



# **Electronic Medication Management The Sixth Medication Right**



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# **Electronic Medication Management (eMM)**

- **Design & implementation is a complex undertaking**
- **Significant impact on facilities & end users**
- **Extensive workflow & process changes**
- **Lengthy revision of policies & procedures**
- **Costly changes to facility infrastructure**

# Electronic Medication Management (eMM)

- Improve patient safety
- Reduce error rates
- Improve quality & efficacy of prescribing, provision & administration
- Improve workflow
- Avoid delays in medication administration
- Enforce standardisation & processes

# SSWAHS eMM Project Scope

- **Pilot in stages:**
  - **‘Proof of concept’ in two wards**
  - **Subsequent rollout across Concord Hospital**
- **No integration with iPharmacy**
- **Pharmacy review verification & inpatient dispensing only**
- **Closed loop medication solution**
- **Passive decision support**

# Rationale for Approach

- **More benefits in electronic prescribing, basic decision support & medication administration**
- **Minimum decision support focuses functionality basics, system performance issues & delays to obtain agreement on rules**
- **Eliminate patient safety risks associated with the paper medication chart**
- **Avoid risks with pharmacy system interfacing**

# Implementation: Aged Care

- **Nov 2007**                      **24 bed Aged Care Ward**
- **April 2008**                    **28 bed Aged Care Ward**
- **July 2008**                     **24 bed Aged Care Ward**
- **July 2009**                    **15 bed Aged Care Rehab Ward**
- **Nov 2009**                     **12 bed Psychogeriatric Ward**

**Total beds = 103 (20% inpatients)**

# Electronic Medication Management

Integration of Cerner PowerChart functionalities & solutions

- Prescribing – PowerOrders
- PharmNet – Pharmacy review/verification & dispensing
- Medication Administration Record (MAR)- Charting administration of medications
- Drug database (MULTUM)
- Pathology Results
- Decision support

# System Functionality



- Allergies recorded for all patients using allergies functionality

# Recording Allergies

Menu	
PowerOrders	+ Add
Flowsheet	
Clinical Notes	
Form Browser	
Patient Information	
Task List	
Transfer History	
Patient Schedule	
MAR	
MAR Summary	
Allergies	+ Add
Medication List	+ Add

Select Allergies from Menu

Allergies

Mark All as Reviewed

Allergies

+ Add    Modify    No Known Allergies    Reverse Allergy Check

D...	Substance	Category	Reactions	Severity	Type	C...	Est. U
------	-----------	----------	-----------	----------	------	------	--------

Click Add Button to add an Allergy

OR Click No Known Allergy button

My Favorites    Search

Search    Penicillin    Select -->

Search by:  
 Name     Code

Search for:  
 Substance     Reaction

For items with these vocabularies/principal types:  
Vocabularies: Allergy, Multum Allergy Category, ...

Name	Vocabularies	Code
penicillin	Multum Drug	d0011
penicillins	Multum Allergy Category 3	

Substance

1. Substance (required)  
NKA    penicillins  
Allergy

2. Reaction type  
Allergy

3. Reaction symptoms  
Add Free Text

Type in name of Substance then click search.

Double click on required selection

# Recording Allergies

My Favorites Search Catalog

Select -->

Name

- Common Reactions
  - Drug-induced anaphylaxis
  - Angioneurotic oedema
  - Drug-induced rash**
  - Drug-induced dystonia
  - O/E - oedema
  - Induced apnoea
  - Acute bleeding
  - Drug-induced bradycardia
  - Onset of confusion
  - Hallucinations
  - Drug-induced constipation
  - Drug AND/OR toxin-induced diarrhoea
  - Gets drowsiness
  - Drug-induced hypoxaemia

Substance

1. **Substance (required)**

NKA penicillins

Allergy

2. **Reaction type**

Allergy

3. **Reaction symptoms**

Add Free Text

Drug-induced rash

To record reaction, open Catalogue Tab

Double Click on appropriate reaction

OK Cancel Apply New...

