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Opioid Conversions

Workbook

Opioid Conversions - workbook

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Useful websites

ANZCA Opioid Calculator	http://www.opioidcalculator.com.au/index.html
Safer Care Victoria	All clinical networks Safer Care Victoria

Disclaimer:

Completion of this workbook does not constitute competency in opioid rotation/conversion. All medication doses should be checked and prescribed by a medical doctor or nurse practitioner with appropriate experience in opioid prescribing.

Staff must adhere to all legislative and professional requirements including EPC policies and procedures regarding opioid medications and their administration. All medications must be recorded in the PalCare file (medication list and care plan when changes are occurring).

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Introduction

Knowledge of how to convert between different types of opioids is an expected skill of community palliative care nurses. This skill takes time, practice and much support from senior palliative care staff. New palliative care nurses should always consult with either the palliative care physician, Clinical Nurse Consultant (CNC) or Nurse Practitioner (NP) when undertaking opioid conversions or if they feel an opioid rotation is needed.

This workbook is aimed at assisting new palliative care nurses to develop the basics of opioid conversions and understand what is involved in an opioid rotation.

Opioid rotation is generally considered when a patient's symptoms are insufficiently responding to their current opioid, but an increase of their current opioid is inappropriate due to:

1. Tolerance to present opioid
2. Poorly controlled symptoms
3. Inability to swallow/deteriorating condition
4. Conditions that impair metabolism of certain opioids
5. Intolerable to side effects

There are many different formulations of opioids with varying equivalent opioid doses and each bind to receptors in different ways. This means that often different doses of different opioids are required to achieve the same analgesic effect. Opioid conversion charts are used to calculate new doses of opioids.

Conversion versus Rotation

It is important for new palliative care nurses to be aware that this workbook is designed to provide an overview of the process of **opioid conversion** and rotation but completion of the workbook does not constitute competency in opioid rotation/conversion.

Any decisions around **opioid rotations** should be made in consultation with senior palliative care staff.

Important Considerations / Points to Remember

- The information contained in this guide is based on the current (2021) Safer Care Victoria Opioid Guidelines. If using this guide later than 2022 the reader should check that guidelines/ratios have not been updated.
- Opioid conversion charts are a GUIDE only. Opioid conversions need to be tailored to the individual patient (See page 9 for considerations).

Common Types of Opioids Used in Palliative Care

- Morphine
- Oxycodone
- Hydromorphone
- Fentanyl
- Buprenorphine

Less Commonly Used Opioids Used in Palliative Care

Other less commonly used opioids in palliative care are:

- Codeine
- Tapentadol
- Methadone
- Tramadol

Formulations / Strengths of Opioids

Below is a list of frequently used opioid formulations in palliative care:

<u>Generic Name</u>	<u>Long-acting agents</u>	<u>Short acting agents</u>
Morphine	MS Contin tabs 5, 10, 15, 30, 60, 100, 200mg MS Mono caps 30, 60, 90, 120mg Kapanol caps 10, 20, 50, 100mg	Oral morphine liquid 2, 5mg/ml Sevredol tabs 10, 20mg Anamorph tabs 30mg
Oxycodone	Oxycontin tabs 10, 15, 20, 30, 40, 80mg Targin tabs (oxycodone/ naloxone) 5/2.5, 10/5, 20/10, 40/20mg	Endone tabs 5mg Oxynorm caps 5, 10, 20mg and liquid 1,10mg/ml
Methadone	Physeptone tabs 10mg, Aspen Methadone Syrup and Biodone Forte 5mg/mL oral liquid x 200mL bottle	
Fentanyl	Durogesic patch 12, 25, 50, 75, 100mcg/hr	Abstral 100, 200, 300, 400, 600, 800 mcg
Hydromorphone		Dilaudid tabs 2, 4, 8mg and liquid 1mg/ml
Buprenorphine	Norspan patches 5, 10, 15,29 ,25, 30,40 mcg/hr	Temgesic sublingual tabs 200mcg and 400mcg
Tramadol	Tramal SR tabs 100, 150, 200mg Durotram XR 100, 200, 300mg	Tramal caps 50mg

Basic Steps For Opioid Conversions

1. **Check** the 'Have I considered?' list on page 9, before starting conversions. Note any recommendations and choose opioids with these considerations in mind.
2. **Convert** all the opioid doses back to oral morphine (See tables on pages 6 - 8)
3. **Calculate** the total 24-hour use of opioid (using the oral morphine equivalent). Add all opioids together (to give a total daily dose of oral morphine equivalent). Can include breakthrough analgesia but no more than 3-4 breakthrough doses for 24-hours and only if used to alleviate background pain. Do not include breakthrough medication for incident pain of used for dyspnea management. Many palliative care specialists don't include any breakthrough doses when rotating opioids so please feel free to discuss with an EPC doctor or NP if considering an opioid rotation.
4. **Dose reduce** the daily total by approx. 25%- 50% with the assumption that the client will be less tolerant to the new drug, and therefore requires a smaller dose.

