

Metro South Palliative Care Service (MSPCS) Opioid Rotation/Conversion Learning Package

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This document was developed by Clive Eakin Palliative Care Staff Specialist in conjunction with Metro South Palliative Care Service Education Steering Committee. Acknowledgement to Professor Liz Reymond's Guidelines for Converting Opioids.

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Contents

Introduction	3
Opioids Most Commonly Used by MSPCS that May Require Rotation	3
Opioids Less Commonly Used by MSPCS that May Require Rotation	3
Preparations of the Opioids Commonly Used by MSPCS	4
MORPHINE	4
OXYCODONE	5
FENTANYL.....	6
BUPRENORPHINE	6
HYDROMORPHONE	7
MSH Prescribe Information	8
PalliMEDS App	9
Breakthrough PRN Dosage	9
MSPC Opioid Conversion/Rotation Guideline	10
Table A	10
Table B	11
Case Study Examples of Opioid Conversion	12
Case Study One	12
Case Study Two	13
Assessment Quiz	14
Additional Assessment Questions	15
Opioid Rotation/Conversion Learning Package Solutions	16
Assessment Quiz Solutions.....	16
Additional Assessment Question Solutions.....	17

Introduction

Opioids are commonly used to control severe pain in palliative patients with both malignant and non-malignant terminal illnesses.

Opioids come in a variety of preparations including oral, transdermal and parenteral and vary widely in their potency depending on their composition.

Opioids are Schedule 8 (Controlled Drug) medicines with strict legislative controls. Only appropriately qualified Medical Practitioners or Nurse Practitioners can prescribe them

Opioid rotation/conversion may be required when:

- a) Patient is allergic to a certain opioid
- b) Patient has become intolerant to their current opioid
- c) Patient's pain remains poorly controlled despite titration of the current opioid dose
- d) Patient is unable to continue to take the opioid in its current form, e.g. no longer able to swallow oral medications requiring conversion to the parenteral route most commonly subcutaneous infusion via a Syringe Driver (Niki Pump)

Opioid rotation may be of the same medicine to a different form (e.g. oral morphine to subcutaneous Morphine), to a different opioid in the same form (e.g. oral Morphine to oral Hydromorphone) or to a different opioid in a different form (e.g. Fentanyl patch to subcutaneous Hydromorphone).

Opioids Most Commonly Used by MSPCS that May Require Rotation

- Morphine
- Oxycodone
- Fentanyl
- Hydromorphone
- Buprenorphine

Opioids Less Commonly Used by MSPCS that May Require Rotation

- Codeine
- Tramadol
- Tapentadol
- Methadone (special case - complex conversion requiring a hospital admission)

Preparations of the Opioids Commonly Used by MSPCS

MORPHINE			
Preparation	Route	Pack	Comment
Ordine Liquid	Oral	2/5/10mg/mL 200mL BOTTLE	Immediate Release (IR) For pain and also useful for breathlessness
Sevredol Tablet	Oral	10/20mg TABLET	Immediate Release (IR) Tablet form if unable to tolerate ordine taste
MS Contin Tablet MS Contin MR Suspension	Oral Oral	5/10/15/30/60/100/200mg TABLET 20/30/60/100/200mg sachet SUSPENSION	Modified Release (MR) Given BD
Kapanol Capsule	Oral	10/20/50/100mg CAPSULE	Modified Release (MR) Given once daily or BD
Morphine Injection	S/C PRN or CSCI	Morphine Sulphate 10/15/30mg/mL (1mL) AMPOULE	Morphine Oral Dose divided by 3 is the equivalent analgesic dose of S/C Morphine