Click OK button, or New button to add another allergy

Allergies

Print 0 minutes ago

Mark All as Reviewed

+ Add Modify No Known Allergies Reverse Allergy Check Display: Active

D...	Substance	Category	Reactions	Severity	Type	C...	Est. Onset	Reaction S...	Updated By	Source	Reviewed
✓	penicillins	Drug	Drug-induc...		Allergy			Active	25/11/200...		25/11/2008

Allergy is now saved to this patient's chart

# System Functionality

- Allergies recorded for all patients using allergies functionality
- Prescribers can view all current & past orders

# Medication List Tab

TESTPATIENT, Coag4 - 951434 Opened by Train9, Train9

TESTPATIENT, Coag4      DOB: 01/01/1900      Age: 107 years      Sex: Female      MR #: 951434  
 Location: 15: W15: 00      CRGH Inpatient [30/10/2007 9:43 <No - Discharge date>]

Medication List      Allergies

Medication List Tab

Medication List

Medication order status filter

Medication order status

Display: All Medications (All Statuses)

- All Active Medications
- All Active Medications 24 Hours Back
- All Medications (All Statuses)
- All Medications 5 Days Back
- Completed Medications
- Future Medications
- Suspended, Incomplete, and On Hold Medications Only

Medication	Status	Dose	Frequency	Route	Notes
patch removal (glyceryl trinitrate patch removal)	Ordered	1 patch	Derma	Patch, nocte (bedtime)	
warfarin (Coumadin)	Ordered	3 mg = 3 tab	Oral, Tab, evening	Ensure that the Warfarin Target Range has been charted before giving this medication	
unlisted medication (RED TAB)	Ordered	RED TAB	Oral, Misc, QID		
paracetamol (Panadol)	Ordered	1,000 mg = 2 tab	Oral, Tab, q6 hr	WA	
paracetamol	Ordered	1000 mg = 2 tab	Oral, Tab, q6 hr	PRN, Pain	
gentamicin	Ordered	240 mg = 6 mL	IV Infus, Soln, inj, q24 hr	In Glucose 5% Target Dose: gentamicin 4 mg/kg 31/10/2007 08:46:11	
digoxin (Lanoxin)	Ordered	250 microg = 1 tab	Oral, Tab, mane		
heparin	Ordered	4,000 unit = 4 mL	IV Inject, Inj, Once		
glyceryl trinitrate (glyceryl trinitrate 5 mg/24 hr transfer...)	Ordered	5 mg/24 hr = 1 patch	Dermal, Patch, mane		
insulin neutral (Actrapid HM4)	Ordered	1 unit = 0.04 mL	Subcut, Inj, TDS AC, PRN	Other: See comments, SLIDING SCALE - Endocrine Team review strongly recommended Blood Glucose level 10 - 14 mmol/L give 4 unit 14.1 - 18 mmol/L give 6 unit 18.1 - 22 mmol/L give 8 unit 22.1 mmol/L	
Sodium Chloride 0.9% 50 mL + heparin 5,000 unit	Discontinued	IV Cont Infus, 10 mL/hr, 5 hr, 50 mL		Starting Dosage - Acute Coronary Syndrome: 12 unit/kg/hr Starting Dosage - AF, VTED, ATED, PHV: 18 unit/kg/hr Concentration: 100 unit/mL	
Sodium Chloride 0.9% 45 mL + heparin 5,000 unit	Discontinued	IV Cont Infus, 10 mL/hr, 4.5 hr, 45 mL		Starting Dosage - Acute Coronary Syndrome: 12 unit/kg/hr Starting Dosage - AF, VTED, ATED, PHV: 18 unit/kg/hr Concentration: 100 unit/mL	
Sodium Chloride 0.9% 50 mL + heparin 5,000 unit	Discontinued	IV Cont Infus, 10 mL/hr, 5 hr, 50 mL		Starting Dosage - Acute Coronary Syndrome: 12 unit/kg/hr Starting Dosage - AF, VTED, ATED, PHV: 18 unit/kg/hr Concentration: 100 unit/mL	
Sodium Chloride 0.9% 50 mL + heparin 5,000 unit	Discontinued	IV Cont Infus, 10 mL/hr, 5 hr, 50 mL		Starting Dosage - Acute Coronary Syndrome: 12 unit/kg/hr Starting Dosage - AF, VTED, ATED, PHV: 18 unit/kg/hr Concentration: 100 unit/mL	
metoclopramide (Maxolon)	Discontinued	10 mg = 2 mL	IM, Inj, TDS, PRN	Nausea and vomiting phone order checked by EEN Wang	
metoclopramide (Maxolon)	Discontinued	10 mg = 2 mL	IM, Inj, TDS, PRN	Nausea and vomiting	
paracetamol	Discontinued	1000 mg = 2 tab	Oral, Tab, q6 hr	PRN, Pain	
paracetamol	Discontinued	1000 mg = 2 tab	Oral, Tab, q6 hr	PRN, Pain	
morphine 50 mg	Discontinued	Bolus Dose: 1 mg, Lock-out Interval: 5 min, Basal Rate: 0.0 mL/hr, Total Dose: 50 mg / 50 mL, Concentration: 1 mg/mL, PCA, 50 mL, Replace every			

