THE USE OF MEDICINES IN SYRINGE DRIVERS

Medication	Indication	SC Starting dose /24 hours	Ampoule
Opioid Morphine	Pain	1/2 total daily dose of oral morphine or 10mg-20mg if not already taking opioids	10mg/1ml 15mg/1ml 20mg/1ml 30mg/1ml 60mg/2ml
	Dyspnoea	5-10mg if not already taking opioids	
Oxycodone	Pain	1/2 total daily dose of oral oxycodone	10mg/1ml 50mg/1ml
Anti-emetic Levomepromazine		2.5mg-5mg (up to 25mg)	25mg/1ml
Cyclizine		100mg-150mg	50mg/1ml
Ondansetron		4mg (up to 16mg)	4mg/2ml 8mg/4ml
Metoclopramide	Impaired gastric emptying	30mg	10mg/2ml
Sedative Midazolam	Terminal restlessness Myoclonic jerking Anticonvulsant	5mg-10mg (up to 60mg)	10mg/2ml
Levomepromazine	Terminal agitation and delirium	12.5mg-25mg (up to 50mg)	25mg/1ml
Anticholinergic Glycopyrronium	Terminal bronchial secretions	600-1200microgram	200 microgram/1ml 600 microgram/3ml
Hyoscine Hydrobromide (also anti-emetic)		600-2400microgram	600 microgram/1ml
Hyoscine butylbromide	Severe colic Intestinal obstruction	60mg-180mg	20mg/1ml

Essential points in using opioids for pain management

- Morphine is the opioid of choice for injection
- To convert from oral morphine to subcutaneous morphine, divide the total 24 hr morphine dose by 2 to obtain the total 24hr morphine dose.
- Ensure adequate breakthrough (PRN) analgesia is prescribed = 1/6th daily dose morphine
- Increase dose if required by 30% increments

LOROS
Hospice Care for Leicester, Leicestershire & Rutland

Guidelines for the Management of Common Symptoms in the Last Few Days of Life

Objectives:

- To help make the last days of life comfortable and dignified
- To give guidance on the effective and safe use of drugs
- To increase confidence and satisfaction in providing palliative care

General Guidelines

Anticipate that the oral route will not be possible, if not immediately, then in the near future. This will ensure that there is no delay in responding to a symptom.

Medication should be prescribed via the subcutaneous (SC) route.

Use water for injection (WFI) as a diluent.

Consider how symptoms can be improved without using drugs:

- Are there any underlying causes that need to be managed?
  For example, urinary retention can cause agitation.
- Are drugs the best treatment?
  For example, would changing the patient's position help noisy respiratory secretions?

If problems persist or if you are unsure what to do contact the Specialist Palliative Care Team or LOROS advice line: 0116 231 8415

For further information please consult:

A Guide to Prescribing for Patients with Advanced Malignancy, 2016
Dr Nicky Rudd & Dr Caroline Cooke, *Consultants in Palliative Medicine, University Hospitals of Leicester NHS Trust & The Leicestershire and Rutland Hospice*
or
The East Midlands Palliative Care Network Guidelines, available at: http://book.pallcare.info/

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PAIN

Is the patient in pain?

Yes

Is the patient prescribed regular oral morphine?

Yes

Convert to continuous morphine SC infusion via syringe driver

Increase the infusion dose as needed to control pain by 30%

Prescribe PRN morphine SC for breakthrough pain
= 1/6th 24hr dose morphine

NB: Increase the PRN dose inline with the SC infusion dose

No

Prescribe:
a) Morphine 2.5mg-5mg SC stat + PRN
b) Morphine 10mg-20mg/24hr
c) Levomepromazine 2.5-5mg/24hr as prophylactic

No

Is the patient prescribed regular oral morphine?

Yes

Convert to continuous morphine SC infusion via syringe driver

No

Prescribe in anticipation:
Morphine 2.5mg-5mg SC PRN

Levomepromazine 2.5mg-5mg SC PRN
After 24hr review. If 2 or more doses have been given consider a syringe driver

Total daily dose oral morphine (mg) / 2 = mg morphine/24hr

If on oral oxycodone and SC morphine not appropriate conversion to SC oxycodone/24hr is 1/2 total daily oral oxycodone dose

If Morphine unavailable use diamorphine 1/3 oral morphine dose

Consult a palliative care specialist if:
1. Pain persists
2. Conversion is needed from other opioids

Compatibility chart for two drugs in Water for Injections (WF1) over 24 hours for Palliative Care

Multiple factors affect drug stability and compatibility. This table is intended as a practical guide and conflicting reports do exist. Regular monitoring for precipitation, site problems and efficacy is essential, even if coded green. For further information seek specialist advice/refer to www.palliativedrugs.com

G (green)	Reported compatible in WFI at doses detailed in these guidelines (data may be observed, physical or chemical or widely used but without supporting data). NB Crystallisation may occur with increasing concentrations
A (amber)	Use with caution (compatibility may depend on drug concentrations or the order of mixing - seek advice)
N/D	No Data
N/A	Not usually applicable or not recommended
(s)	Combination is also "Green" in Saline 0.9%

