

PATIENT PREPARATION FOR MRI

*G'aniev Sardor Saminjonovich. FMIOPH asis.
Sotivoldiev Axadjon Tolibovich FMIOPH ordinant.*

Abstract. Magnetic Resonance Imaging (MRI) is a non-invasive diagnostic modality that plays a critical role in modern medicine. This document provides a comprehensive overview of patient preparation protocols for MRI procedures, focusing on both standard and contrast-enhanced examinations. It covers essential steps such as screening for metal implants, managing dietary restrictions, evaluating renal function, and obtaining informed consent[1,2,3]. Special attention is given to patient-centered care strategies for vulnerable populations and emergency preparedness for adverse reactions. Proper preparation not only enhances image quality but also significantly reduces the risk of complications, ultimately improving diagnostic outcomes and patient satisfaction.

INTRODUCTION

Magnetic Resonance Imaging (MRI) is a cornerstone of modern medical imaging, offering detailed visualization of internal organs, soft tissues, and the central nervous system without the use of ionizing radiation. Patient preparation for MRI is crucial to ensure high-quality imaging, minimize artifacts, and guarantee patient safety[4,5].

General Preparation for MRI- MRI preparation includes pre-scan instructions about personal items, clothing, dietary restrictions, medications, and special patient considerations.

Special Preparation for Contrast MRI -MRI with contrast agents enhances tissue visualization but requires additional precautions, including renal function assessment, informed consent, fasting instructions, and allergy management

Table 1: MRI Preparation Checklist

Step	Action	Notes
Personal Items	Remove jewelry, electronics, metal objects	Important for safety and image clarity
Clothing	Wear metal-free, comfortable clothing	Hospital gowns preferred
Dietary Instructions	Follow fasting guidelines if applicable	Especially important for abdominal or cardiac MRI
Medication	Continue usual meds unless instructed otherwise	Adjust for diabetic patients
Implant Screening	Disclose any implants, prosthetics, or devices	Check MRI-compatibility certificates
Anxiety Management	Offer sedatives or open MRI option if needed	Use music or mirror glasses for comfort
Pregnancy	Inform staff if pregnant	Special considerations for contrast use
Renal Function (Contrast MRI only)	Test serum creatinine/eGFR	Avoid contrast if eGFR <30 mL/min/1.73m ²
Informed Consent (Contrast MRI only)	Obtain signed consent form	Explain risks and alternatives
Post-Procedure Monitoring	Observe patient after contrast administration	Emergency preparedness for allergic reactions

Figure 1: MRI Machine Structure

The figure illustrates the typical configuration of an MRI machine, consisting of a strong superconducting magnet, gradient coils, RF coils, and a patient table. The magnet produces a stable and homogeneous magnetic field, the gradient coils generate spatial[6,7] encoding, and the RF coils transmit and receive signals. The patient lies on the motorized table, which slides into the cylindrical magnet bore.

CONCLUSION

Proper patient preparation for MRI is an essential component in achieving optimal diagnostic imaging results while maintaining patient safety and comfort. MRI procedures, whether with or without contrast enhancement, require a multidisciplinary approach involving careful screening, education, and personalized patient care strategies[8,9,10]. Ultimately, meticulous preparation benefits both healthcare providers and patients by ensuring higher quality images, reducing repeat scans, and minimizing the risk of adverse events[11,12].

References:

1. Shellock, F.G., & Cruess, J.V. (2004). MR procedures: biologic effects, safety, and patient care. *Radiology*, 232(3), 635-652.
2. Kanal, E., Barkovich, A.J., Bell, C., et al. (2013). ACR guidance document on MR safe practices: 2013. *Journal of Magnetic Resonance Imaging*, 37(3), 501-530.
3. Isaqova, N. R. (2022). Influence of constipation on anthropometric indicators of children. *Science and Innovation*, 1(8), 888-892.
4. Raxmatjonovna, I. N. (2023). Effects of colonic diseases on children's health. *World bulletin of public health*, 23, 101-103.
5. Jurabaev A.A., Eshbaev E.A., Mamasaidov Zh.T. - Pathomorphological changes in necrotic enterocolitis of the lateral layer of the intestinal//*New Day in Medicine* 11(73)2024 964-970
6. Мамасайдов Ж. Т., Джурабаев А. А., Эркин А. Э. Некротик энтероколитда ингичка ичак шиллик қаватининг патоморфологияси //Журнал гуманитарных и естественных наук. – 2024. – №. 17. – С. 200-205.
7. Bettmann, M.A. (2004). Frequently asked questions: iodinated contrast agents. *Radiographics*, 24(suppl_1), S3-S10.
8. McIsaac, H.K., Thordarson, D.S., Shafran, R., et al. (2003). Anxiety and MRI scanning. *Journal of Behavioral Medicine*, 26(4), 373-385.
9. Ray, J.G., Vermeulen, M.J., Bharatha, A., et al. (2016). Association Between MRI Exposure During Pregnancy and Fetal and Childhood Outcomes. *JAMA*, 316(9), 952-961.
10. Runge, V.M. (2000). Safety of approved MR contrast media for intravenous injection. *Journal of Magnetic Resonance Imaging*, 12(2), 205-213.
11. Cowper, S.E. (2001). Nephrogenic fibrosing dermopathy: the first 6 years. *Current Opinion in Rheumatology*, 13(6), 673-676.
12. Prince, M.R., Zhang, H., Zou, Z., et al. (2011). Nephrogenic systemic fibrosis and its impact on cardiovascular magnetic resonance. *Journal of Cardiovascular Magnetic Resonance*, 13(1), 1-11.