# Referral and Management Guidelines for Children’s Cancers Within North Trent, Humber and Yorkshire Coast Cancer Networks

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1. The Initial Referral Protocol (09-7A-113)

REFERRAL PATHWAY: ONCOLOGY AND MALIGNANT HAEMATOLOGY SERVICE
SHEFFIELD CHILDRENS NHS FOUNDATION TRUST
This document contains information on how to access the above service and can be used by all healthcare staff in local hospitals and the community.

1. BACKGROUND
2. TELEPHONE ADVICE
3. PRIMARY CARE REFERRALS
4. SECONDARY CARE REFERRALS
   - Extracranial solid tumours or leukaemia
   - Brain tumour
   - Bone tumours and retinoblastoma
   - Late effects patients
5. ADVICE ON ASPECTS OF CARE FOR EXISTING PATIENTS

1. BACKGROUND
The NICE Guidance Improving outcomes in Children and Young Adults with Cancer (August 2005) recognized that-
‘Cancer in children and young people is relatively rare. A general practitioner (GP) will see, on average, a child under 15 years old with cancer every 20 years. There is a wide spectrum of malignancies in this group and a multiplicity of symptoms, many of which are common and nonspecific. Therefore, the prompt diagnosis and referral of patients with suspected cancer from primary care may be very difficult, and delay in appropriate referral is a key issue of concern for many patients and families.’ In order to facilitate appropriate referral NICE have produced a clinical guide for GPs on Referral Guidelines for Suspected Cancer which includes sections on children’s cancer. NICE have also recommended that clear referral pathways are documented for such patients. The purpose of this document is to formally document the well established referral process into the Oncology and Malignant Haematology Service at Sheffield Children’s NHS Foundation Trust.

The Haematology and Oncology Department offers a service for the management of childhood cancer and blood diseases, accruing patients aged 0 to 15 years from the South Yorkshire conurbation extending to the East Coast at Grimsby and covering a population of roughly 2.5 million. We provide a service for the diagnosis, treatment and long term follow up of children with cancer. We are a JACIE accredited transplant centre for under 16 year olds. As members of the Children’s Cancer and Leukaemia Group (CCLG previously the UKCCSG) we are involved in national studies to improve treatments and outcomes for these patients.

2. TELEPHONE ADVICE
There is always a named Consultant on call for the Oncology and Malignant Haematology service available to give advice. The consultant staff are happy to discuss any cases and advise on how urgently the child needs to be seen and by whom. Early warning of a child’s referral in this way is helpful for all concerned in planning their prompt appropriate referral, diagnosis and treatment. Please telephone the consultant you deem most appropriate to the presumed diagnosis of the case or the on call consultant if you are unsure who is most appropriate. (See information on sub specialisation below.)

In normal working hours the Consultant on call may direct you to a colleague who may be the most appropriate consultant for a direct referral. Out of working hours acute referrals are taken by the on call consultant.
The consultant staff on the on-call rota are:

**Consultant Paediatric Haematologists**
- Prof Ajay Vora: Leukaemia and Transplant
- Dr Jenny Welch: Leukaemia and Haemoglobinopathies / red cell disorders
- Dr Jeanette Payne: Leukaemia and Haemophilia / bleeding disorders and thrombosis

**Consultant Paediatric Oncologists**
- Dr Vicki Lee: Brain tumours, Bone tumours, Retinoblastomas
- Dr Anna Jenkins: Solid tumours (including lymphomas)
- Dr Dan Yeomanson: Solid tumours (including lymphomas)

You can access the consultant medical staff by telephoning **Sheffield Children’s Hospital on 0114 271 7000** and requesting switch board to bleep either the doctor you wish to speak to or the consultant on call for the day.

### 3. PRIMARY CARE REFERRALS

Following the decision to refer with reference to the NICE document *Referral Guidelines for Suspected Cancer* and if appropriate seeking telephone advice there are two options for referral for General practitioners.

- **Direct referral to the consultant**
  - We accept referrals by fax or letter and are happy to discuss a case if you need guidance.
  - We all have weekly clinics and can see more urgent cases out of clinic time on the ward as necessary. Please telephone if you are unsure of the best way forward.

- **Cancer two week wait referral system.**
  - All referrals made in this way are brought to an appropriate consultant on the day of arrival. The consultant will advise which clinic they should be seen in. In many cases these referrals are seen in a general paediatric medical or surgical clinic at SCH first within the time required of this system. Though needing rapid and thorough assessment our experience is that most children referred through the two week wait referral system do not have malignant disease. Attending a dedicated Oncology clinic can lead to unnecessary anxiety in such patients and their families. However children who clearly have symptoms or test results suggestive of malignant disease are seen in the next oncology clinic or on the ward as required.

### 4. SECONDARY CARE REFERRALS

#### Suspected Extracranial Solid Tumours or Leukaemia

Following the suspicion of a malignant cause for symptoms or test results suspicious of malignant disease the case should be discussed with the local consultant responsible for their care. The consultant will then make a telephone referral to the Oncology or Haematology consultant to facilitate rapid referral followed by a written referral faxed or posted to the department. In normal working hours the consultant may take details and pass them on to the appropriate colleague according to the presumed diagnosis.

#### Suspected Brain Tumour

When a child has been shown to have an intracranial space occupying lesion on local CT scan they should be referred directly to the paediatric neurosurgeons who can be contacted via the Royal Hallamshire Hospital switch board. During week days, between 9 and 5 pm, there is a Consultant Paediatric Neurosurgeon and Specialist Registrar available at the SCH but they carry pagers contacted via RHH switchboard. Between 5pm and 9am the...
neurosurgeon on call at the Royal Hallamshire Hospital should be the first point of contact for referral.

**Tertiary services for Bone Tumours and Retinoblastoma**
The diagnosis and surgical treatment of suspected bone and eye tumours is done at a supra regional level because of the specialist surgical skills involved. For most children this involves direct referral to Birmingham Royal Orthopaedics Hospital for suspected bone tumours and to Birmingham Children’s Hospital for suspected eye tumours. In view of the difficulty of ophthalmic assessment in young children the ophthalmology department at SCH are happy to discuss and see children with suspected Retinoblastoma in the first instance then refer to Birmingham as appropriate.

Once diagnosis and appropriate initial surgical interventions are performed in Birmingham they will directly refer patients requiring chemotherapy to SCH. Any clinician who has such a patient is welcome to ring SCH to discuss them and for information about who to contact at these centres for advice.

**Referral of Late Effects Patients**
Patients who have previously been treated for a paediatric malignancy are usually followed up long term for possible late effects of treatment including the increased risk of a second malignancy. In the majority of cases when these patients move to live in this area the referral will be made by the treating Paediatric Oncology Centre to SCH, however occasionally this does not happen. Clinicians are welcome to refer patients new to the area in this situation direct to SCH. We hold a weekly Late Effects clinics and also make appropriate transition arrangements to the adult Late Effects clinic at STH.

**5. CONTACTING US FOR ADVICE ON EXISTING PATIENTS**
Please phone the most appropriate person depending on the patient and the query. Out of hours this is likely to be the consultant on call who will be able to access the information you require. The team is here to support all aspects of the patients care and we are happy to hear from you.

**CONTACT DETAILS FOR THE HAEMATOLOGY/ONCOLOGY DEPARTMENT**
The aim of this document is to enable staff from designated shared care centres and community staff to access easily the professional they require

1. **ONCOLOGY**
2. **HAEMATOLOGY**
3. **HAEMATOLOGY and ONCOLOGY OUTPATIENTS**
4. **LATE EFFECTS**
5. **NEUROSURGERY**
6. **PAEDIATRIC SURGERY**
7. **PAEDIATRIC OPHTHALMOLOGY**
8. **PAEDIATRIC ONCOLOGY OUTREACH NURSES**
9. **HAEMATOLOGY NURSE SPECIALIST (NON MALIGNANT HAEMATOLOGY)**
10. **DIETICIAN**
11. **CLIC SARGENT SOCIAL WORKERS**
12. **CLINICAL PSYCHOLOGISTS**
13. **PAEDIATRIC ONCOLOGY PHARMACISTS**
14. **MDT COORDINATOR**
15. **ON CALL ARRANGEMENTS**
1. **ONCOLOGY**
Consultant Paediatric Oncologists
Dr. Vicki Lee   (Bleep via SCH switch board)
Dr. Anna Jenkins  (Bleep via SCH switch board)
Dr. Dan Yeomanson (Bleep via SCH switch board)

Secretaries Phone: 0114 2717366   Fax: 0114 2762289

2. **PAEDIATRIC HAEMATOLOGY**
Consultant Haematologists
Prof. Ajay Vora  (Bleep via SCH switch board)
Dr. Jenny Welch  (Bleep via SCH switch board)
Dr. Jeanette Payne  (Bleep via SCH switch board)

Sister Tracy Twyman  via clinic 0114 2767875

Secretaries Phone: 0114 2717477   Fax: 0114 2762289

3. **HAEMATOLOGY and ONCOLOGY OUTPATIENTS**
Clinic Clerk  0114 2717268
Clinic Nurses  0114 2767875

4. **LATE EFFECTS**
Macmillan Clinical Nurse Specialist in Late Effects
Sister Tanya Urquhart
Phone: 0114 2267815
bleep 209 via switchboard

5. **PAEDIATRIC NEUROSURGERY**
Consultant Neurosurgeons
Mr. John McMullan  (Pager via RHH switch board)
Mr. Hesham Zaki  (Pager via RHH switch board)
Mr. Saurabh Sinha  (Pager via RHH switch board)

Secretaries Phone: 0114 2717545   Fax: 0114 2260543

6. **PAEDIATRIC SURGERY**
Consultant Paediatric Surgeons
Mr. Sean Marven  (Bleep via SCH switch board)
Mr Ross Fisher  (Bleep via SCH switch board)

Secretaries Phone: 0114 2717565   Fax: 0114 2260543

7. **PAEDIATRIC OPHTHALMOLOGY**
Consultant Ophthalmologist
Miss Jane Marr  (Pager via SCH switch board)

Secretaries Phone: 0114 2717520   Fax: 0114 2717281

8. **PAEDIATRIC ONCOLOGY OUTREACH NURSES**
Lyndsay Charlish  07775684862
Rachel Ducker  07831771544
Paul Coyle  07775410169
Caroline Stancer 07748920491
Secretary Phone 0114 2717588
9. HAEMATOLOGY NURSE SPECIALISTS (NON MALIGNANT HAEMATOLOGY)
Haematology Nurse Consultant  Vicky Vidler  0114 2717329
Haematology Nurse Specialist  Louise George  0114 2717329

10. DIETICIAN
Paediatric oncology dietician Jeanne Meiring
0114 2717212
bleep 225

11. CLIC SARGENT SOCIAL WORKERS
Liz East
Patrick Percival
Judith Mansell
Annie Collins
Phone 0114 2717101 0114 2717406

12. CLINICAL PSYCHOLOGISTS
Tracy Dyson
Liz Fitzpatrick
Paul Manning
Rachel Marfleet
Phone 0114 2717296

13. PAEDIATRIC ONCOLOGY PHARMACISTS
Ozman Chohan
Karen Whitehouse
Phone 0114 2717488

14. MDT COORDINATOR
Louisa Hendy Phone
0114 2267958

15. ON CALL ARRANGEMENTS
The Oncologist or Haematologist on call for malignant disease can be contacted via SCH switch board.
Sheffield Children’s Hospital Foundation Trust switch board
0114 2717000

Neurosurgical on call consultants can be contacted via The Royal Hallamshire Hospital switch board
Royal Hallamshire Hospital (Sheffield Teaching Hospitals foundation trust)
0114 2711900

Sheffield Children’s Hospital Haematology and Oncology Ward (M3) 24 hours
0114 2717322 or 2717309

Sheffield Children’s Hospital Haematology/Oncology Clinic (0900hrs -1700hrs)
0114 2717268
Haematology Laboratory (0900hrs -1730hrs)
0114 2717221
2. The Diagnosis and Staging Protocol (09-7A-114)

1. Background

The following protocol is designed to clarify the role of referring clinicians in the diagnosis, staging and identification of relapsed paediatric cancer in our catchments area. It is written in conjunction with the North Trent Children’s Cancer Network as part of the cancer peer review process.

2. Children where malignancy is suspected

All children with the suspicion of a diagnosis of paediatric malignancy should be referred into the Principle Treatment Centre at Sheffield Children’s Hospital as early as possible to facilitate rapid diagnosis and treatment.

Appropriate referral may be to Paediatric Oncologist, Paediatric Haematologist, Paediatric Surgeon, Paediatric Neurosurgeon, or Paediatric Ophthalmic surgeon depending on the case.

Initial blood tests or imaging (ultrasound or CT) to confirm suspicion can obviously be arranged at the referring hospital.

It is our usual practice to perform all diagnostic and staging investigations at the PTC to facilitate rapid diagnosis and coordination of multiple investigations in a single patient. This also facilitates continuity of imaging on same scanner etc for the future monitoring of their treatment response.

Prior to referral the patient’s family must be alerted to the possibility of malignancy as a cause for their symptom by the referring clinician. A detailed referral letter with details of results of any investigations already performed should be sent in advance or with the patient.

The PTC clinician will provide the family and patient with full information with regard to investigations required, diagnosis, prognosis and treatments required as soon as this is available to them. Written correspondence will be provided to the referring clinician and patient’s General Practitioner at diagnosis.

3. Bone Tumours and Retinoblastoma

The diagnosis and surgical treatment of suspected bone and eye tumours is done at a supra regional level because of the specialist surgical skills involved. For most children this involves direct referral to Birmingham Royal Orthopaedics Hospital for suspected bone tumours and to Birmingham Children’s Hospital for suspected eye tumours.

In view of the difficulty of ophthalmic assessment in young children the ophthalmology department at SCH are happy to discuss and see children with suspected Retinoblastoma in the first instance then refer to Birmingham as appropriate.

Once diagnosis and appropriate initial surgical interventions are performed in Birmingham they will directly refer patients requiring chemotherapy to SCH. Any clinician who has such a
4. Children diagnosed unexpectedly with malignancy

Occasionally patients undergo investigations such as imaging or biopsy which result in the diagnosis of malignancy when it was not expected. These patients should be rapidly referred directly to the Oncologist as soon as the diagnosis is received. Such patients are at risk of prolonged delays in starting treatment since there was often not a suspicion of cancer prior to the investigation.

5. Diagnosis of relapsed disease.

The majority of relapses are diagnosed where a family attend a follow up appointment or self refer back to the service. However occasionally they may attend a GP or other clinician with symptoms which cause concern of relapse. When this occurs the clinician should contact the treating clinician at SCFT who will be happy to advise or arrange to review the patient.

References

1. Referral Pathways to the Oncology and Malignant Haematology Service at Sheffield Children’s NHS Foundation Trust Reg ID No 1406 available SCFH intranet, clinical guidelines

2. Referral pathways for patients with possible complications of chemotherapy to the Oncology and Malignant Haematology Service at Sheffield Children’s NHS Foundation Trust

3. NICE Clinical Guidance 27. Referral guidelines for suspected cancer. Has a paediatric cancer section helpful in such patients

4. Investigating malignant disease at presentation (suspected or confirmed) Section 3 M3 guideline, SC(NHS)FT Reg 859 Available SC(NHS)FT intranet at Clinical Guidelines/Haem & Onc / Ward M3/no. 859

3 to 11 Clinical management Protocols for Paediatric Malignancies (09-7A-115 to 123)

The purpose of this document is to outline the modalities of treatment indicated for specific diseases employed across the North Trent Cancer network. Sheffield Children’s Hospital Foundation NHS Trust is the only Principle treatment centre (PTC) treating patients in this network and as such provides all modalities of treatment centrally. Supportive care is provided by our Shared care Partners Northern Lincolnshire and Goole Hospitals NHSFT. However diagnosis and treatments is instituted and happens at the PTC.
Basis Principles of Treatment modality choices for all malignancies
in order of preference are:

1. The best interest of the patients care is paramount in all decisions in treatment planning. Patients are individual and will be treated accordingly.

2. Where a randomised controlled trail is open to the patient they will be offered entry to this as first line treatment.

3. Where an observational trial i.e. non randomised trial is open to the patient they would be offered this if a randomised trial is not available.

4. Where there is no current open trail available they will be offered treatments as per national guidance form CCLG at closure of last trail.

5. Where no national guidelines have been published the advice of the lead investigator of the last national trial will be sort. Generally this is that the child is treated on the standard arm of the last national trial for the more common paediatric cancers.

6. Where NSCG services exist the child will be appropriately referred for diagnosis e.g. Bone tumours, Eye tumours.

Basis principle of MDT referrals made for an individual patient:

All Patients

1. SCH disease specific treatment MDT as appropriate. i.e. Haematological or Solid tumour +/- CNS specific MDT (see flow diagram below)

2. SCH psychosocial MDT

In addition

3. TYA MDT for all patients over 13 years (in addition to above)

4. Referral to an adult disease specific MDT is made where the treating Consultant deems it in the patient’s best interest to seek additional expert advice. E.g. adult type cancer in child e.g. lung cancer, bowel cancer , site specific expertise required e.g. base of skull surgery, brain tumours.

5. POSCU MDT is informed by the PTC MDT coordinator of any newly diagnosed, relapsed patients and late effect patients in their area for their monthly MDT

6. Referral to the late effects MDT occurs at referral to the late effects team for the individual Patient.
Patients with Haematological Malignancies (Excluding Lymphoma)

Patients with Solid Tumours including Lymphoma (Excluding Brain tumours)

Patients with brain tumours

Psychosocial MDT
Tuesday 1pm weekly
Representatives of entire MD team present
- All patients at diagnosis, relapse and palliative treatment
- Individual patient during ongoing treatment if issues

Teenager and young adult MDT
Tuesday 10am weekly
- All patients age 13 years or over at diagnosis, relapse, transfer of care to adult service.

Haematology MDT
Wednesday 9am weekly
- At diagnosis
- Key decision points e.g. disease reassessment
- Active problems for any on treatment or follow up patients.
- End of treatment
- At relapse

Diagnostic and treatment modality MDT
Friday 12.15pm weekly
- At diagnosis
- At restaging Investigations
- At end of treatment.
- At relapse

Treatment Review meeting
Wednesday 2pm weekly
- At diagnosis
- At end of treatment
- At relapse
- Follow up patients with any problems

NTCN CNS MDT
Children and TYA subsection
Wednesday 12.30pm weekly
- At diagnosis
- At end of treatment
- At relapse
- For radiosurgery referral

SC(NHS)FT Late effects MDT
Monthly
- At referral to service before first Late effects clinic appointment.
- Every patient due in clinic before the next LE MDT

STH Late effects MDT
Monthly
- At referral to service before first Late effects clinic appointment STH
- If clinical issues arising for individual patients
4. The Clinical Management Protocols – Leukaemia’s (09-7A-115)

These guidelines are for use within the SY&H CCN for treatment of haematological malignancies (excluding lymphoma) in children and young persons below the age of 16 years. The authors accept no responsibility for their use for any other purpose. The guidance indicates which treatment protocol to use for specific malignancies and where to find further information. The specific treatment regimens and protocols should be consulted before commencing an individual patient’s treatment.

INTRODUCTION

These guidelines were agreed by consensus by the paediatric haematologists at SCH and have been reviewed by the paediatric oncology pharmacist. They are adapted from the following national trial protocols or guidelines on the management of children with haematological malignancies:

**Acute Lymphoblastic Leukaemia. (ALL)**
EsPHALL (Protocol on file)

**Acute Myeloid Leukaemia (AML)**
AML 17. [http://aml17.cardiff.ac.uk](http://aml17.cardiff.ac.uk)

**Infant Acute Lymphoblastic Leukaemia**
Interfant 06 (Protocol on file).

**Down syndrome AML**

**Aplastic Anaemia**

**Chronic Myeloproliferative Disorders**

**Adult-type Chronic myeloid leukaemia (CML)**

**Acute Promyelocytic Leukaemia (APL)**

**Myelodysplasia**

**Haemophagocytic lymphocytic histiocytosis (HLH)**

Guidelines for these rare sub-types can be downloaded by CCLG members from the guidelines section of [www.cclg.org.uk](http://www.cclg.org.uk)

Further guideline on aplastic anaemia can be found on the BCSH guideline site at [http://www.bcshguidelines.com/](http://www.bcshguidelines.com/)

Background

Leukaemia is the single most common cause of childhood cancer representing a third of all cases. Around 80% of patients have Acute Lymphoblastic Leukaemia (ALL), 15% Acute Myeloid Leukaemia (AML) and the remainder are made up of Juvenile Myelomonocytic Leukaemia (JMML), adult type Ph-pos Chronic Myeloid Leukaemia (AT-CML), various sub-types of Myelodysplasia (MDS) and secondary or treatment-related leukaemia.

