

Standardisation of medication charts – Palliative Care, the next chapter

*Hall T*¹, Reid C¹, Kirkup D²,
Douglas C³, Connors V³,

¹ Safe Medication Practice Unit, ² Palliative
Care Team,
PAH, ³ Palliative Care Team, RBWH

Overview

- Background
 - What was the problem ?
- Redesigning the documentation
- Evidence of improvements
- Key messages
- Conclusion

Standardisation

- Benefits of standardisation recognised
 - Staff movement between and within healthcare environments
 - Staff can be trained prior to exposure in clinical practice
- Has been well recognised in Palliative Care where Graseby® syringe drivers became the *sine qua non* for delivering subcutaneous infusions in end-of-life (EOL) care.

Continuous Subcutaneous Infusions in Palliative Care

- Palliative Care patients often exhibit multiple symptoms requiring polypharmacy
- EOL care and other situations may require an alternative to oral medications
- Intravenous therapy considered invasive and unsuitable for community care settings
- Continuous subcutaneous infusions (csci) can ensure continued symptom management

Graseby® Syringe Drivers

- Devices > 25 years old
- Simple 6v battery driven device to drive the plunger on a syringe
- Almost no 'safety' software
- Cheap but no longer available for purchase in Australia. Available elsewhere.
- Widely distributed in both acute and community settings and transferable between these settings

MS 16A HOURLY RATE Syringe Driver

GRASEBY
MEDICAL



TRAINING
DUMMY

START/TEST



mm PER

1 HR



MS 26 DAILY RATE Syringe Driver

GRASEBY
MEDICAL



TRAINING
DUMMY

START/BOOST
1 bleep = 0.23 mm



mm PER

24 HR

10 bleeps



Post Graseby® situation

- Palliative Care community not actively involved in TGA's decision to decline registration of Graseby devices
- Risk of fragmentation of service provision and increased risk of harm if new devices introduced without complexities of cross boundary care considered.

Graseby® Syringe Drivers

MS16 vs. MS26

MS16

- Blue label
- Designed to run on mm/hr barrel length

MS 26

- Green label
- Designed to run on mm/24hr barrel length
- Boost dose button (0.23mm = $\frac{1}{200}$ th of total daily dose)

Error prone situation

- Data from PRIME indicates opioids as high risk medication despite S8 designation and double checks
 - ~32% of SAC 1-like incident reports
 - cf 17% Insulin, 15% Heparin, 7% Enoxaparin, 6% Cytotoxics
- TGA reported incidents
- Frequent reports of significant process failure with Graseby® syringe drivers
- Confusion between MS16 (mm/hr) and MS26 (mm/24 hr) models

Reported Incidents involving Graseby® (2002 – 2004)

Queensland Health aware of

- 1 sentinel event
- 25 significant errors reported in a 24 month period
- Errors occur during:
 - Prescription
 - Preparation
 - Administration
 - Documentation
 - Monitoring

THESE INCLUDE.....

Types of incidents

- Wrong Drug
- Transcription Errors
- Wrong Route
- Extra Dose
- Dose Omission
- Wrong Administration Rate
- Incorrect Opioid Conversion
- Calculation (assembly) Errors
- Drug incompatibility reactions
- Equipment failure
- Disconnection errors

Outcomes of these incidents

- Plan to Develop a chart for continuous subcutaneous infusions using Graseby® syringe drivers to integrate safe:
 - » Prescribing
 - » Administration
 - » Documentation and
 - » Monitoring

'Graseby Syringe Driver Subcutaneous Medication Infusion Chart'

Methodology

- Expert Steering Committee of Palliative Care Clinicians, Nurses, Pharmacists
 - Iterative design process leading to final design
- Audit of current practice
- Trial of the new form
- Re-audit of practice using new form
- Publication of benefits accrued
- Roll out statewide
- Reconvene Expert Steering Committee
 - Ongoing audit and maintenance

CUT THIS OFF

TROUBLE SHOOTING (any concerns contact the Palliative Care Team)		
Problem	Cause	Solution
Is the patient experiencing increase in pain?	Flat battery	Change battery
	Line kinked	Unkink line
	Cannula kinked	Change cannula
	Leaking line	Change line
	Wrong dose	Check order; replace syringe with correct dose
Light not flashing	Infusion finished	Reload syringe
	Flat battery	Change battery
	Line kinked	Unkink line
	Cannula kinked	Change cannula
Infusion too fast	Wrong volume for syringe type	Check syringe type; change syringe
	Line and site recently changed	No action if reduced volume is due to priming line
	Incorrect rate setting	Check rate setting and adjust to order
Infusion too slow	Wrong volume for syringe type	Check syringe type; change syringe
	Line kinked	Unkink line
	Cannula kinked	Change cannula
	Flat battery	Change battery
	Incorrect rate setting	Check rate setting
	Has driver been stopped for procedure?	No action
	Site not functioning	Resite cannula

