Syringe Driver Teaching Booklet

Clatterbridge Centre for Oncology

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WHY AND WHEN TO USE A SYRINGE DRIVER

Give some situations where you might use a syringe driver –

Your answers should have included:

Any situation where medication can't be taken orally, rectally or is ineffective e.g.

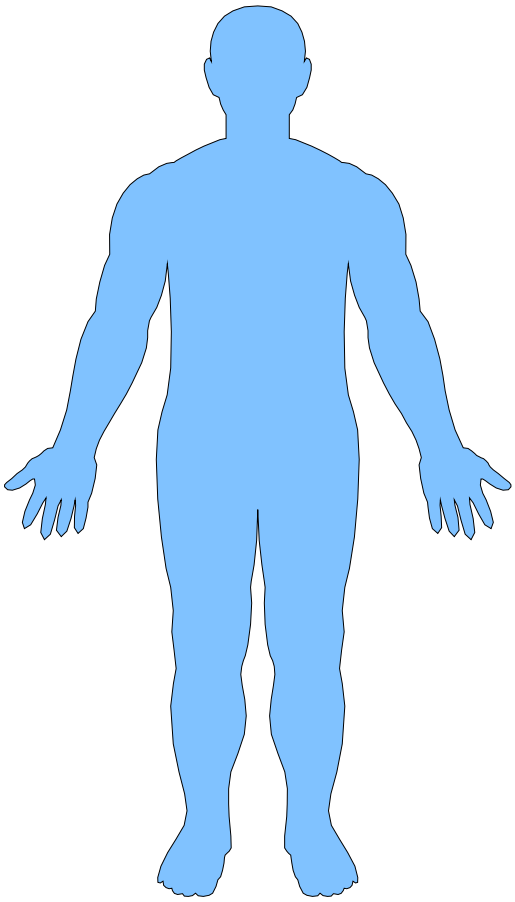
- Persistent nausea and vomiting
- Severe dysphagia
- Malabsorbtion of drugs
- Intestinal obstruction
- Semi-comatose state/unconsciousness
- Too weak for oral drugs e.g shortly before death
- Non-compliant with oral medication/inability to take oral medication

<u>Contraindications/Considerations:</u>

- Thrombocytopenia
- Metal allergy
- Plaster allergy
- Patient/family choice

SITING THE SYRINGE DRIVER

The commonest choices for infusion sites are (mark them on the diagram) –



Your answers should have included –

- Upper chest
- Upper/outer arm
- Abdomen
- Thighs

Avoid areas where there may be an increased risk of malabsorption of the drugs such as:

- Areas of oedema or lymphoedema
- Particularly cachectic areas i.e. little tissue to inject into

If the infusion causes pain or local irritation what actions would you consider taking?

Your answers should have included -

- Changing the site daily
- Changing to a non-metal needle
- Reducing the quantity of or consider an alternative to any irritant drugs
- Increasing the dilution of the solution using a larger syringe
- Injecting hyaluronidase 1500 units into the site first

MIXING AND MEASURING

As a general rule sterile water should be used for mixing the drugs that go into a syringe driver.

Some drugs will need to be mixed with sterile normal saline (as per guidelines), if not there is a risk of crystallisation of the contents of the syringe.

Setting the Rate

- At Clatterbridge Centre for Oncology, Graseby MS26 syringe drivers are used.