Survival of children with leukaemia has improved dramatically over the last few decades. With modern first line therapy, children with ALL should expect an 85% chance of cure and those with AML around 60%. The outlook for rarer forms such as JMML, AT-CML and MDS has also improved due to a reduction in transplant-related mortality such that around 60-80% of these patients can expect to be cured.
Treatment of ALL and AML depends on a variety of prognostic factors including phenotypic and genotypic sub-type, age and presenting features. The specific variables employed in risk stratification have evolved in the light of new research and the algorithms in use at any given time are part of ongoing national trials.

**Referral Pathway**

Patients suspected of a haematological malignancy will be referred from across the network directly to the Paediatric Haematology team at Sheffield Children’s Hospital.

GPs and district hospitals within the network have been provided with information on when to suspect a haematological cancer and how to make a referral

District hospitals will discuss patients suspected of a haematological cancer urgently with the paediatric haematology team at SCH and will be given advice on measures to stabilise the patient before transfer to SCH.

**Diagnosis and Treatment Pathway**

- The approach to investigation of a suspected new or relapsing patient with acute leukaemia is described in Table 1.

- Investigations for the rarer sub-types are detailed in the specific guidelines referred to above and the relevant guideline should be consulted depending on the suspected diagnosis.

- Patient treatment should start on the basis of the diagnosis reached by an individual consultant haematologist who will ensure that the appropriate treatment regimen is allocated to the patient on chemocare.

- All patients with ALL and AML should be offered an opportunity to enter ongoing national or international clinical trials where available, but, regardless of trial entry, should be managed according to the standard treatment arms of current trial regimens.

- The diagnosis, treatment and risks of chemotherapy should be fully explained to the patient and the family before treatment commences. Written information should be provided and informed consent should be obtained for entry into the trial or administration of chemotherapy if the patient is being treated outside a trial.

- Where a trial is not available, patients should be treated according to national guidelines. Updated versions of these guidelines are in an intranet folder: H:\INFOAREA\Haemonc\CCLG guidelines\Leukaemia.

- Once the results of all the relevant investigations are available, and no later than 2 weeks from presentation, the leukaemia MDT will agree a final diagnosis based on an integrated report. On rare occasions, this may necessitate a change to the patient’s originally allocated therapy.

- The entirety of the patient’s care will be co-ordinated and delivered by the leukaemia MDT at SCH except radiotherapy for which patients will be referred to Dr Kate Dunn at Weston Park Hospital.
• A key worker and named nurse will be allocated to the patient at the Team Planning Meeting.

• To avoid patients having to travel long distances for out-patient treatment:

  Some aspects of patient care such as replacement of NG tubes, administration of antimicrobial treatment instigated by SCH and occasionally initial management of febrile neutropenia might be undertaken at a DGH up to POSCU shared care level 1 only.

  A specified list of chemotherapy drugs, blood products, colony stimulating factors and intravenous anti-infective agents may be administered by the paediatric oncology outreach team in a domiciliary setting.

  Maintenance dose adjustment by telephone, based on local blood counts, will be offered to patients with ALL who are selected as suitable for this approach by the paediatric haematology MDT.

• The rare patient in whom standard therapy has failed may be referred to other centres for enrolment in phase I or II studies of experimental drugs.

• Local hospice teams will be asked for advice and support in the supportive and end of life care of children with incurable malignancies.
PROBABLE ACUTE LEUKAEMIA

PRE-TREATMENT INVESTIGATIONS (SEE ALSO UKALL 2003/AML 17 for trial specific investigations)

Summary of blood samples required.

<table>
<thead>
<tr>
<th>Sample</th>
<th>Despatch To:</th>
</tr>
</thead>
<tbody>
<tr>
<td>2ml EDTA x 4</td>
<td>Total</td>
</tr>
<tr>
<td>2ml Clotted x 2</td>
<td>volume</td>
</tr>
<tr>
<td>2ml Heparin</td>
<td>of blood</td>
</tr>
<tr>
<td>5ml Heparin</td>
<td>20ml</td>
</tr>
<tr>
<td>1ml Citrate</td>
<td></td>
</tr>
</tbody>
</table>

A. Blood Samples

1. Haematology Tests

<table>
<thead>
<tr>
<th>Sample</th>
<th>Despatch To:</th>
</tr>
</thead>
<tbody>
<tr>
<td>a) FBC, Film</td>
<td>2ml EDTA Haematology, SCH</td>
</tr>
<tr>
<td>b) Group &amp; Save</td>
<td>2ml EDTA SCH</td>
</tr>
<tr>
<td>c) EDTA for storage *</td>
<td>2ml EDTA</td>
</tr>
<tr>
<td>d) Clotting Screen</td>
<td>1ml citrate</td>
</tr>
<tr>
<td>e) (Tissue typing</td>
<td>5 ml EDTA for suspected AML</td>
</tr>
</tbody>
</table>

2. Biochemistry Tests

<table>
<thead>
<tr>
<th>Sample</th>
<th>Despatch To:</th>
</tr>
</thead>
<tbody>
<tr>
<td>a) Uric acid, U &amp; E, Mg,</td>
<td>2ml Heparin Biochemistry SCH</td>
</tr>
<tr>
<td>LFTs, Bone profile</td>
<td></td>
</tr>
<tr>
<td>b) Immunoglobulins</td>
<td>2ml clotted Biochemistry SCH</td>
</tr>
</tbody>
</table>

3. Virology Tests

| Sample                  | Despatch To:                  |
| Varicella, measles, CMV| Microbiology Hallamshire      |
| titres                 |                               |

4. Research (Suspected ALL)

<table>
<thead>
<tr>
<th>Sample</th>
<th>Despatch To:</th>
</tr>
</thead>
<tbody>
<tr>
<td>a) For Dr Lennard</td>
<td>5ml Heparin Dr Lennard Ext 12759 RHH Via haem at SCH</td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td>b) For Molecular genetics</td>
<td>2ml EDTA Molecular genetics</td>
</tr>
<tr>
<td>c) Asparaginase trial</td>
<td>5ml EDTA Carly Leighton via Courier Via haem at SCH</td>
</tr>
</tbody>
</table>

NB: Samples 1a, 1b, 1c, 2b, 3a and 4a and 4b must be taken prior to transfusion.

B. Chest X-ray

C. BONE MARROW SAMPLES – SEE LABORATORY SOP FOR DETAILS
LABORATORY INVESTIGATIONS AT RELAPSE OF ACUTE LEUKAEMIA

A. **Blood Samples**

1. **Haematology Tests**
   - a) FBC, Film 1ml EDTA Haematology,
   - b) Group & Save 2ml EDTA SCH
   - c) EDTA for storage * 2ml EDTA
   - d) Clotting Screen 1ml citrate

   * Separate EDTA plasma and store at –20°C in Z5. Store remaining cells at -20 °C also in same box in chest freezer in blood bank.

2. **Biochemistry Tests**
   - Uric acid, U & E, Mg 2ml Heparin Biochemistry
   - Ca PO_{4} LFT SCH

3. **Research**
   - 5mls EDTA to Carly Leighton via haem at SCH

B. **Bone Marrow Samples**

See laboratory SOP

TREATMENT

**General**

**Hyperleucocytosis**

Patients with WCC > 100 x 10^9/l are at risk of leucostasis resulting in respiratory failure and encephalopathy. The risk of leucostasis is higher in patients with AML and AT-CML than ALL. Consideration should be given to leucopheresis in patients with symptoms of leucostasis such as drowsiness, confusion, hypoxia (in the absence of focal chest pathology) and priapism. High dose hydroxycarbamide 20 mg/kg for up to 5 days is also effective in achieving rapid cytoreduction.

**Tumour Lysis**

Patients with high WCC and/or bulky disease are at high risk of tumour lysis on starting treatment. The risk is higher in lymphoid leukaemia, particularly Burkitt’s lymphoma/leukaemia. These patients should receive hyperhydration, and Rasburicase. All other patients should receive hyperhydration and Allopurinol for 5 days. Provided the urine output is adequate alkalinisation of the urine is rarely indicated. For details of prevention, monitoring and management of tumour lysis syndrome, please refer to the Haematology/oncology guideline-tumour lysis on the subject.

**Blood components**

- All blood components should be irradiated in patients who have received Fludarabine.
- Red cells should be transfused to patients with symptomatic anaemia or those with a rapidly falling Hb.
- Platelet transfusions should be used judiciously to prevent HLA sensitisation. A threshold of $10 \times 10^9/l$ in the absence of symptoms is safe in patients without additional risk factors such as fever, infection, coagulopathy or hypertension. In those with a higher risk of bleeding, the count should be kept at $> 20 \times 10^9/l$ and in patients with APL (or those on heparin) at $> 50 \times 10^9/l$.

- FFP and cryoprecipitate should be given for severe coagulopathy after discussion with the haematology SpR or consultant.

- Patients with HLH, APL and high WCC AML are at high risk of intra-cranial haemorrhage and should receive aggressive blood component support to correct their coagulopathy.

### Acute Lymphoblastic Leukaemia (ALL)

**ALL Treatment Pathway (Except infants)**

<table>
<thead>
<tr>
<th>Condition</th>
<th>Yes</th>
<th>No</th>
</tr>
</thead>
<tbody>
<tr>
<td>Under 12 months?</td>
<td></td>
<td>→ yes Interfant trial</td>
</tr>
<tr>
<td>B-ALL ?</td>
<td></td>
<td>→ yes CCLG B-NHL protocol</td>
</tr>
<tr>
<td>BCR-ABL?</td>
<td></td>
<td>→ yes ESPHALL</td>
</tr>
<tr>
<td>MLL rearrangement ?</td>
<td></td>
<td>→ yes REGIMEN C</td>
</tr>
<tr>
<td>Hypodiploid &lt; 44 chromosomes ?</td>
<td></td>
<td>→ yes REGIMEN C</td>
</tr>
<tr>
<td>iAMP 21 ?</td>
<td></td>
<td>→ yes REGIMEN C</td>
</tr>
<tr>
<td>≥ 10 years ?</td>
<td></td>
<td>→ yes REGIMEN B</td>
</tr>
<tr>
<td>WBC ≥50x10⁹/l ?</td>
<td></td>
<td>→ yes REGIMEN B</td>
</tr>
<tr>
<td>Marrow morphology at day 8/15</td>
<td></td>
<td>→ yes transfer to Regimen C</td>
</tr>
</tbody>
</table>

*If on regimen B, aged 1-15 years:*
>25% blasts (M3) at day 8?

If on regimen A:

>25% blasts (M3) at day 15?

Regimens A or B

< 25% blasts (M1 or M2) at day 8/15?

Regimen B regardless

≥ 16 years? At day 28

Regimens A or B

>5% but <25% blasts (M2) yes transfer to Regimen C

> 25% blasts (M3) yes OFF PROTOCOL

<5% blasts (M1) yes MRD randomisation

Acute Lymphoblastic Leukaemia (Excluding Infants< 1 year)

Treatment Stratification

Initially, eligible patients will be stratified into three risk groups based on the following criteria:

**Standard risk**: all children >1<10 years with a highest white cell count before starting treatment of <50x10^9/l, and who do not have a high risk karyotype.

**Intermediate risk**: all children ≥10 years old, or with a diagnostic WBC ≥50x10^9/l (or both) and who do not have a high risk karyotype.

**High Risk**: all children, irrespective of initial risk category, who have t (7;19) (E2A-PBX), BCR-ABL (UKALL induction followed by ESPHALL), hypodiploidy (<44 chromosomes), an MLL gene rearrangement or iAMP21 abnormality.

Patients will then start treatment according to their risk group as follows:

(a) Standard risk, (around 60-65% of the total): regimen A - three-drug induction.

(b) Intermediate risk, (around 20-30% of the total): regimen B - four-drug induction.

(c) High risk (around 10-12% of the total): These patients will be allocated regimen C - four drug induction, augmented BFM consolidation, Capizzi interim maintenance, and augmented DIs. These patients are also eligible for CR1 transplant depending on early response.

Detailed descriptions of the individual regimens are in the trial protocol (UKALL 2003 at the time of writing) and should be consulted before starting an individual patient’s therapy.
Treatment modifications For Down syndrome patients

In view of high treatment related mortality, DS patients will receive less intensive chemotherapy and additional supportive care. See current version of UKALL 2003 or 2010 for detailed recommendations.

Eligibility for first remission allogeneic transplantation

Allogeneic transplant in first CR is recommended for the following groups:

1. iAMP21 with SER or day 29 MRD High Risk.
2. MLL rearrangement positive or hypodiploid < 44 with M2 marrow (>5% blasts) at day 28.
3. M3 marrow at day 28.
4. BCR:ABL positive, follow guidance within Philadelphia ALL protocol.
5. t(17;19) (E2A-HLF) positive

The optimal timing of transplant, as recommended by the CCLG BMT Group, is on recovery from the consolidation phase of Regimen C at around weeks 14 – 16. Where there is a delay beyond this time point, it is recommended that patients should receive standard maintenance therapy, rather than Cappizzi maintenance, during the interim. In due course, we may be able to identify patients with persistent high level MRD at the end of consolidation for further cyto-reductive therapy prior to transplant.

Infant ALL

Infants (age < 365 days) with ALL will be entered into the International inter-group trial Interfant 06 (and its successors). The current stratification and treatment allocation is as follows:

Low risk (LR): MLL germline
High risk (HR): MLL rearranged AND
Age at diagnosis < 6 months (i.e. <183 days) AND
WBC ≥ 300 x 10^9/L and/or prednisone poor response

Medium risk (MR):
MLL status unknown OR
MLL rearranged AND age > 6 months OR
MLL rearranged AND age < 6 months AND WBC < 300 x 10^9/L AND prednisone good response

The standard (control) arm of therapy consists of the following blocks: induction, IB, MARMA, OCTADAD and maintenance.

The experimental arm of therapy consists of the following blocks: induction, ADE, MAE, MARMA, OCTADA and maintenance.

All low risk patients receive the standard arm.

Medium risk and high risk patients are randomised to receive the standard or experimental arm (see Section 11.1).
Medium risk patients with MRD levels of ≥ 10e-4 at the start of OCTADA(D) and all high risk patients are eligible for SCT, provided that the donor criteria as defined in the paragraph on SCT are fulfilled. HSCT should be undertaken after MARMA either before commencing OCTADA (D) or after receiving part of OCTADA (D).
Primary Refractory ALL

Primary refractory disease is defined as an M3 marrow at day 29 of induction or M2 marrow at week 15 of Regimen C. Such patients have a poor prognosis and should receive one of the following off-trial regimens followed by an allogeneic transplant in CR1:

- FLAG-Ida
- FLAD
- Cyclophosphamide + Etoposide + Clofarabine (CYCLET)
- Nelarabine for T-cell disease

Philadelphia Positive ALL

Patients who are Philadelphia positive should receive UKALL 2003 Regimen B/C 4 drug induction and transfer to the European Intergroup (ESPHALL) protocol on achieving a complete remission. All patients should receive a TKI inhibitor and a first remission transplant.

Relapse ALL

First relapse should be treated on the current UK relapse protocol (R3 at time of writing). Please refer to Haemopoietic Stem Cell transplant (HSCT) SOP “Management of post-transplant relapse” for patients who relapse after transplant.

AML (Excluding Down syndrome and APL)

New patients with AML, MDS-RAEB or granulocytic sarcoma (extramedulary AML) should be entered into AML 17. Patients refusing entry into the trial will be treated on the standard arm of the trial protocol.

APL and Down syndrome AML should be treated according to the specific CCLG guideline.
Relapse AML

Patients who relapse early (< 6 months from end of treatment) have a poor prognosis while late relapses are salvageable.

Depending on which first line treatment the relapse occurred after, the patient should receive either FLAG or FLAD re-induction followed by an allogeneic transplant in second remission.

Patients failing to achieve a complete remission with one or two re-induction course may still benefit from HSCT if they have shown chemo-sensitivity and are in a good partial remission (Blasts < 20%). Such patients should be offered a transplant with pre-conditioning cyto-reductive therapy.

See also relapse AML guideline, August 2010.

Myelodysplasia including JMML

The myelodysplastic syndromes are a group of disorders characterised by cytopenia in one or more cell lines, ineffective haemopoiesis, dysplasia in one or more cell lines and a high risk of transformation to acute leukaemia. Clonal cytogenetic abnormalities may or may not be present. Myelodysplasia (MDS) in children is rare and until recently has not been as well classified as in adults. MDS in children is often associated with constitutional genetic abnormalities, for example Down syndrome or neurofibromatosis type 1. It is also seen in congenital bone marrow disorders such as Fanconi Anaemia and Dyskeratosis Congenita.. Familial myelodysplasia/AML also occurs in the absence of other inherited conditions and may be associated with platelet storage pool disorders.

Classification of Paediatric MDS
• Myeloproliferative/myelodysplastic
  - JMML (see below)
  - CMML
• Down syndrome disease
  - Transient abnormal myelopoiesis (TAM)
  - MDS/AML (the distinction is artificial)
• Myelodysplastic syndrome
  - Refractory cytopenia (<5% blasts)
  - Refractory anaemia with excess blasts (5-20% blasts) (RAEB)
  - Refractory anaemia with ringed sideroblasts

Two entities are difficult to categorise within this Classification and should be
• Myelofibrosis and myelodysplasia
• Hypoplastic MDS

Diagnostic Approach

Careful History and Examination to include:
• A family history of leukaemia, any bleeding disorder, or any genetic disorder
• Previous cytotoxic or immunosuppressive therapy
• Previous treatment with cytokines, especially G-CSF
• Signs of a congenital or genetic disorders:
  • Fanconi’s anaemia
  • Shwachman’s syndrome
  • Down syndrome
  • Neurofibromatosis Type 1
• Constitutional trisomy 8
• Noonan syndrome

Blood Samples
• Full blood count with differential and absolute monocyte count.
• Well stained blood films should be examined for the presence of abnormal morphology and to enumerate the blast count
• Fetal haemoglobin before any blood transfusion.
• HLA typing

Virology
It is important, particularly in infants with suspected JMML, to exclude a diagnosis of viral infections. Parvovirus, EBV and CMV may all mimic JMML.

Bone Marrow Aspirate and Trephine
• Bone marrow aspirate for karyotype. Include iron stain in cytochemistry. Send sample to molecular laboratory for archiving.
• Trephine biopsy, with examination for abnormally localised immature precursor cells (ALIPS) and reticulin stain for fibrosis.

A bone marrow aspirate is not necessary for diagnosis of DS-TAM if there are a sufficient number of peripheral blood blasts for immunophenotyping and karyotyping.

Cytogenetics
Clonal cytogenetic abnormalities can be detected in over 50% of children with MDS, the most common findings being monosomy 7 and trisomy 8. Deletion of chromosome 5q, a common finding in adult MDS, is rare in children.

Treatment
• Patients with RAEB should be treated as AML and entered into AML 17.

• The vast majority of patients with Down syndrome transient abnormal myelopoiesis (TAM) do not require treatment. Patients with cardiac or liver failure should receive low dose cytarabine (10mg/m²/day for 5 – 10 days depending on response).

• Down syndrome MDS/AML should be treated according to the Down AML guideline.

• For all other types of MDS in children, the definitive treatment is an allogeneic transplant and a donor search should be commenced as soon as the diagnosis is confirmed.

• Pending transplant, patients with RA should receive extended phenotype matched blood and, if feasible, HLA matched platelets to reduce the risk of sensitisation.

• Patients with JMML may respond to low dose oral chemotherapy (Mercaptopurine 50-75 mg/m² po daily) or IV (cytarabine 100 mg/m²/day x 10 days +/- Etoposide 100 mg/m²/day x 5 days) and should receive it for disease control prior to transplant. IV treatment should be reserved for patients with progressive disease unresponsive to oral treatment.
Ph-pos Chronic Myeloid Leukaemia

- For detailed recommendations on diagnosis and management, please consult the UK-CLWP childhood CML guidelines.

- The North Trent Cancer Network haemato-oncology guidelines should also be consulted for up-to-date guidance on definitions of response to Imatinib and indications for use of second generation of TKI inhibitors (see table below).

- Imatinib should be given as first line therapy and patients who are Imatinib intolerant or resistant should receive second or third generation TKI inhibitors (Dasatinib or Nilotinib).

- Leucopheresis and/or hydroxyurea may be required at diagnosis in patients with hyperleucocytosis.

- Allogeneic transplant should be discussed with patients who have a matched sibling or 10/10 matched unrelated donor, especially if they are Imatinib intolerant or resistant.

