Plerixafor (Mozobil) for Stem Cell Mobilisation  
(BMTWOS-001/1)

**Indication**
To be used in combination with G-CSF to enhance mobilisation of stem cells to the peripheral blood for collection and subsequent autologous transplantation in patients with lymphoma and multiple myeloma whose cells mobilise poorly.

**Eligibility**

**Inclusion criteria**
Patients must have a diagnosis of lymphoma (any form, including Hodgkin’s lymphoma and all types of NHL) or myeloma (which is taken to include plasmacytoma requiring autologous transplant, and other myeloma variants such as POEMS syndrome).

**Exclusion criteria**
Patients with severe renal impairment (eGFR<20mls/min) not on haemodialysis. Such patients however may be considered for plerixafor subject to off-label request approval: discuss with Apheresis Consultant and perform clinical risk assessment. 24-hour urine collection for formal creatinine clearance is not required: clearance may be estimated from serum creatinine using Cockcroft & Gault formula as per BNF advice.

**Pre-treatment evaluation**
Informed consent, provision of verbal and written information. Height, weight and body surface area calculation.

**Regimen**
See flowcharts A and B for delayed re-mobilisation and immediate rescue use

**Adverse effects**

<table>
<thead>
<tr>
<th>Very Common (&gt;1 in 10)</th>
<th>Common (&gt;1 in 100, &lt;1 in 10)</th>
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<tbody>
<tr>
<td><strong>Gastrointestinal disorders:</strong> diarrhoea, flatulence</td>
<td><strong>Immune system disorders:</strong> infusion related reactions.</td>
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<td><strong>Skin and subcutaneous disorders:</strong> Hyperhidrosis, erythema</td>
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<td><strong>Nervous system disorders:</strong> dizziness, headache</td>
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<td></td>
<td><strong>Gastrointestinal disorders:</strong> vomiting, abdominal pain, constipation, dyspepsia, flatulence, abdominal distension</td>
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<td><strong>Musculoskeletal, connective tissue and bone disorders:</strong> arthralgia, musculoskeletal pain</td>
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<td><strong>General:</strong> Fatigue, malaise</td>
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<td><strong>Psychiatric disorders:</strong> insomnia</td>
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For more detailed information please refer to the current Summary of Product Characteristics at www.medicines.org.uk

Precautions & contraindications

- Hypersensitivity to the active substance or to any of the excipients.
- Patients without a definite plan to proceed to transplant;
- For “immediate rescue” use\(^2,3\), patients who have had recent neutropenic pyrexia or other bacterial infection shortly before the anticipated first day of PBSC collection, as these patients have probably failed to mobilise mainly because of bacterial sepsis, and delayed re-mobilisation with or without plerixafor once the infection has resolved is more likely to be successful;
- Patients whose total WCC suggests that they are out with the PBSC “mobilisation window” on the basis of a WCC below \(4 \times 10^9\)litre or (after chemotherapy) above \(20 \times 10^9\)litre;
- Plerixafor should never be administered on an “immediate rescue” basis on a Friday evening, as laboratory processing is not possible for Saturday PBSC collections.

Dose modifications\(^4\)

**Renal**

<table>
<thead>
<tr>
<th>Drug</th>
<th>eGFR (ml/min) / Cr µmol/l</th>
<th>Dose</th>
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<tr>
<td>Plerixafor</td>
<td>eGFR 20-50 ml/min</td>
<td>160 micrograms/Kg/day</td>
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<tr>
<td></td>
<td>eGFR &lt;10ml/min but on haemodialysis(^4)</td>
<td>160 micrograms/Kg/day</td>
</tr>
<tr>
<td></td>
<td>eGFR &lt; 20 ml/min not on haemodialysis</td>
<td>Discuss with Apheresis Consultant</td>
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**Evaluation of response to treatment**

If a CD34+ dose of \(2.5 \times 10^6\)/kg or more is achieved (cumulative dose including any previous PBSC collected prior to plerixafor), then the patient should not receive any further plerixafor.

