

Assessing patient safety in MRI procedure : CAHO validated PREM tools.

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INTRODUCTION

- Magnetic Resonance Imaging (MRI) is a pivotal diagnostic modality in contemporary medicine. Despite its non-invasive nature and absence of ionizing radiation, MRI procedures entail potential risks, including those associated with strong magnetic fields and contrast agents. Ensuring patient safety necessitates stringent adherence to protocols and effective communication. The Consortium of Accredited Healthcare Organizations (CAHO) has developed validated Patient-Reported Experience Measures (PREMs) to assess patient perspectives on safety protocols. This study aims to evaluate the effectiveness of MRI safety procedures at EHCC Hospital, Jaipur, through the lens of CAHO's PREM tools.

OBJECTIVES :

- Assess patient awareness about MRI procedures
- Evaluate the effectiveness of communication between healthcare providers and patients.
- Ensure informed consent and understanding of safety precautions.
- Improve patient preparedness and comfort during the MRI process
- Enhance post-scan understanding and expectations.

MRI Safety Zones & Department Overview

The Department of Radiology at EHCC Hospital provides a full range of radiological services related to MRI(3.0 T), CT,X-Rays. They have installed technologically advanced, state-of-the-art medical equipment in our endeavor to provide the best diagnostic output with excellent patient comfort.

Location: Ground floor

Manpower: 5 Radiologists,6 Technicians , 4 PCS staff

MRI Safety zone

1. Patient Waiting Area
2. Patient Interview, Changing Room, Primary Screening, Locker Storage
3. MRI Technologists /Console Room, Secondary Screening
4. MRI Scanner Room

Methodology

RESEARCH QUESTION: How effectively do CAHO-validated PREM tools assess patient safety and communication during MRI procedures?

This study investigates whether CAHO-validated PREM tools accurately capture patient perceptions of safety and communication protocols during MRI procedures. The aim is to identify strengths and areas needing improvement in hospital MRI practices, particularly within the OPD environment.

Study Design

Type of Study: Observational study

Location of Study: EHCC Hospital, Jaipur

Duration of Study: 1 Month

Sample Size: 100

Data Collection Tools

A structured checklist and patient feedback via the **CAHO PREM survey**.

Process

Each checklist step marked as:

- **Compliant**
- **Non-Compliant**
- **Not Applicable**

Data Analysis: MS Excel



Patient Name: _____
UHID: _____ IP/OP: _____
Age: _____ Sex: _____
Department: _____

PATIENT RELATED EXPERIENCE MEASURES: MRI SAFETY PROCEDURE

When to use: The MRI safety questionnaire tool is to gather responses from patients who underwent a planned MRI procedure in an outpatient setting

When to serve tool: After the procedure

Exclusion - Emergency cases, Incapacitated Patients, children under the age of 9 years and patients under sedatives.

