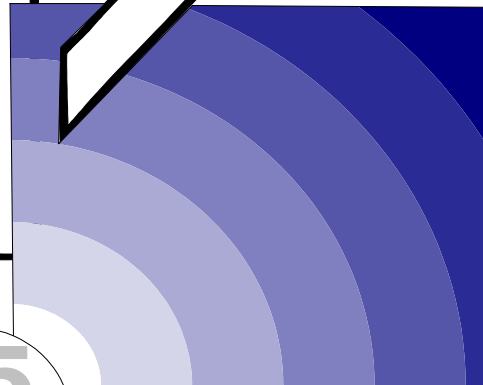
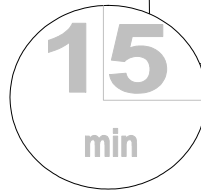


CLIP

15 minute Worksheet



Procedures in Palliative Care

2: Problems with a subcutaneous infusion

Intermediate level

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Aim of this worksheet

To understand how to sort out problems a subcutaneous infusion

How to use this worksheet

- You can work through this worksheet by yourself, or with a tutor.
- Read the case study below, then work on the questions overleaf.
- The work page is on the right side, the information page is on the left.
- Work any way you want: you can try answering from your own knowledge (in which case fold over the information page), you can use the information page (this is not cheating- you learn as you find the information), or you can use other sources of information
- It should take you about 15 minutes. If anything is unclear, discuss it with a colleague.
- If you think any information is wrong or out of date let us know
- Use the activity on the back page and take this learning into your workplace

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 oral morphine, but because she was troubled with nausea and vomiting it was decided to give her drugs as a 24hour subcutaneous infusion through a syringe driver.

The infusion has been running well for the past three days, but today her pain and nausea have returned.

Types of subcutaneous (SC) infusion

There are two types:

Drug infusions: these use syringe drivers to deliver drugs. The infusions usually last 24 hours (using daily pumps such as the Graseby MS26 pump), but occasionally are done over 1-4 hours (using hourly pumps such as the Graseby MS16 pump). See CLiP worksheet on *Setting up a Syringe Driver*.

SC hydration (hypodermoclysis): this infuses up to 2litres/24 hours of rehydration fluids. No pumps are used, only gravity. See CLiP worksheet on *Non Oral Routes*.

Problems with syringe drivers

The best way is to start at the pump and think through the possible problems:

Pump: rundown batteries (*Action-* replace); pump switched off due to back pressure caused by blockage (*Action-* clear the blockage by checking connecting tubing and cannula as below); pump failure- a rare cause (*Action-* replace pump).

Syringe: this may have become dislodged. *Action-* put back in position.

Connecting tubing: this may leak (a break or disconnection) or may have become blocked (due a kink or drug precipitation). *Action-* reconnect or replace tubing.

Cannula: this can become blocked through blood, or because of drug precipitation.
Action- replace the cannula.

Problems with subcutaneous sites

Several problems can occur:

Inflammation: this is usually due to drug irritation (chlorpromazine, diazepam and prochlorperazine should not be used subcutaneously because of skin irritation). Metal butterfly needles are more likely to cause local irritation than plastic cannula. Action: change to a new site, consider changing to a plastic cannula.

Infection: this is unusual but is likely if there is a clear area of spreading cellulitis around the infusion.
Action: change to a new site. The infection may need systemic flucloxacillin.

Leakage of drug from the infusion site: this can happen with older sites (7 days or more) even in the absence of inflammation. Action: change to a new site.

Bleeding from the infusion site: this can occur on insertion but stops within minutes. If it persists this may be due to a coagulation disorder:

Action: -if bleeding stops within minutes of insertion, flush cannula with 1ml 0.9% saline, then start infusion.
-if bleeding persists or starts in an established site, exclude a coagulation disorder and consider alternative routes of drug administration.

Swelling: this is common in subcutaneous infusions and a mild swelling only needs observation. Infusions for hydration can cause uncomfortable swelling if the wrong sites are used such as the thigh or upper chest. The upper back is the best site for large volumes.

Action: observe if mild, otherwise change site.

Problems with drugs

Licensed and unlicensed use: diamorphine, hyoscine hydrobromide and levomepromazine (methotrimeprazine) are the only drugs licensed for subcutaneous administration. However 'licensed' means a license for marketing. It is now accepted in the UK that it is acceptable to use unlicensed routes or purposes *if* there is documented evidence that this is an acceptable and safe practice.

There is now extensive experience of using the following drugs safely by the SC route:

cyclizine, dexamethasone, insulin, erythropoietin, haloperidol, heparin, hydromorphone, hyoscine butylbromide, hyoscine hydrobromide, levomepromazine, midazolam, metoclopramide and octreotide..