If the patient has not yet achieved a CD34+ dose of \(2.5 \times 10^6\)/kg, then plerixafor should be repeated at 22:00 hours that day, with further G-CSF 10 micrograms/kg at 07:30 a.m. the following morning, and further apheresis (3 blood volumes) starting at 09:00 a.m. This may be repeated for **up to 4 days (up to 4 doses of plerixafor)** in total, though experience at the Beatson Cancer Centre to date with more than 30 patients would suggest that the median number of plerixafor doses required will be 2, and that very few patients will require more than 3 doses.
If being given on an “immediate rescue” basis, the drug will normally be started on the first day that the total white cell count rises above $4 \times 10^9$ litre but the peripheral CD34+ count is below 15 per microlitre, during WBC and peripheral CD34+ count monitoring after mobilising chemotherapy. However, this should not be more than one day earlier than the predicted first day of apheresis, using the Clinical Apheresis Unit’s mobilisation chart according to chemotherapy regime5. (This is because some patients experience a transient rise in their WBC immediately upon starting G-CSF after mobilising chemotherapy but before they become neutropenic post-chemo; plerixafor administration during this “G-CSF blip” would be ineffective and wasteful.) Plerixafor and G-CSF should be given daily on the same dosage schedule as for “delayed re-mobilisation”. Note that this will involve an increase of G-CSF dose to 10 micrograms/kg/day if the patient has only been on 5 micrograms/kg/day of G-CSF prior to plerixafor. Plerixafor and G-CSF will generally be given as an out-patient, as for “delayed re-mobilisation”.

References


5. SNBTS Glasgow Document: Table of usual day of first PBSC collection depending on mobilisation chemotherapy. Controlled Document No. GLA CAU 046

Document control

<table>
<thead>
<tr>
<th>Prepared by</th>
<th>Dr Kenny Douglas / Jonathan Allan / Mary Maclean</th>
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<tr>
<td>Checked by</td>
<td>Dr Pam McKay ; Dr Anne Parker</td>
</tr>
<tr>
<td>Approved by</td>
<td>RCAG Prescribing Advisory Subgroup</td>
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<tr>
<td>Issue date</td>
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<td>BMT\WOS-001/01</td>
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FLOW-CHART A: “DELAYED RE-MOBILISATION”

START: PATIENT WITH LYMPHOMA OR MYELOMA WITH DEFINITE PLAN FOR AUTOLOGOUS TRANSPLANT

HAS THE PATIENT FAILED TO MOBILISE A CD34+ DOSE OF 2.5* OR MORE FOLLOWING A PREVIOUS MOBILISATION ATTEMPT?

YES => START G-CSF 10 MICROGRAMS/KG/DAY, USUALLY ON A FRIDAY

IS IT AT LEAST 4 WEEKS SINCE THE PATIENT HAS RECEIVED CHEMOTHERAPY OF ANY SORT?

NO => ORDER PLERIXAFOR FROM PHARMACY USING APPROPRIATE FORM (NEW FORM NEEDED EACH DAY)

ARRANGE ADMINISTRATION WITH WARD OR WITH PATIENT AS APPROPRIATE

YES => THE PATIENT IS ELIGIBLE FOR RE-MOBILISATION WITH PLERIXAFOR PLUS G-CSF

START G-CSF 10 MICROGRAMS/KG/DAY, USUALLY ON A FRIDAY

IS THE PATIENT’S CREATIVE CLEARANCE BELOW 50 ML MINUTE?

NO => CALCULATE OR CLEARANCE FROM URINE CREAT. SEE GRAPHS AND TEXT OF THIS PROTOCOL

YES => PLEIXAFOR DOSE IS 250 MICROGRAMS/KG SUBCUT ON DAY 4 OF G-CSF USUALLY MONDAY EVENING, AT 2200 HOURS (+/- 30 MINUTES)

OR CREATIVE IS 28-59 ML MIN
PLEIXAFOR DOSE IS 150 MICROGRAMS/KG SUBCUT ON DAY 4 OF G-CSF USUALLY MONDAY EVENING, AT 2200 HOURS APPROX
OR CREATIVE IS < 28 ML MIN
PLEIXAFOR DOSE IS OFF LICENCE, SEE ADVICE IN TEXT OF PROTOCOL

