

# Medication Safety

## Canterbury IV Link Study Day

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Medication Safety Pharmacist

2012

# Medication Safety

*“To give the correct drug at the correct dose to the correct patient, via the correct route, at the correct time.”*

# Culture of Safety

- Encourage reporting
- Errors not a measure of competency
- Nonpunitive environment
- Advocate patient safety
- Discuss errors to learn from them
- Question

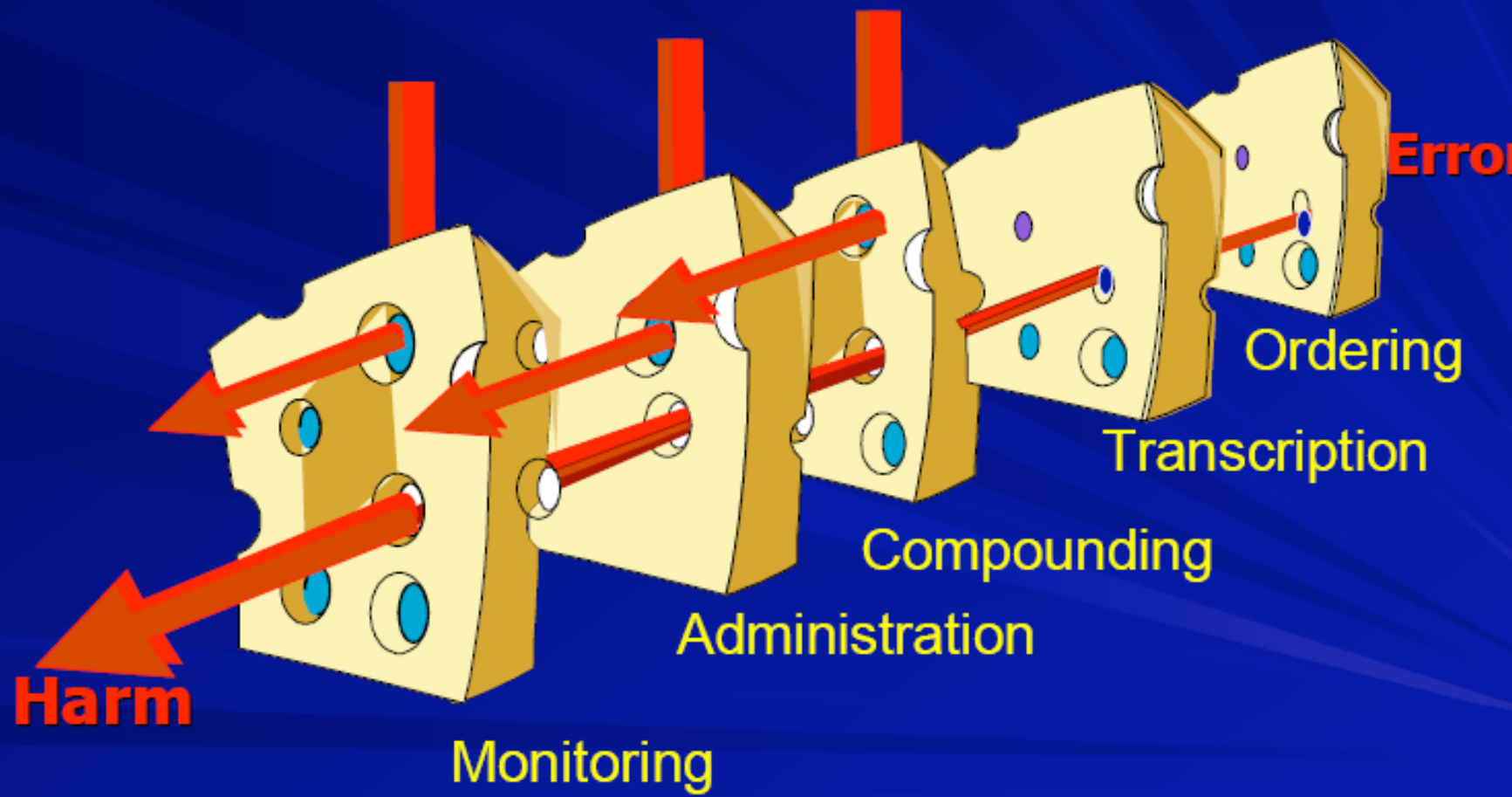
# Root Cause Analysis

- What happened?
- Who was involved?
- When did it happen?
- Where did it happen
- Likelihood of recurrence
- Consequences
- Prevention

