

Multiple myeloma maintenance RVD-lite lenalidomide

ID: 3922 v.2 **Endorsed** Essential Medicine List

⚠ RVD protocols on eviQ:

There are several RVD protocols on eviQ. This reflects current Australian clinical practice with variations in dosing schedules, indications and treatment intent. Please ensure you are viewing the correct protocol.

eviQ will closely review the clinical need for multiple versions of the RVD protocol to rationalise and consolidate in the future.

Patients with myeloma should be considered for inclusion into clinical trials. Link to [ALLG website](#) and [ANZCTR website](#).

This protocol is based on limited evidence; refer to the evidence section of this protocol for more information.

Link to [Medical Scientific Advisory Group \(MSAG\) Clinical Practice Guideline Multiple Myeloma](#)

Link to [MSAG update - bortezomib, lenalidomide and dexamethasone for initial treatment of 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](#).

International Consensus Guideline for Anticancer Drug Dosing in Kidney Dysfunction (ADIKD)

2022

[Click here](#)



Related pages:

- [Multiple myeloma RVD-lite \(lenalidomide bortezomib dexamethasone\) overview](#)
- [Multiple myeloma induction RVD-lite \(lenalidomide bortezomib dexamethasone\)](#)
- [Multiple myeloma consolidation RVD-lite lenalidomide and bortezomib](#)

Treatment schedule - Overview

Drug	Dose	Route
Lenalidomide	10 mg ONCE a day *	PO

* Dose may be increased to 15 mg daily after 3 months if tolerated

This protocol is not designed as standalone therapy but is administered following [consolidation RVD-lite lenalidomide and bortezomib \(ID 3916\)](#).

Continuous until disease progression or unacceptable toxicity

Drug status: **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

Cost: ~ \$2,030 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.](#)

Continuous treatment

Lenalidomide	10 mg (PO)	ONCE a day. Take at same time each day, either with or without food.
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- Dose may be increased to 15 mg daily after 3 months if tolerated

Continuous until disease progression or unacceptable toxicity

Indications and patient population

- Newly diagnosed multiple myeloma patients who are transplant ineligible, following 9 cycles of RVD-lite (lenalidomide, bortezomib and dexamethasone) and 6 cycles of lenalidomide and bortezomib.

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. 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. 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. 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. 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. 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. Effective contraception methods and adequate contraception timeframes should be discussed with all patients of reproductive potential. Prescription of an IMiD requires patient registration with a pregnancy prevention program. Full prescribing information and Authority Application forms available from the Department of Human Services website

Thromboembolism	<p>Patients are at an increased risk of venous thrombosis with this treatment.</p> <p>Risk assessment for VTE should be performed prior to and during treatment.</p> <p>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 kidney dysfunction).</p> <p>Read more about the prophylaxis of venous thromboembolism (VTE) in multiple myeloma</p>
Bone modifying agents	<p>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).¹</p> <p>For more information, please see the following protocols:</p> <p>ID 137 Multiple myeloma zoledronic acid</p> <p>ID 147 Multiple myeloma pamidronate</p> <p>ID 3964 Multiple myeloma denosumab - note denosumab is TGA approved but not PBS reimbursed for this indication.</p>
Bisphosphonates and dental review	<p>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.</p> <p>Read more about medication-related osteonecrosis of the jaw (MRONJ)</p>
Tumour lysis risk	<p>Assess patient for risk of developing tumour lysis syndrome.</p> <p>Read more about prevention and management of tumour lysis syndrome.</p>
PJP prophylaxis	<p>PJP prophylaxis at the discretion of the treating clinician.</p> <p>Read more about prophylaxis of pneumocystis jiroveci (carinii) in cancer patients</p>
Antiviral prophylaxis	<p>It is the consensus opinion of the Haematology Reference committee that consideration be given to continuing antiviral prophylaxis with valaciclovir while on this treatment due to the ongoing high risk of varicella zoster virus reactivation.</p> <p>Read more about antiviral prophylaxis drugs and doses</p>
Growth factor support	<p>G-CSF (short or long-acting) is available on the PBS for chemotherapy induced neutropenia depending on clinical indication and/or febrile neutropenia risk.</p> <p>Access the PBS website</p>
Blood tests	<p>FBC, EUC, LFTs, calcium, magnesium, phosphate and BSL at baseline then monthly thereafter.</p> <p>Patients with normal pre-treatment FBC: repeat FBC fortnightly for the first four weeks then monthly thereafter.</p> <p>Patients with pre-treatment cytopenias: repeat FBC 1 to 2 weekly for the first four weeks then monthly thereafter.</p> <p>Consider monitoring thyroid function tests (reported cases of hypothyroidism).</p>
Hepatitis B screening and prophylaxis	<p>Routine screening for HBsAg and anti-HBc is recommended prior to initiation of treatment. Prophylaxis should be determined according to individual institutional policy.</p> <p>Read more about hepatitis B screening and prophylaxis in cancer patients requiring cytotoxic and/or immunosuppressive therapy</p>
Vaccinations	<p>Live vaccines are contraindicated in cancer patients receiving immunosuppressive therapy and/or who have poorly controlled malignant disease.</p> <p>Refer to the recommended schedule of vaccination for immunocompromised patients, as outlined in the Australian Immunisation Handbook.</p> <p>Read more about COVID-19 vaccines and cancer.</p>

