

Index Number DCN/MRI/SOP/010	Procedure for scanning ventilated critical care (ITU) patients in DCN MRI	NHS Lothian
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Site	Dept of Clinical Neurosciences	Modality	MRI
Department	DCN X-Ray	Location	DCN MRI

Department of Clinical Neurosciences

Neurological MRI under General Anaesthesia

SOP for Critical Care

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Significant injury and death can occur in the MRI as a consequence of poor understanding of the risks of MRI. The new 3 Tesla MRI in DCN has a magnetic field twice as powerful as our previous MRI, providing extremely high quality imaging.

This SOP is designed for you and your patients' safety, please complete every step carefully.

ALL STAFF REQUIRED TO WORK IN MRI MUST HAVE RECEIVED MRI SAFETY TRAINING

Safety Assessment for MRI

'The DCN GA MRI test' – Lie your patient *completely flat* for 90 minutes

- | | | |
|--|------------------------------|-----------------------------|
| ▪ Has there been a significant desaturation? | Yes <input type="checkbox"/> | No <input type="checkbox"/> |
| ▪ Has the FiO ₂ increased or higher than 0.5? | Yes <input type="checkbox"/> | No <input type="checkbox"/> |
| ▪ Has the cardiovascular status become unstable at any point? | Yes <input type="checkbox"/> | No <input type="checkbox"/> |
| ▪ Does your patient have a chest drain that cannot be clamped? | Yes <input type="checkbox"/> | No <input type="checkbox"/> |
| ▪ Is there a high vasopressor/ionotrope requirement? | Yes <input type="checkbox"/> | No <input type="checkbox"/> |

If the answer to any of the above is yes, your patient is **not currently fit for MRI**

- **YOUR PATIENT MAY NOT BE IMMEDIATELY ACCESSIBLE FOR UP TO 90 MINUTES**

How to Book a Neurology MRI:

- **Request the scan on TRAK** – MRI Brain or Spine only please ☐
 - *Please avoid using N/A in the safety questions – this will result in the Radiologist being unable to authorise the scan*
- Discuss the scan with the **on call Consultant Neuroradiologist** (50119 Or via Switch) ☐
- Once authorised, discuss MRI slot availability with the **DCN MRI Radiographers** (50870) ☐
- Call the **on-call Neuroanaesthetist** to organise Anaesthetic cover (8519 via DCN pager) ☐

Please bear in mind there may not be capacity for same-day scanning, but we will endeavour to accommodate the scan as soon as possible

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Team for MRI Transfer

- **MRI-trained Anaesthetist**
- **MRI-trained ODP**
- **ICU nurse**
- **Radiography team**
- **All staff** must complete their own MRI safety questionnaires before entering MRI
- **Please avoid extraneous staff as this is a significant safety issue**

Preparation for Transfer to MRI Checklist

- **MRI safety questionnaire** complete for the patient ☐
- **Roll or log roll** to check for metal under the patient ☐
- **Remove all metal items** (hair clips, jewellery etc) ☐
- **Reduce all equipment** to the minimum necessary ☐
- **Reduce number of IV infusions** to minimum necessary ☐
- Replace all IV lines with **extra long extensions** ☐

If you are unsure about any item, please discuss with MRI radiographers (ex 50870 / 50906) **before** transfer to MRI

Arrival at DCN MRI (1st Floor) (Intraoperative scanner in DCN theatre)

- **Ring the bell** to alert the MRI Radiographers that you have arrived
- In the bay **outside MRI transfer to the MRI table**
- Remove all **MRI Unsafe** equipment and monitoring
- Attach **MRI safe monitoring**
- **Detach portable ventilator and connect c-circuit**
- **Enter the MRI prep room** – patient head first - next to the scanner – can reconnect to MRI ventilator
 - Remove all metal/ferrous items from your person and leave it in this room
 - Disconnect ICU pumps from patient
 - Complete the **GA MRI Safety Pause just prior to transferring into scan room**
- Separate drug pumps should be set up in the control room, ready to be connected to the extra long IV lines.
- Leave the original ICU pumps on the patient ICU bed outside the MRI suite
 - All IV pumps are MRI Unsafe and **CANNOT ENTER THE SCANNING ROOM**