Table 9. Operational definition of failure and suboptimal response for previously untreated patients in ECP CML who are treated with 400 mg IM daily

<table>
<thead>
<tr>
<th>Time</th>
<th>Diagnosis</th>
<th>Failure</th>
<th>Suboptimal response</th>
<th>Warnings</th>
</tr>
</thead>
<tbody>
<tr>
<td>3 mo after diagnosis</td>
<td>No HR (stable disease or disease progression)</td>
<td>NA</td>
<td>Less than CHR</td>
<td>High risk, del(9), t(9;22) in Ph+ cells</td>
</tr>
<tr>
<td>6 mo after diagnosis</td>
<td>Less than CHR, no CCR(Ph+ &gt; 5%)</td>
<td>Less than CCR phosphorus &gt; 35%</td>
<td>NA</td>
<td></td>
</tr>
<tr>
<td>12 mo after diagnosis</td>
<td>Less than PCG-R (Ph+ &gt; 35%)</td>
<td>Less than CCR</td>
<td>Less than MMoR</td>
<td></td>
</tr>
<tr>
<td>18 mo after diagnosis</td>
<td>Less than CCR-R</td>
<td>NA</td>
<td>MMoR</td>
<td></td>
</tr>
<tr>
<td>Anytime</td>
<td>Loss of CHR*, loss of CCRR†, mutation‡</td>
<td>ACA in Ph+ cells§, loss of MMoR¶, mutation∥</td>
<td>Any rise in transcript level, other chromosome abnormalities in Ph+ cells</td>
<td></td>
</tr>
</tbody>
</table>

Failure implies that the patient should be moved to other treatments whenever available. Suboptimal response implies that the patient may still have a substantial benefit from continuing IM treatment but that the long-term outcome is not likely to be optimal, so the patient becomes eligible for other treatments. The same definitions can be used to define the response after IM dose escalation. For risk definitions refer to Table 2. For mutations refer to Table 5. For the definition of HR, CCR, and MoR, refer to Table 6.

PCG-R indicates partial CCR; and NA, not applicable.

*To be confirmed on 2 occasions unless associated with progression to AP/BC.
†To be confirmed on 2 occasions, unless associated with CHR loss or progression to AP/BC.
‡High level of insensitive to IM.
§To be confirmed on 2 occasions, unless associated with CHR or CCR loss.
∥Low level of insensitive to IM.
Severe Aplastic Anaemia

The following are selected extracts of the recommendations contained within the 2009 BCSH guideline for the diagnosis and management of Aplastic Anaemia which are particularly applicable to children. The full guideline should be consulted for diagnosis and management of an individual patient:

**Diagnosis**
- Careful history and clinical examination is important to help exclude rarer inherited forms.
- A detailed drug and occupational exposure history should always be taken. Any putative drug should be discontinued and should not be given again to the patient.
- All patients presenting with aplastic anaemia should be carefully assessed to:
  (i) confirm the diagnosis and exclude other possible causes of pancytopenia with hypocellular bone marrow
  (ii) classify the disease severity using standard blood and bone marrow criteria
  (iii) document the presence of associated PNH and cytogenetic clones. Small PNH clones, in the absence of haemolysis, occur in up to 50% of patients with aplastic anaemia and abnormal cytogenetic clones occur in up to 12% of patients with aplastic anaemia in the absence of MDS
  (iv) exclude a possible late onset inherited bone marrow failure disorder

**Treatment**

**Supportive Care**

(i) Prophylactic platelet transfusions should be given when the platelet count is \(< 10 \times 10^9/l\) (or \(< 20 \times 10^9/l\) in the presence of fever).

(ii) There is no evidence to support the practice of giving irradiated blood components except for patients who are undergoing BMT. However, recent guidance from the BCSH is that irradiated products should empirically be given to patients with aplastic anaemia receiving immunosuppressive therapy.

(iii) Transfusion of irradiated granulocyte transfusions may be considered in patients with life-threatening neutropaenic sepsis.

(iv) The routine use of recombinant Humanised Epoetin in aplastic anaemia is not recommended. A short course of G-CSF may be considered for severe systemic infection that is not responding to intravenous antibiotics and anti-fungal drugs, but should be discontinued after one week if there is no increase in the neutrophil count.

(v) Prophylactic antibiotic and antifungal drugs should be given to patients with neutrophil count \(< 0.2 \times 10^9/l\). Intravenous antifungal treatment should be introduced into the febrile neutropenia regimen early if fevers persist despite broad spectrum antibiotics.

**Definitive treatment**
- Prednisolone should not be used to treat patients with aplastic anaemia because it is ineffective and encourages bacterial and fungal infection.
- Allogeneic BMT from an HLA identical sibling donor is the initial treatment of choice for newly diagnosed patients if they have severe or very severe aplastic anaemia, are \(< 40\) years old and have an HLA compatible sibling donor.
• Immunosuppressive therapy is recommended for children with non-severe aplastic anaemia who are transfusion dependent and those with severe or very severe disease who do not have an HLA identical sibling donor.

• The standard immunosuppressive regimen is a combination of Anti-Thymocyte Globulin (ATG) and ciclosporin. ATG must only be given as an in-patient (see paediatric guideline for doses and schedule). Steroids are given in this situation to counteract the side effects of the ATG.

• Ciclosporin should be continued for at least 12 months after achieving maximal haematological response, followed by a very slow tapering, to reduce the risk of relapse.

• MUD BMT may be considered when a patient has severe aplastic anaemia, has a fully matched donor, is < 50 years old and has failed at least one course of ATG and ciclosporin.

• The optimal conditioning regimen for MUD BMT is uncertain, but currently a Fludarabine, non-irradiation-based regimen is favoured for younger patients.

**Myeloproliferative Disorders (Excluding Ph-pos CML)**

• Essential Thrombocythaemia (ET), Polycythaemia Rubra Vera (PRV) and Primary Myelofibrosis (PMF) are exceptionally rare in childhood.

• In the absence of a JAK 2 mutation, the diagnosis rests on exclusion of secondary causes and the presence of features such as splenomegaly and marrow fibrosis.

• Familial cases often present in childhood and the diagnostic approach should include seeking a family history of the disorder and screening for known genetic mutations where possible.

• ET and PRV should be managed conservatively with drug therapy (aspirin, anagrelide, pegylated alpha-interferon and hydroxycarbamide) and phlebotomy respectively. Interferon is particularly effective in patients with severe pruritus.

• Patients with primary myelofibrosis should be planned for allogeneic transplant as soon as a donor is identified pending which they should receive a trial of steroids.

• Consult the CCLG guidelines on the matter for detailed recommendations on the diagnosis and management of myeloproliferative disorders in childhood.

**Haemophagocytic Lymphohistiocytosis (HLH)**

• HLH should be suspected in any child with unexplained fever, liver failure and coagulopathy.

• The specific criteria for diagnosis are described in HLH 2004 which should be consulted for management of an individual patient.

• All patients (regardless of age, absence of family history and presence of viral trigger) should have samples sent to the immunology laboratory at GOS to screen for a genetic predisposition.
- Patients without a confirmed family history or genetic predisposition should receive the 8 week induction schedule of HLH 2004 and no further therapy.

- Patients suspected of having familial HLH on the basis of a family history or a mutation in an HLH predisposing gene should receive an allogeneic transplant as soon as possible after achieving a complete remission.

Modalities of treatment employed
SCHFT delivered
Chemotherapy
See Appendix 1
SCHFT Current Accepted Chemotherapy Regimes - Lymphoma and Reticulo-endothelial Malignancy

STHFT delivered
Radiotherapy – where national trial and guidelines indicate in selected cases of Hodgkin’s Lymphoma

<table>
<thead>
<tr>
<th>DIAGNOSIS</th>
<th>Reference/Notes</th>
</tr>
</thead>
</table>
| Hodgkin lymphoma (classical)           | First line  
HD 2002-10 EURONET PHL C1 (Trial pending opening in Sheffield)  
Use standard arm of trial = interim guidelines                                                                                       |
Trial may be available towards end of 2011                                                                                     |
| NHL (B cell)                           | First line as per CCLG guidelines (2006)  
based on FABLMB 96 study  
International study pending                                                                                                       |
| Manage according to risk group          | No current trial.                                                                                                                                                                                                |
| Group A                                | Current UK recommendation is to treat as per UKALL2003 Regimen B, with 2 years treatment for males and females  
(Dr Amos Burke, Chair NCRI Paediatric NHL subgroup of Lymphoma CSG, March 2001)                                                  |
| Group B                                | Likely to be treated on UKALL2011 when opens                                                                                                       |
| Group C                                | No current trial. Pending European trial (in discussion) treat as per ALCL 99 without IT therapy as per published report.  
Impact of the Methotrexate Administration Dose on the Need for Intrathecal Treatment in Children and Adolescents With Anaplastic Large-Cell Lymphoma: Results of a Randomized Trial of the EICNHL Group. Laurence Brugieres et al  
| NHL (T cell)                           | UKCCSG Childhood lymphoproliferative disease protocol 2005                                                                                           |

This encompasses:
- Brain stem tumours
- Ependymoma
- Glioma (low grade)
- Medulloblastoma
- Choroid plexus carcinoma
- Germ cell tumours (intracranial)
- Glioma (high grade)

Modalities of treatment employed

SCHFT delivered:
- Paediatric Neurosurgery
- Chemotherapy - as per individual tumour trials and guidelines

STHFT delivered:
- Radiotherapy  As per individual tumour trials and guidelines
- Radiosurgery  Opinion of regional CNS MDT radiosurgery team sought for appropriate cases.
  See Appendix 1

SCHFT Current Accepted Chemotherapy Regimes - CNS Tumours
Chemotherapy for individual tumour groups including references to current open trial and guidelines which include recommendations for radiotherapy in individual tumour types in different ages of child.

<table>
<thead>
<tr>
<th>DIAGNOSIS</th>
<th>Reference/Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Brain stem tumours</td>
<td>Recently closed trial CNS 2007 04</td>
</tr>
<tr>
<td>Choroid Plexus carcinoma</td>
<td>CPT-SIOP-2000 European feasibility study</td>
</tr>
<tr>
<td>Germ cell (intracranial)</td>
<td>CCLG guidelines (March 2006)</td>
</tr>
<tr>
<td>Glioma (low grade)</td>
<td>First line-open (randomised) trial CNS 2004 03</td>
</tr>
<tr>
<td>Glioma (high grade)</td>
<td>First line - CCLG guidelines (Nov 2007)</td>
</tr>
<tr>
<td>Ependymoma (under 3 years)</td>
<td>First line-as per infant ependymoma observation study (CNS 2007 09) closed July 2009</td>
</tr>
<tr>
<td>Ependymoma (over 3 years)</td>
<td>Surgery and radiotherapy are considered first line treatments for children over 3 years. Chemotherapy would only be instituted where child was too ill to receive radiotherapy post operatively in a timely manor</td>
</tr>
<tr>
<td>Medulloblastoma (under 3 years)</td>
<td>Proposed CCLG Infant PNET trial 2006</td>
</tr>
<tr>
<td>Medulloblastoma (localised)</td>
<td>First line - CCLG guidelines (February 2007)</td>
</tr>
<tr>
<td>Medulloblastoma (metastatic)</td>
<td>First line - CCLG guidelines (January 2011)</td>
</tr>
<tr>
<td>Rhabdoid (atypical) CNS</td>
<td>As per proposed European trial standard arm</td>
</tr>
</tbody>
</table>

Modalities of treatment employed
SCHFT delivered:
Chemotherapy See Appendix 1
SCHFT Current Accepted Chemotherapy Regimes – Neuroblastoma
Surgery – total or partial resection as per national trial/ guidelines
STHFT delivered
Radiotherapy – for unresectable residual disease as per national trial/guidelines

<table>
<thead>
<tr>
<th>DIAGNOSIS</th>
<th>Reference/Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age over 12 months stage 4 stage 2,3 MYC N amp</td>
<td>First line -open trial NB 2002 06</td>
</tr>
<tr>
<td>Infants MYCN amp</td>
<td>Second line – as per NB 2006 05 (closed study – publication pending)</td>
</tr>
<tr>
<td>Infants MYCN not amplified</td>
<td>First line - as per Infant 1999 (closed study) <em>Excellent Outcome With Reduced Treatment for Infants With Disseminated Neuroblastoma Without MYCN Gene Amplification De Bernardi et al Clin Oncol 27:1034-1040.2009</em></td>
</tr>
<tr>
<td>Age over 12 months Stage 2/3 MYCN not amp</td>
<td>As per NB 2000 09 (closed study)</td>
</tr>
</tbody>
</table>

NSCG Services exists for diagnosis surgery and local therapy for retinoblastoma Sheffield currently refers to Birmingham Children’s Hospital NHS Foundation Trust Retinoblastoma Team. Modalities of treatment are therefore directed by the NSCG Retinoblastoma MDT and referral to Sheffield made of those patients requiring chemotherapy.

Modalities of treatment employed

BCH NSCG delivered
   Surgery
   Local laser treatment
   Brachytherapy

SCHFT delivered
   Chemotherapy – intravenous
   Chemotherapy - intrathecal

Diagnostic Surgery for unilateral or worse affected eye in bilateral disease is performed in Birmingham, Histological review and treatment plan is made by specialist NSCG MDT and the patients requiring adjuvant chemotherapy according to the current national CCLG Guidelines are referred to Sheffield to receive this treatment.

Chemotherapy
   See Appendix 1
   SCHFT Current Accepted Chemotherapy Regimes – Retinoblastoma

<table>
<thead>
<tr>
<th>DIAGNOSIS</th>
<th>Reference/Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Retinoblastoma</td>
<td>As per (closed) CCLG study RB 2005 11 (closed 2009)</td>
</tr>
<tr>
<td></td>
<td>2nd line CCLG guideline 2nd line therapy for retinoblastoma 2008</td>
</tr>
</tbody>
</table>

Modalities of treatment employed
SCHFT delivered
Chemotherapy See Appendix 1

SCHFT Current Accepted Chemotherapy Regimes - Renal tumours Surgery
STHFT delivered
Radiotherapy – for unrespectable and or residual disease according to national trial guidelines

<table>
<thead>
<tr>
<th>DIAGNOSIS</th>
<th>Reference/Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Wilms tumour</td>
<td>First line - open (non randomised) trial</td>
</tr>
<tr>
<td>Clear cell sarcoma</td>
<td><a href="mailto:SIOPWilms@trials.bham.ac.uk">SIOPWilms@trials.bham.ac.uk</a></td>
</tr>
<tr>
<td></td>
<td>Second line – as per CCLG study (closed 2008) for relapsed and refractory Wilms tumour and clear cell sarcoma of the kidney UKW-R (WT 2001-02)</td>
</tr>
<tr>
<td></td>
<td>Alternatively can use ICE with topotecan as per COG study</td>
</tr>
<tr>
<td>Rhabdoid tumours</td>
<td>Non-Metastatic – as per soft tissue sarcoma study EpSSG NRSTS 2005. Treatment dependant on tissue subtype</td>
</tr>
<tr>
<td></td>
<td>Metastatic – Individual discussion with EpSSG NRSTS 2005 Chief Investigator (Dr Bernadette Brennan, Royal Manchester Children's)</td>
</tr>
</tbody>
</table>
10. The Clinical Management Protocols – Hepatic Tumours (09-7A-121)

Modalities of treatment employed
SCHFT delivered
Chemotherapy See Appendix 1

SCHFT Current Accepted Chemotherapy Regimes – Liver tumours

SCHFT delivered
Surgery – for complex liver resections or transplant referral to Leeds NSCG liver team for opinion is considered at solid tumour MDT

<table>
<thead>
<tr>
<th>DIAGNOSIS</th>
<th>Reference/Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hepatoblastoma (standard</td>
<td>First line - Open trial</td>
</tr>
<tr>
<td>risk)</td>
<td>SIOPEL 6 (LT 2007 03)</td>
</tr>
<tr>
<td>Hepatoblastoma (high risk)</td>
<td>SIOPEL guideline for HR hepatoblastoma (pending)</td>
</tr>
<tr>
<td>Hepatic carcinoma</td>
<td>First line as per SIOPEL 3 (closed trial)</td>
</tr>
</tbody>
</table>

Bone Tumours

NSCG Services exists for diagnosis biopsy and surgery for Bone malignancies
Sheffield currently refers to the Royal Orthopaedic Hospital Birmingham.

Modalities of treatment are therefore directed by the NSCG bone sarcoma MDT and referral to Sheffield made of those patients requiring chemotherapy. For referral routes please see Clinical and Referral Protocols/Guidelines - The Initial Referral Protocol (09-7A-113)

Modalities of treatment employed

SCHFT delivered
Chemotherapy
Pre and post surgery - See Appendix 1
SCHFT Current Accepted Chemotherapy Regimes – Bone tumours

ROH delivered:
Surgical biopsy and resection

STHFT delivered
Radiotherapy
Offered for local therapy where a surgical resection is not possible due to location e.g. Axial skeleton tumours

NSCG service Proton therapy
Advice of national proton panel is sought where patients age and tumour location imply there may be some benefit in considering proton therapy.

<table>
<thead>
<tr>
<th>DIAGNOSIS</th>
<th>Reference/Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ewings Sarcoma</td>
<td>First line – open (randomised) trial ET 2000 03 (Euro Ewing)</td>
</tr>
<tr>
<td></td>
<td>R randomisation closed 2009, R2 randomisation remains open</td>
</tr>
<tr>
<td></td>
<td><a href="mailto:EE99@trials.bham.ac.uk">EE99@trials.bham.ac.uk</a></td>
</tr>
<tr>
<td>Osteosarcoma (localised)</td>
<td>First line – open (randomised) trial EURAMOS-1</td>
</tr>
<tr>
<td></td>
<td>NB this trial is run by MRC not Birmingham CRCTU</td>
</tr>
<tr>
<td></td>
<td><a href="mailto:euramos1@ctu.mrc.ac.uk">euramos1@ctu.mrc.ac.uk</a></td>
</tr>
<tr>
<td></td>
<td>Second line Combination of Gemcitabine and Docetaxel in the Treatment of</td>
</tr>
<tr>
<td></td>
<td>Children and Young Adults With Refractory Bone Sarcoma</td>
</tr>
<tr>
<td></td>
<td>Naved et al</td>
</tr>
<tr>
<td></td>
<td>Cancer 2008;113:419–25</td>
</tr>
<tr>
<td>Osteosarcoma (metastatic)</td>
<td>No trial but follow EURAMOS-1 treatment with radiotherapy</td>
</tr>
</tbody>
</table>
Soft tissue Sarcomas
This encompasses

Fibrosarcoma
Malignant peripheral nerve sheath tumour
Rhabdoid tumours (non-renal)
Rhabdomyosarcoma
Synovial sarcoma

Modalities of treatment employed
SCHFT delivered
Surgical biopsy and resection

Chemotherapy
See Appendix 1
SCHFT Current Accepted Chemotherapy Regimes - CNS Tumours
Chemotherapy individual tumour groups including references to current open trial and guidelines

STHFT delivered
Radiotherapy in accordance with national trial protocols and guidelines

<table>
<thead>
<tr>
<th>DIAGNOSIS</th>
<th>Reference/Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rhabdomyosarcoma (non-metastatic)</td>
<td>As per (open) study RMS 2005&lt;br&gt;<a href="mailto:RMS2005@trials.bham.ac.uk">RMS2005@trials.bham.ac.uk</a>&lt;br&gt;Treatment stratified into risk groups by stage and other risk factors. Includes recommendations for treatment of relapse</td>
</tr>
<tr>
<td>Rhabdomyosarcoma (metastatic)</td>
<td>As per CCLG guidelines&lt;br&gt;Using very high risk (group H) regimen from RMS 2005</td>
</tr>
<tr>
<td>Soft tissue sarcoma treatment recommendations by subtype</td>
<td>As per open study NRSTS 2005&lt;br&gt;<a href="mailto:Lynn.Whitehead@cmft.nhs.uk">Lynn.Whitehead@cmft.nhs.uk</a>&lt;br&gt;Multiple subtypes see protocol for details</td>
</tr>
</tbody>
</table>
12. The Clinical Management Protocols. Any Other Malignancies (09-7A-123)

There will always be rare malignancies which present and cannot be accounted for in any protocol. They are rare either because they are a rare childhood malignancy or because they are an adult spectrum malignancy occurring in childhood.

