ORIGINAL RESEARCH PAPER

Radiodiagnosis

TO EVALUATE THE RISK FOR PATIENT UNDERGOING MRI AND TO OBSERVE THE COMPLIANCE TO SAFETY GUIDELINES IN A TERTIARY CARE HOSPITAL

KEY WORDS:

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Introduction

Magnetic resonance (MR) imaging helps to generate critical diagnostic and anatomic information without the use of ionizing radiation, but it has safety risks because of the large static and changing magnetic fields, high-powered radio frequency coil systems.

It is very important for the patient to understand these risks and how to protect themselves from any sort of harm and to know the safety regulations at MR imaging sites.

Fundamental learning of MR imaging material science and equipment is essential for radiologists to comprehend the beginning of wellbeing guidelines and to keep away from normal misinterpretations that could bargain security.

Every one of the segments of the MR imaging unit can be a factor in wounds to patients and staff. Dangers incorporate translational power and torque, shot damage, over the top explicit retention rate, consumes, neuro-stimulation, associations with dynamic inserts and gadgets, and acoustic damage.

Extra specialized and security strategies identify with paediatric, oblivious, debilitated, or pregnant patients and pregnant imaging staff.

Division of the MR imaging condition into four unmistakable, obviously marked zones—with dynamic confinement of section and expanded supervision for higher zones—is a compulsory and key angle in shirking of MR imaging– related mishaps.

All MR imaging offices ought to have a reported arrangement to deal with crises inside zone IV, including cardiac arrest or code, magnet quench,

The expanding clinical interest for Magnetic Resonance Imaging (MRI) with its better delicate tissue differentiate thought about than other radiological imaging modalities and potential physiological and utilitarian applications has added to the establishment of very nearly 30,000 MRI scanners around the world. In this way, increasingly more medicinal services experts should be prepared in MRI security to shield patients and other social insurance labourers from the potential dangers of MRI [1,2]

It is additionally essential that radiologists, alluding doctors and MR technologists can assess MRI wellbeing and similarity of therapeutic gadgets and inserts since they are frequently the principal social insurance experts who will converse with a patient around a MRI test, potential dangers, and MRI security [3]

Radiologists are very much prepared about MRI suitability criteria however they require support from alluding doctors to evaluate the dangers and advantages of MR imaging techniques [4].

Particularly alluding doctors who know subtleties of a patient's therapeutic history can improve the MRI wellbeing screening process when they know about the dangers of a MRI examine by pre-screening their patients before a MRI test [5]. This is especially imperative in high-hazard patients and in patients with new embeds that have not yet been tried for MRI similarity [6,7].

A specialist board has built up the American College of Radiology (ACR) Guidance Document for Safe MR rehearses [8].

The accompanying segments will audit potential bio-impacts and dangers of the attractive fields that collaborate with patients and human services experts in a MRI suite [9].

There are three major magnetic fields in an MRI suite that that have potential safety risks which are static magnetic field, radiofrequency magnetic field and magnetic field gradients [10].

Aim

The aim of this study is to understand the safety of the patient related to magnetic resonance imaging and to observe the compliance to safety guidelines in a tertiary care hospital.

Objective

- To determine the health effects and safety issues related to MRI environment for the patient.
- To know the safety precautions to be taken before and during the MRI examination.
- To study the steps to be taken in case of emergency situations.
- To implement the safety guidelines in the MRI environment.

MAGNETIC RESONANCE IMAGING

MRI, or resonance imaging, uses strong magnetic fields to vary the spin of atoms in our bodies.

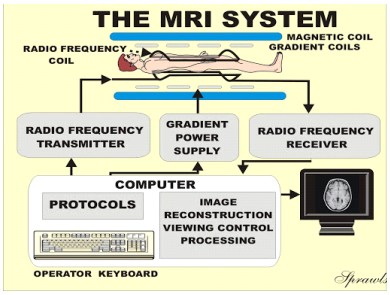
Radio signals detect these tiny changes. MRI computers process this information and construct images of sentimental tissues inside the body, from the brain to blood vessels.

An advantage of MRI is it's virtually harmless to the patient because, unlike CT scanners, MRI doesn't generate radiation. The spinning atom effect is understood as nuclear resonance

(NMR). It was first observed during the late 1930s, but medical applications weren't found for the NMR technique until the 1970s.

He varied the strength of the magnetic flux , which varied the signals from different atoms from which he could build an image .

In 1971 he discovered that MRI might be used for diagnosis . Cancer tumours had different signals compared to healthy tissue. Damadian built the primary whole-body MRI scanner in 1977, which he called the 'Indomitable'.



MRI magnets

The most commonly used magnet in an MRI machine is superconducting magnet.

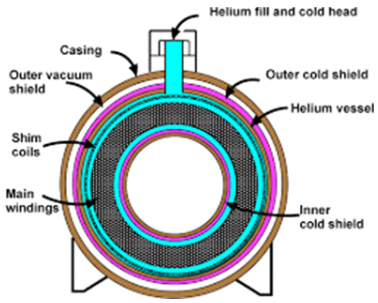
Superconductive MRI magnets use a solenoid-shaped coil made from alloys like niobium/titanium or niobium/tin surrounded by copper.

These alloys have the property of zero resistance to electrical current when cooled down to about 10 kelvin. The coil is kept below this temperature with liquid helium.

The power supply is connected on either side of a short heated segment of the coil and the current to the coil is gradually increased over several hours until the desired magnetic field is reached.

The heated segment is allowed to cool to superconducting temperature and the power supply removed and taken away.

The current continues within the closed-loop system of the coil for years without significant decline. A resulting property is that the magnetic field is always present.



