ISATUXIMAB WITH POMALIDOMIDE AND DEXAMETHASONE

INDICATION
Relapsed/refractory multiple myeloma after receiving 3 prior lines of therapy including lenalidomide and a proteasome inhibitor, and where patient’s disease has progressed on their last treatment, as per CDF criteria. **Bluteq approval is required**

TREATMENT INTENT
Disease modification

GENERAL PRE-ASSESSMENT
1. Ensure all the following staging investigations are done:
   - FBC & film
   - Clotting screen
   - U&E
   - LFTs
   - Albumin
   - Calcium
   - Uric acid
   - CRP
   - Baseline random blood glucose level
   - Virology: EBV, CMV, Hep B, Hep C, HIV serology
   - Consider annual flu and 5 yearly pneumococcal vaccination pre therapy
   - Calculated creatinine clearance (CrCl), urine protein/creatinine ratio
   - Electrophoresis and immunofixation for quantitation of serum paraprotein and immunoglobulins.
   - Serum free light chain assay (Freelite)
   - β2 microglobulin
   - LDH
   - Myeloma FISH should be performed in all patients at diagnosis, and in selected patients at relapse/progression to help guide treatment decisions. Samples should be sent to Wessex Regional Genetic Laboratory, Salisbury NHS Foundation Trust, Salisbury District Hospital, Salisbury, Wiltshire, SP2 8BJ
   - Urine pregnancy testing for pre-menopausal women younger than 55 before each cycle.
   - Send a "group and save" sample to transfusion and inform patient and transfusion laboratory that patient is due to commence isatuximab. Patient will require red cell phenotyping as cross match fails due to binding of isatuximab to red cells.
   - Imaging as per NICE/network guidance and clinical presentation
Myeloma group

Additional Investigations

1. Plasma viscosity if hyperviscosity suspected

2. If allogeneic transplant an option: Tissue typing of patient and siblings and CMV serology

3. Counselling about risks in pregnancy - There are no available data on isatuximab use in pregnant women. Animal reproduction toxicity studies have not been conducted with isatuximab. Immunoglobulin G1 monoclonal antibodies are known to cross the placenta after the first trimester of pregnancy. The use of isatuximab in pregnant women is not recommended. Women of childbearing potential treated with isatuximab should use effective contraception during treatment and for at least 5 months after cessation of treatment. Patients must also comply with pregnancy prevention programme for pomalidomide.

4. Consent - ensure patient has received adequate verbal and written information regarding their disease, treatment and potential side effects. Document in medical notes all information that has been given.

5. Fertility - all patients should be offered fertility advice, as appropriate.

6. Hydration - fluid intake of at least 3 litres/day should be attempted.


9. Treatment must be agreed at the relevant MDT.

REGIMEN SPECIFIC PRE-ASSESSMENT

1. Ensure patients are given a Patient ID Card for isatuximab and are instructed to carry this for 6 months after stopping treatment.

2. Advise patients to inform their other HCPs that they have received isatuximab, particularly before a transfusion and to show their patient ID card to healthcare professionals that treat them.

3. Obtain written consent for the treatment including signing Pregnancy Prevention Programme forms, relating to pomalidomide.
## DRUG REGIMEN:

<table>
<thead>
<tr>
<th>Cycle 1</th>
<th>Pre-meds</th>
<th>Paracetamol 1g PO, *Chlorphenamine 10 mg IV, Omeprazole 20mg PO Dexamethasone, see below montelukast 10 mg PO</th>
<th>To be given 30 minutes prior to isatuximab infusion</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Isatuximab</td>
<td>10mg/kg Intravenous infusion See infusion rates table</td>
<td>Days 1, 8, 15 and 22</td>
</tr>
<tr>
<td></td>
<td>Dexamethasone</td>
<td>40mg if &lt;75 years, OR 20mg if ≥75 years</td>
<td>Days 1, 8, 15, 22</td>
</tr>
<tr>
<td></td>
<td>Pomalidomide</td>
<td>4mg PO daily on days 1-21</td>
<td>NOCTE</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Cycle 2 onwards</th>
<th>Pre-meds</th>
<th>Paracetamol 1g PO, *Chlorphenamine 4mg PO, Omeprazole 20mg PO Dexamethasone, see below</th>
<th>To be given 30 minutes prior to isatuximab infusion</th>
</tr>
</thead>
<tbody>
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</table>

*Chlorphenamine: the intravenous route is preferred for at least the first 4 infusions and can be switched to oral route from cycle 2 onwards if no infusion reactions.

