

Myelodysplastic syndrome azacitidine

ID: 1173 v.3 Endorsed

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



Treatment schedule - Overview

Cycle 1 to 6

Drug	Dose	Route	Day
Azacitidine	75 mg/m ²	Subcut *	1 to 7

*Azacitidine can also be administered as an intravenous infusion.

Frequency: 28 days

Cycles: 6 cycles minimum recommended, then may continue until disease progression or unacceptable toxicity.

Notes:

While the dosing schedule for azacitidine is recommended as 7 consecutive days, this is not practical for all cancer units and alternative scheduling may be used; i.e. azacitidine for 5 days, followed by 2 day weekend break, followed by azacitidine for 2 days.^{1, 2}

Drug status: Azacitidine: (PBS authority)

Cost: ~ \$570 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 6

Day 1 to 7		
Granisetron	2 mg (PO)	60 minutes before chemotherapy

Day 1 to 7		
Azacitidine	75 mg/m ² (Subcut)	Inject subcutaneously*. Roll the syringe between the palms to re-suspend. Rotate the site of injection.

*Azacitidine can also be administered as an intravenous infusion.

Note: While the dosing schedule for azacitidine is recommended as 7 consecutive days, this is not practical for all cancer units and alternative scheduling may be used; i.e. azacitidine for 5 days, followed by 2 day weekend break, followed by azacitidine for 2 days.^{1, 2}

Frequency: 28 days

Cycles: 6 cycles minimum recommended, then may continue until disease progression or unacceptable toxicity.

Indications and patient population

- Myelodysplastic syndrome classified as Intermediate-2 or high risk according to the International Prognostic Scoring System (IPSS)
- Chronic Myelomonocytic Leukaemia (CMML) with 10 to 29% marrow blasts without myeloproliferative disorder

Clinical information

Emetogenicity MODERATE	<p>Suggested default antiemetics have been added to the treatment schedule, and may be substituted to reflect institutional policy.</p> <p>Note: due to the risk of opportunistic infection daily, dexamethasone which is usually recommended for moderately emetogenic chemotherapy has been omitted in this protocol.</p> <p>For patients with a prior episode of chemotherapy induced nausea or vomiting, a NK1 receptor antagonist is available on the PBS in combination with a 5HT3 antagonist and steroid (which may be omitted).</p> <p>Ensure that patients also have sufficient antiemetics for breakthrough emesis:</p> <p>Metoclopramide 10 mg three times a day when necessary (maximum of 30 mg/24 hours, up to 5 days) OR</p> <p>Prochlorperazine 10 mg PO every 6 hours when necessary.</p> <p>Read more about preventing anti-cancer therapy induced nausea and vomiting</p>
Injection site reactions	<p>Injection site reactions are common with subcutaneous azacitidine. Ensure injection sites are rotated and that new injections are at least 2.5 cm from the previous site.</p>
Diarrhoea and constipation	<p>Both diarrhoea and constipation are common side effects associated with azacitidine treatment. Constipation may be attributed to the extended use of 5HT3 antagonists with this treatment.</p> <p>Patients may require either laxatives or anti-diarrhoeals.</p> <p>Read more about treatment induced diarrhoea</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>
Antifungals and antivirals	<p>There are no specific recommendations for the use of antifungal or antiviral prophylaxis with this treatment. The use of prophylaxis should be at the discretion of the treating clinician and based on patient risk factors and local guidelines.</p> <p>Read more about antifungal and antiviral prophylaxis</p>
Blood tests	<p>FBC, EUC, eGFR and LFTs at baseline and prior to each cycle.</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, pregnancy 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. There is a risk of foetal harm in pregnant women. A pregnancy test should be considered prior to initiating treatment in females of reproductive potential if sexually active. It is important that all patients of reproductive potential use effective contraception whilst on therapy and after treatment finishes. Effective contraception methods and adequate contraception timeframe should be discussed with all patients of reproductive potential. Possibility of infant risk should be discussed with breastfeeding patients.</p> <p>Read more about the effect of cancer treatment on fertility</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 \(ADDIKD\).](#)

Notes:

- All dose reductions are calculated as a percentage of the starting dose.
- The modifications in this section are as recommended in the azacitidine product information.
- However it should be noted that some experts advise against dose modification during the initial 3 cycles in order to maintain dosing intensity.³ Decisions regarding dose modifications must be individualised by the treating haematologist.
- The following haematological dose modifications come directly from the azacitidine product information.