OXYCODONE

Preparation	Route	Pack	Comment
Endone (Oxycodone IR tablets)	Oral	5mg TABLET	Immediate Release (IR) Used PRN for Breakthrough Pain
Oxynorm Capsule (Oxycodone IR capsule) Oxynorm Liquid	Oral Oral	5/10/20mg CAPSULE 1mg/ml 250mL BOTTLE	Immediate Release (IR) Used PRN for Breakthrough Pain
Targin Tablet (Oxycodone and naloxone)	Oral	2.5/1.5mg, 5/2.5mg, 10/5mg, 15/7.5mg, 20/10mg, 30/15mg, 40/20mg 60/30mg 80/40mg TABLET	Modified Release (MR) "Said" to be less constipating than oxycontin Maximum recommended dose 80/40mg daily Contra-indicated in moderate to severe liver failure
Oxycontin Tablet	Oral	10/15/20/30/40/80mg TABLET	Modified Release (MR) Given BD

Oxycodone is approximately 1.5x more potent than Morphine

FENTANYL

Preparations	Route	Pack	Comment
Durogesic Patch (Denpax, Fenpatch, Dutran APO-fentanyl)	Skin	12/25/50/75/100mcg/hr PATCH	Apply 1 patch every 72 hrs.
Fentanyl Solution for Injection	S/C or CSCI	50mcg/ml (2mL) AMPOULE 50mcg/ml (10mL)	Safer to use in kidney failure
Sublingual Tablet (Abstral) Fentanyl Lozenge (Actiq)	Sublingual Oral buccal Mucosa	100/200/300/400/600/800mcg TABLET 200/400/600/800/1200/1600mcg LOZENGE	PBS Authority ONLY For breakthrough pain in a palliative care patient with cancer. Where other short acting opioids are clinically inappropriate or there has been adverse effects when using. Fast acting but short duration (<2hrs)

BUPRENORPHINE

Preparation	Route	Pack	Comment
Norspan Patch	Skin	5/10/15/20/25/30/40mcg/ hr PATCH	Apply 1 patch every 7 days Opioid receptor partial agonist

HYDROMORPHONE

Preparation	Route	Pack	Comment
Dilaudid (IR Hydromorphone) Tablet Dilaudid (IR Hydromorphone) Oral liquid	Oral Oral	2/4/8mg TABLET 1mg/mL Oral liquid 200mL BOTTLE	Immediate Release 5 times stronger than Morphine
Jurnista (MR Hydromorphone) Tablet	Oral	4/8/16/32/64mg TABLET	Modified Release Given once daily ONLY
Dilaudid (Hydromorphone) Injection Dilaudid HP (Hydromorphone) Injection	S/C S/C	2mg/mL AMPOULE 10mg/mL	5 times stronger than Morphine