MRI Zones

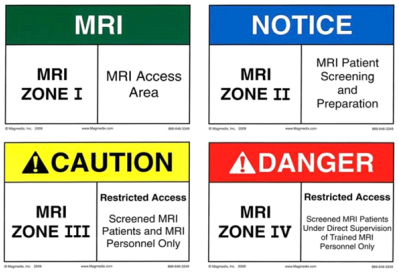
Four different zones are suggested round the MRI scanner. The access to these zones is restricted in MRI facilities and hospitals and the boundary of each zone in this four-zone safety system is defined by its purpose and distance from the MRI scanner. Some zones may extend into other areas or floors of the facility due to the three dimensional extend of the magnetic field.

Zone I includes all areas freely accessible to the general public where the magnet field poses no hazards, such as the entrance to the MR facility.

Zone II is located between Zone I and the more restrictive Zone III. In Zone II patients are under supervision of MR personnel. Zone II often includes the reception area, dressing rooms and MRI screening rooms.

Zone III is access-restricted by physical barriers such as doors with coded access. Inside Zone III, only the approved MR personnel and patients that have undergone MRI screening are allowed. The MR control room is in Zone III.

Zone IV is the room where the magnet is located. Access to Zone IV should only be possible by passing through Zone III. Zone IV is meant so the walls of magnet room contain the five 0.5 mT line (or 5 Gauss) line of the perimeter field of the magnet.



MRI safety zones

MRI implants

MRI devices use strong magnets, metal implants pose the precise risk of potential migration of implants and radiofrequency (RF)-induced heating of the implants, which can cause damage to the encompassing tissue.

Metal implants can result in image artefacts that cause misinterpretation of results. Advances in technology can minimize image distortion by modifying resonance pulse sequences and optimizing scanning parameters. When deciding whether patients should undergo MRI, physicians must consider both the advantages of imaging and the possibility of image distortion due to implants.

Titanium is a paramagnetic material that is not affected by the magnetic field of MRI. The risk of implant-based complications is extremely low, and MRI are often safely utilized in patients with implants. The titanium plates used in the craniofacial area, however, are made of alloys. More precise research is needed because the effects of MRI depend on the proportion of the constituents of the alloy.

MRI compatible metals:

Titanium

Orthopaedic surgeons often use titanium implants for their strength and compatibility with body tissues. Titanium has nonmagnetic properties which makes it compatible for use with an MRI as well. Joint replacements, surgical screws, bone plates and pacemaker cases all of these use titanium. In addition, doctors can use surgical tools made of the metal in MRI rooms.

Cobalt-Chromium

Even though cobalt has magnetic properties, implants such as coronary stents made of cobalt-chromium alloy have tested safe during an MRI. The alloy also tests safe for larger items, such as knee and hip replacements.

Copper

Researchers have tested intrauterine contraceptive devices (IUDs) for MRI safety. Some of these have a small copper coil. The magnetic field didn't move the IUD at field strengths up to 3 teslas, nor did the copper heat up. Some metal objects become warm during an MRI, even if the magnetic field doesn't pull at them. Copper wiring for pacemakers is also tested safe for an MRI.

Stainless Steel

Some stainless steel alloys have a very low reaction, or susceptibility, to magnetic fields. Medical supply companies sell stainless steel tools and accessories that can be easily used by the staff in the MRI room. Stainless steel items such as dental braces can distort MRI images, however. If the metal interferes too much with the MRI image, the doctor may recommend you have your braces removed.

Metal detectors used in MRI:

- A metal detector is a device which is used for detection of the presence of metal objects.
- They are used for locating metal objects present externally on a patient.
- Metal or ferromagnetic detectors are now available which are simple to work with and are capable of detecting very small ferromagnetic objects.
- It should be made sure that the use of metal detector is not meant to exchange a thorough screening process.
- Metal detection systems are supposed to be highly effective as a good quality assurance tool in verifying the proper screening and identifying metal objects which were not found by normal screening method.
- It is important that the use of metal detectors is done in the screening process in zone II.
- Many new metal detectors are capable of being situated within zone III, which is at the door to the magnet room.
- These types of metal detectors which are located at the doors are called wall mounted metal detectors.

Magnetic field interactions acting on a highly ferromagnetic object brought too close to the magnet of the scanner can become so substantial as to be unstoppable by human effort. Items such as a steel gas cylinders and fire extinguishers can enter a magnet at 30-40- mph, the same speed they would reach if dropped from a 40-foot building to the ground.

Two types of metal detectors are used for screening the patient before entering the MRI suite:

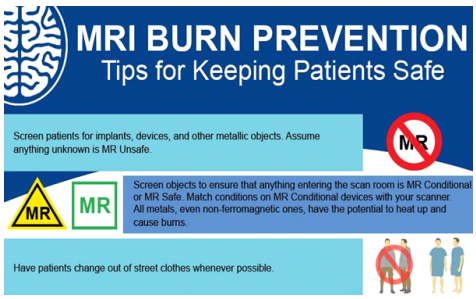
- **Hand held metal detectors:** a handheld unit with a sensor probe which can be swept over the patient to be screened. If the sensor of the metal detector comes near a piece of metal this is indicated by a changing tone.

- **Wall mounted metal detectors:**

These are types of metal detectors which are fixed at the door of the magnet room.

MRI burn prevention:

Provide the bore padding. Once you have a patient within the bore confirm there's a minimum of 1 cm of air space or padding that keeps that patient from touching the transmitting RF coil element.



MRI accidents:

If a ferromagnetic item is brought into the space this item will become a projectile and attract towards the magnet with tremendous force

- This item will fly toward the middle of the magnet and take anything in its path with it
- Ex: If a patient comes in with an unsafe wheelchair, the wheelchair will fly to the middle of the magnet with the patient within the chair
- There are many MRI accidents since MRI was introduced within the 1980's
- Examples include, but aren't limited to:– Patient having an MRI Unsafe aneurysm clip within the brain, leading to the death of the patient
- Six year old boy struck with an oxygen tank, leading to his death
- Patient having nail clippers in his pocket. When being sent into the scanner, the clippers flew out of the pocket and struck the patient within the eye. As a result, this patient lost his eye.

