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# NEWSLETTER

If you have heard of an MRI being described as a 1.5T or 3.0T, you may have wondered what the "T" stands for. **A tesla, or T, is a unit of measurement that describes the strength of the magnet in the machine.** The magnetic field produced by an MRI machine is what causes the photons in the body to align and exhibit different properties in the resulting image.[4] **The more powerful the magnet, the clearer and more detailed the image.**[3]

To give you an idea of just how powerful these magnets are, consider the fact that a 1.5T MRI machine produces a magnetic field 30,000 times greater than the Earth does.[3] **Aside from the standard 1.5T and 3T MRI machines you will come across in most hospitals and imaging centers, other machines have magnets of varying strengths, including 0.25T, 0.5T, and 7T.**[3,5]

"Closed" MRIs (1.5T and 3.0T) have higher image quality and faster scan times. "Open" (0.25T-0.5T) MRIs have the lowest strengths but afford more patient comfort.[5] This comes at the price of diagnostic image quality.[2,5] **Medicare, Medicaid, and private payers reimburse the same for all magnet strengths, despite the fact that it directly impacts image quality and patient outcomes.**[1] Furthermore, there is no penalty for poor image quality.[6]

| Type/Strength | Pros | Cons |
|---|---|---|
| **0.25T/0.5T Open MRI** | • Eases anxiety for patients who are claustrophobic<br>• Can accommodate those who are unable to fit inside of a closed MRI machine<br>• Quieter and child-friendly | • Lowest image resolution<br>• Certain images cannot be taken with an open MRI<br>• Longer scan times |
| **1.5T Closed MRI** | • Produces high quality images<br>• Appropriate for routine scans<br>• Considered the minimum standard for diagnostic quality imaging | • Doesn't accommodate all body sizes<br>• Less effective for scans that need high detail (e.g.: brain and other vasculature scans) |
| **3T Closed MRI** | • Even higher quality images than a 1.5T machine<br>• Best for anatomy that needs great detail such as vessel, musculoskeletal, and brain scans<br>• Can shorten scan time without affecting the quality of the images produced<br>• Overall faster scan times | • Doesn't accommodate all body sizes<br>• Louder<br>• Produces more heat<br>• Not always available at certain imaging centers |
| **7T Closed MRI** | • Highest quality images due to increased signal-to-noise ratio afforded by the magnet | • Used in research settings<br>• New technology and not very common in clinical settings |

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