Haematological toxicity	
Patients WITHOUT reduced blood counts prior to first treatment (i.e. WBC $\geq 3.0 \times 10^9/L$ and ANC $\geq 1.5 \times 10^9/L$, and platelets $\geq 75.0 \times 10^9/L$)	
ANC $< 1.0 \times 10^9/L$ and/or platelets $< 50 \times 10^9/L$	Delay treatment until ANC and platelet recovery.* If recovery is achieved within 14 days, no dose adjustment is required. If recovery is NOT achieved within 14 days, the dose should be reduced according to the table below. Following dose modifications, the cycle duration should return to 28 days.

* counts greater than or equal to nadir count + $(0.5 \times [\text{baseline count} - \text{nadir count}])$

Nadir counts		% Dose in the next cycle
ANC (x 10 ⁹ /L)	Platelets (x 10 ⁹ /L)	
≤ 1.0	≤ 50	50%
> 1.0	> 50	100%

Patients WITH reduced blood counts prior to first treatment (i.e. WBC < 3.0 x 10 ⁹ /L and ANC < 1.5 x 10 ⁹ /L, or platelets < 75.0 x 10 ⁹ /L)	
Decrease in WBC or ANC or platelets from that prior to treatment less than 50%, or greater than 50% but with an improvement in any cell line differentiation	No delay or dose modification
Decrease in WBC or ANC or platelets greater than 50% from that prior to treatment, with no improvement in cell line differentiation	Delay treatment until ANC and platelet recovery.* If recovery is not achieved within 14 days, bone marrow cellularity must be determined. If the bone marrow cellularity is > 50% no dose adjustments should be made. If bone marrow cellularity is ≤ 50%, delay treatment and reduce the dose according to the table below. Following dose modifications, the cycle duration should return to 28 days.

* counts greater than or equal to nadir count + (0.5 x [baseline count - nadir count])

Bone marrow cellularity	% Dose in the next cycle	
	Recovery* ≤ 21 days	Recovery* > 21 days
15 to 50%	100%	50%
< 15%	100%	33%

* counts greater than or equal to nadir count + (0.5 x [baseline count - nadir count])

Renal impairment	
Unexplained clinically significant elevations in serum creatinine or blood urea nitrogen (BUN)	Delay next cycle until values return to normal or baseline and reduce azacitidine by 50% for the next cycle
Unexplained reduction in serum bicarbonate levels to less than 20 mmol/L	Reduce azacitidine by 50%
Severe renal impairment (creatinine clearance <30 mL/min)	Azacitidine contraindicated according to the Australian product information. However, its use has been reported in patients with CrCl<30mL/min and is associated with a higher incidence of toxicity. ⁴

Hepatic impairment
No formal studies have been conducted in patients with hepatic impairment.

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](#)

Azacitidine		
No formal clinical drug interaction studies with azacitidine have been conducted		
Nephrotoxic drugs (e.g. aminoglycosides, amphotericin, contrast dye, frusemide, NSAIDs)	Additive nephrotoxicity	Avoid combination or monitor kidney function closely
Cytidine deaminase (CDA) inhibitors (e.g. cedazuridine)	Potential increased effect/toxicity of azacitidine due to reduced clearance	Avoid combination or monitor for increased effect/toxicity.

