


# Subcutaneous Drug Infusion Compatibility Guideline

Reviewed: November 2013

**Gippsland Region  
Palliative Care Consortium  
Clinical Practice Group**



<i>Policy No.</i>	GRPCC-CPG003_1.0_2011
<i>Title</i>	Subcutaneous Drug Infusion Compatibility Guideline
<i>Keywords</i>	Guideline, Drug, Palliative, Care, Clinical, Practice
<i>Ratified</i>	GRPCC Clinical Practice Group
<i>Effective Date</i>	July 2011
<i>Review Date</i>	Every two years from effective date.
<i>Purpose</i>	This policy has been endorsed by the GRPCC Clinical Practice Group and is based on current evidence-based practice and should be used to inform clinical practice, policies and procedures in health services. The intent of the policy is to promote region wide adoption of best practice. Enquiries can be directed to GRPCC by email <a href="mailto:enquiries@grpcc.com.au">enquiries@grpcc.com.au</a> or phone 03 5623 0684.
<i>Pages</i>	4

## Policy Statement

The oral route of administration is preferable. However when the parenteral route is required, the subcutaneous route is preferred. Drugs may be given as infusions over 24 hours or as bolus doses.

The combination of drugs for subcutaneous infusions must be checked for compatibility prior to prescription and administration.

This protocol should be used in conjunction with The Eastern Metropolitan Region Palliative Care Consortium (Victoria) *Syringe Driver Drug Compatibilities - Practice Guidelines 2011*, as this guideline contains more extended evidenced-based information on many of the elements related to safe use of drug combinations in syringe drivers.

## Definitions

Drugs which CAN be administered subcutaneously:

cyclizine	clonazepam	dexamethasone
fentanyl	hyoscine butylbromide & hyoscine hydrobromide	
glycopyrrolate	haloperidol	hydromorphone
ketamine	ketorolac	levomepromazine
metoclopramide	methadone	midazolam
morphine	octreotide	ondansetron
oxycodone	phenobarbitone	sufentanil

The drug compatibilities in this guideline are collated from published literature. The criteria for the selection of compatibilities into this guideline included at least two of the following:

- published in a journal or hospital newsletter
- published in a reference book,
- laboratory analysis,
- documented concentrations,
- documented use in a clinical setting.

## Policy

### PROCEDURE

1. Subcutaneous infusions will be set up in accordance with each institution's subcutaneous administration policy.
2. Check the compatibility table and references of the different drugs before commencing.
3. Infusion site:
  - a. A plastic (Teflon or Vialon) cannula should be used rather a metal butterfly needle to minimise the risk of site inflammation
  - b. Infusion sites may last up to seven days, depending on the drugs/combination used
  - c. Routine rotation site every 72h reduces the risk of site problems
  - d. The site should be changed more regularly e.g. 24-48h if it becomes painful and/or inflamed.

4. Number of drugs in infusion - no more than two drugs should be combined in an infusion except for the following combinations:
  - a. Morphine, Metoclopramide and Haloperidol
  - b. Morphine, Metoclopramide, Midazolam
  - c. Morphine, Haloperidol, Midazolam\Hydromorphone, Metoclopramide, Midazolam.

**The administration of other drug combinations may be considered if there is supporting literature for drug compatibility.**

5. Diluent for infusions - Sodium Chloride 0.9% is the preferred diluent as it produces a solution that is as close to physiological tonicity as possible. The main exceptions to this rule are solutions containing cyclizine, in which case Water for Injection should be used
6. Storage conditions for drug infusions - Syringes containing drugs for infusion should be prepared immediately prior to commencement of infusion.  
  
Syringes containing drugs should be protected from light e.g. by placing the syringe driver in a pouch.
7. Duration of Infusion - the duration of drug infusions should be limited to 24 hours. If however, circumstances require otherwise (e.g in the community) the duration of the infusions may be extended pending on stability data in published literature.
8. Drugs Not Suitable for Subcutaneous Administration
  - a. Phenothiazine's - prochlorperazine (Stemetil), chlorpromazine (Largactil) promethazine (Phenergan) - too irritant.
  - b. Phenytoin
  - c. Diazepam - absorbed onto PVC. Precipitates at certain dilutions.
9. Potential Problems to Consider
  - a. Phenobarbitone sodium - can be too irritant if not well diluted - pH 8.5 – 10.
  - b. Clonazepam - significant loss of clonazepam occurs when infused through PVC tubing, hence it tends not to be given as a continuous subcutaneous infusion.
  - c. Cyclizine, levomepromazine and ketamine tend to be infused alone, rather than in combination with other drugs due to cost considerations.