Displayed: All Active Orders | All Inactive Orders

Related Results

Show More Orders...  
Orders For Signature

# System Functionality

- Allergies recorded for all patients using allergies functionality
- Prescribers can view all current & past orders
- Drug database (MULTUM)
- Electronic medication prescription (single order or care set) for medications & IV Therapy

# System Functionality

The background of the slide is a close-up photograph of various pharmaceutical pills and capsules. The pills are in various colors including white, orange, green, and blue. Some are round, some are oval, and some are capsules. The lighting is soft, and the focus is slightly blurred, creating a sense of depth. The pills are scattered across the frame, with some in the foreground and others in the background.

- **Passive decision support**

IDENTIFIED ORDER:

**gentamicin**

Show:

Status	Type	Severity	Overrid...	Name
Order	<b>D</b>	<b>●</b>		frusemide 40 MG, PO, BD, 1/11/2004 6:00 PM, 1 DAY(S), St...

Previous Override Reason:

Free Text

Current Override Reason:

 Apply To All**gentamicin - frusemide (interaction)**

gentamicin frusemide: MAJOR MONITOR CLOSELY: The combination of loop diuretics and parenteral aminoglycoside antibiotics or oral neomycin may result in synergistic auditory and vestibular toxicity and nephrotoxicity. The risk of toxicity may be greater with high doses of either drug, preexisting renal insufficiency, advanced age, dehydration, and the presence of other nephrotoxic

 Remove identified order

Drug Reference | Education Leaflet | Reference

Search

## gentamicin

[Pharmacology](#), [Warnings](#), [Pregnancy](#), [Lactation](#), [Side Effects](#)

### Pharmacology (Top)

Gentamicin is an aminoglycoside antibiotic effective against most gram-negative bacteria. Gentamicin binds to the 30S ribosomal subunit, interfering with protein synthesis in sensitive bacteria. Gram-positive and anaerobic bacteria are almost always resistant, and high-level gentamicin-resistant enterococci (HLGRE) have been found to produce aminoglycoside resistance genes. Gentamicin is indicated for the treatment of serious infections due to susceptible organisms such as bacteremia, intra-abdominal infections, peritonitis, pneumonia, complicated urinary tract infections, and osteomyelitis. It provides synergy with other antimicrobial agents such as penicillin, ampicillin, and vancomycin for serious gram-positive infections such as endocarditis. It does not cross the blood-brain barrier, and has generally been replaced by beta-lactam agents with better penetration for central nervous system infections. Gentamicin liposomal injection is a designated orphan drug for the treatment of Mycobacterium avium-intracellulare infection. Surgical wire with gentamicin-impregnated PMMA beads is an orphan drug for the treatment of chronic osteomyelitis of posttraumatic, postoperative, or haematogenous origin. Intratympanic injections of gentamicin have had beneficial effects in the treatment of Meniere's disease.

### Warnings (Top)

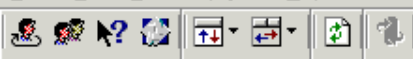
The use of aminoglycosides may result in nephrotoxicity and ototoxicity. The risk is greatest in patients with impaired renal function, those receiving high doses for prolonged periods of time, the elderly, and dehydrated patients.

OK



# System Functionality

- **Passive decision support**
- **Review/verification of orders by pharmacists**



Select a patient MRN: Age: Gender: Location: FIN: Race: Admitted: Physician:

Enter a patient name:

- Demographics
- Patient Note
- Reason For Visit
- Allergies
- Problems
- Medications