# Medication Management System

- Order adequate supplies
- Store appropriately
- Supply of medicines
  - Dispensing
  - Ward stock
- Prescribing
- Preparation
- Administration
- Documentation
- Monitoring

# The “Swiss Cheese” Model of Accident Causation – If Something Can Go Wrong It Will



*Adapted: I. M. Acynic*

# Types of Errors

**Skill-based errors** – slips and lapses – when the action made is not what was intended

- **Rule-based mistakes** – actions that match intentions but do not achieve their intended outcome due to incorrect application of a rule or inadequacy of the plan.

- **Knowledge-based mistakes** – actions which are intended but do not achieve the intended outcome due to knowledge deficits.

# Human Error

There are multiple reasons that human error occurs:

- Communication failure
- Lack of effective training
- Memory lapse
- Inattention
- Poorly designed equipment
- Exhaustion, fatigue
- Ignorance
- Noisy working conditions
- Other personal and environmental factors



A large, solid black triangle is centered on a white background. Inside the triangle, the text "Paris in the the Spring" is written in a white, serif font, arranged in three lines.

Paris  
in the  
the Spring



A large, solid black triangle is centered on a white background. Inside the triangle, the text "Paris in the the Spring" is written in a white, serif font, arranged in three lines.

Paris  
in the  
the Spring

- According to a research at Cambridge University, it doesn't matter in what order the letters in a word are, the only important thing is that the first and last letter be at the right place. The rest can be a total mess and you can still read it without problem. This is because the human mind does not read every letter by itself, but the word as a whole

# Look alike sound alike

- Clotrimazole
- Avastin<sup>®</sup>
- Cefotaxime
- Oxycodone
- Gliclazide
- Doxepin
- Co-trimoxazole<sup>®</sup>
- Ovestin<sup>®</sup>
- Ceftriaxone
- Oxycontin<sup>®</sup>
- Glipizide
- Dothiepin

Drug, Dose and Directions (capital letters)

CO-TRIMAXAZOLE  
CREAM + PESSARIE  
TOP BD .

Indication

Date

6-7-2010

Time

0700

Other

Route

PV/Top

0800

Stop date & Initiate

1200

1400

<b>Drug, Dose and Directions (capital letters)</b>  Furosemide (Duroide) 60mg max 1 tab x 40mg ----- <b>Indication</b>  <b>Signature</b> <b>Pager</b> <b>Surname (capital letters)</b>	<b>Date</b> 9/10/11	<b>Time</b> 0700	<b>Other</b>	10
	<b>Route</b> PO	0800		
	<b>Stop date &amp; initials</b>	1200		
		1400		
	<b>Pharmacy code</b>	1700		
		2100		

# Tall Man Letters

- HumaLOG
- HumuLIN
- OxyCODONE
- OxyNORM
- OxyCONTIN
- DOPamine
- DOBUTamine
- CefOTAXIMe
- CefTRIAXONe



**PRESCRIPTION  
MEDICINE**

**Cefotaxime**

**500 mg** Injection

**1 Vial**

Each vial contains:  
500 mg of cefotaxime  
as cefotaxime sodium.

Powder for intravenous  
and intramuscular use.

**AFT** pharmaceuticals

**PRESCRIPTION  
MEDICINE**

**Ceftriaxone**

**500 mg** Injection

**1 Vial**

Each vial contains:  
500 mg of ceftriaxone  
as ceftriaxone sodium.

Powder for intravenous  
and intramuscular use.