MRI Safety Training and Emergency Procedures in an MRI Suite

All personnel working within the MR environment got to be trained with a comprehensive MRI safety course. For brand spanking new employees who will add the MR environment this course should be included within the employee orientation program and be repeated annually. The MRI safety training should have presentation of technical and medical background of MRI safety. Hands-on demonstrations of missile effects of ferromagnetic objects can help to raised understand and knowledge the risks in an MRI suite. Detailed screening procedures of patients with a questionnaire for metal objects, implants, devices, body piercing, allergies to MRI contrast agents, renal disorder , pregnancy, nursing and also the screening of patients that have a history injuries by a metallic foreign body like bullets, shrapnel, or other sort of metallic fragments help to avoid severe accidents in an MRI suite. A crucial topic to debate in an MRI safety course are severe burn wounds that were experienced by patients.

The patients were in direct contact with transmit RF coils of the MR systems or when skin-to-skin contact points were liable for these injuries. The security course must warn about high acoustic noise levels of the gradient system during an MRI scan and therefore the potential noise reduction with earplugs and headphones to avoid potential hearing damage. Videos from quenching magnets can help to know how powerful a sudden loss of the superconductivity of the magnet could be and emergency procedures during a quench should be discussed. It's important that medical personal entering the MRI scanner room to guide the patient, administer medications or interventions got to be trained in emergency procedures in an MRI suite. Healthcare professionals got to know which objects are often brought into the various MRI zones so as to stop fatal injuries and medical breakdown and the way to get rid of a patient from the MRI magnet room to resuscitate or treat the patient in emergency cases.

MATERIALS AND METHODS

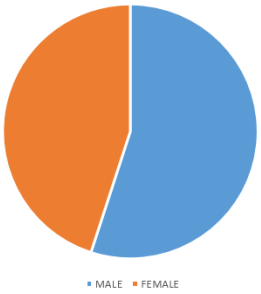
A descriptive study was conducted over a period of 8 months (2019-2020) on 100 patients about the safety protocols which was carried out before and during the MRI examination.

Data for the study was collected from 1.5 Tesla, Toshiba machine, model Excelart Vantage in MGM MEDICAL HOSPITAL, Kamothe, Navi Mumbai for evaluating the risk for patient undergoing MRI.

Unstable, claustrophobic patients, patients below the age of 18, patients with cardiac pacemakers and patients with implants which are not MRI compatible are not included in this study.

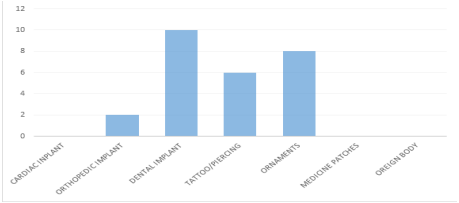
Observations:

MALE	55
FEMALE	45

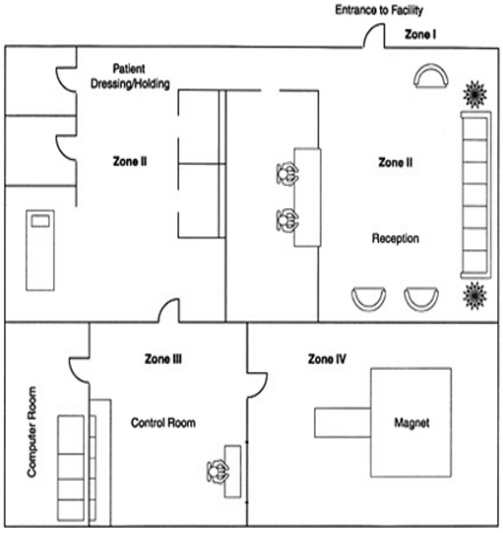


MRI screening:

CARDIAC IMPLANT	0
ORTHOPEDIC IMPLANT	2
DENTAL IMPLANT	10
TATTOO/ PIERCING	6
ORNAMENTS	8
FOREIGN BODY	0
MEDICINE PATCHES	0

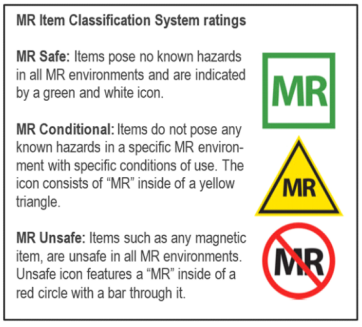


Figures:

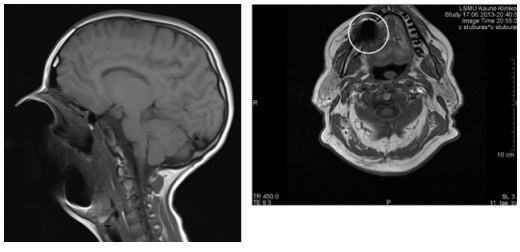


Layout of MRI department

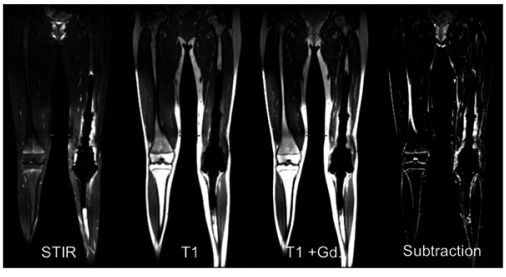
Awareness poster



Dental implant artifacts:



Orthopedic implant artifact:



MRI compatible items:
MRI compatible trolley

MRI compatible oxygen cylinder

Results:

During a period of 8 months of the study, 100 patients who fulfilled inclusion criteria were studied, out of which 55 were male and 45 were female.