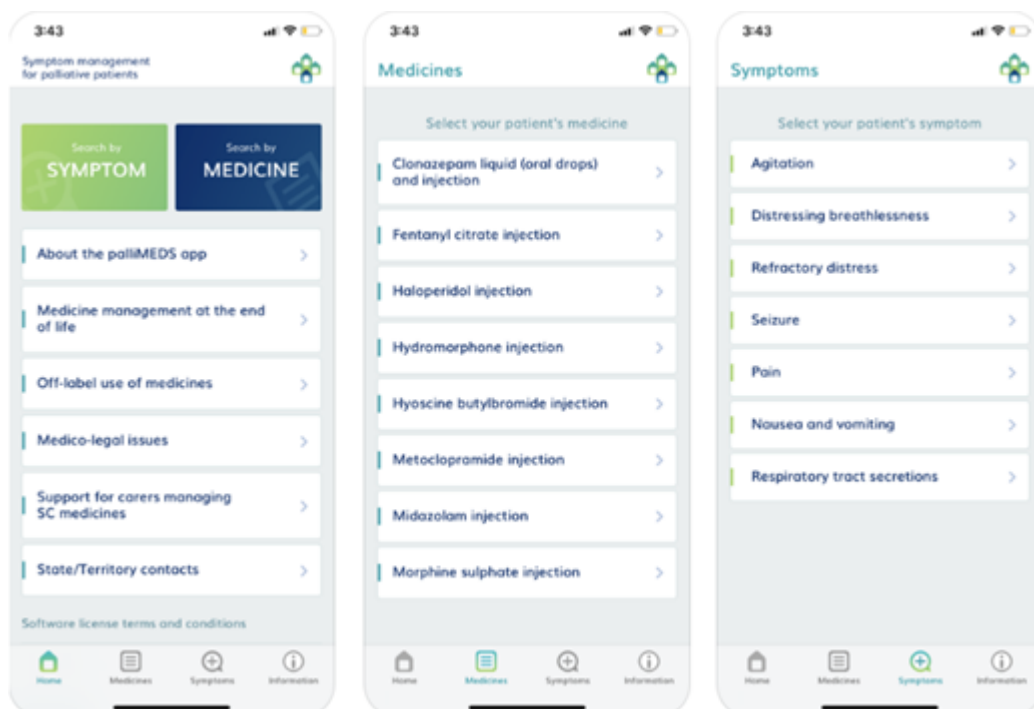
MSH Prescribe Information

The screenshot displays the MSH Prescribe website interface. At the top, there is a teal header with the Queensland Government logo and the text 'MSHPrescribe'. Below the header is a navigation bar with four colored buttons: 'Guidelines' (blue), 'Emergencies' (maroon), 'Updates' (purple), and 'Feedback' (green). Below the navigation bar is a white bar with a 'Back' button and the text 'Palliative Care'. A search bar is located below this bar. The main content area lists several topics under the heading 'Palliative Care':

- Palliative Care
- Continuous subcutaneous infusion (NIKI T34)
- Pain
- Constipation and aperients
- Muscle spasms
- Nausea and vomiting
- End of life cares
- Catastrophic haemorrhage

Please review MSH Prescribe via Qheps if you would like more information on the above medications.

PalliMEDS App



PalliMEDS is a free app to support the clinical knowledge of health professionals who prescribe palliative care medicines or care for people at their end of life.

This easy-to-search mobile reference tool pulls together prescribing information for medicines endorsed by the Australian and New Zealand Society of Palliative Medicine and associated recommendations from Australian Therapeutic Guidelines on palliative care.

Search by symptom or medicine, view dosing considerations, access useful resources and quickly see which medicines are TGA approved and PBS listed.

Separate sections on medicine management at the end of life, use of off-label medicines, medico-legal issues, and carer support are also included.

The palliMEDS app is a collaboration between NPS MedicineWise and the caring@home team. It is part of an Australian Government funded project called caring@home.

The app is free to download from Google play or Apple App Store.

Breakthrough PRN Dosage

Opioid Breakthrough dose for acute pain exacerbation, should be approximately 10% of the total regular opioid requirement over 24hrs. e.g. Targin 50/25mg bd equates to 100mg of Oxycodone over 24hrs, therefore appropriate breakthrough PRN dose is 10mg of immediate release Oxycodone (2 Endone tablets)

MSCPC Opioid Conversion/Rotation Guideline

A two-stage rotation/conversion of opioid guideline was developed by Professor Liz Reymond and has been successfully utilised by MSPCS over the past decade.

The conversion guideline is available to all MSPCS staff on a convenient laminated lanyard card with Table A on one side and Table B on the other side.

Table A

GUIDELINES FOR CONVERTING OPIOIDS: TABLE A <i>Compiled by Professor Liz Reymond MBBS(Hons), PhD, FRACGP, FACHPM</i>			
1. Determine the total previous opioid dose over the past 24 hours (Remember to consider breakthroughs) 2. Convert previous opioid dose to oral morphine equivalent in mg / 24 hrs PREVIOUS DOSE x CONVERSION FACTOR = ORAL MORPHINE DOSE EQUIVALENT (mg / 24 hrs) v03.08.16			
Previous Opioid (dose/24 hrs)	Route	Conversion Factor (Dose=oral morphine mg/24 hrs)	
Buprenorphine patch	mcg/hr	topical	2
Codeine	mg	po	0.13
Fentanyl	mcg	s/c	0.2
Fentanyl patch	mcg/hr	topical	3.6
Hydromorphone	IR, SR mg	po	5
	mg	s/c	15
Morphine	IR, SR mg	po	1
	mg	s/c	3
Oxycodone	IR, SR mg	po	1.5
	mg	s/c	3
Sufentanil	mcg	s/c	2
Tapentadol	SR mg	po	0.4
Tramadol	IR, SR mg	po	0.2
	mg	s/c	0.3

