

ANAESTHESIA FOR PAEDIATRIC ONCOLOGY RADIOTHERAPY / IMAGING

Anaesthesia support may be required for Radiotherapy (RT) and Diagnostic Imaging in a patient's treatment plan.

Modes of RT include photon beam therapy , proton beam therapy and brachytherapy.

Prior to commencement of RT , CT Simulation is done to plan for precise irradiation.

A mould or face shield may be made to facilitate patient set up and treatment accuracy.

The duration of treatment can vary from 2 to 6 weeks depending on the primary tumour and treatment goals.

Cooperation and immobilization of the child is needed . This can be achieved via General Anaesthesia (GA) or Sedation depending on treatment requirements and the patient.

GA is delivered via a volatile or intravenous technique. With an intravenous technique , propofol or dexmedetomidine may be the drug of choice.

TIVA using TCI infusion allows for interindividual consistency as multiple anaesthetists may be involved in the patient's care during long treatment periods of 4 to 6 weeks.

Adequate maintenance of oxygenation, ventilation and airway patency is paramount.

Oxygenation is often achieved via nasal cannulae, face mask or a supraglottic device. The airway device for CT Simulation and subsequent RT must be similar especially when a head shield is applied.

Capnography and pulse oximetry to monitor adequacy of ventilation and oxygenation is important as clinical observation by the anaesthetist is not possible during radiation dose delivery.

Central vein access using Port a Cath , Hickman Catheter or peripherally inserted central catheter.

(PICC) line will provide reliable venous access.

Care of Central Line

Prevent line infection by using a sterile technique . Scrub the connection hub and its luer threads with an antimicrobial wipe using a rotating motion (10 X) . A aseptic non touch technique can be used in the presence of an extension connector. Use chlorhexidine and not plan alcohol swabs.

Maintain line patency by using:

- minimal infusion rates : 5 mls/ h for PICC and Hickman small(white) lumen ; 13ml/h for Hickman large (red) lumen and Port a Cath (with fluid restriction); 21 mls/h for Port a Cath.
- pulsatile flushing method (10 X 1ml boluses) to reduce protein and bacterial adhesion.
- flush using positive pressure to prevent backflow of blood and clamp catheter just prior to injecting the last ml of heparin saline.
- locking volumes : 5 mls of heparin saline (10 IU/ml) for Hickman and Port a Cath (daily use) 3 mls of heparin saline (10 IU/ml) for PICC . 5 mls of heparin saline (100 IU / ml) for weekly flushing of Port a Cath.

Platelet Threshold

20,000 platelets per microliter of blood in the absence of clinical bleeding in view of possible airway device insertion for conduct of GA.

Platelet threshold for oncology is $> 10,000/\text{ml}$ in non neutropenic patients, $>20,000/\text{ml}$ in neutropenic patients, $>50,000/\text{ml}$ for LP or Port a Cath insertion.

Radiotherapy (RT) at National Cancer Centre (NCC)

CT Sim and RT patients can be warded in KKH or are outpatients at NCC.

A Single Consent using the NCC consent form is taken for CT Sim and all RT sessions.

The NCC anaesthesia chart is used.

MIBG Scan

The scan is for neuroendocrine tumours e.g. neuroblastoma.

The isotope (iodine 123 meta-iodobenzylguanidine) is given 2 days prior to the MIBG scans. If the child is unwell e.g. URTI, an anaesthesia consult is necessary prior to isotope injection.

The scans are done over 2 consecutive days. Take 2 GA consents and fill the KKH PAN anaesthesia charts.

Glucose feeds can be given for MIBG scans. Fast patients according to GA time indicated on PAN roster

PET Scan

Pet Scans can be performed for oncology or non oncology patients.

This is done at Dept of Nuclear Medicine (NM) SGH and patients are admitted to KKH the day before the scan.

Take consent for GA and fill the KKH PAN anaesthesia chart.

Venous access (peripheral /central) is established by KKH ward staff for isotope injection. Anticipated GA time is about 1 hour after isotope injection.

Glucose feeds or dextrose containing drips must be stopped 4 h prior to isotope (FDG) injection.

NM Dept will give Instructions to the KKH ward regarding the time of arrival. This will allow for registration , clerking by an NM doctor and isotope injection.

Brain PET Scan /EEG (Neurology Patients)

Patients receive an EEG and a Brain PET Scan in the Department of Nuclear Medicine.

EEG is done an hour before and 1 hour after FDG injection prior to the PET scan.

The patient may require anaesthesia support for both EEG and PET Scan or only for PET Scan, depending on the degree of cooperation. Discussion with the Neurology Speciality Care Nurse / Neurologist is useful.

Take consent for GA and fill the KKH PAN anaesthesia chart.

Glucose feeds or dextrose containing drips must be stopped 4 h prior to FDG isotope injection.

Patients will be admitted to KKH the day before scan and peripheral venous access is established prior to transfer to NM dept.