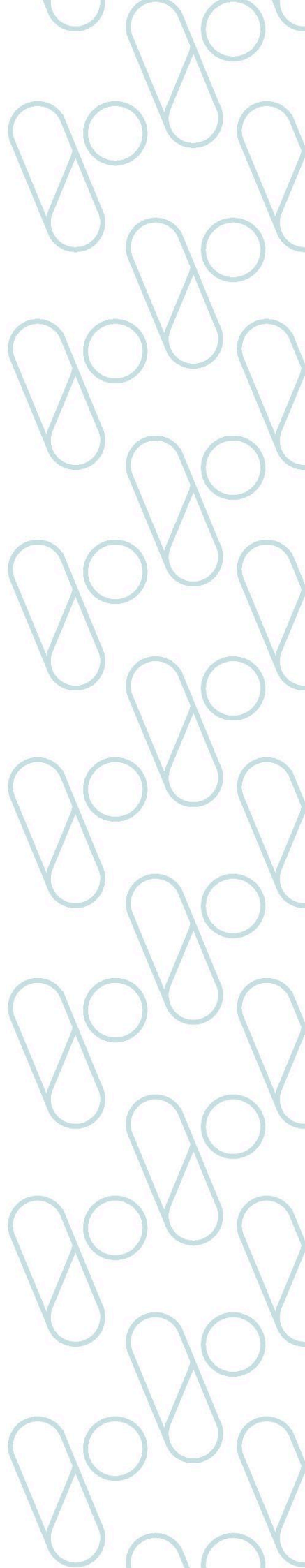
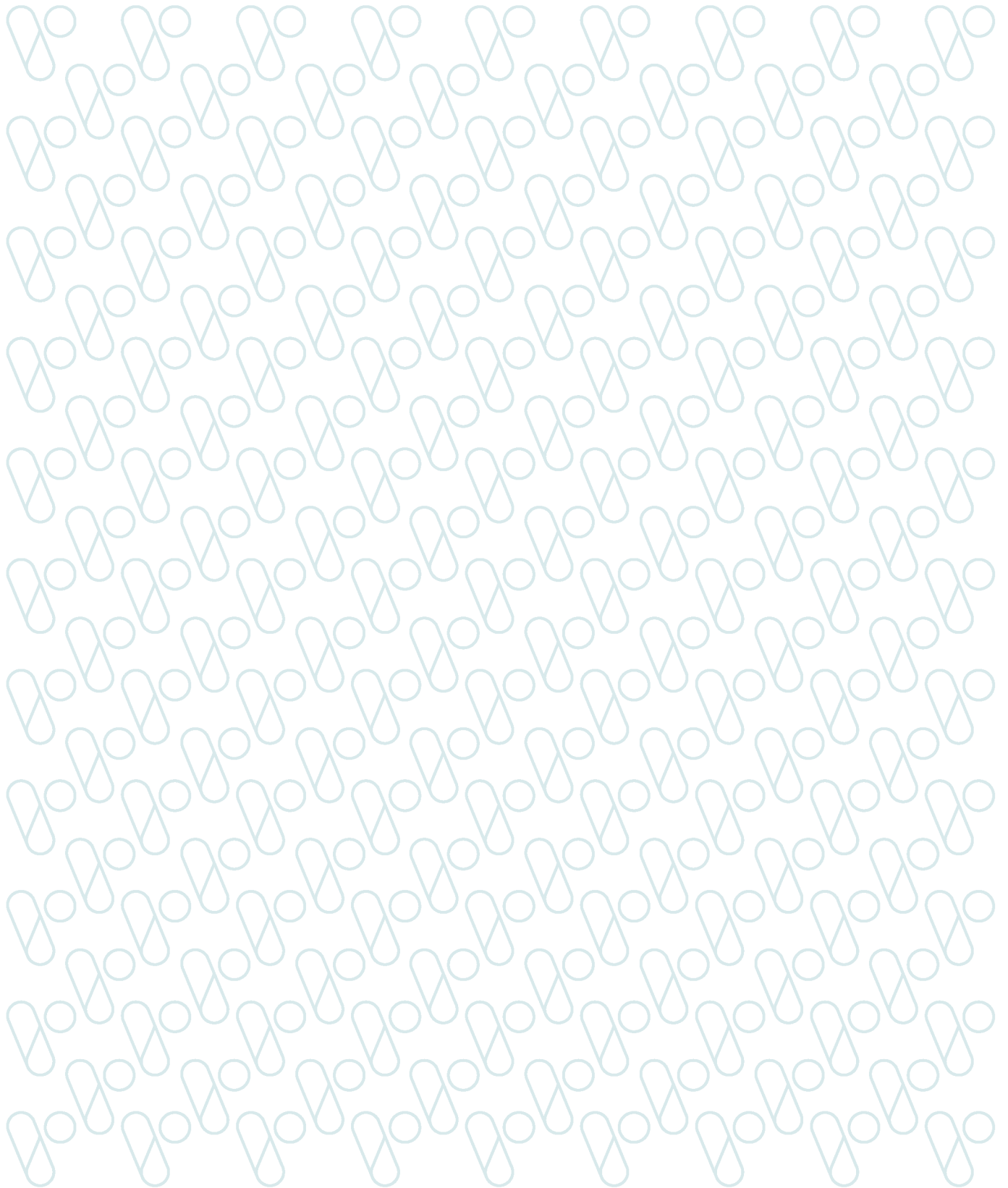


February 2021

Syringe driver compatibility

Guidance document





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Background

This guidance is intended for specialist palliative care teams and clinicians that deliver palliative care to people in specialist and non-specialist settings. It is intended to be used with the support of specialist palliative care clinicians. Clinicians who are not trained or authorised to prescribe or administer these medications should not use this guidance.

