

# Testicular germ cell metastatic VIP (etoposide iFOSFamide ciSplatin)

ID: 318 v.7 Endorsed Essential Medicine List

Clinicians are advised to consult with a medical oncologist from a tertiary treatment centre with high volume experience in testicular cancer prior to use of this regimen.

Link to [ANZUP testicular cancer surveillance recommendations](#)

Check for clinical trials in this patient group. Link to [Australian Clinical Trials](#) website

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 (ADDIKD)

2022

[Click here](#)



### Related pages:

- [Testicular germ cell recurrent VeIP \(vinBLASTine iFOSFamide ciSplatin\)](#)
- [Testicular germ cell metastatic BEP \(bleomycin etoposide ciSplatin\)](#)
- [Autologous conditioning germ cell tumour TICE overview](#)
- [Risk classification of metastatic germ cell tumours](#)

## Treatment schedule - Overview

### Cycle 1 to 4

Drug	Dose	Route	Day
Etoposide *	75 mg/m <sup>2</sup>	IV infusion	1 to 5
ciSplatin	20 mg/m <sup>2</sup>	IV infusion	1 to 5
iFOSFamide	1,200 mg/m <sup>2</sup>	IV infusion	1 to 5
Mesna	1,200 mg/m <sup>2</sup>	IV infusion	1 to 5
Mesna	2,000 mg at 2 hours and 6 hours after completion of ifosfamide infusion	PO	1 to 5
Pegfilgrastim	6 mg	Subcut	6

\* Etopophos (etoposide phosphate) 113.6 mg is equivalent to etoposide 100 mg. Doses in this protocol are expressed as etoposide.

**Frequency:** 21 days

**Cycles:** 4

**Notes:**

The **VelP** regimen is **preferred** over this regimen in patients relapsing after BEP because etoposide is used in both BEP and VIP.

**Drug status:** Etoposide, ifosfamide and cisplatin are on the [PBS general schedule](#)

Pegfilgrastim is [PBS authority](#)

Oral mesna is TGA registered but not PBS listed for this indication

**Cost:** ~ \$1,500 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 to 4

Day 1		
Netupitant	300 mg (PO)	60 minutes before chemotherapy (fixed dose preparation with palonosetron)*
Palonosetron	0.5 mg (PO)	60 minutes before chemotherapy (fixed dose preparation with netupitant)*
Dexamethasone	8 mg (PO)	60 minutes before chemotherapy**
Etoposide	75 mg/m <sup>2</sup> (IV infusion)	in 500 mL sodium chloride 0.9% over 30 to 60 minutes
ciSplatIn	20 mg/m <sup>2</sup> (IV infusion)	in 1000 mL sodium chloride 0.9% over 60 minutes
iFOSFamide	1,200 mg/m <sup>2</sup> (IV infusion)	in 1000 mL sodium chloride 0.9% over 2 hours (loaded with mesna)
Mesna	1,200 mg/m <sup>2</sup> (IV infusion)	in 1000 mL sodium chloride 0.9% over 2 hours (loaded with ifosfamide)
Mesna	2,000 mg (PO)	at 2 hours and 6 hours after completion of ifosfamide infusion
Day 2 and 3		
Dexamethasone	8 mg (PO)	60 minutes before chemotherapy**
Etoposide	75 mg/m <sup>2</sup> (IV infusion)	in 500 mL sodium chloride 0.9% over 30 to 60 minutes
ciSplatIn	20 mg/m <sup>2</sup> (IV infusion)	in 1000 mL sodium chloride 0.9% over 60 minutes
iFOSFamide	1,200 mg/m <sup>2</sup> (IV infusion)	in 1000 mL sodium chloride 0.9% over 2 hours (loaded with mesna)
Mesna	1,200 mg/m <sup>2</sup> (IV infusion)	in 1000 mL sodium chloride 0.9% over 2 hours (loaded with ifosfamide)
Mesna	2,000 mg (PO)	at 2 hours and 6 hours after completion of ifosfamide infusion
Day 4		
Netupitant	300 mg (PO)	60 minutes before chemotherapy (fixed dose preparation with palonosetron)*
Palonosetron	0.5 mg (PO)	60 minutes before chemotherapy (fixed dose preparation with netupitant)*

Day 4		
Dexamethasone	8 mg (PO)	60 minutes before chemotherapy**
Etoposide	75 mg/m <sup>2</sup> (IV infusion)	in 500 mL sodium chloride 0.9% over 30 to 60 minutes
ciSPlatin	20 mg/m <sup>2</sup> (IV infusion)	in 1000 mL sodium chloride 0.9% over 60 minutes
iFOSFamide	1,200 mg/m <sup>2</sup> (IV infusion)	in 1000 mL sodium chloride 0.9% over 2 hours (loaded with mesna)
Mesna	1,200 mg/m <sup>2</sup> (IV infusion)	in 1000 mL sodium chloride 0.9% over 2 hours (loaded with ifosfamide)
Mesna	2,000 mg (PO)	at 2 hours and 6 hours after completion of ifosfamide infusion

Day 5		
Dexamethasone	8 mg (PO)	60 minutes before chemotherapy**
Etoposide	75 mg/m <sup>2</sup> (IV infusion)	in 500 mL sodium chloride 0.9% over 30 to 60 minutes
ciSPlatin	20 mg/m <sup>2</sup> (IV infusion)	in 1000 mL sodium chloride 0.9% over 60 minutes
iFOSFamide	1,200 mg/m <sup>2</sup> (IV infusion)	in 1000 mL sodium chloride 0.9% over 2 hours (loaded with mesna)
Mesna	1,200 mg/m <sup>2</sup> (IV infusion)	in 1000 mL sodium chloride 0.9% over 2 hours (loaded with ifosfamide)
Mesna	2,000 mg (PO)	at 2 hours and 6 hours after completion of ifosfamide infusion

Day 6		
Dexamethasone	8 mg (PO)	ONCE a day (or in divided doses) with or after food
Pegfilgrastim	6 mg (Subcut)	inject subcutaneously on day 6 at least 24 hours after chemotherapy

Day 7 and 8		
Dexamethasone	8 mg (PO)	ONCE a day (or in divided doses) with or after food

- Etopophos (etoposide phosphate) 113.6 mg is equivalent to etoposide 100 mg. Doses in this protocol are expressed as etoposide.

