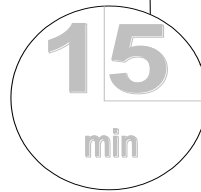


CLiP

15 minute Worksheet



Procedures in Palliative Care

1: Setting up a portable syringe pump

Intermediate level

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Aim of this worksheet

To understand how to set up a syringe pump

How to use this worksheet

- You can work through this worksheet by yourself, or with a tutor.
- Read the case study below, and then turn to the Work page overleaf.
- Work any way you want. You can start with the exercises on the Work page using your own knowledge. The answers are on the Information page - this is not cheating since you learn as you find the information. Alternatively you may prefer to start by reading the Information page before moving to the exercises on the Work page.
- This CLiP worksheet should take about 15 minutes to complete, but will take longer if you are working with colleagues or in a group. If anything is unclear, discuss it with a colleague.
- If you think any information is wrong or out of date let us know.
- Take this learning into your workplace using the activity on the back page.

Case Study

Mary is a 28 year old woman, married with two small children. Six months ago, she was found to have an advanced cancer of the cervix and was treated with pelvic radiotherapy and started chemotherapy. Her pain responded to morphine, but she has now been admitted with nausea and vomiting.

It is decided to give her drugs as a 24hour subcutaneous infusion through a syringe pump

v25

The syringe pump

- 1) T. There is one type of syringe pump in use at present:
Volume calibrated syringe pumps: delivery rates are based on volumes over a preset duration of time (eg. McKinley T34). Syringe pumps calibrated in mm/day or mm.hour (eg. Graseby, Micrel MP) are no longer recommended as problems arose, especially if the two types were confused.
- 2) T. Syringe pumps can take a range of syringe sizes from 2-50mls but the most commonly used sizes are 20mls and 30mls. Volume-calibrated syringe pumps have the ability to sense the size and brand of any syringe and calculate the volume automatically.
- 3) F. Newer syringe pumps are splash proof, but not bath proof!
- 4) T. Most volume-calibrated pumps allow a wide range of infusion rates to be set.
- 5) F. Butterfly needles are often used but they cause more local reactions. However there is a risk of serious needle-stick injury to staff, either because it falls out into the bed clothes, or it sticks into a carers hand inadvertently placed over the injection site. Butterfly needles should be avoided for SC infusions.
- 6) T. Plastic IV cannulae are better tolerated and last longer than metal butterfly needles. Plastic cannula also significantly reduce the risk of needle-stick injuries to staff. Ideally use plastic cannulae without a side port eg. Saf-T-Intima. The cannula and infusion site are often covered with OpSite or similar.

Syringe pump medication

The conversion would be 20mg diamorphine in 24 hours or 30mg morphine in 24 hrs. Increasing numbers of teams are using morphine as their first line injectable opioid.

Her cyclizine can be continued at the same dose, ie. 150mg in 24 hours.

The laxative can be stopped until the vomiting stops.

Of the drugs that could be used in palliative care, three cause too much local irritation to be used: chlorpromazine, diazepam and prochlorperazine. Cyclizine and levomepromazine cause some irritation in some patients.

Many other drugs have been shown to be safe and effective when given by the subcutaneous infusion route:

clonazepam, cyclizine, diamorphine, dexamethasone, fentanyl, furosemide, haloperidol, hyoscine butylbromide, hyoscine hydrobromide, hydromorphone, ketamine, levomepromazine, midazolam, metoclopramide, morphine, omeprazole, oxycodone, octreotide and ranitidine.

Note: syringes must be labelled with the drug and dose, date and time prepared and patient name and NHS number

Setting up the syringe pump

There are several issues to think about

Infusion site: ideally the site needs to be one that does not move too much and that patients can avoid lying on.