General		
	Interaction	Clinical management
Warfarin	Anti-cancer drugs may alter the anticoagulant effect of warfarin.	Monitor INR regularly and adjust warfarin dosage as appropriate; consider alternative anticoagulant.
Direct oral anticoagulants (DOACs) e.g. apixaban, rivaroxaban, dabigatran	<p>Interaction with both CYP3A4 and P-gp inhibitors /inducers.</p> <p>DOAC and anti-cancer drug levels may both be altered, possibly leading to loss of efficacy or toxicity (i.e. increased bleeding).</p>	<p>Apixaban: avoid concurrent use with strong CYP3A4 and P-gp inhibitors. If treating VTE, avoid use with strong CYP3A4 and P-gp inducers.</p> <p>Rivaroxaban: avoid concurrent use with strong CYP3A4 and P-gp inhibitors.</p> <p>Dabigatran: avoid combination with strong P-gp inducers and inhibitors.</p> <p>If concurrent use is unavoidable, monitor closely for efficacy/toxicity of both drugs.</p>
Digoxin	Anti-cancer drugs can damage the lining of the intestine; affecting the absorption of digoxin.	Monitor digoxin serum levels; adjust digoxin dosage as appropriate.
Antiepileptics	Both altered antiepileptic and anti-cancer drug levels may occur, possibly leading to loss of efficacy or toxicity.	Where concurrent use of an enzyme-inducing antiepileptic cannot be avoided, monitor antiepileptic serum levels for toxicity, as well as seizure frequency for efficacy; adjust dosage as appropriate. Also monitor closely for efficacy of the anti-cancer therapy.
Antiplatelet agents and NSAIDs	Increased risk of bleeding due to treatment related thrombocytopenia.	Avoid or minimise combination. If combination deemed essential, (e.g. low dose aspirin for ischaemic heart disease) monitor for signs of bleeding.
Serotonergic drugs, including selective serotonin reuptake inhibitors (SSRIs e.g. paroxetine) and serotonin noradrenaline reuptake inhibitors (SNRIs e.g. venlafaxine)	Increased risk of serotonin syndrome with concurrent use of 5-HT ₃ receptor antagonists (e.g. palonosetron, ondansetron, granisetron, tropisetron, dolasetron, etc.)	<p>Avoid combination.</p> <p>If combination is clinically warranted, monitor for signs and symptoms of serotonin syndrome (e.g. confusion, agitation, tachycardia, hyperreflexia). For more information link to TGA Medicines Safety Update</p>
Vaccines	Diminished response to vaccines and increased risk of infection with live vaccines.	<p>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.</p> <p>For more information; refer to the recommended schedule of vaccination for cancer patients, as outlined in the Australian Immunisation Handbook</p>

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

Days 1 to 7

Subcutaneous injection

[Safe handling and waste management](#)

[Safe administration](#)

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

Any toxicity grade 2 or greater may require dose reduction, delay or omission of treatment and review by medical officer before recommencing treatment.

- weigh patient on each visit

Pre treatment medication

Verify antiemetics taken or administer as prescribed.

Chemotherapy - Time out

Azacitidine

Prior to administration:

- allow refrigerated drug to warm to room temperature for up to 30 minutes prior to administration
- ensure there is an air bubble of 0.3-1.0 mL in between the syringe plunger and drug to ensure full administration of the desired volume.

Administer azacitidine:

- via subcutaneous injection on days 1 to 7
- vigorously roll the syringe between the palms until a uniform, cloudy suspension is achieved
- rotate sites for each injection (thigh, abdomen, upper arm)
- new injections should be given at least 2.5 cm from the previous site.

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

Discharge information

Antiemetics

- Antiemetics as prescribed.

Antidiarrhoeals

- Antidiarrhoeals as prescribed.

Laxatives

- Ensure patient has prophylactic laxatives.

Prophylaxis medications

- Prophylaxis medications (if prescribed) i.e. tumour lysis prophylaxis, PJP prophylaxis, antifungals, antivirals.

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)	
Headache	
Hypersensitivity reaction	Anaphylaxis and infusion related reactions can occur with this treatment. Read more about hypersensitivity reaction
Injection-site reactions	Inflammation of or damage to the tissue surrounding the area where a drug was injected.
Nausea and vomiting	Read more about prevention of treatment induced nausea and vomiting
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
Abdominal pain	Dull ache, cramping or sharp pains are common with some anti-cancer drugs. These are caused by either increased or decreased gastrointestinal motility and can be associated with diarrhoea or constipation.
Anorexia	Loss of appetite accompanied by decreased food intake. Read more about anorexia
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	
Diarrhoea	Read more about treatment induced diarrhoea
Fatigue	Read more about fatigue
Late (onset weeks to months)	
Anaemia	Abnormally low levels of red blood cells (RBCs) or haemoglobin in the blood. Read more about anaemia

