

ANAESTHESIA FOR DIAGNOSTIC IMAGING

Diagnostic Imaging (DI) includes CT scan, MRI, PET scan, MIBG and angiography.

PATIENTS WHO CAN BE LISTED AS OUTPATIENTS

- ASA 1 and 2 patients
- Full term healthy infants who are 6 weeks of age and older

PATIENTS REQUIRING ANAESTHETIC ASSESSMENT:

Patients with stable but complex medical/ congenital heart disease who are currently stable should be referred to the Anaesthetic Consultant doing the list.

FASTING GUIDELINES

See fasting guidelines

For PET scan patients, only water to be given as clear feeds. **Do not give dextrose/glucose or caloric laden beverage for at least 4 hours before injection of isotope.** This is because hyperglycemia results in poor uptake of radioactive isotope FDG (Fluorodeoxyglucose) into tissues and affects the quality of imaging. If glucose is given before the procedure, inform the Nuclear medicine department as this may likely result in cancellation of the scan.

LABORATORY INVESTIGATIONS

No investigation is required if the patient is a day case and or if the child is otherwise fit and well.

INTRAVENOUS ACCESS

For PET scan, intravenous cannula placement should be established for injection of isotope.

CONSENT

Anaesthesia consent depending on institutional practice.

ANAESTHETIC MANAGEMENT

Check to ensure that CT Scan, MRI and Angiography suites, MIBG, PET scan room are equipped for general anaesthesia and sedation/monitored anaesthesia care.

MRI/ CT scan Room

For children undergoing CT/ MRI under GA, there is generally a separate induction and recovery area located just outside the CT/ MRI room.

Equipment check

Diagnostic imaging(DI) is generally considered a remote area as it is not located within the operating theatre area. As in the operating theatre, all equipment should be checked prior to induction of anaesthesia.

Equipment includes:

- Drug trolley
- Anaesthesia machine Airway equipment including Ayre's T piece
- Monitors: pulse oximeters, NIBP and capnograph and anaesthesia agent monitor
- Suction apparatus
- Patient warming devices

- Infusion pumps

MRI room

Strict observation of MR safety rules i.e. no metallic objects, which may cause injury to both patients and staff.

There is a central physiologic and respiratory agent monitor that sends signals to a remote monitor in the control room.

PET and MIBG facility in Nuclear Medicine

These rooms may not have a nitrous oxide wall source.

Anaesthesia machine, physiological monitoring equipment, drugs, syringe pumps, syringes and needles, resuscitators, airway equipment and breathing tubes are checked to ensure age appropriate. Anaesthesia plan including the use of equipment should be discussed and planned prior to going to remote sites.

For repeat scans such as MIBG, handover of the anaesthesia should be performed between anesthesia teams.

CONDUCT OF ANAESTHESIA

General considerations

For patients undergoing CT scan or MRI, induction and reversal *should* be done in the induction area, *on a trolley that allows Trendelenburg position*.

Sedation with propofol or general anaesthesia, usually spontaneous respiration with an LMA can be used. Intubation / IPPV may be required in small infants or children at risk of raised intracranial pressure or in any child in whom spontaneous respiration is inadequate.

All airway devices must be well secured. The child must be well oxygenated and sufficiently deepened before transfer from the induction area to the scan room.

Transfer of patients

MRI

For heavier children > 20kg or with unstable cervical spine, avoid carrying the patient in and out of the scanning rooms.

The MRI bed can be pushed out into the induction area for the child to be transferred directly onto the table.

Accompanying ward/ICU staff and equipment accompanying ICU / HD patients – on ventilator or otherwise – will need to be assessed for MRI safety before entry into the scan room.

CT scan

The trolley carrying the child can be pushed into the room and the child transferred onto the scanning table. Should there be anticipated delay in the transfer from induction room to the CT scan room, consider ventilating the patient during transit (Ambu bag/ T piece with O₂ cylinder) and prepare for equipment.

Smaller children may be carried into the scanning room.

In the scan room

IV drip flushed and tested to ensure smooth flow.

The position of the airway must be re-checked.

All monitors are placed and checked for good signals.

All pressure points must be protected.

Blankets and plastic wraps should be used to keep patients warm.

Patient's mask and oral airway should be brought into the room together with the child in the event of accidental dislodgement of LMA or ETT.

MRI specific considerations

Check that the patient has no metal pieces on e.g. earrings, religious bangles or on the clothes before transferring into the MRI scan room.

Zinc oxide tape may interfere with imaging. Intubated patients from ICU may need endotracheal tubes to be secured with silk tape instead.

In MRI patients, the skin must be cleaned and prepared with a special abrasive gel before application of ECG leads. (allows good adhesion of ECG leads). This is a very important step taken to reduce the incidence of burns at this site.

Soft earplugs are inserted and eyes taped and protected.

In the scan room, when ECG leads are placed ensure that the leads do not cross each other.

Consider temperature monitoring.

All monitors must be placed and good signals are obtained in both the main and slave monitors.

Intravenous infusion can be continued if deemed necessary, in the MRI room using an MRI-conditional infusion system. The infusion administration line is extended, typically using two 200cm fine bore intravenous extension.

Breathing tubing, Carbon dioxide sampling line and intravenous lines must be checked for adequate length before mobilizing the MRI bed into the scanning position within the scanner.

Common problems

1. Desaturation

This can occur with dislodgement of the LMA or ETT. The patient must be removed from the coil and patency and position of the airway checked and appropriate management instituted.

2. Hypotension

This is uncommon and can be due to prolonged fasting and inappropriately high levels of volatile agents. Boluses of crystalloid can be given and volatile depth adjusted.

In the event of a critical cardio-respiratory event (especially in the MRI scanning room), the patient should be quickly transferred to the induction area for resuscitation. **No resuscitation is to be done in the MRI room!!**

Special note for Neurology PET (epilepsy)

Document any seizure event during the anesthesia for the PET and inform the neurology primary physician.

RECOVERY

Patients are observed in the induction / recovery area till they wake up. The outpatient can be transferred to the waiting area till the discharge criteria are met.

In the event of complications that require admission of the child, arrangements with the referring physician must be made and the parents informed.

Critically ill patients

Presence of accompanying physician for In-patient scans:

All ICU patients will require the presence of a suitably qualified physician during transport to and from the Diagnostic Imaging areas.

For all other categories of patients, the primary physician will decide on the necessity of an accompanying doctor.