In the screening process which was done before the MRI scan, from total 100 patients, 10% had dental implants which were MRI compatible, 2% had orthopedic implants which were made of titanium. 6% had tattoo/ piercings and 8% patients had permanently fixed ornaments which were either made of gold or silver.

Screening with hand held metal detector was not done for 5% patients and red bulb indication which is situated at the door of the MRI magnet room was not switched on for 4% of the patients.

Discussion

All hospitals and medical centers must provide safe environment for patient and staff who are within the presence of the MRI scanner. They ought to establish, document and implement MRI safety protocol so as to avoid any incidents from occurring. MRI safety information could save lives, money and time. Such important issues are; information about the magnetic fields and their influence on ferromagnetic objects near them, implants and metallic foreign bodies.

Hence, the MRI environment is split into four safety zones designed to maximize safety restricting the flow of traffic through the world and to stop MRI-related incidents. Each boundary zone is defined by its purpose and distance from the MRI system. Radiology nurses and other staff working in hospitals or medical centers also as patients must exercise extreme caution and must remember of the powerful magnetic flux and its associated hazards. Also, it's imperative that radiology nurses and every one staff involved in MRI environment adhere to established safety guidelines information to stop metal objects and patients with ferromagnetic implants from entering the magnet room.

Having proper safety training for workers in situ is a huge potential to enhance safety in MRI environment. Safety training provides radiology nurses and other staff with the vital knowledge of the danger and hazards related to MRI and most significantly the way to prevent incidents from occurring. Staff development and training is one among the foremost vital components within the MRI department. Trained staff are going to be better equipped to handle patient inquiries and to tell the patients of the MRI procedure. Therefore, it's crucial to notice that staff during a safe work environment can focus better on their duties. This may eventually cause better work output and quality. Managers and team leaders at MRI unit must have safety educational program in situ and therefore the program should cover areas such as; accident prevention, safety promotion, safety compliance, safety practices, risk and hazards related to MRI.

Conclusion:

A thorough screening of patient should be done with metal detector before entering the MRI room.

The radiographic worker should have knowledge about any previous history or medical condition which the patient may have.

The patient should be well informed about the procedure to be done.

Proper training of the staff and the radiologist can minimize the risk of any disaster or accidents occurring in the MRI suite. Most of the accidents are caused by poor or lack of communication between the radiographic worker and the patient, therefore effective communication between the worker and the patient can benefit in enhancing the safety and preventing any sort of accidents.

