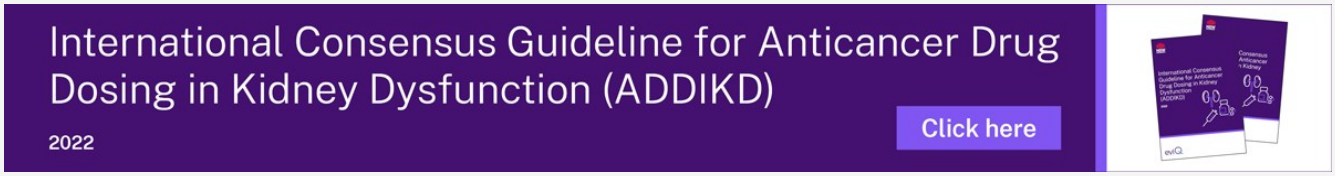
# Multiple myeloma lenalidomide and dexamethasone oral

**ID: 547** v.6 **Endorsed** Essential Medicine List

Patients with myeloma should be considered for inclusion into clinical trials. Link to ALLG website and ANZCTR website.

Link to Medical Scientific Advisory Group (MSAG) Clinical Practice Guideline Multiple Myeloma

The anticancer drug(s) in this protocol may have been included in the ADDIKD guideline. Dose recommendations in kidney dysfunction have yet to be updated to align with the ADDIKD guideline. Recommendations will be updated once the individual protocol has been evaluated by the reference committee. For further information refer to the ADDIKD guideline. To assist with calculations, use the eviQ Estimated Glomerular Filtration Rate (eGFR) calculator.




## Treatment schedule - Overview

### Cycle 1 and further cycles

| Drug | Dose | Route | Day |
|---|---|---|---|
| Dexamethasone | 40 mg ONCE a week* | PO | 1, 8, 15, 22 |
| Lenalidomide | 25 mg ONCE a day | PO | 1 to 21 |

* It is the consensus of the Haematology Reference Committee that 40 mg dexamethasone weekly is to be used as per the Rajkumar et al.[1] and Benboubker et al.[2] trials and clinical practice. However, dexamethasone dose reduction based on clinical toxicity and response may be reasonable.

**Frequency:** 28 days

**Cycles:** Continuous until disease progression or unacceptable toxicity.

**Notes:**

- It is the consensus of the reference committee that a 20 mg/week starting dose of dexamethasone should be considered in patients > 75 years.[3]
- In the MM09 and MM010 studies, the main dose limiting toxicities of lenalidomide were neutropenia and thrombocytopenia, manageable with dose adjustment and/or addition of growth factor support; and venous thromboembolic events managed with anticoagulants.[4, 5]

**Drug status:** **Dexamethasone** is on the PBS general schedule

**Lenalidomide**: (PBS authority)

**NB:** patient registration into a pregnancy prevention risk management program is required.

Full prescribing information and Authority Application forms available from the Department of Human Services website

Lenalidomide is available as **5 mg**, **10 mg, 15 mg** and **25 mg** capsules

Dexamethasone is available as **4 mg** and **0.5 mg** tablets

**Cost:** ~ $2,420 per cycle

## Treatment schedule - Detail

*The supportive therapies (e.g. antiemetics, premedications, etc.), infusion times, diluents, volumes and routes of administration, if included, are listed as defaults. They may vary between institutions and can be substituted to reflect individual institutional policy.*

*Antiemetics if included in the treatment schedule are based upon recommendations from national and international guidelines. These are **defaults only** and may be substituted to reflect individual institutional policy. Select here for recommended doses of alternative antiemetics.*

### Cycle 1 and further cycles

| Day 1 | | |
|---|---|---|
| Dexamethasone | 40 mg (PO) | ONCE a week on days 1, 8, 15, and 22. Take in the morning with food. |
| Lenalidomide | 25 mg (PO) | ONCE a day on days 1 to 21. Take at same time each day, either with or without food. |
| **Day 2 to 7** | | |
| Lenalidomide | 25 mg (PO) | ONCE a day on days 1 to 21. Take at same time each day, either with or without food. |
| **Day 8** | | |
| Dexamethasone | 40 mg (PO) | ONCE a week on days 1, 8, 15, and 22. Take in the morning with food. |
| Lenalidomide | 25 mg (PO) | ONCE a day on days 1 to 21. Take at same time each day, either with or without food. |
| **Day 9 to 14** | | |
| Lenalidomide | 25 mg (PO) | ONCE a day on days 1 to 21. Take at same time each day, either with or without food. |
| **Day 15** | | |
| Dexamethasone | 40 mg (PO) | ONCE a week on days 1, 8, 15, and 22. Take in the morning with food. |
| Lenalidomide | 25 mg (PO) | ONCE a day on days 1 to 21. Take at same time each day, either with or without food. |
| **Day 16 to 21** | | |
| Lenalidomide | 25 mg (PO) | ONCE a day on days 1 to 21. Take at same time each day, either with or without food. |
| **Day 22** | | |
| Dexamethasone | 40 mg (PO) | ONCE a week on days 1, 8, 15, and 22. Take in the morning with food. |

**Note:** it is the consensus of the Haematology Reference Committee that 40 mg dexamethasone weekly is to be used as per the Rajkumar et al.[1] and Benboubker et al.[2] trials and clinical practice. However, dexamethasone dose reduction based on clinical toxicity and response may be reasonable.

**Frequency:** 28 days

**Cycles:** Continuous until disease progression or unacceptable toxicity.

## Indications and patient population

- Relapsed/refractory multiple myeloma (after failure of at least one prior therapy)
- Newly diagnosed multiple myeloma who are ineligible for autologous stem cell transplantation.

## Clinical information

| | |
|---|---|
| **Caution with oral anti-cancer drugs** | Select links for information on the safe prescribing, dispensing and administration of orally administered anti-cancer drugs.<br>Read more about the COSA guidelines and oral anti-cancer therapy |
| **Emetogenicity minimal or low** | No routine prophylaxis required. If patients experience nausea and/or vomiting, consider using the low emetogenic risk regimen.<br>Read more about preventing anti-cancer therapy induced nausea and vomiting |
| **Teratogenic effects** | Immunomodulatory drugs (IMiDs) include thalidomide, lenalidomide and pomalidomide. They can cause severe congenital disabilities or death to an unborn baby when taken during pregnancy.<br>All patients and partners of patients that can conceive a child must use at least one reliable contraceptive method for at least 4 weeks before starting treatment, during treatment (including dose interruptions), and for 4 weeks after stopping treatment.<br>Male patients should also use a condom when having sexual intercourse with a woman of childbearing potential during treatment (including dose interruptions), and for 4 weeks after stopping treatment.<br>In female patients and female partners of male patients, a pregnancy test should be carried out prior to initiating treatment (after 4 weeks of contraception use), weekly during the first month of treatment and monthly thereafter.<br>Effective contraception methods and adequate contraception timeframes should be discussed with all patients of reproductive potential.<br>Prescription of an IMiD requires patient registration with a pregnancy prevention program.<br>Full prescribing information and Authority Application forms available from the Department of Human Services website |
| **Thromboembolism** | Patients are at an increased risk of venous thrombosis with this treatment.<br>Risk assessment for VTE should be performed prior to and during treatment.<br>It is the consensus opinion of the Haematology Reference Committee that concomitant thromboprophylaxis is recommended: consider using low dose aspirin for patients without pre-existing risk factors, while patients with pre-existing risk factors should receive enoxaparin 40 mg subcut daily for the duration of treatment (unless contraindicated; reduce dose in renal impairment)<br>Read more about the prophylaxis of venous thromboembolism (VTE) in multiple myeloma |
| **Bone modifying agents** | Use of a bone modifying agent (BMA) should be considered in all patients with symptomatic myeloma requiring treatment. For patients with newly diagnosed symptomatic myeloma, zoledronic acid, pamidronate or denosumab should be considered for monthly administration (adjust for kidney dysfunction where appropriate) for up to 2 years. A longer duration of therapy may be appropriate (MRC M IX trial).[6]<br>For more information, please see the following protocols:<br>ID 137 Multiple myeloma zoledronic acid<br>ID 147 Multiple myeloma pamidronate<br>ID 3964 Multiple myeloma denosumab - note denosumab is TGA approved but not PBS reimbursed for this indication. |
| **Bisphosphonates and dental review** | Caution should be taken with prolonged use of bisphosphonates due to the risk of osteonecrosis of the jaw (ONJ). A dental review prior to treatment is recommended, and all dental issues treated before the initiation of bisphosphonates. Dental review 6 to 12 monthly during treatment is advisable to minimise risk of ONJ. Concurrent daily oral supplements of calcium 500 mg and vitamin D 400 International Units are recommended.<br>Read more about medication-related osteonecrosis of the jaw (MRONJ) |