## References

1. Dickman A, Schneider J, Varga J. The syringe driver: continuous subcutaneous infusion in palliative care. 2nd ed. Oxford: Oxford University Press; 2005
2. Syringe Driver Drug Compatibilities - Practice Guidelines 2011 Eastern Metropolitan Region Palliative Care Consortium (Victoria) *Clinical Working Party*
3. Palliative Care Therapeutic Guidelines. Version 3, 2010
4. Syringe Driver - Drug Compatibility database. Palliative Care Matters, [www.pallcare.info](http://www.pallcare.info)
5. Gardiner PR. Compatibility of an injectable oxycodone formulation with typical diluents, syringes, tubings, infusion bags and drugs for potential co-administration. *Hospital Pharmacist* Sept 2003;10: 354-361
6. Palliative Drugs, [www.palliativedrugs.com](http://www.palliativedrugs.com)
7. Trissel's 2 Clinical Pharmaceutical Database (Parenteral Compatibility), 2007, Micromedex, [http://www.micromedexsolutions.com/micromedex2/4.9.0/WebHelp/Tools/IV\\_Compatibility/IV\\_Compatibility.htm](http://www.micromedexsolutions.com/micromedex2/4.9.0/WebHelp/Tools/IV_Compatibility/IV_Compatibility.htm) (Accessed: January 2014)
8. GRPCC-CPG002\_1.0\_2010 - Opioid Conversion Guidelines, Available online from [www.grpcc.com.au](http://www.grpcc.com.au) under Health Professionals (Accessed: January 2014)

## Key Performance Indicator

100% of drugs in a subcutaneous infusion are checked for compatibility before the preparation and administration of the prescribed combination.

Considerable information contained in this guideline was taken from Calvary Healthcare Bethlehem related document.

# Drug Compatibility in Subcutaneous Infusions Chart in Standard Forms

	Cyclizine	Dexametha- sone	Fentanyl	Glycopyr- rolate	Haloperidol	Hydromorphone	Hyoscine N- ButylBr	Hyoscine HBr	Ketamine	Ketorolac	Levomepromazine	Metoclo- pramide	Methadone	Midazolam	Morphine	Octreotide	Ondan- setron	Oxycodone	Phenobarb. Sod
Cyclizine	pH 3-3.7	⊘			✔							⊘			⚠			⚠	⊘
Dexamethasone	⊘	pH 7-8.5		⊘	⊘	⚠			✔		⊘		✔	⊘	⚠		⚠	✔	⊘
Fentanyl			pH 4-7.5			✔	✔	✔	✔			✔		✔			✔		⊘
Glycopyrrolate		⊘		pH 2.3-4.3	✔	✔								✔	✔		✔		⊘
Haloperidol	✔	⊘		✔	pH 2.8-3.6	⚠	⊘			⊘		✔	✔	✔	✔			✔	⊘
Hydromorphone		⚠	✔	✔	⚠	pH 4-5.5		✔		⚠	✔	✔		✔					⊘
Hyoscine N- Butylbromide			✔		⊘		pH 3-5.5								✔			✔	⊘
Hyoscine Hydrobromide			✔			✔		pH 4							✔			✔	⊘
Ketamine		✔	✔						pH 3.5-5.5						✔			✔	⊘
Ketorolac					⊘	⚠				pH 7-8									⊘
Levome- promazine		⊘				✔					pH 3-5				✔			✔	⊘
Metoclopramide	⊘		✔	✔	✔	✔						pH 3-6.5	✔		✔		✔	✔	⊘
Methadone		✔			✔							✔	pH 4.5-7	✔					⊘
Midazolam		⊘	✔	✔	✔	✔							✔	pH 2.9-3.7	⚠		✔	✔	⊘
Morphine	⚠	⚠		✔	✔		✔	✔	✔		✔	✔		⚠	pH 2.5-6		✔		⊘
Octreotide																pH 3.5			⊘
Ondansetron		⚠	✔	✔								✔		✔	✔		pH 3.9-4.5	✔	⊘
Oxycodone	⚠	✔			✔		✔	✔	✔		✔	✔		✔			✔	pH 4.5-5.5	⊘
Phenobarb. Sod	⊘	⊘	⊘	⊘	⊘	⊘	⊘	⊘	⊘	⊘	⊘	⊘	⊘	⊘	⊘	⊘	⊘	⊘	pH 8.5-10.5
KEY	⊘	Incompatible	✔	Compatible	⚠	Usually compatible (may be concentration dependent - observe carefully)													

- Please note:
- This table should be used as a general guide only as high concentrations of drug combinations will affect the compatibility of the end infusion, and vigilant monitoring is required in all cases.
  - pH may vary with different formulations; check product information or consult the manufacturer
- References:
- Dickman A, Schneider J, Varga J. The syringe driver: continuous subcutaneous infusion in palliative care. 2nd ed. Oxford: Oxford University Press; 2005
  - Palliative Care Therapeutic Guidelines. Version 2, 2005
  - Syringe Driver - Drug Compatibility database. Palliative Care Matters, www.pallcare.info
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