**AFT** pharmaceuticals



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www.baxterhealthcare.com.au  
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Made in Australia  
Information For Hong Kong Drug  
(1) (b) : 281 88 41 88 / 281 88 41 88  
To be used as directed by the Physic  
281 88 41 88 / 281 88 41 88

**30**  
controlled  
release  
tablets  
**AFT-Metoprolol CR**  
Metoprolol succinate 47.5 mg  
AFT pharmaceuticals

**Diclofenac Sandoz® 50mg**  
diclofenac enteric-coated tablets 50mg  
50 enteric-coated tablets

PRESCRIPTION ONLY MEDICINE  
KEEP OUT OF REACH OF CHILDREN  
**aspen**  
**Lanoxin® Tablets**  
250 micrograms  
250 DIGOXIN TABLETS

PRESCRIPTION ONLY MEDICINE  
KEEP OUT OF REACH OF CHILDREN  
**aspen**  
**Lanoxin-PG® Tablets**  
62.5 micrograms  
250 DIGOXIN TABLETS  
Paediatric/Geriatric tablets

**120 mg**  
(B)  
EXP.

**Cardizem CD**  
diltiazem hydrochloride  
30 controlled delivery caps

Diclofenac 50mg Tablet      Digoxin 250mcg Tablet      Digoxin 62.5mcg Tablet      Diltiazem 120mg Modified Release Capsule

**30**  
controlled  
release  
tablets  
**AFT-Metoprolol CR**  
Metoprolol succinate 47.5 mg  
AFT pharmaceuticals

**30**  
controlled  
release  
tablets  
**AFT-Metoprolol CR**  
Metoprolol succinate 47.5 mg  
AFT pharmaceuticals

**30**  
controlled  
release  
tablets  
**AFT-Metoprolol CR**  
Metoprolol succinate 47.5 mg  
AFT pharmaceuticals

**30**  
controlled  
release  
tablets  
**AFT-Metoprolol CR**  
Metoprolol succinate 47.5 mg  
AFT pharmaceuticals

PRESCRIPTION MEDICINE  
KEEP OUT OF REACH OF CHILDREN  
**SPIROSTONE 25**  
100 TABLETS each of  
SPIRONOLACTONE 25 mg  
DOSAGE:  
As directed by physician

**50 MULTIVITAMIN TAB (RP)**  
Batch: RP201115-101 Exp  
Christchurch Hospital

**NIFUR**  
DOSE:  
or as directed by physician  
Store below 25°C  
Use by: 03/12/20

PRESCRIPTION  
**NIFURAN**  
DOSE: 1-2 tablets  
or as directed by physician  
Store below 25°C  
Use by: 03/12/20  
B: 10630

# Medication charts

- Appropriately labelled with patient name
- Allergies/adverse reactions
- Generic names
- Approved abbreviations
- Complete and legible
  - Include dose/frequency/times circled
  - Surname and pager

## REGULAR DRUGS

**Drug, Dose and Directions (continued)**

Slow 24h  
to BD

### Indication

## References

**Foot**

## Summary

Drug, Dose and Directions (capital letters)



4101

## Annex

Blind date & I

### Step 4: Results

### Primary code



MONTH

DATE \_\_\_\_\_



Other

0200

100

1200

1400

1700

2100

Time

Other

Drug, Dose and Directions (capital letters)  POTASSIUM CHLORIDE SR  TT BD	Date	Time	Other			
	7/24/10	0700				
	Route po	0800				
	Stop date & Initials	1200				
Indication	↓ K <sup>+</sup>	1400				
Signature	Pharmacy code	1700				
Pager		2100				
Surname (capital letters)						
Drug, Dose and Directions (capital letters)  PARACETAMOL 1g QID	Date	Time	Other	7/24		
	7/24/10	0700				
	Route po/iv	0800				
	Stop date & Initials	1200				
Indication	Pe	1400				
Signature	Pharmacy code	1700				
Pager		2100				
Surname (capital letters)						
Drug, Dose and Directions (capital letters)  LAXOL tab TT BD	Date	Time	Other			
	7/24/10	0700				
	Route po/iv	0800				
	Stop date & Initials	1200				
Indication	constipation	1400				
Signature	Pharmacy code	1700				
Pager		2100				
Surname (capital letters)						
Drug, Dose and Directions (capital letters)  SLOW K R bid	Date	Time	Other			
	8/4	0700				
	Route po	0800				
	Stop date & Initials	1200				
		1400				
	Pharmacy code	1700				
		2100				