| | |
|---|---|
| **Corticosteroids** | Diabetic patients should monitor their blood glucose levels closely. To minimise gastric irritation, advise patient to take immediately after food. Consider the use of a H2 antagonist or proton pump inhibitor if appropriate.<br>Read more about acute short term effects from corticosteroids |
| **Tumour lysis risk** | Assess patient for risk of developing tumour lysis syndrome.<br>Read more about prevention and management of tumour lysis syndrome. |
| **Pneumocystis jirovecii pneumonia (PJP) prophylaxis** | PJP prophylaxis is recommended e.g. trimethoprim/sulfamethoxazole 160/800 mg PO one tablet twice daily, twice weekly (e.g. on Mondays and Thursdays) OR one tablet three times weekly (e.g. on Mondays, Wednesdays and Fridays).<br>Read more about prophylaxis of pneumocystis jiroveci (carinii) in cancer patients |
| **Antiviral prophylaxis** | Read more about antiviral prophylaxis drugs and doses |
| **Growth factor support** | G-CSF (short or long-acting) is available on the PBS for chemotherapy induced neutropenia depending on clinical indication and/or febrile neutropenia risk.<br>Access the PBS website |
| **Blood tests** | FBC, EUC, LFTs, calcium, magnesium, phosphate and BSL at baseline and prior to each treatment.<br>Patients with normal pre-treatment FBC: repeat FBC fortnightly for the first cycle then monthly thereafter.<br>Patients with pre-treatment cytopenias: repeat FBC 1 to 2 weekly for the first cycle then monthly thereafter.<br>Consider monitoring thyroid function tests (reported cases of hypothyroidism). |
| **Hepatitis B screening and prophylaxis** | Routine screening for HBsAg and anti-HBc is recommended prior to initiation of treatment. Prophylaxis should be determined according to individual institutional policy.<br>Read more about hepatitis B screening and prophylaxis in cancer patients requiring cytotoxic and/or immunosuppressive therapy |
| **Vaccinations** | Live vaccines are contraindicated in cancer patients receiving immunosuppressive therapy and/or who have poorly controlled malignant disease.<br>Refer to the recommended schedule of vaccination for immunocompromised patients, as outlined in the Australian Immunisation Handbook.<br>Read more about COVID-19 vaccines and cancer. |
| **Fertility and lactation** | Cancer treatment can have harmful effects on fertility and this should be discussed with all patients of reproductive potential prior to commencing treatment.<br>Possibility of infant risk should be discussed with breastfeeding patients.<br>Read more about the effect of cancer treatment on fertility |

## Dose modifications

*Evidence for dose modifications is limited, and the recommendations made on eviQ are intended as a guide only. They are generally conservative with an emphasis on safety. Any dose modification should be based on clinical judgement, and the individual patient's situation including but not limited to treatment intent (curative vs palliative), the anti-cancer regimen (single versus combination therapy versus chemotherapy versus immunotherapy), biology of the cancer (site, size, mutations, metastases), other treatment related side effects, additional co-morbidities, performance status and patient preferences.Suggested dose modifications are based on clinical trial findings, product information, published guidelines and reference committee consensus . The dose reduction applies to each individual dose and not to the total number of days or duration of treatment cycle unless stated otherwise. Non-haematological gradings are based on Common Terminology Criteria for Adverse Events (CTCAE) unless otherwise specified. Renal and hepatic dose modifications have been standardised where possible. For more information see dosing considerations & disclaimer .*

The dose recommendations in kidney dysfunction (i.e.renal impairment) displayed may not reflect those in the ADDIKD guideline and have been included for historical reference only. Recommendations will be updated once the individual protocol

has been evaluated by the reference committee, with this version of the protocol then being archived. Clinicians are expected to refer to the ADDIKD guideline prior to prescribing in kidney dysfunction.
**International Consensus Guideline for Anticancer Drug Dosing in Kidney Dysfunction (ADDIKD)**.

Initial treatment with lenalidomide should not be started if ANC less than 1.0 x $10^9$/L and/or platelets less than 75 x $10^9$/L (or platelets less than 30 x $10^9$/L if heavy bone marrow involvement), however, may be commenced at the discretion of the treating haematologist.

| Dose reduction steps for lenalidomide to manage haematological toxicities | |
|---|---|
| Starting dose | 25 mg |
| Dose level 1 | 15 mg |
| Dose level 2 | 10 mg |
| Dose level 3 | 5 mg |

| Haematological toxicity | |
|---|---|
| **ANC x $10^9$/L (pre-treatment blood test)** | |
| First fall to less than 0.5 | Interrupt lenalidomide treatment |
| Return to greater than or equal to 0.5 when neutropenia is only observed toxicity | Resume lenalidomide at starting dose |
| Return to greater than or equal to 0.5 when dose-dependent haematological toxicities other than neutropenia are observed | Resume lenalidomide at dose level 1 |
| For each subsequent drop less than 0.5 | Interrupt lenalidomide treatment |
| Return to greater than or equal to 0.5 | Resume lenalidomide at next lower dose level (dose level 2 or 3)<br>Do not dose below 5 mg |
| Consider using G-CSF for neutropenia | |
| **Platelets x $10^9$/L (pre-treatment blood test)** | |
| First fall to less than 30 | Interrupt lenalidomide treatment |
| Return to greater than or equal to 30 | Resume lenalidomide at dose level 1 |
| For each subsequent drop less than 30 | Interrupt lenalidomide treatment |
| Return to greater than or equal to 30 | Resume lenalidomide at next lower dose level (dose level 2 or 3)<br>Do not dose below 5 mg |

| Renal impairment | |
|---|---|
| Lenalidomide is substantially excreted by the kidneys. Monitoring of renal function is advised in all patients with renal impairment. The following dose adjustments are recommended at the ***start of therapy*** for patients with moderate or severe impaired renal function or endstage renal disease. | |
| **Creatinine clearance (mL/min)** | |
| 30 to 50 | Reduce lenalidomide dose to 10 mg once daily* |
| less than 30 (not requiring dialysis) | Reduce lenalidomide dose to 15 mg on alternate days (every 48 hours) |
| less than 30 (requiring dialysis) | Reduce lenalidomide dose to 5 mg once daily. On dialysis, the dose should be administered following dialysis |

** The dose may be escalated to 15 mg after 2 cycles if the patient is not responding to treatment and is tolerating treatment*

| Hepatic impairment |
|---|
| No formal studies of lenalidomide in patients with hepatic impairment, therefore no specific dose recommendations. |

| Dermatological reactions[7, 8] | |
|---|---|
| Rare cases of Stevens-Johnson syndrome and toxic epidermal necrolysis have been reported. These may be potentially fatal. | |
| **Rash** | |
| Grade 1 | Continue lenalidomide. Treat with topical corticosteroids and oral antihistamines. |
| Grade 2 | Consider interruption of lenalidomide. Treat with topical corticosteroids and oral antihistamines until toxicity resolves. |
| Grade 3 | Consider interruption of lenalidomide. Treat with oral antihistamines or oral corticosteroids until toxicity resolves. |
| Stevens-Johnson syndrome or toxic epidermal necrolysis | Permanent discontinuation of lenalidomide treatment. |

| Dexamethasone and lenalidomide |
|---|
| The reference committee recommend that the dexamethasone and lenalidomide dose be individualised or dose reduced where the high dose regimen is not well tolerated (i.e. in older patients or those that develop severe steroid related side effects). |

## Interactions

*Drug interactions in eviQ protocols are under review and being updated to align with current literature. Further site-wide updates and changes will occur in due course.* References & Disclaimer

*The drug interactions shown below are not an exhaustive list. For a more comprehensive list and for detailed information on specific drug interactions and clinical management, please refer to the specific drug product information and the following key resources:*

