

What is fMRI?

MRI: MRI, or magnetic resonance imaging is a way to see inside the body in order to get a clear picture of anatomy. It is used routinely for detection of diseases or abnormal conditions. MRI does not rely on the type of radiation used for an X-ray or computed tomography (CT) scan. The MRI scan requires specialized equipment that uses a powerful, magnetic field along with rapidly changing local magnetic fields, radiofrequency energy and a powerful computer to generate very clear pictures of internal body structures.



Is MRI safe? To date, over 150 million patients have had MRI procedures. MRI has been shown to be extremely safe for adults, children, and infants, as long as the proper precautions are taken. In general, the MRI procedure produces no pain and causes no short-term or long-term tissue damage of any kind.

Precautions must be taken to ensure no metal enters the scanning area: The powerful magnet of the scanner can attract certain metallic objects known as 'ferromagnetic' objects, causing them to move suddenly towards the center of the magnet. This is a danger for anyone inside the magnet. Therefore, when in the vicinity of the magnet, all personnel must go through a metal detector to enter. This, and careful screening prevents any metal objects entering the magnet area.

The MRI 'bore' or tube that the participant enters is small, and therefore, certain claustrophobic individuals may feel uncomfortable. We do not scan anyone who reports claustrophobia.

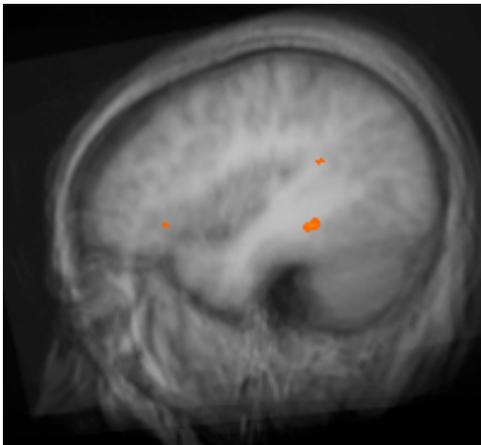


Acoustic noise in the scanning environment is loud, it can reach amplitudes of 113 dB in some magnet environments, but is usually around 90 dB. Although this is well below the U.S. Food and Drug Administration guidelines for acoustic noise levels in an MR system (140 dB), we still require all subjects to wear hearing protection. In the case of children, the headphone system we use reduces the MR noise by 30 dB. This brings the noise down to approximately the level of normal adult conversation.

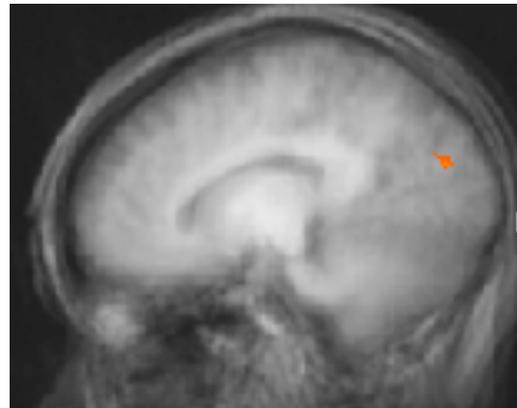
What is fMRI? Functional MRI uses exactly the same magnet as regular MRI. The only difference is that during a functional scan, the MR scanner and computer take scans or 'pictures' of the brain over time. If, at one time a subject is doing something different than a later time, the two scans will be different.

What is the difference that the scans are measuring? When a part of the brain is active, the cells in that region need more oxygen to function, which results in an increase in blood flow to that area. The functional images measure the differences in blood volume in the brain when someone is doing a task at one time versus when they are resting at another time. The result is a colored map of brain areas that are active during the task.

Active areas when seeing letters



Active areas when imagining letters



If you have any questions regarding MRI or fMRI, please feel free to contact us:

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Useful websites:

<http://www.mch.com/clinical/radiology/fmri/Principles.html>

<http://www.mrisafety.com/default.asp>

http://coglab.psy.cmu.edu/P4K_fmri/home_set.htm