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Appendix

Syringe Driver Compatibility Chart

PURPOSE:

To provide compatibility information when compounding syringes for use in syringe driver for administration via continuous subcutaneous infusion (CSCI) for a period of 24 hours. With regards to diluent, this 2023 update reflects the preference for sodium chloride 0.9% (NaCl 0.9%) wherever possible. This is because NaCl 0.9% is isotonic and therefore less irritating to subcutaneous tissue compared to water for injection (WFI) which is hypotonic.

DILUENT:

Sodium Chloride 0.9% is recommended for all single medication infusions with the exception of cyclizine - always use WFI for cyclizine. In combinations, check the chart overleaf and if not listed, check other compatibility sources (see references) and consider WFI as the diluent where no data is available. Your hospice and palliative care pharmacist can provide further advice.

REFERENCES:

1. Dickman A & Schneider J. The Syringe Driver: Continuous subcutaneous infusions in palliative care. 4th ed. Oxford University Press; 2016.
2. Palliative Care Formulary, PCF8. 8th ed. Edited by Wilcock A, Howard P & Charlesworth S. Pharmaceutical Press; 2022. Appendix: Compatibility Charts and individual monographs.
3. Good PD, Schneider JJ & Ravenscroft PJ. The compatibility and stability of midazolam and dexamethasone in infusion solutions. J. Pain Symptom Manag [Internet]. 2004 [cited 2023 Oct 6];27(5):471-475. Available from: https://www.jpsmjournal.com/article/S0885-3924(04)00067-3/fulltext
4. Safer Care Victoria. Syringe Driver Compatibility Guidance Document [Internet]. 2021. [cited 2023 Oct 6]. Available from: https://www.safercare.vic.gov.au/clinical-guidance/palliative/syringe-driver-compatibility
5. Observational data from clinical setting (based on observation of the medication combination on mixing and during infusion for any physical changes e.g. precipitation, discolouration or clouding) via:
    a. New Zealand hospice pharmacists,
    b. correspondence with Dr Andrew Dickman, or
    c. Drug Compatibility Checker via Medicines Complete online (formerly known as the Syringe Driver Survey Database via palliativedrugs.com)

TWO-DRUG COMBINATIONS FOR USE IN SYRINGE DRIVERS VIA CSCI OVER 24 HOURS

	cyclizine	dexamethasone*	famotidine+	fentanyl	glycopyrrolate	haloperidol	hyoscine BUTYLbromide	ketamine	levetiracetam	levomepromazine	methadone	metoclopramide	midazolam	morphine sulphate	octreotide	ondansetron	oxycodone
cyclizine		SI		SI								SI			SI	SI	SI
dexamethasone*	SI					SI				SI			SI#		SI		
famotidine+															SI		
fentanyl	SI																
glycopyrrolate																	
haloperidol		SI					SI										
hyoscine BUTYLbromide						SI											
ketamine																	
levetiracetam																	
levomepromazine		SI															
methadone																	
metoclopramide	SI																
midazolam		SI#															
morphine sulphate																	
octreotide	SI	SI	SI														
ondansetron	SI																
oxycodone	SI																

- Incompatible
- NaCl 0.9% as diluent
- SI — Sometimes incompatible in NaCl 0.9% (usually at higher concentrations)
- WFI as diluent
- SI — Sometimes incompatible in WFI (usually at higher concentrations)
- SI — Sometimes incompatible in both NaCl 0.9% and WFI (usually at higher concentrations)
- Not usually used together (if split cell it means that there is still compatibility information available for combination)
- No information available within stated references

* Dexamethasone should always be added to the syringe last (after diluting the other medications as much as possible); transient turbidity can happen initially.

Chemical incompatibility can occur between midazolam and dexamethasone in a time and temperature dependent way resulting in reduced effectiveness of midazolam. [Reference: Good et al, 2004]. However, this shouldn't be an issue for infusions stored ≤ 25°C for ≤ 24 hours or at the doses of dexamethasone used for site protection (0.5-1 mg).

\+ Famotidine is still new to practice in NZ – this data is predominantly from the clinical setting and still requires caution, especially at higher concentrations of medications.

COMMON THREE-DRUG COMBINATIONS

	DILUENT
morphine + midazolam + levomepromazine	NaCl 0.9%
morphine + metoclopramide + midazolam	NaCl 0.9%
morphine + haloperidol + midazolam	NaCl 0.9%
morphine + hyoscine BUTYLbromide + haloperidol	NaCl 0.9%
oxycodone + midazolam + levomepromazine	NaCl 0.9%
oxycodone + metoclopramide + midazolam	NaCl 0.9%
oxycodone + haloperidol + midazolam	NaCl 0.9%
oxycodone + hyoscine BUTYLbromide + haloperidol	NaCl 0.9%
fentanyl + midazolam + levomepromazine	NaCl 0.9%
fentanyl + haloperidol + midazolam	NaCl 0.9%
Fentanyl + cyclizine + midazolam	WFI

NOTES:

- Heat and light can cause medication combinations to become incompatible – **keep below 25°C and protect from sun and UV light**.
- Results from some included combinations are based on data collected in clinical settings via observing the medication combination at time of mixing and during infusion for any physical changes (discolouration, clouding or crystallisation). Hence, it is important that all CSCI syringes are observed for physical changes on compounding and at regular intervals during infusion.
- Although the combinations are based on physical and chemical compatibilities over 24 hours, many of the combinations have been observed to be physically compatible over a period of 72 hours when kept at 2-8°C. In NZ, a 72-hour expiry may be assigned to syringes compounded aseptically within pharmacies (NZ Pharmacy Service Standards 2010 – Aseptic Dispensing of Sterile Products). A watchful eye must be kept to ensure that the syringe remains colourless, clear and free from particulate matter during this extended period.
- Particular attention should be paid to those syringes containing high doses of any of the medications as they have the potential to become incompatible at higher concentrations.
- Please note that the hyoscine formulation stated in these charts is hyoscine BUTYLbromide (Buscopan®, Spazmol®) **NOT** hyoscine HYDROBromide, which although can be administered via CSCI is not included in this chart.

Supported by





Aotearoa Specialist Adult Palliative Care Guidelines. Appendix: Syringe Driver Compatibility Chart
Version 1.0. July 2023. Review date July 2025