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Transferring the Patient into the Scan Room

- Once MRI safety pause complete can transfer into scan room - **patient feet first**
- Connect to **MRI ventilator** in scan room
- Connect IV lines to lines **already fed through** waveguide
- Radiographers will raise scanner table to lift patient off MRI trolley up to scanning position
 - **Ensure no lines / tubing etc get caught**
- **Hearing protection** given to patient
- **Arm supports and straps** should be used to prevent lines getting caught
- For brain imaging ventilator tubing may need adjusting to enable MRI head coil to be positioned

A **test run** of moving patient through the magnet should be carried out to check lines / tubing will not get pulled.

After the scan

- Once scan is finished patient can be moved direct from the scanning room to the ICU bed outside MRI
- Reconnect ICU pumps, monitoring and portable ventilator outside MRI
- ODP / Radiographers remember to recharge MRI monitoring batteries and plug in mobile monitoring unit and check if Oxygen cylinders needing replaced.

Scanning on the ground floor DCN MRI scanners

Occasionally ventilated scans will need to happen on the ground floor scanners if the intraoperative scanner is not available or a 1.5T scan is needed. Preference is always for the intraoperative scanner.

- As the ground floor environment will be less familiar to anaesthetic and ODP staff, when a case is arranged to happen on the ground floor the **anaesthetist and ODP should visit** the area to understand the environment and patient pathway.
- When using the ground floor scanners you must **check if there is a paediatric GA MRI** happening on the ground floor paediatric MRI scanner at the same time because the MRI **monitoring can interfere with each other** if both are in use at the same time in close

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proximity. If this is the case, ensure the adult patient monitoring and the paediatric patient monitoring are changed so they are using different monitoring channels.

- Patient arrives to **DCN Imaging inpatient holding bay** and is transferred onto the MRI table (Radiographer to ensure correct table for scanner to be used)
- Remove all **MRI Unsafe** equipment and monitoring
- Attach **MRI safe monitoring**
- **Detach portable ventilator and connect c-circuit**
- **Move patient from the inpatient holding bay round into the MRI controlled access area to the MRI prep room** – patient head first – can reconnect to MRI ventilator
 - Remove all metal/ferrous items from your person and leave it in this room
 - Disconnect ICU pumps from patient
 - Complete the **GA MRI Safety Pause just prior to transferring into scan room**
- Separate drug pumps should be set up in the control room, ready to be connected to the extra-long IV lines.
- Move the original ICU pumps back to the patient ICU bed outside the MRI suite
 - All IV pumps are MRI Unsafe and **CANNOT ENTER THE SCANNING ROOM**
- **Patient taken into scan room on successful completion of GA MRI Safety pause**
 - Transfer process on ground floor is same as described for first floor intraoperative scanner.

Other Points to Consider

- For **any emergency** the patient **must** be removed from the scan room and ideally outside the MRI controlled access area.
- The MRI scanner is **always on** and so there is *always* a strong magnetic field nearby
- Some types of tattoos or permanent makeup contain ferromagnetic material
- Please bear in mind the **maximum weight capacity** – 250Kg for the MRI when booking a scan. The **diameter of the bore** is 70cm – if there is doubt whether the patient will fit in MRI please contact the Radiographers (50870) who can come and assess.

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- **Moving within a powerful magnetic field** can cause staff to experience a metallic taste, headaches or sensory disturbance when very close to opening of magnetic bore – please alert someone if you feel unwell.
- **MRI infusion pumps** – these are now available for use to those trained. Remember to remove the black battery from the mobile unit on the drip stand and replace in the charger after use. **Battery should not** be removed in the scanning room.

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