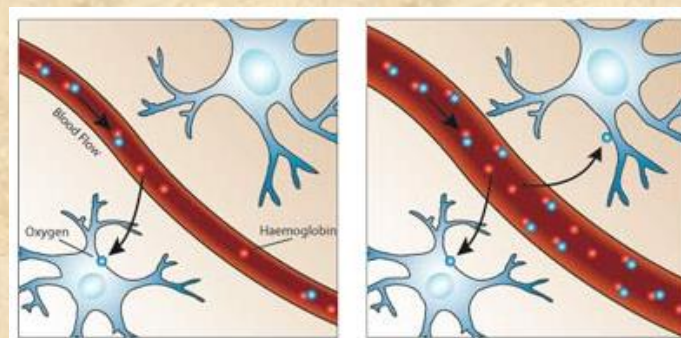


FMRI FOR BRAIN MAPPING

Magnetic Resonance Imaging (MRI) uses strong magnetic fields to produce images of body organs to evaluate many conditions in different parts of body. Functional Magnetic Resonance Imaging (FMRI) is a specialized form of MRI used for measuring and mapping the brains functional activity. FMRI is becoming the diagnostic method of choice for learning how a normal, diseased or injured brain is working, as well as for assessing the potential risks of surgery or other invasive treatments of the brain. FMRI may detect abnormalities within the brain that cannot be found with other imaging techniques. Functional MRI is still evolving and improving. While it appears to be as accurate in finding the location of brain activity as any other methods.

FMRI measures the small changes in blood flow that occur with brain activity. In an FMRI examination, patient will perform one or more tasks during the imaging process, such as tapping own fingers or toes, wiggling your tongue, reading, viewing pictures, listening to speech and/or playing simple word games. This will cause increased metabolic activity in the areas of the brain responsible for these tasks. This activity, which includes expanding blood vessels, chemical changes and the delivery of extra oxygen, can then be recorded on MRI images. This form of MRI is known as blood oxygenation level dependent (BOLD) imaging.



a) Resting

b) Activated

Fig: BOLD effect (Courtesy of Stuart Clare, FMRIB)

Physicians perform FMRI to:

- Examine the functional anatomy of the brain.
- Determine which part of the brain is handling critical functions such as thought, speech, movement and sensation, which is called brain mapping
- Help to assess the effects of stroke, trauma, or degenerative disease (such as alzheimer's) on brain function.

- Monitor the growth and function of brain tumors.
- Guide the planning of surgery, radiation therapy, or other invasive treatments for the brain.

Limitations:

High-quality images depend on your ability to remain perfectly still and follow breath-holding instructions while the images are being recorded. If you are anxious, confused or in severe pain, you may find it difficult to lie still during imaging.

Implants and other metallic objects can make it difficult to obtain clear images. Patient movement can have the same effect.

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