\* Non-PBS, dosing extrapolated from trials and as per reference committee consensus.<sup>1,2</sup>

\*\* The dose of dexamethasone on day 1 is 8 mg as per eviQ RC consensus but may be increased to 12 mg at the clinician's discretion. Link to [ID 7 Prevention of antineoplastic induced nausea and vomiting](#).

**Frequency:** 21 days

**Cycles:** 4

## Indications and patient population

- Relapsed or refractory metastatic germ cell tumours, salvage therapy
- Metastatic germ cell tumours in patients who cannot tolerate the bleomycin in BEP (e.g. patients with underlying pulmonary disease)

## Clinical information

<b>Venous access required</b>	IV cannula (IVC) or central venous access device (CVAD) is required to administer this treatment. Read more about <a href="#">central venous access device line selection</a>
<b>Hypersensitivity/infusion related reaction</b>	High risk with etoposide.
<b>Emetogenicity HIGH</b>	Suggested default antiemetics have been added to the treatment schedule, and may be substituted to reflect institutional policy. Ensure that patients also have sufficient antiemetics for breakthrough emesis: Metoclopramide 10 mg three times a day when necessary (maximum of 30 mg/24 hours, up to 5 days) OR Prochlorperazine 10 mg PO every 6 hours when necessary. Read more about <a href="#">preventing anti-cancer therapy induced nausea and vomiting</a>
<b>Etoposide conversion factor</b>	Note: Etopophos (etoposide phosphate) 113.6 mg is equivalent to etoposide 100 mg. Doses in this protocol are expressed as etoposide.
<b>Ifosfamide-induced encephalopathy</b>	May occur in patients treated with high dose ifosfamide (~ 5 to 8 g/m <sup>2</sup> ). Assess neurological function prior to each ifosfamide dose. Read more about <a href="#">ifosfamide-induced encephalopathy</a> Link to <a href="#">ifosfamide-induced encephalopathy assessment chart</a>
<b>Hydration</b>	Hydration helps to prevent cisplatin-induced nephrotoxicity. The default regimen is appropriate for patients with normal electrolytes, kidney function, fluid status etc. and should be adjusted according to individual requirements. Read more about <a href="#">cisplatin hydration regimens</a>
<b>Ototoxicity</b>	Ototoxicity may occur with platinum-based therapy; patients should be monitored for signs and symptoms. Platinum compounds should be used with caution in patients with pre-existing conditions or risk factors. Ototoxicity may become more severe in patients being treated with other drugs with nephrotoxic potential e.g. aminoglycosides. An audiometry test should be performed if symptoms develop. Read more about <a href="#">ototoxicity - tinnitus and hearing loss</a>
<b>Peripheral neuropathy</b>	Assess prior to each treatment. If a patient experiences > grade 2 review by medical officer before commencing treatment as alternate regimen may be considered. Read more about <a href="#">peripheral neuropathy</a> Link to <a href="#">chemotherapy-induced peripheral neuropathy screening tool</a>
<b>Mesna dosing and administration</b>	There is evidence for several mesna doses as well as differing administration timings (e.g. 2, 4, 6, or 8 hours post initiation or completion of the ifosfamide/cyclophosphamide dose) with no clear evidence that one particular regimen is superior over another. The eviQ mesna recommendations may be based upon the individual trial/study or reference committee consensus and provide guidance on one safe way to administer the protocol. Individual institutional policy may vary and should be evidence based.
<b>Biosimilar drug</b>	Read more about biosimilar drugs on the <a href="#">Biosimilar Awareness Initiative</a> page
<b>Growth factor support</b>	G-CSF (short or long-acting) is available on the PBS for chemotherapy induced neutropenia depending on clinical indication and/or febrile neutropenia risk. Access the <a href="#">PBS website</a>
<b>Blood tests</b>	FBC, EUC, LFTs, calcium and magnesium at baseline and prior to each cycle.
<b>Hepatitis B screening and prophylaxis</b>	Routine screening for HBsAg and anti-HBc is recommended prior to initiation of treatment. Prophylaxis should be determined according to individual institutional policy. Read more about <a href="#">hepatitis B screening and prophylaxis in cancer patients requiring cytotoxic and/or immunosuppressive therapy</a>

<b>Vaccinations</b>	<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 <a href="#">Australian Immunisation Handbook</a>.</p> <p>Read more about <a href="#">COVID-19 vaccines and cancer</a>.</p>
<b>Fertility and fathering a child</b>	<p>Cancer treatment can have harmful effects on fertility and this should be discussed with all patients of reproductive potential prior to commencing treatment. It is important that all patients of reproductive potential use effective contraception whilst on therapy and after treatment finishes. Effective contraception methods and contraception timeframe should be discussed with all patients of reproductive potential.</p> <p>Read more about the <a href="#">effect of cancer treatment on fertility</a></p>

## 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 \(ADDIKD\)](#).

**Note:** Delay and dose reductions are not recommended as the efficacy of this treatment may be greatly compromised - clinicians are advised to consult with a medical oncologist from a tertiary treatment centre with high volume experience in testicular cancer if dose delay or reduction due to toxicities or renal or hepatic dysfunction is being contemplated; an alternative treatment regimen may need to be considered.