For a few national Guidelines are in existence-

<table>
<thead>
<tr>
<th>DIAGNOSIS</th>
<th>Reference/Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Adrenocortical tumours</td>
<td>CCLG guidelines (2007)</td>
</tr>
<tr>
<td>Melanoma</td>
<td>CCLG guidelines (2004)</td>
</tr>
<tr>
<td>Melanotic tumours</td>
<td>CCLG guidelines 2004)</td>
</tr>
<tr>
<td>Nasopharyngeal carcinoma</td>
<td>CCLG guidelines (2007)</td>
</tr>
<tr>
<td>Pancreatic tumours</td>
<td>CCLG guidelines (2003)</td>
</tr>
</tbody>
</table>

Where a national guideline cannot be found appropriate national or international expert advice will be sought either via the CCLG paediatric Oncology network or where appropriate form local adult Site specific MDTs.

The specific malignancies that may receive chemotherapy as all or part of treatment include the following (this is not an exclusive list).

**CNS tumours**
- Brain stem tumours
- Choroid plexus carcinoma
- Ependymoma
- Germ cell tumours (intracranial)
- Glioma (low grade)
- Glioma (high grade)
- Medulloblastoma

**Bone tumours**
- Ewings tumour
- Osteosarcoma

**Germ cell tumours**
- Extra cranial
- Intracranial

**Liver tumours**
- Hepatoblastoma
- Hepatocellular carcinoma

**Lymphoma**
- Hodgkin lymphoma
- Non-Hodgkin lymphoma (B cell)
- Non-Hodgkin lymphoma (T cell)
- Non-Hodgkin lymphoma (Large Cell Anaplastic)
- Lymphoproliferative disease

**Neuroblastoma**

**Renal tumours**
- Clear cell sarcoma
- Rhabdoid tumour (renal)
- Wilms tumour

**Retinoblastoma**

**Soft tissue sarcomas**
- Fibrosarcoma
- Malignant peripheral nerve sheath tumour
- Rhabdoid tumours (non-renal)
- Rhabdomyosarcoma
- Synovial sarcoma

**Other rare tumours**
- Adrenocortical tumours
- Melanoma
Melanotic tumours
Nasopharyngeal carcinoma
Pancreatic tumours

Leukaemia
- Acute lymphoblastic leukaemia (ALL)
- Acute myeloid Leukaemia (AML, APL)
- Chronic myeloid leukaemia (CML)

Myelodysplasia
- Myelodysplasias inc JMML, CMML, myelodysplastic syndrome
- Transient abnormal myelopoiesis (TAM)
- Refractory cytopenias

Histiocytosis
- Lymphohistiocytosis
- Haemophagocytic lymphohistiocytosis

The approved treatment regimens in current use at Sheffield Children’s Hospital for treatment of these are listed on the Haematology/Oncology shared area on the H drive for use with in the PTC where all treatment is prescribed.

Protocols from current Trials can be accessed from the COLT (Children’s Oncology and Leukaemia Trials – Birmingham Clinical Trials Unit) website at www.cancerstudies.bham.ac.uk

Other treatment guidelines are available to download from the CCLG (Childhood Cancer and Leukaemia Group website (password required) at www.cclg.org.uk.

Other relevant documents are available on the Haematology/Oncology shared area on the H drive.

Treatment courses highlighted in blue can be administered by trained low risk chemotherapy administrators i.e. community nursing staff.


Follow-up and long term sequelae Guideline of the Oncology and Malignant Haematology Service at Sheffield Children’s NHS Foundation Trust

Contents

1. Background
2. End of treatment
3. Immediate follow up
4. Late effects service SC(NHS)FT
5. Transition to the STH late effects service
6. Referral of patients treated else where to follow up or late effects service
7. MDT responsible at different stages of follow up process.

1. Background
The purpose of this protocol is to clearly outline the follow up process for patients previous treated for a paediatric malignancy. Whilst it outlines the patient pathway through the process each patient is an individual and should have their care tailored to their individual care needs. Deviation from the protocol may be appropriate for individuals as arranged by their treating clinician to best meet their care needs in agreement with the individual patient.
Follow up process in summary at SC(NHS)FT

**Patient completes current treatment**
1. Treatment MDT notified at completion of treatment
2. Treating Clinician or Specialist Nurse completes End of Treatment Summary
   Included treatment given, result, complications, and on going follow up requirement for first 5 years. See appendix A
3. Clinical follow up initially in treating clinician follow up clinic, or Joint neuro-oncology clinic or joint orthopaedic oncology clinic or Bone Marrow Transplant clinic as patient requires.
4. Decision to transfer to late effects clinic discussed with patient and family at follow up clinic attendance

**Transfer to Late Effects Clinic SCH (NHS) FT**
1. Formal referral to Macmillan clinical nurse specialist in late effects. This may occur immediately at the end of treatment or between 2 and 5 years after completion of final treatment depending on patient requirement on agreement with the late effects service. See Appendix C
2. Patient will be seen in a late effects clinic at SC(NHS)FT. This may be either a nurse led or consultant clinic dependant on their risk of late effects. Some patients may still require attendance at joint clinics such as neuro-oncology for VP shunt review and orthopaedics for endoprosthesis follow up or joint endocrine follow up clinic.

**Transition to Late Effects Service and the Sheffield Teaching Hospital NHS FT Clinic**
1. Decision to Transition to late effects clinic discussed with patient and family at follow up clinic attendance. Usually made between 15 and 19 years of age but individualised to patients need; including stage of growth & puberty and maturity.
2. Long term Follow up and sequelae summary compiled/ finalised by Macmillan late effects nurse specialist (see appendix D) and next appointment agreed at TYA LE MDT. Appropriate clinic appointment then made at STH.. Referral made as required for neurosurgery, orthopaedic or endocrine follow up as required for individual
3. Patient seen by Late Effects Clinician from SCH(NHS)FT in STH late effects setting until the age of 25 years then transitioned on to appropriate late effects adult clinician and nurse consultant.
2. **End of Treatment**

End of treatment is defined as completion of final active treatment and recovery from the acute effects of that treatment and completion of any test documenting disease and side effect status following treatment.

At this point the treating MDT is notified of the completion of treatment and notes any modifications to the treatment required due to side effects.

The treating Clinician or Specialty Nurse will complete an End of Treatment summary (appendix A) or MDT Diagnostic Report (Appendix B) highlighting:

- Diagnosis and date
- Treatment received and trial involvement if any
- Any significant problems during treatment
- Any ongoing problems
- Follow up details, frequency for first 5 years
- Risk factors for late effects (reference CCLG long term follow up practice statement as our tool for planning ongoing surveillance)

A copy of this summary is:
- placed in the patients case notes
- offered to patients family
- sent to link clinician in appropriate local hospital
- sent to patients General practitioner

This process should ideally be done within 2 months of completion of treatment to facilitate good patient care but must be completed by 6 months to comply with Cancer Peer Review.

3. **Immediate follow up**

The SC(NHS)FT does not have any peripheral follow up clinic arrangements for its patients. All follow up for malignancy recurrence risk and sequelae occur at Sheffield Children’s Hospital. This allows continuity of care with the treating clinician. All follow up investigations are also arranged at SC(NHS)FT.

As the frequency of clinic visits reduces over time it may become more convenient for families to receive some of their support more locally. If still requiring physiotherapy, occupational therapy or speech and language therapy patients are referred to local services by the appropriate member of the multidisciplinary team. Referrals for common paediatric problems requiring regular follow up more locally to home are also made to avoid excessive travel for families as required.

The point at which a patient moves from the consultants follow up clinic is determined by the risk of recurrence. Generally this is 5 years from end of treatment (EOT) but may be sooner with some patients.

4. **Late effects service SCH (NHS) FT**

The plan to refer to the late effects service is discussed with the patient and their family at an appropriate clinic appointment. Explanation of the service and need for long term follow up is given. The clinician then formally refers to the Macmillan Clinical nurse specialist in late effects.
The majority of patients are under 16 years at point of referral to late effects and will be seen in the SCH(NHS)FT clinic. This clinic is held in same place as their previous clinics with familiar clinic clerk and nursing staff to ease transition.

A minority of patients are already 16 years or above at transfer to late effects. These patients are generally offered at least one appointment with the late effects team in the familiar surroundings at SC(NHS)FT before referral to see the same team in an adult setting.

5. Transition to the STH late effects service

Once the patient reaches the age of 16 they can be formally transitioned into the transition young persons late effects clinic held at the Royal Hallamshire Hospital. This is facilitated by the Macmillan CNS Late Effects and involves a number of processes.

As each young person becomes appropriate for transition their long term follow up and sequelae summary is taken to the TYA LE MDT and their case discussed. From this MDT it is decided what form of follow up each young person should receive i.e. Nurse or consultant led. See Appendix B.

The young person and their family are invited to a transition clinic at SCH(NHS)FT to discuss their future follow up and to receive an individualised copy of their long term follow up and sequelae summary. The specialist nurse will go through this summary with them and ensure the young person is provided with information regarding their future risks and required follow up (based on their maturity and understanding). The CLIC Sergeant young person's social worker, clinical psychologist and consultant in late effects are also available to the young people and their families to discuss other issues related to transition, i.e. Education, employment, finances, sexual health and relationships etc. This service will be supported by literature and a DVD. The clinic will involve a visit to the adult setting to see the facilities in this new environment. First attendances at the Transition Late Effects Clinic are intended to be joint appointments with paediatric and adult consultant whenever possible.

6. Referral of patients treated else where to follow up or late effects service

Patients who have previously been treated for a paediatric malignancy are usually followed up long term for possible late effects of treatment including the increased risk of a second malignancy. In the majority of cases when these patients move to live in this area the referral will be made by the treating Paediatric Oncology Centre to SC(NHS)FT, however occasionally this does not happen. Clinicians are welcome to refer patients new to the area in this situation direct to SCH (NHS) FT. We hold a weekly Late Effects clinics and also make appropriate transition arrangements to the adult Late Effects clinic at STH.

7. MDT responsible at different stages of follow up

For initial follow up the patients remain under the diagnostic and treatment MDT specified for their disease. Post treatment issues will be discussed when appropriate and any suspicion of relapse will be reviewed at the MDT.

On transfer to the SC(NHS)FT Late Effects Service they will be discussed at the next meeting of the Late effects MDT at SC(NHS)FT as a new patient to the service with their late effects summary just prior to their first appointment with the service.

At transition to the Late Effect Service at the STH they will again be discussed at the Late Effects MDT at SC(NHS)FT to ensure all areas of the follow up they require will be covered by the arrangements made.
Prior to a patient’s transition appointment at STH they will be discussed at the Teenage and Young Adult (TYA) Late effects MDT at STH as a new patient to the service after which responsibility passes to that MDT.

The TYA MDT is informed of all newly diagnosed and relapsed patients over the age of 13 years at SC(NHS)FT. Its role in Sheffield is that of a psychosocial MDT and is in parallel to the relevant diagnostic MDT for that patient.

1. M3 Haematology / Oncology Guidelines Reg. I.D. No. 933
   SECTION 9: SUPPORTIVE CARE 9.6 LATE EFFECTS

2. Locally we use the CCLG long term follow up practice statement as our tool for planning ongoing surveillance:-
   http://www.cclg.org.uk/library/19/PracticeStatement/LTFU-full.pdf
Appendix A

Template for End of Treatment summary for oncology patients

<table>
<thead>
<tr>
<th>Patient details</th>
<th>ONCOLOGY DIAGNOSIS</th>
</tr>
</thead>
<tbody>
<tr>
<td>(affix ID label)</td>
<td>(include date presented, symptoms, stage, histology and site)</td>
</tr>
</tbody>
</table>

**TREATMENT**

<table>
<thead>
<tr>
<th>On Clinical Trial</th>
<th>Yes/No</th>
<th>If Yes – specify:</th>
</tr>
</thead>
<tbody>
<tr>
<td>CHEMOTHERAPY</td>
<td></td>
<td>(Include cumulative doses if applicable)</td>
</tr>
<tr>
<td>RADIOTHERAPY</td>
<td></td>
<td>(Site dose and fractions)</td>
</tr>
<tr>
<td>SURGERY</td>
<td></td>
<td></td>
</tr>
<tr>
<td>ANY OTHER TREATMENT</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**OUTCOME OF TREATMENT**

| PROBLEMS DURING TREATMENT | |
|----------------------------||
| DATE TREATMENT COMPLETED   | |
| RESULT OF TREATMENT        | |
| ANY RESIDUAL/ONGOING PROBLEMS | |

**FOLLOW UP PLAN**

<table>
<thead>
<tr>
<th>VACCINATION ADVICE - Patient &amp; GP</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>(To be sent 6 months after Rx ends)</td>
<td></td>
</tr>
</tbody>
</table>

**SPECIFIC LONG TERM FOLLOW UP (ADD/DELETE AS REQUIRED)**

Also refer to protocol for further details if on a clinical trial

<table>
<thead>
<tr>
<th>Growth &amp; measurement</th>
<th>Annual (at least) check of height and weight</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tumour follow up (CXR, scans etc)</td>
<td>State frequency and how long to continue</td>
</tr>
<tr>
<td>Cardiac echo</td>
<td>At completion of treatment</td>
</tr>
<tr>
<td>Renal function check</td>
<td>Annual if nephrotoxic chemotherapy given</td>
</tr>
<tr>
<td>Audiology</td>
<td></td>
</tr>
<tr>
<td>Endocrine investigations</td>
<td></td>
</tr>
<tr>
<td>Lung function tests</td>
<td></td>
</tr>
<tr>
<td>DEXA</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>WALLACE LEVEL</th>
<th>1 / 2 / 3</th>
</tr>
</thead>
<tbody>
<tr>
<td>FERTILITY RISK</td>
<td>HIGH / MEDIUM / LOW</td>
</tr>
<tr>
<td>CARDIAC RISK</td>
<td>HIGH / MEDIUM / LOW</td>
</tr>
</tbody>
</table>

Appendix B  see PDF file MDT diagnostic Report
Appendix C          Late Effects Service SCH (NHS) FT Referral Pathway

SCH LATE EFFECTS REFERRAL PATHWAY

**Solid Tumours**  
5 years post EOT  
**Brain Tumours**  
At EOT (joint follow up in Neuro-oncology Clinic)

**Leukaemia**  
3-5 years post EOT

**Transplants**  
2 years post transplant or joint follow up if required earlier

---

Referral to Late Effects Clinic  
(Direct to Tanya Urquhart (TU), Macmillan CNS in Late Effects)  
EOT Summary produced by referring

---

Personal Surveillance Plan created by TU.  
Referral discussed in LE MDT

---

Nurse Led Clinic for Low Risk patients  
Consultant led Clinic for medium / high risk patients

+++ Endocrine Late Effects Clinic (x 1 monthly)  
Commenced June 15th 2010

---

Age 16 – 18  
SCH LE MDT to plan transition  
Patient meets with TU & wider LE service team to review Personal Surveillance Plan.  
**Transition clinic**

---

Referral to RHH TYA LE MDT  
Ongoing follow up in RHH

---

Any referral needing decision before next MDT will be dealt with by TU. This will be achieved through discussions with relevant members of the MDT.
Appendix D  
Late Effects Summary at Transition  
LATE EFFECTS/ LONG TERM FOLLOW-UP CLINIC

The purpose of this document is to provide patients / carers / Specialists and GPs with a summary of the patient’s cancer diagnosis and treatment, information about potential long term health risks and a personalised follow up and screening programme. It should be discussed with the patient / parent / carer at their first meeting with the Late Effects Service.

**TREATMENT SUMMARY**

<table>
<thead>
<tr>
<th>PATIENT DETAILS</th>
</tr>
</thead>
<tbody>
<tr>
<td>(Name, Address, DOB, Hospital No’s, contact telephone numbers)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>DATE &amp; DETAILS OF DIAGNOSIS</th>
</tr>
</thead>
<tbody>
<tr>
<td>(including any staging and End of Treatment date)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>TREATMENT TRIAL?</th>
</tr>
</thead>
<tbody>
<tr>
<td>YES □ Name of Trial</td>
</tr>
<tr>
<td>NO □</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>CONSULTANT and KEY WORKER (Eg: Specialist Nurse) whilst on Treatment</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>SURGERY</th>
</tr>
</thead>
<tbody>
<tr>
<td>(provide details and date of surgery)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>CHEMOTHERAPY</th>
</tr>
</thead>
<tbody>
<tr>
<td>(regimen including cumulative doses)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>RADIOTHERAPY</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total doses / fields and fractions (including BMT details, i.e. TBI)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>RESPONSE AND SPECIFIC PROBLEMS DURING TREATMENT</th>
</tr>
</thead>
<tbody>
<tr>
<td>(Include any end of treatment assessment results and significant problems during treatment).</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>WALLACE LEVEL</th>
</tr>
</thead>
<tbody>
<tr>
<td>A paediatric tool for assigning patients to a risk based medical follow up programme. It does not predict future psychosocial problems. (See Appendix 1)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>1 / 2 / 3</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>CLIC SARGENT WORKER</th>
</tr>
</thead>
<tbody>
<tr>
<td>(Whilst on treatment)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>ASSESSMENT OF RISK AND FOLLOW-UP PLANS</th>
</tr>
</thead>
<tbody>
<tr>
<td>LONG-TERM F/U CONSULTANT and KEY WORKER (Eg: Specialist Nurse)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>(Provide name and contact details)</th>
</tr>
</thead>
</table>
Please contact if advice regarding a patient is required.

**SUGGESTED F/U**
(Outline type and frequency of follow up)

<table>
<thead>
<tr>
<th>CURRENT PROBLEMS</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>(Summarise ongoing medical problems)</td>
<td></td>
</tr>
<tr>
<td>Statement of educational need?</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>CURRENT MEDICATION</th>
<th></th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>PSYCHOSOCIAL ISSUES</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>(Summarise any ongoing psychosocial problems).</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>FERTILITY RISK</th>
<th>HIGH / MEDIUM / LOW</th>
</tr>
</thead>
<tbody>
<tr>
<td>(Give details and include potential actions for GP)</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>CARDIAC RISK</th>
<th>HIGH / MEDIUM / LOW</th>
</tr>
</thead>
<tbody>
<tr>
<td>(Give details and include potential actions for GP)</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>ALSO AT RISK FOR</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>(Give details and include potential actions for GP)</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>SCREENING</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>(Tick all that are required)</td>
<td></td>
</tr>
</tbody>
</table>

|  | ⬜ | ⬜ | ⬜ |
|---|---|---|
| ECHO | APFTs |  |
| DXA | TFTs |  |
| Skin | LFT |  |
| FBC | Glucose/Ins |  |
| U+E | Lipid Profile |  |
| Lung FT | Neuro-oncology |  |
| Gonadotrophins |  |
| Other | (Give details) |  |

| WHAT HAS BEEN COMMUNICATED TO PATIENT AND FAMILY? |  |
| (including discussions, written information and treatment intent) |  |

<table>
<thead>
<tr>
<th>OTHER PROFESSIONALS REFERRED TO OR ALREADY INVOLVED</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Other Specialist Consultant</td>
<td></td>
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<tr>
<td>Please list:</td>
<td></td>
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<tr>
<td>Physiotherapist</td>
<td></td>
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<tr>
<td>Hearing and Speech</td>
<td></td>
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<td></td>
<td>Occupational Therapist</td>
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<tr>
<td></td>
<td>Dietician</td>
</tr>
<tr>
<td></td>
<td>Psychologist</td>
</tr>
</tbody>
</table>

**ACTIONS FOR GP**
(Including any Medication review, symptom surveillance, screening and adding patient to palliative care register if appropriate)

**USEFUL WEBSITES & LEAFLETS**
(Please provide list)

**ANY OTHER INFO THAT MAY BE HELPFUL**
(E.g. social circumstances, problems with attendance, double letters to separate family members etc...)

---

This document should be discussed and agreed with the patient / carer before forwarding to the GP.

- Discussed with patient: Yes / No
- Consent obtained to send on to GP: Yes / No

This document should be discussed and agreed with the patient / carer before forwarding to the GP.

- Discussed with patient: Yes / No
- Consent obtained to send on to GP: Yes / No

Completed by: ____________
Today’s date: ____________
Next review date: ____________
14. CCN agreed list of acceptable chemotherapy regimens (09-7A-130)

Please see below the list of acceptable chemotherapy regimens for the CCN across the PTC and all POSCU’s and levels including community services which is updated annual. The specific malignancies that may receive chemotherapy as all or part of treatment include the following (this is not an exclusive list).

