Continuous subcutaneous infusions (CSCI) using a syringe driver (SD)
Guidance and tips for community prescribers

Indications:
To control symptoms when medication cannot be taken orally

1. Last days/week of life: taking medication orally becomes progressively difficult due to irreversible deterioration:
   Tips:
   - Reduce tablet burden in the last weeks/months of life. Review medicine indications and stop those that don't add to quality of life. Changing formulations to liquids can be helpful.
   - In the last days/week of life, focus on oral intake for pleasure. Helpful regular opioid analgesia, anti-emetics, anxiolytics etc can be converted to a CSCI/SD. Consider this proactively to reduce burden and risk of crisis (especially prior to weekends and bank holidays).
   - Ensure prn SC medication is prescribed AND prn PO/SL medication, well in advance of any need, 'just in case' (anticipatory prescribing). Then prescribe a CSCI/SD if and when symptoms develop.
   - Do not prescribe a CSCI/SD in advance. It is impossible to guess what drugs and doses will be needed in a few days' time. Dose ranges should not be prescribed for a CSCI/SD.

2. Temporarily: when nausea and vomiting prevent the taking and absorption of anti-emetics and analgesia.
   Tips:
   - Convert back to PO medication when N/V is controlled
     - Anti-emetic on first day, analgesic second.
     - Ensure there is no gap between stopping CSCI/SD and starting PO medication.

3. GI tract obstruction: This may be temporary if the obstruction can be manipulated (e.g. oesophageal stent) or resolves (e.g. bowel obstruction)

'Contraindications' - Syringe drivers and CSCIs:

- Are not required if a patient is able to eat and drink. They are only an alternative route of administration; the drug action is not improved. If PO medication is not effective, seek advice about alternatives.
- Are rarely indicated for longer term administration.

Seek advice from your Specialist Palliative Care Service if you encounter these problems.

Important notes

- Most patients' symptoms will be controlled with a two or three drug combination in a single syringe. Seek advice if you are considering a three or more drug combination or using two SDs at the same time.
- Refer to **'Derbyshire Symptom Management Guidance for last days of life'** on https://derbyshire.eolcare.uk/ for detailed symptom management, prescribing advice and opioid equivalency.
- For most 'Solutions for Injection', the SC route is 'off label'. This is accepted practice in palliative care and there is extensive clinical experience.
- Water For Injections (WFI) or Sodium Choride 0.9% (NaCl 0.9%) are used to make up to a given volume in the syringe. Some drugs can only be drawn up in NaCl 0.9%.

- Consider compatibility and final volume when prescribing and refer to guides (see below). Compatibility relies not only on the drug and diluent combination but the environment – keep SDs outside of clothes so they aren't too warm.
- CSCI/SDs drawn up by the bedside should be started at the time. Only those made up in pharmacy aseptic conditions have a shelf life of more than 24hours.
- Regularly check syringes for signs of incompatibility and check functioning of lines and SC sites. If symptoms worsen, check syringe, line and site before altering prescription.
- Your Specialist Palliative Care Service can advise about optimising drug conversion, combinations, compatibilities and alternatives.

Drug compatibility resources

For common compatibilities refer to **'Palliative Care Syringe Driver – DCHS Medication Compatibility Guide'** available through https://derbyshire.eolcare.uk/

Other resources include:

www.palliativedrugs.com Syringe Driver Survey Database (SDSD), free to register and access

https://book.pallcare.info Syringe Driver drug compatibility, free to access

The Syringe Driver Book, by Dickman & Schneider

Specialist palliative care advice contact details

South Derbyshire and Derby City:

- In working hours: phone the community palliative care team on 01332 787582 or alternatively 01332 788794 (Palliative Medicine secretaries) to speak with a Palliative Medicine consultant
- Out of hours: phone Royal Derby Hospital, 01332 340131, and ask for the Palliative Medicine consultant on-call

Note: the Nightingale Macmillan Unit nursing staff are not familiar with drawing up syringe drivers and therefore are unable to provide advice about this element at present.