**Additional Post-medications:** the use of post-infusion medications (e.g. inhaled corticosteroids, short and long acting bronchodilators), should be considered for patients with a history of chronic obstructive pulmonary disease to manage respiratory complications should they occur. Following the first four infusions, if the patient experiences no major IRRs, these inhaled post-infusion medications may be discontinued at the discretion of the physician.
INFUSION RATES

Isatuximab infusion should be administered intravenously at the infusion rate presented in the Table below. Incremental escalation of the infusion rate should be considered only in the absence of infusion reactions.

<table>
<thead>
<tr>
<th>Dilution volume</th>
<th>Initial rate</th>
<th>Absence of infusion reaction</th>
<th>Rate increment</th>
<th>Maximum rate</th>
</tr>
</thead>
<tbody>
<tr>
<td>First infusion</td>
<td>250 mL</td>
<td>25 mL/ hour</td>
<td>For 60 minutes</td>
<td>150 mL/ hour</td>
</tr>
<tr>
<td>Second infusion</td>
<td>250 mL</td>
<td>50 mL/ hour</td>
<td>For 30 minutes</td>
<td>200 mL/ hour</td>
</tr>
<tr>
<td>Subsequent infusions</td>
<td>250 mL</td>
<td>200 mL/ hour</td>
<td>-----------</td>
<td>200 mL/ hour</td>
</tr>
</tbody>
</table>

For more information on infusion reactions, see section “Infusion reactions”. For management of infusion reactions, see section “Managing infusion reactions”.

CYCLE FREQUENCY

The cycle is repeated every 28 days until disease progression.

DOSE MODIFICATIONS

Haematological

Isatuximab:

In the event of grade 4 neutropenia, isatuximab administration should be delayed until neutrophil count improves to at least 1.0 x 10^9/L. The use of colony-stimulating factors (e.g. G-CSF) should be considered to mitigate the risk of neutropenia.

Pomalidomide:

To initiate a new cycle of Pomalidomide, ANC ≥ 1.0 x 10^9/L and Platelets ≥ 50 x 10^9/L.

<table>
<thead>
<tr>
<th>Toxicity</th>
<th>Dose Modification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Neutropenia:</td>
<td></td>
</tr>
<tr>
<td>ANC &lt; 0.5 x 10^9/L OR Febrile Neutropenia and ANC &lt; 1.0 x 10^9/L.</td>
<td>Interrupt Pomalidomide, monitor FBC weekly</td>
</tr>
<tr>
<td>When ANC return to ≥1 x 10^9/L</td>
<td>Resume Pomalidomide at the next lower dose (e.g. if starting dose was 4mg, reduce to 3 mg OD)</td>
</tr>
<tr>
<td>For each subsequent drop ANC &lt; 0.5 x 10^9/L</td>
<td>Interrupt Pomalidomide</td>
</tr>
</tbody>
</table>
When ANC ≥ 1.0 x 10^9/L
Resume pomalidomide treatment at one dose level lower than the previous dose.

**Thrombocytopenia:**

<table>
<thead>
<tr>
<th>Platelet threshold</th>
<th>Action</th>
</tr>
</thead>
<tbody>
<tr>
<td>Platelets &lt; 25 x 10^9/L</td>
<td>Interrupt Pomalidomide, monitor FBC weekly Resume pomalidomide treatment at one dose level lower than the previous dose.</td>
</tr>
<tr>
<td>Platelets ≥ 50 x 10^9/L</td>
<td>Resume pomalidomide treatment at one dose level lower than the previous dose.</td>
</tr>
<tr>
<td>For each subsequent drop Platelets &lt; 25 x 10^9/L</td>
<td>Interrupt Pomalidomide</td>
</tr>
<tr>
<td>Platelets ≥ 50 x 10^9/L</td>
<td>Resume pomalidomide treatment at one dose level lower than the previous dose.</td>
</tr>
</tbody>
</table>

If toxicities occur after dose reductions to 1 mg, then discontinue Pomalidomide.

**Pomalidomide dosing levels:**

<table>
<thead>
<tr>
<th>Dose level</th>
<th>Oral pomalidomide dose</th>
</tr>
</thead>
<tbody>
<tr>
<td>Starting dose</td>
<td>4mg</td>
</tr>
<tr>
<td>Dose level -1</td>
<td>3mg</td>
</tr>
<tr>
<td>Dose level -2</td>
<td>2mg</td>
</tr>
<tr>
<td>Dose level -3</td>
<td>1mg</td>
</tr>
</tbody>
</table>

**Non-Haematological**

**Isatuximab:**

For the management of infusion-related reactions, please see section below “Managing Infusion-related reactions”.