For patients with no considerations in STEP 1
Dose reduced by 25% (multiply by 0.75)

For patients with liver or kidney disease, rotating from Targin or who are elderly
Dose reduced by 50% (Multiply by 0.50)
5. **Convert** to the new opioid

Use the tables on pages 5, 6 and 7 to calculate the required 24-hour opioid-equivalent dose.
6. **Calculate** the appropriate slow-release dose

For twice daily slow-release opioid dose (MS Contin, Oxycontin, Targin). Divide by two (2).

For a patch, refer to daily equivalent dose

If the slow-release dose calculated is more than the available formulation, the dose needs to be rounded to closest formulation. More often rounded down than up. This however is patient specific.
7. **Calculate the breakthrough dose**

Divide total daily opioid dose by 6-12. At EPC, the breakthrough dose is usually 1/6 of the total opioid dose.

Beginners Conversion Guides

Contained in this guide are the opioid conversion guidelines for Eastern Palliative Care. Added to the standard guides are a 'To convert' column and a 'Result should be' column. The 'To convert' column outlines the equation you need to use to make your conversion and the 'Result should be' column provides an idea of whether your conversion should be bigger or smaller than the original opioid.

If there is a range in the ratio conversion suggested, generally choose the safer number which is in bold. This means when converting to oral morphine, use the smaller option; but when converting from oral morphine, use the larger option. In the tables below, the safer options is in **bold**.

OTHER ORAL OPIOIDS TO ORAL MORPHINE

FROM ORAL	TO ORAL	RATIO	TO CONVERT	EXAMPLE	Result should be
Hydromorphone	Morphine	1:5	Multiply by 5	Hydromorphone 1mg = oral morphine 5mg	Bigger
Oxycodone	Morphine	1:1.5	Multiply by 1.5	Oral Oxycodone 10mg = Oral morphine 15mg	Bigger
Tapentadol	Morphine	3:1	Divide by 3	Oral Tapentadol 300mg = Oral morphine 100mg	Smaller
Tramadol	Morphine	5:1 to 10:1	Divide by 5- 10	Oral Tramadol 100mg = Oral morphine 10mg-20mg	Smaller

ORAL MORPHINE TO OTHER ORAL OPIOIDS

FROM ORAL	TO ORAL	RATIO	TO CONVERT	EXAMPLE	Result should be
Morphine	Hydromorphone	5:1	Divide by 5	Oral morphine 5mg = Oral Hydromorphone 1mg	Smaller
Morphine	Oxycodone	1.5:1	Divide by 1.5	Oral morphine 15mg = Oral Oxycodone 10mg	Smaller
Morphine	Tapentadol	1: 3	Multiply by 3	Oral morphine 100mg = Oral Tapentadol 300mg	Bigger
Morphine	Tramadol	1:5 to 1:10	Multiply by 5-10	Oral morphine 10mg = Oral Tramadol 50mg-100mg	Bigger

ORAL TO SUBCUTANEOUS (SC) OF THE SAME DRUG

FROM ORAL	TO SC	RATIO	SUM	EXAMPLE	Result should be
Morphine	Morphine	2:1 to 3:1	Divide by 2-3	Oral morphine 30mg = SC Morphine 10mg-15mg	Smaller
Oxycodone	Oxycodone	1.5: to 2:1	Divide by 1.5-2	Oral Oxycodone 30mg= SC Oxycodone 15mg-20mg	Smaller
Hydromorphone	Hydromorphone	2:1 to 3:1	Divide by 2-3	Oral Hydromorphone 24mg = SC Hydromorphone 8mg – 12mg	Smaller

SUBCUTANEOUS (SC) TO ORAL OF THE SAME DRUG

FROM SC	TO ORAL	RATIO	SUM	EXAMPLE	Result should be
Morphine	Morphine	1:2 to 1:3	Multiply by 2-3	SC morphine 15mg = Oral Morphine 30-45mg	Bigger
Oxycodone	Oxycodone	1:1.5 to 1:2	Multiply by 1.5-2	SC oxycodone 20mg = oral Oxycodone 30mg-40mg	Bigger
Hydromorphone	Hydromorph one	1:2 to 1:3	Multiple by 2-3	SC Hydromorphone 12mg = oral Hydromorphone 24mg-36mg	Bigger