For hydration, the best site is the upper back, above the scapular spine (**H**)

The upper, outer arms are commonly used for drugs (**D**)

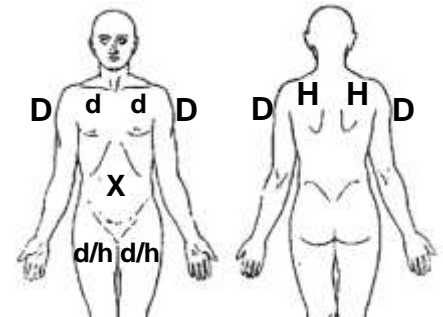
The front upper thighs are an alternative for drugs or low volume fluids (**d/h**)

The upper chest is a less commonly used alternative site for drugs (**d**)

The abdomen is the least suitable site for subcutaneous infusions (**X**)

Which connector? Ideally this should have a small filling volume, but this is not essential.

Should I use a filter? There is no evidence that filters reduce infection or prevent site irritation.



Setting up a McKinlay T34 pump

Note: If you have not used this pump find someone who has been trained in its use.

1. Install a new battery (Duracell 9v).
2. Ensure barrel clamp is down and press and hold ON/OFF key.
3. Wait until the actuator stops moving. Verify the battery is fully charged,
4. Connect the extension set to the syringe luer lock. For a new line gently depress the syringe plunger – most lines take 0.9ml. Check the patients name against the label on the syringe.
5. Lift the barrel clamp arm and seat the syringe into the pump. Ensure the scale is facing forward.
6. Lower the barrel clamp arm. Check that the LCD display shows the syringe is correctly positioned and has sensed the correct syringe size and brand.
7. Connect the extension line to the cannula (these have a small dead-space and do not need priming).
8. Check the infusion duration (usually 24hrs). If correct press YES.
9. When LCD panel asks 'Start infusion?' press YES. Set the keypad lock for safety.



True or false?

- | | | |
|---|------|-------|
| 1. Syringe pumps are calibrated in <u>mls</u> per hour | True | False |
| 2. Syringe pumps can use any make and size of syringe | True | False |
| 3. Syringe pumps are waterproof | True | False |
| 4. Some syringe pumps allow a range of infusion rates to be set | True | False |
| 5. Butterfly needles are the best needles to use | True | False |
| 6. The use of IV plastic cannulae inserted subcutaneously reduces local reactions | True | False |

Change

What changes would you make to Mary's medication when you change to a syringe pump?

Oral medication	Change to
morphine as MST 30mg twice daily	⇒
cyclizine 50mg 8-hourly	⇒
senna 2 tablets twice daily	⇒

Reflect

Think about the following

- What helps to decide a good site for the needle?
- Does the length and diameter of the connecting tube matter?
- What about a filter?
- Should I fill the tubing?

FURTHER ACTIVITY: Setting up a portable syringe pump

Find a patient with a syringe pump and see what type was used and where the needle has been sited.

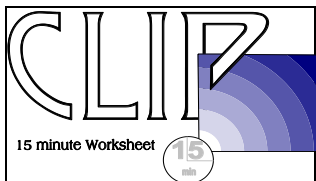
FURTHER READING: Setting up a portable syringe pump