- *MIMS - interactions tab (includes link to a CYP-450 table) (login required)*
- *Australian Medicines Handbook (AMH) – interactions tab (login required)*
- *Micromedex Drug Interactions (login required)*
- *Cancer Drug Interactions*
- *Cytochrome P450 Drug Interactions*

| Dexamethasone | | |
|---|---|---|
| | **Interaction** | **Clinical management** |
| **CYP3A4 interactions** | Dexamethasone is a substrate of CYP3A4 and a weak to moderate inducer of CYP3A4. The clinical relevance of CYP3A4 induction by dexamethasone is unknown as the mechanism has yet to be established | The effects of the concomitant use of dexamethasone with other CYP3A4 inducers, inhibitors or substrates is variable. If used concomitantly, monitor patients closely for adverse drug reactions |
| **Warfarin** | Concurrent use may result in increased risk of bleeding or diminished effects of warfarin | Monitor prothrombin time / INR (especially during initiation or discontinuation) and for signs of drug toxicity during concomitant use; adjust warfarin dose as required |
| **Oral hypoglycaemics** | Corticosteroids may cause hyperglycaemia and worsen diabetes control | Monitor blood glucose levels and adjust oral hypoglycaemic dose as required |

| Lenalidomide | | |
|---|---|---|
| | **Interaction** | **Clinical management** |
| **Digoxin** | Potentially increased digoxin plasma levels when combined with lenalidomide; mechanism unknown | Monitor digoxin levels and for signs of drug toxicity during treatment with lenalidomide |
| **HMG-CoA reductase inhibitors (Statins)** | Potentially additive toxicity | Monitor for signs and symptoms of myotoxicity and rhabdomyolysis (e.g.: unexplained muscle pain, muscle stiffness or tenderness, dark urine) during concomitant use |
| **Erythropoietic agents, combined oral contraceptives or hormone replacement therapy** | Additive risk of thromboembolic events due to an increased risk of VTE | Consider the benefit/risk of concomitant therapy |

| General | | |
|---|---|---|
| | **Interaction** | **Clinical management** |
| **Warfarin** | Anti-cancer drugs may alter the anticoagulant effect of warfarin. | Monitor INR regularly and adjust warfarin dosage as appropriate; consider alternative anticoagulant. |
| **Direct oral anticoagulants (DOACs) e.g. apixaban, rivaroxaban, dabigatran** | Interaction with both CYP3A4 and P-gp inhibitors /inducers.<br><br>DOAC and anti-cancer drug levels may both be altered, possibly leading to loss of efficacy or toxicity (i.e. increased bleeding). | Apixaban: avoid concurrent use with strong CYP3A4 and P-gp inhibitors. If treating VTE, avoid use with strong CYP3A4 and P-gp inducers.<br><br>Rivaroxaban: avoid concurrent use with strong CYP3A4 and P-gp inhibitors.<br><br>Dabigatran: avoid combination with strong P-gp inducers and inhibitors.<br><br>If concurrent use is unavoidable, monitor closely for efficacy/toxicity of both drugs. |
| **Digoxin** | Anti-cancer drugs can damage the lining of the intestine; affecting the absorption of digoxin. | Monitor digoxin serum levels; adjust digoxin dosage as appropriate. |
| **Antiepileptics** | Both altered antiepileptic and anti-cancer drug levels may occur, possibly leading to loss of efficacy or toxicity. | Where concurrent use of an enzyme-inducing antiepileptic cannot be avoided, monitor antiepileptic serum levels for toxicity, as well as seizure frequency for efficacy; adjust dosage as appropriate. Also monitor closely for efficacy of the anti-cancer therapy. |
| **Antiplatelet agents and NSAIDs** | Increased risk of bleeding due to treatment related thrombocytopenia. | Avoid or minimise combination.<br>If combination deemed essential, (e.g. low dose aspirin for ischaemic heart disease) monitor for signs of bleeding. |
| **Serotonergic drugs, including selective serotonin reuptake inhibitors (SSRIs e.g. paroxetine) and serotonin noradrenaline reuptake inhibitors (SNRIs e.g. venlafaxine)** | Increased risk of serotonin syndrome with concurrent use of 5-HT3 receptor antagonists (e.g. palonosetron, ondansetron, granisetron, tropisetron, dolasetron, etc.) | Avoid combination.<br>If combination is clinically warranted, monitor for signs and symptoms of serotonin syndrome (e.g. confusion, agitation, tachycardia, hyperreflexia).<br>For more information link to TGA Medicines Safety Update |
| **Vaccines** | Diminished response to vaccines and increased risk of infection with live vaccines. | Live vaccines (e.g. BCG, MMR, zoster and varicella) are contraindicated in patients on immunosuppressive therapy. Use with caution in patients on non-immunosuppressive therapy.<br>For more information; refer to the recommended schedule of vaccination for cancer patients, as outlined in the Australian Immunisation Handbook |

## Administration

*eviQ provides safe and effective instructions on how to administer cancer treatments. However, eviQ does not provide every treatment delivery option, and is unable to provide a comprehensive list of cancer treatment agents and their required IV line giving set/filter. There may be alternative methods of treatment administration, and alternative supportive treatments that are also appropriate. Please refer to the individual*

*product information monographs via the TGA website for further information.*

## Day 1

**This is an oral treatment**

Safe handling and waste management (reproductive risk only)

Safe administration

General patient assessment prior to each day of treatment.

Any toxicity grade 2 or greater may require delay of treatment and review by medical officer before commencing treatment.

Peripheral neuropathy assessment tool.

Any toxicity grade 1 or greater may require dose reduction or delay of treatment and review by medical officer before commencing treatment.

### Dexamethasone

- administer orally ONCE a week in the morning, on **days 1, 8, 15 and 22**
- to be taken with or immediately after food.

**Note**: if a dose is forgotten or vomited, contact treating team.

### Treatment - Time out

### Lenalidomide

- administer orally ONCE a day, at the same time each day, on **days 1 to 21** every 28 days
- to be swallowed whole with a glass of water; do not break, crush or chew
- can be taken either with or without food

**Note**: missed doses should not be taken if it is less than 12 hours until the next dose.

**Continue safe handling precautions (reproductive risk only) for 7 days after completion of drug(s).**

## Days 2 to 7

**This is an oral treatment**

Safe handling and waste management (reproductive risk only)

Safe administration

General patient assessment prior to each day of treatment.

Any toxicity grade 2 or greater may require delay of treatment and review by medical officer before commencing treatment.

Peripheral neuropathy assessment tool.

Any toxicity grade 1 or greater may require dose reduction or delay of treatment and review by medical officer before commencing treatment.

### Treatment - Time out

### Lenalidomide

- administer orally ONCE a day, at the same time each day, on **days 1 to 21** every 28 days
- to be swallowed whole with a glass of water; do not break, crush or chew
- can be taken either with or without food

**Note**: missed doses should not be taken if it is less than 12 hours until the next dose.

**Continue safe handling precautions (reproductive risk only) for 7 days after completion of drug(s).**

## Day 8

**This is an oral treatment**

Safe handling and waste management (reproductive risk only)

Safe administration

General patient assessment prior to each day of treatment.

Any toxicity grade 2 or greater may require delay of treatment and review by medical officer before commencing treatment.

Peripheral neuropathy assessment tool.

Any toxicity grade 1 or greater may require dose reduction or delay of treatment and review by medical officer before commencing treatment.

### Dexamethasone

- administer orally ONCE a week in the morning, on **days 1, 8, 15 and 22**
- to be taken with or immediately after food.

**Note**: if a dose is forgotten or vomited, contact treating team.

### Treatment - Time out

### Lenalidomide

- administer orally ONCE a day, at the same time each day, on **days 1 to 21** every 28 days
- to be swallowed whole with a glass of water; do not break, crush or chew
- can be taken either with or without food

**Note**: missed doses should not be taken if it is less than 12 hours until the next dose.

**Continue safe handling precautions (reproductive risk only) for 7 days after completion of drug(s).**

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## Days 9 to 14

**This is an oral treatment**

Safe handling and waste management (reproductive risk only)

Safe administration

General patient assessment prior to each day of treatment.

Any toxicity grade 2 or greater may require delay of treatment and review by medical officer before commencing treatment.

Peripheral neuropathy assessment tool.

Any toxicity grade 1 or greater may require dose reduction or delay of treatment and review by medical officer before commencing treatment.

### Treatment - Time out

### Lenalidomide

- administer orally ONCE a day, at the same time each day, on **days 1 to 21** every 28 days
- to be swallowed whole with a glass of water; do not break, crush or chew
- can be taken either with or without food

**Note**: missed doses should not be taken if it is less than 12 hours until the next dose.

**Continue safe handling precautions (reproductive risk only) for 7 days after completion of drug(s).**

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## Day 15

**This is an oral treatment**

Safe handling and waste management (reproductive risk only)

Safe administration

General patient assessment prior to each day of treatment.

Any toxicity grade 2 or greater may require delay of treatment and review by medical officer before commencing treatment.

Peripheral neuropathy assessment tool.

Any toxicity grade 1 or greater may require dose reduction or delay of treatment and review by medical officer before commencing treatment.

### Dexamethasone

- administer orally ONCE a week in the morning, on **days 1, 8, 15 and 22**
- to be taken with or immediately after food.

**Note**: if a dose is forgotten or vomited, contact treating team.

### Treatment - Time out

### Lenalidomide

- administer orally ONCE a day, at the same time each day, on **days 1 to 21** every 28 days
- to be swallowed whole with a glass of water; do not break, crush or chew
- can be taken either with or without food

**Note**: missed doses should not be taken if it is less than 12 hours until the next dose.

**Continue safe handling precautions (reproductive risk only) for 7 days after completion of drug(s).**

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## Days 16 to 21

**This is an oral treatment**

Safe handling and waste management (reproductive risk only)

Safe administration

General patient assessment prior to each day of treatment.