**Pomalidomide**

<table>
<thead>
<tr>
<th>Toxicity</th>
<th>Dose Modification</th>
</tr>
</thead>
<tbody>
<tr>
<td>- Grade 3 or 4 - When resolved to Grade ≤ 2</td>
<td>- Interrupt pomalidomide - Resume pomalidomide treatment at one dose level lower than the previous dose.</td>
</tr>
</tbody>
</table>
| - Skin rash G2 or G3 | - Interrupt or discontinue pomalidomide. *
| - Skin rash G4 (exfoliative/bullous rash) | - Discontinue pomalidomide |
| Angioedema (all grades) | Discontinue pomalidomide |

*When interrupting pomalidomide due to rash, consider standard management with topical treatments and/or antihistamines. If rash does not resolve following interruption and management, consider discontinuing pomalidomide
### Renal and Hepatic Impairment

**Isatuximab**

<table>
<thead>
<tr>
<th>Renal</th>
<th>Hepatic</th>
</tr>
</thead>
<tbody>
<tr>
<td>Based on population pharmacokinetic analysis and on clinical safety, no dose adjustment is recommended in patients with mild to severe renal impairment</td>
<td>Based on population pharmacokinetic analysis, no dose adjustment is recommended in patients with mild hepatic impairment. Data in patients with moderate and severe hepatic impairment are limited, but there is no evidence to suggest that dose adjustment is required in these patients.</td>
</tr>
</tbody>
</table>

**Pomalidomide**

<table>
<thead>
<tr>
<th>Renal</th>
<th>Hepatic</th>
</tr>
</thead>
<tbody>
<tr>
<td>No dose adjustment required in renal impairment. On haemodialysis days, patients should take pomalidomide following haemodialysis</td>
<td>Patients with serum total bilirubin &gt; 1.5 x ULN were excluded from clinical studies. Hepatic impairment has a modest effect on the pharmacokinetics of pomalidomide. No adjustment of the starting dose of pomalidomide is required for patients with hepatic impairment as defined by the Child-Pugh criteria. However, patients with hepatic impairment should be carefully monitored for adverse reactions and dose reduction or interruption of pomalidomide should be used as needed.</td>
</tr>
</tbody>
</table>

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### INVESTIGATIONS – during treatment

- FBC, U&Es, LFTs, Ca++, glucose – every 4 weeks.
- Ig’s, paraprotein, Freelite assay usually monthly
- Consider bone marrow assessment after four cycles for non-secretory Myeloma.

### CONCURRENT MEDICATIONS

- Allopurinol 300 mg daily for 7 days for cycle 1 only
- Prophylactic aciclovir 200 mg TDS (consider reducing to 200mg BD if CrCl<10ml/min) for the duration of treatment and for 3 months afterwards.
- Prophylactic fluconazole 50mg OD.
- Consider prophylactic co-trimoxazole 480mg to 960mg OD on M/W/F if heavily pre-treated or previous autograft.
- Consider prophylactic levofloxacin 500mg od for 12 weeks (cycles 1-3), at clinician discretion, only in patients deemed at high risk of infections. Adjust dose for renal function
- Prophylactic G-CSF should be administered to keep/maintain dose intensity (aim to keep neutrophil counts >1.0), weekly to start with (subject to review)
Myeloma group

- Proton pump inhibitor or H2 antagonist at clinician’s discretion on days of steroids
- Thromboprophylaxis/anticoagulation see VTE section below.
- Bone protection as per NSSG Bone Protection protocol MM.

EMETIC RISK

Low risk

EXTRAVASATION RISK

Unknown

ADVERSE EFFECTS / REGIMEN SPECIFIC COMPLICATIONS

Isatuximab:

- **Interference with Serological Testing**
  Because CD38 protein is expressed on the surface of red blood cells (RBCs), isatuximab, an antiCD38 antibody, may interfere with blood bank serologic tests with potential false positive reactions in indirect antiglobulin tests (indirect Coombs tests), antibody detection (screening) tests, antibody identification panels, and antihuman globulin (AHG) crossmatches in patients treated with isatuximab.

  I. Blood Transfusion must be notified of this interference with serological testing and Blood Bank must be notified that a patient has received isatuximab.

  II. Patients must be typed and screened prior to starting isatuximab.

  III. Ensure patients are given a Patient ID Card for isatuximab and are instructed to carry this for 6 months after stopping treatment.

  IV. Ask patients to tell their other HCPs that they have received isatuximab, particularly before a transfusion and to show their patient ID card to healthcare professionals that treat them.