# Prescribing

- ALWAYS leading '0'
  - 0.5mg NOT .5mg
- NO trailing '0'
  - 5mg NOT 5.0mg
- 'units' in full NOT 'U'
  - misread as extra 0, 10 fold increase in dose
- 'mcg' NOT  $\mu\text{g}$

# Abbreviations

- Approved abbreviations on front of QMR4
  - OD is NOT on this list
  - Misread as BD
  - Mane/midi/nocte?
  - NOT qd – misread as QID
  - NOT qds –daily or QID?

Drug, Dose and Directions (capital letters)

Amphetamine  
25mg cp

Indi

Sign

Page

...

Date	2/6	Time	Other	3/6
		0700		
Route	PO	0800		
Stop date & Initials		1200		
		1400		
armacy code		1700		
		2100		



<u>Drug, Dose and Directions (capital letters)</u> PARACETAMOL 1g.	Date 25.1.10.	Time 0700	Other	25	26	
	Route 0	0800				
	Stop date & Initials	1200				
		1400				
<u>Indication</u> PAIN <u>Signature</u> <u>Pager</u> <u>Surname</u>	Pharmacy code	1700	1800			
		2100				
<u>Drug, Dose and Directions (capital letters)</u> DICLOFENAC SR.	Date 25.1.10.	Time 0700	Other		26	
	Route 0	0800				
	Stop date & Initials	1200				
		1400				
<u>Indication</u> PAIN <u>Signature</u> <u>Pager</u> <u>Surname</u>	Pharmacy code	1700				
		2100				

# Changes to charting

Keep it clear and concise

- Cross off, date and sign
- Write new order

Drug, Dose and Directions (capital letters)

TRAMADOL SR

~~Strong~~ ~~q1h~~

200mg BD

9/3/10  
193

Date

7/3/10

Route

IV

Stop date & Initials

Time

Other

0700

0800

1200

1400

1700

2100

Indication

Signature

Pager

Surname (

Pharmacy code

# Nurses must know:

- Therapeutic use of a drug
- Normal dose range
- Side effects
- Contraindications

before administering any medicine BUT

- 1 in 4 did NOT know CI/SE
- 1 in 10 did NOT know normal dose

# Information Sources

- Product information
- MIMS
- NOIDS
- Protocols
- PML
- Pharmacist
- Drug chart annotation
- Drug Information

Drug, Dose and Directions (capital letters)		Date	Time	Other
DIAMYCRON (GLUCAZIDE) <del>400mg</del> 400mg MANE		11/10/14	0700	
		Route PO	0800	
		Skip date & Initials also	1200	
			1400	
Indication		Pharmacy code	1700	
Signature			2100	
Page				
Surname				

10-Aug-2011 Tears Naturale 0.3% Eye Drops - use sos - 10  
10-Aug-2011 Paracetamol 500Mg Tab - 2 tabs, Four Times Daily - 720  
10-Aug-2011 Thiamine Hydrochloride 50Mg Tab - 2 tabs, Mane - 180  
10-Aug-2011 Alendronate Sodium 70Mg Tab - 1 tab weekly  
- 12  
10-Aug-2011 Cartia 100Mg Tab - 1 tabs, Once Daily - 90  
10-Aug-2011 Diamicon 80Mg Tab - .5 tabs, Mane  
10-Aug-2011 Nitrofurantoin 50Mg Tab - 1 tabs, Nocte -

# REGULAR DRUGS

MONTH

DATE

11/11

11

Drug, Dose and Directions (capital letters)

GLICLAXIDE

Sy BD

Date

21/5/10

Route po

Stop date & Initials

Time

Other

0700

0800

1200

1400

1700

2100

Pharmacy code

Indicati

Signatu

Pager

Surnam





# 7R's

How foolproof is your checking system?