S.No.	Question / प्रश्न	Patient response		
1	Did the doctor inform you about the need for the MRI Scan in the plan of treatment? / क्या डॉक्टर ने आपको उपचार योजना में एमआरआई स्कैन की आवश्यकता के बारे में बताया?	Yes	No	
2	Did the hospital staff/ doctor explain you about the cost of MRI scan? / क्या अस्पताल के स्टाफ/डॉक्टर ने आपको एमआरआई स्कैन की लागत के बारे में बताया?	Yes	No	
3	Did the doctor inform you about the type of MRI scan needed and the part of the body involved? / क्या डॉक्टर ने आपको आवश्यक एमआरआई स्कैन के प्रकार और शरीर के संबंधित भाग के बारे में बताया?	Yes	No	
4	Did the staff inform you about the appointment (time & date) and estimated time duration of the MRI scan? / क्या स्टाफ ने आपको अपॉइंटमेंट (समय और दिनांक) और स्कैन की अनुमानित अवधि के बारे में बताया?	Yes	No	
5	Did the doctor take your permission (consent) for the MRI scan? / क्या डॉक्टर ने एमआरआई स्कैन के लिए आपकी अनुमति (सहमति) ली?	Yes	No	
6	Did the staff verify your name/ hospital registration number with the file or MRI request slip? / क्या स्टाफ ने आपकी फाइल या एमआरआई अनुरोध पर्ची के साथ नाम/ अस्पताल पंजीकरण संख्या की पुष्टि की?	Yes	No	
7	Did the staff ask you about any history of allergies? (for Contrast Enhanced MRI) / क्या स्टाफ ने आपसे किसी एलर्जी के इतिहास के बारे में पूछा? (कॉन्ट्रास्ट युक्त एमआरआई के लिए)	Yes	No	Not Applicable
8	Did the staff/doctor explain about side-effects of contrast? / क्या स्टाफ/डॉक्टर ने कॉन्ट्रास्ट के दुष्प्रभावों के बारे में बताया?	Yes	No	Not Applicable
9	Did the doctor advise for blood tests, which is required before the contrast-enhanced MRI? (S. Creatinine & S. Urea) / क्या डॉक्टर ने कॉन्ट्रास्ट युक्त एमआरआई से पहले आवश्यक रक्त परीक्षण (S. क्रिएटिनिन और S. यूरिया) की सलाह दी?	Yes	No	Not Applicable
10	Have you observed the staff performing hand wash/hand rub during the procedure? / क्या आपने प्रक्रिया के दौरान स्टाफ को हाथ धोते या सैनिटाइज करते देखा?	Yes	No	
11	Did the staff ask you about history of surgery with any metal devices like implants or pacemakers placed inside your body (in situ)? / क्या स्टाफ ने आपसे किसी सर्जरी का इतिहास और शरीर के अंदर लगे मेटल उपकरणों (जैसे इम्प्लांट या पेसमेकर) के बारे में पूछा?	Yes	No	

Reference: CAHO White Paper

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Patient Name: _____
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12	Did the staff inform you about removing all metallic wearable items like jewellery, coins, pen, watch, safety pins, belts etc. before MRI scan? / क्या स्टाफ ने आपको एमआरआई स्कैन से पहले सभी धातु से बनी चीज़ें जैसे गहने, सिक्के, पेन, घड़ी, सेफ्टी पिन, बेल्ट आदि हटाने के लिए कहा?	Yes	No	
13	Did the staff screen you with a metal detector device before entering the MRI Room? / क्या स्टाफ ने एमआरआई कक्ष में प्रवेश करने से पहले आपको मेटल डिटेक्टर से जांचा?	Yes	No	
14	Did you notice the caution signage's in the MRI unit or room? / क्या आपने एमआरआई यूनिट या कमरे में चेतावनी चिन्ह देखे?	Yes	No	
15	Did the staff ask you to change to hospital clothes in the changing room? / क्या स्टाफ ने आपको चेंजिंग रूम में अस्पताल के कपड़े पहनने को कहा?	Yes	No	
16	Did you have privacy in the changing room? / क्या आपको चेंजिंग रूम में गोपनीयता (प्राइवैसी) मिली?	Yes	No	
17	Did the staff inform you not to move or lie still during the MRI scan? / क्या स्टाफ ने आपको एमआरआई स्कैन के दौरान न हिलने या स्थिर रहने की जानकारी दी?	Yes	No	
18	Did the staff inform you about constraints of space where you lie down inside the MRI machine? / क्या स्टाफ ने एमआरआई मशीन के अंदर लेटने की सीमित जगह के बारे में बताया?	Yes	No	Not Applicable
19	Did the staff inform you about how to respond if you feel uncomfortable or scared during the MRI scan? / क्या स्टाफ ने आपको स्कैन के दौरान असहज या डर लगने पर क्या करना है, यह बताया?	Yes	No	
20	Did the staff inform you about the occurrence of loud noise when the MRI scan is in the process? / क्या स्टाफ ने आपको एमआरआई स्कैन के दौरान तेज़ आवाज़ आने के बारे में बताया?	Yes	No	Not Applicable
21	Did the staff tell you when and where the result/ report of MRI scan will be available? / क्या स्टाफ ने आपको बताया कि एमआरआई रिपोर्ट कब और कहाँ मिलेगी?	Yes	No	

Reference: CAHO White Paper

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Rationale: Magnetic resonance imaging (MRI) is an important diagnostic method in modern clinical medicine.