OPIOID CONVERSIONS			
<i>These are average equivalents because of pharmacokinetic variation between individuals; doses are approximate because of the strengths of preparations available.</i>			
CHANGING FROM ►	morphine oral 30 mg 4-hourly	morphine oral CR or SR 60 mg/day	morphine SC 10 mg 4-hourly
CHANGING TO ▼			
fentanyl transdermal*	50 micrograms/hour	25 micrograms/hour	50 micrograms/hour
hydromorphone oral	6 mg 4-hourly	2 mg 4-hourly	6 mg 4-hourly
hydromorphone SC	1.5–2 mg 4-hourly	0.5 mg 4-hourly	1.5–2 mg 4-hourly
morphine SC	10 mg 4-hourly	3 mg 4-hourly	10 mg 4-hourly
morphine CSCI	60 mg/day	20 mg/day	60 mg/day
oxycodone oral	15 mg 4-hourly	5 mg 4-hourly	15 mg 4-hourly
oxycodone oral CR	40 mg twice daily	20 mg twice daily	40 mg twice daily

*On transfer from a Fentanyl transdermal patch to a syringe driver it should be recognised that a significant store of Fentanyl will exist in subcutaneous stores. It is recommended that a "wash-out" delay of at least 12 hours be implemented between removing the patch and starting the subcutaneous infusion.

CR = controlled-release preparation; CSCI = continuous subcutaneous infusion;
SC = subcutaneous; SR = sustained-release preparation

Table 10.7 From Therapeutic Guidelines Palliative Care #2 2005



GRASEBY SYRINGE DRIVER SUBCUTANEOUS MEDICATION INFUSION CHART

Facility/Service:

Ward:

If pain is not controlled, please see PRN chart for breakthrough analgesia.
If not effective notify RMO or palliative care team.

GRASEBY SYRINGE DRIVER

Important Note

*There are two Graseby syringe driver models.
It is important that differences are noted and care taken in ensuring the RATE is set correctly.*

Graseby MS 16A

- Blue colour plate, delivers dose in millimetres (mm) per hour
- To calculate RATE make the length of the fluid in syringe barrel 48mm divided by 24 hours. This will equal a rate of 2 mm per hour.

Graseby MS 26

- Green colour plate, delivers dose in millimetres (mm) per 24 hours
- To calculate RATE, take the delivery time, measure the length of the fluid in syringe barrel and make this the rate (mm) for 24hrs. For example, 48mm divided by one day equals 48 mm in 24 hours.

PRIMING THE GIVING SET

A minimum volume extension set is commonly used to connect the pump to the infusion site. There is no need to change the giving set with each syringe. Sites are recommended to adopt a standard for the duration of use for a giving set based upon infection control principles.

NB

- Do not prime the line with normal saline solution (NaCl 0.9%) - use the contents of the syringe.
- After priming the extension set, the remaining volume of drug will not last 24 hours as the dose calculated for the 24 hour period does not include overage for this purpose.
- If changing the concentration, then the extension tubing must be changed and reprimed

DO NOT WRITE IN THIS BINDING MARGIN

DO NOT WRITE IN THIS BINDING MARGIN

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GRASEBY SYRINGE DRIVER - SUBCUTANEOUS MEDICATION INFUSION CHART

Safety Features of Chart

Page 1

- **Graseby® Syringe Driver Section:**
 - Alerts clinicians to the TWO different types of Graseby® syringe driver models currently available and outlines the differences
 - Also includes points to consider when priming the giving set

Safety Features of Chart

Page 2

- Prescription Section
 - Up to four (4) medications can be mixed in one syringe
 - Order is valid for seven days
 - Allows for initial prescription plus ONE change then requires a new form
 - Review is required every 24 hrs by an authorised clinician
 - Clinical Pharmacist review section
 - Prompts for medication, dose, rate, prescriber signature and print name

Medical Officer Prescription Section

YEAR: 20 _____

MEDICAL OFFICER PRESCRIPTION <i>(valid for up to seven days)</i>							
Date/Time	Medication <small>(Print generic name)</small>	Dose <small>(In 24hrs)</small>	Rate <small>(mm/Hr)</small>	Prescriber Signature	Print Your Name	Daily Clinical Review <small>Authorised person to sign to indicate 24 hr review & continuation of order for further 24 hrs.</small>	
						Date	Signature
Clinical Pharmacist Review Signature: _____						Date: _____	

