

Notes for completing MRI screening forms

MRI utilizes a very strong magnetic field, rapidly switching gradient magnetic fields and powerful radiofrequency transmissions. Although the levels typically used for MRI are safe, there are a number of instances when it is unsafe (even potentially fatal) for someone to be in or around a MRI scanner. The screening forms are used to identify which individuals can safely enter the magnet room.

*****check you have the latest version of the forms and notes from <http://cfmri.ucsd.edu/forms.html>**

A. THE SAFETY QUESTIONS: There are 21 safety questions divided into 2 sections (boxes)

Q1-7 (Upper box): Absolute contraindications to entering the MRI scanner

1. Yes No Do you have a heart pacemaker?
2. Yes No Is there a possibility of metal in your head? (e.g. aneurysm clips, do not include dental work)
3. Yes No Is there a possibility of metal in your eyes or have you ever needed an eyewash having worked with metals?
4. Yes No Do you have an implanted medical device? (cochlear implant, metal ear tubes, tens unit, bone stimulator, insulin or other medication pump, automatic defibrillator, internal pacing wires).
5. Yes No Have you had any metallic dental implants (posts, crowns) within the last 6 weeks?
6. Yes No Have you had any bone, tendon, spine or joint surgery within the last 6 weeks?
7. Yes No [*Research subjects only:*] Do you weigh more than 300 lbs (135 kg)?

Notes on Absolute contraindications:

If any of these are checked "yes" the subject cannot enter the MRI scanner.

(Note that the last question applies to research subjects only as this is the weight limit for the MRI table).

Q8-21 (Lower box): Potential contraindications to entering the MRI scanner

8. Yes No Is there any possibility that you may be pregnant?
9. Yes No Do you suffer with claustrophobia?
10. Yes No Do you have any medical problems when you lie flat on your back? (breathing problems, back pain, nausea)
11. Yes No Do you have an IUD that may contain copper, or a contraceptive diaphragm?
12. Yes No Have you had any stents, clips or surgery to any of any of your vessels (carotid artery vascular clamp, coronary stent, aortic clips, IVC filter, coils for blocked arteries)
13. Yes No Do you have metal anywhere else in your body? (spinal rods, dental work, piercings, shrapnel, buckshot, bullets) – please indicate where on your body using the diagram above
14. Yes No Do you have any piercings that can't be removed?
15. Yes No Do you have a cerebrospinal fluid (CSF) shunt? (treatment for hydrocephalus or water on the brain)
16. Yes No Do you have tattooed eyeliner, tattooed eyebrows or Bigen hair dye?
17. Yes No Have you had any previous surgery? (give details, and indicate where on your body using the diagram above)
 Details: _____ Date: ____ / ____ / ____
 Details: _____ Date: ____ / ____ / ____
18. Yes No Have you had any medical condition that has prevented you completing an MRI exam in the past?
19. Yes No [*If medications or other substances are administered:*] Do you suffer with asthma or allergies to any medication?
20. Yes No Do you have a transdermal medicated patch? (nicotine patch, contraceptive patch, medicated pain relief patch)
21. Yes No Do you wear a hearing aid or dentures?

Notes on potential contraindications to MRI:

If any of these are checked "yes", further clarification, or monitoring is needed for the subject to enter the MRI scanner.

Q8. Pregnancy

You must have specific IRB approval to scan women who answer yes to this question.

Q9. Claustrophobia

Subjects with claustrophobia will require additional training and encouragement to complete their MRI exam. Keeping the exam very short will help. Claustrophobic subjects who have been unable to complete MRI exams in the past remain unlikely to complete them in the future.

Q10. Difficulty lying supine

Subjects with medical conditions that are exacerbated when they lie flat are unlikely to be able to complete a MRI exam. If symptoms are severe enough to hamper communication (e.g. very breathless subject), then they should not undergo MRI. If symptoms are mild, then it is OK to proceed, but remain in close verbal and visual contact with the subject. Keeping the exam short will help.

Q11. Copper-containing IUD, or diaphragm

Older IUD contraceptives containing copper are safe at 1.5T but untested at 3T. You must identify the exact device that the subject has and it must be listed as safe at <http://www.mrisafety.com/>
Diaphragm containing a metal ring may get hot (remove before scan).

Q12. Metal associated with vessels

There is a potential danger of ferromagnetic hardware being displaced by the strong magnetic field. Coronary (heart) stents are MRI safe. Most carotid (neck) vascular clamps are safe at 1.5T (except Poppen-Blaylock clamp) but untested at 3T. Stents become firmly attached to tissues, and are unlikely to move beyond first few months. More details are needed before proceeding. You must identify the exact device that the subject has and it must be listed as safe at <http://www.mrisafety.com/>

Q13. Other metal in the body

Metal bullets/shot/shrapnel in the head or torso are a contraindication to MRI. The only exception to this is implanted dental work in place for more than 6 weeks. Longstanding immobile bullets/shot/shrapnel in bones in the limbs are not a contraindication. Spinal rods or intramedullary rods older than 6 weeks are not a contraindication to MRI, but in these cases images quality may be significantly degraded depending on location. Piercings should be removed (or see below).