DEVELOPMENT AND ENDORSEMENT

The document was originally developed by an expert working group and endorsed by Safer Care Victoria (SCV). The guidelines were previously supported and housed on the Eastern Metropolitan Region Palliative Care Consortium website.

In late 2019, SCV convened an expert working group of clinicians from across Victoria to review these guidelines. This included the transition of the guidelines to SCV. The review was conducted in line with SCV's strategy for clinical guidance.

REVIEW METHODOLOGY

The methodology used to conduct the review was:

1. Primary review of all medication and dilutant compatibilities by palliative care pharmacist.
2. Three independent pharmacists provided a second check of the medication and dilutant compatibilities.
3. Further review and endorsement by broader multidisciplinary expert working group.
4. Final review and endorsement by SCV.

This review was undertaken using a consensus approach with a working group of expert clinicians. The guidance was reviewed for practice changes and reformatted for enhanced usability. A scan of the literature was completed to locate and reference new evidence. This built upon previous versions of the guidance that can be found at www.emrpcc.org.au/clinical-guidelines

Following the review, the guidance was endorsed by SCV.

SAFETY CONSIDERATIONS

For safety compatibility we reported only medication combinations in different medication classes or with different mechanisms of action. Only two and three medication compatibilities are included in this guidance.

The following medication classes were used:

Class 1

Fentanyl

Hydromorphone

Methadone

Morphine hydrochloride

Morphine sulfate

Oxycodone

Class 2

Haloperidol

Levomepromazine

Metoclopramide

Class 3

Clonazepam
Midazolam

Class 4

Cyclizine

Class 5

Glycopyrronium bromide (glycopyrrolate)

Hyoscine butylbromide

Class 6

Ketorolac

Class 7

Ketamine

Class 8

Levetiracetam

Class 9

Octreotide

Class 10

Ondansetron

Class 11

Ranitidine*

* Ranitidine (oral and parenteral forms) is currently suspended by the Therapeutic Goods Administration pending review.

PALLIATIVE CARE IN VICTORIA

Specialist palliative care in Victoria comprises community and inpatient palliative care, consultancy teams, outpatient clinics and day hospices. A statewide advice service is also available.

There are three ways for health professionals, especially nurses, doctors, and paramedics, to obtain specialist advice.

1. Community palliative care services

- Call your local palliative care service. The Department of Health’s Victorian [palliative care service directory](#) can be used to find your local service providers.
- Consider referral to the service.

2. Palliative care consultancy services

- Complementing the community palliative care services there are [palliative care consultancy services](#) in each rural region.
- In metropolitan Melbourne, there are palliative care consultancy services in every metropolitan health service except for Royal Victorian Eye and Ear Hospital. The Royal Women’s Hospital links with Melbourne Health.

3. Statewide specialist palliative care advice service

- Healthcare professionals and the general public can call the Palliative Care Advice Service on 1800 360 000 (7am–10pm).
- This service is operated by The Royal Melbourne Hospital through the Parkville Integrated Palliative Care Service.

RELATED DOCUMENTS

Opioid conversion guidance: www.bettersafecare.vic.gov.au/clinical-guidance/palliative/opioid-conversion

Anticipatory medicines guidance: www.bettersafecare.vic.gov.au/resources/tools/anticipatory-medicines

Palliative sedation therapy guidance: www.bettersafecare.vic.gov.au/resources/tools/palliative-sedation-therapy

Using this guidance

When using this guidance please remember to:

- print it in colour or use it electronically.
- seek help if you need it: this guidance does not replace clinical expertise and support.

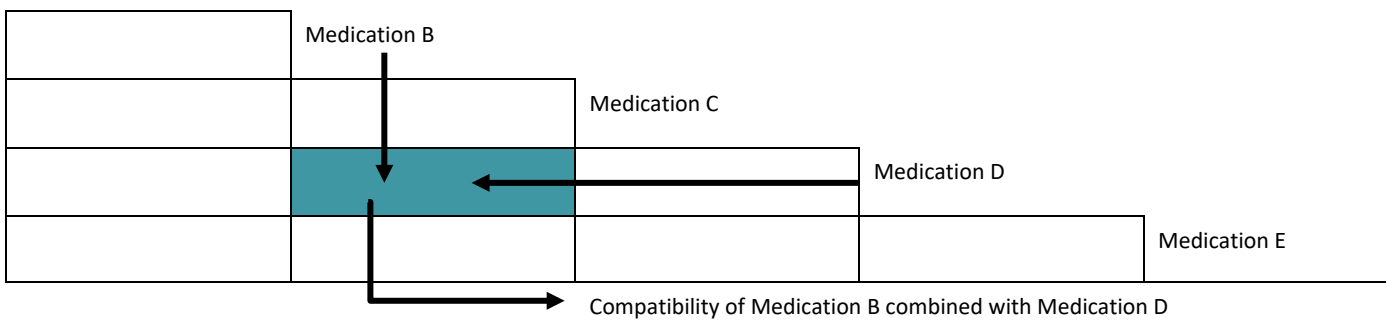
Instructions for reading two-medication compatibility chart

Reported as either:

- the compatibility of a combination of non-opioid with an opioid, or
- two non-opioid medications in the stated diluent.

Two medication compatibility – how to use the table

Medication A



Instructions for reading the three-medication compatibility list

- All opioids are reported as the first medication.
- All non-opioids are listed in alphabetical order.
- When searching for medication combinations, search by the opioid medication first and then by the non-opioid which occurs first alphabetically.
- Medication combinations **are not** repeated in reverse order.