SR NO:	NAME	IPD/OPD	AGE	SEX	SCAN	PATIENT SCREENING							STAFF CHECKLIST					
						CARDIAC IMPLANT	ORTHOPEDIC IMPLANT	DENTAL IMPLANT	FOREIGN BODY	MEDICINE PATCHES	TATTOO/ PIERCING	ORNAMENTS	NAME OF WORKER	RED BULB INDICATION	REQUISITION FORM	RESTRICTED AREA	CONSENT FORM	SCREENING WITH METAL DETECTOR
1	BANUBAI GHARAT	3722210	65	FEMALE	MRI BRAIN ANGIO	ABSENT	ABSENT	ABSENT	ABSENT	ABSENT	ABSENT	ABSENT	VIJAY YADAV	YES	YES	YES	YES	YES
2	GAUTAM DIWANJI	3722667	60	MALE	MRI BRAIN ANGIO	ABSENT	ABSENT	PRESENT	ABSENT	ABSENT	ABSENT	ABSENT	SACHIN MULIK	YES	YES	YES	YES	YES
3	SULBHA JADHAV	3746176	53	FEMALE	MRI CERVICAL SPINE	ABSENT	ABSENT	ABSENT	ABSENT	ABSENT	ABSENT	PRESENT	VIDYA PATIL	YES	YES	YES	YES	YES
4	DEVENDRA NAKHAVE	3745415	29	MALE	MRI WRIST JOINT	ABSENT	ABSENT	ABSENT	ABSENT	ABSENT	ABSENT	ABSENT	SAGAR SURVE	YES	YES	YES	YES	YES
5	SHANTA CHOUDHARI	3745354	30	FEMALE	MRI LT SHOULDER	ABSENT	ABSENT	ABSENT	ABSENT	ABSENT	ABSENT	ABSENT	AJAY BHADRE	YES	YES	YES	YES	YES
6	JAYASHREE PATIL	3750559	52	FEMALE	MRI RT KNEE JOINT	ABSENT	ABSENT	PRESENT	ABSENT	ABSENT	ABSENT	ABSENT	MAYUR BIRAMANE	YES	YES	YES	YES	YES
7	RAMESH KADU	3879088	32	MALE	MRI BRAIN PLAIN	ABSENT	ABSENT	ABSENT	ABSENT	ABSENT	ABSENT	ABSENT	VIJAY YADAV	NO	YES	YES	YES	YES
8	JANABAI MHASALE	3861749	23	FEMALE	MRI RT FEMUR	ABSENT	ABSENT	ABSENT	ABSENT	ABSENT	ABSENT	ABSENT	SACHIN MULIK	YES	YES	YES	YES	YES
9	PRADEEP MORE	3886900	41	MALE	MRI DORSAL SPINE	ABSENT	ABSENT	ABSENT	ABSENT	ABSENT	ABSENT	ABSENT	VIDYA PATIL	YES	YES	YES	YES	YES
10	RATAN KHANDE	3883247	39	MALE	MRI FISTULOGRAM	ABSENT	ABSENT	ABSENT	ABSENT	ABSENT	PRESENT	ABSENT	SAGAR SURVE	YES	YES	YES	YES	YES
11	SANGITA SAWANT	3884213	52	FEMALE	MRI PELVIS	ABSENT	ABSENT	ABSENT	ABSENT	ABSENT	ABSENT	PRESENT	AJAY BHADRE	YES	YES	YES	YES	YES
12	YASHWANT MISAL	3884025	45	MALE	MRI BRAIN CONTRAST	ABSENT	ABSENT	ABSENT	ABSENT	ABSENT	ABSENT	ABSENT	MAYUR BIRAMANE	YES	YES	YES	YES	YES
13	SUBRATO BANARJEE	3729752	62	MALE	MRI RT SHOULDER	ABSENT	PRESENT	ABSENT	ABSENT	ABSENT	ABSENT	ABSENT	AJAY BHADRE	YES	YES	YES	YES	YES
14	AKHTARI BEGUM	3728191	54	FEMALE	MRI BRAIN PLAIN	ABSENT	ABSENT	ABSENT	ABSENT	ABSENT	ABSENT	ABSENT	SACHIN MULIK	YES	YES	YES	YES	YES
15	RITA GOLARE	3735103	55	FEMALE	MRI LT SHOULDER	ABSENT	ABSENT	ABSENT	ABSENT	ABSENT	ABSENT	ABSENT	VIJAY YADAV	YES	YES	YES	YES	YES
16	BASHIR KURNE	3724936	60	MALE	MRI RT ANKLE	ABSENT	ABSENT	ABSENT	ABSENT	ABSENT	PRESENT	ABSENT	VIDYA PATIL	YES	YES	YES	YES	YES
17	AMMAR DABIKAR	3745947	25	MALE	MRI HIP JOINT	ABSENT	ABSENT	ABSENT	ABSENT	ABSENT	ABSENT	ABSENT	SAGAR SURVE	YES	YES	YES	YES	NO
18	GULNAZ SHAIKH	3879609	40	FEMALE	MRI LUMBAR SPINE	ABSENT	ABSENT	ABSENT	ABSENT	ABSENT	ABSENT	ABSENT	MAYUR BIRAMANE	YES	YES	YES	YES	YES
19	LAXMIBAI CHIKHALKOLHE	3743186	60	FEMALE	MRI LUMBAR SPINE	ABSENT	ABSENT	PRESENT	ABSENT	ABSENT	ABSENT	ABSENT	AJAY BHADRE	YES	YES	YES	YES	YES
20	PRITI ANANTWAR	3749583	28	FEMALE	MRI RT TIBIA	ABSENT	ABSENT	ABSENT	ABSENT	ABSENT	ABSENT	ABSENT	VIJAY YADAV	YES	YES	YES	YES	YES
21	ZUBER ANSARI	3748317	18	MALE	MRI CERVICAL SPINE	ABSENT	ABSENT	ABSENT	ABSENT	ABSENT	ABSENT	ABSENT	SACHIN MULIK	YES	YES	YES	YES	YES
22	SHUBHAM ALI	3752204	35	MALE	MRI LUMBAR SPINE	ABSENT	ABSENT	ABSENT	ABSENT	ABSENT	ABSENT	ABSENT	SAGAR SURVE	YES	YES	YES	YES	YES
23	BANIBAI RATHOD	3753442	65	FEMALE	MRI LUMBAR SPINE	ABSENT	ABSENT	ABSENT	ABSENT	ABSENT	ABSENT	ABSENT	VIDYA PATIL	YES	YES	YES	YES	YES
