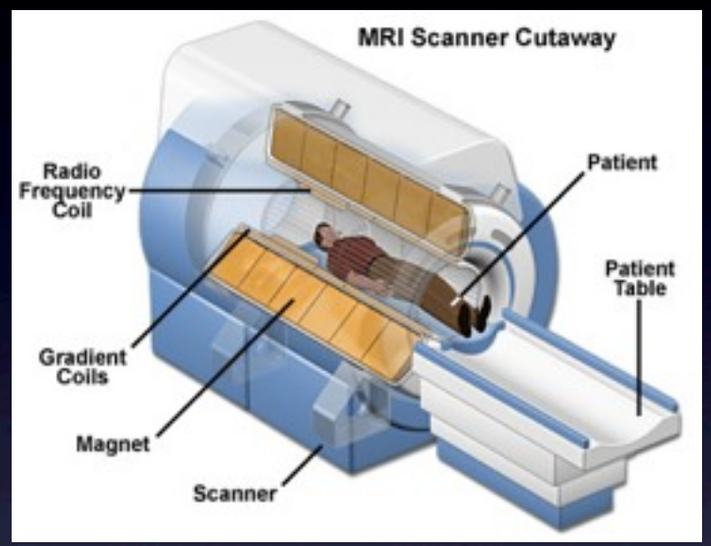
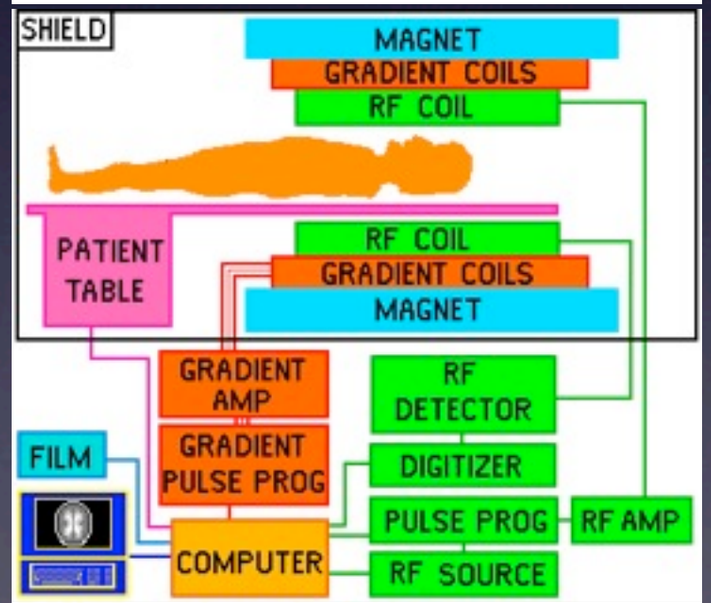
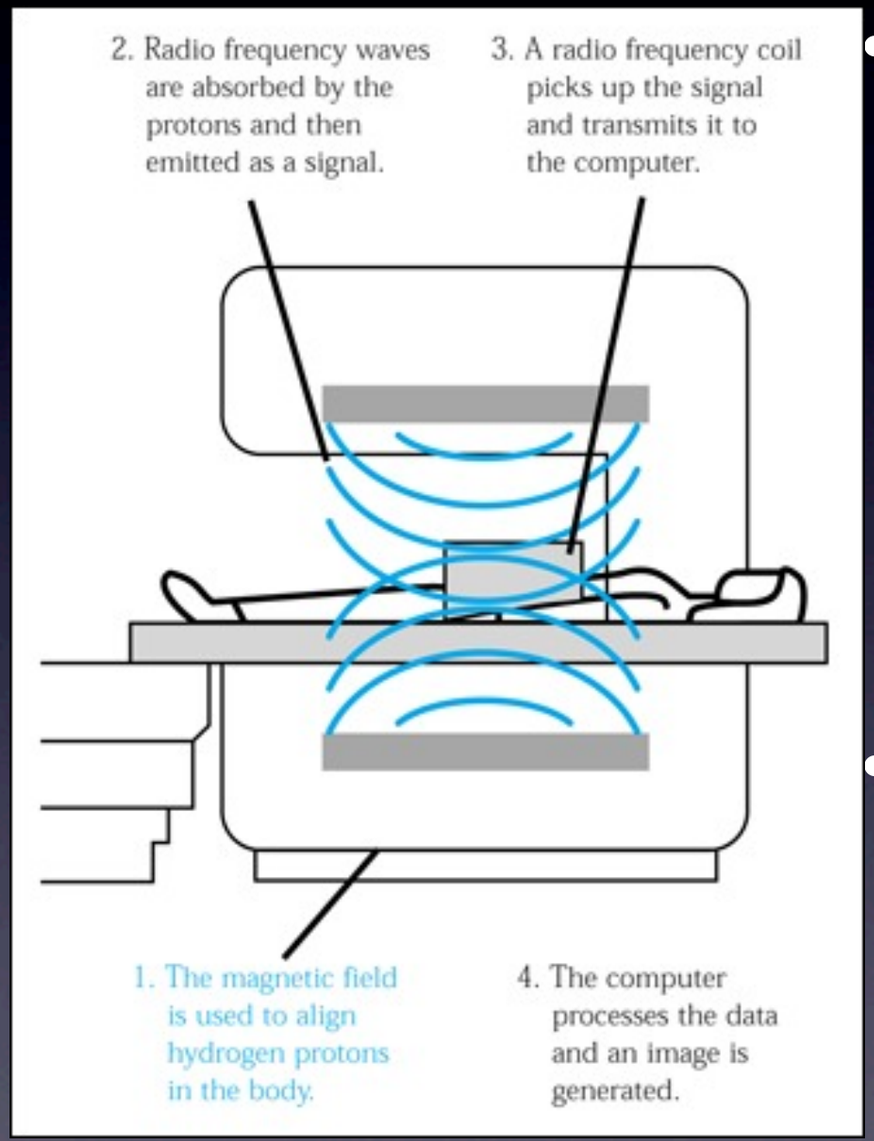
MRI scanner: working principle