Example:

Fentanyl	Levomepromazine	Midazolam
Fentanyl	Metoclopramide	Midazolam
Fentanyl	Metoclopramide	Ondansetron

KEY FOR USING THE COMPATIBILITY TABLES

Symbol	Explanation
WFI	Water for Injection
!	See advice on administration of levetiracetam
#	Use non-PVC tubing; up to 50% of a dose of clonazepam is adsorbed by PVC tubing
##	Haloperidol at concentrations greater than 1 mg/1 mL may precipitate in sodium chloride 0.9%
###	Compatibility data for oxycodone 10 mg/mL and 20 mg/2 mL formulation only, seek specialist advice for compatibility information for 50 mg/1 mL formulation
**	Concentration dependent compatibility
^	May cause precipitation on mixing, dilute maximally

	Do not use, incompatible at usual concentrations.
	Use with caution as reports of incompatibility, compatibility may depend on order of mixing or medication concentrations.
	Appears compatible. Information is gathered from the clinical setting based on observation of the medication combination on mixing and during infusion for any physical changes, e.g. precipitation, discolouration or clouding. The information is not validated evidence-based research.
	No data.
	Not applicable or not generally recommended, e.g. seek specialist advice as may be in the same medication class.
	Reported compatible (data may be observational, but also some laboratory information exists for physical compatibility in varying ambient conditions).
	Reported compatible (data may be observational, but also some laboratory information exists for both physical or chemical compatibility in varying ambient conditions).

Clinical principles

The information in this document is intended as a guide only. It is the responsibility of the user to ensure the information is used correctly. This guide reflects adult palliative care practice in Victoria and is based on evidence at the time of review.

- In accordance with quality practice, this guide should be submitted for organisational approval prior to use. When setting up and using syringe drivers, follow organisational policy and procedures.
- All medication compatibility combinations derived from this guide should be checked and prescribed by a medical doctor or nurse practitioner with appropriate experience, before administering.
- Medication doses should be modified in response to the adult patient's/client's clinical situation and status, including previous exposure to opioids and concurrent medications.
- It is recommended that the number of medications in one syringe be limited to three.
- Caution should be used when combining medications in syringe drivers; mixtures should be closely monitored for discolouration, precipitation and crystallisation.
- Subcutaneous administration of a medication may be off-label prescribing.
- All patients should be monitored closely when commencing and/or switching opioid medications.
- Infusion durations in this guide are for 24 hours.

COMPATIBILITY

- Compatibility is dependent on the concentration of each medication in the total final volume being infused, rather than the actual dose.
- Numerous factors affect stability and compatibility including salt, strength, diluents, order of drawing up, temperature and infusion periods. In this guide, infusion durations are for 24 hours.
- Monitoring of the combined medications in the syringe driver throughout the infusion period is advised.
- Sodium chloride 0.9% is the diluent used routinely in Victorian practice and preferred to prevent infusion-related reactions.
- Water for Injection must be used for cyclizine and considered if incompatibility is suspected.
- When combining medications for syringe driver use, be aware that laboratory compatibility data is available for only a few medication combinations. As a consequence, the majority of combinations listed in this guide are based on observational data.

More information

If the combination is not listed in this practice guideline, consult:

- Dickman A and Schneider J. *The Syringe Driver. Continuous subcutaneous infusion in palliative care* (4th ed). United Kingdom, Oxford: Oxford University Press 2016.
- The syringe driver database at www.palliativedrugs.com.*

*The syringe drive database available at www.palliativedrugs.com can be accessed after registration. Combinations on the database have been assessed by palliativedrugs.com pharmacists. The information is not substantiated but is observational data. The database may contain information not included in this document. The database states that 'medications may be compatible at certain concentrations and not at others, therefore it is recommended that the concentration of medication in solution is compared, not the dose'.⁴

DURATION OF INFUSION

- Infusions in this guide are recommended for 24 hours.
- Infusions greater than 24 hours are generally not advised due to limited physical, chemical and microbiological stability of solutions.
- Clinical judgement and specialist palliative care consultation should be considered if extending infusion duration over 24 hours.

INFUSION SITE MANAGEMENT

- A plastic (Teflon® or Vialon®) cannula should be used rather than a metal butterfly needle to reduce site inflammation.
- A skin reaction at the infusion site is most commonly found with **cyclizine, furosemide (frusemide), ketamine, levomepromazine and methadone**.
- Sodium chloride 0.9% is recommended as diluent as it is closest to physiological tonicity, and therefore less likely to cause irritation. Cyclizine should always be diluted with Water for Injection.
- Subcutaneous sites may last up to a week, depending on the medications used. The site should be changed if painful or inflamed. Routine rotation to a different subcutaneous site every 72 hours reduces the frequency of site problems. If frequent re-siting is necessary, e.g. every 24 to 48 hours, consider the following strategies:
 - Use a larger syringe to enable a more dilute mixture to be used, thereby decreasing the final medication concentrations.
 - Change to a 12-hourly regimen, thereby permitting further dilution of the medications.
 - Change an irritant medication to a less irritant alternative.
 - Inject dexamethasone 1 mg directly into the infusion site, via the cannula to be used. Flush with sodium chloride 0.9% then connect the syringe driver and commence.