These guidelines are also held on the Sheffield Children’s Hospital intranet and cover all the requirements listed in the measure. Chemocare is the computerised prescribing system in use at the Children’s hospital and only these accepted regimens can be prescribed via this system.

| CNS tumours                                      | Brain stem tumours                  |
|                                                 | Choroid plexus carcinoma            |
|                                                 | Ependymoma                          |
|                                                 | Germ cell tumours (intracranial)    |
|                                                 | Glioma (low grade)                  |
|                                                 | Glioma (high grade)                 |
|                                                 | Medulloblastoma                      |
| Bone tumours                                     | Ewings tumour                       |
|                                                 | Osteosarcoma                        |
| Germ cell tumours                                | Extra cranial                       |
|                                                 | Intracranial                        |
| Liver tumours                                    | Hepatoblastoma                      |
|                                                 | Hepatocellular carcinoma            |
| Lymphoma                                         | Hodgkin lymphoma                    |
|                                                 | Non-Hodgkin lymphoma (B cell)       |
|                                                 | Non-Hodgkin lymphoma (T cell)       |
|                                                 | Non-Hodgkin lymphoma (Large Cell Anaplastic) |
|                                                 | Lymphoproliferative disease         |
| Neuroblastoma                                    | Clear cell sarcoma                  |
| Renal tumours                                    | Rhabdoid tumour (renal)             |
|                                                 | Wilms tumour                         |
| Retinoblastoma                                   | Fibrosarcoma                        |
| Soft tissue sarcomas                             | Malignant peripheral nerve sheath tumour |
|                                                 | Rhabdoid tumours (non-renal)        |
|                                                 | Rhabdomyosarcoma                    |
|                                                 | Synovial sarcoma                    |
| Other rare tumours                               | Adrenocortical tumours              |
|                                                 | Melanoma                            |
|                                                 | Melanotic tumours                   |
|                                                 | Nasopharyngeal carcinoma            |
|                                                 | Pancreatic tumours                  |
| Leukaemia                                        | Acute lymphoblastic leukaemia (ALL)  |
|                                                 | Acute myeloid Leukaemia (AML, APL)   |
|                                                 | Chronic myeloid leukaemia (CML)      |
| Myelodysplasia                                   | Myelodysplasias inc JMML, CMML, myelodysplastic syndrome |
|                                                 | Transient abnormal myelopoiesis (TAM) |
|                                                 | Refractory cytopenias                |
Histiocytosis
Lymphohistiocytosis
Haemophagocytic lymphohistiocytosis

The approved treatment regimens in current use at Sheffield Children’s Hospital for treatment of these are listed in Table 1.

Protocols from current Trials can be accessed from the COLT (Children’s Oncology and Leukaemia Trials – Birmingham Clinical Trials Unit) website at www.cancerstudies.bham.ac.uk

Other treatment guidelines are available to download from the CCLG (Childhood Cancer and Leukaemia Group) website (password required) at www.cclg.org.uk.

Other relevant documents are available on the Haematology/Oncology shared area on the H drive.
Treatment courses highlighted in blue can be administered by trained low risk chemotherapy administrators i.e. community nursing staff.
TABLE 1: CNS TUMOURS

<table>
<thead>
<tr>
<th>DIAGNOSIS</th>
<th>Reference/Notes</th>
<th>First line regimens</th>
<th>Second line</th>
</tr>
</thead>
<tbody>
<tr>
<td>Brain stem tumours</td>
<td>Recently closed trial CNS 2007 04 [<a href="mailto:BSGTemozol@trials.bham.ac.uk">BSGTemozol@trials.bham.ac.uk</a>]</td>
<td>Individual courses</td>
<td>Temozolamide 6WK</td>
</tr>
<tr>
<td></td>
<td></td>
<td>TEMOZO + RXT 6WK</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Temozolamide 4WK</td>
<td></td>
</tr>
<tr>
<td>Choroid Plexus carcinoma</td>
<td>CPT-SIOP-2000 European feasibility study</td>
<td>Individual courses</td>
<td>Seek guidance from national co-ordinators</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Choroid Plexus</td>
<td></td>
</tr>
<tr>
<td>Germ cell (intracranial)</td>
<td>CCLG guidelines (March 2006) Available from CCLG website</td>
<td>Protocol GERM CELL INTRACRANIAL Courses</td>
<td>Seek guidance from national co-ordinators</td>
</tr>
<tr>
<td></td>
<td></td>
<td>CNS GC INTERIM</td>
<td></td>
</tr>
<tr>
<td>Glioma (low grade)</td>
<td>First line-open (non randomised) trial CNS 2004 03 [<a href="mailto:LGG2@trials.bham.ac.uk">LGG2@trials.bham.ac.uk</a>]</td>
<td>Protocol SIOP Low Grade Glioma 2003</td>
<td>Alternative therapy from CNS 2004 03 protocol</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Individual courses</td>
<td>LGG CISPLATIN</td>
</tr>
<tr>
<td></td>
<td></td>
<td>LGG VVV CARBOETOP</td>
<td>LGG CYCLO CONSOL (Separate courses &lt;10kg)</td>
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<tr>
<td></td>
<td></td>
<td>LGG VCARBO</td>
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<td></td>
<td></td>
<td>LGG VCARBO 3</td>
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<td></td>
<td></td>
<td>LGG VCW6</td>
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<tr>
<td></td>
<td></td>
<td>(Separate courses &lt;10kg)</td>
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<tr>
<td>Glioma (high grade)</td>
<td>First line - CCLG guidelines (Nov 2007) Available from CCLG website</td>
<td>Individual courses</td>
<td>HG GLOMA PCV</td>
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<tr>
<td></td>
<td></td>
<td>TEMOZO + RXT 6WK</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Temozolamide 4WK</td>
<td></td>
</tr>
<tr>
<td>Ependymoma (under 3 years)</td>
<td>First line-as per infant ependymoma observation study CNS 2007 09 [<a href="mailto:COLTFUTrials@trials.bham.ac.uk">COLTFUTrials@trials.bham.ac.uk</a>]</td>
<td>Protocol Ependymoma Infant 05</td>
<td>Seek guidance from national co-ordinators</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Individual courses</td>
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<td></td>
<td></td>
<td>EPEND INF VCARB</td>
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<td>EPEND INF MTX</td>
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<td>EPEND INF CYCLO</td>
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<td></td>
<td>EPEND INF CISP</td>
<td></td>
</tr>
<tr>
<td>Disease</td>
<td>Referral and Management Guidelines</td>
<td>Protocol</td>
<td>Courses</td>
</tr>
<tr>
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</tr>
<tr>
<td>Ependymoma (over 3 years)</td>
<td>Surgery and radiotherapy are considered first line treatments for children over 3 years. Chemotherapy would only be instituted where child was too ill to receive radiotherapy post operatively in a timely manor</td>
<td>Protocol</td>
<td>SIOP ependymoma 99 Or Ependymona Infant 05 Courses As above + SIOP EPEN VCE</td>
</tr>
<tr>
<td>Medulloblastoma (under 3 years)</td>
<td>Proposed CCLG Infant PNET trial 2006</td>
<td>Courses</td>
<td>CNS 2001 03 IND PACKER VINC PACKER MAINT</td>
</tr>
<tr>
<td>Medulloblastoma (localised)</td>
<td>First line - CCLG guidelines (February 2007) Available from CCLG website</td>
<td>Individual courses</td>
<td>PACKER VINC PACKER MAINT</td>
</tr>
<tr>
<td>Medulloblastoma (metastatic)</td>
<td>First line - CCLG guidelines (January 2011) Available from CCLG website</td>
<td>Individual courses</td>
<td>CNS MEDUL MTX CNS MEDUL ETOP CNS MEDUL CYCLO CNS MEDUL V CARBO CNS 2000 HD Thiotepa CNS MED MAINT (to be written)</td>
</tr>
<tr>
<td>Rhabdoid (atypical) CNS</td>
<td>As per proposed European trial standard arm Expert advice always sort in this rapidly evolving disease.</td>
<td>Courses</td>
<td>CNS ATR DOX CNS ATRHAB DOX CNS ATRHAB VCA CNSATRHAB ICE</td>
</tr>
</tbody>
</table>
### BONE TUMOURS

<table>
<thead>
<tr>
<th>DIAGNOSIS</th>
<th>Reference/Notes</th>
<th>First line regimens</th>
<th>Second line</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ewings Sarcoma</td>
<td>First line – open (randomised) trial ET 2000 03 (Euro Ewing) R randomisation closed 2009, R2 randomisation remains open <a href="mailto:EE99@trials.bham.ac.uk">EE99@trials.bham.ac.uk</a></td>
<td>Protocol&lt;br&gt;EURO-EWING 99 Individual courses&lt;br&gt;EE VIDE&lt;br&gt;EE VAI&lt;br&gt;EE VI +RT&lt;br&gt;EE BU/MEL (&lt;&gt;1yr&lt;&gt;60kg</td>
<td>EE BU/MEL  if not used during first line&lt;br&gt;On advice of national trial advisors</td>
</tr>
<tr>
<td>Osteosarcoma (localised)</td>
<td>First line – open (randomised) trial EURAMOS-1&lt;br&gt;NB this trial is run by MRC not Birmingham CRCTU <a href="mailto:euramos1@ctu.mrc.ac.uk">euramos1@ctu.mrc.ac.uk</a>&lt;br&gt;Second line <em>Combination of Gemcitabine and Docetaxel in the Treatment of Children and Young Adults With Refractory Bone Sarcoma Naved et al Cancer 2008;113:419–25</em></td>
<td>Protocol&lt;br&gt;EURAMOS Osteosarcoma Individual courses&lt;br&gt;EURAMOS MAP&lt;br&gt;EURAMOS MAP(IE)&lt;br&gt;EURAMOS (MAP) IE&lt;br&gt;EURAMOS MPE (AI)2&lt;br&gt;EURAMOS AP&lt;br&gt;EURAMOS MX1&lt;br&gt;EURAMOS- MA&lt;br&gt;EURAMOS IFn or IFn C1</td>
<td>Courses&lt;br&gt;OSTEO IE (if IE not used during first line)&lt;br&gt;GEMCIT/DOCETAXEL&lt;br&gt;Palliative&lt;br&gt;CYCLO oral&lt;br&gt;EETOPOSIDE 4WK&lt;br&gt;EETOPOSIDE 4WK&lt;br&gt;OS&lt;br&gt;Or phase 1 studies</td>
</tr>
<tr>
<td>Osteosarcoma (metastatic)</td>
<td>No trial but follow EURAMOS-1 treatment with radiotherapy</td>
<td>Protocol&lt;br&gt;EURAMOS Osteosarcoma Courses&lt;br&gt;As above</td>
<td>As above</td>
</tr>
</tbody>
</table>
### GERM CELL TUMOURS (Extra cranial)

<table>
<thead>
<tr>
<th>DIAGNOSIS</th>
<th>Reference/Notes</th>
<th>First line regimens</th>
<th>Second line</th>
</tr>
</thead>
</table>
| Germ cell tumour  
Manage according to risk group | First line - as per GC III (Trial closed 2010) | Protocol  
GERM CELL GC III  
Individual courses  
GC 2005 JEB  
Cisplatin (not carboplatin) may be more appropriate for adolescent boys | GC 2005 VEIP |

### LIVER TUMOURS

<table>
<thead>
<tr>
<th>DIAGNOSIS</th>
<th>Reference/Notes</th>
<th>First line regimens</th>
<th>Second line</th>
</tr>
</thead>
</table>
| Hepatoblastoma  
(standard risk) | First line - Open trial  
SIOPEL 6 (LT 2007 03) | HEPCCDP SIOPEL6 | HEPHRGL CDDP  
HEPHRGL CARBODOX |
| Hepatoblastoma  
(high risk) | SIOPEL guideline for HR hepatoblastoma (pending) | Courses  
HEPHRGL CDDP  
HEPHRGL CARBODOX | Palliative |
| Hepatic carcinoma | First line as per SIOPEL 3 (closed trial) | If residual disease  
HEP SR PLADO | Seek guidance from national co-ordinators |

### LYMPHOMA

<table>
<thead>
<tr>
<th>DIAGNOSIS</th>
<th>Reference/Notes</th>
<th>First line regimens</th>
<th>Second line</th>
</tr>
</thead>
</table>
| Hodgkin lymphoma  
(classical) | First line  
HD 2002-10 EURONET PHL C1 (Trial pending opening in Sheffield) | Protocol  
Hodgkins EuroNet-PHL-C1 | Protocol  
HODGKINS HD 2000 02 relapse Courses |
<table>
<thead>
<tr>
<th>Hodgkin lymphoma (lymphocyte predominant)</th>
<th>First &amp; second line – CCLG guidelines (2006)</th>
<th>HD EURONET IEP HD EURONET ABVD HD EURONET BEAM</th>
<th>As per Hodgkins Interim guidelines HD OEPA HD COPP</th>
</tr>
</thead>
<tbody>
<tr>
<td>NHL (B cell)</td>
<td>First line as per CCLG guidelines (2006)</td>
<td>Protocol B CELL LYMPHOMA (NHL)</td>
<td>Protocol NHL IMMUNOTHERAPY</td>
</tr>
<tr>
<td>Manage according to risk group</td>
<td>based on FABLMB 96 study</td>
<td>Individual courses</td>
<td>Individual courses</td>
</tr>
<tr>
<td>Group A</td>
<td>International study pending</td>
<td>NHL A COPAD NHL COP B</td>
<td>NHL CYVE + rituximab</td>
</tr>
<tr>
<td>Group B</td>
<td></td>
<td>NHL B COPADM1 and 2</td>
<td>ICE + rituximab</td>
</tr>
<tr>
<td>Group C</td>
<td></td>
<td>NHL B CYM NHL COP C</td>
<td>BEAM</td>
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<td></td>
<td>NHL C COPADM 1 &amp; 2</td>
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<td>NHL C +VE CYVE +/- MTX</td>
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<td></td>
<td></td>
<td>NHL C –VE CYVE 1 and2</td>
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<td></td>
<td>NHL C M1</td>
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<td></td>
<td></td>
<td>NHL C M2</td>
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<td></td>
<td>NHL C M3</td>
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<tr>
<td></td>
<td></td>
<td>NHL C M4</td>
<td></td>
</tr>
<tr>
<td>NHL (T cell)</td>
<td>No current trial. Pending possible inclusion in UK ALL trial, options are to treat as per ALL regimen (Arm B) or as per published BFM 90 Intensive ALL-type therapy without local radiotherapy provides a 90% event-free</td>
<td>Protocol EURO-LB02 T/preB-L Lymphoma</td>
<td>Discuss with national expert (as per advice in EUROLB02)</td>
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<td></td>
<td></td>
<td>Individual courses</td>
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<td></td>
<td></td>
<td>LB02 Prephase</td>
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<td></td>
<td>LB02 IND1A CN/DX</td>
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<tr>
<td>Condition</td>
<td>Details</td>
<td>Protocol/Protocol Details</td>
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<tr>
<td></td>
<td>survival for children with T-cell lymphoblastic lymphoma Alfred Reiter et al Blood 2000;95;416-421 (Local modification to use pegasparaginase not E-coli native asparaginase)</td>
<td>LB02 IND1A CN/PD LB02 IND 1A DEX LB02 IND 1A PRED LB02 IND 1B LB02 PROTOCOL M LB02 RE-IND 2A LB02 RE-IND 2B LB02 MAINTENANCE LB02 EOT MAINT</td>
<td></td>
</tr>
<tr>
<td>NHL (Anaplastic large cell)</td>
<td>No current trial. Pending European trial (in discussion) treat as per ALCL 99 without IT therapy as per published report. Impact of the Methotrexate Administration Dose on the Need for Intrathecal Treatment in Children and Adolescents With Anaplastic Large-Cell Lymphoma: Results of a Randomized Trial of the EICNHL Group. Laurence Brugieres et al J Clin Oncol 2009 ; 27:897-903.</td>
<td>Individual courses ALCL99 Prephase ALCL99 AM1 ALCL99 AM2 ALCL99 AM3 ALCL99 BM1 ALCL99 BM2 ALCL99 BM3 All require chemocare validation before use Seek guidance from national co-ordinators</td>
<td></td>
</tr>
<tr>
<td>Lymphoproliferative disease</td>
<td>UKCCSG Childhood lymphoproliferative disease protocol 2005</td>
<td>Protocol NHL IMMUNOTHERAPY B cell lymphoma (NHL) C Courses EBV Rituximab NHL COP B All courses as above for patients with extensive disease requiring reg C NHL treatment Protocol (if unresponsive) B CELL LYMPHOMA (NHL) regimen C Courses As above</td>
<td></td>
</tr>
</tbody>
</table>
## NEUROBLASTOMA

New European study in development

<table>
<thead>
<tr>
<th>DIAGNOSIS</th>
<th>Reference/Notes</th>
<th>First line regimens</th>
<th>Second line</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age over 12 months stage 4 stage 2,3 MYC N amp Infants MYCN amp</td>
<td>First line - open trial NB 2002 06 Second line – as per NB 2006 05 (closed study – publication pending)</td>
<td>Protocol Neuroblastoma HR-NBL 1 Individual courses NB COJEC VCE NB COJEC VCIS NB COJEC VECY NB HR BUMEL IV or &gt;60kg NB CEM (&lt; or &gt; 12kg or GFR &lt;100 or &gt;100) NB ISOTRT &lt;12kg NB ISOTRETINOIN NB ISO +CH14 +IL2 NB ISOTTRET +CH14 NB TVD trial</td>
<td>Courses TVD for NBL (non trial)</td>
</tr>
<tr>
<td>Infants MYCN not amplified</td>
<td>First line - as per Infant 1999 (closed study) Excellent Outcome With Reduced Treatment for Infants With Disseminated Neuroblastoma Without MYCN Gene Amplification De Bernardi et al Clin Oncol 27:1034-1040.2009</td>
<td>Individual courses INF NB CO (&gt;5kg) INF NB VPCARBO (&gt;5kg) INF NB CADO (&gt;5kg)</td>
<td>Discussion with national experts</td>
</tr>
<tr>
<td>Age over 12 months Stage 2/3 MYCN not amp</td>
<td>As per NB 2000 09 (closed study)</td>
<td>Protocol NB 2009 &gt;1yr Courses NB 2009 CADO NB 2009 VPCARBO</td>
<td>Guidance within NB2009 NB 2009 CISP ETOP High dose cyclo/Etop (course not yet available on c/c) +/- NB HR BUMEL and PBSC</td>
</tr>
</tbody>
</table>
### RENAL TUMOURS

<table>
<thead>
<tr>
<th>DIAGNOSIS</th>
<th>Reference/Notes</th>
<th>First line regimens</th>
<th>Second line</th>
</tr>
</thead>
<tbody>
<tr>
<td>Wilms tumour</td>
<td>First line - open (non randomised) trial</td>
<td>Protocol WILMS SIOP WT 2001 Individual courses WT02 LR Preop WT02 HR preop WT02 V10</td>
<td>Individual courses WTRE AVD CONT WTRE AVD CONT2 WTRE AVD WK1-9</td>
</tr>
<tr>
<td>Clear cell sarcoma</td>
<td>Second line – as per CCLG study (closed 2008) for relapsed and refractory Wilms tumour and clear</td>
<td>WT02 AV-1 WT02 AVD wk 1-10 WT02 AVD wk 1-10 WT02 AVD wk 11-27 WT02 CYCLO/DOX</td>
<td>WTRE CYCLO/DOX WTRE CYCLO/ETOP WTRE HD MELPHAL WTRE ICE</td>
</tr>
<tr>
<td></td>
<td>cell sarcoma of the kidney UKW-R (WT 2001-02)</td>
<td>WT02 Vp-carbo DOX renal dose VINC single dose AVD single dose VA single dose</td>
<td>WTRE IMR CYC/ETO WTRE VP-CARBO</td>
</tr>
<tr>
<td></td>
<td>Alternatively can use ICE with topotecan as per COG study</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Rhabdoid tumours</td>
<td>First line – as per soft tissue sarcoma study Epssg NRSTS 2005 Treatment dependant on tissue</td>
<td>Individual courses EPSSG CYCE (&gt;or &lt;1yr or 2 +2 hyd) EPSSG IF/DO SL EPSSG IFOS</td>
<td>Courses VINORELBINE RMS VC</td>
</tr>
<tr>
<td></td>
<td>subtype</td>
<td>EPSSG IFOS DOX EPSSG VDCY (&lt;or &gt; 1yr) VA single dose Vinc dose</td>
<td>Following discussion with trial co-ordinators</td>
</tr>
</tbody>
</table>
## RETINOBLASTOMA

<table>
<thead>
<tr>
<th>Diagnosis</th>
<th>Reference/Notes</th>
<th>First line regimens</th>
<th>Second line</th>
</tr>
</thead>
<tbody>
<tr>
<td>Retinoblastoma</td>
<td>As per (closed) CCLG study RB 2005 11 (closed 2009)</td>
<td>Protocol</td>
<td>Courses</td>
</tr>
<tr>
<td></td>
<td><strong>2nd line</strong> CCLG guideline 2nd line therapy for retinoblastoma 2008</td>
<td>RETINOBLASTOMA 05</td>
<td>SARCOMA IVA</td>
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<tr>
<td></td>
<td><strong>Courses</strong> RB JOE</td>
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<td></td>
<td>RB JOE IT</td>
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<td></td>
<td>RB JOE pre XRT</td>
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## SOFT TISSUE SARCOMA

<table>
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<th>Reference/Notes</th>
<th>First line regimens</th>
<th>Second line</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Rhabdomyosarcoma (non-metastatic)</strong></td>
<td>As per (open) study RMS 2005 <a href="RMS2005@trials.bham.ac.uk">RMS2005@trials.bham.ac.uk</a></td>
<td>Protocol</td>
<td>Protocol</td>
</tr>
<tr>
<td></td>
<td>Treatment stratified into risk groups by stage and other risk factors. Includes recommendations for treatment of relapse</td>
<td>Rhabdomyosarcoma 2005</td>
<td>Rhabdomyosarcoma progression 2</td>
</tr>
<tr>
<td></td>
<td><strong>Courses</strong> RMS IVAVV&gt;10KG</td>
<td></td>
<td>Courses</td>
</tr>
<tr>
<td></td>
<td>RMS IVA &gt;10kg</td>
<td>RMS DOX/CARBO</td>
<td>RMS DOX/CARBO</td>
</tr>
<tr>
<td></td>
<td>RMS IVADVV &gt;10KG (SL)</td>
<td>RMS DOX/CYC</td>
<td>RMS ETOP/CARBO</td>
</tr>
<tr>
<td></td>
<td>RMS IVAD &gt;10KG (SL)</td>
<td>RMS TOP/CYC&gt;10</td>
<td>RMS TOPO/CARBO</td>
</tr>
<tr>
<td></td>
<td>As above</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Rhabdomyosarcoma (metastatic)</strong></td>
<td>As per CCLG guidelines Using very high risk (group H) regimen from RMS 2005</td>
<td>Courses</td>
<td></td>
</tr>
<tr>
<td></td>
<td><strong>Courses</strong> RMS IVADVV</td>
<td>RMS IVADV</td>
<td></td>
</tr>
<tr>
<td></td>
<td>RMS IVAD</td>
<td>RMS IVA</td>
<td></td>
</tr>
<tr>
<td></td>
<td>RMS IVA</td>
<td>As above</td>
<td></td>
</tr>
<tr>
<td><strong>Soft tissue sarcoma treatment recommendations by subtype</strong></td>
<td>As per open study NRSTS 2005 <a href="Lynn.Whitehead@cmft.nhs.uk">Lynn.Whitehead@cmft.nhs.uk</a></td>
<td>EPSSG CYCE &gt;1YR</td>
<td>VINORELBINE</td>
</tr>
<tr>
<td></td>
<td><strong>Multiple subtypes see protocol for details</strong></td>
<td>EPSSG IF/DO SL</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>EPSSG IFOS</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>EPSSG VDCY&lt;1YR</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>EPSSG VDCY&gt;1YR</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>2+2HYD</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td><strong>Courses</strong></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>VINORELBINE</td>
<td></td>
</tr>
</tbody>
</table>
### RARE TUMOURS

The Guidelines listed are available from the CCLG website members area (password protected).