24	SADASHIV NAIK	3781925	61	MALE	MRI CERVICAL SPINE	ABSENT	ABSENT	ABSENT	ABSENT	ABSENT	ABSENT	ABSENT	MAYUR BIRAMANE	YES	YES	YES	YES	YES
25	KALPANA SUTAR	3785240	53	FEMALE	MRI LUMBAR SPINE	ABSENT	ABSENT	ABSENT	ABSENT	ABSENT	ABSENT	PRESENT	AJAY BHADRE	NO	YES	YES	YES	YES
26	PRAFUL DESHMUKH	3785165	35	MALE	MRI KNEE JOINT	ABSENT	ABSENT	ABSENT	ABSENT	ABSENT	ABSENT	ABSENT	VIJAY YADAV	YES	YES	YES	YES	YES
27	DARSHANA KASARE	3785744	39	FEMALE	MRI PELVIS	ABSENT	ABSENT	ABSENT	ABSENT	ABSENT	ABSENT	ABSENT	VIJAY YADAV	YES	YES	YES	YES	YES
28	DARSHANA JADHAV	3793833	50	FEMALE	MRI LT WRIST JOINT	ABSENT	ABSENT	PRESENT	ABSENT	ABSENT	ABSENT	ABSENT	VIJAY YADAV	YES	YES	YES	YES	YES
29	ZUBAIN M K	3787274	46	MALE	MRI LUMBAR SPINE	ABSENT	ABSENT	ABSENT	ABSENT	ABSENT	ABSENT	ABSENT	VIDYA PATIL	YES	YES	YES	YES	YES
30	ROHIT PATIL	3789324	22	MALE	MRI S I JOINT	ABSENT	ABSENT	ABSENT	ABSENT	ABSENT	ABSENT	ABSENT	SAGAR SURVE	YES	YES	YES	YES	YES
31	PRAKASH BHOSALE	3796131	37	MALE	MRI DORSAL SPINE	ABSENT	ABSENT	ABSENT	ABSENT	ABSENT	ABSENT	ABSENT	SACHIN MULIK	YES	YES	YES	YES	YES
32	SWATI KATKARI	3794737	20	FEMALE	MRI VENOGRAM	ABSENT	ABSENT	ABSENT	ABSENT	ABSENT	ABSENT	ABSENT	SACHIN MULIK	YES	YES	YES	YES	YES
33	VILAS MANDAVKAR	3796574	31	MALE	MRI RT KNEE JOINT	ABSENT	ABSENT	ABSENT	ABSENT	ABSENT	ABSENT	ABSENT	VIDYA PATIL	YES	YES	YES	YES	NO
34	ROHINI SHIRSAT	3529221	53	FEMALE	MRI SHOULDER JOINT	ABSENT	ABSENT	ABSENT	ABSENT	ABSENT	ABSENT	ABSENT	AJAY BHADRE	YES	YES	YES	YES	YES
35	DAUAD HUSSAIN	3792629	65	MALE	MRI LUMBAR SPINE	ABSENT	ABSENT	PRESENT	ABSENT	ABSENT	ABSENT	ABSENT	SACHIN MULIK	YES	YES	YES	YES	YES
36	SANDEEP PATIL	3793086	52	MALE	MRI LUMBAR SPINE	ABSENT	ABSENT	ABSENT	ABSENT	ABSENT	ABSENT	ABSENT	VIJAY YADAV	YES	YES	YES	YES	YES
37	KULDEEP SINGH	3798518	27	MALE	MRI BRAIN PLAIN	ABSENT	ABSENT	ABSENT	ABSENT	ABSENT	PRESENT	ABSENT	VIJAY YADAV	YES	YES	YES	YES	YES
38	KARISHMA MADHAVI	3797881	23	FEMALE	MRI RT KNEE JOINT	ABSENT	ABSENT	ABSENT	ABSENT	ABSENT	ABSENT	ABSENT	MAYUR BIRAMANE	YES	YES	YES	YES	YES
39	PRIYANKA PANDEY	3793545	21	FEMALE	MRI LT KNEE JOINT	ABSENT	ABSENT	ABSENT	ABSENT	ABSENT	ABSENT	ABSENT	VIDYA PATIL	YES	YES	YES	YES	YES
40	CHINDRAJEET KUMAR	3794737	33	MALE	MRI CERVICAL SPINE	ABSENT	ABSENT	ABSENT	ABSENT	ABSENT	ABSENT	ABSENT	SAGAR SURVE	YES	YES	YES	YES	YES
41	ABHIJEET GADKARI	3796835	28	MALE	MRI RT KNEE JOINT	ABSENT	ABSENT	ABSENT	ABSENT	ABSENT	ABSENT	ABSENT	SACHIN MULIK	YES	YES	YES	YES	YES
42	NAFISA TADE	3797250	42	FEMALE	MRI CERVICAL SPINE	ABSENT	ABSENT	ABSENT	ABSENT	ABSENT	ABSENT	ABSENT	VIDYA PATIL	YES	YES	YES	YES	YES
43	DATTATRAY KUMBHAR	3802447	62	MALE	MRI LUMBAR SPINE	ABSENT	ABSENT	PRESENT	ABSENT	ABSENT	ABSENT	ABSENT	VIJAY YADAV	YES	YES	YES	YES	YES
44	RAGHUNATH JADHAV	3800084	50	MALE	MRI LUMBAR SPINE	ABSENT	ABSENT	ABSENT	ABSENT	ABSENT	ABSENT	ABSENT	VIDYA PATIL	YES	YES	YES	YES	YES
45	SHITAL SALUNKHE	3771742	27	FEMALE	MRI RT KNEE JOINT	ABSENT	ABSENT	ABSENT	ABSENT	ABSENT	ABSENT	ABSENT	VIJAY YADAV	YES	YES	YES	YES	YES
46	VANDANA KENI	3805520	45	FEMALE	MRI LUMBAR SPINE	ABSENT	ABSENT	ABSENT	ABSENT	ABSENT	PRESENT	ABSENT	SAGAR SURVE	YES	YES	YES	YES	YES
47	PRAKASH AMBURLE	3802862	61	MALE	MRI LT KNEE JOINT	ABSENT	ABSENT	ABSENT	ABSENT	ABSENT	ABSENT	ABSENT	SACHIN MULIK	YES	YES	YES	YES	YES
48	SAROJ DHINGANE	3805136	53	FEMALE	MRI LUMBAR SPINE	ABSENT	ABSENT	ABSENT	ABSENT	ABSENT	ABSENT	ABSENT	MAYUR BIRAMANE	YES	YES	YES	YES	YES
49	PREMA SINGH	3803232	67	MALE	MRI LUMBAR SPINE	ABSENT	ABSENT	ABSENT	ABSENT	ABSENT	ABSENT	ABSENT	AJAY BHADRE	YES	YES	YES	YES	YES