IF BEING ADMINISTERED ON WARD, PRESCRIBE IN MILLGRAMS AND MILLILITRES OR A DRUG PRESCRIPTION
IF BEING SELF ADMINISTERED, GIVE CLEAR WRITTEN INSTRUCTIONS TO PATIENT ON DOSAGE AND ADMINISTRATION

GIVE G-CSF 10 MICROGRAMS/KG AT 0730 A.M. ON MORNING OF APERESIS

PERFORM APERESIS; MINIMUM OF THREE BLOOD VOLUMES REGARDLESS OF PERIPHERAL CD34+ COUNT

HAS A CUMULATIVE CD34+ DOSE OF 2.5* OR MORE BEEN ACHIEVED?

YES => HAS THE PATIENT HAD 3 DOSES OR LESS OF PLEIXAFOR SO FAR?

NO => REPEAT PLEIXAFOR THIS EVENING

STOP

* CD34+ cell doses are x 10⁶/kg.
FLOW-CHART B: "IMMEDIATE RESCUE" USE

START: PATIENT WITH LYMPHOMA OR MYELOMA WITH DEFINITE PLAN FOR AUTOLOGOUS TRANSPLANT

FOLLOWING INDUCTION CHEM, HAS THE PREDICTED MODIFICATION BEEN REACHED OR NOT?

NO

IS THE PATIENT'S TOTAL WCC 4.0 OR MORE?

YES

UNLESS THIS IS A G-CSF ONLY MODIFICATION IS PATIENT'S TOTAL WCC LESS THAN 2.0?

NO

HAS THE PATIENT BEEN INFECTION FREE FOR 3 DAYS, AND IS PATIENT'S TEMPERATURE BELOW 37.5°C TODAY?

YES

THE PATIENT IS ELIGIBLE FOR PLERIXAFOR OR AN IMMEDIATE RESCUE BASIS

IS THE PATIENT'S CREATININE CLEARANCE BELOW 50 ML/ MINUTE?

NO (CALCULATE OR CLEARANCE FROM SERUM CREAT. SEE BIP GUIDANCE AND TEXT OF THIS PROTOCOL)

YES

PLERIXAFOR DOSE IS 240 MICROGRAMS/KG SUBCUT ON DAY 4 OF G-CSF (USUALLY MONDAY EVENING), AT 22:00 HOURS (+/- 30 MINUTES)

IF CREATININE IS 20.56 ML/MIN, PLERIXAFOR DOSE IS 360 MICROGRAMS/KG SUBCUT ON DAY 4 OF G-CSF (USUALLY MONDAY EVENING), AT 22:00 HOURS APPROX.

REPEAT PLERIXAFOR THIS EVENING

ORDER PLERIXAFOR FROM PHARMACY USING APPROPRIATE FORM (NEW FORM NEEDED EACH DAY)

ARRANGE ADMINISTRATION WITH WARD OR WITH PATIENT AS APPROPRIATE

IF BEING ADMINISTERED ON WARD, PRESCRIBE IN MILLIGRAMS AND MILLILITRES ON A DRUG PARADE

IF BEING SELF ADMINISTERED, GIVE CLEAR WRITTEN INSTRUCTIONS TO PATIENT ON DOSAGE AND ADMINISTRATION

GIVE G-CSF 10 MICROGRAMS/KG AT 07:30 A.M. ON MORNING OF APHERESIS

PERFORM APHERESIS (MINIMUM OF THREE BLOOD VOLUMES) REGARDLESS OF PERIPHERAL CD34+ COUNT

HAS A CUMULATIVE CD34+ DOSE OF 2.5+ OR MORE BEEN ACHIEVED?

YES

HAS THE PATIENT HAD 3 DOSES OR LESS OF PLERIXAFOR SO FAR?

NO

REPEAT PLERIXAFOR THIS EVENING

* CD34+ doses are x 10^6/kg