Journal articles

- Anderson SL. Shreve ST. Continuous subcutaneous infusion of opiates at end-of-life. *Annals of Pharmacotherapy*. 2004; **38**(6): 1015-23.
- Barnes L, Westmoreland J, Wilson C. Syringe drivers: standardised protocols to minimise errors. *End of Life Care*, 2009; **3**(3): 43-51.
- Costello J, Nyatanga B, Mula C, Hull J. The benefits and drawbacks of syringe drivers in palliative care. *International Journal of Palliative Nursing*. 2008; **14**(3): 139-44.
- Cruikshank S, Adamson E, Logan J, Brackenridge K. Using syringe drivers in palliative care within a rural, community setting: capturing the whole experience. *International Journal of Palliative Nursing*. 2010; **16**(3): 126-32.
- Frisoli Junior A, de Paula AP, Feldman D, Nasri F. Subcutaneous hydration by hypodermoclysis. A practical and low cost treatment for elderly patients. *Drugs & Ageing*. 2000; **16**(4): 313-9.
- Graham F, Clark D. The syringe driver and the subcutaneous route in palliative care: the inventor, the history and the implications. *Journal of Pain & Symptom Management*, 2005; **29**(1): 32-40.
- Hewitt M, Goldman A, Collins GS, Childs M, Hain R. Opioid use in palliative care of children and young people with cancer. *Journal of Pediatrics*, 2008; **152**(1): 39-44.
- Khan M, Younger G. Promoting safe administration of subcutaneous infusions. *Nursing Standard*. 2007; **21**(31): 50-6.
- McLeod F, Flowers C. A practical guide for nurses in diluent selection for subcutaneous infusions using a syringe driver. *International Journal of Pall Nursing*. 2006; **12**(12): 558-65.
- Nelson KA, Glare PA, Walsh D, Groh ES. A prospective, within-patient, crossover study of continuous intravenous and subcutaneous morphine for chronic cancer pain. *Journal of Pain & Symptom Management*. 1997; **13**(5): 262-7.
- NHS National Patient Safety Agency. Safer ambulatory syringe drivers. *Rapid Response Report* 16 December 2010; NPSA/2010/RRR019.
- O'Doherty CA, Hall EJ, Schofield L, Zeppetella G. Drugs and syringe drivers: a survey of adult specialist palliative care practice in the United Kingdom and Eire. *Palliative Medicine*. 2001; **15**(2): 149-54.
- Pirello RD, Chen CT, Thomas SH. Initial experiences with subcutaneous recombinant human hyaluronidase. *Journal of Palliative Medicine*. 2007; **10**(4): 861-5.
- Ross JR, Saunders Y, Cochrane M, Zeppetella G. A prospective, within-patient comparison between metal butterfly needles and Teflon cannulae in subcutaneous infusion of drugs to terminally ill hospice patients. *Palliative Medicine*. 2002; **16**(1): 13-6.
- Schneider J, Good P, Ravenscroft P. Effect of tubing on loss of clonazepam administered by continuous subcutaneous infusion. *Journal of Pain and Symptom Management*. 2006; **31**(6): 563-7.
- Shaw S, Meek F. Thinking about nursing practice and culture: syringe drivers. *International Journal of Palliative Nursing*. 2007; **13**(10): 490-3.
- Torre MC. Subcutaneous infusion: non-metal cannulae vs metal butterfly needles. *British Journal of Community Nursing*. 2002; **7**(7): 365-9.
- Watanabe S, Pereira J, Tarumi Y, Hanson J, Bruera E. A randomized double-blind crossover comparison of continuous and intermittent subcutaneous administration of opioid for cancer pain. *Journal of Palliative Medicine*. 2008; **11**(4): 570-4.
- Wilcock A, Jacob JK, Charlesworth S, Harris E, Gibbs M, Allsop H. Drugs given by a syringe driver: a prospective multicentre survey of palliative care services in the UK. *Palliative Medicine*, 2006; **20**(7): 661-4.

Further resources

- e-lfh: e-Learning for Healthcare* contains a range of online self-learning programmes, including several relating to end-of-life care (e-elca). Registration is required but is free. <http://www.e-lfh.org.uk/projects/e-elca/index.html>
- The Syringe Driver: continuous subcutaneous infusions in palliative care, 2nd ed Dickman A, Schneider J. Oxford: OUP, 2005.
- Oxford Textbook of Palliative Medicine* 4th ed. Hanks G, Cherny NI, Christakis NA, Fallon M, Kaasa S, Portenoy RK. eds. Oxford: Oxford University Press, 2010.
- PCF6- *Palliative Care Formulary*, 6th ed. Twycross RG, Wilcock A, Howard P. www.palliativedrugs.com



Current Learning in Palliative care
An accessible learning programme for health care professionals

15 minute worksheets are available on:

- An introduction to palliative care
- Helping the patient with pain
- Helping the patient with symptoms other than pain
- Moving the ill patient
- Psychological and spiritual needs
- Helping patients with reduced hydration and nutrition
- Procedures in palliative care
- Planning care in advance
- Understanding and helping the person with learning disabilities
- The last hours and days
- Bereavement

Available online on
www.clip.org.uk