

Helping the patient with pain

8: Changing opioids

Advanced level

Produced by
St. Oswald's Hospice
Regent Avenue
Gosforth
Newcastle-upon-Tyne
NE3 1EE

Tel: 0191 285 0063
Fax: 0191 284 8004

This version written and
edited by:

Claud Regnard Honorary
consultant in Palliative Care
Medicine at St. Oswald's
Hospice

Phillip Caisley Staff Grade
Doctor, St. Oswald's Hospice

Ellie Bond Senior Doctor,
Adult and Children's Services,
St. Oswald's Hospice

Aim of this worksheet

To understand how to convert from one opioid to the other, looking at dose conversions and routes of administration

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- If you think any information is wrong or out of date let us know.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

Pat is a 36 year old woman, married with two sons aged 12 and 9. She had problems with her bowels for several months before some rectal bleeding made her see her GP. Investigations revealed a carcinoma of the sigmoid colon with liver metastases.

She has been troubled with nausea and vomiting and is finding it hard to keep her tablets down. She has been on oral morphine for several months, but is asking if it can be given any other way.

v22

Potency

The potency of a drug tells you how strong the drug is in comparison with other similar drugs. A potent opioid will need less drug to give the same pain relief as higher doses of a weak opioid.

The opioids listed vary considerably in their potency:

3 strongest: fentanyl, buprenorphine and hydromorphone.

3 weakest: codeine, oral pethidine and tramadol.

Each preparation can be given in different ways:

oral (swallowed): codeine, dihydrocodeine, morphine, dextromoramide, diamorphine, hydromorphone.

sublingual / buccal: buprenorphine, fentanyl.

injection: codeine, morphine, diamorphine, buprenorphine, fentanyl, hydromorphone (special order)

transdermal: fentanyl, buprenorphine.

	Conversion ratio from oral morphine	24 hour dose equivalent	12 hourly dose equivalent	4 hourly dose equivalent and 1/6 th breakthrough dose*	10% of 24hr dose for breakthrough dose *
PO dihydrocodeine, codeine, tramadol	x 10	300mg	n/a	50mg	30mg
PO pethidine	x 8	240mg	n/a	40mg	25mg
PO tapentadol	x 3	90mg	n/a	15mg	10mg
PO morphine	x 1	30mg	15mg	5mg	2.5mg
PO oxycodone	÷ 1.5	20mg	10mg	3 mg	2mg
SC oxycodone	÷ 2	15mg	7.5mg	2.5mg	1.5mg
SC morphine	÷ 2	15mg	7.5mg	2.5mg	1.5mg
SC diamorphine	÷ 3	10mg	5mg	1.1mg	1mg
PO hydromorphone	÷ 5	6mg	3mg	1mg (but 1.3mg is smallest oral dose available)	0.6mg (but 1.3mg is smallest oral dose available)

These conversions are approximations and the dose of the new opioid may have to be adjusted.

* Some teams are using 10% of the 24hr dose as a more cautious calculation for breakthrough doses

30mg oral morphine/24hours

≡ 300mg oral codeine / 24 hours [x 10]

≡ 15mg subcutaneous diamorphine / 24 hours [÷ 3]

≡ 20mg oral oxycodone / 24 hours [÷1.5]

≡ 6mg oral hydromorphone / 24 hours [÷ 5]

For TD fentanyl or buprenorphine, use the manufacturers' tables but the following can be used as a quick check:

total daily dose of oral morphine /day [÷ 3] ≡ dose of fentanyl or buprenorphine in microg/hour.

For Pat, this works out as the equivalent of 20microg/hour TD opioid. This can be done by using a 25microg/hr fentanyl patch or a 20microg/hr buprenorphine patch.

Choice of opioids for Pat

Pat needs an opioid by a non-oral route that is at least as potent (since weaker opioids mean she would have to take a lot of the drug to have the same effect (eg. 60mg morphine = 600mg codeine!)).

There are several opioids you might choose: morphine, diamorphine, oxycodone, hydromorphone, buprenorphine and fentanyl.

Morphine and diamorphine (UK only) are usually the first choices for parenteral use, and both can be given by subcutaneous infusion. Morphine injection is cheaper than diamorphine and units and teams are beginning to make it the first line parenteral strong opioid of choice.

Oxycodone injection is second line to morphine and diamorphine if the patients was already on oral oxycodone. The concentrated oxycodone injection is expensive.

Hydromorphone injection is a good alternative in countries where this is available and can also be given by subcutaneous infusion. It is only available in the UK as an import.

Transdermal fentanyl or 4 buprenorphine: the time to reach a steady blood level is unpredictable, but can be as much as 14 hours. Consequently it is best *not* to give the last dose of controlled release opioid with the first patch, and cover any pain with instant-release preparations.

Efficacy of opioids

This defines how effective a drug is, regardless of dose. It is not the same as potency. For example, parenteral morphine is more potent than oral morphine, but it is not more effective. So, Pat's pain would NOT be better relieved by changing to a more potent opioid or route.