<table>
<thead>
<tr>
<th>DIAGNOSIS</th>
<th>Reference/Notes</th>
<th>First line regimens</th>
<th>Second line</th>
</tr>
</thead>
<tbody>
<tr>
<td>Adrenocortical tumours</td>
<td>CCLG guidelines (2007)</td>
<td>Mitotane with cisplatin/etoposide/doxorubicin <em>(not available yet on chemocare)</em></td>
<td>Seek guidance from national co-ordinators</td>
</tr>
<tr>
<td>Melanoma</td>
<td>CCLG guidelines (2004)</td>
<td>Courses</td>
<td>Temozolamide 4WK</td>
</tr>
<tr>
<td>Melanotic tumours</td>
<td>CCLG guidelines 2004)</td>
<td>Courses</td>
<td>VCYC <em>(not yet available on chemocare)</em>&lt;br&gt;NB-OPEC&lt;br&gt;NB-OJEC</td>
</tr>
<tr>
<td>Nasopharyngeal carcinoma</td>
<td>CCLG guidelines (2007)</td>
<td>Courses</td>
<td>Ifn-B&lt;br&gt;Cisp/5FU/Leucovorin <em>(not yet on chemocare)</em></td>
</tr>
<tr>
<td>Pancreatic tumours</td>
<td>CCLG guidelines (2003)</td>
<td>Courses</td>
<td>HEP SR PLADO</td>
</tr>
</tbody>
</table>

### PALLIATIVE TREATMENTS

<table>
<thead>
<tr>
<th>DIAGNOSIS</th>
<th>Reference/Notes</th>
<th>Regimens</th>
</tr>
</thead>
<tbody>
<tr>
<td>Haematology palliative</td>
<td></td>
<td>Symptom dependant&lt;br&gt;  * Vincristine + steroid&lt;br&gt;  * Intrathecal methotrexate or Depocyte&lt;br&gt;  * Oral Etoposide&lt;br&gt; Courses VINC dose</td>
</tr>
<tr>
<td>Oncology palliative</td>
<td>Dependant on primary disease- see individual diseases</td>
<td>Courses</td>
</tr>
<tr>
<td>---------------------</td>
<td>------------------------------------------------------</td>
<td>---------</td>
</tr>
</tbody>
</table>
|                     |                                                      | Vinorelbine  
 |                     |                                                      | Etoposide 4Wk  
 |                     |                                                      | Etoposide OS 4Wk  
 |                     |                                                      | Gemcitabine/Docetaxol?  
 |                     |                                                      | AVD single dose  
 |                     |                                                      | VINC dose  
 |                     |                                                      | VA single dose  
 |                     |                                                      | RMS Topo/cyclo  
 |                     |                                                      | TOPO Single ag  

**LEUKAEMIA**

HSCT regimens are in a separate section below.

<table>
<thead>
<tr>
<th>DIAGNOSIS</th>
<th>Reference/Notes</th>
<th>First line regimens</th>
<th>Second line</th>
</tr>
</thead>
</table>
| Acute lymphoblastic leukaemia (ALL)    | As per open studies UKALL2003. www.ctsu.ox.ac.uk/projects/leuk/ukall2003 UK ALL R3 (confirm current version with PI)  
ESPPhALL (confirm current version with PI)  
Interfant 06 (confirm current version with PI) | Protocol UKALL 2003 protocol Regimen A, B or C dependant on risk age > 1 year <1year Interfant 06  
Courses  
ALL03 IND A  
ALL03 IND B  
ALL03 IND C/A, C/B  
ALL03 CONSOL A  
ALL03 CONSOL B  
ALL03 CONSOL C  
ALL03 INTMAIT | * UKALL R3 protocol for relapse or refractory disease  
* R3 FLAD or FLAG – Ida then HSCT  
* Nelarabine for T-cell ALL then HSCT  
Protocols  
R3 UKALL v5 20/4/10  
Courses  
R3 CYCLET IND  
R3 INDUCT MIT  
R3 HR CONSOL |
| ALL03 INTM A | R3 CONSOLIDATION |
| ALL03 INTM B | R3 INTENSIF (2) |
| ALL03 INTM C | R3 INTERIM MAINT |
| ALL03 DI PEG | R3 FLAD |
| ALL03 DI CYC A/B | R3 MAINTENANCE |
| ALL03 DI CYC (2)C | R3 EOT MAINT |
| ALL03 MAINT | AML17 FLAG-IDA |
| ALL03 EOT MAINT (SDI B, SDI G, 2DI B, 2DI G, C BOYS) | (CNS) |
| ALL03 MAINT | NELARABINE |

**ESPhALL courses (no c/c protocol available)**

- ESPHALL 1B + IM
- ESPHALL DELR 2A
- ESPHALL DELR 2B
- ESPHALL HR1
- ESPHALL HR2 (SL)
- ESPHALL HR3

**Interfant courses (no c/c protocol available)**

- INFT06 PREPHASE
- INFT06 INDUCTION
- INFT06 CNS+ IND
- INFT06 ADE
- INFT06 MAE
- INFT06 PROT 1B
- INFT06 MARMA
- INFT06 OCTADA
- INFT06 OCTADAD
- INFT06 CYT MAINT
- INFT06 MTX MAINT
<table>
<thead>
<tr>
<th>Condition</th>
<th>Details</th>
<th>Protocol</th>
<th>Courses</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Acute myeloid Leukaemia (AML)</strong></td>
<td>As per open study AML 17 (paediatric) <a href="http://aml17.cardiff.ac.uk">http://aml17.cardiff.ac.uk</a> Downs patients as per AML 15 paediatric guideline <a href="http://aml15.cardiff.ac.uk">http://aml15.cardiff.ac.uk</a> Relapse courses as per closed AML relapse protocol</td>
<td>Protocol</td>
<td>AML17</td>
<td>* Re-induction and consolidation with FLAG or FLAD (2 courses) then HSCT</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Courses</td>
<td>AML17 ADE 10+3+5 (CNS) AML17 ADE 8+3+5 AML17 ADEGO3 (+CNS) AML17 ADEGO6 (+CNS) AML17 ARA-C 3 (+ CNS) AML17 FLAG-IDA AML17 ITS CNS AML17 MACE (+CNS) AML17 MIDAC (+CNS)</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Downs Courses</td>
<td>AML15 ADE 10+3+5 AML15 ADE 8+3+5 AML15 Ara-C 3 AML 15 ARA3 CNS AML15 ADE 10+CNS</td>
<td></td>
</tr>
<tr>
<td><strong>Acute promyelocytic leukaemia (APL)</strong></td>
<td>Proposed APL paediatric trial Int consortium for childhood APL. Treatment study for patients with acute APL &lt;21 years of age. ICC APL 01</td>
<td>Courses</td>
<td>(no c/c protocol available) APL ATRA MAINT APL CONSOL APL CONSOL II APL CONSOL III APL MAINT 1 APL Induction</td>
<td></td>
</tr>
<tr>
<td><strong>Chronic myeloid leukaemia (CML)</strong></td>
<td>NICE guidance</td>
<td>* Imatinib then HSCT. Hydroxyurea Courses</td>
<td>IMATINIB HYDROXYUREA</td>
<td>* Dasatinib if intolerant of imatinib then HSCT Courses</td>
</tr>
<tr>
<td><strong>Myelodysplasia</strong></td>
<td>JMML CMML Downs syndrome disease</td>
<td>* JMML mercaptopurine holding to HSCT Course</td>
<td></td>
<td>* cytarabine/etoposide IV if unresponsive to mercaptopurine</td>
</tr>
</tbody>
</table>
### Referral and Management Guidelines for Children’s Cancers within North Trent, Humber and Yorkshire Coast Cancer Networks

#### Myelodysplastic syndrome
- **MDS**
- **Refractory cytopenias**
- **Transient abnormal myelopoiesis (TAM) as per GOSH protocol**

Guideline for the investigation & management of haematological malignancy in childhood. SYours & Humberside Cancer Network

#### JMML Induction
- * Downs or MDS or RAEB use AML therapy (see above for courses)*
- * Sideroblastic RA, CMML, Myelodysplastic syndrome use HSCT*
- * TAM use cytarabine + exchange transfusion*

**Course**
- **TAM Ara-C**

#### HISTIOCYTOSIS

The Guidelines listed are available from the CCLG website members area (password protected).

<table>
<thead>
<tr>
<th>DIAGNOSIS</th>
<th>Reference/Notes</th>
<th>First line regimens</th>
<th>Second line</th>
</tr>
</thead>
</table>
| Haemophagocytic lymphohistiocytosis (HLH) | **HLH 04 closed trial**                     | * Etoposide/ciclosporin/steroid induction. Then HSCT if donor available & disease remains active  
Course: HLH04 Induction                                                                                                                                   | **HSCT**    |
|                            | **CCLG LCH guidelines 2010**                 |                                                                 **2nd line**  
As per standard therapy arm Courses LCH3 INDUCTION LCH3 INDUCTION2 LCH3 CONTINUING LCH3 CONT GP2/3                                                                 |             |
|                            | **Lymphohistiocytosis (LCH)**                |                                                                 * Re-induction if on maintenance  
* Bony disease on treatment cladribine 5mg/m²/dy x 5 q 21 days                                                                                               | **LCH Cladribine** |
### STEM CELL TRANSPLANT & ASSOCIATED TUMOURS

Treatment is as per JACIE approved guidelines.

<table>
<thead>
<tr>
<th>DIAGNOSIS</th>
<th>Reference/Notes</th>
<th>First line regimens</th>
<th>Second line</th>
</tr>
</thead>
<tbody>
<tr>
<td>ALL or Lymphoma</td>
<td>JACIE guideline HSCT 010</td>
<td>Age &gt; 3yr Ciclo120/TBI with ATG/ C1H Courses</td>
<td>2nd HSCT FLU/MELPH140/ATG courses BMT M-Allo (C1H)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Age &lt;3yr TREO12/CY120/MELPH/ATG(C1H) Courses</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>BMT TR/CY/((C1H)</td>
<td></td>
</tr>
<tr>
<td>CML</td>
<td>JACIE guideline HSCT 010</td>
<td>Treo14/CY120/ATG or C1H Courses</td>
<td>2nd HSCT FLU/MELPH140/ATG courses BMT M-Allo (C1H)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>BMT TR/CY/ATG</td>
<td></td>
</tr>
<tr>
<td>AML, JMML, MDS</td>
<td>JACIE guideline HSCT 010</td>
<td>TREO/CY120/MELPH/ATG or C1H Courses</td>
<td>2nd HSCT FLU/MELPH140/ATG courses BMT M-Allo (C1H)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>BMT TR/CY/((C1H)</td>
<td></td>
</tr>
<tr>
<td>HLH</td>
<td>JACIE guideline HSCT 010</td>
<td>TREO/CY120/Etop/ATG or C1H Courses</td>
<td>2nd HSCT FLU/MELPH140/ATG courses BMT M-Allo (C1H)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>BMT HLH ATG/C1H</td>
<td></td>
</tr>
<tr>
<td>Aplastic anaemia</td>
<td>JACIE guideline HSCT 010 CCLG rare marrow disorders guideline. Aplastic anaemia in childhood. 2005</td>
<td>Matched Sibling HSCT or immunotherapy (ATG/steroid/ciclosporin) Courses Aplastic anaemia BMT Aplastic</td>
<td>HSCT CY200/ATG Course BMT aplastic</td>
</tr>
</tbody>
</table>
15. Policy for Preventing Regular Use of Regimens Not on the Accepted List (09-7A-131)

1. CHEMOTHERAPY PRESCRIBING

Chemotherapy treatment will be agreed by the relevant MDT meeting and documented in the MDT minutes. Initial treatment for each care episode will be allocated or authorised by the named consultant or the on call consultant.

All chemotherapy treatment that is approved by the network Chemotherapy strategy group will be allocated and prescribed using the computerised prescribing system Chemocare. The list of approved treatments is maintained on chemocare. Chemocare is available on all the computers in the clinic rooms, ward station and office, in A3 and on individual medical staff terminals in the department. Permission to prescribe and to access the programme requires a password and training. Registrars will receive training from the Senior oncology pharmacist, and from the consultants. Nursing and junior medical staff will receive training to use the system for information on planned chemotherapy but cannot prescribe.

Under certain circumstances it may be necessary to give treatment that is not on the approved list. These include:

- Use for palliative treatment when agreed guidelines for specific tumour type have been tried with inadequate response
- Use for palliative treatment when recommended treatment is unacceptable to the patient or family (only after relapse/progression)
- When current treatment has unacceptable toxicity in a specific patient
- New nationally approved guidelines circulated since last annual review date for chemotherapy courses
- Treatment in use elsewhere that has documented efficacy or survival advantage compared with current recommendations
- New R&D approved clinical trials
- Rare tumour/diagnosis which is not specified on the approved list.

Chemotherapy treatment that is agreed at the relevant MDT meeting but is not on the approved list needs a “SINGPAT chemotherapy request form” to be completed and sent with the evidence for use to the Senior Oncology pharmacist or deputy.

The course of treatment will then be entered onto chemocare or re-instated from the archive. New courses will be signed off by the requesting consultant; archived courses may have additional diagnoses added. The course will be released for that patient only then unreleased. There will be retrospective notification to D&TC of necessity to use treatment not on the accepted list with an annual review of all exceptions.

Monitoring requirements and critical tests that are required prior to starting chemotherapy courses are incorporated into the Chemocare prescribing system at the point of authorisation. Chemocare prescriptions have a protected authorisation system which acts as a legal signature.

Chemotherapy charts must be printed on pink card or paper, intrathecal chemotherapy on yellow paper or card. For restrictions on prescribing intrathecal chemotherapy see haematology/oncology guidelines Section 1 – Intrathecal Protocol. Chemotherapy and hydration will be prescribed in the correct order of administration, with compatibility checked between all vehicles and drugs which will run concurrently through a single lumen. If vehicle volumes are not clinically critical, pharmacy will complete the fluid volumes to maximise
stability. Non-cytotoxic drugs which are part of the treatment protocol, i.e. steroids, hydration, are prescribed on the pink oral treatment card on chemocare (this is to ensure accurate record of treatment given), and additionally on the white in-patient chart to record administration.

Always refer to the current treatment protocol when prescribing a chemotherapy prescription and take note if dose modifications are required because of previous toxicity or age.

Doses are generally prescribed according to the surface area of the child, but in small children or in certain protocols doses may be based on weight. Alternatively small children may have percentage dose reductions. Check the protocol carefully. Children should have their surface area calculated prior to the prescription of chemotherapy. Surface area can be accurately estimated from weight (providing the child is not obese or severely malnourished) by reference to the CCLG chart on the ward. Alternatively surface area can be calculated using weight and height (preferably done by the auxologist in Growth and Measurement), which may be preferable if children are obese or severely underweight.

Ensure that contra-indicated drugs will be stopped 48 hours prior to treatment starting, e.g. cotrimoxazole and HD methotrexate, vincristine and itraconazole/voriconazole.

When patients are admitted, current oral chemotherapy should be reviewed before prescribing on the in-patient prescription chart. If the patient is critically unwell, e.g. in septic shock, oral chemotherapy should be delayed until the next working day. For admissions where infection is possible but the child is clinically well, the table below may provide a guide. If unsure always check with the consultant or specialist registrar. Consultants or specialist registrars will review treatment on the next working day for all patients admitted overnight.

<table>
<thead>
<tr>
<th>DRUG</th>
<th>Course/regimen</th>
<th>Action</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mercaptopurine +/- Methotrexate</td>
<td>Maintenance courses for leukaemia/lymphoma patients</td>
<td>Check blood count. If ANC &lt; 0.75 x 10⁹/L stop. Review next working day</td>
</tr>
<tr>
<td>Mercaptopurine/ Tioguanine</td>
<td>Consolidation/induction or intensification courses for leukaemia/lymphoma patients</td>
<td>Continue overnight. Review next working day</td>
</tr>
<tr>
<td>Dexamethasone/ Prednisolone</td>
<td>Leukaemia/lymphoma patients all courses if part of treatment. (see patient notes for details in protocol section)</td>
<td>Discuss with SpR or consultant if presenting with varicella zoster. Otherwise review next working day</td>
</tr>
<tr>
<td>Etoposide</td>
<td>Palliative chemotherapy courses</td>
<td>Stop if not tolerated or ANC &lt; 0.5 x 10⁹/L</td>
</tr>
<tr>
<td>Imatinib</td>
<td>Leukaemia Pre or post transplant</td>
<td>Stop if ANC &lt; 0.5 x 10⁹/L, bilirubin &gt; 3 x UNL or Creatinine &gt; 2 x UNL</td>
</tr>
<tr>
<td>Procarbazine</td>
<td>Hodgkins lymphoma CNS tumours</td>
<td>Continue Review next working day</td>
</tr>
<tr>
<td>Temozolamide</td>
<td>CNS tumours</td>
<td>Check blood count. If ANC &lt; 0.5 x 10⁹/L stop. Review next working day</td>
</tr>
</tbody>
</table>
2. CHEMOTHERAPY ADMINISTRATION

For details of intrathecal drug administration please refer to the Intrathecal drug protocol located in section 1 of the Haematology/oncology guidelines. Intrathecal chemotherapy must only be given by a doctor who has been appropriately trained in the administration of drugs by this route and whose name appears on the ITC register.

Validated trained nursing staff, or trained medical staff, may administer intravenous chemotherapy through central venous lines. A central register will be kept on M3 of all trained nursing and medical staff with this guideline. Nursing staff may also give cytotoxic drugs by intramuscular or subcutaneous injection or connect chemotherapy infusions to an established peripheral cannula.

