

[Regimen Name](#) | [Drug Regimen](#) | [Cycle Frequency](#) | [Premedication & Supportive Measures](#) | [Dose Modifications](#) | [Adverse Effects](#) | [Interactions](#) | [Drug Administration & Special Precautions](#) | [Clinical Monitoring](#) | [Administrative Information](#) | [Key References](#) | [Other Notes](#)

A	REGIMEN NAME	MAGRATH PROTOCOL Chemotherapy
Cancer	Lymphoblastic Lymphoma Burkitt's Lymphoma	Curative Intent
Regimen Category	Core: Standard therapy endorsed by the Disease Site Group and a regimen widely used by most Integrated Cancer Programs in this disease site	
Rationale and Uses	First line therapy for Burkitt's lymphoma	

▲ [Back to Top](#)

B	DRUG REGIMEN
<u>Regimen A- CODOX M</u>	
<u>CYCLOPHOSPHAMIDE</u> (Round to nearest 10mg)	800mg/m ² in 500mL NS over 1hour IV Day 1
<u>CYCLOPHOSPHAMIDE</u> (Round to nearest 10mg)	200mg/m ² in 500mL NS over 1hour IV Days 2-5
<u>DOXORUBICIN</u> (Round to nearest 1 mg)	40mg/m ² IV Day 1
<u>VINCRIStINE</u> (Round to nearest 0.1 mg)	1.5mg/m ² (Max 2mg) IV Days 1, and 8 (also day 15 in cycle 3)
<u>CYTARABINE</u>	70mg IT Days 1, 3
<u>METHOTREXATE</u> (MTX) (Round to nearest 12.5mg)	1200mg/m ² in 1L NS over 1 hour IV Day 10
<u>METHOTREXATE</u> (Round to nearest 12.5mg)	240mg/m ² /hr in 1L NS over 23 hrs CIV Day 10 (after MTX 1 hour infusion)

B			
DRUG REGIMEN (continued)			
<u>LEUCOVORIN</u> (Round to nearest 1mg)	192mg/m ²	IV	Day 11 (12 hrs post completion of MTX CIV infusion)
<u>LEUCOVORIN</u> (Round to nearest 1mg)	12mg/m ²	IV	Day 11 (6 hrs post loading dose) Q6H until MTX level is < 0.1 µmol/L
<u>FILGRASTIM</u>	7.5µg/kg	SC	Starting day 13 (daily until ANC > 1.0 X 10 ⁹ /L)
<u>METHOTREXATE</u>	12mg	IT	Day 15
<u>Regimen B – IVAC</u>			
<u>IFOSFAMIDE</u> (Round to nearest 10mg)	1500mg/m ² in 500mL NS over 2 hours	IV	Days 1 to 5
<u>MESNA</u> (Round to nearest 1mg)	1500mg/m ² in 500mL NS over 2 hours	IV	Days 1 to 5 (concurrent with Ifosfamide)
<u>MESNA</u> (Round to nearest 1mg)	360mg/m ² in 100mL NS over 30min	IV	Days 1 to 5 (4 hrs post completion of Ifosfamide infusion, Q3H X 2 doses)
<u>CYTARABINE</u> (Round to nearest 10mg)	2000mg/m ² in 250mL NS over 1 hr	IV	Days 1 & 2 (Q12H X 4 doses)
<u>ETOPOSIDE</u> (Round to nearest 10mg)	60mg/m ² in 500mL NS over 1 hr	IV	Days 1 to 5
<u>METHOTREXATE</u> (Round to nearest 0.2mg)	12mg	IT	Day 5
<u>FILGRASTIM</u>	7.5µg/kg	SC	Starting day 7 (daily until ANC > 1.0 X 10 ⁹ /L)

▲ [Back to Top](#)

C**CYCLE FREQUENCY**

ADVANCE STAGE - alternate A + B regimens every 3 weeks for total of 6 cycles
(3 cycles of A & 3 cycles of B)

LIMITED STAGE - 3 cycles of A regimen every 3 weeks

▲ [Back to Top](#)

D**PREMEDICATION AND SUPPORTIVE MEASURES**

ANTIEMETIC REGIMENS:

Regimen A:

DAY 1 – [HESKETH LEVEL 5](#)

DAYS 2, 3, 4, & 10 –

[HESKETH LEVEL 4](#)

DAYS 8 & 15 –

[HESKETH LEVEL 1](#)

Prophylactic corticosteroid ophthalmic eye drops is recommended concurrently with high dose cytarabine

Regimen B:

DAYS 1 to 2 – [HESKETH LEVEL 5](#)

DAYS 3 to 5 – [HESKETH LEVEL 4](#)

▲ [Back to Top](#)

E**DOSE MODIFICATIONS**

Doses should be modified according to the protocol by which the patient is being treated. The following recommendations are in use at some centres

Hematologic Toxicities

See [Appendix 6](#) for general recommendations.

Renal Impairment

<u>Creatinine Clearance</u>	<u>% usual dose</u>
0.2-0.8mL/sec	REDUCE Methotrexate to 50% dose and REDUCE Etoposide to 75% dose
< 0.2mL/sec	OMIT Methotrexate REDUCE Etoposide to 50% dose
Serum Creatinine >200µmol/L	REDUCE Ifosfamide to 75% dose
Serum Creatinine >300µmol/L	REDUCE Ifosfamide to 67% dose (<i>Suggested action</i>)

There is no consistent evidence indicating a need for Cyclophosphamide dosage modification in patient with renal impairment. Dosage may be halved or interval increased by 50-100% if CrCl <0.3 mL/second.

Hepatic Impairment

<u>Bilirubin (µmol/L)</u>	<u>% usual dose</u>
1-2 X ULN	REDUCE Etoposide to 50% dose REDUCE Vincristine to 50% dose and REDUCE Doxorubicin to 50% dose
2-4X ULN	REDUCE Etoposide to 25% dose REDUCE Vincristine to 25% dose and REDUCE Doxorubicin to 25% dose
2-3 X ULN	REDUCE Methotrexate to 75% dose
>3X ULN	OMIT Methotrexate
> 4 X ULN	OMIT Doxorubicin & Etoposide

Consider Ifosfamide dose reduction if LFT's elevated (eg. Bilirubin or AST)
(*Suggested action*)

E**DOSE MODIFICATIONS (continued)**Neurotoxicity

<u>Symptom</u>	<u>% usual dose of Vincristine</u>
1. areflexia only	100%
2. abnormal buttoning, writing	67%
3. moderate motor neuropathy (\pm cranial)	Hold until recovery then reduce dose by 50%
4. severe motor neuropathy	Omit

▲ [Back to Top](#)**F****ADVERSE EFFECTS**

Refer to the Cyclophosphamide, Cytarabine, Methotrexate, Leucovorin, Doxorubicin, Vincristine, Ifosfamide, and Mesna monographs for full details of adverse effects.

Most frequently occurring adverse effects

- Myelosuppression
- Hyperuricemia
- Nausea and vomiting
- Stomatitis
- Neuropathy
- Vesicant
- Cardiotoxicity
- Hemorrhagic cystitis
- Alopecia
- Cerebral dysfunction
- Acute encephalopathy (including seizures)
- Pulmonary toxicity
- Pigmentation disorder
- Conjunctivitis
- Hypotension
- Hepatotoxicity

▲ [Back to Top](#)

K

KEY REFERENCE(S)

Magrath IT, Adde M, Shad A et al. Adults and children with small non-cleaved-cell lymphoma have a similar excellent outcome when treated with the same chemotherapy regimen. J Clin Oncol 14: 925-934, 1996.

Magrath IT, Janus C, Edwards BK, et al. An effective therapy for both undifferentiated (including Burkitt's) lymphomas and lymphoblastic lymphomas in children and young adults. Blood, 1984; 63: 1102-1111

▲ [Back to Top](#)

L

OTHER NOTES

This regimen should only be given by hematologists trained in the care of high grade lymphoma patients, and practicing in institutions with adequate acute care designed to support high grade lymphoma patients.

For the treatment of Lymphoblastic Lymphoma, hematologists may refer to Acute Lymphocytic Leukemia regimens (i.e. Dana Farber).

▲ [Back to Top](#)