Evidence

A phase II trial,⁵ compared azacitidine (AZA) with best supportive care in patients with intermediate-high risk and high risk myelodysplasia (MDS) and acute myeloid leukaemia (AML) with 20 to 30% blasts, as well as patients with refractory anaemia (RA) and refractory anaemia with ringed sideroblasts (RARS) with associated cytopenias. Patients were allowed to cross over. AZA was given for seven days every four weeks (75 mg/m²/day IV). This study showed AZA resulted in reduced transfusion, and improved quality of life. Most importantly AZA delayed both transformation to acute myeloid leukaemia (AML) and death. A further analysis of this trial and two other trials with AZA was performed and published.⁶ All patients had been treated with AZA 75 mg/m²/day IV or SC for seven days, every four weeks. This indicated, in patients with MDS, 10% to 17% of patients had a complete response and 23% to 36% with haematological improvement. In patients with AML, 7% achieved CR or PR compared to 0% on the standard care arm. Time to any responses occurred after 3 cycles (range 1 to 17 cycles) although 90% of responders achieved a response by cycle 6.⁶

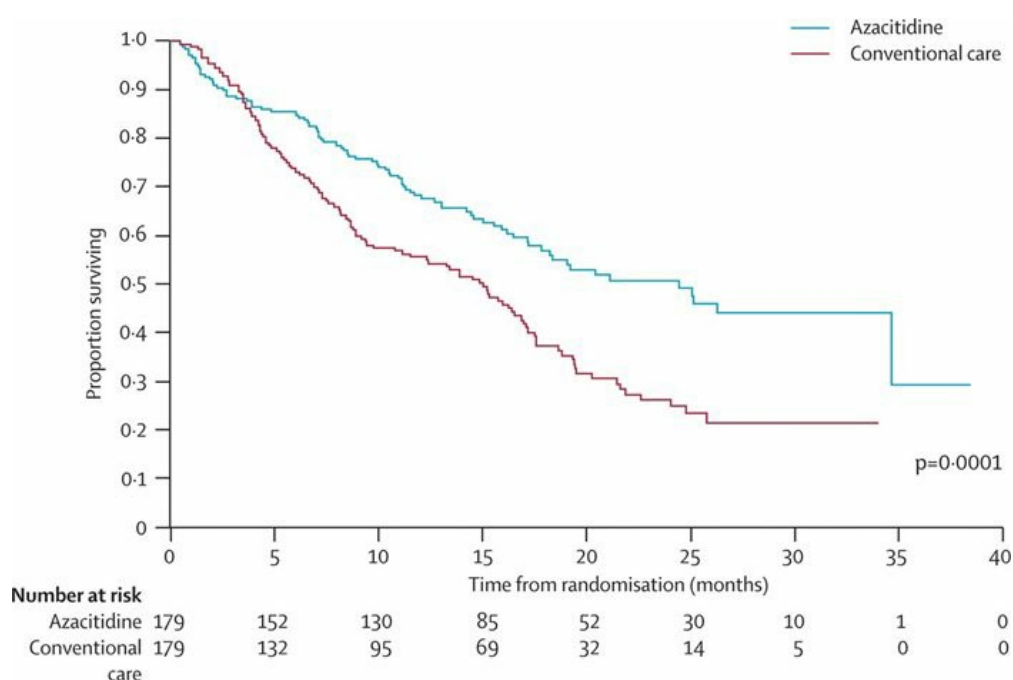
A phase III, international, multicentre, controlled, open-label trial, was conducted for patients with higher- risk myelodysplastic syndromes (AZA-001). These included patients "with higher-risk myelodysplastic syndromes (an international prognosis scoring system rating of intermediate-2 or high risk) and FAB-defined refractory anaemia with excess blasts, refractory anaemia with excess blasts in transformation, or chronic myelomonocytic leukaemia with at least 10% bone marrow blasts and a white-blood-cell count lower than 13×10⁹ cells/L".⁷ They were to receive AZA (75 mg/m² SC per day for 7 days every 28 days) or conventional care (best supportive care, low-dose cytarabine, or intensive chemotherapy). The primary endpoint was overall survival. Erythroid stimulating hormones were prohibited. Patients were treated with a median of 9 cycles. This study confirmed that "treatment with

azacitidine increases overall survival in patients with higher-risk myelodysplastic syndromes relative to conventional care".⁷ Most experts concur that ongoing therapy is appropriate for patients who are experiencing hematologic responses. The survival benefit appears to extend beyond patients who achieve complete and partial responses".²