## 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](#)

<b>Cisplatin</b>		
	<b>Interaction</b>	<b>Clinical management</b>
<b>Nephrotoxic drugs (e.g. aminoglycosides, amphotericin, contrast dye, frusemide, NSAIDs)</b>	Additive nephrotoxicity	Avoid combination or monitor kidney function closely
<b>Ototoxic drugs (e.g. aminoglycosides, frusemide, NSAIDs)</b>	Additive ototoxicity	Avoid combination or perform regular audiometric testing
<b>Neurotoxic drugs (e.g. vincristine, paclitaxel)</b>	Additive neurotoxicity	Monitor closely for neuropathy if combination used
<b>Paclitaxel</b>	Administration schedule may influence the development of myelosuppression	Minimise toxicity by administering paclitaxel first in regimens using the combination
<b>Carbamazepine, phenytoin, valproate</b>	Decreased antiepileptic plasma levels	Monitor antiepileptic serum levels and seizure frequency for efficacy; adjust dosage as appropriate or select alternative antiepileptic (e.g. clonazepam, diazepam, lorazepam)

<b>Etoposide and Etoposide Phosphate</b>		
	<b>Interaction</b>	<b>Clinical management</b>
<b>CYP3A4 and P-gp inhibitors (e.g. amiodarone, aprepitant, azole-antifungals, ritonavir, lapatinib, nilotinib, sorafenib, macrolides, ciclosporin etc.)</b>	Increased toxicity of etoposide possible due to reduced clearance	Avoid combination or monitor for etoposide toxicity
<b>CYP3A4 inducers (e.g. carbamazepine, phenytoin, phenobarbitone, rifampicin, St John's wort etc.)</b>	Reduced efficacy of etoposide possible due to increased clearance	Avoid combination or monitor for decreased clinical response to etoposide
<b>Glucosamine</b>	Reduced efficacy of etoposide (due to induction of glucose-regulated stress proteins resulting in decreased expression of topoisomerase II)	Avoid combination or monitor for decreased clinical response to etoposide
<b>Grapefruit juice</b>	Reduced efficacy of oral etoposide possible due to possible alteration of P-gp mediated intestinal transport of etoposide	Avoid combination or monitor for decreased clinical response to etoposide

Ifosfamide		
	Interaction	Clinical management
<b>Aprepitant</b>	Increased risk of ifosfamide-induced neurotoxicity due to increased levels of active metabolites	Avoid combination or monitor closely for neurotoxicity; consider alternate antiemetic regimens
<b>CYP3A4 inducers (e.g. carbamazepine, phenytoin, phenobarbitone, rifampicin, St John's wort etc.)</b>	Increased toxicity of ifosfamide possible due to increased conversion to active and toxic metabolites	Avoid combination or monitor for ifosfamide toxicity
<b>CYP3A4 inhibitors (e.g. azole antifungals, clarithromycin, erythromycin, grapefruit juice, ritonavir etc.)</b>	Reduced efficacy of ifosfamide possible due to decreased conversion to active metabolites	Avoid combination or monitor for decreased clinical response to ifosfamide
<b>Nephrotoxic drugs (e.g. aminoglycosides, amphotericin, contrast dye, frusemide, NSAIDs)</b>	Additive nephrotoxicity	Avoid combination or monitor kidney function closely
<b>Suxamethonium</b>	Potential of muscle relaxant effect possible	Alert the anaesthetist if a patient has been treated with ifosfamide within ten days of planned general anaesthesia
<b>CNS depressants (including opiates, opioids, phenothiazines)</b>	Increased risk of ifosfamide-induced neurotoxicity due to additive CNS effects	Avoid combination or monitor for excessive CNS depression/encephalopathy

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NK-1 antagonist e.g. aprepitant, fosaprepitant, netupitant		
	Interaction	Clinical management
<b>Dexamethasone</b>	Increased effects/toxicity of dexamethasone due to inhibition of its metabolism via CYP3A4	Reduce dose of <b>antiemetic dexamethasone</b> by approximately 50% when adding a NK-1 antagonist. For protocols that already recommend a NK-1 antagonist, the dose reduction of <b>antiemetic dexamethasone</b> has already been taken into account.  If <b>dexamethasone is part of the chemotherapy protocol</b> , dose reduction as per the product information is not routinely recommended in clinical practice and no additional dexamethasone is required for antiemetic cover.
<b>Warfarin</b>	Reduced anticoagulant efficacy of warfarin due to increased clearance (aprepitant induces CYP2C9). *Note interaction only applicable to aprepitant/ fosaprepitant	INR should be monitored in the 2 week period, particularly at 7 to 10 days following the administration of aprepitant/ fosaprepitant
<b>Combined oral contraceptive</b>	Reduced contraceptive efficacy due to increased clearance. *Note interaction only applicable to aprepitant/ fosaprepitant	Alternative non-hormonal methods should be used during and for 1 month after stopping aprepitant/ fosaprepitant
<b>CYP3A4 inducers (e.g. carbamazepine, phenytoin, phenobarbitone, rifampicin, St John's wort etc.)</b>	Reduced efficacy of NK-1 antagonist possible due to increased clearance	Avoid combination or monitor for decreased antiemetic effect. Consider using an alternative antiemetic regimen
<b>CYP3A4 inhibitors (e.g. azole antifungals, clarithromycin, erythromycin, grapefruit juice, ritonavir etc.)</b>	Increased toxicity of NK-1 antagonist possible due to reduced clearance	Avoid combination or monitor for increased adverse effects of NK-1 antagonist (e.g. headache, hiccups, constipation)
<b>Drugs metabolised by CYP3A4 (e.g. etoposide, imatinib, irinotecan, midazolam, paclitaxel, vinblastine, vincristine etc.)</b>	Increased effects/toxicity of these drugs possible due to inhibition of CYP3A4 by NK-1 antagonist	Avoid combination or monitor for increased toxicity especially with orally administered drugs



