

Magnetic Resonance Imaging Systems Market, 2024 - 2032

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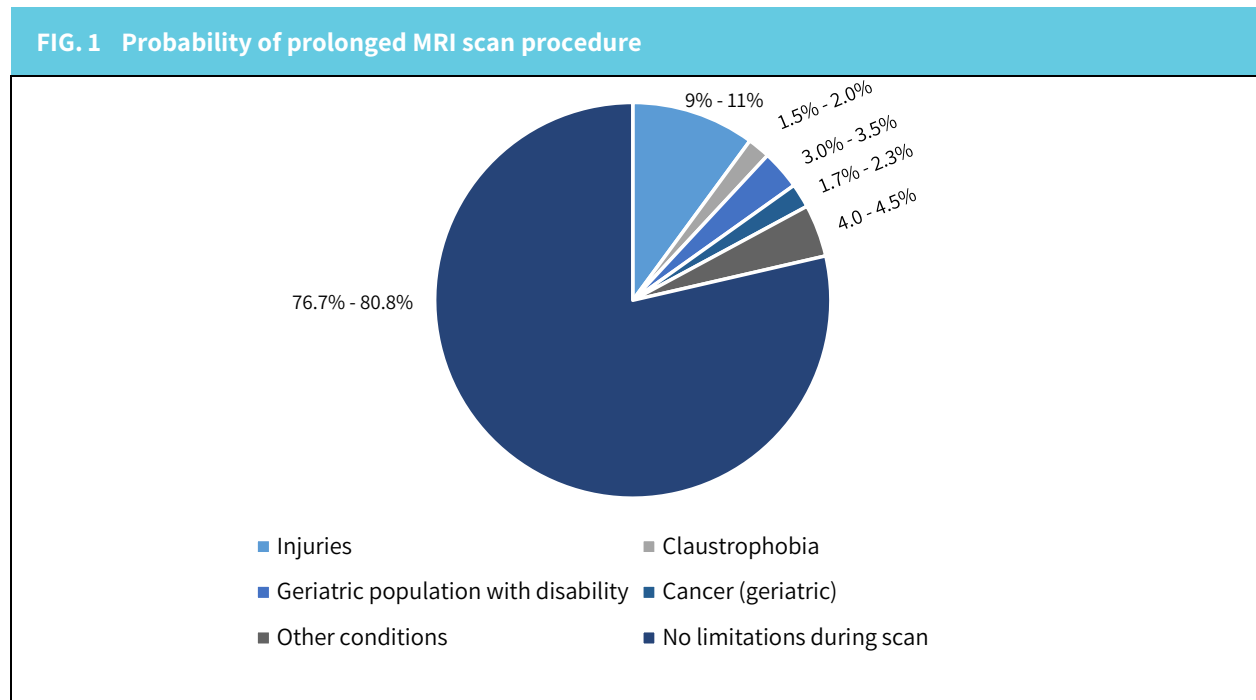
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Assessment of Limitations During MRI Scans

1.1 Overview

Globally, approximately 21.4% of patients undergoing MRI scans require extended time to conduct the scan attributed to various reasons including age-related discomfort, injuries, hearing or cognitive impairments, claustrophobia, and others. The standard MRI examinations require around 10 minutes of imaging and 5 minutes for patient handling time, leading to total cycle time of 15 minutes. However, these conditions can extend procedure time upto 30 to 60 minutes. The MRI technician collaborates closely with the patient to ensure the safe and comfortable execution of the MRI scan. This involves considering unique needs or specific considerations that may arise due to the patient's age or health status.

The pie chart below illustrates the percentage of the population experiencing prolonged scan times, categorized by the associated disorders. The calculation of this percentage employed a bottom-up approach, considering factors such as disease prevalence rates, adoption of MRI scans, age etc.