- Patient involvement is of utmost importance for optimizing the workflow, safety, and patient comfort and saving valuable time for the MRI department
- Safety concern arises due to strong magnetic fields which can pose risks. If patients have metallic implant , pacemaker and insufficient knowledge about MRI procedure

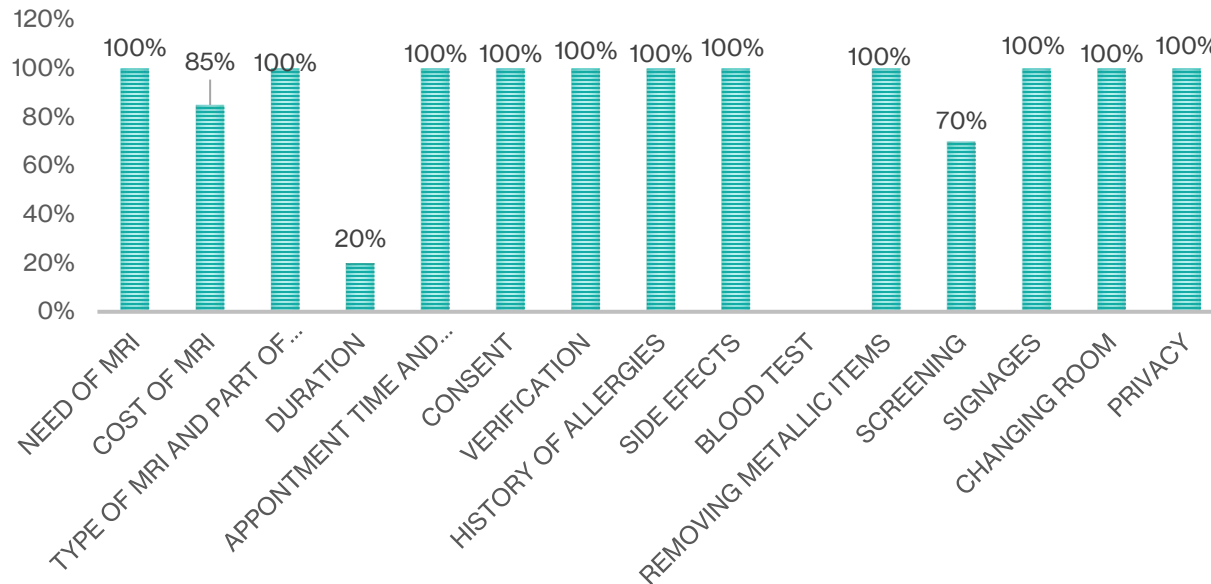
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Graphical Analysis and key Insights