REGULAR DRUGS		MONTH DATE		MAY	
Drug, Dose and Directions (capital letters) LAXSOL TI mane	Date	5/5/11	Time	Other	6
	Route	PO	0800		
	Stop date & Initials		1200		
			1400		
Indication					
Signature Pager Surname (capital letters)	Pharmacy code	1700			
		2100			
Drug, Dose and Directions (capital letters) PARACETAMOL 1g QID	Date	5/5/11	Time	Other	6-6
	Route	PO	0800		
	Stop date & Initials		1200		
			1400		
Indication					
Signature Pager Surname (capital letters)	Pharmacy code	1700			
		2100			
Drug, Dose and Directions (capital letters) CLOPIDOGREL 75mg mane	Date	5/5/11	Time	Other	6
	Route	PO	0800		
	Stop date & Initials		1200		
			1400		
Indication					
Signature Pager Surname (capital letters)	Pharmacy code	1700			
		2100			
Drug, Dose and Directions (capital letters) CITALOPRAM 20mg nocte	Date	5/5/11	Time	Other	5
	Route	PO	0800		
	Stop date & Initials		1200		
			1400		
Indication					
Signature Pager Surname (capital letters)	Pharmacy code	1700			
		2100			
Drug, Dose and Directions (capital letters) SINONET 50/200 CR + TDS	Date	5/5/11	Time	Other	6
	Route	PO	0800		
	Stop date & Initials		1200		
			1400		
Indication					
Signature Pager Surname (capital letters)	Pharmacy code	1700			
		2100			

ZOPICLON <sup>12</sup>		Date	23/4	02					
3.75 - 7.5mg		23/4/11	23/4	2100					
frequency nocte		Route	24/4	2130					
Maximum dose in 24 hours		PO	25/4	2130					
Tick if drug is also charted regularly <input type="checkbox"/>		Stop date & initials							
Indication									
Signature		Pharmacy code							
Pager									
Surname (capital)									
Drug COCAINE		Date	24/4	0830	50mg				
Dose 30mg		24/4/11	24/4	1300	30mg				
Frequency 4-6°		Route	24/4	2130	30mg				
Maximum dose in 24 hours		PO							
Tick if drug is also charted regularly <input type="checkbox"/>		Stop date & initials	25/4	0730	30mg				
Indication									
Signature		Pharmacy code							
Pager									
Surname									
Drug MORPHINE		Date	24/4	1015	5mg				
Dose 5mg to 10mg		24/4/11	24/4	1125	5mg				
Frequency 2°		Route	24/4	1410	10mg				
Maximum dose in 24 hours 40mg/24°			24/4	1740	5mg				
Tick if drug is also charted regularly <input type="checkbox"/>		Stop date & initials	25/4	1615	5mg				
Indication			25/4	0830	5mg				
Signature		Pharmacy code							
Pager									
Surname (capital)									

25/4	1150	5mg	26/4	1230
25/4	1430	5mg		
25/4	1800	5mg		
25/4	2310	5mg		
26/4	0645	5mg		
26/4	0835	5mg		

Drug, Dose and Directions (capital letters)

Mellformin 1g TDS

Indicat

Signat

Pager

Surnar

Date

30/6/10

Time

0700

Other

Route

PO

0800

7

7

Stop date & Initials

1200

1400

Pharmacy code

1700

2100

7

7

# When is a drug error most likely to occur?

- Interruptions 87%
- Busy 84%
- Difficulty reading prescription 65%
- Dose calculations 42%
- Unfamiliar with drug 43%
- Unfamiliar with patient 33%
- At night 27%
- Drug not on ward 20%



# What would help reduce drug errors?

- Protect time for drug rounds 79%
- Regular training updates 74%
- Regular competency assessments 59%
- Drug information from a pharmacist 51%
- National prescription chart 48%
- Wearing a bib ('do not disturb') 47%
- Patients drugs by bedside 38%

# Safe practice skills for **You** to develop and practise ...

- Whenever learning and practising skills that involve medication use, consider the potential hazards to the patient and what you can do to enhance patient safety
- Knowledge of medication safety will impact the way you:
  - Understand, document and administer medication
  - Use memory aids and perform drug calculations
  - Perform medication and allergy histories
  - Communicate with colleagues
  - Involve and educate patients about their medication
  - Learn from medication errors and near misses