Efficacy

The landmark trial (Fenaux 2009)⁷ showed that after a median follow-up of 21 months, median overall survival was significantly improved in the AZA arm compared to the conventional care group; 24 months versus 15 months. At 2 years, on the basis of Kaplan-Meier estimates, 51% of patients in the AZA group were alive compared with 26% on conventional care. Improved survival was seen in all subgroups including cytogenetic subgroups. AZA also lowers the risk of progression to acute myeloid leukaemia in patients with higher-risk myelodysplastic syndrome compared with treatment with conventional care regimens. However, the difference in survival between the azacitidine and intensive chemotherapy groups was not significant, "possibly because of the small number of patients in this analysis."⁷

Overall Survival⁷



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Toxicity

Myelosuppression is the main toxicity observed. Significant worsening of neutropenia occurred in 58% and significant worsening of thrombocytopenia in 52%. Nausea and vomiting occurred in 4%, and treatment related infection occurred in 20%.⁵ Myelotoxicity is worst in the first two cycles. Nadir was seen in the second and third weeks after treatment. Adverse events were almost twice as common in the best supportive care arm compared to the AZA arm. Treatment with AZA did not increase the rate of infection or bleeding.⁶ The most common treatment-related non-haematological adverse events with AZA included injection site reactions, nausea, vomiting, fatigue, and diarrhoea.⁷ AZA has renal excretion. Dose adjustment for moderate renal impairment is recommended but data is not available to guide adjustment. AZA is contraindicated in severe renal impairment (Creatinine clearance <30 mL/min).

References

- 1 Lyons, R. M., T. M. Cosgriff, S. S. Modi, et al. 2009. "Hematologic response to three alternative dosing schedules of azacitidine in patients with myelodysplastic syndromes." *J Clin Oncol* 27(11):1850-1856.
- 2 Gore, S. D. 2011. "New ways to use DNA methyltransferase inhibitors for the treatment of myelodysplastic syndrome." *Hematology Am Soc Hematol Educ Program* 2011:550-555.
- 3 Keating, G. M. 2012. "Azacitidine: a review of its use in the management of myelodysplastic syndromes/acute myeloid leukaemia." *Drugs* 72(8):1111-1136.
- 4 Batty, G. N., H. Kantarjian, J. P. Issa, et al. 2010. "Feasibility of therapy with hypomethylating agents in patients with renal

insufficiency." Clin Lymphoma Myeloma Leuk 10(3):205-210.

- 5 Silverman, L. R., E. P. Demakos, B. L. Peterson, et al. 2002. "Randomized controlled trial of azacitidine in patients with the myelodysplastic syndrome: a study of the cancer and leukemia group B." J Clin Oncol 20(10):2429-2440.
- 6 Silverman, L. R., D. R. McKenzie, B. L. Peterson, et al. 2006. "Further analysis of trials with azacitidine in patients with myelodysplastic syndrome: studies 8421, 8921, and 9221 by the Cancer and Leukemia Group B." J Clin Oncol 24(24):3895-3903.
- 7 Fenaux, P., G. J. Mufti, E. Hellstrom-Lindberg, et al. 2009. "Efficacy of azacitidine compared with that of conventional care regimens in the treatment of higher-risk myelodysplastic syndromes: a randomised, open-label, phase III study." Lancet Oncol 10(3):223-232.

Bibliography

Shapiro, R. M. and A. Lazo-Langner. 2018. "Systematic review of azacitidine regimens in myelodysplastic syndrome and acute myeloid leukemia." BMC Hematol 18:3.

