GUIDELINE FOR
CRANIAL MAGNETIC RESONANCE IMAGING OF INFANTS

- Guideline applies to term infants < 6 weeks of age on TMBU or those attending the Day Case Unit.
- Parents can be reassured that there are no complications of MRI itself

Indications for Undertaking Cranial MRI

- Prognostic scanning for asphyxiated infants assigned to Sarnat Grade II or III. Scans yield most reliable prognostic information when taken before 10 days post insult.
- Scanning to inform the process of withdrawal of care.
- Diagnostic scanning for congenital and morphological abnormalities (usually performed between 12 and 18 months of age).
- Prognostic scanning for preterm infants with IVH or PVL. Scans yield most reliable information if performed near term corrected gestational age.

Practical disadvantages of cranial MRI that may directly impinge on patient safety:

- Patient movement may degrade image quality making sedation necessary.
- The scan may take up to 20 minutes during which time the baby is not easily visualised in the scanner. Reliable monitoring is therefore essential.
- **Any ferromagnetic materials in or near the magnetic coil will have a missile effect making metal checks for the infant and attendants essential**

Organising a Sedation MRI Scan

Assess the baby for potential upper airway obstruction and degree of muscle weakness. Are you sure this case is suitable for a sedation scan?	
Day Care Unit scans	**TMBU scans**
Notify consultant anaesthetist (usually Dr McDonald) before proceeding further if booking to GA list	If there are doubts regarding airway protection discuss with TMBU consultant before proceeding further.
Discuss with paediatric radiologist. Fax request form to the MRI department. Aim to achieve prognostic scans before discharge from TMBU. Scans for the Day Care Unit will always be booked to the Wednesday GA list or as a sedation scan. TMBU takes responsibility for sedation scans. Consultant anaesthetist takes responsibility for GA scans.	
Inform Day Care Unit of patient details, named neonatal consultant, scan date and time, sedation or GA.	Inform TMBU nursing staff and transport team of patient details, scan date and time
Inform parents of scan and explain procedure. Do not consent at this stage.	Inform parents of scan and explain procedure. Take verbal consent for sedation scans and document this in the notes.

Preparing infants on TMBU and Day Care Unit for a sedation scan:

- Day Care Unit cases should arrive at 12:00.
- Day Care Unit nurse will contact neonatal registrar, bleep 8193.
- One of the neonatal medical team will prepare the patient as follows:
  1. Check infant is fit for sedation, document assessment in notes
  2. Up-date anaesthetist if booked on the GA list
  3. Insert IV line but this is not a routine requirement
  4. Explain procedure and take verbal consent for sedation scan. Document this in the medical notes.
  5. Prescribe sedation. Suggest 50 mg/kg Chloral Hydrate 30 minutes prior to scan. Consider 30 mg/kg in infants who may require less sedation.
  6. Consider a small feed to help settle the baby if this is considered safe (i.e. neurological examination normal).
- Nursing staff should:
  1. Check for metal objects in or on the baby. Remove clothing with metal poppers.
  2. Change nappy and swaddle, place ear defenders, give nasal prong oxygen as required.
  3. Sedate with oral chloral hydrate when instructed by MRI department (see BSUH Neonatal Prescribing Guidelines)
- Transfer to MRI department with minimum of oxygen saturation monitoring, suction equipment and bag and mask.
- Babies transferring from TMBU and the Day Care Unit will be accompanied by an experienced nurse and neonatal registrar or consultant.

<u>Care in the MRI Department</u>

- Repeat check for metal objects (baby and attending staff).
- Transfer the baby to the scanner bed (consider baby's thermal environment).
- Attach MRI compatible infant oxygen saturation monitor and ensure reliable traces from the start.
- Lay the baby on one side or supine with head in neutral position. Vac-fix bag may be used. The bag is wrapped around the baby's head and the air extracted, this helps keep the head still and may reduce noise levels.
- Medical staff should be present throughout the examination but as good monitoring will be in place they may leave the MRI room and observe from the control room.
- Discuss with consultant if there are difficulties with sedation (additional Chloral Hydrate and/or alternative sedation may be prescribed, see BSUH Neonatal Prescribing Guidelines).
- **<u>In the case of acute respiratory deterioration in the scanner remove the infant from the scanner room then address the problems of airway and breathing.</u>**
- **<u>Beware of any ferromagnetic materials in or near the magnetic coil.</u>**

General Anaesthesia Scan:

- For the very occasional infant <6 weeks requiring a GA scan discuss with the consultant anaesthetist in charge of the MRI GA list.
- If an overnight admission is requested this will need to be arranged under the care of the paediatric consultant of the week.

Scanning the ventilated infant:

- May be extremely sick and present particular problems for transfer to and in the MRI department.
- The benefit of the scan must therefore be justified against the risk of the procedure itself.

- Meticulous preparation should be made for transfer. The baby's carers will include a nurse confident in transfers plus an experienced registrar or consultant.
- Preparation for scanning will be as for the self-ventilating sedated infant but you should be aware of the following:
    1. Disconnect infant from the ventilator and hand bag during the procedure as there are no facilities for lengthening the ventilator tubing effectively in order to distance the ventilator from the scanner.
    2. There is no facility for ensuring the use of pumps in the presence of a magnetic field. Simple intravenous infusions may be briefly cessated but beware risk of hypoglycaemia. Avoid taking babies to MRI that are reliant on inotropes. If this is unavoidable or if the baby has a vital central venous or arterial line lengthen the infusion tubing to allow pumps to remain out of the scanning room.

<u>Return from MRI Department</u>

- Transfer back to TMBU or the Day Care Unit according to the same standards used prior to scanning.
- Once returned self-ventilating, sedated infants should at the very least have saturation monitoring until fully awake.
- Allow home only when able to feed and protect their airway proficiently.