# High Alert Medications

- Warfarin/Heparin/LMWH
- Insulin
- Chemotherapy
- Potassium concentrate ampoules
- Opioids



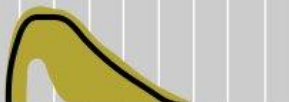



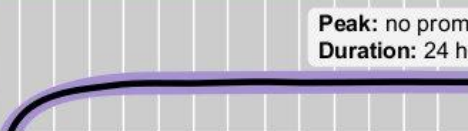

# Warfarin

- Two brands, NOT interchangeable
  - Marevan<sup>®</sup> 1mg, 3mg, 5mg
    - Used routinely
    - Consider dx script only 1mg tablets
  - Coumadin<sup>®</sup> 1mg, 2mg, 5mg
    - For patients intolerant to Marevan<sup>®</sup>
    - Prescribe as Coumadin<sup>®</sup>
- Interactions
- Patient education

Drug, Dose and Directions (capital letters) Laxsol 2 tab x mane	Date 21/1/11 Route Po Stop date & initials	Time 0700 0800 1200 1400	Other	22 23 24
Indication Signature Pager Surname (capital letters)	Pharmacy code ✓	1700 2100		
Drug, Dose and Directions (capital letters) Mirtazapine 30mg 1 tab x nocte	Date 21/1/11 Route PO Stop date & initials	Time 0700 0800 1200 1400		22 23 24
Indication Signature Pager Surname (capital letters)	Pharmacy code ✓	1700 2100		22 23 24
Drug, Dose and Directions (capital letters) Nefopam Hcl 30mg x 3 tabs tds	Date 21/1/11 Route Po Stop date & initials	Time 0700 0800 1200 1400		22 23 24
Indication Signature Pager Surname	Pharmacy code ✓	1700 2100		22 23 24
Drug, Dose and Directions (capital letters) Marevan 3mg 2 tab od * [redacted] date & initials	Date 21/1/11 Route Po date & initials	Time 0700 0800 1200 1400		22 23 24
Indication Signature Pager Surname (capital letters)	Pharmacy code	1700 2100		22 23 24

# Insulin

## Specific formulations

Type of Insulin	Presentation	Lilly Brand Name	Subcutaneous Insulin Activity*	Novo Brand Name
			HOURS 0 2 4 6 8 10 12 14 16 18 20 22 24 26 28	
Insulin analogues FAST ACTING		Humalog (generic name: Lispro)		NovoRapid (generic name: Aspart)
Neutral (regular or soluble) SHORT ACTING	10ml vial 3ml cartridge	Humulin R		Actrapid
Isophane (NPH) INTERMEDIATE ACTING	10ml vial 3ml cartridge	Humulin NPH		Protaphane
Premixed Insulin 70% Isophane 30% Regular	10ml vial 3ml cartridge	Humulin 30/70		Mixtard 30 Penmix 30
Premixed Insulin Lispro 25% Lispro 75% Lispro protamine suspension	3ml cartridge	Humalog Mix25		
The other premixed insulin available are Penmix 50 and Humalog Mix50				
Long Acting Glargine	10ml vial 3ml cartridge	Lantus (Aventis)		
Long Acting Detemir not currently funded	FlexPen 3ml cartridge			Levemir

\* Insulin activity may vary from patient to patient

# REGULAR DRUGS

MONTH

DATE

Drug, Dose and Directions (capital letters)

Date

Time

Other

Enoxaparin 0.5g/kg/d  
 (0.5g/kg/d)  
 Indication

15/3/11

0700

Route S/C

0800

Stop date & Initials

1200

15/3/11

1400

Pharmacy code

1700

Signature

Pager

Surname

Drug, Dose and Directions (capital letters)

Date

Time

Other

Clexane 400mg  
 400mg BD  
 Indication

15/3/11

0700

Route S/C

0800

Stop date & Initials

1200

15/3/11

1400

Pharmacy code

1700

Signature

Pager

Surname

Drug, Dose and Directions (capital letters)

Date

Time

Other

Clexane 400mg  
 400mg BD  
 Indication

15/3/11

0700

Route S/C

0800

Stop date & Initials

1200

15/3/11

1400

Pharmacy code

1700

Signature

Pager

Surname

Drug, Dose and Directions (capital letters)