North Derbyshire:

- In working hours: phone your community palliative care CNS directly or alternatively 01246 568801 (Ashgate Hospice) to speak with the medical team
- Out of hours: phone Chesterfield Royal Hospital, 01246 277271, and ask for the Palliative Medicine consultant on-call

Commonly used drugs

Drug	**Usual ampoule size**	**Notes / tips** Refer to 'Derbyshire Symptom Management Guidance for last days of life' for detailed dose prescribing advice.
Diamorphine		First line strong opioid. Powder for solution for injection. 5mg, 10mg, 30mg, 100mg stocked*.
Morphine Sulfate	10mg/ml 30mg/ml	Alternative first line strong opioid 10mg/ml and 30mg/ml dose ampoules stocked*.
Oxycodone	10mg/ml	Alternative strong opioid used in cases when oxycodone produces better analgesia and/or fewer side effects than morphine at equivalent doses. 10mg/ml (as 1ml and 2ml sizes), 50mg/ml ampoules stocked*.
Haloperidol	5mg/ml	For nausea and vomiting and/or confusion, hallucinations, agitation. Plasma half-life 12 – 35h, duration of action 24h, sometimes longer, so can be given as daily SC bolus.

Hyoscine Butylbromide (HBBr)	20mg/ml	For respiratory secretions or bowel colic and bowel obstruction. Usual effective dose of 80mg/24hours.
Midazolam	10mg/2ml	For anxiety and restlessness. Volume may limit if very large doses required: 60mg=12mls.
Levomepromazine	25mg/ml	For nausea and vomiting and/or confusion, hallucinations, agitation. Protect from light. Plasma half-life 15 – 30h, duration of action 12 - 24h so can be given as daily/twice daily SC bolus.
Metoclopramide	10mg/2ml	Commonly used for nausea/vomiting in partial GI obstruction temporarily. In last days of life, if symptoms controlled with oral metoclopramide, give same dose as CSCI - but switching to haloperidol can improve compatibility with other drugs if needed. Volume may limit if high dose required: 60mg=12mls.
Cyclizine	50mg/ml	Commonly used for nausea/vomiting associated with brain tumours. Tendency to irritate SC site and less compatible with other drugs. In the last days of life, if symptoms controlled with oral cyclizine, give same dose as CSCI - but switching to haloperidol can improve compatibility with other drugs if needed.
Dexamethasone	3.3mg/ml	Poor compatibility with other drugs. Long duration of action (36 – 54 hours) so can be given as daily SC dose. Steroids may not need to be continued in the last days of life. 3.8mg/ml if 3.3mg/ml not available

*Palliative Care Drugs Stockist Scheme

Less commonly used drugs – seek specialist palliative care advice

Drug	**Usual ampoule size**	**Notes / tips** Please seek further advice from your specialist palliative care service.
Alfentanil	1mg/2ml	Alternative opioid when eGFR<15mls as other opioids may be poorly tolerated. 1mg alfentanil = 10mg diamorphine. Duration of action 30 min so only suitable for CSCI. Other ampoule sizes produced.
Ranitidine	50mg/2ml	May be helpful for symptom management of complete bowel obstruction
Octreotide	500 micrograms / 1ml	<u>Only prescribe in sodium chloride 0.9%</u> Second line to Hyoscine butylbromide to reduce GI secretions in complete bowel obstruction or fistula.
Levetiracetam	500mg/5ml	If seizures controlled on oral Levetiracetam, can be given as CSCI. Volume may be limiting. Use midazolam SC PRN and CSCI for seizures or seizure prevention in the last days of life.
Parecoxib	40mg	<u>Only prescribe in sodium chloride 0.9%.</u> Powder for solution for injection. NSAID.
Ketorolac	30mg/ml	<u>Only prescribe in sodium chloride 0.9%.</u> NSAID.
Furosemide	20mg/2ml	May be beneficial in managing symptoms from heart failure when parenteral administration required and/or in the last days of life. Other ampoule sizes produced. Volume may be limiting.