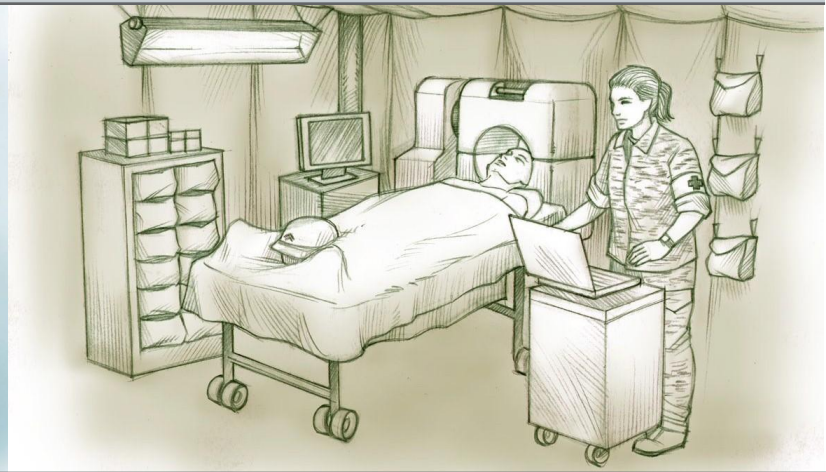
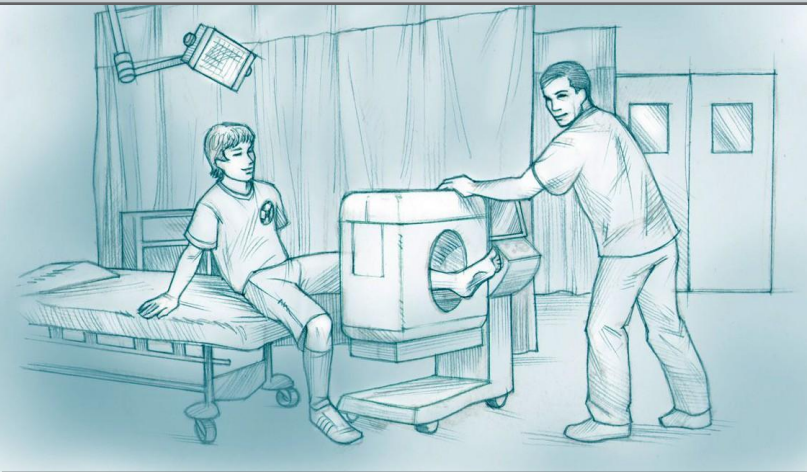


The Future of MRI

Small, Portable Systems Featuring Faster Scans and Higher Resolution



MRI—An Indispensable Tool

MRI (Magnetic Resonance Imaging) is one of the most popular, non-invasive, diagnostic tools in medicine today. MRI machines uniquely provide medical professionals with detailed images of internal organs and soft body tissue that are much more precise and detailed than CAT scans, and without the radiation dangers of X-rays. These images are indispensable in helping doctors detect tumors, internal bleeding, injury, blood vessel disease, and infection.

A Growing Market

Approximately 80 million MRI scans are conducted on 24 thousand MRI scanners worldwide each year. In the United States alone, the MRI market is approximately \$2 billion and growing with more than 40 million MRI scans conducted each year. The second largest market, Japan, enjoys the best access with the highest number of systems per million people. In the world's most populous Asia-Pacific region, the compound annual growth rate for MRI is projected at 16 percent. Although the MRI market is well-established in Europe and Asia where a number of major manufacturers are also based, it is still in its infancy in developing countries. China, for example is spending tremendously on MRI machines for its hospitals and developing MRI manufacturing capability.

The Challenge—The Need for Speed

The quality and resolution of MRI have improved in the past two decades, primarily due to more powerful magnets. Electronics and imaging software have also improved as in other imaging technologies. At present, there is little that can be done to further improve the operation of the basic MRI system while significant limitations and challenges remain. Operating costs, installation complexity, and safety concerns need to be addressed. Scan time—arguably the most important factor in operating costs and patient concerns—has not improved in any meaningful way. Healthcare professionals are in agreement that shortening scan times while preserving image quality is the biggest game-changer.

The Solution—Digital-RF Technology

To date, improvements in MRI images have been possible primarily with more powerful, better designed magnets, and to a lesser degree with advanced electronics and software. The industry continues to pursue even more powerful magnets and refinements based on multiple sensors and processors. However, the resulting gains are forecasted to be marginal overall with little improvement in basic operation or patient experience. HYPRES offers a new solution based on its patented Digital-RF technology that brings, for the first time, the full power of digital processing to MRI.

Digital Superconductor Electronics

Digital superconductor electronics, proven in metrology and wireless communications, provide significant benefits for medical imaging. Digital-RF transitions MRI to fully digital MRI with reduced scan times, improved image resolution, lower cost, enhanced safety, and improved accessibility to people worldwide. HYPRES all-digital receivers and processors are at the core of Digital MRI. They feature the world's fastest digital circuits, 100 times faster than today's MRI processors. Digital-RF technology can be used to both modify existing MRI systems and develop new small, portable machines that can be operated safely in any environment. These portable MRIs could be taken to the patient—in the doctor's office, emergency room, or even on the battlefield in a military field hospital.

Benefits of Digital-RF MRI

Retrofit version: 3.0T performance in a 1.5T scanner

Compact version: 1.5T performance in a 0.1T portable scanner

- Faster scan times
- Higher resolution and contrast
- Simultaneous multi-slice imaging
- Lower RF radiation absorption
- Lower magnetic field exposure
- Lower operating costs
- Safe operation in any environment



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