Advice on specific medications

Medication	Advice
Levetiracetam	<ul style="list-style-type: none">• Recommended administration 50 mL of WFI over 24 hours.^{6, 8-11}• There is increasing observational compatibility information of admixtures containing up to 1000 mg of levetiracetam diluted to at least 18 mL.⁴ Reports of using in concentrations of up to 100 mg/1 mL in either WFI or normal saline, however maximal dilution is recommended and should not exceed 2000 mg in 30 mL.⁶• There are reports of bolus dosing administered in 100 mL of normal saline over 30 minutes.¹²
Sufentanil	<ul style="list-style-type: none">• Not registered in Australia under the Therapeutic Goods Administration (TGA), only available through the special access scheme (SAS).• Synthetic opioid analgesic – use limited to as an alternative to fentanyl due to volume constraints in a continuous syringe driver.^{1, 2, 13}• Limited compatibility data available.• Reports of sorption to PVC containers which appear to be pH dependent (less sorption at pH 4 or more).²• Incompatibility has not been observed in combination with clonazepam, ketamine, methadone, levomepromazine, metoclopramide, midazolam and octreotide.^{2, 13}

ADVICE TO INFUSE ALONE

Medication	Advice
Furosemide (frusemide)	<ul style="list-style-type: none">• Intravenous administration is preferred. However continuous or intermittent subcutaneous infusions can be considered (seek specialist advice).^{2, 14-15}• Dilute maximally in sodium chloride 0.9%.• Solution is alkaline – high risk of incompatibility (especially with acidic medications). Known incompatibility with metoclopramide and midazolam.
Lidocaine (lignocaine)	<ul style="list-style-type: none">• For use in a specialist setting only as requires intermittent or continuing ECG monitoring.²• Limited compatibility data and volume constraints exist.
Phenobarbital (phenobarbitone)	<ul style="list-style-type: none">• Phenobarbital has an alkaline pH and can cause tissue necrosis when administered as subcutaneous bolus injection.^{1, 2, 16}• Consult specialist palliative care services for using bolus phenobarbital.¹⁶• It should be given via a separate syringe driver. Dilution up to 10 times is recommended.
Proton pump inhibitors	<ul style="list-style-type: none">• Avoid use and seek specialist advice – ranitidine is preferred to be administered via the subcutaneous route.• Limited safety and efficacy data exist.• Case reports of esomeprazole and omeprazole being used subcutaneously.^{17, 18}
Sodium valproate	<ul style="list-style-type: none">• Reports of administering as an infusion alone.^{19, 20}• Dilute maximally with either Water for Injection or sodium chloride 0.9%.¹⁹• Limited safety data available. However, reports of tissue necrosis.²¹

BOLUS SUBCUTANEOUS INJECTIONS ONLY

Medication	Advice
Dexamethasone	<ul style="list-style-type: none">• Dexamethasone has a long half-life and bolus dosing is recommended.^{1, 2}• Reports of use in a syringe driver to prevent infusion site reactions. However, use limited due to incompatibility (seek specialist advice).• Concentration dependent incompatibility exists with cyclizine, haloperidol and levomepromazine.²• Chemical incompatibility with midazolam and glycopyrronium bromide (glycopyrrolate).²
Olanzapine	<ul style="list-style-type: none">• Reconstitute powder with Water for Injection prior administration.• Olanzapine has a long half-life and there are increasing reports of its safe use when given as a bolus injection.²¹• There is no laboratory physical or chemical stability reported for a reconstituted solution of olanzapine in a syringe driver or a pre-drawn syringe. The reconstituted solution is stable for one-hour post dilution and therefore its use in a syringe driver should be avoided.²²• There has been one published report of its use via a 24-hour infusion in the last days of life in a patient already stable on olanzapine.²³

Two medication compatibility: Opioid

NORMAL SALINE (SODIUM CHLORIDE 0.9%)

Drug A → with Drug B ↓	Fentanyl	Hydromorphone	Methadone	Morphine hydrochloride	Morphine sulfate	Oxycodone ###
Clonazepam #						
Glycopyrronium bromide (glycopyrrolate)						
Haloperidol ##						
Hyoscine butylbromide						
Ketamine						
Ketorolac			^			
Levetiracetam !						
Levomepromazine						
Metoclopramide						
Midazolam						
Octreotide						
Ondansetron						
Ranitidine						

WATER FOR INJECTION (WFI)

Drug A → with Drug B ↓	Fentanyl	Hydromorphone	Methadone	Morphine hydrochloride	Morphine sulfate	Oxycodone ###
Clonazepam #						
Cyclizine		**				**
Glycopyrronium bromide (glycopyrrolate)						
Haloperidol ##		**				
Hyoscine butylbromide						
Ketamine						
Ketorolac						
Levetiracetam !						
Levomepromazine						
Metoclopramide						
Midazolam						
Octreotide						
Ondansetron						
Ranitidine						

Symbol	Explanation
WFI	Water for Injection
!	See advice on administration of levetiracetam
#	Use non-PVC tubing; up to 50% of a dose of clonazepam is adsorbed by PVC tubing
##	Haloperidol at concentrations greater than 1 mg/1 mL may precipitate in sodium chloride 0.9%
###	Compatibility data for oxycodone 10 mg/mL and 20 mg/2 mL formulation only, seek specialist advice for compatibility information for 50 mg/1 mL formulation
**	Concentration dependent compatibility
^	May cause precipitation on mixing, dilute maximally

	Do not use, incompatible at usual concentrations
	Use with caution reports of incompatibility, compatibility may depend on order of mixing or medication concentrations
	Appears compatible. Information is gathered from the clinical setting based on observation of the medication combination on mixing and during infusion for any physical changes, e.g. precipitation, discolouration or clouding. The information is not validated evidence based research.
	No data.
	Not applicable or not generally recommended e.g. seek specialist advice as may be in the same medication class
	Reported compatible (data may be observational, but also some laboratory information exists for physical compatibility in varying ambient conditions)
	Reported compatible (data may be observational, but also some laboratory information exists for both physical or chemical compatibility in varying ambient conditions)