Table A

Table B

GUIDELINES FOR CONVERTING OPIOIDS: TABLE B			
3. Convert daily oral morphine equivalent dose to opioid of choice			
ORAL MORPHINE DOSE x CONVERSION FACTOR = EQUIVALENT OPIOID DOSE (units / 24 hrs)			
<i>IR=immediate release</i>		<i>SR=slow release</i>	
<i>po=per oral</i>		<i>s/c=subcutaneous</i>	
Previous Opioid (dose/24 hrs)		Route	Conversion Factor (Dose=oral morphine mg/24 hrs)
Buprenorphine patch	mcg/hr	topical	0.5
Codeine	mg	po	8
Fentanyl	mcg	s/c	5
Fentanyl patch	mcg/hr	topical	0.28
Hydromorphone	IR, SR mg	po	0.2
	mg	s/c	0.067
Morphine	IR, SR mg	po	1
	mg	s/c	0.33
Oxycodone	IR, SR mg	po	0.66
	mg	s/c	0.375
Sufentanil	mcg	s/c	0.5
Tapentadol	SR mg	po	2.5
Tramadol	IR, SR mg	po	5
	mg	s/c	3.33

Table B

Case Study Examples of Opioid Conversion

Case Study One

AH is a 53-year-old woman with extensive metastatic Non-Small Cell Lung Cancer (NSCLC). She has multiple metastases to bone, and liver, and two brain metastases. She has had palliative radiotherapy for bone metastases pain a few months ago. She is linked to the community palliative care team.



She has been living at home, but in the past two weeks has become increasingly weak and anorexic. She has had increasing pain and some episodes of brief confusion and short-term memory loss. She feels nauseated (no vomiting) and is unable to eat very much and has been having increasing difficulty swallowing her tablets.

Her current background opioid medications are a **Fentanyl patch 75mcg/hr**, changed every 72hrs, with PRN **Oxynorm 20mg capsule q2hrs** for breakthrough pain. She has taken five Oxynorm capsules in the past 24hrs. She is reviewed at home by the Nurse Practitioner and a decision is made to rotate to Hydromorphone delivered subcutaneously via a syringe driver over 24hours and PRN Subcutaneous injection for breakthrough pain. The Fentanyl patch is removed.

- Using **TABLE A**, convert the total opioid analgesic requirement in past 24 hours to oral Morphine equivalent

Fentanyl - $75\text{mcg/hr} \times 3.6 = 270\text{mg}$ oral Morphine

Oxycodone (Oxynorm capsules) breakthroughs total $5 \times 20\text{mg} = 100\text{mg} \times 1.5\text{mg} = 150\text{mg}$ oral Morphine

Total oral Morphine equivalent in 24hrs = 270mg+150mg = 420mg

- Using **TABLE B**, convert the 24hour oral Morphine equivalent to subcutaneous Hydromorphone

Total oral Morphine = $420\text{mg} \times 0.067 = 28\text{mg}$

Therefore - 28mg of parenteral Hydromorphone is added to a syringe driver and delivered over 24 hours.

The appropriate breakthrough dose is 3mg Hydromorphone subcutaneous PRN q 2hrs (approximately 10% of the regular 24hr opioid dose).

Case Study Two

Mr KD is an 89-year-old man with Advanced End Stage Heart Failure and Chronic Obstructive Airways Disease. He has no further cardiology or respiratory appointments and the approach is now entirely supportive and he has been referred to the community palliative care service.



He takes sustained release (SR) oxycodone with naloxone (Targin) tablets 10/5mg bd for pain caused by widespread osteoarthritis and osteoporotic vertebral fractures. He is eating well and has no problems with swallowing tablets.

He has been experiencing increasing breathlessness and is using oral liquid Morphine (Ordine) 2mg/ml taking 4mg q4hr PRN with good effect. He has taken four lots of Ordine in the past 24hours.