Glycopyrronium	**N/D**						
Haloperidol	**G**	**N/D Commonly used by specialists**					
Hyoscine Butylbromide	**A**	**N/A**	**G**				
Levomepromazine	**N/A**	**G**	**N/A**	**G**			
Metoclopramide	**N/A**	**G**	**N/D (specialists use occasionally)**	**N/A**	**N/A**		
Midazolam	**A**	**G**	**G (s)**	**G (s)**	**G**	**G (s)**	
Morphine Sulphate	**G**	**G**	***G (at lower concentrations)**	**G (s)**	**G**	**G (s)**	**N/D **Widely used in specialist units**
Oxycodone	**A**	**G**	**G**	**G**	**G**	**G**	**G**
	Cylizine Use WFI only	**Glycopyrronium**	**Haloperidol**	**Hyoscine Butylbromide**	**Levomepromazine**	**Metoclopramide**	**Midazolam**

SEEK SPECIALIST ADVICE FOR COMBINING MORE UNUSUAL DRUGS OR MORE THAN TWO DRUG COMBINATIONS
Also see: www.palliativedrugs.com

DIAMORPHINE: 2 drug combinations hold true if diamorphine is substituted for morphine sulphate with the following provisios: maximum concentrations must not exceed Diamorphine 20mg/ml + Cyclizine 20mg/ml, nor Diamorphine 50mg + Haloperidol 4mg/ml.

*May be incompatible at concentrations above 20mg/ml morphine + 2mg/ml Haloperidol .

**May be incompatible at concentrations above 10mg/ml + Midazolam 5mg/ml.

Respiratory Tract Secretions

- Noisy respiratory tract secretions can be a normal part of dying
- Consider whether they are troublesome or need treating at all
- Changing the positioning of the patient is the first step of management
- If the patient is unconscious reassure relatives and friends that the patient is unaware and not suffering
- This can a difficult symptom to resolve and drugs may not be effective.

Absence of troublesome secretions

Prescribe in anticipation of the symptom being troublesome:

- Glycopyrronium 200microgram by SC injection PRN up to 2hrly

Consider:

- Patient positioning
- Stopping I.V. or subcutaneous fluids or PEG feed
- In a small number of patients, suction may be helpful

If Secretions Troublesome:

- Give glycopyrronium 200microgram SC and PRN, up to 2hrly
- If two or more doses of glycopyrronium have been given and are effective, consider a SC infusion of glycopyrronium 800microgram/24hr
- Review after 24hrs

If symptoms persist, increase to a maximum of 1.2mg/24hr glycopyrronium

Alternative: Hyoscine hydrobromide (may cause sedation and confusion) 400micrograms SC stat and PRN; maximum 2400microgram/24hr

Restlessness and Agitation

A human presence often helps to calm agitated patients

Reduced Confusion, restlessness & agitation

Prescribe in anticipation of the symptom developing:

- Midazolam 2.5mg-5mg by SC injection PRN

Consider underlying causes:

- Uncontrolled pain
- Full bladder
- Full rectum
- Dyspnoea
- Anxiety or fear

and resolve where possible

Where anguish and anxiety are predominant:

- Give midazolam 2.5mg-5mg stat and PRN SC (this may need to be repeated after 30 minutes)
- If two or more doses have been given in 24 hours, with effect, consider starting a SC infusion of 5mg-10mg/24hr midazolam
- The SC infusion dose may need to be increased gradually to midazolam 30mg/24hr

Where delirium and psychotic features are predominant (e.g. hallucinations, confusion):

- Give levomepromazine 6.25mg-12.5mg stat and PRN by SC injection up to a maximum total daily dose of 50mg.
- If two or more doses have been given in 24 hours, with effect, consider starting a SC infusion of 12.5mg-25mg/24hr levomepromazine
- The SC infusion dose may need to be increased gradually to levomepromazine 50mg/24hr

Occasionally a combination of Midazolam and levomepromazine is required. Seek specialist advice if patient is not settled with mid-azolam 30mg and levomepromazine 50mg

Nausea and Vomiting

Is patient already on an effective antiemetic?

Yes

Prescribe this if possible
- As SC infusion/24hr
- As PRN dosing

No

Is nausea or vomiting present?

Yes

- Give levomepromazine 2.5mg-5mg by SC injection stat and PRN
- Review after 24 hours. If two or more PRN doses of levomepromazine have been given, and are effective, consider levomepromazine 12.5mg/24hr SC infusion
- This can be increased if required to 25mg/24hr SC infusion

No

Prescribe in anticipation of the symptom developing:
- Levomepromazine 2.5mg by SC injection PRN

- Alternative antiemetic: Cyclizine 50mg SC PRN up TDS or 150mg/24hr SC infusion: Ondansetron 4mg SC PRN up to 16mg/24hr.

BREATHLESSNESS

Is amelioration of underlying cause appropriate?
- Removal of pleural, ascitic and pericardial fluid
- Treatment of chest infection
- Treatment of heart failure
- Treatment of pulmonary emboli

Calm and reassure the patient and carers by touch, talking and explaining

Position patient:
- Sit up in bed
- Comfy, reclining armchair with foot stool

Reduced Breathlessness

Air flow across the face is helpful: use a fan or open a window

Trial of oxygen if SaO2 <92%

Severe respiratory distress
- For relief of anxiety consider
  lorazepam 0.5mg-1mg SL PRN
  midazolam 2.5mg SC stat and PRN
  midazolam 5mg-10mg/24hr SC infusion
- For relief of breathlessness consider
  morphine 2.5mg SC stat and PRN
  morphine 5mg-10mg/24hr SC infusion

NB: Prescribe prophylactic antiemetic (e.g. levomepromazine 2.5mg-5mg/24hr) if opioid naïve patient.