Safety Features of Chart

Page 2 cont

- Syringe Section
 - Prompts for use of Luer lock syringes
 - Identifies two different brands currently available within QH
 - Identifies correct volume that will be delivered using 48mm over 24 hours (pre-printed)
 - Recommends 10mL & 20mL syringes
 - Prompts that injection volumes $> 15\text{mL}$ require review (may require multiple pumps rather than increase in rate)

Syringe Information Section

SYRINGES

ALL SYRINGES MUST BE FILLED TO 48mm (Check Syringe Brand)

Terumo 10 mL syringe

Fill to 9.4 mL = 48mm

BD 10 mL syringe

Fill to 7.8 mL = 48mm

Terumo 20 mL syringe

Fill to 15 mL = 48mm

BD 20 mL syringe

Fill to 15 mL = 48mm

If volume exceeds 15mL order must be reviewed

Safety Features of Chart

Page 2 cont

- Nursing Calculation and Administration Record Section
 - formula for each new syringe documented
 - includes medication name, strength and volume
 - 0.9% sodium chloride pre-printed (preferred diluent)
 - each formulation calculation checked/signed by a 2nd RN
 - rate in mm/hr documented
 - volume in syringe (post priming) documented, enables accurate monitoring of rate
 - syringe size and type documented
 - documented when cannula “site” last changed

Nursing Calculation & Administration Record Section

NURSING CALCULATION AND ADMINISTRATION RECORD							
Date / Time	/	/	/	/	/	/	/
Medication / Strength	Volume	Volume	Volume	Volume	Volume	Volume	Volume
	mL	mL	mL	mL	mL	mL	mL
	mL	mL	mL	mL	mL	mL	mL
	mL	mL	mL	mL	mL	mL	mL
	mL	mL	mL	mL	mL	mL	mL
	mL	mL	mL	mL	mL	mL	mL
Normal Saline	mL	mL	mL	mL	mL	mL	mL
Total Volume	mL	mL	mL	mL	mL	mL	mL
Prepared By / Checked By	/	/	/	/	/	/	/
Current Rate (mm/hr)							
Total Volume in Syringe at Commencement of Infusion (after priming)	mL	mL	mL	mL	mL	mL	mL
Syringe Type							
Syringe Size	mL	mL	mL	mL	mL	mL	mL
Date Site Changed							

NURSING CALCULATION AND ADMINISTRATION RECORD

Date / Time	15/2/08 14.00	16/2/08 14.00					
Medication / Strength	Volume	Volume	Volume	Volume	Volume	Volume	Volume
Morphine 10mg/5ml	3 mL	— mL	mL	mL	mL	mL	mL
Mitoclopramide 5mg/5ml	6 mL	6 mL	mL	mL	mL	mL	mL
Morphine 5mg/5ml	mL	6 mL	mL	mL	mL	mL	mL
	mL	mL	mL	mL	mL	mL	mL
	mL	mL	mL	mL	mL	mL	mL
Normal Saline	6 mL	3 mL	mL	mL	mL	mL	mL
Total Volume	15 mL	15 mL	mL	mL	mL	mL	mL
Prepared By / Checked By	AS JS	AS JS					
Current Rate (mm/hr)	2	2					
Total Volume in Syringe at Commencement of Infusion (after priming)	14.5 mL	15 mL	mL	mL	mL	mL	mL
Syringe Type	BD	BD					
Syringe Size	20 mL	20 mL	mL	mL	mL	mL	mL
Date Site Changed	15/2/08						

Safety Features of Chart

Page 3

- Nursing Check Section
 - Prompts are outlined for both clinical and operational checks, required every four hours
 - Prompts include:
 - Pain score (VNS 0-10)
 - Nursing check of patient and device
 - Rate
 - Volume
 - Signature

Nursing Check Record Section

NURSING CHECK RECORD

Monitoring of the infusion must be documented every four (4) hours.

- Ask the patient to rate their pain by a numerical scale (0 = no pain, 10 = worst pain imaginable) and record in Nursing Check Record below.
- If infusion is not for analgesia write *not applicable* in the pain score section of the nursing check record.
- Is the site okay?
- Is the patient symptom-free?
- Is the machine whirring intermittently?
- Does the solution appear clear?
- Has the driver pushed through the required number of millimetres?
- Is the light flashing?
- Is the syringe inserted into the driver properly?
- Is the battery inserted properly?
- Are the connectors connected?
- No kinks observed in the line?

Any negative responses and variances must be actioned and documented in the Progress Notes.

Any concerns must be reported to RMO or palliative care team.

Date: _____

Time	Pain Score (0-10)	Nursing Check (Yes/No)	Rate (mm/hr)	Volume Left (mL)	Sign
0400					
0800					
1200					
1600					
2000					
2400					

Date: 15/2/08.