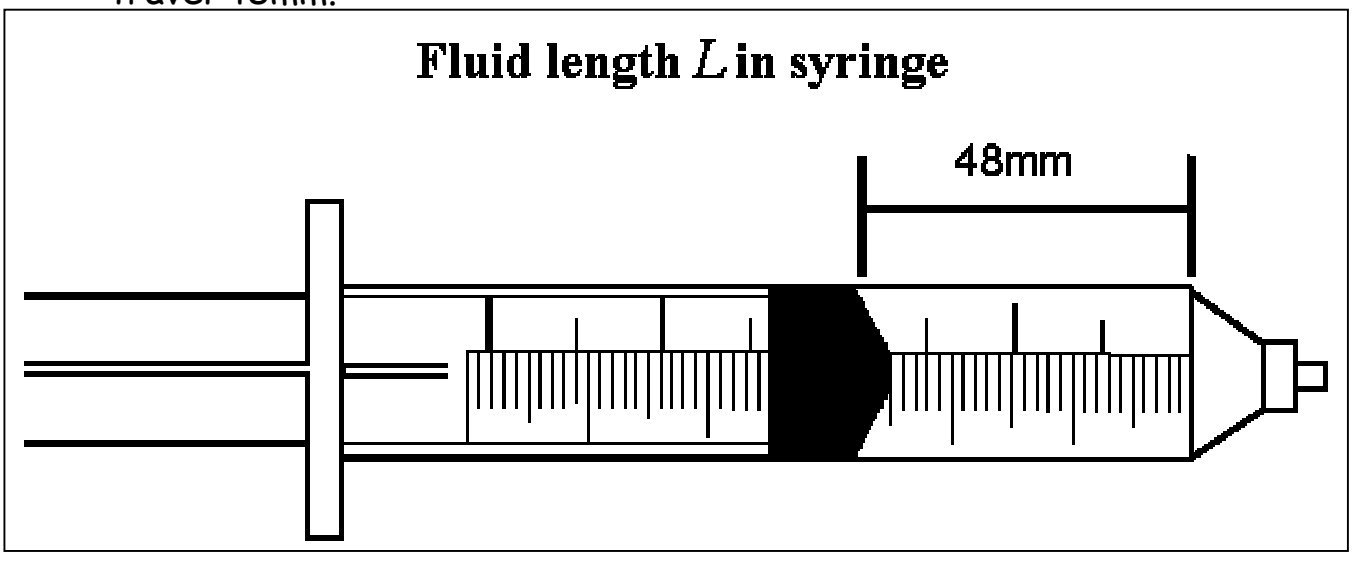
- To set the rate for this type of syringe driver measure the length of the liquid in the barrel of the syringe in **millimetres**.

- The length in millimetres is therefore the rate that is set on the side of the syringe driver – no maths required!

- If this is a new infusion, **prime the line first**, then measure the barrel of the syringe

- Measure the syringe each time the infusion is changed

e.g. length of barrel = 48mm: set the rate to 48mm in 24hours. In other words the plunger in the syringe will take 24 hours to travel 48mm.



SETTING UP THE SYRINGE DRIVER

1. Insert the battery, the alarm will sound (press the boost button to silence). Each battery should last for about 50 full syringes. The light will flash every 30 seconds, but will stop flashing 24 hours before the battery runs out.

2. Fit the finger grip of the syringe into the slot provided

3. Secure the syringe with the rubber strap

4. Press the white button on the actuator and slide along until firmly against the syringe plunger

5. Press the boost button once

6. Place the syringe driver in the plastic holder and protect from light

7. Check the syringe, syringe driver and injection site at least every 4 hours

DRUG INFORMATION

Diamorphine

Dose: 5mg ↑ - **there is no maximum dose**

Analgesic of choice as it is highly soluble.
S/C diamorphine is 3 times stronger than oral morphine

e.g MST 60mg BD +30mg of oramorph = 150mg of oral morphine in 24 hours –
this would mean 50mg of S/C diamorphine in 24 hours.

Always ensure that a PRN dose of diamorphine is available for breakthrough pain, this should be 1/6 of the 24 hours dose.

e.g diamorphine 30mg/24hours needs 5mg of diamorphine S/C available PRN.

Cyclizine (Valoid)

Used for:	nausea and vomiting
Dose:	50-150mg/24hours
Available as:	50mg/ml
Notes:	mix only with water may precipitate with diamorphine useful in intestinal obstruction

Clonazepam (Rivotril)

Used for:	terminal restlessness, myclonus and neuropathic pain
Dose:	2-4mg/24hours
Available as:	1mg/2ml

Dexamethasone (Decadron)

Used for:	raised intracranial pressure, pain caused by nerve compression, nausea and vomiting
Dose:	8-16mg/24hours
Available as:	8mg/2ml
Notes:	use a separate syringe driver as high risk of precipitation if mixed with other drugs

Haloperidol (Haldol)

Used for:	nausea and vomiting, sedation in higher doses
Dose:	2.5-15mg/24hours
Available as:	5mg/ml
Notes:	useful for hiccups as well as drug induced nausea and vomiting

Glycopyrronium (Robinul)

Used for:	reduction of respiratory secretions
Dose:	800-2400mcg/24hours
Available as:	600mcg/3ml
Notes:	less sedating than hyoscine hydrobromide

Hyoscine Hydrobromide

Used for:	reduction of respiratory secretions
Dose:	400-2400mcg/24hours
Available as:	400mcg/ml
Notes:	also has a small antiemetic and sedative effect