General		
	Interaction	Clinical management
<b>Warfarin</b>	Anti-cancer drugs may alter the anticoagulant effect of warfarin.	Monitor INR regularly and adjust warfarin dosage as appropriate; consider alternative anticoagulant.
<b>Direct oral anticoagulants (DOACs) e.g. apixaban, rivaroxaban, dabigatran</b>	Interaction with both CYP3A4 and P-gp inhibitors /inducers.  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.  Rivaroxaban: avoid concurrent use with strong CYP3A4 and P-gp inhibitors.  Dabigatran: avoid combination with strong P-gp inducers and inhibitors.  If concurrent use is unavoidable, monitor closely for efficacy/toxicity of both drugs.
<b>Digoxin</b>	Anti-cancer drugs can damage the lining of the intestine; affecting the absorption of digoxin.	Monitor digoxin serum levels; adjust digoxin dosage as appropriate.
<b>Antiepileptics</b>	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.
<b>Antiplatelet agents and NSAIDs</b>	Increased risk of bleeding due to treatment related thrombocytopenia.	Avoid or minimise combination. If combination deemed essential, (e.g. low dose aspirin for ischaemic heart disease) monitor for signs of bleeding.
<b>Serotonergic drugs, including selective serotonin reuptake inhibitors (SSRIs e.g. paroxetine) and serotonin noradrenaline reuptake inhibitors (SNRIs e.g. venlafaxine)</b>	Increased risk of serotonin syndrome with concurrent use of 5-HT3 receptor antagonists (e.g. palonosetron, ondansetron, granisetron, tropisetron, dolasetron, etc.)	Avoid combination. If combination is clinically warranted, monitor for signs and symptoms of serotonin syndrome (e.g. confusion, agitation, tachycardia, hyperreflexia). For more information link to <a href="#">TGA Medicines Safety Update</a>
<b>Vaccines</b>	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 <a href="#">Australian Immunisation Handbook</a>

## 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*

## Day 1 to 5

**Approximate treatment time: 5 hours**

[Safe handling and waste management](#)

[Safe administration](#)

[General patient assessment](#) prior to each day of treatment.

[Peripheral neuropathy assessment tool](#).

Any toxicity greater than grade 2 should be reviewed by medical officer, however delay and dose reductions are not recommended as the efficacy of the treatment may be greatly compromised- clinicians are advised to consult with a medical oncologist from a tertiary treatment centre with high volume experience in testicular cancer if dose delay or reduction is being contemplated. An alternative treatment regimen may need to be considered.

Prime IV line(s).

Insert IV cannula or access [TIVAD](#) or [CVAD](#).

### Pre treatment medication

Verify antiemetics taken or administer as prescribed.

Verify dexamethasone taken or administer as prescribed.

### ⌚ Chemotherapy - Time out

#### Etoposide

##### Administer etoposide (irritant):

- via IV infusion over 30 to 60 minutes
- rapid infusion may cause hypotension
- observe for hypersensitivity
- flush with ~ 100 mL sodium chloride 0.9%
- if using etoposide phosphate administer in ~ 50 mL sodium chloride 0.9% or glucose 5% over ~15 minutes.

##### Stop infusion at first sign of reaction:

- if symptoms are mild and resolve when infusion is stopped, consider recommencing infusion after review by medical officer at a slower rate.
- for severe reactions seek medical assistance immediately and do not restart infusion.

#### Cisplatin

##### Commence prehydration for cisplatin:

- administer 10 mmol magnesium sulphate ( $MgSO_4$ ) in 1000 mL sodium chloride 0.9% over 60 minutes
- ensure patient has passed urine prior to cisplatin administration as per institutional policy.

##### Administer cisplatin (irritant):

- via IV infusion over 60 minutes
- flush with 100 mL of sodium chloride 0.9%.

#### Ifosfamide infusion

##### Prior to administration:

- assess neurological function at baseline and prior to each ifosfamide dose
  - inpatients: 4 hourly assessments until 24 hours after ifosfamide infusion is completed
  - outpatients: advise patient/carer of the potential for neurotoxicity
    - [neurological assessment tool](#)

- perform baseline urinalysis and monitor for haematuria prior to each ifosfamide dose
  - note the administration of mesna will cause a false positive for ketonuria
- ensure patient receives at least 3 L of IV or oral fluids per day

**Administer ifosfamide (irritant) with mesna:**

- via IV infusion over 2 hours
- flush with ~100 mL of sodium chloride 0.9%

**Oral Mesna**

- administer mesna 2000 mg orally at 2 hours and 6 hours post completion of ifosfamide/mesna infusion
- if vomiting occurs within 2 hours of taking oral mesna, repeat the dose or give IV mesna
- if patient cannot tolerate oral mesna, it may be given by IV bolus
- the oral mesna dose is equivalent to twice the IV dose.

Remove IV cannula and/or deaccess [TIVAD](#) or [CVAD](#).

Continue [safe handling](#) precautions until 7 days after completion of drug(s)

**Discharge information**

**Antiemetics**

- Antiemetics as prescribed.

**Mesna tablets**

- Mesna tablets with written instructions on how to take them.

**Growth factor support**

- Arrangements for administration if prescribed.

**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)	
<b>Hypersensitivity reaction</b>	Anaphylaxis and infusion related reactions can occur with this treatment. Read more about <a href="#">hypersensitivity reaction</a>
<b>Nausea and vomiting</b>	Read more about <a href="#">prevention of treatment induced nausea and vomiting</a>
<b>Encephalopathy</b>	Ifosfamide induced encephalopathy has been reported in 10 to 30% of patients receiving high dose ifosfamide. Common symptoms include confusion, ataxia, weakness, seizures, somnolence and hallucinations. Onset may be 2 to 48 hours after commencing treatment. When reversible, symptoms usually resolve within 1 to 3 days. Read more about <a href="#">ifosfamide-induced encephalopathy</a>
<b>Taste and smell alteration</b>	Read more about <a href="#">taste and smell changes</a>
<b>Bone pain</b>	Bone pain, usually in the lower back or pelvis, associated with G-CSF.
<b>Haemorrhagic cystitis</b>	An inflammatory process, characterised by diffuse mucosal inflammation with haemorrhage involving the entire bladder. Patients are at risk following treatment with cyclophosphamide, ifosfamide and radiation therapy. Read more about <a href="#">haemorrhagic cystitis</a>