Any toxicity grade 2 or greater may require delay of treatment and review by medical officer before commencing treatment.

Peripheral neuropathy assessment tool.

Any toxicity grade 1 or greater may require dose reduction or delay of treatment and review by medical officer before commencing treatment.

### Treatment - Time out

### Lenalidomide

- administer orally ONCE a day, at the same time each day, on **days 1 to 21** every 28 days
- to be swallowed whole with a glass of water; do not break, crush or chew
- can be taken either with or without food

**Note**: missed doses should not be taken if it is less than 12 hours until the next dose.

**Continue safe handling precautions (reproductive risk only) for 7 days after completion of drug(s).**

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## Day 22

**This is an oral treatment**

### Dexamethasone

- administer orally ONCE a week in the morning, on **days 1, 8, 15 and 22**
- to be taken with or immediately after food.

**Note**: if a dose is forgotten or vomited, contact treating team.

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## Discharge information

### Dexamethasone tablets and lenalidomide capsules

- Dexamethasone tablets and lenalidomide capsules with written instructions on how to take them.

### Antiemetics

- Antiemetics as prescribed.

### Thromboprophylaxis

- Low dose aspirin OR enoxaparin 40 mg subcut daily for the duration of treatment if prescribed.

### Growth factor support

- Arrangements for administration if prescribed.

### Prophylaxis medications

- Prophylaxis medications (if prescribed) i.e. antivirals, tumour lysis prophylaxis, PJP prophylaxis and medication for constipation.

### Patient information

- Ensure patient receives patient information sheet.

# Side effects

*The side effects listed below are not a complete list of all possible side effects for this treatment. Side effects are categorised into the approximate onset of presentation and should only be used as a guide.*

| Immediate (onset hours to days) | |
|---|---|
| **Flu-like symptoms** | |
| **Taste and smell alteration** | Read more about taste and smell changes |

| Early (onset days to weeks) | |
|---|---|
| **Neutropenia** | Abnormally low levels of neutrophils in the blood. This increases the risk of infection. Any fever or suspicion of infection should be investigated immediately and managed aggressively.<br>Read more about immediate management of neutropenic fever |
| **Thrombocytopenia** | A reduction in the normal levels of functional platelets, increasing the risk of abnormal bleeding.<br>Read more about thrombocytopenia |
| **Arthralgia and myalgia** | Generalised joint pain or and/or stiffness and muscle aches, often worse upon waking or after long periods of inactivity. Can improve with movement. May be mild or severe, intermittent or constant and accompanied by inflammation.<br>Read more about arthralgia and myalgia |
| **Constipation** | |
| **Cough** | |
| **Diarrhoea** | Read more about treatment induced diarrhoea |
| **Fatigue** | Read more about fatigue |
| **Respiratory tract infection** | |
| **Skin rash** | Anti-cancer drugs can cause a number of changes in the skin with maculo-papular rash the most common type of drug-induced skin reaction.<br>Read more about skin rash |
| **Side effects of corticosteroids** | Insomnia, oedema, increased risk of infection e.g. oral thrush, gastric irritation, worsening of peptic ulcer disease, increased blood sugar levels, loss of diabetic control, mood and behavioural changes - including anxiety, euphoria, depression, mood swings, increased appetite and weight gain, osteoporosis and fractures (long term use), bruising and skin fragility are associated with corticosteroid use. |
| **Thromboembolism** | Venous thromboembolism (VTE), including deep vein thrombosis (DVT) and pulmonary embolism (PE) is significantly increased in multiple myeloma patients treated with thalidomide in combination with other therapies including doxorubicin, melphalan and prednisolone or dexamethasone; and lenalidomide and pomalidomide in combination with dexamethasone.<br>Read more about management of thromboembolism (VTE) in multiple myeloma |

| Late (onset weeks to months) | |
|---|---|
| **Anaemia** | Abnormally low levels of red blood cells (RBCs) or haemoglobin in the blood.<br>Read more about anaemia |
| **Diarrhoea (late onset)** | Chronic loose stools due to bile acid malabsorption has been observed in patients receiving lenalidomide. Referral to Gastroenterology should be considered. An empiric trial of cholestyramine (a bile-acid binding resin) is reasonable for these patients.<br>Read more about treatment induced diarrhoea |
| **Hypothyroidism** | |
| **Muscle cramps** | Cramping in the hands, calves and/or thighs associated with hypomagnesaemia (low magnesium) and/or hypocalcaemia (low calcium). |
| **Stevens-Johnson syndrome (SJS)** | Stevens-Johnson syndrome (SJS) or toxic epidermal necrolysis (TEN) is characterised by fever, malaise, a painful rash, erythematous macules, targetoid lesions, or diffuse erythema progressing to vesicles and bullae, and oral, ocular and/or genital mucositis with painful mucosal erosion. Patients who develop SJS/TEN should never be re-exposed to the causative agent. |

| Delayed (onset months to years) | |
|---|---|
| **Cataract** | A disorder characterised by partial or complete opacity of the crystalline lens of one or both eyes. This results in a decrease in visual acuity and eventual blindness if untreated. |

## Evidence

This regimen has a role in both the upfront and relapsed/refractory settings.

The FIRST trial (MM-020) provided supporting evidence for the use of lenalidomide/dexamethasone (LenDex or Rd) in the upfront setting for transplant-ineligible patients.[2] Between 2008 and 2011 across 18 countries and multiple treatment centres, a total of 1,623 patients were assigned in 1:1:1 randomisation to receive either LenDex in 28-day cycles till disease progression (Rd continuous), LenDex for 18 cycles then stop (Rd18), or Melphalan/Prednisone/Thalidomide in 42-day cycles for 12 cycles (MPT). Continuous Rd was found to achieve better median progression-free survival (PFS) and trend towards better overall survival (OS) compared to the other two comparator regimens. Among the previously treated patients, the studies supporting the use of this regimen were published as MM-009 4 and MM-0105, with longer-term follow-up published in 2009.[9]

In paired randomised studies recruiting in the USA (MM-009) and Europe, Israel and Australia (MM-010), lenalidomide with dexamethasone was compared to dexamethasone alone. These studies were double-blind, placebo-controlled, multicentre studies. Eligible patients had progressive myeloma after at least 1 line of therapy and had measurable disease not progressing on a regimen including high-dose dexamethasone. Other important eligibility criteria included ECOG =2, ALT/AST <3 x ULN, total bilirubin <2 x ULN, creatinine <221 micromol/L, ANC >1.0 x $10^9$/L, and platelet count >75 x $10^9$/L (>30 x $10^9$/L if heavy marrow infiltration). Treatment assignment was stratified according to B-2 microglobulin, prior SCT, and number of prior therapies. The primary endpoint was time to disease progression.[4, 5]

### Efficacy

The following table depicts the results from the FIRST trial (MM-020), excerpted from the product information of lenalidomide (Revlimid®).[10] PFS was statistically superior compared to Rd18 and MPT arms; OS showed trend in favour of Continuous Rd but did not reach the threshold for significance.

Summary of efficacy data from study MM-020

| Endpoint | Continuous Rd (N = 535) | Rd18 (N = 541) | MPT (N = 547) |
|---|---|---|---|
| **PFS (months)** | | | |
| Median [95% CI] | 25.5 [20.7, 29.4] | 20.7 [19.4, 22.0] | 21.2 [19.3, 23.2] |
| HR [95% CI]; p-value | | | |
| Rd vs. MPT | 0.72 [0.61, 0.85]; p = 0.00006 | | |
| Rd vs. Rd18 | 0.70 [0.60, 0.82]; p = 0.00001 | | |
| Rd18 vs. MPT | 1.03 [0.89, 1.20]; ns | | |
| **Overall survival (months)*** | | | |
| Median [95% CI] | 58.9 [56.0, NE] | 56.7 [50.1, NE] | 48.5 [44.2, 52.0] |
| HR [95% CI]; p-value | | | |
| Rd vs. MPT | 0.75 [0.62, 0.90]; p = 0.002 | | |
| Rd vs. Rd18 | 0.91 [0.75, 1.09]; ns | | |
| Rd18 vs. MPT | 0.83 [0.69, 0.99]; p = 0.034 | | |
| **Myeloma response, n (%)** | | | |
| Complete response | 81 (15.1) | 77 (14.2) | 51 (9.3) |
| Very good partial response | 152 (28.4) | 154 (28.5) | 103 (18.8) |
| Partial response | 169 (31.6) | 166 (30.7) | 187 (34.2) |
| Overall response (CP, VGPR or PR) | 402 (75.1) | 397 (73.4) | 341 (62.3) |
| **Duration of response (months)** | | | |
| Median [95% CI] | 35.0 [27.9, 43.4] | 22.1 [20.3, 24.0] | 22.3 [20.2, 24.9] |

* OS data is based on an updated analysis (03 March 2014); NE = not estimable; ns = not significant.