Ask Mish





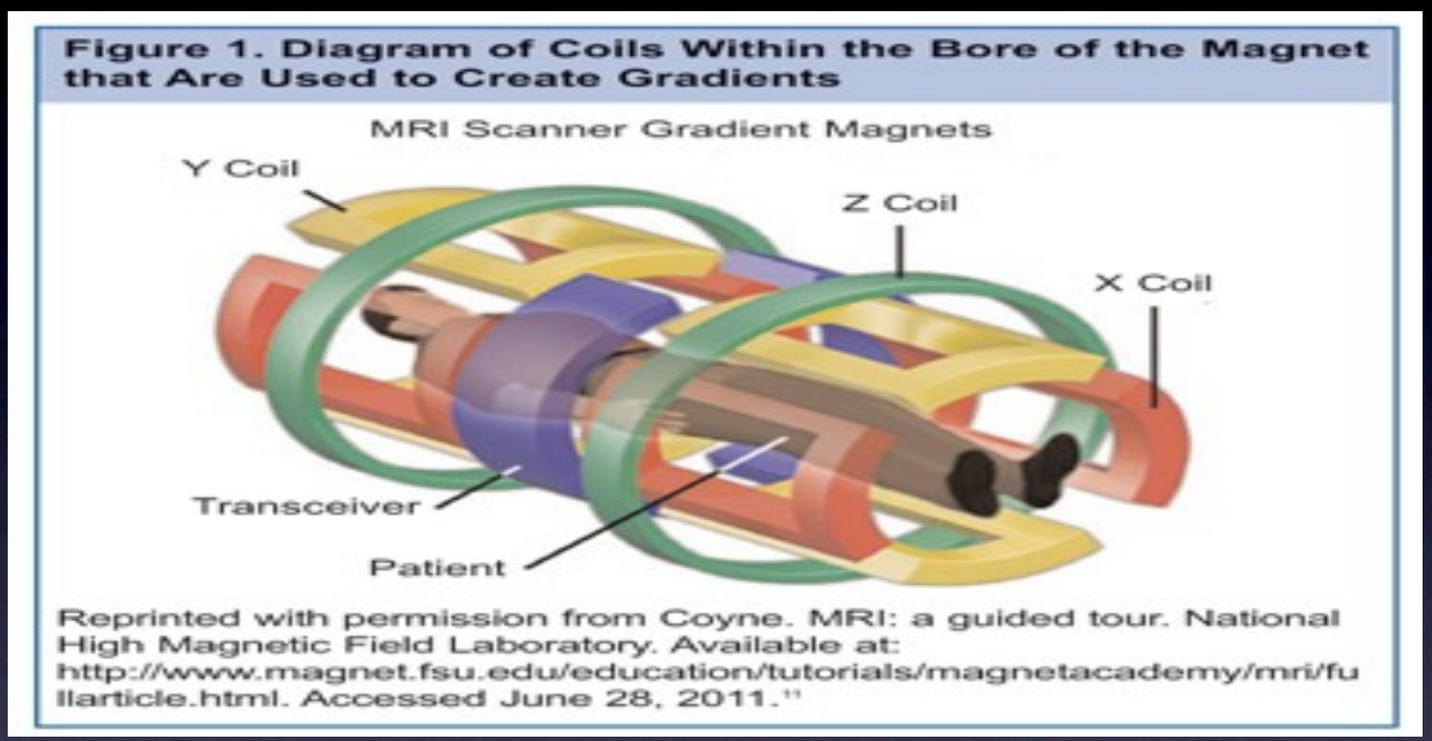


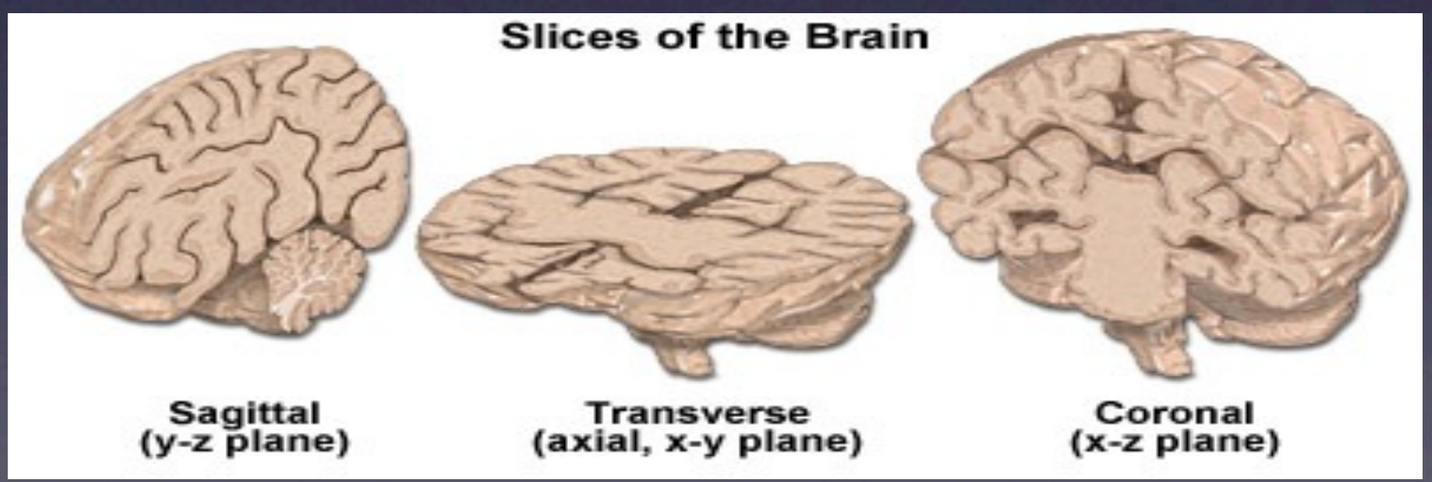
- MRI scanner is actually a long coil of superconducting wire (magnet). Superconducting means there is no resistance (R=0) when the free electrons (aka electrical current) are passing through the wire. Superconducting wire is obtained by keeping the temperature of the wire very low (e.g. by using liquid N2 or He). The result of using a superconducting wire is a strong MF, meaning 1T; 1.5 T or 3T.

- The patient is not allowed to wear any metal on him when he is scanned with an MRI scanner. If he has a pacemaker, metal valves or any metal implants, MRI is contraindicated since it can variates the intensity of the MF.

MRI scanner: gradient coils


Ask Mish





- Gradient coils are small coils of wire attached to the long coil (magnet) used to variate the intensity of the MF. This variation is important to localize different parts of the brain (different parts of the brain will respond to different radio frequency waves and will emit different signals).
- There are 3 types of gradient coils corresponding to each axis X, Y and Z.
- They can localize any part of the brain, in sagittal, transverse (axial) or coronal plane.

MRI scanner today

Ask Mish