Changing opioids would be easy IF all opioids had the same potency, range of adverse effects and were available by the same routes of administration. **Life is never that simple!**
 We will now look at changing doses and routes (for differences between opioids see CLiP worksheet 6 *Alternatives to Morphine*)

Choose

From this list of oral opioids, choose the 3 strongest, and the 3 weakest (the list is in alphabetical order, so no clue there!)

- buprenorphine
- codeine
- dextromoramide
- diamorphine
- dihydrocodeine,
- fentanyl
- hydromorphone
- morphine
- oral pethidine
- tramadol

3 strongest

3 weakest

Write

Next to the list above, write the routes of administration available
 O = oral, SL = sublingual, I = injection (subcutaneous, intravenous, or intramuscular) D = transdermal

Calculate

Pat is on 60mg of morphine daily

Check the table opposite and write in the equivalent daily dose of other opioids

Opioid	Dose per day
codeine (oral)	mg
oxycodone (oral)	mg
diamorphine (subcutaneous)	mg

Opioid	Dose per day
Hydromorphone (oral)	mg

Opioid	Dose in microg/hour
fentanyl (transdermal)	microg/hr

Reflect

Now think about the available routes of administration for these opioids. Which opioids could you use in Pat?

Ask a colleague

Finally- if you gave Pat a more potent (stronger) opioid, would her pain be better relieved?

FURTHER ACTIVITY: Changing opioids

- Find a patient on dihydrocodeine. Using the conversion chart on page 2, calculate how much daily oral morphine they would need.
- Find a patient on morphine. Using the conversion chart on page 2, calculate how much daily subcutaneous morphine they would need

FURTHER READING: Changing opioids

Journal articles

Clark AJ, Ahmedzai SH, *et al.* Efficacy and safety of transdermal fentanyl and sustained-release oral morphine in patients with cancer and chronic non-cancer pain. *Current Medical Research & Opinion.* 2004; **20**(9): 1419-28.

Fallon M, Cherny NI, Hanks G. Opioid analgesic therapy. In: *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, p661-98.

Hanks GW. *et al.* Expert Working Group of the Research Network of the European Association for Palliative Care. Morphine and alternative opioids in cancer pain: the EAPC recommendations. *British Journal of Cancer.* 2001; **84**(5): 587-93.

Kirvela M, Lindgren L, Seppala T, Olkkola KT. The pharmacokinetics of oxycodone in uremic patients undergoing renal transplantation. *Journal of Clinical Anesthesia.* 1996; **8**(1):13-8.

Mazoit JX, Sardouk P, Zetlaoui P *et al.* Pharmacokinetics of unchanged morphine in normal and cirrhotic patients. *Anaesthesia and Analgesia,* 1987; **66**: 293-98.

Medicines and Healthcare Products Regulatory Agency. Fentanyl patches: serious and fatal overdose from dosing errors, accidental exposure and inappropriate use. *Drug Safety Update.* 2008; **2**(2): 2–3.

Nicholson AB. Methadone for cancer pain. *Cochrane Database of Systematic Reviews.* 2007; **4**: CD003971.

Nugent M, Davis C, Brooks D, Ahmedzai SH. Long-term observations of patients receiving transdermal fentanyl after a randomized trial. *Journal of Pain and Symptom Management.* 2001; **21**(5): 385-91.

Portenoy RK, Thaler HT, Inturrisi CE *et al.* The metabolite morphine-6-glucuronide contributes to the analgesia produced by morphine infusion in patients with pain and normal renal function. *Clinical Pharmacology and Therapeutics* 1992; **51**: 422-431.

Regnard C, Pelham A. Severe respiratory depression and sedation with transdermal fentanyl: four case studies. *Palliative Medicine.*2003; **17**: 714–16.

Saarto T, Wiffen PJ. Antidepressants for neuropathic pain. *Cochrane Database of Systematic Reviews.* 2007; **4**: CD005454.

Further resources

A Guide to Symptom Relief in Palliative Care, 6th ed. Regnard C, Dean M. Oxford: Radcliffe Medical Press, 2010

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>

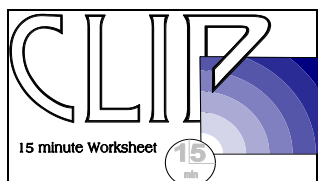
PCF6- Palliative Care Formulary, 6th ed. Twycross RG, Wilcock A, Howard P. www.palliativedrugs.com

Twycross RG. (1999) *Morphine and the Relief of Cancer Pain: information for patients, families and friends.* Beaconsfield: Beaconsfield Publishers.

Oxford Textbook of Palliative Medicine 4th ed. Hanks G, Cherny NI, Christakis NA, Fallon M, Kaasa S, Prtenoy RK. eds. Oxford : Oxford University Press, 2010.

Symptom Management in Advanced Cancer, 4th edition. Twycross RG, Wilcock A, Stark-Toller C. Oxford: Radcliffe Press, 2009

Wall and Melzack's Textbook of pain, 5th ed. McMahon SB, Koltzenburg M, eds. Edinburgh : Elsevier Churchill Livingstone, 2005.



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