Early (onset days to weeks)	
<b>Neutropenia</b>	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 <a href="#">immediate management of neutropenic fever</a>
<b>Thrombocytopenia</b>	A reduction in the normal levels of functional platelets, increasing the risk of abnormal bleeding.  Read more about <a href="#">thrombocytopenia</a>
<b>Oral mucositis</b>	Erythematous and ulcerative lesions of the gastrointestinal tract (GIT). It commonly develops following chemotherapy, radiation therapy to the head, neck or oesophagus, and high dose chemotherapy followed by a blood and marrow transplant (BMT). Read more about <a href="#">oral mucositis</a>
<b>Diarrhoea</b>	Read more about <a href="#">treatment induced diarrhoea</a>
<b>Fatigue</b>	Read more about <a href="#">fatigue</a>
<b>Peripheral neuropathy</b>	Typically symmetrical sensory neuropathy, affecting the fingers and toes, sometimes progressing to the hands and feet. It is associated with several classes of anti-cancer drugs. These include taxanes, platinum-based compounds, vinca alkaloids and some drugs used to treat multiple myeloma. Read more about <a href="#">peripheral neuropathy</a>
<b>Nephrotoxicity</b>	Renal dysfunction resulting from damage to the glomeruli, tubules or renal vasculature.
<b>Ototoxicity</b>	Tinnitus and hearing loss may occur due to damage in the inner ear. Tinnitus is usually reversible, while hearing loss is generally irreversible. Hearing loss is dose-related, cumulative and may be worse in those with pre-existing hearing problems. Read more about <a href="#">ototoxicity - tinnitus and hearing loss</a>
<b>Hypomagnesaemia, hypokalaemia, hypocalcaemia</b>	Abnormally low levels of magnesium, potassium and calcium in the blood.

Late (onset weeks to months)	
<b>Anaemia</b>	Abnormally low levels of red blood cells (RBCs) or haemoglobin in the blood. Read more about <a href="#">anaemia</a>
<b>Alopecia</b>	Hair loss may occur from all parts of the body. Patients can also experience mild to moderate discomfort of the hair follicles, and rarely pain as the hair is falling out. Read more about <a href="#">alopecia</a> and <a href="#">scalp cooling</a>

## Evidence

4 cycles of BEP remain the standard therapy for patients with disseminated germ cell tumours. The VIP regimen may be considered a treatment alternative for patients with underlying pulmonary disease.

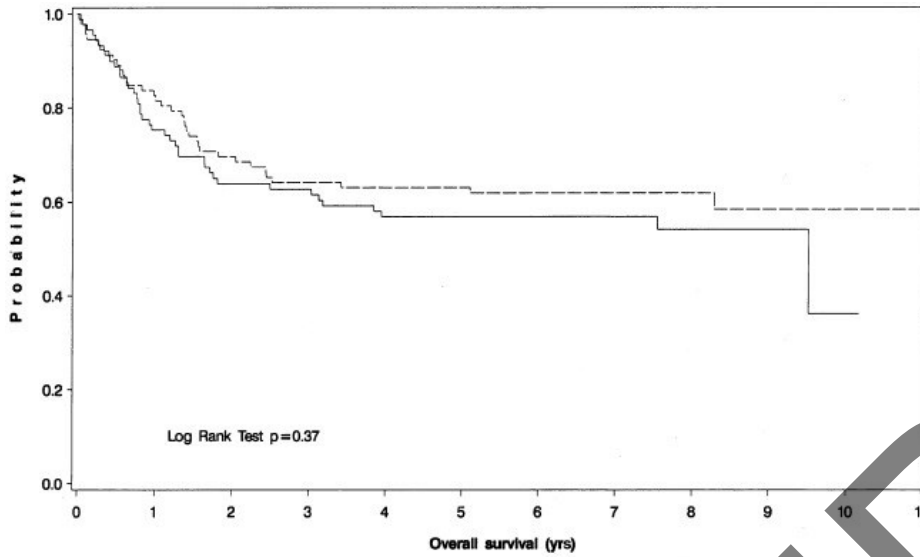
The evidence supporting this regimen comes from the intergroup trial which compared the standard therapy of bleomycin, etoposide and cisplatin (BEP) with etoposide, ifosfamide and cisplatin (VIP) in advanced germ cell tumours. The results of the trial were reanalysed using the IGCCCG staging system by Hinton et al.<sup>3</sup>

From October 1987 to April 1992, 286 eligible patients were randomised to receive either BEP or VIP. Progression-free survival (PFS), overall survival (OS), and toxicity were assessed for the treatment arms.<sup>3</sup>

### Efficacy

With a median follow up of 7.3 years, the PFS rates were 64% versus 58% and the OS rates 69% versus 67% in the VIP and BEP arms respectively. For patients reclassified with the IGCCCG staging system, the PFS rates were 81%, 72% and 54% and the OS rates were 89%, 81% and 60% for good, intermediate and poor risk patients respectively. Difference in OS (VIP 62%, BEP 57%) and PFS (VIP 56%, BEP 49%) for the subset of patients reclassified as poor risk were not significantly different.<sup>3</sup>

Overall survival by treatment stage for patients classified as having poor prognosis by IGCCG<sup>3</sup>



		Time Interval			
Treatment Arm	0-3	3-6	6-9	9-12	
VIP	33/92	2/59	1/49	0/11	
BEP	33/89	5/54	1/41	1/7	

(# events/# at risk)

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**Toxicity**

Haematological toxicity was the most common toxicity in both arms. 3 possible drug related deaths occurred in good or intermediate risk patients. In the VIP arm, 1 good risk patient died from sepsis. In the BEP arm, 2 intermediate risk patients died from sepsis, 1 from pulmonary haemorrhage and 1 death typical of bleomycin after a total dose of 300 000 International units.

Treatment group	Risk group	Grade 3/4 toxicity(%) <sup>3</sup>
VIP	Good prognosis	85
	Intermediate prognosis	93
	Poor prognosis	93
BEP	Good prognosis	75
	Intermediate prognosis	73
	Poor prognosis	79

**References**

- 1 Olver, I. N., P. Grimison, M. Chatfield, et al. 2013. "Results of a 7-day aprepitant schedule for the prevention of nausea and vomiting in 5-day cisplatin-based germ cell tumor chemotherapy." Support Care Cancer 21(6):1561-1568.
- 2 Albany, C., M. J. Brames, C. Fausel, et al. 2012. "Randomized, double-blind, placebo-controlled, phase III cross-over study evaluating the oral neurokinin-1 antagonist aprepitant in combination with a 5HT3 receptor antagonist and dexamethasone in patients with germ cell tumors receiving 5-day cisplatin combination chemotherapy regimens: a hoosier oncology group study." J Clin Oncol 30(32):3998-4003.
- 3 Hinton, S., P. J. Catalano, L. H. Einhorn, et al. 2003. "Cisplatin, etoposide and either bleomycin or ifosfamide in the treatment of disseminated germ cell tumors: final analysis of an intergroup trial." Cancer. 97(8):1869-1875.