He is reviewed by the community palliative care Registrar and a decision is made to rotate him from Targin tablet to SR oral Morphine tablet (MS Contin) with the aim of helping further alleviate both his pain and the symptomatic breathlessness.

- Using **TABLE A** convert the total opioid analgesic requirement in past 24 hours to oral Morphine equivalent

Targin 10/5mg bd = 20mg SR Oxycodone in 24 hrs. $20\text{mg} \times 1.5 = 30\text{mg}$ oral Morphine

Ordine 4mg x 5 = 20mg oral Morphine

Total oral Morphine equivalent in 24hrs = 30+20mg = 50mg

- **TABLE B** not required as we already have the oral Morphine dose in 24hrs

Dividing by two the MS Contin dose is therefore 25mg BD

The breakthrough Ordine dose continues at 4mg q2hrs PRN

Assessment Quiz

Calculate the follow using the MSPCS Conversion Chart. Once completed, review with your preceptor.

1. A patient is receiving SR Morphine (MS Contin) 90mg bd. Convert to parenteral Morphine to be delivered subcutaneously by Syringe Driver over 24hrs.
2. A patient is receiving Targin 30/15mg bd with Endone 5mg tablet q2hr PRN for breakthrough pain. She has required six Endone tablets for breakthrough pain in the past 24hrs. Despite this the pain remains poorly controlled and the patient is having difficulty swallowing the tablets. Convert to an appropriate dose of parenteral morphine delivered subcutaneously by Syringe Driver over 24 hours. Also calculate an appropriate subcutaneous Morphine dose to be given PRN qh4hr.
3. A patient is on taking subcutaneous Hydromorphone 25mg over 24hrs via Syringe Driver (Niki pump). Convert to an appropriate Fentanyl patch dosage. (Tip: select the patch strength closest to your calculated dose.)
4. What is the appropriate breakthrough dose of IR Oxycodone (Endone or Oxynorm) for someone taking Targin 40/20mg bd as their regular opioid analgesia?
5. A patient is taking Targin 60/30mg bd and they have required five Oxynorm 10mg capsules in the past 24hrs. Pain remains poorly controlled. Patient is alert and swallowing well. Convert to oral SR Hydromorphone (Jurnista) daily dose. Also, what would be an appropriate breakthrough dose of oral IR Hydromorphone (Dilaudid) tablet to give Q2hr PRN.

Additional Assessment Questions

1. A patient is receiving Targin 20/10mg bd and also Tapentadol SR 100mg bd. Pain is well controlled, but the patient is experiencing significant nausea and some confusion.

Convert both of these medications to an equivalent Fentanyl Patch Dose.

(Tip, select the patch strength closest to your calculation)

2. A patient has been receiving 20mg of subcutaneous hydromorphone via a syringe driver over 24hrs. Their pain has been stable and well controlled for a week.

Convert the patient from the subcutaneous hydromorphone to oral SR Hydromorphone (Jurnista)

(Tip, select the SR oral Hydromorphone (Jurnista) strength closest to your calculation)

Opioid Rotation/Conversion Learning Package Solutions

Assessment Quiz Solutions

1. SR Morphine (MS Contin) 90 mg bd = 180mg oral Morphine equivalent over 24hrs.

No further conversion required from Table A of the guideline.

Taking Table B to convert to subcutaneous Morphine the factor is 0.33. Therefore, $180\text{mg} \times 0.33 = 59.4\text{mg}$. **This is rounded up to 60mg subcutaneous Morphine given over 24 hours by Syringe Driver.**

2. Targin 30/15mg bd = 60mg oral oxycodone in 24hrs. Endone 5mg x 6 = 30mg of oral Oxycodone in 24hrs. Total oral Oxycodone requirement in 24hrs is $60+30\text{mg} = 90\text{mg}$.

Using Table A of guideline to convert to oral Morphine equivalent factor is 1.5. Therefore $90 \times 1.5 = 135\text{mg}$ of oral Morphine equivalent.

