PAEDIATRIC ONCOLOGY
(including paediatric neuro-oncology)

Key Words:

Lead Clinicians: **Dr D Spooner Dr D Ford**

Macmillan Paediatric Liaison Radiographer: **Helen Woodman**

All subtypes are treated according to CCLG protocols

IMMOBILISATION AND SEDATION

A cast is often used, especially in paediatric neuro-oncology .

Sedation is NOT to be used

General anaesthetic:

May be occasionally be necessary (usually children aged 4 years or less). Cases MUST be discussed with Dr Ford or Dr Spooner prior to booking.

Booking:
- This is arranged through the Radiotherapy Bookings office.
- The Radiotherapy bookings office must be informed that the patient requires GA for treatment.
- NOTE no more than 3 GA's can be on Radiotherapy treatment at any one time.
- See bookings procedure AD01-02

If a paediatric patient requires Radiotherapy treatment out of normal working hours of the department - e.g. weekends / bank holidays - the prescribing Clinical Oncologist must complete an **' Out of hours Paediatric Treatment Request form RAFPAED' which** should be kept with the treatment sheet and the on-call consultant / specialist oncology registrar must be informed that they have to be within the Cancer centre during the period that the out of hours radiotherapy treatment is given.

Paediatric resuscitation equipment is checked regularly by the designated radiographer team of core resuscitation workers (and also by UHBT Resuscitation Officer) and Boyle's machine is checked regularly by theatre staff (ODA).

Signed consent:
- Not only is it routine to obtain parental signed consent for general anaesthetic, it is now accepted that parental signed consent is necessary any children requiring radiotherapy/cytotoxic chemotherapy.
- It is the responsibility of the Consultant to obtain this consent.
- Consent needs to be obtained on a Birmingham Children's Hospital form (type 2)
- NOTE for female patients 12-15 years of age a 'confirmation of pregnancy status in females 12-15 years of age' form RAF24.0 must be completed by the Consultant clinical oncologist / Macmillan Paediatric Liaison Radiographer and kept with the treatment request form.

Chemotherapy:
- All paediatric chemotherapy is given under the care of paediatric oncologists at Princess Diana Children's Hospital Birmingham

Radiotherapy:
General Principles

- Aim for fractionation sizes no greater than 1.8Gy/#
- Irradiating parts of vertebrae should be avoided. Aim to give homogenous dose to the whole body

HODGKIN'S DISEASE

- As per EuroNet PHL-C1 study. Patients stratified into one of three groups. Use of involved field radiotherapy determined on radiological and PET response to induction chemotherapy.
- Radiotherapy occurs after completion of chemotherapy.
- Involved field radiotherapy based on **initial** disease area and volume.
- 19.8Gy/11#. See protocol for CTV/PTV guidance
- Boost 10.8Gy/6# if poor response and or bulky residual disease
- Liver and lung aim for a maximum of 15Gy in 1.2Gy/#
- Relapse – keep volume to a minimum (post chemotherapy volume). See UKCCSG protocol
- Chemotherapy details via the paediatric oncology unit.

NON-HODGKIN'S LYMPHOMA

- See CCLG Protocol –Interim guidelines for the management of Burkitt/ Burkitt like and B cell Non Hodgkin's Lymphoma
- All chemotherapy regimes: details from paediatric oncology unit at the Princess Diana Children's Hospital, Birmingham.
- No standard role for radiotherapy

BRAIN

Medulloblastoma

- Standard Risk Non metastatic as per standard arm of HIT SIOP PNET 4 Trial. CSRT 23.4Gy/13# with boost to posterior fossa of 30.6Gy/17# (Total 54Gy/30#). Concurrent weekly vincristine with radiotherapy followed by chemotherapy as per PNET 4 Trial
- High Risk Non Metastatic or residual disease >1.5cm3. CSRT 36Gy/20# with boost to posterior fossa of 18Gy/10# (Total 54Gy/30#). Concurrent weekly vincristine with radiotherapy followed by chemotherapy as per PNET 4 Trial
- Metastatic. HART study CNS 2001 06 protocol. Hyperfractionated RT treating bd with Minimum of 8 hour gap in between. CSRT 39.68Gy/32# over 16 treatment days. Primary tumour boost 22.32Gy/18# over 9 treatment days (Total 62Gy/50#). Boost to metastases 9.92Gy/8# over 4 treatment days. Concurrent weekly vincristine chemotherapy and subsequent chemotherapy as per protocol.

Pineoblastoma

- In view of good results on subgroup analysis of PNET3. Initially treated with 12/52 chemotherapy followed by CSRT 36Gy/20# with boost to Posterior fossa 18Gy/10# (Total 54Gy/30#).