In MM-009,[4] 177 patients were assigned to the lenalidomide/dexamethasone group and 176 to the dexamethasone group. Complete, near-complete, or partial responses occurred in 108 patients (61.0%) in the lenalidomide group and in 35 patients (19.9%) in the placebo group (P<0.001); complete responses occurred in 14.1% and 0.6%, respectively (P<0.001). The median time to progression was 11.1 months in the lenalidomide group and 4.7 months in the placebo group (P<0.001). Median OS times in the two groups were 29.6 months and 20.2 months, respectively (P<0.001). In MM-010,[5] 176 patients were assigned to the lenalidomide/dexamethasone group and 175 to the dexamethasone group. Complete, near-complete, or partial responses occurred in 106 patients (60.2%) in the lenalidomide group and in 42 patients (24%) in the placebo group (P<0.001); complete responses occurred in 15.9% and 3.4%, respectively (P<0.001). The median time to progression was 11.3 months in the lenalidomide group and 4.7 months in the placebo group (P<0.001). OS was significantly improved in the lenalidomide group (hazard ratio for death, 0.66; P = 0.03). A pooled analysis with longer follow-up (median 48 months) confirmed lenalidomide/dexamethasone significantly improved overall response (60.6 vs. 21.9%, p<0.001), complete response rate (15.0 vs. 2.0%, p<0.001), time to progression (median 13.4 vs. 4.6 months, p<0.001), duration of response (median of 15.8 vs. 7 months, p<0.001), and OS (median 38.0 vs. 31.6 months, p=0.045).[9] A further analysis suggests this efficacy is maintained in patients aged over 65 years.[11] A small non randomised study of 45 patients aged over 75 years with relapsed myeloma found 62% overall response rate and median PFS of 14 months, similar to the MM-009 and MM-010 studies.[12]

Lastly, most studies have utilised a high-dose dexamethasone regimen of 40 mg on days 1 to 4, 9 to 12 and 17-20 in the first four 28 days cycles with 40 mg on days 1 to 4 in subsequent cycles. Rajkumar et al.[1] compared this high-dose dexamethasone regimen with 40 mg on days 1, 8, 15 and 22 of every 28 days cycle during the first 4 cycles in patients with newly diagnosed myeloma prior to ASCT. The study was stopped after the second interim analysis with 50% of patients completing the study and a median follow-up of 1 year as OS (a secondary endpoint) was significantly greater in the low-dose dexamethasone cohort (96% vs 87% OS, p=0·0002). Grade 3 or higher toxicity (52% vs 35% p=0.0001), deaths (12 vs 1, p=0.003), venous thromboembolism (26% vs 12% p=0.0003) and infection (16% vs 9% p=0.04) were significantly more frequent in the high-dose dexamethasone cohort. Given this and other experience with the high-dose dexamethasone regimens, the reference committee recommend that the dexamethasone dose be individualised or dose reduced where the high dose regimen is not well tolerated (i.e. in older patients or those that develop severe steroid-related side effects).

**Response rates, TTP, PFS and OS: Pooled Analysis of MM-009 and MM-010 Trials:[9]**

**Table 2** Response rates, time-to-progression, progression-free survival and overall survival

| | *Lenalidomide+dexamethasone (n=353)* | *Dexamethasone+placebo (n=351)* | *P-value* |
|---|---|---|---|
| *Up to Unblinding (median FU=17.5 months)* | | | |
| *Response rate, %* | | | |
| ORR | 60.6 | 21.9 | <0.001 |
| CR | 15.0 | 2.0 | <0.001 |
| VGPR | 17.3 | 2.8 | |
| PR | 28.3 | 17.1 | |
| Median TTP, months | 13.4 | 4.6 | <0.001 |
| Median DOR, months | 15.8 | 7.0 | <0.001 |
| Median PFS, months | 11.1 | 4.6 | <0.001 |
| Extended FU (Median FU=48 months) | 38.0 | 31.6 | 0.045 |
| Median OS, months | | | |

Abbreviations: CR, complete response; DOR, duration of response; FU, follow-up; ORR, overall response rate; OS, overall survival; PFS, progression-free survival; PR, partial response; TTP, time-to-progression; VGPR, very good partial response.



## Toxicity

In the combined analysis,[9] grade 3 or 4 adverse events were reported in 83.3% of the lenalidomide/dexamethasone group and in 69.7% of the dexamethasone group. The grade 3 or 4 events resulted in study discontinuation in 19.8% and 10.2% or patients. Grade 3 or 4 adverse events occurring in >5% of patients are summarised in the table below. The main differences were increased bone marrow suppression (neutropenia, thrombocytopenia and anaemia) and thromboembolism with the combination of lenalidomide and dexamethasone compared with dexamethasone alone. Hyperglycaemia was seen in almost 8% of patients. The most frequently reported non-haematologic adverse effects included fatigue, insomnia, dizziness, diarrhoea, constipation, muscle cramps and infection. Infection was observed twice as often in the lenalidomide/dexamethasone cohort (Grade 3 or 4 ~21% vs 12%, p=0.14). The reference committee recommends routine antimicrobial and thromboprophylaxis.

A retrospective analysis of phase III data has shown that lenalidomide/dexamethasone remains effective and well-tolerated in patients with moderate or severe renal impairment (RI), albeit with an increase in myelosuppression.[13] Lenalidomide has a predominantly renal route of excretion and in patients with RI the plasma concentration and half-life of the drug are significantly increased. As a consequence, lower starting doses are required in patients with RI to avoid over-exposure and an increased risk of adverse events, while maintaining good therapeutic index.

After > 60 months' follow up of the FIRST trial cohort of patients, there were no new safety signals compared to earlier studies. The rate of grade 3-4 infections were observed in a greater proportion of Rd continuous patients (32%), compared to Rd18 (22%) or MPT (17%). The rate of second primary solid tumours were equivalent in the subgroups, with slightly higher haematological malignancies in the MPT cohort (3%, compared to Rd continuous 1% and Rd18 <1%).[14]

**Grade 3 and 4 Adverse Events: 'First' Trial[2]**

Table 3. Grade 3 or 4 Adverse Events.

| Event | Continuous Lenalidomide–Dexamethasone (N=532) | Lenalidomide–Dexamethasone for 18 Cycles (N=540) | MPT (N=541) |
|---|---|---|---|
| | number of patients with event (percent) | | |
| Any grade 3 or 4 event* | 453 (85) | 433 (80) | 480 (89) |
| Hematologic adverse event | | | |
| Neutropenia | 148 (28) | 143 (26) | 243 (45) |
| Anemia | 97 (18) | 85 (16) | 102 (19) |
| Thrombocytopenia | 44 (8) | 43 (8) | 60 (11) |
| Lymphopenia | 30 (6) | 18 (3) | 37 (7) |
| Leukopenia | 24 (5) | 30 (6) | 53 (10) |
| Nonhematologic adverse event† | | | |
| Infection | 154 (29) | 118 (22) | 93 (17) |
| Cardiac disorder | 63 (12) | 39 (7) | 46 (9) |
| Pneumonia | 43 (8) | 45 (8) | 31 (6) |
| Deep-vein thrombosis, pulmonary embolism, or both | 42 (8) | 30 (6) | 29 (5) |
| Asthenia | 41 (8) | 33 (6) | 32 (6) |
| Fatigue | 39 (7) | 46 (9) | 31 (6) |
| Back pain | 37 (7) | 34 (6) | 28 (5) |
| Hypokalemia | 35 (7) | 20 (4) | 11 (2) |
| Hyperglycemia | 28 (5) | 23 (4) | 9 (2) |
| Rash | 33 (6) | 28 (5) | 28 (5) |
| Cataracts | 31 (6) | 14 (3) | 3 (1) |
| Dyspnea | 30 (6) | 22 (4) | 18 (3) |
| Constipation | 12 (2) | 10 (2) | 29 (5) |
| Peripheral sensory neuropathy | 6 (1) | 2 (<1) | 51 (9) |

* The grade 3 or 4 adverse events listed here were those reported by the investigator in at least 5% of any study group in the safety population, which was defined as all the patients who underwent randomization and received at least one dose of the study treatment (lenalidomide, dexamethasone, melphalan, prednisone, or thalidomide).
† Diarrhea occurred in 21 patients (4%) in the continuous lenalidomide–dexamethasone group, in 18 (3%) in the group that received 18 cycles of lenalidomide–dexamethasone, and in 8 (1%) in the MPT group.