Fertility and lactation	<p>Cancer treatment can have harmful effects on fertility and this should be discussed with all patients of reproductive potential prior to commencing treatment.</p> <p>Possibility of infant risk should be discussed with breastfeeding patients.</p> <p>Read more about the effect of cancer treatment on fertility</p>
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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 $1.0 \times 10^9/L$ and/or platelets less than $75 \times 10^9/L$ (or platelets less than $30 \times 10^9/L$ 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	10 mg
Dose level 1	5 mg
Dose level 2	5 mg on alternate days
Dose level 3	Discontinue lenalidomide
If lenalidomide dose was increased to 15 mg:	
Starting dose	15 mg
Dose level 1	10 mg
Dose level 2	5 mg
Dose level 3	5 mg for 21 days, no lenalidomide for 7 days (Day 1 - 21 of a 28-day cycle)
Dose level 4	Discontinue lenalidomide

Haematological toxicity	
ANC x $10^9/L$ (pre-treatment blood test)	
Do not initiate if neutrophils are <1	
First fall to less than 0.5	Interrupt lenalidomide treatment
Return to greater than or equal to 0.5	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 at next lower dose level (dose level 2 or 3)

Haematological toxicity	
	Do not dose below 5 mg
Consider using G-CSF if neutropenia is the only toxicity at any dose level and maintaining the current lenalidomide dose	
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) 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 end stage renal disease. Subsequent lenalidomide dose modifications should be based on individual patient treatment tolerance. Patients with impaired renal function should be monitored for signs and symptoms of neutropenia or thrombocytopenia as per the recommendations above.	
Creatinine clearance (mL/min)	
30 to 60	5 mg once daily
less than 30	5 mg on alternate days
On dialysis	5 mg 3 times a week post dialysis

Hepatic impairment	
No formal studies of lenalidomide in patients with hepatic impairment, therefore no specific dose recommendations. If abnormal liver function tests are reported, interrupt lenalidomide treatment. Once parameters have returned to baseline, treatment at a lower dose may be considered.	

Dermatological reactions	
Rare cases of Stevens-Johnson syndrome and toxic epidermal necrolysis have been reported. These may be potentially fatal.	
Rash maculo-papular	
Grade 2 or greater	Cease lenalidomide and do not resume
Stevens-Johnson syndrome	
Suspected Stevens-Johnson syndrome	Cease lenalidomide and do not resume
Toxic epidermal necrolysis	
Suspected toxic epidermal necrolysis	Cease lenalidomide and do not resume
Rash exfoliative or bullous	
Presence of exfoliative or bullous rash	Cease lenalidomide and do not resume

Thromboembolism	
Interrupt lenalidomide and start anticoagulation therapy. Once stabilised on anticoagulation and any complications of thromboembolism have been managed, lenalidomide may be restarted at the original dose depending on the risk-benefit assessment and continue anticoagulation if restarting lenalidomide.	