### Version 7

Date	Summary of changes
18/11/2021	Cisplatin changed from moderately to highly emetogenic as per NCCN, MASCC/ESMO and ASCO guidelines and medical oncology reference committee consensus. Treatment schedule antiemetics and clinical information updated to reflect the change. NK-1 antagonist added to interactions. Version number changed to V.7.

### Version 6

Date	Summary of changes
04/09/2020	Biosimilar drug added to clinical information. Version number changed to V.6.

### Version 5

Date	Summary of changes
16/04/2020	'Mesna dosing and administration' block added to clinical information. Version number changed to v.5

### Version 4

Date	Summary of changes
08/10/2019	Clinical information updated with PBS expanded indications for G-CSF. Treatment schedule note updated.

### Version 3

Date	Summary of changes
08/03/2010	Review, new dose modifications and transferred to eviQ.
26/03/2010	Renal dose modifications for cisplatin changed.
02/07/2010	Haematological dose modifications updated (20% changed to 25% dose reduction).
26/07/2010	Patient information sheet modified (G-CSF removed from table).
13/08/2010	Pegfilgrastim added to treatment schedule. G-CSF included in the table in patient information sheet.
26/08/2010	Encephalopathy related to Ifosfamide side effect added.
21/03/2011	New format to allow for export of protocol information. Protocol version number changed to V.2. Antiemetics and premedications added to the treatment schedule. Additional Clinical Information, Key Prescribing table and Key Administration .table combined into new section titled Clinical Considerations. Drug specific information placed behind the drug name link.
16/01/2012	PHC view updated.
30/11/2012	Reviewed at reference committee meeting. No change. 2 year review.
10/7/2013	Dose modifications for cisplatin updated.
09/05/2014	Reviewed at Medical Oncology Reference committee meeting. Minor changes. PHC view removed. 2 year review.
27/03/2015	Links to Germ Cell Tumour HPCT protocols added.
31/03/2017	Protocol discussed and decided to have a 5 year review period. Next due for review in 2019.
31/05/2017	Transferred to new eviQ website. Protocol version number changed to V.3.
22/06/2018	Antiemetics updated to be in line with international guidelines. Note to dexamethasone added.
25/03/2019	Protocol reviewed at Medical Oncology Reference Committee meeting. ANZUP surveillance recommendations added as related page. Next review in 5 years.

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](http://www.eviQ.org.au)

**First approved:** 29 March 2006

**Last reviewed:** 15 March 2019

**Review due:** 30 June 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/318>*

*19 Jun 2023*

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# Patient information - Testicular cancer metastatic - VIP (etoposide, ifosfamide, cisplatin)

Patient's name:

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## Your treatment

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

VIP (etoposide, ifosfamide, cisplatin)			
This treatment cycle is repeated every 21 days. You will have up to 4 cycles.			
Day	Treatment	How it is given	How long it takes
1 to 5	<b>Etoposide</b> ( <i>e-TOE-poe-side</i> )	By a drip into a vein	About 5 hours
	<b>Cisplatin</b> ( <i>siss-PLAT-in</i> )		
	<b>Ifosfamide</b> ( <i>eye-FOS-fa-mide</i> )		
	<b>Mesna</b> ( <i>MES-na</i> )	One dose of mesna is given by a drip into a vein followed by 2 doses orally 2 hours and 6 hours after completion of ifosfamide	
6	<b>Pegfilgrastim</b> ( <i>peg-fil-GRA-stim</i> )	By injection under your skin	About 5 minutes

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

**During your treatment immediately** tell the doctor or nurse looking after you if you get any of the following problems:

- leaking from the area where the drugs are being given
- pain, stinging, swelling or redness in the area where the drugs are being given or at any injection sites
- a skin rash, itching, feeling short of breath, wheezing, fever, shivers, or feeling dizzy or unwell in any way (allergic reaction).



## 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

Anti-cancer drugs can reduce the number of blood cells in your body. You will need to have regular blood tests to check that your blood cell count has returned to normal. If your blood count is low, your treatment may be delayed until it has returned to normal. 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.
- **Mesna:** you will be given a drug called mesna with this treatment. Mesna helps to protect your bladder from the chemotherapy. It can be given by mouth as a tablet or by injection through your drip. Your doctor or nurse will tell you how and when to take the mesna tablets.
- **G-CSF:** you will 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.

## 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)

#### Allergic reaction

- Allergic reactions are uncommon but can be life threatening.
- **If you feel unwell during the infusion or shortly after it, or:**
  - **get a fever, shivers or shakes**
  - **feel dizzy, faint, confused or anxious**
  - **start wheezing or have difficulty breathing**
  - **have a rash, itch or redness of the face**

