

2 Guidelines for Requesting and Authorising by Radiographers – Annex A

Adjustment to the scope of professional practice.

Magnetic Resonance Imaging Department.

Hull and East Yorkshire Hospitals Trust.

- 1 - The requesting of plain film radiographs of the orbit/skull for the purposes of excluding metallic foreign bodies by MRI Radiographers.
- 2 - The interpretation of plain film radiographs and/or CT head scans for the exclusion of metallic intra-ocular foreign bodies by MRI Radiographers.
- 3 - The recording of an appropriate report onto the Radiology reporting system.
- 4 - Basic PACS training to enable point 2.

History of the scheme.

Patients attending the MRI department without first disclosing a history of injury to the eye involving metallic objects are a common occurrence.

Ho et al conclude that retained IOFB (metallic) are well tolerated and typically have minimal adverse visual prognosis. They should be managed conservatively in the absence of specific indications for removal (**ref 1**) Historically, a patient in US with ocular injury involving 2mm x 3.5mm retained ferromagnetic foreign body resulted in unilateral blindness after undergoing MRI (Kelly et al – **ref 8**).

Our first main step is screening the patient. BAMRR (**ref 7**) recommend a questionnaire to obtain information concerning prior injury from metallic foreign bodies.

We found that speedy resolution of the problem was only possible when there was a Radiologist immediately available to

- Discuss the circumstances of the injury with the patient
- Review any relevant cranial x-rays
- Write a request for the orbit examination if required
- Review the orbit x-ray once it has been performed.

With a department working a 12 hour day, it was not possible to scan any patient with a dubious history even if there were relevant imaging studies available unless the reporting Radiologist had specifically stated that there were no metallic foreign bodies demonstrated in the orbits. This was immensely frustrating.

The College of Radiologists (**ref 2**) state -

‘As in other areas of healthcare, some radiological services are being delivered by non-medically qualified healthcare professionals. In the interests of good clinical care and patient safety these individuals should work in a team with ready access to a fully trained radiologist for advice.

The types of investigation which may be suitable for primary reporting by healthcare professionals without the benefit of a medical degree are those where there is a single organ investigation, with a single suspected pathology and a yes/no answer.’

By devolving these duties to suitably trained MRI Radiographers, relevant patient records could be promptly reviewed or appropriate plain films undertaken and reviewed at times when a Radiologist may be unavailable.

The service is improved as the need to re-appoint patients for this reason has been resolved and the patient is happy as everything can be undertaken in one visit.

Why Plain film?

The most commonly recommended imaging modality for the screening of metallic IOFB's is plain radiography. (Bailey and Robinson – **ref 3**)

The Medicines and Healthcare products Regulatory Agency (MHRA- **ref 4**) state 'where the presence of metal fragments in the eye is suspected but unproven and no xray is available, it should be policy to obtain an ocular xray to confirm or negate presence of metal before MR scanning is performed'

Other possible imaging methods –

Ultrasound – may be superior to MR or CT for evaluating tissue damage caused by an IOFB but requires a skilled operator to determine whether retained particles are intra- or extra – ocular.

Metal detectors – manufactures claim can detect small metallic particles within the orbit. Research has concentrated on ingested FB's. Felt to be an unlikely option. (Bailey and Robinson – **ref 3**)

Purpose.

This document is designed to outline the skills required by MRI Radiographers who wish to adjust their scope of practice to include the interpretation of plain films of the orbit, skull vault or sinuses and/or CT scans of the head for the purposes of excluding the presence of metallic intra-ocular foreign bodies.

Aim.

The Radiographer will be able to accurately interpret plain films of the orbit, skull vault and sinuses, and/or head CT scans for the purposes of excluding metallic intra-ocular foreign bodies in accordance with local guidelines.

Objectives.

The Radiographer will:

- Understand the potential risks of performing an MR examination in the presence of an intra-ocular metallic foreign body.
- Know the indications for requesting plain x-rays of the orbits prior to MR examinations.
- Understand current ionising radiation regulations. (The trust run a course for diagnostic radiographers).
- Be able to accurately interpret x-rays of the orbit, skull vault and sinuses for the purposes of excluding metallic intra-ocular foreign bodies.
- Be able to interpret CT scans of the head for the purposes of excluding metallic intra-ocular foreign bodies – further training may be required here.
- Be able to record a report of their findings on the Radiology Reporting system.
- Be able to use PACS workstations to view appropriate studies.

Guidelines.

For MRI Radiographers requesting and reviewing x-ray examination of the orbits for the exclusion of metallic intra-ocular foreign bodies.

1. The Radiographer (MRI) who wishes to adjust the scope of his/her professional practice in this area must be able to demonstrate theoretical knowledge related to the rationale for requesting x-rays of the orbit for the purposes outlined in this training programme. Competence will be assessed using a standard questionnaire (Orbit form 1) and the results held on file.
2. The Radiographer must be aware of the relevant regulations regarding the exposure of individuals to ionising radiation (**ref 5**). Competence will be assessed using a standard questionnaire (Orbit form 1) and the results held on file.