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](#)

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

Vaccines		
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. 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.

Administration

This is a continuous 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](#).

🕒 Treatment - Time out

Lenalidomide

- administer orally ONCE a day, at the same time each day
- 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).

Discharge information

Lenalidomide capsules

- 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. Read more about immediate management of neutropenic fever
Thrombocytopenia	A reduction in the normal levels of functional platelets, increasing the risk of abnormal bleeding. Read more about thrombocytopenia
Thromboembolism	Venous thromboembolism (VTE), including deep vein thrombosis (DVT) and pulmonary embolism (PE) is increased in multiple myeloma patients treated with lenalidomide monotherapy post autologous transplant.
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. 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. Read more about skin rash

Late (onset weeks to months)	
Anaemia	Abnormally low levels of red blood cells (RBCs) or haemoglobin in the blood. 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. 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

Lenalidomide/bortezomib/dexamethasone (RVd) induction followed by continuous lenalidomide/dexamethasone (Rd) was demonstrated to be superior to continuous Rd in patients with newly diagnosed multiple myeloma (MM), without an intent for immediate autologous stem cell transplant (ASCT), prolonging both progression-free survival (PFS) and overall survival (OS) in SWOG S0777.² However, the patient population in SWOG S0777 were significantly younger than the typical transplant-ineligible

population in Australia, with 57% of patients aged less than 65 years.

Induction therapy was discontinued in 23% of patients receiving RVd in SWOG S0777 due to adverse events.² Older patients are at higher risk of discontinuation³ and attenuated RVd regimens have been proposed to reduce toxicity and to optimise continuation of therapy. There are no phase III studies evaluating these dose attenuated schedules. The expert reference panel supported publication of this protocol on the basis of the information summarised below. The committee was most strongly influenced by the phase II O'Donnell study evaluating RVd-lite.⁴

RVd-lite was evaluated in a single-arm phase II study of 50 patients.⁴ It was administered over a 35 day cycle with lenalidomide 15 mg orally on days 1-21, bortezomib 1.3 mg/m² subcutaneously on days 1, 8, 15 and 22 and dexamethasone 20 mg orally on the day of and day after bortezomib for 9 cycles (for patients >75 years old, dexamethasone dose was administered weekly on day 1, 8, 15 and 22). This was followed by six 28-day cycles of consolidation with lenalidomide 15 mg orally on days 1-21 and bortezomib 1.3 mg/m² subcutaneously on days 1 and 15. Maintenance lenalidomide was not mandated, but was given to 66% of patients. Only the induction part of this protocol is currently available through the PBS.