Using Table B of the guideline to convert to subcutaneous Morphine the factor is 0.33. Therefore, $135\text{mg} \times 0.33 = 44.55\text{mg}$.

This is rounded to 45mg subcutaneous Morphine given over 24 hours by Syringe Driver

An appropriate PRN breakthrough dose would be 1/10th this of 4.5mg Morphine, rounded up to 5mg subcutaneous Morphine to be given PRN q4hr.

3. Hydromorphone 25mg subcutaneous via syringe driver over 24hrs.

Using Table A of guideline convert to oral morphine equivalent the factor is 15. $25\text{mg} \times 15 = 375\text{mg}$ oral morphine equivalent.

Using Table B of the guideline to convert to Fentanyl Patch mcg/hr topically the factor is 0.28 therefore $375\text{mg} \times 0.28 = 105\text{mcg/hr}$.

The appropriate Fentanyl patch strength is 100mcg/hr topically applied.

4. The conversion guideline tables are not required for this calculation, as the same opioid Oxycodone is used for SR dose and breakthrough IR dose.

Targin 40/20mg bd is equivalent to 80mg oral Oxycodone over 24hrs.

The breakthrough dose is calculated at approximately 1/10 of this dose i.e. $80\text{mg}/10 = 8\text{mg}$.

This is rounded to 10mg of IR Oxycodone PRN which could be given as two 5mg Endone tablets or one 10mg Oxynorm capsule.

5. Targin 60/30mg bd is equivalent to 120mg oral Oxycodone over 24hrs. Oxynorm 5 x 10mg oral capsules is equivalent to 50mg of oral oxycodone over 24hrs.

Total oral Oxycodone requirement is therefore $120\text{mg} + 50\text{mg} = 170\text{mg}$.

Using Table A of the guideline converting this to oral Morphine equivalent the factor is 1.5.

Therefore, $170\text{mg} \times 1.5 = 255\text{mg}$ of oral Morphine equivalent.

Using Table B of the guideline to convert to oral Hydromorphone over 24hrs the factor is 0.2 $255\text{mg} \times 0.2 = 51\text{mg}$.

SR oral Hydromorphone (Jurnista) comes in strengths of 4mg, 8mg, 16mg, 32mg and 64 mg tablet once daily. **The oral dose is therefore rounded to 48mg SR Hydromorphone (Jurnista) - 32mg +16mg tablet once daily.** The breakthrough pain dose of IR oral Hydromorphone (Dilaudid) should be approximately 1/10 of this dose i.e. $48/10 = 4.8\text{mg}$.

Therefore, the 4mg IR Hydromorphone tablet (Dilaudid) should be used PRN.

Additional Assessment Question Solutions

1. Targin 20/10mg bd is 40 mg of oxycodone over 24hrs

Using Table A to convert to oral morphine, the Conversion Factor is 1.5, therefore $1.5 \times 40 = 60\text{mg}$

Tapentadol SR 100mg bd is 200mg of Tapentadol over 24hrs

Using Table A to convert to oral morphine, the Conversion Factor is 0.4, therefore $200 \times 0.4 = 80\text{mg}$

Therefore, total Oral Morphine Dose Equivalent (mg/24hrs) is $60\text{mg} + 80\text{mg} = 140\text{mg}$

Using Table B to convert to Fentanyl Patch the Conversion Factor is 0.28

$140\text{mg} \times 0.28 = 39.2\text{mcg/hr}$

It would be most appropriate to use a 25mcg/hr and a 12mcg/hr Fentanyl patch together to deliver 37mcg/hr Fentanyl as the available strength closest to your calculation.

2. Using Table A to convert subcutaneous Hydromorphone to oral Morphine the Conversion Factor is 15

Therefore $20 \times 15 = 300\text{mg}/24\text{hrs}$ Oral Morphine

using Table B the Conversion Factor to Oral SR Hydromorphone is 0.2, therefore $300\text{mg} \times 0.2 = 60\text{mg}$

It would be most appropriate to use 64mg once daily SR oral Hydromorphone (Jurnista)