Profile Results Unverified Orders Monitor

Action	Name	Order Sentence	Start Date/Time	Rx Priority	Last Unverified Action	FIN
	Sloan, Harvey	Perindopril 4 MG PO M...	2/11/2004 08:00	Routine	* Order	17122
	Sloan, Harvey	Perindopril 4 MG PO M...	2/11/2004 08:00	Routine	* Cancel	17122
	Sloan, Geoffery	Trimethoprim 300 MG ...	1/11/2004 18:32	Routine	* Order	17141
	Sloan, Geoffery	Cefotaxime 1 GM IV BD	1/11/2004 18:00		* Order	17141
	Sloan, Geoffery	Coloxyl with senna 2 T...	1/11/2004 18:00	Routine	* Order	17141
	Sloan, Geoffery	frusemide 80 MG PO BD	1/11/2004 18:00		* Modify	17141
	Sloan, Geoffery	gentamicin 240 MG IV ...	1/11/2004 18:00		* Complete	17141
	Sloan, Geoffery	Panadol 1 GM PO Q6...	1/11/2004 18:00		* Order	17141
	Sloan, Geoffery	Perindopril 4 MG PO M...	1/11/2004 18:00	Routine	* Order	17141
	Sloan, Geoffery	salbutamol 5 MG NEB ...	1/11/2004 18:00		* Order	17141
	Sloan, Geoffery	Temazepam 10 MG P...	1/11/2004 18:00	Routine	Activate Student Order	17141
	Sloan, Geoffery	warfarin 3 MG PO NO...	1/11/2004 18:00		* Order	17141
	Sloan, Harvey	gentamicin 240 MG IV ...	1/11/2004 15:00		* Discontinue	17122
	Sloan, Harvey	Panadol 1 GM PO Q4...	1/11/2004 14:54		* Discontinue	17122
	Sloan, Harvey	Coloxyl with senna 2 T...	1/11/2004 14:50	Routine	* Discontinue	17122
	Sloan, Harvey	Cefotaxime 500 MG IV...	1/11/2004 14:44		* Discontinue	17122
	Sloan, Harvey	salbutamol 5 MG NEB ...	1/11/2004 14:43		* Discontinue	17122
	Sloan, Harvey	warfarin 3 MG PO NO...	1/11/2004 14:39		* Discontinue	17122
	Sloan, Harvey	frusemide 40 MG PO BD	1/11/2004 14:38		* Discontinue	17122
	KJP, Hie	penicillin 600 MG IM Q...	29/10/2004 17:00		* Order	17089
	KJP, Reference Range	penicillin 600 MG IM Q...	29/10/2004 17:00		* Order	17117
	Choo, Teo Wai	allopurinol 100 MG PO ...	2/10/2004 08:00		* Order	16986
	Monteiro, Mavis	Atacand Plus 16 MG P...	1/10/2004 08:00		* Order	16976
	Rossi, Valentino	prednisoLONE 5 MG P...	28/06/2004 08:00		* Order	16864
	Lai, Mandy	morphine sulfate 20 M...	23/06/2004 13:30		* Order	16983
	Sulaiman, Ali	Seretide Accuhaler 1 I...	23/06/2004 12:17		* Order	16977
	Rossi, Valentino	prednisoLONE 10 MG ...	23/06/2004 08:00		* Order	16864

- (None)
- Accept
- Reject
- Verify
- View Profile

Actions

Select

Submit Cancel Apply

Sloan, Geoffery

MRN: Age: 82 Years Gender: Male Location: 115 / 1117 B  
FIN: 17141 Race: Admitted: 1/11/2004 17:16 Physician: Brennan, Gerald

### Patient details

Enter a patient name: Sloan, Geoffery Profile Results Unverified Orders Monitor

**Clinical Details**

**Demographics**

- Height: 72 CM
- Result Dt/Tm: 1/11/2004 17:40
- Weight: 84 KG
- Result Dt/Tm: 1/11/2004 17:40
- Creatinine: 0.5
- Result Dt/Tm: 1/11/2004 17:20
- BSA: 1.4 m<sup>2</sup>
- BSA Method: Gehan George
- BW: OUT OF RANGE
- BW Method: Devine
- CrCl (est.): MISSING DATA
- CrCl Method: Cockcroft-Gault

**Patient Note()**

Click here to view/edit the patient note...

**Reason For Visit**

**Allergies (1)**

Click here to add a new allergy...

penicillin

**Problems (4)**

Click here to add a new problem...

- Deep venous thrombosis
- CONGESTIVE HEART FAILURE, UNSPECIFIED
- CHRONIC RENAL FAILURE
- Chronic obstructive pulmonary disease and allied condi...