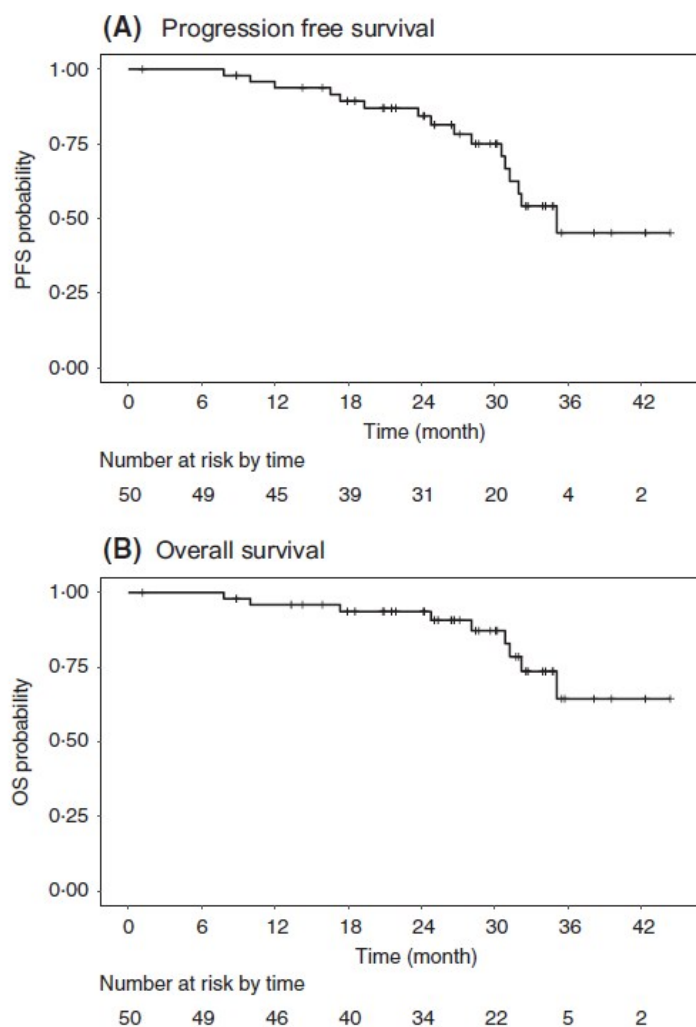
Source	Study & Year Published	Supports Use	Is the dose and regimen consistent with the protocol?	Comments
Phase II trial	O'Donnell et al. 2018 ⁴	Yes	Yes	Followed by 6 cycles of consolidation with lenalidomide and bortezomib.
Guidelines	Date published/revised	Supports Use	Is the dose and regimen consistent with the protocol?	Comments
NCCN	V.3.2023	Yes	Yes	
BCCA	N/A	N/A	N/A	N/A
CCO	2022	Yes	Yes	
MSAG	2022	Yes	Yes	

Efficacy

The primary endpoint of the RVd-lite study was overall response rate (ORR) after 4 cycles of therapy. The ORR was 86% for the 50 patients, 66% of whom achieved a very good partial response (VGPR) or better. At a follow-up of 61 months, median PFS was 41.9 months (95% CI, 31.2 – not reached) and median OS not reached. The 5-year OS was 61.3%.⁵

Within the limits of cross-trial comparisons, this was comparable to the results obtained in SWOG S0777 which reported a median PFS of 41 months in those receiving RVd induction and the median OS was not reached, but was longer than 84 months.⁶

Figure 1: Progression free survival and overall survival graphs⁴



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Toxicity

The toxicity profile can be seen in the table below. Fatigue was the most common toxicity, reported by 37 (74%) of patients. Peripheral neuropathy was reported in 31 (62%). 27 experienced sensory peripheral neuropathy: 17 grade 1; 9 grade 2 and 1 grade 3. Six patients reported peripheral motor neuropathy: 3 grade 1 and 3 grade 2.⁴

39 patients had dose modifications: 19 patients (38%) for bortezomib, 27 (54%) for lenalidomide and 32 (64%) for dexamethasone. Two patients discontinued treatment because of toxicity: retinal artery thrombosis (attributable to lenalidomide) and grade 3 peripheral neuropathy (attributable to bortezomib).

Table 1: Treatment-related adverse events with overall incidence greater than 15%⁴

Adverse event	Any grade		Grade 3 or higher	
	Total	%	Total	%
Fatigue	37	74	8	16
Peripheral Neuropathy	30	60	1	2
Hypophosphataemia	23	46	17	34
Neutropenia	22	44	7	14
Diarrhoea	19	38	0	0
Peripheral Oedema	18	36	1	2
Insomnia	17	34	1	2
Rash	17	34	5	10
Anaemia	14	28	1	2
Thrombocytopenia	12	24	1	2
Constipation	12	24	0	0
Dysgeusia	12	24	0	0
Hyperglycaemia	12	24	2	4
Nausea	9	18	0	0
Depression	8	16	0	0
Psychiatric Disorder, other	8	16	2	4
Generalized Muscle Weakness	8	16	2	4

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Patient Reported Outcomes

At the end of treatment there were statistically significant improvements in scores of physical functioning, future perspective and disease symptoms. Patients reported fewer symptoms across all symptom domains with the exception of diarrhoea.^{4, 5}