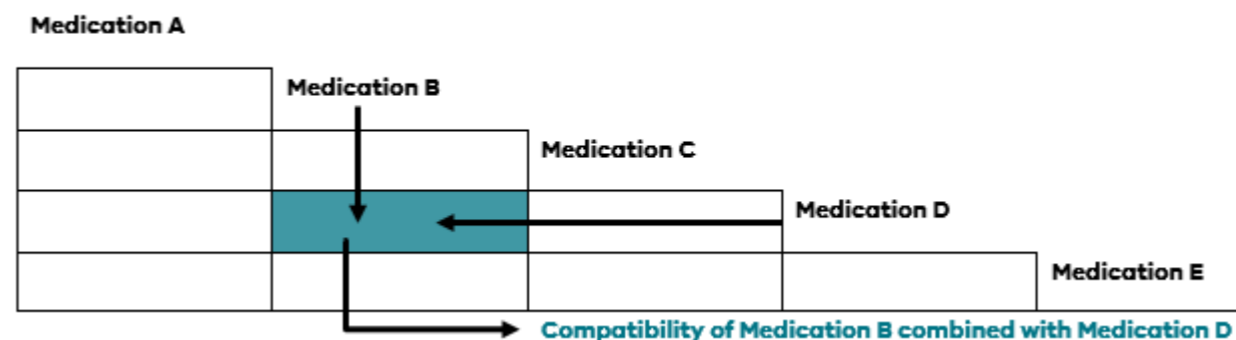
Two medication compatibility: Non opioid

NORMAL SALINE (SODIUM CHLORIDE 0.9%)

Clonazepam#

	Glycopyrronium bromide (glycopyrrolate)																				
		Haloperidol###																			
			Hyoscine butylbromide																		
				Ketamine																	
					Ketorolac																
						Levetiracetam !															
							Levomopromazine														
								Metoclopramide													
									Midazolam												
										Octreotide											
											Ondansetron										
								**													Ranitidine

Two medication compatibility- how to use the table



Symbol	Explanation
WFI	Water for Injection
!	See advice on administration of levetiracetam
#	Use non-PVC tubing; up to 50% of a dose of clonazepam is adsorbed by PVC tubing
##	Haloperidol at concentrations greater than 1 mg/1 mL may precipitate in sodium chloride 0.9%
###	Compatibility data for oxycodone 10 mg/mL and 20 mg/2 mL formulation only, seek specialist advice for compatibility information for 50 mg/1 mL formulation
**	Concentration dependent compatibility
^	May cause precipitation on mixing, dilute maximally

	Do not use, incompatible at usual concentrations
	Use with caution reports of incompatibility, compatibility may depend on order of mixing or medication concentrations
	Appears compatible. Information is gathered from the clinical setting based on observation of the medication combination on mixing and during infusion for any physical changes, e.g. precipitation, discolouration or clouding. The information is not validated evidence based research.
	No data.
	Not applicable or not generally recommended e.g. seek specialist advice as may be in the same medication class
	Reported compatible (data may be observational, but also some laboratory information exists for physical compatibility in varying ambient conditions)
	Reported compatible (data may be observational, but also some laboratory information exists for both physical or chemical compatibility in varying ambient conditions)

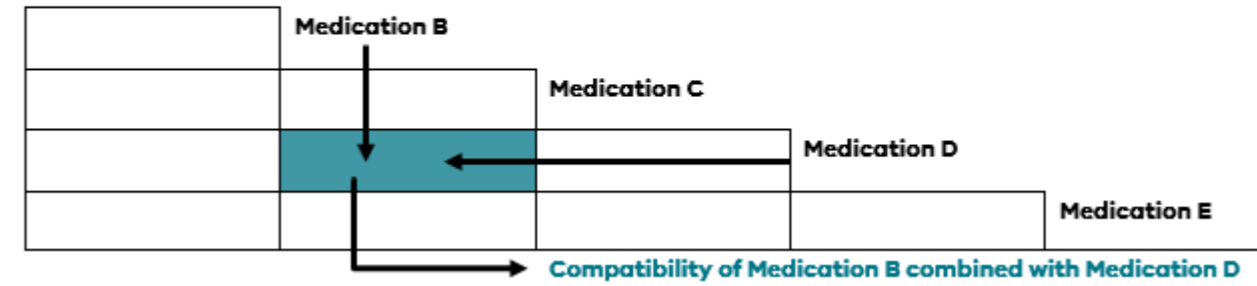
WATER FOR INJECTION (WFI)

Clonazepam#

	Cyclizine																	
		Glycopyrronium bromide (glycopyrrolate)																
			Haloperidol ##															
				Hyoscine butylbromide														
					Ketamine													
						Ketorolac												
							Levetiracetam !											
										Levomepromazine								
											Metoclopramide							
												Midazolam						
													Octreotide					
														Ondansetron				
											**							Ranitidine

Two medication compatibility- how to use the table

Medication A



Symbol	Explanation
WFI	Water for Injection
!	See advice on administration of levetiracetam
#	Use non-PVC tubing; up to 50% of a dose of clonazepam is adsorbed by PVC tubing
##	Haloperidol at concentrations greater than 1 mg/1 mL may precipitate in sodium chloride 0.9%
###	Compatibility data for oxycodone 10 mg/mL and 20 mg/2 mL formulation only, seek specialist advice for compatibility information for 50 mg/1 mL formulation
**	Concentration dependent compatibility
^	May cause precipitation on mixing, dilute maximally