SUBCUTANEOUS (SC) MORPHINE TO OTHER SUBCUTANEOUS (SC) DRUGS

FROM SC	TO SC	RATIO	SUM	EXAMPLE	Result should be
Morphine	Hydromorphone	5:1	Divide by 5	SC morphine 10mg = SC Hydromorphone 2mg	Smaller
Morphine	Oxycodone	1:1		SC morphine 10mg = SC Oxycodone 10mg	Same
Morphine	Fentanyl	75:1	Divide by 75	SC morphine 7.5mg (7500mcg) = Fentanyl 100mcg	Smaller

SUBCUTANEOUS (SC) OTHER DRUGS TO SC MORPHINE

FROM SC	TO SC	RATIO	SUM	EXAMPLE	Result Should be
Hydromorphone	Morphine	5:1	Multiply by 5	SC hydromorphone 2mg = SC morphine 10mg	Bigger
Oxycodone	Morphine	1:1		SC morphine 10mg = SC oxycodone 10mg	Same
Fentanyl	Morphine	75:1	Multiply by 75	SC Fentanyl 100mcg = 7500mcg of morphine (7.5 Morphine SC)	Bigger

TRANSDERMAL FENTANYL PATCH TO MORPHINE

FENTANYL TRANSDERMAL PATCH TO MORPHINE (CONSERVATIVE CONVERSION RATIO)		
Fentanyl (mcg/hr) patch	Oral morphine equivalent (mg/24hr)	Oral morphine breakthrough (mg) (using 1:6 ratio)
12	30	5
25	60	10
37	90	15
50	120	20
75	180	30
100	240	40

BUPRENORPHINE TRANSDERMAL PATCH TO MORPHINE

Buprenorphine patch (mcg/hr)	Oral morphine (mg/24 hours)	SC Morphine (mg/24hours)
5	9-12	3-5
10	18-24	5-8
15	27-36	See note*
20	36-48	12-16
25	45-60	See note*
30	54-72	See note*
40	72-96	See note*

*Note: Information not available from Safer Care Victoria Opioid Conversion Ratio Guideline version February 2021

Have I Considered? List

The metabolism of opioids is affected by many different factors. Before recommending any opioids conversion to a General Practitioner, the following is a list of considerations you need to check.

Does my patient have...

1. **Renal impairment:** (eGFR < 30ml/minute/1.73m²)

- Morphine is excreted by kidneys therefore is poorly tolerated and can accumulate in renal impairment.
- Consider hydromorphone, fentanyl or buprenorphine or starting morphine at a very low dose.

2. **Liver disease:** Liver failure/liver cancer/end stage liver cancer

Oral oxycodone/naloxone (Targin): Oxycodone and naloxone are metabolized in the liver however Naloxone has a high first pass metabolism. In patients with liver impairment, Naloxone is not metabolized the same way and can counteract the oxycodone's analgesic action. Naloxone should not be used in significant liver disease

Consider switching to morphine/hydromorphone and dose reduce by 50% because the patient now has no naloxone blocking the receptors and monitor for side effects.

Avoid oxycodone in severe liver disease

3. **Elderly**

- Older people can often have altered opioid sensitivity and metabolism due to poor renal function and increasing frailty.
- Before choosing an opioid, consider checking the patient's renal function (eGFR). If less than 30ml/min/ 1.73m² consider oral hydromorphone or commencing at a very low dose.
- May need to dose reduce by 50% for the new opioid in elderly clients

Examples

Case Example One

Mrs Smith has liver cancer and is taking Oxycontin 40mg/20mg BD. She is using Oral morphine 5mg as PRN breakthrough medication is using 6 per day for breakthrough background pain. Mrs Smith's pain remains poorly controlled and in consultation with the Palliative Care Physician, you decide to rotate to MS Contin.

Calculate the appropriate dose of MS Contin and Oral morphine liquid as breakthrough medication. Use the 7 steps method.