History

Version 3

Date	Summary of changes
04/05/2012	New protocol taken to Haematology Reference Committee meeting
04/07/2012	Approved and published on eviQ
04/08/2014	Protocol reviewed by email survey. Note added to dose mods "however it should be noted that some experts advise against dose modification during the initial 3 cycles in order to maintain dosing intensity. Decisions regarding dose modifications must be individualised by the treating haematologist" Added link to ALLG and ANZCTR with statement 'Patients with MDS should be considered for inclusion into clinical trials'. Next review in 2 years
20/05/2016	Reviewed at RCM, no changes. Review in 5 years
04/10/2016	Updated renal dose modification for CrCl<30mL/min as per Batty et al. reference.
31/05/2017	Transferred to new eviQ website. Version number change to V.3
19/01/2019	Protocol reviewed via email and teleconference with the following changes: <ul style="list-style-type: none">Chronic Myelomonocytic Leukaemia (CMML) with 10 to 29% marrow blasts without myeloproliferative disorder added to indicationsInclusion of 2018 systematic review to bibliographyFor review in 5 years.
04/12/2019	Inclusion of sentence on intravenous administration of azacitidine.

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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<https://www.eviq.org.au/p/1173>

31 Aug 2023

Patient information - Myelodysplastic syndrome - Azacitidine

Patient's name:

Your treatment

The treatment schedule below explains how the drug for this treatment is given. It may be given to treat Myelodysplastic syndrome (MDS) or Chronic Myelomonocytic Leukaemia (CMML).

Azacitidine


This treatment cycle is repeated every 28 days. You will have at least 6 cycles.

Day	Treatment	How it is given	How long it takes
1 to 7	Azacitidine (AY-za-SYE-ti-deen)	By injection under the skin. The injections will be given into your thigh, abdomen or upper arm and the site will be rotated each time to reduce injection site reactions.	About 5 minutes

Note: you may be given azacitidine intravenously by a drip into a vein. Speak to your doctor or nurse for more information.

When to get help

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

 IMMEDIATELY go to your nearest hospital Emergency Department, or contact your doctor or nurse if you have any of the following at any time:	Emergency contact details 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:.....

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

- pain, stinging, swelling or redness around the injection site
- 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.
- **Antidiarrhoeals:** you may be given some medication to treat diarrhoea. Your doctor or nurse will tell you how and when to take your antidiarrhoeal medication.
- **Laxatives:** you may be given some medication to prevent or treat constipation. Your doctor or nurse will tell you how and when to take the laxatives.
- **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.

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)	
Headache	<ul style="list-style-type: none"> You can take paracetamol if you have a headache. Tell your doctor or nurse immediately, or go to the nearest hospital Emergency Department if you get a very bad headache that is not helped by pain medication.
Allergic reaction	<ul style="list-style-type: none"> Allergic reactions are uncommon but can be life threatening. If you feel unwell during the infusion or shortly after it, or: <ul style="list-style-type: none"> 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 <p><u>While you are in hospital:</u> Tell your doctor or nurse immediately.</p> <p><u>After you leave:</u> Contact your doctor or nurse immediately, or go to the nearest hospital Emergency Department.</p>
Injection-site reaction	<ul style="list-style-type: none"> At the injection site you may get pain, redness, swelling or bruising. These symptoms are usually not serious. Tell your doctor or nurse immediately if you notice any redness or pain during or after treatment.
Nausea and vomiting	<ul style="list-style-type: none"> You may feel sick (nausea) or be sick (vomit). Take your anti-sickness medication as directed even if you don't feel sick. Drink plenty of fluids (unless you are fluid restricted). Eat small meals more frequently. Try food that does not require much preparation. Try bland foods like dry biscuits or toast. Gentle exercise may help with nausea. Ask your doctor or nurse for eviQ patient information - Nausea and vomiting during cancer treatment. 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.
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.
Stomach pain	<ul style="list-style-type: none"> • You may get: <ul style="list-style-type: none"> ◦ dull aches ◦ cramping or pain ◦ bloating or flatulence (gas). • Tell your doctor or nurse immediately, or go to the nearest hospital Emergency Department if you have stomach pain that you are unable to control.
Appetite loss (anorexia)	<ul style="list-style-type: none"> • You may not feel like eating. • Try to avoid drinking fluids at meal times. • Try to eat small meals or snacks regularly throughout the day. • Try to eat food that is high in protein and calories. • If you are worried about how much food you can eat, or if you are losing weight, ask to speak to a dietitian.
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.
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.
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.

General advice for patients 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

- Some cancer treatments can be dangerous 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. 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 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.

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
- 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)
- Call the Myeloma Australia Support Line on 1800 693 566 (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 – <https://aci.health.nsw.gov.au/networks/bmtct>
- 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
- Carer Help - carerhelp.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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