If a child does not have a central line, then intravenous chemotherapy must be given by a member of the medical staff who has been instructed and validated for safe administration of chemotherapy. This should be through a freshly sited peripheral venous cannula. If it is not possible to put in a new cannula, it is essential that the patency of the cannula be assessed prior to the administration of any cytotoxic drugs.

All chemotherapy is prepared in pharmacy. It will be supplied to the ward/clinic only when intention to proceed with treatment has been confirmed verbally or electronically. No intravenous chemotherapy will be supplied for patients in theatre. Each product MUST be checked by two people against the prescription. One or both must be a nurse who is qualified to administer intravenous chemotherapy. Administer according to the nursing procedure for administration of chemotherapy (see Section 4.3 for chemotherapy at home).

It is essential that the patency of the intravenous access be confirmed by administration of a 0.9% sodium chloride bolus, prior to the administration of any cytotoxic drugs. Check and note if the line bleeds back. If a central line does not bleed back, it can still be used for administering chemotherapy, providing it is certain that forward flow into the vein is satisfactory. If in any doubt do not use the line until checked by a more senior colleague. This is particularly important if drugs are to be given through a peripheral line.

All staff involved in administration or checking must fully understand the chemotherapy schedule and details of administration (e.g. rate, duration, flushing volumes, compatibilities). For vinca alkaloid administration refer to the separate section Haematology/Oncology guidelines section 4.2.

Do not change rates, lumens, timing or order of administration without specific advice. Obtain advice from a more senior doctor (including the consultant on call if necessary) if any clarification is required. It is only possible to change the timing in certain protocols and never by more than 1 hour per day. Information regarding chemotherapy compatibility with other medication can be obtained from the Oncology Pharmacists.

If different drugs are to run sequentially a flush must be run between drugs at the same rate as the completed infusion. It is not necessary to flush between two bags of the same drug in the same vehicle. For bolus injections or infusions from a syringe give at least 10mls sodium chloride 0.9% injection. For infusions from a burette and giving set infuse at least 20mls sodium chloride 0.9% injection. Use dextrose 5% if either drug is incompatible with saline. (Refer to Appendix I this section, also available in the ward treatment room).

Cisplatin, high dose cyclophosphamide, ifosfamide, melphalan and high dose methotrexate require specific hydration therapy to counteract their toxicity during and immediately after
their administration. See later in this Section (5) for more details, but also always refer to the treatment protocol in the case notes.

All staff have a duty to protect themselves from exposure to chemotherapy by wearing appropriate clothing, including gloves, and footwear. It is a legal requirement to dispose of all cytotoxic waste in cytotoxic labelled bins for safety in handling of waste.

Staff and parents who are pregnant are advised not to handle chemotherapy or patient excreta during and up to 48 hours after completion of chemotherapy.

Staff should be aware of the following SCH (NHS) FT guidelines:

- Haematology/oncology guidelines Section 1 Intrathecal administration of cytotoxic drugs policy
- Haematology/oncology guidelines Section 4.2 Vinca alkaloid protocol and waiver
- Guidelines for the handling and administration of cytotoxic Drugs
- Guidelines for the administration of cytotoxic drugs by IM or SC route
- Guidelines for the administration of oral cytotoxic drugs
- Guidelines for the administration of cytotoxic drugs by the IV route
- Guidelines for the administration of bolus cytotoxic drugs by a Central Venous Catheter
- Haematology/oncology guidelines Section 4.5 Extravasation guideline
- Guidelines for the management to be taken in the event of a cytotoxic drug spillage
- Guidelines for the disposal of cytotoxic drug waste
- Guidelines for the handling of excreta from children receiving cytotoxic drugs

3. MONITORING

Pre-treatment monitoring, to avoid excessive chemotherapy toxicity, is detailed in the protocols in the patient notes and in the investigations section 3, Haematology/Oncology guidelines.

Nursing and medical staff should be vigilant for respiratory and haemodynamic changes during chemotherapy administration.

Regular checks of the IV access area are necessary for vesicant chemotherapy. See Haematology/oncology extravasation guideline 4.4. Allergic reactions are treated according to severity of symptoms. Early recognition of symptoms is vital and patients and parents should be advised to summon assistance in the event of any CNS, respiratory or skin changes. Refer to the SCT resuscitation handbook on the ward for emergency management of an allergic reaction. Skin reactions can be managed with oral or topical antihistamines and/or steroids. All reactions must be reported to a senior medical colleague, for assessment of the likelihood of recurrence and implications for future treatment. Proven or severe reactions must be documented on the medic-alert form in the front of the medical notes.

The following chemotherapy drugs are known to cause allergic reactions, but any individual may react to any drug or excipient.

<table>
<thead>
<tr>
<th>DRUG</th>
<th>MOST COMMON REACTION</th>
</tr>
</thead>
<tbody>
<tr>
<td>Asparaginase</td>
<td>Type 1 (rash), progressing to type 3 (anaphylaxis &amp; bronchospasm) reactions.</td>
</tr>
<tr>
<td>Bleomycin</td>
<td>Fever and respiratory complications. Rare hyperpyrexia syndrome.</td>
</tr>
</tbody>
</table>
Cytarabine | Flu like syndrome  
---|---
Etoposide | Type 1 (rash), progressing to type 3 (anaphylaxis & bronchospasm) reactions.
Cisplatin, carboplatin | Late onset rashes. Re-challenge may lead to bronchospasm and anaphylaxis.
Procarbazine | Type 1 allergic rashes. Mild Monoamine-oxidase type reactions have been reported if taken concurrent with tyramine containing foods.
Rituximab, Gemtuzumab, Alemtuzumab | Mouse derived protein reactions. Pre-medicate with steroid and antihistamine. Slow infusion if hypotension occurs.
Antithymocyte globulins | Rabbit or Horse derived protein reactions. Pre-medicate with steroid and antihistamine.

See Haematology/oncology guidelines section 5 for monitoring and management of common chemotherapy toxicities.

4. **HYDRATION FLUIDS**

Chemotherapy that has renal or uroepithelial toxicity requires accompanying intravenous hydration to ensure an adequate fluid through-put. Even if a child is drinking, the following drugs should not be given without intravenous hydration:

- Oral busulfan
- Cisplatin
- Cyclophosphamide at daily doses > 1g/m²
- Ifosfamide
- Methotrexate at doses > 1g/m²
- Melphalan

Hydration may also be required to prevent a build up of toxic breakdown products of tumour cells. (See Haematology/Oncology guidelines Section 5.1 - Tumour lysis) or in patients who have an inadequate oral intake during any chemotherapy (in addition to the drugs noted above).

**HYDRATION RATES** – Hydration is usually given at a rate of 2000-3000ml/m²/24 hours (84-125ml/m²/hr), taking into account the fluid volumes of the chemotherapy. Hyper-hydration with 200ml/m²/hr for 3-4 hours may be required to pre-hydrate patients having cisplatin or melphalan. The fluid chosen should have sufficient sodium content to avoid hyponatremia and potassium to prevent hypokalaemia. Recommended fluids are generally:

<table>
<thead>
<tr>
<th>5% dextrose + 0.45% sodium chloride</th>
<th>Hydration for less than 6 hours/day</th>
</tr>
</thead>
<tbody>
<tr>
<td>2.5% dextrose + 0.45% sodium chloride + potassium 20mmol/L</td>
<td>Hydration for &gt; 6 hours/day</td>
</tr>
<tr>
<td>4% dextrose + 0.18% sodium chloride + potassium 20mmol/L</td>
<td>Methotrexate hydration (with sodium bicarbonate)</td>
</tr>
<tr>
<td>5% dextrose + 0.45% sodium chloride</td>
<td>Hydration for prevention of tumour lysis</td>
</tr>
</tbody>
</table>

This may change according to compatibility of chemotherapy and fluids, or individual patient haemodynamics. Hydration bags contain up to 3000mls. For quantities > 3000ml/24 hours
the daily hydration fluid will be split into 2 equal bags. Very large children (> 1.4m²) do not require > 4000-5000ml/24 hours total fluid, so fluid volumes/m² should be reduced to avoid fluid overload.

Hydration above maintenance requirements can lead to fluid overload. Monitor fluid balance, allowing for bed wetting and vomiting or watery diarrhoea and check that there is adequate urine output. A “significant” positive balance will vary with the weight of the child but in general represents a +ve balance of > 25 mls/kg. Frusemide IV (0.5mg/kg) may be necessary to maintain output (unless specifically contraindicated).

It is essential that children receiving ifosfamide or higher dose cyclophosphamide pass urine at least every 4 hours, as this minimises bladder toxicity. They should be encouraged to pass urine, and if necessary frusemide should be given.

Renal function should be monitored routinely throughout chemotherapy with hydration. A daily electrolyte and serum creatinine check should be sufficient in most cases.

Electrolyte containing fluid which extravasates is potentially irritant/vesicant. In the event of extravasation refer to Haematology/Oncology guidelines Section 4.4.

5. INTRAVENOUS ADDITIVES

MESNA is added to prevent urothelial toxicity. It is given whenever ifosfamide is given and also in regimens where the cyclophosphamide dose exceeds 1g/m².

If dose of cyclophosphamide < 300mg/m²/day then mesna is not required, providing there is adequate oral fluid input and micturition is encouraged.

For doses cyclophosphamide 300 mg / m² to 1 g / m² no mesna is required. IV hydration is given at 125 mls/m²/hour commencing with or before the first cyclophosphamide dose and continuing for at least six hours after last cyclophosphamide dose. Always check individual protocols for details.

It is essential to maintain hydration in the event of line occlusion. Patients who have a double lumen may be able to have fluids piggybacked to the chemotherapy, with mesna as bolus doses every 6 hours or orally every 6 hours. Seek advice on compatibility from the oncology pharmacist.

The final bag of post hydration may be speeded up by 30% on the advice of a registrar or consultant, providing the total rate does not exceed 200ml/m²/hr, the minimum duration of hydration is maintained (see above), and the patient has no haematuria or fluid overload.

If a child develops haematuria whilst receiving cyclophosphamide or ifosfamide

- Check the fluid regimen to ensure that they are receiving intravenous hydration at rate of 3000 mls/m²/day (125 mls/m²/hr). If not increase to that rate. If already receiving that rate increase hourly rate by 25%.
- Ensure that they have received Mesna as per the guidelines outlined in their specific protocol. If not then give Mesna as an infusion, if possible, or divide the total daily requirement by 4 and give every 6 hours as a bolus.
- If a child develops haematuria and is already receiving mesna at the appropriate dose, then give an extra bolus equivalent to 25% of the total daily mesna dose and increase the daily mesna dose by 25%. Increase fluid rate as described above.
SODIUM BICARBONATE is given with HIGH DOSE METHOTREXATE to maintain a urine pH > 7 throughout the methotrexate infusion and during the CALCIUM LEUCOVORIN RESCUE. Both drugs are essential to ensure excretion of the methotrexate and rescue of the normal cells. ALWAYS refer to specific protocol for details as this varies depending on dose and duration of administration of methotrexate.

Failure to excrete methotrexate, particularly if caused by renal impairment, may necessitate the use of carboxypeptidase G2 (Voraxaze™) in addition to leucovorin. This contains glucarpidase, a recombinant enzyme which rapidly breaks down methotrexate in the blood. Emergency supplies are available on a named patient basis. The consultant should contact pharmacy to arrange supplies, or the on call pharmacist out of hours. It is necessary to stop leucovorin rescue for 2 hours pre and 2 hours post a carboxypeptidase dose.

MANNITOL is added to CISPLATIN hyper-hydration to force diuresis and minimise renal damage. Frusemide can exacerbate renal toxicity with cisplatin and increase electrolyte loss. Fluid balance should therefore be maintained with additional mannitol. Refer to specific protocol for details.

For fluid overload during the last 18 hours of post chemotherapy hydration, give an additional infusion of 1-2g/kg mannitol over 2-6 hours. Use a separate lumen to the hydration.

References:
SCH A/E guidelines on allergy 3.7
SCH policy on Chemotherapy administration
Nursing chemotherapy administration policies
The Hazardous Waste (England and Wales) Regulations 2005
Chemocare SOP - Prescribing on Chemocare, JACIE SOP Chemotherapy Prescribing for BMT patients.
Hypersensitivity reactions to systemic chemotherapy. 2004 Up to date in Haematology and oncology.
UKCCSG drug monographs
SPC carboxypeptidase G2 (supplied by manufacturer)

Section 4.1 written by Dr M Gerrard, Revised by J Buckham, March 2010) (Approved by Oncology / Haematology team, May 2010)
Appendix II

Request to use patient specific regimen for chemotherapy on the authority of a named consultant

Proposed Treatment
(Drugs/doses/scheduling)..........................................................................................................................
..................................................................................................................................................................
..................................................................................................................................................................

References must be attached.

Clinical Data

Name of Patient ................................................... Sex .................
Date of birth ...............................................................................................................................
Weight /SA (if applicable)..................................................................................................................
Hospital number .................................. Diagnosis .........................................................
..............................................................................................................................................................

Reason for not using approved therapy..........................................................................................
..............................................................................................................................................................
..............................................................................................................................................................

Consultant’s signature ....................................................................................................................

Date ..............................................................................................................................................

Declaration of interests:

Please return this form to: Jane Buckham, Senior Oncology Pharmacist

Please note that this treatment may only be used by the named Consultant for the named patient.

This request will be passed to the next Drugs and Therapeutics Committee for monitoring.
PHARMACY/CHEMOTHERAPY GROUP USE ONLY

Name of regimen/course ...........................................................................................................

Entered on c/c
by.............................................date....................................................................

C/C Signed off by
consultant.................................date...................................................................

Release date......................................................by...................................................

Unreleased date..................................................by.............................

Cost of a course ...................................................................................................................

Sing pat drug request necessary? Y/N for
..............................................................................................................................................

..............................................................................................................................................

Authorised by Senior Pharmacist (signed)..........................................................

Date passed to the Drugs and Therapeutics Committee for monitoring..........................

Recommendation
16. CCN Common Guidelines on Chemotherapy Complications (09-7A-133)

The full clinical guidelines including those below are available on the Sheffield Children’s Hospital intranet to all staff answering advice calls. Please refer to current guidelines when giving telephone advice or refer call to a more senior advice if there are any concerns.

i. Cytotoxic Administration Techniques.
ii. The Care of Venous Access Devices, including treatment of line complications.
iii. The recognition and treatment of Cytotoxic Extravasation.
iv. Recognition and treatment of allergic reactions including anaphylaxis.
v. Use of blood products.
vi. Tumour Lysis Syndrome.
viii. Stomatitis, Diarrhoea and other Mucositis.
ix. Mouthcare

From May 2011 the shared care clinical guidelines for Paediatric Malignancy and Haematological conditions will be available on the NTCN website under the children’s cancer area. These documents are controlled via the internal document control at SC(NHS)FT and updated as internal updates are carried out.
17. CCN List of Low Risk Regimens (09-7A-136)

All nursing staff, including community based nurses, have been trained to type 2 full level chemo administration and oncology skills. Please see below the list of low risk regimens which can also be found on the Sheffield Children’s Hospital intranet site, and are a part of the Chemo Care computerised prescribing system. These regimens may be given in the home setting or a District General Hospital.

<table>
<thead>
<tr>
<th>BONE TUMOUR</th>
<th>Reference/Notes</th>
<th>First line regimens</th>
<th>Second line</th>
</tr>
</thead>
<tbody>
<tr>
<td>Osteosarcoma (localised)</td>
<td>First line – open (randomised) trial EURAMOS-1 NB this trial is run by MRC not Birmingham CRCTU <a href="mailto:euramos1@ctu.mrc.ac.uk">euramos1@ctu.mrc.ac.uk</a></td>
<td>EURAMOS IFn or IFn C1</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>LYMPHOMA</th>
<th>Reference/Notes</th>
<th>First line regimens</th>
<th>Second line</th>
</tr>
</thead>
<tbody>
<tr>
<td>NHL (T cell)</td>
<td></td>
<td>Individual courses LB02 IND 1B LB02 RE-IND 2B</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>PALLIATIVE TREATMENTS</th>
<th>Reference/Notes</th>
<th>Regimens</th>
</tr>
</thead>
</table>
| Haematology palliative | | Symptom dependant  *
Vincristine ± steroid
* Oral Etoposide
Courses VINC dose |
### LEUKAEMIA

<table>
<thead>
<tr>
<th>DIAGNOSIS</th>
<th>Reference/Notes</th>
<th>First line regimens</th>
<th>Second line</th>
</tr>
</thead>
<tbody>
<tr>
<td>Acute lymphoblastic leukaemia (ALL)</td>
<td>As per open studies UKALL2003. <a href="http://www.ctsu.ox.ac.uk/projects/leuk/ukall2003">www.ctsu.ox.ac.uk/projects/leuk/ukall2003</a>  UK ALL R3 <em>(confirm current version with PI)</em>  ESPhALL <em>(confirm current version with PI)</em>  Interfant 06 <em>(confirm current version with PI)</em></td>
<td>Protocol  UKALL 2003 protocol  Regimen A, B or C dependant on risk age &gt; 1 year  &lt;1year Interfant 06 Courses  ALL03 CONSOL B  ALL03 CONSOL C  ALL03 DI CYC A/B  ALL03 DI CYC (2)C  Interfant courses <em>(no c/c protocol available)</em></td>
<td>INFT06 PROT 1B  INFT06 OCTADA  INFT06 OCTADAD</td>
</tr>
</tbody>
</table>

There are a selected number of paediatric community staff across the PTC catchment area who are trained by the PTC to administer children’s chemotherapy in the community unsupervised. They are under honouree contracts to the PTC and their continued chemotherapy training is monitored and reviewed by the Lead Nurse at the PTC. Measure 09.6A.201 refers.
18. CCN Training and Qualifications for Staff for the 24-Hour Telephone Service (09-7A-137)

24 Hour Telephone Advice Service for Sheffield Children’s Foundation Trust

1. Introduction
   The aim of this policy is to establish the framework for the provision of the 24 hour telephone advice service to patients and parents, carers and families, treated at SCHFT as recommended in the Quality Measures for Children’s Cancer (DH 2009).

This 24 hour advice service is provided by the Principal Treatment Centre at the Sheffield Children’s (NHS) Foundation Trust, which is the common access point for across the Networks served by the Principle Treatment Centre.

The aim of the policy is to further ensure that patients, carers and families and professionals receive prompt, appropriate information and advice from staff who have the agreed level of training, knowledge and competence, as set out in the NICE Improving Outcomes Guidance (NICE 2005) and further recommended within the report of the National Chemotherapy Advice Group (NCAG: DH 2009).

2. Contact points for service

Patients and families under the care of SCHFFT oncology unit are given the following contact advice points such that they have access to direct advice 24 hours a day. They also have open access admission to the paediatric oncology ward M3 at SCHFT.

1. Key worker phone number – our Paediatric Oncology Outreach Nurses and Specialist Nurses for Leukaemia and Late Effects are nominated at key workers and are available via mobile phone or clinic phone number with in working hours. Thus patients or carers may contact a member of staff who they know well between 9am and 5pm.

2. The oncology ward M3 acts as a 24 hour advice service point that backs up the key worker outreach service round the clock. The ward is only staffed by oncology nursing staff and always has chemotherapy trained nursing staff (Band 6 or above) available for advice. They have access to medical staff including ST3 juniors, Specialist registrars, and the on call consultant 24hours a day if they feel this is required.

3. Level of experience

The key workers are all senior nursing staff (band 7) who have experience in working with children with malignancies, giving chemotherapy and know their given patients group well. Obviously this service is limited to the working hours of the individual and this
requires the back up of the 24hour service of the paediatric oncology ward. However in day to day working practice this is often the preferred route of advice taken by families.

These key workers have immediate access to consultant oncologists and haematologists advice should they deem this necessary and all patients have open access to the ward and will be advised to attend for medical review if required.

The Oncology Ward M3 only treats children with malignancies or haematological conditions. The ward is staffed by oncology trained nursing staff and always has chemotherapy trained nursing staff (Band 6 or above) available for advice. They have access to medical staff including ST3 Junior Doctors, Specialist Registrars, and the on call consultant 24hours a day if they feel this is required.

Calls received out of hours are discussed on the ward round the next morning as a means of good communication and monitoring of advice given.

Should the staff member deem it necessary they will take a contact number of the caller and contact the consultant on call to phone them back and discuss the situation directly with the caller.

The nurse in charge of the ward also has the ability to request that the patient attend the ward on an open access basis without necessarily contacting the medical staff first if it is deemed necessary i.e. Febrile patients likely to be neutropenic.

4. Information resources available to staff giving advice.

All staff giving telephone advice have immediate access to the department’s and hospital wide clinical guidelines both via the SC(NHS)FT intranet and in paper form on the oncology ward M3. These documents are controlled and updated on a regular basis according to our intranet document control systems.