PRE SCAN EXPERIENCE COMPLIANCE



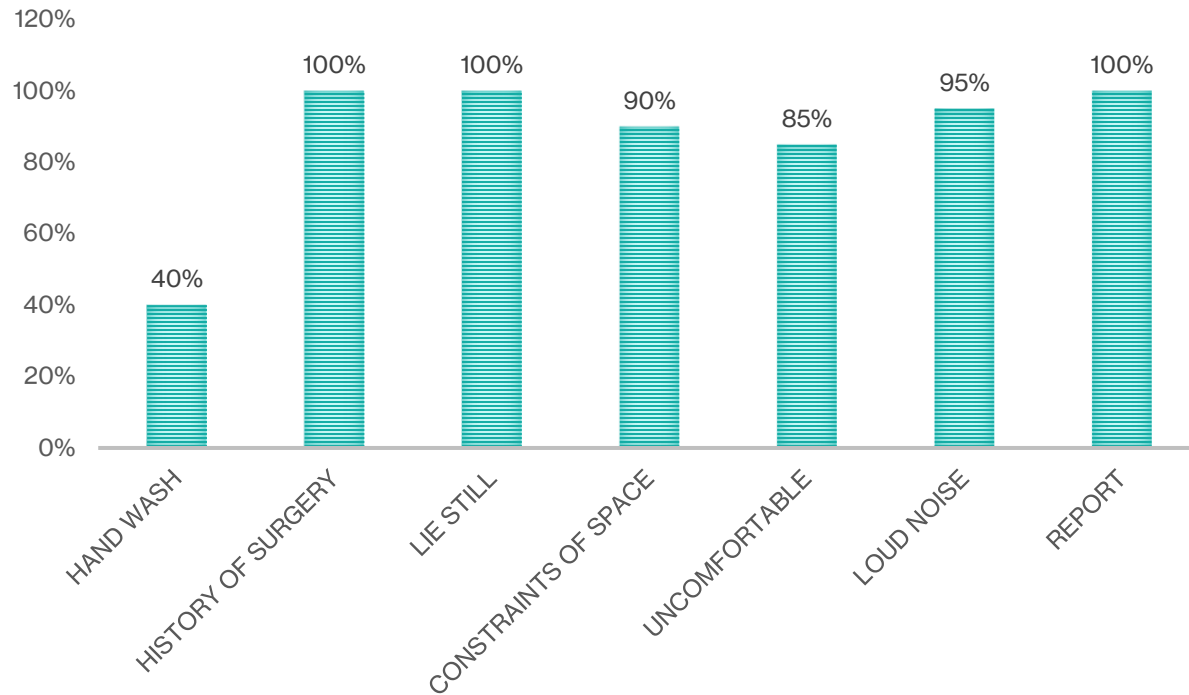
Observations:

• **Excellent Compliance (100%)** is observed in most parameters, indicating a strong protocol adherence in areas like patient consent, allergy history, removal of metallic items, and patient privacy.

• Areas Needing Improvement:

- **Duration Explanation (20%):** This represents a significant communication gap. Patients are not adequately informed about how long the procedure will take.
- **Screening (70%):** Indicates partial implementation and suggests scope for better training or reinforcement of the screening protocol.
- **Cost Explanation (85%):** Although relatively high, there is room to enhance transparency regarding MRI charges.

POST SCAN EXPERIENCE COMPLIANCE%



The Post scan phase also showed strong adherence in several domains:

- History of Surgery, Lie Still Instructions, and Report Availability** all show **100% compliance**, indicating effective pre-scan briefings and procedural efficiency.

- Loud Noise (95%)** and **Constraints of Space (90%)**:

These represent a generally good level of patient preparedness regarding environmental discomforts during an MRI.

- Uncomfortable Experience (85%)**:

While fairly high, this reveals that 15% of patients still felt discomfort not adequately addressed.

Possible improvements include better noise reduction, temperature control, or communication throughout the scan.

Areas for Improvement:

- Hand Wash (40%)**:

This low score suggests inadequate promotion of hygiene protocols post-scan. It is a basic yet crucial infection control measure and must be reinforced.

CONCLUSION

High Compliance in Core Safety Areas:

The study revealed excellent adherence to essential MRI safety protocols, including metallic screening, informed consent, and procedural explanation—reflecting strong institutional compliance with CAHO standards.

Communication Gaps Noted Pre-Scan:

Moderate deficiencies were observed in pre-scan communication, particularly regarding noise expectations, procedure discomfort, and cost clarity—indicating the need for improved patient preparation.

Critical Hygiene Deficit:

Hand hygiene compliance was notably low (~40%), presenting a potential infection control risk and highlighting the need for visible, patient-facing hygiene practices by staff.

Importance of Patient-Centered Feedback:

Using CAHO-validated PREM tools enabled direct insights into patient experience, underlining how patient-reported data can guide service refinements and improve safety culture.

Actionable Recommendations for Quality Improvement:

Targeted interventions such as staff training, signage enhancements, and technology upgrades (like live report status) were identified to enhance both safety and satisfaction in the MRI workflow.



Recommendations

- Train staff to perform hand hygiene in front of patients and place visual reminders near MRI rooms to boost patient confidence in infection control.
- Provide a working handheld or walk-through metal detector and place visible instructions near the MRI area to guide both patients and staff.
- Conduct periodic training sessions on patient communication and perform regular compliance audits to track improvements.
- Integrate PREM tool responses into quality improvement plans and close feedback loops with corrective actions.



Thank You