**Grade 3 and 4 Adverse Events: Pooled Analysis of MM-009 and MM-010 Trials:**[9]

**Table 4** Grade ⩾3 adverse events occurring in more than 5% of patients

| *Adverse event, n (%)* | *Lenalidomide+ dexamethasone (n=353)* | *Dexamethasone+ placebo (n=351)* |
|---|---|---|
| Neutropenia | 125 (35.4)** | 12 (3.4) |
| Thrombocytopenia | 46 (13.0)** | 22 (6.3) |
| Anemia | 38 (10.8)* | 21 (6.0) |
| Pneumonia | 32 (9.1) | 19 (5.4) |
| All thromboembolic events | 56 (15.9)** | 19 (5.4) |
| Hyperglycemia | 27 (7.6) | 27 (7.7) |
| Fatigue | 23 (6.5) | 17 (4.9) |
| Muscle weakness | 20 (5.7) | 11 (3.1) |
| Hypokalemia | 20 (5.7) | 5 (1.4) |
| Asthenia | 17 (4.8) | 18 (5.1) |

* $P<0.001$; ** $P<0.05$.



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## History

### Version 6

| Date | Summary of changes |
|---|---|
| **13/04/2023** | Reviewed at the 2022 eviQ Haematology Reference Committee meeting with the following changes:<br>• Note regarding dexamethasone reduction in specific patient populations added to treatment schedule notes<br>• Bone modifying agents block added to clinical information, related note removed from treatment schedule and linked pages removed<br>• Link to Medical Scientific Advisory Group (MSAG) guidelines updated<br>• Changed all references of ‘i-Access™ program’ to ‘pregnancy prevention risk management program’<br>• Lenalidomide administration details updated in treatment schedule, administration and patient information<br><br>Other changes include:<br>• Specific medications removed from G-CSF note in 'Dose modifications' section<br>• Dose modifications for rash updated to align with product information<br>• Cataract, cough and respiratory tract infection added to side effects<br><br>Changed to v.6. Review in 2 years. |

**Version 5**

| Date | Summary of changes |
|---|---|
| **19/03/2010** | New eviQ protocol presented at Haematology Reference Group meeting. |
| **20/05/2010** | Approved and published on eviQ. |
| **02/08/2010** | Updated PCP prophylaxis recommendations. |
| **20/01/2012** | PHC view added. |
| **19/02/2012** | New format to allow for export of protocol information.<br>Protocol version number changed to v.2.<br>Antiemetics and premedication added to the treatment schedule.<br>Additional Clinical Information, Key Prescribing table and Key Administration table combined into new section titled Clinical Considerations.<br>Drug specific information placed behind the drug name link. |
| **30/03/2012** | Lenalidomide has been reclassified from minimal to low emetic potential to align with MASCC Antiemetic Guideline 2011. |
| **31/08/2012** | Protocol reviewed at Haematology Reference Committee meeting.<br>Next review in 2 years. |
| **19/06/2013** | Added new bisphosphonate and VTE clinical information block. |
| **02/09/2013** | Approved and published on eviQ (from RCM 2012). |
| **13/03/2015** | Protocol reviewed at Haematology Reference Committee meeting. The following updates were made:<br>• Dexamethasone dosing changed to 40mg on day 1, 8, 15, 22 throughout treatment as per reference committee.<br>• Notes section updated.<br>• Toxicity data from 2014 Benboubker et al. 2014 paper added.<br>• Calculator removed.<br><br>Next review in 2 years. |
| **18/10/2015** | Removed reference to 'I-Access™ Program'. |
| **31/05/2017** | Transferred to new eviQ website. Version number change to v.4. |
| **24/11/2017** | Protocol reviewed at Haematology Reference Committee meeting:<br>• Reference to the 'i-Access™ program' added back into drug status.<br>• Added to indications 'Patients with newly diagnosed multiple myeloma who are ineligible for autologous stem cell transplantation'.<br>• Added to dose modifications dexamethasone and lenalidomide reduction for the frail and elderly.<br>• Added FIRST trial to evidence.<br>• Version number increased to v.5. |
| **24/05/2019** | Protocol reviewed at Haematology Reference Committee meeting:<br>• Note regarding dexamethasone updated.<br>• Review in 2 years. |
| **10/10/2019** | Clinical information updated with PBS expanded indications for G-CSF. |
| **30/04/2021** | Protocol reviewed at Haematology Reference Committee meeting. The following updates were made:<br>• Late onset diarrhoea block added in side effects<br>• Administration section updated to include all days of treatment<br><br>Next review in 2 years. |
| **29/11/2021** | Interactions updated. |
| **21/12/2021** | Changed antiemetic clinical information block to minimal or low, to align with new categories. See ID 7: Prevention of anti-cancer therapy induced nausea and vomiting (AINV) v5. |
| **20/01/2022** | Interactions updated. |

**First approved:** 20 May 2010
**Last reviewed:** 30 April 2021
**Review due:** 31 December 2023

***The currency of this information is guaranteed only up until the date of printing, for any updates please check:***
*https://www.eviq.org.au/p/547*
*09 Jun 2023*

# Patient information - Multiple myeloma - Lenalidomide and dexamethasone

**Patient's name:**

## Your treatment

The treatment schedule below explains how the drugs for this treatment are given.

| Lenalidomide and dexamethasone | | |
|---|---|---|
| This treatment cycle is repeated every 28 days. Your doctor will advise you of the number of treatments you will have. | | |
| **Day** | **Treatment** | **How it is given** |
| 1, 8, 15 and 22 | **Dexamethasone** *(dex-a-meth-a-sone)* | Take orally ONCE a week in the morning with food on days 1, 8, 15 and 22 only. |
| 1 to 21 | **Lenalidomide** *(len-a-lid-o-mide)* | Take orally ONCE a day on days 1 to 21 at the same time every day. Take either with or without food. Swallow whole, do not break, open, chew or crush capsules. |

**Missed doses:**

- **Dexamethasone:** if you forget to take your tablets or vomit your tablets, contact your treating team.
- **Lenalidomide:** if you forget to take a capsule and if it less than 12 before your next dose, skip that dose and take your normal dose at the next time it is due. Do not take an extra dose.

## When to get help

Anticancer drugs (drugs used to treat cancer) can sometimes cause serious problems. It is important to get medical help immediately if you become unwell.

| **IMMEDIATELY go to your nearest hospital Emergency Department, or contact your doctor or nurse if you have any of the following at any time:** | **Emergency contact details**<br>Ask your doctor or nurse from your treating team who to contact if you have a problem |
|---|---|
| • a temperature of 38ºC or higher<br>• chills, sweats, shivers or shakes<br>• shortness of breath<br>• uncontrolled vomiting or diarrhoea<br>• pain, tingling or discomfort in your chest or arms<br>• you become unwell. | Daytime:<br>Night/weekend:<br>Other instructions: |

## Important information about taking lenalidomide

Lenalidomide is only available under a restricted distribution pregnancy prevention risk management program. You, your doctor

and your pharmacist must be registered and comply with conditions of the pregnancy prevention risk management program.

Lenalidomide can cause major birth defects to an unborn baby. Lenalidomide must not be taken if you are pregnant. Contraception **must** be used while you are being treated with lenalidomide.

- **If you are a male patient and your female partner is of child-bearing potential** you **must** use a barrier method of contraception (e.g. condoms) while taking lenalidomide and for one week after finishing lenalidomide treatment.
- **If you are a woman of child-bearing potential (a patient or a partner of a patient)** you **must** use at least one effective method of contraception during treatment with lenalidomide. You should start using contraception four weeks before taking lenalidomide and continue for four weeks after finishing lenalidomide treatment. It is important that you discuss appropriate contraception with your doctor.

If you become pregnant while taking lenalidomide you must stop the treatment and tell your doctor immediately. If you are a male patient and your female partner becomes pregnant during your treatment you must inform your doctor immediately.

## Other information about your treatment

### Changes to your dose or treatment delays

Sometimes a treatment may be started at a lower dose or the dose needs to be changed during treatment. There may also be times when your treatment is delayed. This can happen if your doctor thinks you are likely to have severe side effects, if you get severe side effects, if your blood counts are affected and causing delays in treatment, or if you are finding it hard to cope with the treatment. This is called a dose reduction, dose change or treatment delay. Your doctor will explain if you need any changes or delays to your treatment and the reason why.

### Blood tests and monitoring

You will need to have a blood test before you start treatment and regularly throughout your treatment. Your doctor or nurse will tell you when to have these blood tests.