3. The Radiographer must be able to demonstrate awareness of the circumstances that are likely/unlikely to cause a penetrating injury. Competence will be assessed using a standard questionnaire (Orbit form 1) and the results held on file.
4. The Radiographer will undertake a number of test film viewings from a library of suitable radiographs. The results of which will be discussed with the orbit scheme facilitator and recorded on training document (Orbit form 2).
5. The Radiographer will undertake a **minimum** of 6 supervised 'live' film viewings of actual patients attending for MR examinations. All 'live' viewings will be recorded on (Orbit form 3), which each Radiographer will maintain as their personal record of film viewings.
6. Only when both the facilitator and the Radiographer, wishing to extend the scope of his/her practice, are both satisfied with the level of competence achieved will the Radiographer be permitted to request and view films within the scope of this scheme unsupervised.
7. At all times, the Radiographer will be at liberty to decline to request or view films.
8. The Radiographer will refer any cases he/she are not entirely confident in to suitably qualified Radiologist.
9. Upon completion of the training, Mrs N Webster will be informed of the adjustment to the scope of professional practice. Mrs M Nutman, Radiology Manager should also be informed. This is the responsibility of the individual not the facilitator.
10. Competence and updating. Due to the sporadic nature of the requirement for orbit x-rays, it maybe difficult to gain sufficient 'live' experience to maintain a high level of competence. If an individual does not view 5 'cases' in a period of 1 year, they should ask for a further film file test to be performed.

Orbit form 1.

ADJUSTMENT TO THE SCOPE OF PROFESSIONAL PRACTICE.
MRI DEPARTMENT
HULL AND EAST YORKSHIRE HOSPITALS TRUST.

The requesting of plain films of the orbit for the purposes of excluding metallic foreign bodies by MRI radiographers.

QUESTIONNAIRE.

Name _____

		TRUE	FALSE
1	All patients who report an eye injury will require an orbit x-ray.		
2	All patients who report an eye injury involving metal fragments will require an orbit x-ray.		
3	All patients who report an eye injury involving fast moving metallic fragments will require an orbit x-ray.		
4	Only patients who report an injury with fast moving ferromagnetic fragments require an orbit x-ray.		
5	Patients who report an eye injury but had the fragment removed in hospital do NOT require an orbit x-ray.		
6	Patients whose eye injury was more than 10 years ago do NOT need an orbit x-ray.		
7	Only patients who report an injury with a high speed metallic fragment, on whom there is no previous cranial imaging, require an orbit x-ray.		
8	Women can only have orbit x-rays if they are within 28 days of the start of their last menstrual cycle.		
9	Patients that have worked with a lathe may have suffered a penetrating injury to the eye.		
10	Patients that have always worn eye protection and deny any injury to the eye do not need an orbit x-ray.		
11	Patients that have used power tools without eye protection but have never had an injury and don't have any relevant radiological exams must have an orbit x-ray.		
12	Only ferromagnetic metals will experience any force in a moving magnetic field.		
13	Patients who experience ocular discomfort when entering the magnet bore should be removed from the bore as quickly as possible.		
14	Patients who experience ocular discomfort when entering the magnet bore should be removed from the bore as slowly as possible.		
15	A patient who enters the scanner with a metallic foreign body in their eye may go blind.		
16	Small fragments entering the eye under gravity are unlikely to cause a penetrating injury.		
17	Small fragments blown into the eye by the wind are unlikely to cause a penetrating injury.		
18	Patients who have had corneal surgery should not have MRI investigations.		
19	Patients who have had squint corrections can have MRI investigations.		
20	Retained intra-ocular metallic foreign bodies will always be visible to an optician or ophthalmologist.		

Orbit form 2.

**ADJUSTMENT TO THE SCOPE OF PROFESSIONAL
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ORBIT X-RAYS ANSWER SHEET.

Review all the films for all the studies.

Write your interpretation of the films in the comments box. Make additional notes on the back if required.

Your answer should indicate if the patient is safe to scan, probably safe, definitely unsafe, requires further views, needs a radiologist opinion or any combination of these.

	PA	Lat.	CT	Comment
1	1			
2	1	1		
3	1			
4	2			
5	1			
6	2			
7	1			
8	3	1		

9	1			
10	1			
11	1	1		
12	1	1	1	
13	2			
14	1			
15	1	1		
16	1	2		
17	1			
18	1			
19	1			
20	1			
21	1			

22	1			
23	2	1		
24	2	1		
25	1			
26	1			
27	1			
28	1	1		
29	1			
30	1	1		
31	1			
32	1			
33	1			

34	1			
35	2	1		
36	1			
37	1			
38	1			
39	2	2		

Cases to be reviewed on PACS.

HEY number	
HEY1268456	
HEY0754718	
HEY1332325	
HEY0997566	
HEY0055703	
HEY1287144	
HEY0579225	
HEY1043783	
HEY0542321	
HEY0426626	
HEY0436873	
HEY1082139	
HEY1162334	

This section aimed to gain and improve PACS skills and become more accustomed to CT images (where appropriate).

References and further reading.

- 1 - Retained intraorbital metallic foreign bodies – Ho VH, Wilson MW, Fleming JC, Hail BG. Ophthalm. Plast. Reconstr. Surgery 2004 May; 20 (3):232-6
- 2 - Standards for the Reporting and Interpretation of Imaging Investigations. Royal College of Radiologists. January 2006. See Y drive, MRI dept, Orbit reporting forms.
- 3 - Screening for intra-orbital metallic foreign bodies prior to MRI: Review of the evidence. William Bailey, Leslie Robinson. Radiography (2007) 13, 72-80. See Y drive, MRI dept, Orbit reporting forms.
- 4 - Devices Bulletin: Safety Guidelines for Magnetic Resonance Imaging Equipment in Clinical Use. MHRA DB2007 (03) December 2007. See Y drive, MRI dept, Orbit reporting forms.
- 5 - IR(ME)R 2000. See Y drive, MRI dept.
- 6 - Questions and Answers in Magnetic Resonance Imaging (2nd Ed). Elster AD, Burdette JH.
- 7 - BAMRR Website.
- 8 - Ferromagnetism of intraocular foreign body causes unilateral blindness after MR study - Kelly WM, Paglen PG, Pearson JA, San Diego AG, Soloman MA. AJNR 1986; 2:243-5