**While you are in hospital: Tell your doctor or nurse immediately.**

**After you leave: Contact your doctor or nurse immediately, or go to the nearest hospital Emergency Department.**

<b>Nausea and vomiting</b>	<ul style="list-style-type: none"> <li>• You may feel sick (nausea) or be sick (vomit).</li> <li>• Take your anti-sickness medication as directed even if you don't feel sick.</li> <li>• Drink plenty of fluids (unless you are fluid restricted).</li> <li>• Eat small meals more frequently.</li> <li>• Try food that does not require much preparation.</li> <li>• Try bland foods like dry biscuits or toast.</li> <li>• Gentle exercise may help with nausea.</li> <li>• Ask your doctor or nurse for eviQ patient information - <a href="#">Nausea and vomiting during cancer treatment</a>.</li> <li>• <b>Tell your doctor or nurse immediately, or go to the nearest hospital Emergency Department if you have uncontrolled vomiting or feel dizzy or light-headed.</b></li> </ul>
<b>Brain swelling (encephalopathy)</b>	<ul style="list-style-type: none"> <li>• You may feel: <ul style="list-style-type: none"> <li>◦ dizzy</li> <li>◦ sleepy</li> <li>◦ confused or agitated.</li> </ul> </li> <li>• You may also get: <ul style="list-style-type: none"> <li>◦ headaches</li> <li>◦ loss of balance</li> <li>◦ hallucinations</li> <li>◦ seizure (fits).</li> </ul> </li> <li>• These symptoms are caused by the drug ifosfamide.</li> <li>• If you are being treated as an outpatient, try to have someone stay at home with you during the days that you are having this medicine.</li> <li>• <b>Tell your doctor or nurse immediately, or go to the nearest hospital Emergency Department if you get any of the symptoms listed above.</b></li> </ul>
<b>Taste and smell changes</b>	<ul style="list-style-type: none"> <li>• You may find that food loses its taste or tastes different.</li> <li>• These changes are likely to go away with time.</li> <li>• Do your mouth care regularly.</li> <li>• Chew on sugar-free gum or eat sugar-free mints.</li> <li>• Add flavour to your food with sauces and herbs.</li> <li>• Ask your doctor or nurse for eviQ patient information - <a href="#">Taste and smell changes during cancer treatment</a>.</li> </ul>
<b>Bone pain after G-CSF injection</b>	<ul style="list-style-type: none"> <li>• You may have discomfort or a dull ache in your pelvis, back, arms or legs.</li> <li>• To reduce the pain, take paracetamol before each injection.</li> <li>• <b>Tell your doctor or nurse as soon as possible if your pain is not controlled.</b></li> </ul>
<b>Bladder irritation (haemorrhagic cystitis)</b>	<ul style="list-style-type: none"> <li>• You may get: <ul style="list-style-type: none"> <li>◦ blood in your urine, sometimes with blood clots</li> <li>◦ pain or burning when you urinate</li> <li>◦ the urge to urinate more than normal</li> <li>◦ stomach or pelvic pain or discomfort.</li> </ul> </li> <li>• When you go home, make sure you drink plenty of fluids (unless you are fluid restricted).</li> <li>• Empty your bladder often.</li> <li>• <b>Tell your doctor or nurse as soon as possible if you notice any blood in your urine.</b></li> </ul>

**Early (onset days to weeks)**

<p><b>Infection risk (neutropenia)</b></p>	<ul style="list-style-type: none"> <li>• 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.</li> <li>• Wash your hands often.</li> <li>• Keep a thermometer at home and take your temperature regularly, and if you feel unwell.</li> <li>• Do your mouth care regularly.</li> <li>• Inspect your central line site (if you have one) daily for any redness, pus or swelling.</li> <li>• Limit contact with people who are sick.</li> <li>• Learn how to recognise the signs of infection.</li> <li>• Ask your doctor or nurse for eviQ patient information - <a href="#">Infection during cancer treatment</a>.</li> <li>• <b>Tell your doctor or nurse immediately, or go to the nearest hospital Emergency Department if you get any of the following signs or symptoms:</b> <ul style="list-style-type: none"> <li>◦ a temperature of 38°C or higher</li> <li>◦ chills, shivers, sweats or shakes</li> <li>◦ a sore throat or cough</li> <li>◦ uncontrolled diarrhoea</li> <li>◦ shortness of breath</li> <li>◦ a fast heartbeat</li> <li>◦ become unwell even without a temperature.</li> </ul> </li> </ul>
<p><b>Low platelets (thrombocytopenia)</b></p>	<ul style="list-style-type: none"> <li>• 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.</li> <li>• Try not to bruise or cut yourself.</li> <li>• Avoid contact sport or vigorous exercise.</li> <li>• Clear your nose by blowing gently.</li> <li>• Avoid constipation.</li> <li>• Brush your teeth with a soft toothbrush.</li> <li>• Don't take aspirin, ibuprofen or other similar anti-inflammatory medications unless your doctor tells you to.</li> <li>• Tell your doctor or nurse if you have any bruising or bleeding.</li> <li>• <b>Tell your doctor or nurse immediately, or go to your nearest hospital Emergency Department if you have any uncontrolled bleeding.</b></li> </ul>
<p><b>Mouth pain and soreness (mucositis)</b></p>	<ul style="list-style-type: none"> <li>• You may have: <ul style="list-style-type: none"> <li>◦ bleeding gums</li> <li>◦ mouth ulcers</li> <li>◦ a white coating on your tongue</li> <li>◦ pain in the mouth or throat</li> <li>◦ difficulty eating or swallowing.</li> </ul> </li> <li>• Avoid spicy, acidic or crunchy foods and very hot or cold food and drinks.</li> <li>• Try bland and soft foods.</li> <li>• Brush your teeth gently with a soft toothbrush after each meal and at bedtime. If you normally floss continue to do so.</li> <li>• Rinse your mouth after you eat and brush your teeth, using either: <ul style="list-style-type: none"> <li>◦ 1/4 teaspoon of salt in 1 cup of warm water, or</li> <li>◦ 1/4 teaspoon of bicarbonate of soda in 1 cup of warm water</li> </ul> </li> <li>• Ask your doctor or nurse for eviQ patient information - <a href="#">Mouth problems during cancer treatment</a>.</li> <li>• <b>Tell your doctor or nurse if you get any of the symptoms listed above.</b></li> </ul>