Hyoscine Butylbromide (Buscopan)

Used for:	colic/spasmodic pain
Dose:	20-60mg/24hours
Available as:	20mg/ml
Notes:	useful for colic from intestinal obstruction may crystallise with cyclizine

Levomepromazine (Nozinan)

Used for:	nausea and vomiting, sedation, pain
Dose:	5-25mg/24hours – antiemetic 25-150mg/24hours – sedative
Available as:	25mg/ml
Notes:	may cause site irritation can be mixed with saline or water above 15mg can have an analgesic effect

Metoclopramide (Maxalon)

Used for:	nausea and vomiting
Dose:	30-60mg/24hours
Available as:	10mg/2ml
Notes:	works by increasing gut motility therefor do not use in intestinal obstruction can cause irritation at the injection site

Midazolam (Hypnovel)

Used for:	sedation
Dose:	10-100mg/24hours
Available as:	10mg/2ml
Notes:	useful for anxiety, agitation, muscle spasm and as an anticonvulsant

Octreotide (Sandostatin)

Used for:	reducing gastric secretions
Dose:	300-600mcg/24hours
Available as:	50mcg/ml; 100mcg/ml; 500mcg/ml
Notes:	will reduce the size and frequency of vomits in gastric and intestinal obstruction will precipitate when mixed with cyclizine

Ondansetron (Zofran)

Used for:	nausea and vomiting
Dose:	8-24mg/24hours
Available as:	4mg/2ml; 8mg/4ml
Notes:	useful for nausea and vomiting caused by radiotherapy or chemotherapy dilute with saline

COMMON PROBLEMS & MISTAKES

The injection site appears sore and inflamed

Some drugs (particularly cyclizine and levomepromazine) can cause soreness and inflammation.

Alternatively it can be caused by a reaction to the needle itself.

What would you consider doing about this?

Your answers should have included:

- Changing the injection site regularly i.e. every 24 – 48 hrs
- Increase the dilution of the infusion i.e. by using a 20 or 30ml syringe
- Use a teflon needle rather than a metal one
- Inject 1500u of hyaluronidase into the site first
- Change to a less irritant drug combination

The infusion is finishing in less than 24 hours

What could be the possible causes of this?

Your answer should have included:

That this can be due to either:

- the infusion not being measured correctly when setting the rate or

- regular use of the boost button on the syringe driver.

Pressing the boost button once will move the syringe forward 0.23mm.

In a 10ml syringe with 30mg of diamorphine this means a dose of 0.3mg would need up to 5 boosts!

Ask the doctor to prescribe a dose of diamorphine s/c for breakthrough pain, this should usually be 1 sixth o the 24-hour dose.

The infusion takes more than 24 hours

What could be the possible causes of this?

Your answers should have included:

- An incorrect rate
- The syringe driver light isn't flashing
- The syringe isn't site into the driver correctly
- The battery needs replacing
- The syringe needs changing due to crystallisation
- The injection site looks sore, red or lumpy. You may need to change the site
- Has the infusion been stopped at all for any reason?

PRACTICAL ASSESSMENTS

Date/Assessors Initials				
Safely Mix Drugs & Diluent				
Correctly Set Up Line, Needle & Syringe				
Correctly Set Rate of the Syringe Driver				
Correctly Site the Needle				
Correctly Start the Syringe Driver				
Able to Discuss Why the Current Drugs Are Being Used				

USEFUL READING

Drug Information Letter No.117: Palliative Care Prescribing
North West Medicines Information Centre
January 2001

Palliative Care Formulary 1
1998
Twycross, Wilcock & Thorp

The Syringe Driver In Palliative Care
Andrew Dickman & Clare Littlewood, St.Helens & Knowsley Hospitals
1998

Quiz

You're going to mark this yourself, so don't cheat!

1. If in doubt mix with what solution?

2. Which is the analgesic that is most commonly used in syringe drivers and why?

3. Name 2 sedating antiemetics.

4. Name a non-sedating antiemetic.

5. Hyoscine butylbromide is used for treating what?

6. Hyoscine hydrobromide is used for treating what?

7. Which 2 drugs are useful for reducing respiratory secretions?

8. How would you deal with an infusion that has crystallised?

9. Your patient has a red/inflamed injection site, what steps would you take to minimise the risk of this happening again?

10. What is the boost button for?