Supratentorial Non-Pineal PNETs

- As per CNS 2004 01 protocol. Hyperfractionated RT treating bd with Minimum of 8 hour gap in between. CSRT 39.68Gy/32# over 16 treatment days. Primary tumour boost 22.32Gy/18# over 9 treatment days (Total 62Gy/50#). Boost to metastases 9.92Gy/8# over 4 treatment days. Concurrent weekly vincristine chemotherapy and subsequent chemotherapy as per protocol.

Ependymoma

As per SIOP Ependymoma 99 Trial. Standard dose of 54Gy/30# with option of 5.4Gy/3# boost in light of emerging data (Pediatr Blood Cancer 2004; 00:1-4)

High Grade Glioma

- As per CCLG Guidelines. 54Gy/30# with concurrent temozolamide. Followed by 6 months adjuvant temozolamide. Tumour biopsy not always required if in keeping with diagnosis radiologically and significant risk of morbidity.

Low Grade Glioma

- As per SIOP LGG 2004 (CCLG CNS 2004 03). 54Gy/30#.

Germ Cell Tumours

- As per now closed SIOP CNS GCT 96 trial
  Germinoma
- CSRT 24Gy/15#. Tumour boost 16gy/10#. Total 40Gy/25#

Nongerminomatous Germ Cell Tumours

- 4 Cycles of PEI chemotherapy. Then:
- Localised. 54Gy/30# to tumour bed
- Metastatic. CSRT 30Gy/20#. Tumour boost CNS 24Gy/15# (Total 54Gy/35#). Tumour boost Spine 16Gy/10# (Total 46Gy/30#).
  SIOP CNS GCT II trial awaited 2008

WILM'S TUMOUR

- Primary diagnosis see SIOP WT 2001 protocol. CCLG protocol number WT 2002 01
  Flank RT
  Stage III intermediate risk, Stage II and III high risk and Stage IV and V dependant on the local Stage 14.4Gy/8#. Boost 10.8Gy/6# if macroscopic residual disease or high risk.
  Whole Abdominal RT
    If diffuse intra-abdominal tumour or gross pre or peri-operative rupture. 21Gy/14#
    Liver RT
    If areas of R1 resection of metastases. Generally 21Gy/14# shielding a lobe of liver for last fraction
  Pulmonary RT
    If visible metastases remain in the lungs following pre-operative chemotherapy 15Gy/10# with lung correction
  See protocol for other areas
  NB Dose and fractionation variation dependant on age of patient. See protocol
- Relapsed cases see UKW-R- Relapsed Wilms WT 2001 02 CCLG protocol

  Treatment strategy based on histological type and previous treatment. Abdominal 20Gy/10# +/- boost or 30Gy/20# or Whole lung 12Gy/8# +/- boost (without inhomogeneity correction) only in patients who have not received RT to these sites. Metastases in liver or bone 30Gy/15#.

- All chemotherapy regimes: details from paediatric oncology unit at the Princess Diana Children's Hospital, Birmingham

NEUROBLASTOMA

- No standard role for radiotherapy other than in high risk disease
- See HR-NBL-1/SIOPEN protocol. CCLG protocol number NB 2002 06
- 21Gy/14# to pre surgical disease volume
- All chemotherapy regimes: details from paediatric oncology unit at the Princess Diana Children's Hospital, Birmingham.

SOFT TISSUE SARCOMA

- Localised soft tissue sarcoma as per EpSSG RMS 2005 protocol CCLG protocol number STS 2006 04. Complicated risk stratification algorhythm based on pathological type, post surgical stage (IRS Group), site, nodal status, age and tumour size. Certain cases not for RT. RT dose ranges between 36Gy/20# and 55Gy/33#. See protocol.
- Localised non rhabdomyosarcoma soft tissue sarcoma as per EpSSG NRSTS 2005. CCLG protocol number STS 2006 03
  Complicated risk stratification algorhythm based on pathological type, IRS group, size, grade, pre or post-op or definitive treatment. Certain cases not for RT. RT Dose range between 50.4Gy/28# to 59.4Gy/33#. See protocol
- All chemotherapy regimes: details from paediatric oncology unit at the Princess Diana Children's Hospital, Birmingham.

RETINOBLASTOMA

- Plaque therapy See specialist working paper designed by Dr A Goodman.
- Certain cases for EBRT. To D/W Dr Spooner or Dr Ford

OSTEOSARCOMA and EWINGS SARCOMA

- See Medical Treatment Portfolio section 12 on musculoskeletal tumours