<b>Diarrhoea</b>	<ul style="list-style-type: none"> <li>• You may get bowel motions (stools, poo) that are more frequent or more liquid.</li> <li>• You may also get bloating, cramping or pain.</li> <li>• Take your antidiarrhoeal medication as directed by your doctor.</li> <li>• Drink plenty of fluids (unless you are fluid restricted).</li> <li>• Eat and drink small amounts more often.</li> <li>• Avoid spicy foods, dairy products, high fibre foods, and coffee.</li> <li>• Ask your doctor or nurse for eviQ patient information - <a href="#">Diarrhoea during cancer treatment</a>.</li> <li>• <b>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.</b></li> </ul>
<b>Tiredness and lack of energy (fatigue)</b>	<ul style="list-style-type: none"> <li>• You may feel very tired, have no energy, sleep a lot, and not be able to do normal activities or things you enjoy.</li> <li>• Do not drive or operate machinery if you are feeling tired.</li> <li>• Nap for short periods (only 1 hour at a time)</li> <li>• Prioritise your tasks to ensure the best use of your energy.</li> <li>• Eat a well balanced diet and drink plenty of fluids (unless you are fluid restricted).</li> <li>• Try some gentle exercise daily.</li> <li>• Allow your friends and family to help.</li> <li>• <b>Tell your doctor or nurse if you get any of the symptoms listed above.</b></li> </ul>
<b>Nerve damage (peripheral neuropathy)</b>	<ul style="list-style-type: none"> <li>• You may notice a change in the sensations in your hands and feet, including: <ul style="list-style-type: none"> <li>◦ tingling or pins and needles</li> <li>◦ numbness or loss of feeling</li> <li>◦ pain.</li> </ul> </li> <li>• You may find it difficult to do everyday activities, such as doing up buttons or picking up small objects.</li> <li>• Test water temperature with your elbow when bathing to avoid burns.</li> <li>• Use rubber gloves, pot holders and oven mitts in the kitchen.</li> <li>• Wear rubber shoes or boots when working in the garden or garage.</li> <li>• Keep rooms well lit and uncluttered.</li> <li>• Ask your doctor or nurse for eviQ patient information – <a href="#">Nerve problems during cancer treatment</a>.</li> <li>• Tell your doctor or nurse if you get any of the symptoms listed above.</li> </ul>
<b>Kidney damage</b>	<ul style="list-style-type: none"> <li>• This treatment can cause changes to how your kidneys work.</li> <li>• You will have blood tests to make sure your kidneys are working properly.</li> <li>• You may need to drink more fluids while you are having treatment. Your doctor or nurse will tell you if you need to do this.</li> <li>• <b>Tell your doctor or nurse as soon as possible if you notice that your urine changes colour or you don't need to empty your bladder as often.</b></li> </ul>
<b>Hearing changes (ototoxicity)</b>	<ul style="list-style-type: none"> <li>• You may get ringing in your ears or loss of hearing.</li> <li>• You may have your hearing tested before and during your treatment.</li> <li>• <b>Tell your doctor or nurse as soon as possible if you notice any changes to your hearing.</b></li> </ul>
<b>Low blood magnesium, potassium and calcium levels (hypomagnesaemia, hypokalaemia, hypocalcaemia)</b>	<ul style="list-style-type: none"> <li>• This may be found from your routine blood tests and treated by your doctor.</li> <li>• If it is severe you may get: <ul style="list-style-type: none"> <li>◦ muscle cramps or twitches</li> <li>◦ numbness or tingling in your fingers, toes or around your mouth</li> <li>◦ constipation</li> <li>◦ an irregular heartbeat</li> <li>◦ sleepy, drowsy or confused</li> </ul> </li> <li>• <b>Tell your doctor or nurse as soon as possible if you get any of the signs or symptoms listed above.</b></li> </ul>

## Late (onset weeks to months)

### Low red blood cells (anaemia)

- 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.**

### Hair loss (alopecia)

- Your hair may start to fall out from your head and body.
- Hair loss usually starts 2 to 3 weeks after your first treatment.
- You may become completely bald and your scalp might feel tender.
- Use a gentle shampoo and a soft brush.
- Take care with hair products like hairspray, hair dye, bleaches and perms.
- Protect your scalp from the cold with a hat, scarf or wig.
- Protect your scalp from the sun with a hat or sunscreen of SPF 50 or higher.
- Moisturise your scalp to prevent itching.
- Ask your doctor or nurse about the [Look Good Feel Better](#) program

## 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

- While you are receiving this treatment it is important that you try to maintain a healthy diet.
- Grapefruit and grapefruit juice can interact with your medication and should be avoided while you are on this treatment.
- 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.

### Fertility

- Some cancer treatments can reduce your fertility. This can make it difficult or impossible to 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.

### Fathering a child

- Some cancer treatments can be dangerous to unborn babies. Talk to your doctor or nurse if you think there is any chance that your partner could be pregnant.
- Do not try to father a child during this treatment. Contraception should be used during treatment and after stopping treatment. Ask your doctor or nurse about what type of contraception you should use.
- If you are planning fatherhood after completing this treatment, talk to your doctor. Some doctors advise waiting between 6 months and 2 years after treatment.

### 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.

### Risk of developing a second cancer

- Some anticancer treatments can increase your chance of developing a second cancer, this is rare. Your doctor will discuss with you the specific risks of your treatment.

### 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

### Testicular cancer information

- Healthy Male Andrology Australia – [healthymale.org.au](http://healthymale.org.au)
- Livestrong – [livestrong.org](http://livestrong.org)

### General cancer information and support

- Australian Rare Cancer (ARC) Portal – [arcportal.org.au/](http://arcportal.org.au/)
- Beyondblue – [beyondblue.org.au](http://beyondblue.org.au)
- Cancer Australia – [canceraustralia.gov.au](http://canceraustralia.gov.au)
- Cancer Council Australia – [cancer.org.au](http://cancer.org.au)
- Cancer Voices Australia – [cancervoicesaustralia.org](http://cancervoicesaustralia.org)
- CanTeen – [canteen.org.au](http://canteen.org.au)
- Carers Australia – [carersaustralia.com.au](http://carersaustralia.com.au)
- CHILL Cancer related hair loss - [scalpcooling.org](http://scalpcooling.org)
- eviQ Cancer Treatments Online – [eviQ.org.au](http://eviQ.org.au)
- LGBTQI+ People and Cancer - [cancercouncil.com.au/cancer-information/lgbtqi](http://cancercouncil.com.au/cancer-information/lgbtqi)
- Look Good Feel Better – [lgfb.org.au](http://lgfb.org.au)
- Patient Information – [patients.cancer.nsw.gov.au](http://patients.cancer.nsw.gov.au)
- Radiation Oncology Targeting Cancer – [targetingcancer.com.au](http://targetingcancer.com.au)
- Redkite – [redkite.org.au](http://redkite.org.au)
- Return Unwanted Medicines – [returnmed.com.au](http://returnmed.com.au)