	Do not use, incompatible at usual concentrations
	Use with caution reports of incompatibility, compatibility may depend on order of mixing or medication concentrations
	Appears compatible. Information is gathered from the clinical setting based on observation of the medication combination on mixing and during infusion for any physical changes, e.g. precipitation, discolouration or clouding. <u>The information is not validated evidence based research.</u>
	No data.
	Not applicable or not generally recommended e.g. seek specialist advice as may be in the same medication class
	Reported compatible (data may be observational, but also some laboratory information exists for physical compatibility in varying ambient conditions)
	Reported compatible (data may be observational, but also some laboratory information exists for both physical or chemical compatibility in varying ambient conditions)

Three medication combinations by opioid

FENTANYL – GENERAL PRECAUTIONS

Fentanyl and Cyclizine		Concentration dependent compatibility and generally incompatible on observation		
			Water for Injection (WFI)	Normal saline Sodium chloride 0.9%
Fentanyl	Cyclizine	Midazolam	**	
Fentanyl	Glycopyrronium bromide (glycopyrrolate)	Midazolam		
Fentanyl	Haloperidol ##	Midazolam		
Fentanyl	Hyoscine butylbromide	Levomepromazine		
Fentanyl	Hyoscine butylbromide	Midazolam		
Fentanyl	Levomepromazine	Midazolam		
Fentanyl	Metoclopramide	Midazolam	Reported physical and chemical compatibility when undiluted	
Fentanyl	Metoclopramide	Ondansetron		
Fentanyl	Metoclopramide	Ranitidine		

HYDROMORPHONE – GENERAL PRECAUTIONS

Hydromorphone and Cyclizine	Concentration dependent compatibility			
Hydromorphone and Haloperidol	Concentration dependent compatibility – both Water for Injection and normal saline (sodium chloride 0.9%)			
Hydromorphone and Ketorolac	Variable compatibility reported in Water for Injection – nil reports in normal saline (sodium chloride 0.9%)			
			Water for Injection (WFI)	Normal saline Sodium chloride 0.9%
Hydromorphone	Clonazepam #	Haloperidol ##		
Hydromorphone	Cyclizine	Haloperidol ##	**	
Hydromorphone	Cyclizine	Midazolam	**	
Hydromorphone	Cyclizine	Octreotide	**	
Hydromorphone	Haloperidol ##	Ketamine	**	**
Hydromorphone	Haloperidol ##	Ketorolac		
Hydromorphone	Haloperidol ##	Midazolam	**	**
Hydromorphone	Haloperidol ##	Ranitidine		**
Hydromorphone	Hyoscine butylbromide	Levomepromazine		
Hydromorphone	Hyoscine butylbromide	Midazolam		
Hydromorphone	Ketamine	Levomepromazine		
Hydromorphone	Ketamine	Midazolam		
Hydromorphone	Ketorolac	Metoclopramide		
Hydromorphone	Levomepromazine	Midazolam		
Hydromorphone	Levomepromazine	Octreotide		
Hydromorphone	Levomepromazine	Ranitidine		
Hydromorphone	Metoclopramide	Midazolam		
Hydromorphone	Metoclopramide	Octreotide		
Hydromorphone	Metoclopramide	Ondansetron		
Hydromorphone	Octreotide	Ondansetron		

METHADONE – NIL GENERAL PRECAUTIONS REPORTED

			Water for Injection (WFI)	Normal saline Sodium chloride 0.9%
Methadone	Clonazepam #	haloperidol ##		
Methadone	Clonazepam #	hyoscine butylbromide		
Methadone	Clonazepam #	levomepromazine		
Methadone	Clonazepam #	metoclopramide		
Methadone	Cyclizine	haloperidol ##	Observational report compatibility in dextrose 5%	
Methadone	Glycopyrronium bromide (glycopyrrolate)	midazolam		
Methadone	Haloperidol ##	ketamine		
Methadone	Haloperidol ##	midazolam		
Methadone	Hyoscine butylbromide	levomepromazine		
Methadone	Hyoscine butylbromide	ranitidine		
Methadone	Ketamine	midazolam		
Methadone	Levomepromazine	midazolam		
Methadone	Metoclopramide	midazolam		
Methadone	Metoclopramide	ranitidine		
Methadone	Octreotide	ranitidine		

MORPHINE HYDROCHLORIDE – GENERAL PRECAUTIONS

Morphine hydrochloride and ketorolac	variable compatibility reported in normal saline (sodium chloride 0.9%) - nil reports in Water for Injection			
			Water for Injection (WFI)	Normal saline Sodium chloride 0.9%
Morphine hydrochloride	Cyclizine	Haloperidol ##		
Morphine hydrochloride	Glycopyrronium bromide (glycopyrrolate)	Midazolam		
Morphine hydrochloride	Haloperidol ##	Hyoscine butylbromide		
Morphine hydrochloride	Haloperidol ##	Ketorolac		
Morphine hydrochloride	Haloperidol ##	Midazolam		
Morphine hydrochloride	Hyoscine butylbromide	Ketorolac		
Morphine hydrochloride	Hyoscine butylbromide	Metoclopramide		
Morphine hydrochloride	Hyoscine butylbromide	Midazolam		
Morphine hydrochloride	Ketorolac	Metoclopramide		
Morphine hydrochloride	Levomepromazine	Midazolam		
Morphine hydrochloride	Metoclopramide	Midazolam		