1.	Check 'Have you considered?' list	Mrs Smith has liver impairment and is using Targin, meaning a 50% dose reduction is needed
2.	Convert all opioids to oral	Oral morphine liquid 5mg x 4 = 20mg oral morphine Targin 40mg BD = 80mg Oxycodone daily 80 mg Oxycodone x 1.5 = 120mg oral morphine
3.	Calculate 24-hour opioid usage	120mg + 20mg = 140mg oral morphine over 24 hours
4.	Dose reduce	50% in this case because of liver impairment 140mg x 0.50 = 70mg oral morphine
5.	Convert to new opioid	Not required
6.	Calculate sustained release opioid dose	70mg divided by 2 = 35mg oral morphine Choose the closest lowest dose equivalent 35mg of MS Contin BD
7.	Calculate break through medication dose	70mg of oral morphine divided by 6 = 11.67mg oral morphine = 10mg PRN oral morphine

Case Example Two

Mr Black has end-stage renal failure. He has previously been using 10mg Oxycontin BD and using 5-6 doses of Endone 5mg for breakthrough background pain per day. Mr Black's pain is still poorly controlled and the GP asked you recommend a fentanyl patch dose. Calculate the correct fentanyl patch to recommend.

1.	<i>Check 'Have you considered list'</i>	Renal impairment therefore not appropriate for morphine.
2.	<i>Convert all opioids to oral morphine</i>	10mg Oxycontin BD = 20mg daily x1.5= 30mg oral morphine
		5mg Endone x4 = 20mg Endone 20mg x1.5= 30mg oral morphine
3.	<i>Calculate 24-hour opioid usage</i>	30mg oral morphine + 30mg oral morphine= 60mg oral morphine
4.	<i>Dose reduce</i>	By 50% = 0.50 x 60mg = 30mg oral morphine
5.	<i>Convert to new opioid</i>	30mg oral morphine closest to range of 12mcg/hr fentanyl patch.
6.	<i>Calculate slow-release patch dose</i>	
7.	<i>Calculate the Break Through Medication dose</i>	30mg divided by 6 = 5mg oral morphine Given the patient has end stage renal failure, hydromorphone is more appropriate than morphine Therefore, 5mg oral morphine divided by 5 to convert to hydromorphone =1mg hydromorphone PRN

Case Example Three

Mr Green has metastatic Non-Small Cell Lung Cancer (NSCLC). He has had escalating opioid doses under the supervision of EPC. He is now on MS Contin 60mg BD with Ordine 20mg breakthrough medication. He is using 3-4 per day breakthroughs for incident pain but his pain is still poorly controlled. You have decided that a rotation to oxycodone is appropriate.

- Calculate the appropriate dose of slow release and immediate release oxycodone
- What dose of subcutaneous morphine should be recommended?

1.	<i>Check 'Have you considered list'</i>	Nil considerations
2.	<i>Convert all opioids to oral morphine</i>	MS Contin and Oral morphine liquid are already in oral morphine format
3.	<i>Calculate 24-hour opioid usage</i>	MS Contin 60mg x 2= 120mg oral morphine Do not include breakthroughs as it is being used for incidental pain
4.	<i>Dose reduce</i>	Dose reduced by approx. 25% 120 x 0.75 = 90mg oral morphine

5.	Convert to the new opioid	Use the opioid conversion chart to convert to the required oral equivalent 90mg oral morphine divided by 1.5 = 60mg oxycodone
6.	Calculate the appropriate slow-release dose	Oxycontin in taking twice daily. 60mg divided by two is 30mg 30mg oxycontin BD
7.	Calculate Break Through Medication dose	60mg/6= 10mg oxycodone
7b.	Convert from ORAL oxycodone to SC morphine	10mg of oral oxycodone to oral morphine x1.5 = 15mg oral morphine To convert to SC divide by 3 = 5mg SC morphine PRN

Practice Questions

Convert

1. When converting from oral hydromorphone to SC hydromorphone please use the 3:1 conversion ratio

a) 80mg oral oxycodone to oral morphine
b) 30mg oral morphine to subcutaneous morphine
c) 100mg oral morphine to oral hydromorphone
d) 60mg oral hydromorphone to subcutaneous hydromorphone
e) 30mg subcutaneous morphine to subcutaneous hydromorphone

2. Mrs Brown has pancreatic cancer. She is now in a terminal phase and can no longer swallow. She is in pain and will require a syringe driver. She is currently taking Oral morphine liquid 5mg prn and using 2 per day for breakthrough background pain and also taking MS Contin 20mg BD. Calculate the appropriate dose of SC morphine that will go into an infusion and the SC breakthrough dose.