**Medications**

- \* Cefotaxime 1 GM IV BD
- \* Coloxyl with senna 2 TAB PO BD PRN

Action	Name	Order Sentence	Start Date/Time	Rx Priority	Last Unverified Action	FIN
▼	Sloan, Harvey	Perindopril 4 MG PO M...	2/11/2004 08:00	Routine	* Order	17122
▼	Sloan, Harvey	Perindopril 4 MG PO M...	2/11/2004 08:00	Routine	* Cancel	17122
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▼	Sloan, Harvey	Coloxyl with senna 2 T...	1/11/2004 14:50	Routine	* Discontinue	17122
▼	Sloan, Harvey	Cefotaxime 500 MG IV...	1/11/2004 14:44		* Discontinue	17122
▼	Sloan, Harvey	salbutamol 5 MG NEB ...	1/11/2004 14:43		* Discontinue	17122
▼	Sloan, Harvey	warfarin 3 MG PO NO...	1/11/2004 14:39		* Discontinue	17122
▼	Sloan, Harvey	frusemide 40 MG PO BD	1/11/2004 14:38		* Discontinue	17122
▼	KJP, Hie	penicillin 600 MG IM Q...	29/10/2004 17:00		* Order	17089
▼	KJP, Reference Range	penicillin 600 MG IM Q...	29/10/2004 17:00		* Order	17117
▼	Choo, Teo Wai	allopurinol 100 MG PO ...	2/10/2004 08:00		* Order	16986
▼	Monteiro, Mavis	Atacand Plus 16 MG P...	1/10/2004 08:00		* Order	16976
▼	Rossi, Valentino	prednisolONE 5 MG P...	28/06/2004 08:00		* Order	16864
▼	Lai, Mandy	morphine sulfate 20 M...	23/06/2004 13:30		* Order	16983
▼	Sulaiman, Ali	Seretide Accuhaler 1 I...	23/06/2004 12:17		* Order	16977
▼	Rossi, Valentino	prednisolONE 10 MG ...	23/06/2004 08:00		* Order	16864

Accept

Submit Cancel Apply

# System Functionality

- **Passive decision support**
- **Review/verification of orders by pharmacists**
- **Nurses view medication orders & record administration on MAR**

Time View

- Scheduled
- Unscheduled
- PRN
- Continuous Infusions
- Future
- Discontinued Scheduled
- Discontinued Unscheduled
- Discontinued PRN
- Discontinued Continuous Infusion

Therapeutic Class View

Medications	10/06/2009 12:00	10/06/2009 14:00	10/06/2009 15:50	10/06/2009 16:00	10/06/2009 20:00
<b>Scheduled</b>					
allopurinol 50 mg, Oral, Tab, BD					50 mg
allopurinol 50 mg, Oral, Tab, BD		Administered	50 mg Auth (Ver)		
atorvastatin (Lipitor) 20 mg, Oral, Tab, BD					20 mg
atorvastatin 20 mg, Oral, Tab, BD			Not Given: Refu		
candesartan (Atacand) 32 mg, Oral, Tab, BD		Overdue	32 mg		32 mg
candesartan 32 mg, Oral, Tab, BD					
digoxin 250 microg, Oral, Tab, BD					250 microg
digoxin 250 microg, Oral, Tab, BD					
<b>Pulse Rate</b>			250 microg result 57 bpm Auth (V)		
glibenCLAMIDE (Daonil) 5 mg, Oral, Tab, BD, Administration time is a guide only: MUST taken with meals					5 mg
glibenCLAMIDE 5 mg, Oral, Tab, BD, Administration time is a guide only: MUST taken with meals					
<b>Glucometer Result</b>			5 mg Auth (Verif) 5.3 mmol/L Auth		

Current date/time

Administered

Overdue

Medication due

Assessment

# System Functionality

- **Passive decision support**
- **Verification of orders by pharmacists**
- **Nurses view medication orders & record administration on MAR**
- **All users across the facility can view the MAR Summary**

# MAR Summary

Gives a snapshot of the patient's administration history

Menu	
PowerOrders	+ Add
Flowsheet	
Clinical Notes	
Form Browser	
Patient Information	
Task List	
Transfer History	
Patient Schedule	
MAR	
MAR Summary	
Allergies	+ Add
Medication List	+ Add

Select the MAR Summary from Menu

Wider timeframe (can be adjusted)