Source: GMI Analysis

1.2 Conditions impacting the MRI Scan time

1.2.1 Chronic conditions in geriatric population

According to World Population Prospects, 2022 published by United Nations, Department of Economic and Social Affairs, the global population of individuals aged 65 years and older stood at around 771 million, constituting nearly 10% of the world's total population in 2022. This demographic has been experiencing a notable growth trajectory, and projections indicate that it is anticipated to reach 16% by the year 2050. Further down the timeline, it is estimated to escalate to 24% by the year 2100. Moreover, according to statistics from the U.S. Department of Health & Human Services, the geriatric population, individuals aged 55 and above, was identified as having one, two, three, or more of six chronic conditions. These conditions comprised diabetes, cardiovascular disease, chronic obstructive pulmonary disease, asthma, cancer, or arthritis.

TABLE 1. U.S.: Geriatric population with chronic conditions

Age 55 years and over	Percentage of population with chronic conditions
1+ chronic conditions	77.55%
2+ chronic conditions	46.6%
3+ chronic conditions	18.75%

Source: U.S. Department of Health & Human Services

MRI scans are crucial for the geriatric population with chronic conditions due to their ability to provide detailed and high-resolution images. These scans offer diagnostic precision, allowing healthcare professionals to assess the extent of chronic diseases. For conditions such as arthritis or cancer, regular MRI scans are required for monitoring disease progression. Cardiovascular conditions, neurological structural issues, musculoskeletal issues, pulmonary complications, and soft tissue abnormalities are effectively visualized using MRI. Pre-surgical planning, pain management, and early detection of cancer are additional benefits. Hence, MRI becomes a fundamental instrument for providing holistic care to the geriatric population facing chronic conditions. Given their health status and age, these individuals often require considerable assistance during MRI scans, particularly in terms of patient positioning and maintaining stillness. Consequently, the turnaround time, typically set at 5 minutes according to sound MRI examination principles, may extend from 5 to 10 minutes or even longer.

1.2.2 Physical limitations

Certain physical constraints may pose challenges for some individuals including elderly, making it challenging for them to maintain stillness throughout the entire MRI procedure. Patients with mobility issues, frailty, or chronic pain might require lot of additional assistance or adjustments to ensure they can sustain a stable position for the necessary duration.

- **Orthopedic disorders:** According to the World Health Organization, more than 1.71 billion individuals suffer from musculoskeletal disorder. Also, patients with orthopedic challenges, such as those with recent fractures or joint replacements, may find it challenging to maintain specific positions. Careful consideration and customization of positioning are essential to accommodate these limitations.
- **Repositioning challenges:** Individuals with conditions affecting muscle strength or those prone to discomfort may find it challenging to stay in a fixed position for an extended period. Regular breaks or adjustments to the positioning can be implemented to address repositioning challenges.
- **Joint stiffness and range of motion:** Individuals with arthritis conditions may experience joint stiffness and limited range of motion. Specialized positioning aids and adjustments become crucial to facilitate a comfortable and stable position during the MRI.

1.2.3 Hearing or cognitive impairments

According to WHO, more than 1.5 billion people worldwide experience hearing loss, affecting at least one ear. Individuals, including the geriatric population, with partial or complete hearing impairment may face challenges in understanding instructions or effectively communicating with the MRI technologist during the procedure. In such cases, additional support may be required to ensure the patient comprehends the procedure and can express any concerns or discomfort. The need for extra time to explain instructions by the technician may extend the scanning process.

1.2.4 Anxiety or claustrophobia

Anxiety or claustrophobia can be evident in certain individuals undergoing MRI, especially if they are unfamiliar with the procedure. Recognizing these concerns is crucial, and providing continuous support and reassurance throughout the entire process is essential. With over 130 million MRI scan procedures conducted annually, an average of 2% of all scheduled patients for MR imaging experiences claustrophobia. Consequently, the prevention of MR imaging due to claustrophobia is a prevalent issue, leading to approximately 2.4 million incomplete MR procedures worldwide. Patients with claustrophobic anxiety are more prone to fear and may feel confined or closed in during MR imaging. Thus, the extended time required for MRI scans primarily stems from the challenges faced by individuals with claustrophobia.