nuclear magnetic resonance. The procedure is still considered experimental. One Ohio researcher has reported views of the spine as "just spectacular."

Some studies indicate it can detect early changes in blood vessels, even in tiny capillaries, following stroke or heart attack that would show doctors what damage has been done far sooner than they'd otherwise have known.

Diagnosis with the NMR scan requires no injection of dye (as a contrast fluid) and gives a three-dimensional picture. Its impact on medicine is predicted to be as revolutionary as the CAT scan was a decade ago. NMR units cost \$500,000 to \$1.5 million.