50	KUNDALIK PARAVE	3801662	65	MALE	MRI LUMBAR SPINE	ABSENT	ABSENT	ABSENT	ABSENT	ABSENT	ABSENT	ABSENT	SAGAR SURVE	YES	YES	YES	YES	YES
51	RAVINDRA BHOIR	3803421	29	MALE	MRI CERVICAL SPINE	ABSENT	ABSENT	ABSENT	ABSENT	ABSENT	ABSENT	ABSENT	SAGAR SURVE	YES	YES	YES	YES	YES
52	LATA MUNDE	3797248	62	FEMALE	MRI DORSAL SPINE	ABSENT	ABSENT	ABSENT	ABSENT	ABSENT	ABSENT	PRESENT	AJAY BHADRE	YES	YES	YES	YES	YES
53	KASHINATH KOLI	3605467	62	MALE	MRI LUMBAR SPINE	ABSENT	ABSENT	ABSENT	ABSENT	ABSENT	ABSENT	ABSENT	AJAY BHADRE	YES	YES	YES	YES	YES
54	SUNIL MARDEKAR	3796528	39	MALE	MRI LUMBAR SPINE	ABSENT	ABSENT	ABSENT	ABSENT	ABSENT	ABSENT	ABSENT	VIDYA PATIL	YES	YES	YES	YES	YES
55	NAGMA SHAIKH	3754807	53	FEMALE	MRI RT SHOULDER	ABSENT	ABSENT	ABSENT	ABSENT	ABSENT	ABSENT	ABSENT	VIDYA PATIL	YES	YES	YES	YES	YES
56	DENNIS SILVA	3800930	45	MALE	MRI DORSAL SPINE	ABSENT	ABSENT	ABSENT	ABSENT	ABSENT	ABSENT	ABSENT	VIDYA PATIL	YES	YES	YES	YES	YES
57	VIDHYA GAMARE	3811138	25	FEMALE	MRI RT KNEE JOINT	ABSENT	ABSENT	ABSENT	ABSENT	ABSENT	ABSENT	ABSENT	SACHIN MULIK	YES	YES	YES	YES	YES
58	MANDAR GADGE	3804066	25	MALE	MRI RT KNEE JOINT	ABSENT	ABSENT	ABSENT	ABSENT	ABSENT	ABSENT	ABSENT	SACHIN MULIK	YES	YES	YES	YES	NO
59	ISHWAR JADHAV	3804122	52	MALE	MRI RT KNEE JOINT	ABSENT	ABSENT	ABSENT	ABSENT	ABSENT	ABSENT	ABSENT	SACHIN MULIK	YES	YES	YES	YES	YES
60	VAISHALI CHAVAN	3803504	40	FEMALE	MRI LT WRIST JOINT	ABSENT	ABSENT	PRESENT	ABSENT	ABSENT	ABSENT	PRESENT	SACHIN MULIK	YES	YES	YES	YES	YES
61	JYOTIRAM SALUNKHE	3812937	35	MALE	MRI RT KNEE JOINT	ABSENT	ABSENT	ABSENT	ABSENT	ABSENT	ABSENT	ABSENT	AJAY BHADRE	NO	YES	YES	YES	YES
62	VITTHAL MOKAL	3804646	53	MALE	MRI LT THUMB	ABSENT	ABSENT	ABSENT	ABSENT	ABSENT	ABSENT	ABSENT	VIJAY YADAV	YES	YES	YES	YES	YES
63	NISAR KHAN	3810483	19	MALE	MRI LT ELBOW	ABSENT	ABSENT	ABSENT	ABSENT	ABSENT	ABSENT	ABSENT	VIJAY YADAV	YES	YES	YES	YES	YES
64	SUMITRA DEVI	3797192	35	FEMALE	MRI PELVIS	ABSENT	ABSENT	ABSENT	ABSENT	ABSENT	ABSENT	ABSENT	SAGAR SURVE	YES	YES	YES	YES	YES
65	MOHD SOHAB	3813647	19	MALE	MRI BRAIN CONTRAST	ABSENT	ABSENT	ABSENT	ABSENT	ABSENT	PRESENT	ABSENT	SAGAR SURVE	YES	YES	YES	YES	YES
66	SEEMA SHARMA	3813605	32	FEMALE	MRI BRAIN CONTRAST	ABSENT	ABSENT	ABSENT	ABSENT	ABSENT	ABSENT	ABSENT	SAGAR SURVE	YES	YES	YES	YES	YES
67	SANKAT SARDAR	3808457	22	MALE	MRI RT SHOULDER	ABSENT	PRESENT	ABSENT	ABSENT	ABSENT	ABSENT	ABSENT	MAYUR BIRAMANE	YES	YES	YES	YES	YES
68	BIMALAVAT GUPTA	3764091	35	MALE	MRI LUMBAR SPINE	ABSENT	ABSENT	ABSENT	ABSENT	ABSENT	ABSENT	ABSENT	VIDYA PATIL	YES	YES	YES	YES	YES
69	AMOL TAMBE	3807418	25	MALE	MRI CERVICAL SPINE	ABSENT	ABSENT	ABSENT	ABSENT	ABSENT	ABSENT	ABSENT	VIDYA PATIL	YES	YES	YES	YES	YES
70	VISHWANATH ROY	3899995	25	MALE	MRI PELVIS	ABSENT	ABSENT	ABSENT	ABSENT	ABSENT	ABSENT	ABSENT	VIJAY YADAV	YES	YES	YES	YES	YES
71	ABDUL MOIN	3845332	48	MALE	MRI LUMBAR SPINE	ABSENT	ABSENT	ABSENT	ABSENT	ABSENT	ABSENT	ABSENT	VIJAY YADAV	YES	YES	YES	YES	YES
72	SHENAD GHARAT	3843750	55	MALE	MRI CERVICAL SPINE	ABSENT	ABSENT	ABSENT	ABSENT	ABSENT	ABSENT	ABSENT	AJAY BHADRE	YES	YES	YES	YES	NO
73	SUBADHAR BALGUDE	3812571	70	FEMALE	MRI BRAIN PLAIN	ABSENT	ABSENT	ABSENT	ABSENT	ABSENT	ABSENT	ABSENT	SACHIN MULIK	YES	YES	YES	YES	YES
74	SUBHASH CHOUBEY	3815544	59	MALE	MRI BRAIN PLAIN	ABSENT	ABSENT	ABSENT	ABSENT	ABSENT	ABSENT	ABSENT	SACHIN MULIK	YES	YES	YES	YES	YES
75	SAIFUL ASHRAFI	3810267	32	MALE	MRI CERVICAL SPINE	ABSENT	ABSENT	ABSENT	ABSENT	ABSENT	ABSENT	ABSENT	SACHIN MULIK	YES	YES	YES	YES	YES