Time	Pain Score (0-10)	Nursing Check (Yes/No)	Rate (mm/hr)	Volume Left (mL)	Sign
0400					
0800					
1200					
1600	6	Yes	2	14.5	AS
2000	4	Yes	2	12.0	AS
2400	4	Yes	2	10.5	AS

Date: 16/2/08.

Time	Pain Score (0-10)	Nursing Check (Yes/No)	Rate (mm/hr)	Volume Left (mL)	Sign
0400	5	Yes	2	17.0	AS
0800	3	Yes	2	4.5	AS
1200	3	Yes	2	2.0	AS
1600	2	Yes	2	13.8	AS
2000					
2400					

Safety Features of Chart

Page 4

- Troubleshooting Section
 - Table is provided to assist with any problems identified at the fourth hourly checks and provides appropriate solutions

TROUBLE SHOOTING <i>(any concerns contact the Palliative Care Team)</i>		
Problem	Cause	Solution
Is the patient experiencing increase in pain?	Flat battery	Change battery
	Line kinked	Unkink line
	Cannula kinked	Change cannula
	Leaking line	Change line
	Wrong dose	Check order, replace syringe with <u>Correct dose</u>
Light not flashing	Infusion finished	Reload syringe
	Flat battery	Change battery
	Line kinked	Unkink line
	Cannula kinked	Change cannula
Infusion too fast	Wrong volume for syringe type	Check syringe type. Change syringe
	Line and site recently changed	No action / Reduced volume due to priming line
	Incorrect rate setting	Check rate setting and adjust to order
Infusion too slow	Wrong volume for syringe type	Check syringe type. Change syringe
	Line kinked	Unkink line
	Cannula kinked	Change cannula
	Flat battery	Change battery
	Incorrect rate setting	Check rate setting
	Has driver been stopped for procedure?	No action
	Site not functioning	Resite cannula

Pre and Post Audit results

	No. of infusions reviewed <i>Pre-implementation</i>	No. of infusions reviewed <i>Post-implementation</i>
Total no. of infusions	36	37
Total no. of wards	1	1

Where prescribed ?

	Pre audit (n=36)%	Pre- audit	Post audit (n=37)%	Post- audit
new Form	N/A	N/A	35	94.6%
Med Chart	0	0%	0	0%
IV Fluid Form	0	0%	0	0%
Other	36	100%	2	5.4%

Order current as per hospital policy ?

	Pre-audit (n=36)	% Pre-audit	Post- audit (n=37)	% Post- audit
Yes	30	83%	32	86.5% ↑
No	6	17%	5	13.5%

Documentation of clinical review ?

	Pre audit (n=36)	% Pre- audit	Post audit (n=37)	% Post- audit
No of days clinical review required	NA	NA	37	
No. of days clinical review documented	NA	NA	20	54%

Initial calculation documented ?

	Pre audit (n=36)	% Pre -audit	Post audit (n=37)	% Post -audit
Yes	NA	NA	32	86%
No	NA	NA	3	8%
NA	old chart used		2	5%

Total volume of infusion correct ?

	Pre audit (n=36)	% Pre -audit	Post audit (n=37)	% Post -audit
Yes	6	17%	37	100%
No	28	78%	0	0%
Not Documented	2	6%	0	0%

Infusion device operational ?

	Pre audit (n=36)	% Pre -audit	Post audit (n=37)	% Post -audit
Yes	35	97%	36	97%
No	1	3%	1	3%

Syringe size (mL) documented ?

	Pre audit (n=36)	% Pre -audit	Post audit (n=37)	% Post -audit
10mL	23	64%	22	59%
20mL	7	19%	15	41%
30mL	5	14%	0	0%
Other	1	3%	0	0%

Syringe contents correct ?

	Pre audit (n=36)	% Pre -audit	Post audit (n=37)	% Post -audit
Yes	35	97%	36	97%
No	1	3%	1	3%

Pain score documented ?

	Pre audit (n=36)	% Pre -audit	Post audit (n=37)	% Post -audit
Yes	NA	NA	35	95%
No	NA	NA	2	5%

Problems

- Scope of document use beyond Palliative Care into Chronic Pain management
- Accepting issues raised by this group
- Incorporating proposed changes into Change Register

Conclusion

- Improvements in clarity of documentation
- Improvements in clinical value (e.g. Pain score enables clinician to monitor effectiveness)
- Ability to detect errors in device set up, operation and syringe assembly
- Improved utility in delivery of a palliative intervention
- Principles of form design can be applied to any new device post Graseby®

Niki T34 (McKinley) syringe driver



CADD pump