References

- 1 Morgan, G. J., J. A. Child, W. M. Gregory, et al. 2011. "Effects of zoledronic acid versus clodronic acid on skeletal morbidity in patients with newly diagnosed multiple myeloma (MRC Myeloma IX): secondary outcomes from a randomised controlled trial." *Lancet Oncol* 12(8):743-752.
- 2 Durie, B. G. M., A. Hoering, M. H. Abidi, et al. 2017. "Bortezomib with lenalidomide and dexamethasone versus lenalidomide and dexamethasone alone in patients with newly diagnosed myeloma without intent for immediate autologous stem-cell transplant (SWOG S0777): a randomised, open-label, phase 3 trial." *Lancet* 389(10068):519-527.
- 3 Palumbo, A., S. Bringhen, M. V. Mateos, et al. 2015. "Geriatric assessment predicts survival and toxicities in elderly myeloma patients: an International Myeloma Working Group report." *Blood* 125(13):2068-2074.
- 4 O'Donnell, E. K., J. P. Laubach, A. J. Yee, et al. 2018. "A phase 2 study of modified lenalidomide, bortezomib and dexamethasone in transplant-ineligible multiple myeloma." *Br J Haematol* 182(2):222-230.
- 5 O'Donnell, E.K., J.P. Laubach, A.J. Yee, et al. 2019. "Updated Results of a Phase 2 Study of Modified Lenalidomide, Bortezomib, and Dexamethasone (RVd-lite) in Transplant-Ineligible Multiple Myeloma." *Blood* 134: 3178.
- 6 Durie, B. G. M., A. Hoering, R. Sexton, et al. 2020. "Longer term follow-up of the randomized phase III trial SWOG S0777: bortezomib, lenalidomide and dexamethasone vs. lenalidomide and dexamethasone in patients (Pts) with previously untreated multiple myeloma without an intent for immediate autologous stem cell transplant (ASCT)." *Blood Cancer J* 10(5):53.

History

Version 2

Date	Summary of changes
13/04/2023	<p>Reviewed at the 2022 eviQ Haematology Reference Committee meeting with the following changes:</p> <ul style="list-style-type: none">• Medical Scientific Advisory Group (MSAG) guidelines added to evidence• Bone modifying agents block added to clinical information, related note removed from treatment schedule and linked pages removed• Link to Medical Scientific Advisory Group (MSAG) guidelines updated• Changed all references of 'i-Access™ program' to 'pregnancy prevention risk management program'• Lenalidomide administration details updated in treatment schedule, administration and patient information <p>Other changes include:</p> <ul style="list-style-type: none">• Cataract, cough and respiratory tract infection added to side effects <p>Changed to v.2. Review in 2 years.</p>

Version 1

Date	Summary of changes
27/09/2021	New protocol developed out of session and approved for publication. For review in 1 year.
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.

The information contained in this protocol is based on the highest level of available evidence and consensus of the eviQ reference committee regarding their views of currently accepted approaches to treatment. Any clinician (medical oncologist, haematologist, radiation oncologist, medical physicist, radiation therapist, pharmacist or nurse) seeking to apply or consult this protocol is expected to use independent clinical judgement in the context of individual clinical circumstances to determine any patient's care or treatment. While eviQ endeavours to link to reliable sources that provide accurate information, eviQ and the Cancer Institute NSW do not endorse or accept responsibility for the accuracy, currency, reliability or correctness of the content of linked external information sources. Use is subject to eviQ's disclaimer available at www.eviQ.org.au

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Review due: 31 December 2024

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/3922>

14 Jun 2023

Patient information - Multiple myeloma - Maintenance RVD-lite lenalidomide

Patient's name:

Your treatment

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

RVD-lite lenalidomide maintenance

This treatment is taken continuously. Your doctor will advise you how long to take the capsules.


Day	Treatment	How it is given
Continuous	Lenalidomide (<i>len-a-lid-o-mide</i>)	Take orally ONCE a day at the same time every day. Take on an empty stomach, at least one hour before or two hours after food. Swallow whole, do not break, open, chew or crush capsules.

Missed doses:

- **Lenalidomide:** if you forget to take a capsule and it is less than 12 hours before your next dose, skip the missed 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.