5. Advice for professionals

Professionals wishing to discuss patients know to the service have access to two routes of seeking this 24 hours a day.

1. Ward M3
   The ward staff frequently take advice calls for district general staff with regard to patients for potential referral, currently on treatment or previously treated by the PTC. These calls are able to be forwarded to the consultant on call directly should this be required.

2. On call registrar or Consultant Oncologist or Consultant Haematologist. Professionals seeking referral advice are put directly through by switch board to either the Specialist registrar or Consultant on call depending on the level of advice required. When the consultant on call is an oncologist there is always a Consultant Haematologist available for telephone advice with regards to hematological disorders. The haematology advice service is widely used by clinicians caring for children through out the region.

6. Contact Numbers

WARD M3 SCHFT 0114 271 7322
SCHFT Switch board 0114 271 7000
19. CCN Guidelines/Protocols for the Referral of Patients with Complications Related to Chemotherapy (09-7A-138)

A Guideline for the management of patients with Complications of Chemotherapy treated at Sheffield Children’s NHS Foundation Trust

1. Background
2. Contact numbers
3. Information resources available
4. Patient presenting during acute chemotherapy treatment
5. Patient presenting with a past history of cancer treatment
6. Patients currently on treatment at another cancer centre presenting on holiday

1. Background

Families with children treated at SCH (NHS) FT malignant haematology and oncology service have open access to our ward and clinic for the duration of their active treatment and 6 months beyond. Thereafter they have telephone access to our service and will be seen directly if they have significant symptoms related to disease or its treatment either in our clinic or as a ward attendee.

The complications of disease and treatment for paediatric cancer are multiple, complex and specific for each child. The risk of rapid clinical deterioration of these patients and those of drug interactions due to polypharmacy are significant in children on treatment.

We ask parents to contact us directly for all of their child’s healthcare needs whilst they are on treatment for a malignancy even for minor ailments. We specifically advise that they do not take their child to their GP or another hospital without prior discussion with us. If the situation arises where another healthcare professional is consulted about a child under our care we ask that they contact us promptly to discuss management even if they would normally be happy to manage the clinical presentation in a healthy child.

2. Contact numbers

In hours 9 – 17.00 Monday to Friday.

You are welcome to contact the medical staff directly via switch board in normal working hours. If you have any difficulty in this then the staff on the Haematology Oncology ward M3 will be happy to advise or contact someone to call you back as appropriate.

SC(NHS)          FT switch board       0114 271 7000
Named haematologist or oncologist for patient
Oncology Specialist Registrar
Haematology specialist Registrar

WARD M3          0114 271 7322

Out of hours 17.00 to 9 am Monday to Friday, or weekend.
Out of normal working hours we ask that you contact the staff on M3 as your first point of contact. They have access to consultant and junior medical staff on call who can call you back if required.
1. Information resources available

The medical and nursing staff at the PTC have full access to the clinical guidelines on the SC(NSH)FT intranet for such complications as:

1. Neutropenic Sepsis
2. Cytotoxic Extravasation
3. Nausea and Vomiting associated with chemotherapy
4. Cytotoxic complications including, Mucositis, constipation,
5. Portacath and hickman line complications

Our shared care guidelines are also available on the North Trent Cancer Network web site under children cancer and include guidance for a broad range for complications of children cancer, treatment complications and non malignant haematological conditions.

4. Patient presenting during acute chemotherapy or radiotherapy treatment.

We would prefer to know about any illness in our patients currently on treatment or recently completed treatment in case they are presenting with symptoms suggestive of complications of treatment or relapsed disease.

We respectfully request that any physician discusses the patients with the centre before prescribing any medication other than those required immediately in a life threatening situation. The risk of rapid clinical decline and complex drug interactions is high in such patients.


Where a patient is fully recovered and off treatment for more than six months the clinician is welcome to contact the department if they feel the presenting symptoms may possibly be related to previous treatment or relapsed disease.

Beyond 6 months off treatment clinicians should have a low threshold for contacting the department if the patient’s previous treatment included a bone marrow transplant or high dose chemotherapy.

Children and young adults treated for a paediatric malignancy have an increased risk of experiencing a second malignancy compared to the general population.

6. Patients currently on treatment at another cancer centre presenting on holiday

It is always best to contact the centre that knows the child best if possible first. However if that centre deem it necessary for the child to be admitted for treatment or assessment locally we are more than happy to see such children. If you have difficulty in contacting the patients treating clinician for advice we would be happy to help. Often we may have basic information already about children planning to travel to the area from the treating cancer centre in case such a situation arises.
20. CCN Radical Radiotherapy Policy (09-7A-139)

All children receiving Radical Radiotherapy needing sedation or general anaesthesia are treated at Weston Park Hospital in Sheffield, which is the only Radiotherapy department in the North Trent Children’s Cancer Network. Treatment is delivered under the care of a Clinical Oncologist Dr Simon Pledge who is a core member of the PTC diagnostic and treatment MDT. Please refer to the Radiotherapy treatment handbook for working practices. Radical treatments given according to Children’s Cancer and Leukaemia Group (formerly United Kingdom Children’s Cancer Study Group) guidelines. Full current protocols for all major tumour types are available on the CCLG (formerly UKCCSG) website http://www.cclg.org.uk/ and are used to guide treatment. Where possible a copy of the relevant section should be printed out and accompany the notes through planning.

21. CCN Palliative Radiotherapy Policy (09-7A-140)

All children receiving Palliative Radiotherapy are treated at Weston Park Hospital in Sheffield, which is the only Radiotherapy department in the North Trent Children’s Cancer Network. Treatment is delivered under the care of a Clinical Oncologist Dr Simon Pledge who is a core member of the PTC diagnostic and treatment MDT. Please refer to the Radiotherapy treatment handbook for working practices. Palliative treatments given on an individualised basis. Craniospinal techniques for medulloblastoma etc see neurology section. Facilities available for GA/sedation should be available where necessary but avoided if possible by early involvement of the Play Specialists.
22. CCN Psychosocial Assessment Guidelines (09-7A-141)

Version 1: July 2010
Author: Dr Liz Fitzpatrick, Consultant Clinical Psychologist
Approved by: Children & Young Peoples Cancer Network Co-ordinating Group
North Trent Cancer Network / Humber & Yorkshire Coast Cancer Network

1. Guidance

09-7A-141 - The Children’s Cancer Network Commissioning Group should, in consultation with the Multi-disciplinary Teams (MDT’s), agree CCN-wide guidelines for the psychosocial assessment of patients and carers.

2. Definition

*Psychosocial care comprises the psychological and social supportive care for a child or young person and his / her family during active cancer therapy, long-term follow-up and palliative care, as well as for families after bereavement, and includes respite care.* (IOG, p.73)

3. Introductory statement

The statements in this guidance document are aimed specifically at children and young people up to 16 years of age and their families. In general, children and young people with cancer and their families want to live as “normal” a life as possible during their cancer treatment and beyond whilst “coping” with the impact of a serious illness. The impact of a cancer diagnosis can have emotional, social, cognitive, educational and practical consequences in addition to the challenges posed by the disease itself, its symptoms and side effects of treatment. In order for children to live full and active lives in the future they must be enabled to achieve their optimum potential during the treatment process. This means that at key stages of the care pathway, efforts should be directed at minimising the impact of the treatment on them and those caring for them. This document aims to provide information on what children and their families can expect from the MDT in terms of psychosocial assessment and support.

4. Operational context

The provision of psychosocial care at the Principal Treatment Centre at Sheffield Children’s Hospital occurs in the context of the implementation of a number of existing pieces of legislation and guidance documents relating to the care of children and young people. These include The Children’s Act (2004), the NICE Improving Outcomes Guidance (2005), Getting the Right Start: National Service Framework for Children, Young People and Maternity Services – Part 1 – Standards for Hospital Services (2003), amongst others.

The NICE IOG guidance for children and young people with cancer published guidance on how services should be delivered by NHS organisations in England. Its aim is to promote improved outcomes for all children and young people with cancer and to ensure a holistic approach in this endeavour. It is recognised that the psychosocial support needs of children will be highly individual and will change at different stages of the care pathway. The
provision of psychosocial care is complex and relies on the contribution of all members of the multi-disciplinary team, not only those traditionally ascribed this role.

The “More than my Illness” review (CLIC Sargent 2008) suggested a model of service delivery which aimed to support the implementation of the NICE guidance and help achieve the outcomes aimed for in “Every Child Matters”. This guidance suggests that every child should have access to: a fully integrated team of professionals co-ordinated by a “Key Worker”; information and empowerment to make informed choices; tailored packages of care that are individual to the child and family and take into account their unique circumstances; and that assessment and care planning is carried out at key stages of the care pathway.

The IOG recommends that structured assessments should be carried out at key points in a child’s cancer journey:

- at diagnosis
- during treatment
- at the end of treatment
- during long-term follow-up
- at relapse
- during palliative care
- at bereavement

Re-assessment may be required at other key points in the child’s life, e.g. at transition points; where there are changes in the personal or environmental circumstances of the child or family, e.g. financial, employment, housing. Re-assessment may also be triggered by a change in concern about the child’s health, general development, behavioural or emotional well-being, either by the child themselves, the family or by the professional system around them. Assessments are carried out in partnership with the child and family and other carers by building on previous discussions and knowledge of the child / family and not in a repetitious fashion. Methods of assessment may be structured and/or unstructured, verbal, written and observational and carried out by all members of the multi-disciplinary team. Each member of the team has particular skills and methods of assessment which they routinely employ. Assessments are made by different members of the team and include: information needs, coping skills, including previous coping and new methods needed, practical support issues including financial and housing issues, social and cultural circumstances, education related issues, employment related issues for parents / carers, psychological, emotional and spiritual issues.

Access to family support and particularly to siblings is a key message of the guidance. There should also be access to expert psychological support (e.g. Clinical Psychologists) with clear routes of referral and to neuropsychological services for assessment, particularly for those with CNS tumours. The role which other members of the team play in providing psychological and emotional support should be acknowledged and appropriate training and support provided.

6. **Psychosocial Assessment and Care at Sheffield Children’s Hospital PTC**

6.1 **Diagnosis**

During the process of making a diagnosis, the medical and nursing professionals involved, routinely gather psychosocial information as part of the early assessment process. It is usual that the medical diagnosis is shared with the child and their family and that other members of the team become involved from a psychosocial point of view after this time although this may vary in individual cases. All children are allocated a Paediatric Oncology Outreach Nurse...
Specialists (POONS), who may also act as key-worker for the child and are also allocated a CLIC Sargent Social Worker at or soon after diagnosis. All newly diagnosed children are discussed at the weekly Psycho-social MDT and Treatment Planning Meeting and this is the main formal forum to which all members of the MDT attend. Children's psychosocial needs are also discussed in individual MDT’s, and other team planning meetings, e.g. Leukaemia MDT, Solid Tumour MDT, Late Effects MDT, TYA MDT.

6.2 Post Diagnosis

Other members of the MDT, such as Play Specialists, Ward Teachers and the Teenage Cancer Trust Youth Support Co-ordinator are routinely involved with children’s care on the ward and conduct both psychosocial assessment and provide support. Play Specialist support is also available at all clinics. The Clinical Psychologists are fully integrated members of the team and aim to meet all newly diagnosed families and offer psychological support and intervention, neuropsychological assessment and supervision, support and training to other members of the MDT.

The Social Workers as well as other members of the team will make referrals for children where there are Safeguarding issues to the Trust Safeguarding Team, the Hospital Social Work Team and/or local Social Services Departments in line with local trust policies, local Safeguarding Board and national guidance. Onward referrals can also be made to Child and Adolescent Mental Health Teams in Sheffield or locally to families where there are concerns not relating to the cancer diagnosis and/or where there are serious concerns about a child’s significant mental health problems. The Clinical Psychologists or Medical staff usually make these referrals but all members of the team are able to do so and also to consult with these services for advice. Parents and carers can also be given information about where to refer themselves for further support around mental health difficulties, substance abuse, etc. and the members of the team will provide support and liaison to achieve this.

A child / family’s information needs will be assessed by most members of the team, and information is provided for all children and families from diagnosis according to their needs and may be in written, verbal or electronic forms. Each family is given a family held record, “The Blue Book” at diagnosis which contains information about numerous aspects of cancer care and the service itself and space for families to record various aspect of their journey. The details of its contents are provided in Appendix 2.

The role of members of the Psycho-Social Team is outlined below:

6.3 CLIC Sargent Social Workers

The CLIC Sargent Team offer practical, emotional and financial support together with Welfare Rights Advice to all families where a child has been diagnosed with cancer. They will see children and families on the ward, in clinic (at the Children’s Hospital or at the Late Effects Clinic at the Royal Hallamshire Hospital), at home, or at the Teenage Cancer Unit at Weston Park Hospital. They conduct comprehensive assessments of a child / family’s needs in a format consistent with the Common Assessment Framework (DCSF, 2004, CWDC, 2007). Any assessment at or post diagnosis and any re-assessment throughout the child’s cancer journey is completed in partnership with the child / family. A care plan is drawn up which includes consideration of the child / family’s information needs, coping skills, practical support issues, social and cultural circumstances, education-related issues and employment-related issues for parents / carers. The CLIC Sargent Social Workers have a lead role in conducting sibling support days and facilitating the “End of Treatment” meeting for children, siblings and parents. They also co-ordinate a peer support group for children / adolescents.
with the late effects of cancer treatment. As with all members of the team, they will refer to and/or consult with and work with other psychosocial members of the team.

6.4 **Paediatric Oncology Outreach Nurses**

The Paediatric Oncology Outreach Nurse Specialists (POONS) should be included in the initial consultation and present when the diagnosis / prognosis and treatment plans are discussed with the child and their family. This ensures that the family have a contact who can explain and re-iterate information and learn to cope with the diagnosis and on-going treatment. They often act as a child’s Key Worker and provide a holistic approach. They make home visits to administer some types of treatment, take blood samples, advise on care, help family’s access services like loan of specialist equipment. The POONS will identify and liaise with existing services involved and the available services in a child’s locality. Assessment of psychosocial needs is commenced at the time of diagnosis and built upon throughout the formation of a positive working relationship.

6.5 **Youth Support Co-ordinators**

Each young person over the age of 13 has access to the services of the Youth Support Co-ordinator who is based at the Teenage Cancer Trust Unit at Weston Park Hospital (a 5 minute walk away). The Youth Support Co-ordinator will visit young people on the children’s ward and organises activities which provide enjoyment while patients are receiving treatment at hospital and to encourage social interaction such as trips to the cinema, bowling, jewellery making, street magic, art therapy workshops and pizza nights. Along with organising group activities they also spend time with patients on their own catching up, playing board games or simply providing some company. Supervision is provided by the Lead Cancer Nurse for Teenagers and Young Adults.

6.6 **Play Specialists**

Play Specialists provide normal play and activity opportunities to aid children’s development and to provide a sense of normality in an otherwise unfamiliar and ‘abnormal’ environment. They are based on the ward and in the various clinics. They have a key role in preparing children for invasive procedures or other treatments such as radiotherapy, TBI or bone-marrow transplantation. They will use a variety of methods to assess and intervene with a child’s procedural anxiety including observation, role-play, using adapted toys, distraction, using expressive and creative play activities, photo-books, familiarisation visits and imparting information to the child in a developmentally appropriate way. They work particularly closely with the hospital teaching staff. The Play Specialists contribute to the psychosocial assessment of the child and communicate these through informal contact with other members of the team and through the weekly Psychosocial MDT Meeting as do all members of the team.

6.7 **Hospital Teaching Staff**

The Ward Teachers are closely involved in providing continued education for children diagnosed with cancer both on the ward and in the ward school-room. It is of significant concern to most children and their families that a child’s education suffers as little disruption during cancer treatment as possible. It can also help to maintain a child’s sense of self-esteem and a sense of normality. The teachers provide support and assistance to families and liaise with a child’s school from the point of diagnosis. Advice and assistance in the statementing process is provided for children and families. Home tuition may also be arranged if required and facilitation of special consideration or special arrangements will be made for examinations. The teacher’s assessments of the child’s abilities, aptitudes and
approach to learning provide valuable information in building a picture of a child’s needs in relation to coping with their cancer and its treatment and in guiding the assessment of the child’s information needs.

6.8 Clinical Psychologists

There are 1.65 WTE qualified Clinical Psychologists with dedicated input into the service. One psychologist is undertaking specialist training in Neuropsychology. Clinical Psychologists specialise in child and adolescent development, assessment and treatment and will work with any member of the family to offer psychological therapy, support and advice. The Clinical Psychologist may also refer children or carers to other services for specialist assessment or intervention, although in practice this is rare and most onward referrals are for parents / carers with significant mental health issues beyond those expected as the sequelae of coping with a child’s cancer diagnosis and treatment. The types of problems which the psychologists help with are varied and include: adjustment to diagnosis for the child, parents and siblings; behavioural problems around eating/feeding, sleeping and tantrums; anxiety problems such as those associated with the anticipation of procedures; general anxiety; depression; anger-control issues; family and peer relationship problems; mood changes; physical symptoms of treatment side-effects such as nausea and vomiting; body-image and identity issues; non-adherence to treatment; and un-explained intensity of physical symptoms.

Assessment and advice is also offered about problems with school / educational functioning, e.g. memory, concentration, cognitive ability. Psychometric and neuropsychological assessments are carried out to inform children, parents and schools about a particular child’s needs. Those children being treated with bone marrow transplantation should automatically be seen by the clinical psychologists and comprehensive psychological assessments are undertaken which may also include neuropsychological assessment as appropriate. Those children whose preparation includes total body irradiation are automatically also neuropsychologically assessed. Those with brain tumours are also likely to have an assessment in this manner. Re-assessment can take place at a number of different stages of the child’s cancer journey.

The Clinical Psychologists routinely meet most newly diagnosed children and their carers and any child or family member may be referred to them by any member of the MDT, either in person, by telephone, e-mail or in writing. They are also present at many clinics and are available for parents, children or other members of the team to consult with. The aim of the service is for the psychologists to be seen as a fully integrated member of the multi-disciplinary team and an “ordinary part of the patient journey” rather than an ‘add-on’ or after-thought. The weekly Psychosocial Meeting is chaired by one of the Clinical Psychologists.

As a profession, Clinical Psychology has a long tradition of skills-transfer to non-psychologists and so is keen to offer consultation, training and supervision in order to advance all clinician’s psychological skills and support them in their work. At the present time, ‘Reflective Practice’ meetings are facilitated by the psychologists for: the CLIC Sargent Social Workers and the POONs; the ward and clinic staff; and the Therapy staff (Physiotherapy and Occupational Therapy). Individual consultation and support is available to all members of the team on a request basis. The introduction of a standardised psychological assessment tool, The Distress Thermometer, is currently being investigated so that all members of the team may use this as a tool with patients and families. Some members of the MDT have completed the Advanced Communication Skills course and an assessment of further training needs will be conducted.
References


Appendix 1

Referral made to PTC

Information already known about a child (gathered from previous consultations during pre-diagnostic phase or from referring clinicians)

CLIC Sargent worker allocated. Assessments begun with child/family.

Diagnostic consultation
Consultant & POONS
(further psychosocial details taken & any assessment of need made)

POONS allocated

Information brought together in weekly Psychosocial MDT. Care plan formulated, & distributed

Assessments made by other members of the team (e.g. Play Specialists, Teachers, Physiotherapists, Occupational Therapists, Ward nurses, Clinical Nurse Specialists, Haematologists, Oncologists, Pharmacists, Dieticians).

Clinical Psychologist meets family & begins assessment. All children needing TBI have a comprehensive psychological and neuropsychological assessment made and sibling bone marrow donors are assessed in line with HTA requirements by accredited assessors from the team.

Regular reviews of all children and further information feeds into further re-assessment and care-plans

Onward referrals made to other services as appropriate, e.g. Child Protection, Child & Adolescent Mental Health Teams

Figure 1: Psychosocial Assessment process at Sheffield Children’s PTC
Appendix 2
Index of “Blue Book”

1. Welcome to the Ward M3 & Haematology & Oncology Outpatient Dept.
2. Who’s who & useful telephone numbers.
3. Venous access (Broviac & Portacaths).
4. Treatment side effects.
5. Treatment schedules, protocols & parents diary.
6. Chicken pox, measles & immunisations.
8. The internet & information booklets.
9. Advice on pets.
10. End of treatment & long term follow up
11. Effects of dexamethasone
12. Grandparents
13. Siblings
14. Diet advice (GOS)
15. Trial information
16. Tumour banking
17. ALL / AML, etc. booklets
18. CLIC Sargent information
19. Community Oncology Team information
20. Psychology information leaflet