Step 1	Check 'Have you considered list'	
Step 2	Convert all opioids to oral morphine	
Step 3	Calculate 24-hour opioid usage	
Step 4	Dose reduce	NB: No opioid rotation is occurring
Step 5	Convert to new opioid	
Step 6	Calculate appropriate slow-release dose	2a. Subcutaneous dose in the infusion =
Step 7	Calculate Break Through Medication dose	2b. Calculate what doses of subcutaneous PRN morphine should be

3. Mrs Xi is 30 and has liver cancer. She has been taking a combination of Oxynorm 10mg and Oral morphine liquid 5mg for breakthrough background pain. She is currently on a Targin 40mg/20mg BD but her pain is poorly controlled. In the past 24 hours she has used x3 Oxynorm break through doses and x1 dose of Ordine. You have decided to rotate her to an oxycodone slow release (oxycontin) and immediate release.

Calculate the appropriate dose of Oxycontin and oxycodone IR tablet to recommend.

Step 1	Check 'Have you considered list'	
Step 2	Convert all opioids to oral morphine	
Step 3	Calculate 24-hour opioid usage	
Step 4	Dose reduce	
Step 5	Convert to new opioid	
Step 6	Calculate appropriate slow release dose	3a. Calculate the slow-release dose
Step 7	Calculate Break Through Medication dose	3b. Calculate what doses of oral PRN oxycodone should be recommended

4. Ms Orange is a 40 with Motor Neurone Disease. She is taking Oxycontin 30mg BD and using 2-3 Oxynorm 10mg PRN for incidental pain. She is having difficulty swallowing and the general practitioner has recommended a switch to a Fentanyl patch and Oral morphine liquid. Using the step method, calculate the appropriate strength of patch to recommend and dose of Oral morphine liquid for breakthrough.

Step 1	Check 'Have you considered list'	
Step 2	Convert all opioids to oral morphine	
Step 3	Calculate 24-hour opioid usage	
Step 4	Dose reduce	
Step 5	Convert to new opioid	
Step 6	Calculate appropriate slow-release dose	4a. Calculate the appropriate strength of patch
Step 7	Calculate Break Through Medication dose	4b. Calculate the appropriate dose of Oral morphine liquid to recommend

Self-Assessment -Answers

1a	$80\text{mg} \times 1.5 = 120\text{mg}$ oral morphine
1b	30mg oral morphine / 3 = 10mg SC morphine
1c	$100\text{mg} / 5 = 20\text{mg}$ oral Hydromorphone
1d	$60\text{mg}/3 = 20\text{mg}$ SC Hydromorphone
1e	$30\text{mg}/ 5 = 6\text{mg}$ SC Hydromorphone
2a	$20\text{mg} \times 2 = 40\text{mg} + 5\text{mg} \times 2 = 50\text{mg}$ oral morphine 50mg oral morphine/3= 16.7mg SC morphine Rounded down to 15mg over 24/24 in a syringe driver
2b	<u>Break through subcut doses</u> $15\text{mg}/ 6 = 2.5\text{mg}$ Rounded to the nearest appropriate dose = 2.5mg SC morphine
3	Patient has liver disease therefore dose reduced by 50% Targin $40\text{mg}/20\text{mg} \times 2 = 80\text{mg}$ Oxycodone Oxynorm $10\text{mg} \times 3 = 30\text{mg}$ Oxycodone IN TOTAL 110mg Oxycodone plus 5mg morphine (Ordine) 110mg Oxycodone $\times 1.5 = 165\text{mg}$ oral morphine 165mg oral morphine plus 5mg oral morphine = 170mg oral morphine/24 hour Dose reduced by 50% = $170 \times 0.5 = 85\text{mg}/1.5$ to convert to oxycodone = 56.67mg oxycodone
3a	SR oxycodone is twice daily formulation. $56\text{mg}/2 = 28\text{mg}$ 28mg oxycontin BD is closest to oxycontin 30mg BD
3b	Break through medication (BTM) $56\text{mg} / 6$ doses = 9.3mg BTM is 10mg oxycodone
4	No factors to consider STEP 2: oxycontin 30mg BD= 60mg Oxycodone STEP 3: $60\text{mg} \times 1.5 = 90\text{mg}$ morphine over 24 hours STEP 4: Dose reduce by 25% for oral morphine ($90 \times 0.75\text{mg} = 67.5\text{mg}$ oral morphine)
4a	STEP 5: 67.5mg morphine is therefore appropriate to switch to a $25\text{mcg}/\text{hr}$ Fentanyl patch
4b	$67.5\text{mg}/6$ doses = 11.25mg Use 10mg Ordine