Date

Time

Other

Humalog mix 25 6U.  
 Indication

16/3/11

0700

Route S/C

0800

Stop date & Initials

1200

17/3

1400

Pharmacy code

1700

Signature

Pager

Surname

Drug, Dose and

Date

Time

Other

0700



										REGULAR DRUGS		MONTH		
												DATE		
										Drug, Dose and Directions (capital letters) <i>Glimepiride</i> <i>80mg BD</i>	Date <i>2/2</i>	Time	Oti	
												0700		
											Route <i>po</i>	0800	<i>5</i>	
											Stop date & Initials	1200		
										Indication		1400		
											Signature	Pharmacy code	1700	
													2100	
													Surname (c)	
										Drug, Dose and Directions (capital letters) <i>metformin</i> <i>850mg BD</i> <i>with food</i>	Date <i>2/2</i>	Time	Ot	
												0700		
											Route <i>po</i>	0800		
											Stop date & Initials	1200		
										Indication		1400		
											Signature	Pharmacy code	1700	<i>5</i>
													2100	
													Surname (capital)	
										Drug, Dose and Directions (capital letters) <i>Humalog</i> <i>25unit BD</i>	Date <i>2/2</i>	Time	Ot	
												0700		
											Route <i>SLC</i>	0800		
											Stop date & Initials	1200		
										Indication		1400		
											Signature	Pharmacy code	1700	
													2100	
													Surname	
										Drug, Dose and Directions (capital letters) <i>Cilazapril</i> <i>2.5mg</i> <i>mare</i>	Date <i>2/2</i>	Time	Ot	
												0700		
											Route <i>po</i>	0800		
											Stop date & Initials	1200		
										Indication		1400		
											Sig	Pharmacy code	1700	
													2100	
													Pa	

Drug <u>PARALCEPAMIN</u>	Date <u>7/4/11</u>	7/4	07	15	~	
Dose <u>1g</u>		7/4	16	14		
Frequency <u>q.i.d.</u>	Route <u>G.</u>	07/04	21	19		
Maximum dose in 24 hours			00			
Tick if drug is also charted regularly <input type="checkbox"/>	Stop date & initials	5/4	08 <sup>00</sup>	18 <sup>00</sup>		
Indication						
Signature Pager Surname (cap)	Pharmacy code					
Drug <u>CENTURON PAIN</u>	Date <u>7/4/11</u>	07/04	21	00	60	
Dose <u>30-60mg</u>			00		mg	
Frequency <u>Q.W.</u>	Route <u>G</u>					
Maximum dose in 24 hours						
Tick if drug is also charted regularly <input type="checkbox"/>	Stop date & initials					
Indication						
Signature Pager Surname (cap)	Pharmacy code					
Drug <u>MURAMINE SULFATE</u>	Date <u>7/4/11</u>	7/4	11	05	5mg	
Dose <u>2.5 - 10mg</u>		7/4	12	20	5mg	
Frequency <u>40</u>	Route <u>o.i.v.</u>				mg	
Maximum dose in 24 hours						
Tick if drug is also charted regularly <input type="checkbox"/>	Stop date & initials					
Indication						
Signature Pager Surname (cap)	Pharmacy code					

# Oxycodone

- Oxycotin<sup>®</sup>
  - Oxycodone SR,
  - Outer coat releases 40% over 1<sup>st</sup> hour
  - Inner matrix releases 60% over remaining 11 hours
- Oxynorm<sup>®</sup>
  - Oxycodone IR
- Oxycodone OR morphine NOT both
- Oxycodone/oxytocin/oxybutynin



# Medication Safety

- *“To give the correct drug at the correct dose to the correct patient, via the correct route, at the correct time.”*

# Audits

Identify areas for improvement:

- Patient identification
- Patient allergy status
- 7 Rs check
- Independent calculations
- # distractions during medication process

# Incident Data

Identify areas for improvement:

- IV administration despite
  - poor prescribing
  - known allergy to that therapy
- Double checking

# Medication Safety

## Be a leader