 <p>IMMEDIATELY go to your nearest hospital Emergency Department, or contact your doctor or nurse if you have any of the following at any time:</p>	Emergency contact details Ask your doctor or nurse from your treating team who to contact if you have a problem
<ul style="list-style-type: none">• a temperature of 38°C or higher• chills, sweats, shivers or shakes• shortness of breath• uncontrolled vomiting or diarrhoea• pain, tingling or discomfort in your chest or arms• you become unwell.	Daytime:..... Night/weekend:..... 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

- **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	<ul style="list-style-type: none"> • You may get: <ul style="list-style-type: none"> ◦ a fever ◦ chills or sweats ◦ muscle and joint pain ◦ a cough ◦ headaches. • Tell your doctor or nurse if you get any of the symptoms listed above. • 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	<ul style="list-style-type: none"> • You may find that food loses its taste or tastes different. • These changes are likely to go away with time. • Do your mouth care regularly. • Chew on sugar-free gum or eat sugar-free mints. • Add flavour to your food with sauces and herbs. • Ask your doctor or nurse for eviQ patient information - Taste and smell changes during cancer treatment.

Early (onset days to weeks)	
Infection risk (neutropenia)	<ul style="list-style-type: none"> • 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. • Wash your hands often. • Keep a thermometer at home and take your temperature regularly, and if you feel unwell. • Do your mouth care regularly. • Inspect your central line site (if you have one) daily for any redness, pus or swelling. • Limit contact with people who are sick. • Learn how to recognise the signs of infection. • Ask your doctor or nurse for eviQ patient information - Infection during cancer treatment. • Tell your doctor or nurse immediately, or go to the nearest hospital Emergency Department if you get any of the following signs or symptoms: <ul style="list-style-type: none"> ◦ a temperature of 38°C or higher ◦ chills, shivers, sweats or shakes ◦ a sore throat or cough ◦ uncontrolled diarrhoea ◦ shortness of breath ◦ a fast heartbeat ◦ become unwell even without a temperature.
Low platelets (thrombocytopenia)	<ul style="list-style-type: none"> • 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. • Try not to bruise or cut yourself. • Avoid contact sport or vigorous exercise. • Clear your nose by blowing gently. • Avoid constipation. • Brush your teeth with a soft toothbrush. • Don't take aspirin, ibuprofen or other similar anti-inflammatory medications unless your doctor tells you to. • Tell your doctor or nurse if you have any bruising or bleeding. • Tell your doctor or nurse immediately, or go to your nearest hospital Emergency Department if you have any uncontrolled bleeding.

Blood clots (thromboembolism)	<ul style="list-style-type: none"> • Blood clots can occur with this treatment. • Tell your doctor or nurse immediately, or go to the nearest hospital Emergency Department if you get any of the following signs or symptoms: <ul style="list-style-type: none"> ◦ redness, heat or pain in your leg(s) ◦ numbness or weakness in your face, arm or leg ◦ chest pain ◦ sudden shortness of breath ◦ dizziness ◦ trouble speaking ◦ blurred vision ◦ severe headache ◦ unexplained falls or loss of balance.
Joint and muscle pain and stiffness	<ul style="list-style-type: none"> • You may get muscle, joint or general body pain and stiffness. • Applying a heat pack to affected areas may help. • Talk to your doctor or nurse about other ways to manage these symptoms. You may need medication to help with any pain.
Constipation	<ul style="list-style-type: none"> • You may have bowel motions (stools, poo) that are less frequent, harder, smaller, painful or difficult to pass. • You may also get: <ul style="list-style-type: none"> ◦ bloating, cramping or pain ◦ a loss of appetite ◦ nausea or vomiting. • Drink plenty of fluids (unless you are fluid restricted). • Eat plenty of fibre-containing foods such as fruit, vegetables and bran. • Take laxatives as directed by your doctor. • Try some gentle exercise daily. • Tell your doctor or nurse if you have not opened your bowels for more than 3 days.
Cough	<ul style="list-style-type: none"> • Some people who receive this treatment develop a cough • Tell your doctor or nurse if you develop a cough
Diarrhoea	<ul style="list-style-type: none"> • You may get bowel motions (stools, poo) that are more frequent or more liquid. • You may also get bloating, cramping or pain. • Take your antidiarrhoeal medication as directed by your doctor. • Drink plenty of fluids (unless you are fluid restricted). • Eat and drink small amounts more often. • Avoid spicy foods, dairy products, high fibre foods, and coffee. • Ask your doctor or nurse for eviQ patient information - Diarrhoea during cancer treatment. • 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)	<ul style="list-style-type: none"> • You may feel very tired, have no energy, sleep a lot, and not be able to do normal activities or things you enjoy. • Do not drive or operate machinery if you are feeling tired. • Nap for short periods (only 1 hour at a time) • Prioritise your tasks to ensure the best use of your energy. • Eat a well balanced diet and drink plenty of fluids (unless you are fluid restricted). • Try some gentle exercise daily. • Allow your friends and family to help. • Tell your doctor or nurse if you get any of the symptoms listed above.