### Other medications given during this treatment

- **Anti-sickness (anti-nausea) medication:** you may be given some anti-sickness medication. Make sure you take this medication as your doctor or nurse tells you, even if you don't feel sick. This can help to prevent the sickness starting.
- **Blood clot prevention medication:** you may be given low dose aspirin or daily injections of a drug called enoxaparin to prevent blood clots. Your doctor will decide if you need this medication.
- **Prophylaxis medication:** you may need to take some medications to prevent infection and to help prevent or reduce some of the side effects of the chemotherapy. Your doctor or nurse will tell you how and when to take these medications.
- **G-CSF:** you may be given injection(s) of a drug called G-CSF (also called filgrastim, lipegfilgrastim or pegfilgrastim) under your skin. This helps to boost your white blood cell count. Your white blood cells help to fight infection. Lipegfilgrastim and pegfilgrastim are given once. Filgrastim is given for several days until your white blood cells recover. Your doctor will decide if you need this medication.

## Side effects

Cancer treatments can cause damage to normal cells in your body, which can cause side effects. Everyone gets different side effects, and some people will have more problems than others.

The table below shows some of the side effects you may get with this treatment. You are unlikely to get all of those listed and you may also get some side effects that have not been listed.

Tell your doctor or nurse about any side effects that worry you. Follow the instructions below and those given to you by your doctor or nurse.

| Immediate (onset hours to days) | |
|---|---|
| **Flu-like symptoms** | • You may get:<br>  ◦ a fever<br>  ◦ chills or sweats<br>  ◦ muscle and joint pain<br>  ◦ a cough<br>  ◦ headaches.<br>• Tell your doctor or nurse if you get any of the symptoms listed above.<br>• **Tell your doctor or nurse immediately, or go to the nearest hospital Emergency Department if you have a temperature of 38°C or higher.** |
| **Taste and smell changes** | • You may find that food loses its taste or tastes different.<br>• These changes are likely to go away with time.<br>• Do your mouth care regularly.<br>• Chew on sugar-free gum or eat sugar-free mints.<br>• Add flavour to your food with sauces and herbs.<br>• Ask your doctor or nurse for eviQ patient information - Taste and smell changes during cancer treatment. |

| Early (onset days to weeks) | |
|---|---|
| **Infection risk (neutropenia)** | • This treatment lowers the amount of white blood cells in your body. The type of white blood cells that help to fight infection are called neutrophils. Having low level of neutrophils is called neutropenia. If you have neutropenia, you are at greater risk of getting an infection. It also means that your body can't fight infections as well as usual. This is a serious side effect, and can be life threatening.<br>• Wash your hands often.<br>• Keep a thermometer at home and take your temperature regularly, and if you feel unwell.<br>• Do your mouth care regularly.<br>• Inspect your central line site (if you have one) daily for any redness, pus or swelling.<br>• Limit contact with people who are sick.<br>• Learn how to recognise the signs of infection.<br>• Ask your doctor or nurse for eviQ patient information - Infection during cancer treatment.<br>• **Tell your doctor or nurse immediately, or go to the nearest hospital Emergency Department if you get any of the following signs or symptoms:**<br>  ◦ **a temperature of 38°C or higher**<br>  ◦ **chills, shivers, sweats or shakes**<br>  ◦ **a sore throat or cough**<br>  ◦ **uncontrolled diarrhoea**<br>  ◦ **shortness of breath**<br>  ◦ **a fast heartbeat**<br>  ◦ **become unwell even without a temperature.** |
| **Low platelets (thrombocytopenia)** | • This treatment lowers the amount of platelets in your blood. Platelets help your blood to clot. When they are low, you are at an increased risk of bleeding and bruising.<br>• Try not to bruise or cut yourself.<br>• Avoid contact sport or vigorous exercise.<br>• Clear your nose by blowing gently.<br>• Avoid constipation.<br>• Brush your teeth with a soft toothbrush.<br>• Don't take aspirin, ibuprofen or other similar anti-inflammatory medications unless your doctor tells you to.<br>• Tell your doctor or nurse if you have any bruising or bleeding.<br>• **Tell your doctor or nurse immediately, or go to your nearest hospital Emergency Department if you have any uncontrolled bleeding.** |

| | |
|---|---|
| **Joint and muscle pain and stiffness** | • You may get muscle, joint or general body pain and stiffness.<br>• Applying a heat pack to affected areas may help.<br>• Talk to your doctor or nurse about other ways to manage these symptoms. You may need medication to help with any pain. |
| **Constipation** | • You may have bowel motions (stools, poo) that are less frequent, harder, smaller, painful or difficult to pass.<br>• You may also get:<br>◦ bloating, cramping or pain<br>◦ a loss of appetite<br>◦ nausea or vomiting.<br>• Drink plenty of fluids (unless you are fluid restricted).<br>• Eat plenty of fibre-containing foods such as fruit, vegetables and bran.<br>• Take laxatives as directed by your doctor.<br>• Try some gentle exercise daily.<br>• **Tell your doctor or nurse if you have not opened your bowels for more than 3 days.** |
| **Cough** | • Some people who receive this treatment develop a cough<br>• Tell your doctor or nurse if you develop a cough |
| **Diarrhoea** | • You may get bowel motions (stools, poo) that are more frequent or more liquid.<br>• You may also get bloating, cramping or pain.<br>• Take your antidiarrhoeal medication as directed by your doctor.<br>• Drink plenty of fluids (unless you are fluid restricted).<br>• Eat and drink small amounts more often.<br>• Avoid spicy foods, dairy products, high fibre foods, and coffee.<br>• Ask your doctor or nurse for eviQ patient information - Diarrhoea during cancer treatment.<br>• **Tell your doctor or nurse immediately, or go to your nearest hospital Emergency Department if your diarrhoea is not controlled, you have 4 or more loose bowel motions per day, and if you feel dizzy or light-headed.** |
| **Tiredness and lack of energy (fatigue)** | • You may feel very tired, have no energy, sleep a lot, and not be able to do normal activities or things you enjoy.<br>• Do not drive or operate machinery if you are feeling tired.<br>• Nap for short periods (only 1 hour at a time)<br>• Prioritise your tasks to ensure the best use of your energy.<br>• Eat a well balanced diet and drink plenty of fluids (unless you are fluid restricted).<br>• Try some gentle exercise daily.<br>• Allow your friends and family to help.<br>• **Tell your doctor or nurse if you get any of the symptoms listed above.** |
| **Chest infection** | • You can develop a chest infection whilst receiving this treatment.<br>• **Tell your doctor or nurse as soon as possible if you get any of the following symptoms:**<br>◦ **shortness of breath**<br>◦ **difficulty breathing**<br>◦ **wheezing**<br>◦ **coughing up mucus** |
| **Skin rash** | • You may get a red, bumpy rash and dry, itchy skin.<br>• Moisturise your skin with a gentle non-perfumed moisturising cream like sorbolene or aqueous cream.<br>• Do not scratch your skin.<br>• Protect your skin from the sun by wearing sun-protective clothing, a wide-brimmed hat, sunglasses and sunscreen of SPF 50 or higher.<br>• **Talk to your doctor or nurse about other ways to manage your skin rash.** |

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| **Side effects from steroid medication** | • Steroid medication may cause:<br>◦ mood swings and behaviour changes<br>◦ an increased appetite<br>◦ weight gain<br>◦ swelling in your hands and feet<br>◦ stomach upsets<br>◦ trouble sleeping<br>◦ fragile skin and bruising<br>◦ an increase in your blood sugar level<br>◦ weak and brittle bones (osteoporosis)<br>• Take your steroid medication with food to reduce stomach upset<br>• If you have diabetes, your blood sugar levels may be tested more often.<br>• Tell your doctor or nurse if you get any of the symptoms listed above. |
| **Blood clots (thromboembolism)** | • Blood clots can occur with this treatment.<br>• **Tell your doctor or nurse immediately, or go to the nearest hospital Emergency Department if you get any of the following signs or symptoms:**<br>◦ **redness, heat or pain in your leg(s)**<br>◦ **numbness or weakness in your face, arm or leg**<br>◦ **chest pain**<br>◦ **sudden shortness of breath**<br>◦ **dizziness**<br>◦ **trouble speaking**<br>◦ **blurred vision**<br>◦ **severe headache**<br>◦ **unexplained falls or loss of balance.** |