- **Interference with Determination of Complete Response**
  Isatuximab is a human IgG kappa monoclonal antibody detectable on both the serum protein electrophoresis (SPE) and immunofixation (IFE) assays used for the clinical monitoring of endogenous M-protein. This interference can impact the determination of complete response and of disease progression in all patients with IgG kappa myeloma.

- **Testing for hepatitis B virus:**

  All patients starting on isatuximab must be screened for hepatitis B virus before initiation, patients with unknown serology who are already on treatment should also be screened.
Monitoring is required for patients with positive serology for clinical and laboratory signs of hepatitis B reactivation during treatment, and for at least 6 months following the end of treatment.

Patients with positive serology need to be advised to seek medical help immediately if they experience signs and symptoms suggestive of hepatitis B virus reactivation.

Treatment with isatuximab should be stopped in patients with hepatitis B virus reactivation; appropriate treatment needs to be instituted in consultation with experts in the treatment of hepatitis B virus infection; consult with experts before resuming isatuximab in patients with adequately controlled viral reactivation.

Suspected adverse drug reactions associated with isatuximab need to be reported to the Yellow Card Scheme.

- **Contraception**
  
  To avoid exposure to the fetus, women of reproductive potential should use effective contraception during treatment and for 5 months after cessation of isatuximab treatment.

  Patient must comply with pregnancy prevention programme in order to be eligible to receive pomalidomide.

- **Infusion reactions**

  Infusion reactions, mostly mild or moderate, have been observed in 38.2% of patients treated with SARCLISA (see section 4.8). All infusion reactions started during the first SARCLISA infusion and resolved on the same day in 98% of the infusions. The most common symptoms of an infusion reaction included dyspnoea, cough, chills and nausea. The most common severe signs and symptoms included hypertension and dyspnoea.

  To decrease the risk and severity of infusion reactions, patients should be pre-medicated prior to isatuximab infusion with acetaminophen, H2 antagonists or proton pump inhibitors, diphenhydramine or equivalent; dexamethasone is to be used as both premedication and anti-myeloma treatment. Vital signs should be frequently monitored during the entire SARCLISA infusion. When required, interrupt isatuximab infusion and provide appropriate medical and supportive measures. In case symptoms do not improve after interruption of isatuximab infusion, recur after initial improvement with appropriate medicinal products, require hospitalization or are life-threatening, permanently discontinue isatuximab and institute appropriate management.

- **Managing Infusion related reactions**

  Administration adjustments should be made if patients experience infusion reactions:

  - In patients who experience Grade 2 (moderate) infusion reactions, a temporary
Myeloma group

interruption in the infusion should be considered and additional symptomatic medicinal products can be administered. After improvement to grade ≤1 (mild), infusion may be resumed at half of the initial infusion rate under close monitoring and supportive care, as needed. If symptoms do not recur after 30 minutes, the infusion rate may be increased to the initial rate, and then increased incrementally, as shown in Table 2.

- If symptoms do not resolve rapidly or do not improve to Grade ≤1 after interruption of the infusion, recur after initial improvement with appropriate medicinal products, or require hospitalization or are life-threatening (Grade ≥3), treatment with isatuximab should be permanently discontinued and additional supportive therapy should be administered, as needed.

- **Other common adverse effects:** Upper respiratory tract infections, pneumonia, bronchitis, febrile neutropenia, dyspnoea, diarrhoea, nausea, vomiting.

**Pomalidomide:**

- Venous thromboembolism (VTE): There is an increased risk of thrombosis with pomalidomide. Unless the patient is thought to be at particularly low-risk of thrombosis or high-risk of bleeding, some form of VTE prophylaxis is recommended as follows:
  1. Prophylactic low-molecular weight heparin OR
  2. Prophylactic DOAC e.g. apixaban 2.5mg bd (check product specific information)

Aspirin can be appropriate for patients with no additional risk factors for thrombosis. It is generally not preferred for patients with additional risk factors.

If VTE occurs, pomalidomide can be continued and the patient should be fully anticoagulated according to standard guidelines.

- Fatigue, dizziness and confusion
- Peripheral neuropathy, diarrhea/constipation, pneumonia, peripheral oedema.