Q14 Non-removable piercings

We recommend that subjects should not be scanned with piercings in place as there is a small risk of heating, vibration or discomfort. If not removable and non-magnetic (test with magnet in workshop) and it is deemed important to proceed with the MRI, scanning may be OK – but immobilize piercing with tape and insulate as much as possible from skin (at least 1cm insulation to prevent burns). Remain in close verbal and visual contact with subject. Warn subject about pain, heating, vibration of piercing. Any unpleasant sensations / adverse reaction must be reported to IRB.

Q15. CSF shunts

Most are MRI safe – but some are programmed magnetically, and subjects will need the unit to be reprogrammed by their doctor after MRI. More details are needed before proceeding. You must identify the exact device that the subject has and it must be listed as safe at <http://www.mrisafety.com/>

Q16. Tattooed eyeliner, tattooed eyebrows or Bigen hair dye

May cause local heating and distortion of the MR images. Scanning may be unproblematic – but remain in close visual and verbal contact with subject Warn subject about pain, heating, tactile sensations in the tattoo (and complete a peripheral nerve stimulation form if tactile sensations are experienced). Any unpleasant sensations / adverse reaction must also be reported to IRB.

Q17. Previous surgery.

This question is an opportunity to find out about metal in the body that subjects failed to mention in Q12 or Q13.

Q18. Prior problems completing a MRI exam

This question is an opportunity to find out about potential medical problems or contraindications to MRI that subjects forgot to mention in earlier questions.

Q19. i.v. injections

If gadolinium or other MRI contrast agents will be injected, it is important to know that the subject has not had an allergy to this or similar medications. More details are needed before proceeding. Note that all such procedures require specific approval from IRB.

Q20. Transdermal delivery patch (e.g. nicotine, contraceptive or medicated pain relief patch)

These may cause local heating. Remove before MRI

Q21. Hearing aids & dentures (and removable bridge)

Remove before MRI. Hearing aids that are implanted and cannot be removed are a contraindication to MRI exam.

B. THE SCREENING FORMS:

Three screening forms are provided:

- 1) Recruitment / Advanced Screening Form
- 2) Pre-entry Screening Form
- 3) Operator checklist

1. Recruitment / Advanced Screening Form:

(Form available from cfmri website as an editable MS Word document).

Advance screening of research subjects:

We strongly advise that PIs screen their research subjects well in advance of their proposed scan session. This allows subjects who are unsafe to enter the scanner room to be identified early (thus preventing scanner sessions being cancelled at short notice due to unsuitable research subjects). It also provides time to seek assistance if more information is needed before a research subject may safely enter the magnet room (e.g. determining if a surgical screw is MRI-compatible).

USE:

This form is used for pre-screening research subjects in advance of their MRI study. It is also used to screen operators and research staff as part of the safety training class.

A "recruitment screening form" is available from <http://cfmri.ucsd.edu/forms.html> This has space for PI's to fill in subject's contact information. PI's may use this form, or design one that better suits their specific needs.

Do not use the recruitment screening form for pre-entry screening (although the questions are the same – the advanced form is not HIPPA compliant for subject anonymity).

CONTENTS:

The form is divided into 4 sections:

- 1) Subject contact information
- 2) Diagram for subject to indicate any metal / previous surgery etc.
- 3) The 21 Safety questions, divided in 2 sections: 1-7: Absolute contraindications to MRI and 8-21: Potential contraindications to MRI
- 4) Area for subject to sign (and for fMRI center safety personnel to sign if a secondary review is needed)

ARCHIVE:

Once completed the PI should retain it for their own files.

2. Pre-Entry Screening Form:

(Form available from cfmri website as a printable PDF document only. Note: The PDF is a fillable form, so for your convenience, Principal Investigator/Lab, IRB Protocol #, and Operator fields can be pre-filled before printing)

The scanner operator is responsible for completing the pre-entry screening form on every research subject (and subject's essential caregiver e.g. a parent) immediately before each exam. The operator is also responsible for knowing the screening status of members of their research team (even though they have been safety screened). If the operator is unsure, we recommend they are rescreened using this form.

USE:

The form is filled out on the day of the MRI exam, and is valid only for that day. Subjects who are re-scanned on subsequent days must complete a new form. These forms need to be anonymous. The subject is identified only by a subject number provided by the PI. Unlike the other forms, this form must not be substituted, and operators need to use the official fMRI center form at <http://cfmri.ucsd.edu/forms.html>

CONTENTS:

The form is divided into 4 sections:

- 1) Subject information (completed by Operator)
- 2) The 21 Safety questions, 1-7: Absolute contraindications to MRI and 8-21: Potential contraindications to MRI (completed by Operator or research subject)
- 3) Certification by operator that subject is safe to enter scanner room - and an area to detail what actions were taken if any of Q8-21 were checked "yes".
- 4) Diagram for subject to indicate any metal / previous surgery etc.

ARCHIVE:

Once completed and signed, a **legible** copy of this form must be filed with Linda at the fMRI Center.

3. Operator Checklist:

(Form available from cfmri website as an editable MS Word document).

USE:

This is a checklist of last minute "actions" filled in by the operator immediately before anyone who does not have current operator training enters scan room. Operators are encouraged to use it as is, or may modify it to suit their own requirements.

CONTENTS:

The form contains Q1-7 from the screening form to reconfirm there are no absolute contraindications to MRI, and a list of items to check before subject enters the MRI room.

ARCHIVE:

A copy must be filed with Linda at the fMRI Center. PI may also keep a copy for their safety records.