| Late (onset weeks to months) | |
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| **Low red blood cells (anaemia)** | • You may feel dizzy, light-headed, tired and appear more pale than usual.<br>• Tell your doctor or nurse if you have any of these signs or symptoms. You might need a blood transfusion.<br>• **Tell your doctor or nurse immediately, or go to the nearest hospital Emergency Department if you have any chest pain, trouble breathing, or feel like your heart is racing.** |
| **Diarrhoea (late onset)** | • Whilst usually mild and easily manageable, bowel motions (stools, poo) that are more frequent or more liquid may persist during treatment with lenalidomide.<br>• Bile acid malabsorption (BAM), a condition in which patients do not absorb bile acids properly from their intestines, can be a cause of persistent diarrhoea in patients taking lenalidomide.<br>• It can be treated by making some dietary changes such as making sure that fat does not make up more than 20% of the diet.<br>• Your doctor will recommend if treatment is necessary for your diarrhoea<br>• Drink plenty of fluids (unless you are fluid restricted).<br>• Ask your doctor or nurse for eviQ patient information - Diarrhoea during cancer treatment.<br>• **Tell your doctor or nurse immediately, or go to your nearest hospital Emergency Department if your diarrhoea is not controlled, you have 4 or more loose bowel motions per day, and if you feel dizzy or light-headed.** |
| **Slow thyroid gland (hypothyroidism)** | • You may:<br>◦ fatigue and low energy levels<br>◦ depression<br>◦ slow heart rate<br>◦ unexplained weight gain<br>◦ intolerance to cold temperatures<br>◦ fatigued and aching muscles<br>◦ dry, coarse skin<br>◦ puffy face<br>◦ hair loss<br>◦ constipation<br>◦ problems with concentration<br>• You will have regular blood tests to check how well your thyroid is working<br>• **Tell your doctor or nurse if you get any of the symptoms listed above.** |
| **Muscle cramps** | • You may get muscle cramps, usually in the hands, calves and thighs.<br>• Tell your doctor or nurse if you get any of these symptoms. Your doctor may prescribe you medication for this. |
| **Stevens-Johnson syndrome (SJS)** | • This side effect is rare, but can be very serious.<br>• **Tell your doctor or nurse immediately, or go to the nearest hospital Emergency Department if you get any of the following symptoms:**<br>◦ **flu-like symptoms, then a painful red or purple rash that spreads**<br>◦ **swelling of the face or tongue**<br>◦ **painful or peeling skin**<br>◦ **blisters on the skin, mouth, nose, eyes and genitals.** |

| Delayed (onset months to years) | |
|---|---|
| **Cataract** | • Tell your doctor or nurse if you notice any changes to your eyes, including blurred vision. |

## General advice for people having cancer treatment

### Chemotherapy safety

- Learn how to keep you and your family safe while you are having anticancer drugs.

- See our patient information sheet - Chemotherapy safety at home.

### Blood clot risk

- Cancer and anticancer drugs can increase the risk of a blood clot (thrombosis).
- Tell your doctor if you have a family history of blood clots.
- A blood clot can cause pain, redness, swelling in your arms or legs, shortness of breath or chest pain.
- If you have any of these symptoms go to your nearest hospital Emergency Department.

### Medications and vaccinations

- Before you start treatment, tell your doctor about any medications you are taking, including vitamins or herbal supplements.
- Don't stop or start any medications during treatment without talking to your doctor and pharmacist first.
- Paracetamol is safe to take if you have a headache or other mild aches and pains. It is recommended that you avoid taking aspirin, ibuprofen and other anti-inflammatory type medications for pain while you are having treatment. However, if these medications have been prescribed by your doctor, do not stop taking them without speaking with your doctor.
- Vaccinations such as flu and tetanus vaccines are safe to receive while having treatment. Do not have any live vaccines during your treatment or for 6 months after it finishes. If you are unsure, check with your doctor before you have any vaccinations.
- People you live with should be fully vaccinated, including having live vaccines according to the current vaccination schedule. Extra care needs to be taken with hand washing and careful disposal of soiled nappies for infants who have recently received the rotavirus vaccine.

### Other medical and dental treatment

- If you go to hospital or any other medical appointment (including dental appointments), always tell the person treating you that you are receiving anticancer drugs.
- Before you have any dental treatment, talk to your doctor.

### Diet and food safety

- While you are receiving this treatment it is important that you try to maintain a healthy diet.
- Speak to your doctor or nurse about whether drinking alcohol is safe with your treatment.
- If you have any concerns about recent weight loss or weight gain or questions about your diet, ask to speak to a dietitian.
- There are some foods that may cause infection in high risk individuals and should be avoided. For more information on foods to avoid and food hygiene please ask for a copy of the Listeria and food brochure.

### Fertility

- Some cancer treatments can reduce your fertility. This can make it difficult or impossible to get pregnant or father a child.
- Talk to your doctor or nurse before you start any treatment. Depending on your situation there may be fertility sparing options available to you and/or your partner, discuss these with your doctor or nurse.

### Pregnancy and breastfeeding

- This treatment can cause major congenital disabilities or death to unborn babies. Talk to your doctor or nurse if you think there is any chance that you could be pregnant.
- Do not try to get pregnant or father a child during this treatment. You must use contraception while having this treatment and after stopping treatment, see the "Important information" section above for more information. Ask your doctor or nurse about what type of contraception you should use.
- If you are planning pregnancy/fatherhood after completing this treatment, talk to your doctor. Some doctors advise waiting between 6 months and 2 years after treatment.
- Do not breastfeed if you are on this treatment, as anti-cancer medications can also pass into breast milk.

### Sex life and sexuality

- The desire to have sex may decrease as a result of this treatment or its side effects.
- Your emotions and the way you feel about yourself may also be affected by this treatment.
- It may help to discuss your concerns with your partner and doctor or nurse.

### Quitting smoking

- It is never too late to quit smoking. Quitting smoking is one of the best things you can do to help your treatment work better.
- There are many effective tools to improve your chances of quitting.
- Talk to your treating team for more information and referral to a smoking cessation support service.

### Staying active

- Research shows that exercise, no matter how small, has many benefits for people during and after cancer treatment.

- Talk to your doctor before starting an exercise program. Your doctor can advise whether you need a modified exercise program.

**For more information about cancer treatment, side effects and side effect management see our Patient and carers section.**

## Where to get more information

### Telephone support

- Call Cancer Council on 13 11 20 for cancer information and support
- Call the Leukaemia Foundation on 1800 620 420 (Mon to Fri 9am – 5pm)
- Call the Lymphoma Nurse Support Line on 1800 953 081 (Mon to Fri 9am - 5pm)

### Haematology, transplant and cellular therapy information

- Arrow bone marrow transplant foundation – arrow.org.au
- Australasian Menopause Society – menopause.org.au
- Chris O'Brien Lifehouse - Total Body Irradiation - mylifehouse.org.au/departments/radiation-oncology/total-body-irradiation/
- Healthy Male Andrology Australia – healthymale.org.au/
- International Myeloma Foundation – myeloma.org
- Leukaemia Foundation – leukaemia.org.au
- Lymphoma Australia – lymphoma.org.au
- Myeloma Australia – myeloma.org.au
- NSW Agency for Clinical Innovation, Blood & Marrow Transplant Network – aci.health.nsw.gov.au/resources/blood-and-marrow-transplant
- NSW Agency for Clinical Innovation - aci.health.nsw.gov.au/projects/immune-effector-cell-service
- NCCN Guidelines for Patients Immunotherapy Side Effects: CAR T-Cell Therapy - nccn.org/patientresources/patient-resources/guidelines-for-patients
- Talk Blood Cancer – cmlsupport.org.uk/organisation-type/social-media-groups

### General cancer information and support

- Australian Rare Cancer (ARC) Portal – arcportal.org.au/
- Beyondblue – beyondblue.org.au
- Cancer Australia – canceraustralia.gov.au
- Cancer Council Australia – cancer.org.au
- Cancer Voices Australia – cancervoicesaustralia.org
- CanTeen – canteen.org.au
- Carers Australia – carersaustralia.com.au
- eviQ Cancer Treatments Online – eviQ.org.au
- Food Standards Australia New Zealand: Listeria & Food Safety – foodstandards.gov.au/publications/pages/listeriabrochuretext.aspx
- LGBTQI+ People and Cancer - cancercouncil.com.au/cancer-information/lgbtqi
- Look Good Feel Better – lgfb.org.au
- Patient Information - patients.cancer.nsw.gov.au
- Radiation Oncology Targeting Cancer - targetingcancer.com.au
- Redkite – redkite.org.au
- Return Unwanted Medicines – returnmed.com.au
- Staying active during cancer treatment – patients.cancer.nsw.gov.au/coping-with-cancer/physical-wellbeing/staying-active

### Quit smoking information and support

Quitting smoking is helpful even after you have been diagnosed with cancer. The following resources provide useful information and support to help you quit smoking. Talk to your treating team about any other questions you may have.

- Call Quitline on 13 QUIT (13 78 48)
- iCanQuit – iCanQuit.com.au
- Patient Information - patients.cancer.nsw.gov.au/coping-with-cancer/physical-wellbeing/quitting-smoking
- Quitnow – quitnow.gov.au

**Additional notes:**



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