Chest infection	<ul style="list-style-type: none"> • You can develop a chest infection whilst receiving this treatment. • Tell your doctor or nurse as soon as possible if you get any of the following symptoms: <ul style="list-style-type: none"> ◦ shortness of breath ◦ difficulty breathing ◦ wheezing ◦ coughing up mucus
Skin rash	<ul style="list-style-type: none"> • You may get a red, bumpy rash and dry, itchy skin. • Moisturise your skin with a gentle non-perfumed moisturising cream like sorbolene or aqueous cream. • Do not scratch your skin. • Protect your skin from the sun by wearing sun-protective clothing, a wide-brimmed hat, sunglasses and sunscreen of SPF 50 or higher. • Talk to your doctor or nurse about other ways to manage your skin rash.

Late (onset weeks to months)	
Low red blood cells (anaemia)	<ul style="list-style-type: none"> You may feel dizzy, light-headed, tired and appear more pale than usual. Tell your doctor or nurse if you have any of these signs or symptoms. You might need a blood transfusion. 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)	<ul style="list-style-type: none"> Whilst usually mild and easily manageable, bowel motions (stools, poo) that are more frequent or more liquid may persist during treatment with lenalidomide. 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. 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. Your doctor will recommend if treatment is necessary for your diarrhoea Drink plenty of fluids (unless you are fluid restricted). Ask your doctor or nurse for eviQ patient information - Diarrhoea during cancer treatment. 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)	<ul style="list-style-type: none"> You may: <ul style="list-style-type: none"> fatigue and low energy levels depression slow heart rate unexplained weight gain intolerance to cold temperatures fatigued and aching muscles dry, coarse skin puffy face hair loss constipation problems with concentration You will have regular blood tests to check how well your thyroid is working Tell your doctor or nurse if you get any of the symptoms listed above.
Muscle cramps	<ul style="list-style-type: none"> You may get muscle cramps, usually in the hands, calves and thighs. Tell your doctor or nurse if you get any of these symptoms. Your doctor may prescribe you medication for this.
Stevens-Johnson syndrome (SJS)	<ul style="list-style-type: none"> This side effect is rare, but can be very serious. Tell your doctor or nurse immediately, or go to the nearest hospital Emergency Department if you get any of the following symptoms: <ul style="list-style-type: none"> flu-like symptoms, then a painful red or purple rash that spreads swelling of the face or tongue painful or peeling skin blisters on the skin, mouth, nose, eyes and genitals.
Delayed (onset months to years)	
Cataract	<ul style="list-style-type: none"> 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:

This document is a guide only and cannot cover every possible situation. The health professionals caring for you should always consider your individual situation when making decisions about your care. Contact your cancer clinic staff or doctor if you have any questions or concerns about your treatment, or you are having problems coping with side effects. While eviQ endeavours to link to reliable sources that provide accurate information, eviQ and the Cancer Institute NSW do not endorse or accept responsibility for the accuracy, currency, reliability or correctness of the content of linked external information sources. Use of this document is subject to eviQ's disclaimer available at www.eviq.org.au

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