Experience is growing in the use of other drugs by the SC route such as fentanyl, ketamine and oxycodone

Drug incompatibility: if this results in precipitation, then this can cause blockage. This may be seen as a cloudiness in the syringe, or small crystals on the walls of the syringe. Most of the drugs used in syringe drivers are compatible with each other. The main exception cyclizine which is incompatible with many drugs.

However, the absence of precipitation does not mean that drugs are compatible and if possible it is best to limit the number of drugs in a syringe to two. Other drugs can be given by other routes (eg. PR) or those that are long acting can be give once daily (eg. haloperidol or levomepromazine).

See www.palliativedrugs.com for current compatibility data.

Reflect

What should you check and what would you do about it?
 (Hint: start at the skin)

Area to check	Possible problem(s)	Action
Pump		
Syringe		
Connecting tubing		
Cannula		
Skin		

Write

What drugs are suitable for subcutaneous administration?

Ring those drugs that *should not* be used subcutaneously

- | | | |
|--|-----------------------|----------------|
| chlorpromazine | diamorphine | haloperidol |
| hyoscine butylbromide | hyoscine hydrobromide | metoclopramide |
| cyclizine | prochlorperazine | midazolam |
| levomepromazine
(methotrimeprazine) | dexamethasone | diazepam |

Only three of these drugs are licensed for subcutaneous infusion.
Underline these three drugs.

Mary becomes much more settled on her syringe driver. You are called one evening, however, because her pain and nausea have returned once more and the nurse has noticed a cloudiness to the syringe contents.

Q What do you think has happened?

FURTHER ACTIVITY: Problems with a subcutaneous infusion

Look at each part of a subcutaneous infusion on a patient

-what problems could occur?

FURTHER READING: Problems with a subcutaneous infusion

Journal articles

Bruera E. Neumann CM. Pituskin E. Calder K. Hanson J. A randomized controlled trial of local injections of hyaluronidase versus placebo in cancer patients receiving subcutaneous hydration. *Annals of Oncology*. 1999; **10**(10): 1255-8.

Donnelly M. The benefits of hypodermoclysis. *Nursing Standard*. 1999; **13**(52): 44-5.

Frisoli Junior A. de Paula AP. Feldman D. Nasri F. Subcutaneous hydration by hypodermoclysis. A practical and low cost treatment for elderly patients. *Drugs & Aging*. 2000; **16**(4): 313-9.

Fudin J. Smith H S. Toledo-Binette C S. Kenney E. Yu A B. Boutin R. Use of continuous ambulatory infusions of concentrated subcutaneous (s.q.) hydromorphone versus intravenous (i.v.) morphine: cost implications for palliative care. *American Journal of Hospice & Palliative Care*. 2000; **17**(5): 347-53.

Hunt R. Fazekas B. Thorne D. Brooksbank M. A comparison of subcutaneous morphine and fentanyl in hospice cancer patients. *Journal of Pain & Symptom Management*. 1999; **18**(2): 111-9.

Jain S. Mansfield B. Wilcox MH. Subcutaneous fluid administration--better than the intravenous approach?. *Journal of Hospital Infection*. 1999; **41**(4): 269-72.

Negro S. Azuara ML. Sanchez Y. Reyes R. Barcia E. Physical compatibility and in vivo evaluation of drug mixtures for subcutaneous infusion to cancer patients in palliative care. *Supportive Care in Cancer*. 2002; **10**(1): 65-70.

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.

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 Ireland. *Palliative Medicine*. 2001; **15**(2): 149-54.

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.

Torre MC. Subcutaneous infusion: non-metal cannulae vs metal butterfly needles. *British Journal of Community Nursing*. 2002; **7**(7): 365-9.

Resource books and websites

Regnard C, Hockley J. *A Clinical Decision Guide to Symptom Relief in Palliative Care*, 5th ed, 2003. Abingdon: Radcliffe Medical Press

Information on palliative drugs: www.palliativedrugs.com

Symptom Management in Advanced Cancer, 3rd edition. 1997. Twycross RG. Abingdon: Radcliffe Medical Press.

The Oxford Textbook of Palliative Medicine, 3rd edition. 2002. Calman K, Hanks GWC and Doyle D, eds. Oxford: Oxford Medical Publications.

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

Fifty seven 15 minute worksheets are available on:

- An introduction to palliative care (3 worksheets)
- Helping the patient with pain (9 worksheets)
- Helping the patient with symptoms other than pain (11 worksheets)
- Moving the ill patient (2 worksheets)
- Psychological needs (8 worksheets)
- Helping patients with reduced hydration and nutrition (8 worksheets)
- Procedures in palliative care (4 worksheets)
- Understanding and helping the person with alternative communication (learning disabilities) (5 worksheets)
- The last hours and days (4 worksheets)
- Bereavement (3 worksheets)

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Helping the Patient with Advanced Disease: a Workbook.

Regnard C. ed.

Oxford: Radcliffe Medical Press www.radcliffe-oxford.com