MORPHINE SULFATE – GENERAL PRECAUTIONS

Morphine sulfate and Ketorolac	Incompatibility reported in Water for Injection - nil reports in normal saline (sodium chloride 0.9%)			
			Water for Injection (WFI)	Normal saline Sodium chloride 0.9%
Morphine sulfate	Clonazepam #	Cyclizine		
Morphine sulfate	Clonazepam #	Haloperidol ##		
Morphine sulfate	Clonazepam #	Hyoscine butylbromide		
Morphine sulfate	Clonazepam #	Ketamine		
Morphine sulfate	Clonazepam #	Levomepromazine		
Morphine sulfate	Clonazepam #	Metoclopramide		
Morphine sulfate	Cyclizine	Glycopyrronium bromide (glycopyrrolate)		
Morphine sulfate	Cyclizine	Haloperidol ##		
Morphine sulfate	Cyclizine	Hyoscine butylbromide		
Morphine sulfate	Cyclizine	Levomepromazine		
Morphine sulfate	Cyclizine	Midazolam		
Morphine sulfate	Cyclizine	Octreotide		
Morphine sulfate	Cyclizine	Ranitidine		
Morphine sulfate	Glycopyrronium bromide (glycopyrrolate)	Haloperidol ##		
Morphine sulfate	Glycopyrronium bromide (glycopyrrolate)	Levetiracetam !		
Morphine sulfate	Glycopyrronium bromide (glycopyrrolate)	Levomepromazine		
Morphine sulfate	Glycopyrronium bromide (glycopyrrolate)	Metoclopramide		
Morphine sulfate	Glycopyrronium bromide (glycopyrrolate)	Midazolam		
Morphine sulfate	Haloperidol ##	Hyoscine butylbromide		
Morphine sulfate	Haloperidol ##	Ketamine		
Morphine sulfate	Haloperidol ##	Midazolam		
Morphine sulfate	Haloperidol ##	Octreotide		
Morphine sulfate	Haloperidol ##	Ondansetron		
Morphine sulfate	Haloperidol ##	Ranitidine		
Morphine sulfate	Hyoscine butylbromide	Levomepromazine		
Morphine sulfate	Hyoscine butylbromide	Midazolam		
Morphine sulfate	Hyoscine butylbromide	Octreotide		

			Water for Injection (WFI)	Normal saline Sodium chloride 0.9%
Morphine sulfate	Hyoscine butylbromide	Ondansetron		
Morphine sulfate	Hyoscine butylbromide	Ranitidine		
Morphine sulfate	Ketamine	Metoclopramide		
Morphine sulfate	Ketamine	Midazolam		
Morphine sulfate	Levetiracetam !	Levomepromazine		
Morphine sulfate	Levetiracetam !	Midazolam		
Morphine sulfate	Levomepromazine	Midazolam		
Morphine sulfate	Levomepromazine	Octreotide		
Morphine sulfate	Levomepromazine	Ondansetron		
Morphine sulfate	Levomepromazine	Ranitidine		
Morphine sulfate	Metoclopramide	Midazolam		
Morphine sulfate	Metoclopramide	Octreotide		
Morphine sulfate	Metoclopramide	Ondansetron		
Morphine sulfate	Metoclopramide	Ranitidine		
Morphine sulfate	Midazolam	Octreotide		
Morphine sulfate	Midazolam	Ondansetron		
Morphine sulfate	Midazolam	Ranitidine		

OXYCODONE – GENERAL PRECAUTIONS

Compatibility data for oxycodone 10 mg/mL and 20 mg/2 mL formulation only, seek specialist advice for compatibility information for 50 mg/1 mL formulation.

Oxycodone and Cyclizine	Concentration dependent compatibility			
			Water for Injection (WFI)	Normal saline Sodium chloride 0.9%
Oxycodone	Clonazepam #	Glycopyrronium bromide (glycopyrrolate)		
Oxycodone	Clonazepam #	Haloperidol ##		
Oxycodone	Clonazepam #	Hyoscine butylbromide		
Oxycodone	Clonazepam #	Ketamine		
Oxycodone	Clonazepam #	Ketorolac		
Oxycodone	Clonazepam #	Levomepromazine		
Oxycodone	Clonazepam #	Metoclopramide		
Oxycodone	Clonazepam #	Octreotide		
Oxycodone	Clonazepam #	Ondansetron		
Oxycodone	Cyclizine	Glycopyrronium bromide (glycopyrrolate)	**	
Oxycodone	Cyclizine	Haloperidol ##	**	
Oxycodone	Cyclizine	Hyoscine Butylbromide		
Oxycodone	Cyclizine	Levomepromazine	**	
Oxycodone	Cyclizine	Midazolam	**	
Oxycodone	Cyclizine	Octreotide	**	
Oxycodone	Cyclizine	Ondansetron		
Oxycodone	Cyclizine	Ranitidine	**	
Oxycodone	Glycopyrronium bromide (glycopyrrolate)	Ketamine		
Oxycodone	Glycopyrronium bromide (glycopyrrolate)	Levomepromazine		
Oxycodone	Glycopyrronium bromide (glycopyrrolate)	Metoclopramide		
Oxycodone	Glycopyrronium bromide (glycopyrrolate)	Midazolam		
Oxycodone	Haloperidol ##	Hyoscine butylbromide		**
Oxycodone	Haloperidol ##	Ketamine		
Oxycodone	Haloperidol ##	Midazolam		
Oxycodone	Haloperidol ##	Octreotide		