**TREATMENT RELATED MORTALITY**

<5%
REFERENCES


3. Imnovid® (Pomalidomide), eMC UK Summary of Product Characteristics, Mar 2022

4. SARCLISA 20mg/mL, eMC UK Summary of Product Characteristics: Feb 2022


REVIEW

<table>
<thead>
<tr>
<th>Name</th>
<th>Revision</th>
<th>Date</th>
<th>Version</th>
<th>Review date</th>
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<tbody>
<tr>
<td>Faouzi Djebbari</td>
<td>New protocol</td>
<td>January 2020</td>
<td>1.0</td>
<td>June 2020</td>
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<tr>
<td>(Haematology Pharmacist)</td>
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<tr>
<td>Faouzi Djebbari</td>
<td>Pre-meds updated</td>
<td>Feb 2020</td>
<td>1.1</td>
<td>June 2021</td>
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<td>(Haematology Pharmacist)</td>
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<tr>
<td>Faouzi Djebbari</td>
<td>Pre-med section updated, need for bluteq updated</td>
<td>June 2020</td>
<td>1.2</td>
<td>June 2021</td>
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<tr>
<td>NSSG Myeloma Group</td>
<td>Annual myeloma protocol review and update</td>
<td>Oct 2020</td>
<td>1.3</td>
<td>June 2021</td>
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<td>NSSG Myeloma Group</td>
<td>Minor update to infusion table</td>
<td>February 2021</td>
<td>1.4</td>
<td>June 2021</td>
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<tr>
<td>NSSG Myeloma Group</td>
<td>Minor update of pomalidomide dose reduction levels</td>
<td>May 2021</td>
<td>1.5</td>
<td>June 2021</td>
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<tr>
<td>Quality Manager</td>
<td>Nursing care plan added</td>
<td>May 2021</td>
<td>1.5</td>
<td>June 2021</td>
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<tr>
<td>NSSG Myeloma Group</td>
<td>2021 Annual Protocol Review</td>
<td>June 2021</td>
<td>1.6</td>
<td>June 2022</td>
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<td>NSSG Myeloma Group</td>
<td>Annual protocol review 2022, updated drug regimen section and dose modifications section</td>
<td>June 2022</td>
<td>1.7</td>
<td>June 2023</td>
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<td>Updated concurrent medication section</td>
<td>Nov 2022</td>
<td>1.8</td>
<td>June 2023</td>
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</table>
Nursing Care Plan: ISATUXIMAB WITH POMALIDOMIDE AND DEXAMETHASONE

Indication: Relapsed/refractory Myeloma.
Frequency: The cycle is repeated every 28 days until disease progression.
Alopecia: No

On cycle 1 day 1 send phenotyping bloods to the Transfusion Lab prior to Isatuximab infusion – send 3x EDTA tubes, all labelled with Safe Tx in a cross match sample bag, marked for the attention of a BMS 7. These bloods can be signed for on Aria once the sample has been sent. Please call the transfusion lab to let them know that phenotyping bloods are being sent because the patient is going to commence Isatuximab. Patient will require red cell phenotyping as cross match fails due to binding of Isatuximab to red cells.

ISATUXIMAB: Monoclonal antibody
Administered as an IV infusion in incremented rates.

Cycle 1 - days 1, 8, 15 and 22
Cycle 2 onwards - days 1 and 15
Isatuximab infusion should be administered at the infusion rate detailed on Aria – please note that there is an initial infusion rate and a subsequent rate. Incremental escalation of the infusion rate should be considered only in the absence of infusion reactions

Classification of extravasation: Unknown

Emetic risk: Low

Side effects: Interference with serological testing (for bloods transfusion), upper respiratory tract infections, pneumonia, bronchitis, febrile neutropenia, dyspnoea, diarrhoea, nausea, vomiting.

Dosing reactions: include dyspnoea, cough, chills and nausea. The most common severe signs and symptoms included hypertension and dyspnoea. If a patient experiences a reaction, the infusion rate can be recommenced at half the previous rate when they are stable enough to recommence infusion, this must be done under close supervision.

POMALIDOMIDE: Immunomodulator and angiogenesis inhibitor.
Administered orally at night on days 1-21

Emetic risk: Low

Side effects: VTE, fatigue, dizziness and confusion, peripheral neuropathy, diarrhoea/constipation, pneumonia, peripheral oedema. Risks of cardiac failure, interstitial lung disease and hepatotoxicity.

DEXAMETHASONE: Corticosteroid
Administered orally on days 1, 8, 15 and 22 taken with or after food preferably at breakfast

Side effects: restlessness, insomnia, mood changes, gastritis, hyperglycaemia, increased appetite, fluid retention, weight gain, immunosuppression.

Regime Specific Considerations

- Pre-medications (as per protocol/Aria prescription) 30 minutes before commencing Isatuximab infusion.
- Ensure patients have been given a Patient ID Card for Isatuximab and are instructed to carry this for 6 months after stopping treatment, please check with Myeloma CNS team.
- Bloods are required at the start of each cycle. Patients with unstable blood counts may require more frequent monitoring.
- Advise patients to maintain fluid intake of 2-3 litres a day and avoid dehydration through the prompt management of diarrhoea and nausea/vomiting.