76	SHUBHANGI GHADGE	3814895	42	FEMALE	MRI RT WRIST	ABSENT	ABSENT	ABSENT	ABSENT	ABSENT	ABSENT	ABSENT	SAGAR SURVE	YES	YES	YES	YES	YES
77	SHRADDHA TIWARI	3570952	74	FEMALE	MRI BRAIN CONTRAST	ABSENT	ABSENT	PRESENT	ABSENT	ABSENT	ABSENT	ABSENT	SAGAR SURVE	YES	YES	YES	YES	YES
78	MANAV THAPAR	3811210	20	MALE	MRI RT KNEE JOINT	ABSENT	ABSENT	ABSENT	ABSENT	ABSENT	ABSENT	ABSENT	VIDYA PATIL	YES	YES	YES	YES	YES
79	SHASHIKALA JADHAV	3816991	53	FEMALE	MRI LT KNEE JOINT	ABSENT	ABSENT	ABSENT	ABSENT	ABSENT	ABSENT	PRESENT	VIJAY YADAV	YES	YES	YES	YES	YES
80	SUMATI KHAIRE	3815672	79	FEMALE	MRI BRAIN PLAIN	ABSENT	ABSENT	ABSENT	ABSENT	ABSENT	ABSENT	ABSENT	VIJAY YADAV	YES	YES	YES	YES	YES
81	MORESHWAR POTDAR	3813463	89	MALE	MRI BRAIN ANGIO	ABSENT	ABSENT	ABSENT	ABSENT	ABSENT	ABSENT	ABSENT	VIDYA PATIL	YES	YES	YES	YES	YES
82	NILIMA HUMBIN	3817928	19	FEMALE	MRI BRAIN CONTRAST	ABSENT	ABSENT	ABSENT	ABSENT	ABSENT	ABSENT	ABSENT	VIDYA PATIL	YES	YES	YES	YES	YES
83	JIJABAI TANDEL	3817248	76	FEMALE	MRI LUMBAR SPINE	ABSENT	ABSENT	ABSENT	ABSENT	ABSENT	ABSENT	ABSENT	SACHIN MULIK	YES	YES	YES	YES	YES
84	ABHILASH SINGH	3819103	25	MALE	MRI BRAIN CONTRAST	ABSENT	ABSENT	ABSENT	ABSENT	ABSENT	ABSENT	ABSENT	SACHIN MULIK	YES	YES	YES	YES	YES
85	SHAIKH ARFATH	3815777	23	MALE	MRI LUMBAR SPINE	ABSENT	ABSENT	ABSENT	ABSENT	ABSENT	ABSENT	ABSENT	SACHIN MULIK	YES	YES	YES	YES	YES
86	PANDURANG S	3817901	70	MALE	MRI FEMUR	ABSENT	ABSENT	PRESENT	ABSENT	ABSENT	ABSENT	ABSENT	SAGAR SURVE	YES	YES	YES	YES	NO
87	APARNA TAJRE	3811296	28	FEMALE	MRI RT TIBIA	ABSENT	ABSENT	ABSENT	ABSENT	ABSENT	ABSENT	ABSENT	VIJAY YADAV	YES	YES	YES	YES	YES
88	SHITAL GHADGE	3815683	41	FEMALE	MRI BRAIN CONTRAST	ABSENT	ABSENT	ABSENT	ABSENT	ABSENT	ABSENT	ABSENT	VIJAY YADAV	YES	YES	YES	YES	YES
89	RESHMA PATIL	3819563	24	FEMALE	MRI RT WRIST	ABSENT	ABSENT	ABSENT	ABSENT	ABSENT	ABSENT	ABSENT	VIJAY YADAV	YES	YES	YES	YES	YES
90	SUSHILA MHATRE	3818094	45	FEMALE	MRI BRAIN ANGIO	ABSENT	ABSENT	ABSENT	ABSENT	ABSENT	ABSENT	ABSENT	VIJAY YADAV	YES	YES	YES	YES	YES
91	RAJNIKANT CHAURASIYA	3745102	32	MALE	MRI LUMBAR SPINE	ABSENT	ABSENT	ABSENT	ABSENT	ABSENT	ABSENT	ABSENT	VIJAY YADAV	YES	YES	YES	YES	YES
92	VIJAY LODAKAR	3819495	36	MALE	MRI CERVICAL SPINE	ABSENT	ABSENT	ABSENT	ABSENT	ABSENT	ABSENT	ABSENT	VIJAY YADAV	NO	YES	YES	YES	YES
93	NAKOSABAI SARGAR	3817265	60	FEMALE	MRI LUMBAR SPINE	ABSENT	ABSENT	ABSENT	ABSENT	ABSENT	ABSENT	PRESENT	SACHIN MULIK	YES	YES	YES	YES	YES
94	YOGESH MOKAL	3819327	28	MALE	MRI BRAIN VENOGRAM	ABSENT	ABSENT	ABSENT	ABSENT	ABSENT	ABSENT	ABSENT	SAGAR SURVE	YES	YES	YES	YES	YES
95	LAXMAN SASE	3812883	32	MALE	MRI FISTULA	ABSENT	ABSENT	ABSENT	ABSENT	ABSENT	ABSENT	ABSENT	SACHIN MULIK	YES	YES	YES	YES	YES
96	SUSHILA ANCHAN	3815718	74	FEMALE	MRI BRAIN PLAIN	ABSENT	ABSENT	PRESENT	ABSENT	ABSENT	ABSENT	ABSENT	SACHIN MULIK	YES	YES	YES	YES	YES

97	PARVAZ KHAN	3820443	22	MALE	MRI LUMBAR SPINE	ABSENT	ABSENT	ABSENT	ABSENT	ABSENT	ABSENT	ABSENT	VIDYA PATIL	YES	YES	YES	YES	YES
98	NANDA PUKALE	3915228	54	FEMALE	MRI BRAIN VENOGRAM	ABSENT	ABSENT	ABSENT	ABSENT	ABSENT	ABSENT	ABSENT	VIDYA PATIL	YES	YES	YES	YES	YES
99	JAMINA ANSARI	3916320	28	FEMALE	MRI BRAIN CONTRAST	ABSENT	ABSENT	ABSENT	ABSENT	ABSENT	PRESENT	ABSENT	VIJAY YADAV	YES	YES	YES	YES	YES
100	SHIRIA DEVI	3910992	50	FEMALE	MRI LUMBAR SPINE	ABSENT	ABSENT	ABSENT	ABSENT	ABSENT	ABSENT	PRESENT	VIJAY YADAV	YES	YES	YES	YES	YES

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