			Water for Injection (WFI)	Normal saline Sodium chloride 0.9%
Oxycodone	Haloperidol ##	Ondansetron		
Oxycodone	Haloperidol ##	Ranitidine		
Oxycodone	Hyoscine butylbromide	Levomepromazine		
Oxycodone	Hyoscine butylbromide	Metoclopramide		
Oxycodone	Hyoscine butylbromide	Midazolam		
Oxycodone	Hyoscine butylbromide	Octreotide		
Oxycodone	Hyoscine butylbromide	Ondansetron		
Oxycodone	Hyoscine butylbromide	Ranitidine		
Oxycodone	Ketamine	Levomepromazine		
Oxycodone	Ketamine	Metoclopramide		
Oxycodone	Ketamine	Midazolam		
Oxycodone	Ketamine	Octreotide		
Oxycodone	Ketorolac	Metoclopramide		
Oxycodone	Ketorolac	Ranitidine		
Oxycodone	Levetiracetam !	Metoclopramide		
Oxycodone	Levetiracetam !	Midazolam		
Oxycodone	Levomepromazine	Midazolam		
Oxycodone	Levomepromazine	Octreotide		
Oxycodone	Levomepromazine	Ondansetron		
Oxycodone	Levomepromazine	Ranitidine		
Oxycodone	Metoclopramide	Midazolam		
Oxycodone	Metoclopramide	Octreotide		
Oxycodone	Metoclopramide	Ondansetron		
Oxycodone	Metoclopramide	Ranitidine		
Oxycodone	Midazolam	Octreotide		
Oxycodone	Midazolam	Ondansetron		
Oxycodone	Midazolam	Ranitidine		
Oxycodone	Octreotide	Ondansetron		

Three medication combinations by non-opioid

NON-OPIOID TWO MEDICATION – GENERAL PRECAUTIONS

Cyclizine and Hyoscine butylbromide	Incompatibility			
Cyclizine and Ketorolac	Incompatibility			
Cyclizine and Ondansetron	Incompatibility			
Glycopyrronium bromide (glycopyrrolate) and Ketorolac	Incompatibility			
Haloperidol and Ketorolac	Incompatibility in Water for Injection, variable reports of compatibility in normal saline (sodium chloride 0.9%)			
Ketorolac and Levomepromazine	Incompatibility			
Ketorolac and Midazolam	Incompatibility in Water for Injection, variable reports of compatibility in normal saline (sodium chloride 0.9%)			
Midazolam and Ranitidine	Incompatibility			
Clonazepam and Cyclizine	Variable compatibility reported in Water for Injection			
Cyclizine and Metoclopramide	Variable compatibility reported in Water for Injection			
Cyclizine and Octreotide	Variable compatibility reported in Water for Injection			
Haloperidol and Hyoscine butylbromide	Concentration dependent compatibility in normal saline (sodium chloride 0.9%)- observational reports of compatibility in Water for Injection			
Ketorolac and Metoclopramide	Concentration dependent compatibility in normal saline (sodium chloride 0.9%)			
Levomepromazine and Ranitidine	Concentration dependent compatibility – both Water for Injection and normal saline (sodium chloride 0.9%)			
			Water for Injection (WFI)	Normal Saline Sodium Chloride 0.9%
Clonazepam #	Cyclizine	Midazolam		
Clonazepam #	Haloperidol ##	Hyoscine butylbromide		
Clonazepam #	Levomepromazine	Ondansetron		
Cyclizine	Glycopyrronium bromide (glycopyrrolate)	Haloperidol ##		
Cyclizine	Haloperidol ##	Hyoscine butylbromide		
Cyclizine	Haloperidol ##	Midazolam		
Cyclizine	Haloperidol ##	Octreotide		
Cyclizine	Haloperidol ##	Ranitidine		
Cyclizine	Hyoscine butylbromide	Midazolam		
Cyclizine	Levomepromazine	Octreotide		
Cyclizine	Metoclopramide	Octreotide		
Glycopyrronium bromide (glycopyrrolate)	Haloperidol##	Ondansetron		
Glycopyrronium bromide (glycopyrrolate)	Ketamine	Midazolam		

			Water for Injection (WFI)	Normal Saline Sodium Chloride 0.9%
Glycopyrronium bromide (glycopyrrolate)	Levomepromazine	Midazolam		
Glycopyrronium bromide (glycopyrrolate)	Levomepromazine	Octreotide		
Haloperidol ##	Hyoscine butylbromide	Midazolam		**
Haloperidol ##	Hyoscine butylbromide	Octreotide		**
Haloperidol ##	Hyoscine butylbromide	Ranitidine		**
Haloperidol ##	Ketamine	Midazolam		
Haloperidol ##	Midazolam	Octreotide		
Hyoscine butylbromide	Ketamine	Levomepromazine		
Hyoscine butylbromide	Ketorolac	Octreotide		
Hyoscine butylbromide	Levetiracetam I	Levomepromazine		
Hyoscine butylbromide	Levetiracetam I	Midazolam		
Hyoscine butylbromide	Levomepromazine	Midazolam		
Hyoscine butylbromide	Levomepromazine	Octreotide		
Hyoscine butylbromide	Levomepromazine	Ondansetron		
Hyoscine butylbromide	Levomepromazine	Ranitidine	**	**
Hyoscine butylbromide	Metoclopramide	Midazolam		
Hyoscine butylbromide	Metoclopramide	Octreotide		
Hyoscine butylbromide	Midazolam	Octreotide		
Hyoscine butylbromide	Octreotide	Ondansetron		
Hyoscine butylbromide	Octreotide	Ranitidine		
Ketamine	Levomepromazine	Midazolam		
Levomepromazine	Midazolam	Ondansetron		
Levomepromazine	Midazolam	Octreotide		
Levomepromazine	Octreotide	Ondansetron		
Levomepromazine	Octreotide	Ranitidine		
Metoclopramide	Midazolam	Ranitidine		
Metoclopramide	Octreotide	Ondansetron		
Metoclopramide	Octreotide	Ranitidine		

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