

## Differences between an Open and Closed MRI Scanner



GE TwinSpeed "Closed" MRI scanner: located at MRI Center of Idaho, Boise

The terms "closed" and "open" refer to the geometry of the magnets used in MRI scanners.

The closed magnet configuration refers to a tube-like tunnel, which was the original shape of the most MRI scanners. The field strengths of these closed scanners range from .35 Tesla up to 3.0 Tesla (Tesla being a measure of the strength of the magnetic field). All high field superconducting MRI scanners ( $\geq 1.5$  Tesla) are of the closed configuration type.

Open magnets, which have been developed more recently, typically are either permanent magnets or resistive electromagnets. The typical open configuration consists of two large, rounded, horizontally oriented metal discs which are the poles of the magnet between which the patient is placed. These magnets have no sides and are thus "open". In general, open magnets are considered low to mid-field and have magnetic field strengths of 0.2 to 0.7 Tesla.

Although most MRI scans can be performed in either a closed or open magnet, there are some differences and trade-offs. Extremely claustrophobic patients often prefer an open MRI environment. Certain large patients can fit only in open MRI scanners. Open configurations also can provide motion studies of the joints which are not possible by closed configuration.

Closed MRI scanners typically scan patients faster than open MRI scanners. In addition, closed MRI scanners with high field strengths are capable of achieving greater resolution and thinner slices for viewing smaller parts of the anatomy.

Currently, advanced techniques to detect early stroke, subtle multiple sclerosis plaques and cartilage degeneration in the knee are available only on high field, closed scanners. MR myelograms can be performed only on high field systems.

Ultimately, you should discuss with your doctor and radiologist which type of scanner is best suited for your particular examination.

*This article was modified from the following source:*

<http://www.hillandthomas.com/library04.shtml>



Airis II "Open" MRI scanner: located at Mercy North Hospital, Nampa



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