23 November 2008 0000 - 25 November 2008 0000							
Time View	23/11/2008 2000 - 0000	24/11/2008 0000 - 0400	24/11/2008 0400 - 0800	24/11/2008 0800 - 1200	24/11/2008 1200 - 1600	24/11/2008 1600 - 2000	24/11/2008 2000
Scheduled							
<b>cholecalciferol (Ostelin)</b> 1,000 unit, Oral, Cap, daily after food			1,000 unit @0730				
<b>dietary supplement (2CAL - vanilla)</b> 90 mL, Oral, Susp, QID							
<b>dietary supplement (2CAL - vanilla)</b> 90 mL, Oral, Susp, QID	Not Given: Refused - Notify Doctor @2200		90 mL @0600		90 mL @1200	@1800	@2000
<b>flucloxacillin</b> 2 g, IV Infus, Inj, QID, Infuse in 100 mL Sodium chloride ...	2 g @2330		2 g @0600		2 g @1200	@1800	
<b>flucloxacillin</b> 2 g, IV Infus, Inj, QID, Infuse in 100 mL Sodium chloride 0.9% or Glucose 5%, and infuse over 30 minutes							
<b>frusemide</b> 40 mg, Oral, Tab, mane							
<b>frusemide (Lasix)</b> 80 mg, Oral, Tab, mane				80 mg @0800			
<b>frusemide (Lasix)</b> 40 mg, Oral, Tab, midday							
<b>ipratropium (Atrovent)</b> 500 microg, Inhal, Soln, neb, QID							

Not given dose

Active orders

Administered dose

Pending dose

Inactive orders

# Inpatient Order

Medication List

+ Add Document Medication by Hx Reconciliation ▾

Orders Medication List

Document Medication  
by Hx

Click Add Button in  
Medication List

Find: atacand Search

Folder:

Search for & select  
required medication

Atacand  
Atacand Plus

Order Sentences

Order Sentences for: candesartan (Atacand)

(None)
16 mg, Oral, Tab, mane
<b>32 mg, Oral, Tab, mane</b>
4 mg, Oral, Tab, mane
8 mg, Oral, Tab, mane

Select closest order sentence in  
Order Sentence window

Orders for Signature

Order Name	Status	Start	Details
15; W15; 19 Admit: 20/12/2008 11:25			
Medications			
candesartan (Atacand)	Order	18/02/2009 14:00	32 mg, Oral, Tab, TDS

Details for candesartan (Atacand)

Remaining Administrations: (Unknown) Stop: (Unknown)

Order details	Detail values
START Date and Time [18/02/2009 14:00]	QID before food
Dose [32]	Sat Sun
Dose Unit [mg]	<b>TDS</b>
Route [Oral]	TDS after food
Form [Tab]	TDS before food
Frequency [TDS]	Tue Thur
PRN	weekly
PRN Reason	weekly FRI
Pharmacy Order Priority	weekly MDN
Patient's Own Meds	weekly SAT
Duration	weekly SUN
Duration Unit	
Stop Date and Time	
Order for Future Meds	

0 Missing Required Details

Sign

Update details of order as required.  
(Note – instruction for the nurse  
should be entered into the order  
*comments* tab)

Click sign button  
to sign off

Sign




# IV Heparin Infusions

This medication is not prescribed electronically – Dummy Order

 Heparin 100 unit/mL in Sodium chloride 0.9% 50 mL

Order IV heparin


▼ Details for **Sodium Chloride 0.9% 50 mL + heparin 5,000 unit**

 Details / 
  **Continuous Details** / 
  Order Comments

Base Solution	Bag Volume	Rate	Infuse Over
Sodium Chloride 0.9%	50 mL	mL/hr	hr
Additive	Additive Dose	Occurrence	
heparin	5,000 unit	EB	
Total Bag Volume		50 mL	

2 Missing Required Details Sign

Enter infuse over time or rate & sign off

 <b>Sodium Chloride 0.9% 50 mL + heparin 5000 unit</b> 14/01/2009 16:01:00 IV Cont Infus, 5.56 mL/hr, 9 hr, 50 mL, Use paper IV heparin infusion chart for recording rate changes, bolus and other administration details. Discontinue order when Heparin order is ceased	Pending	Not previously given
<b>Administration Information</b>		
<b>Sodium Chloride 0.9%</b>		
<b>heparin</b>		

Order in MAR will instruct nurse to refer to paper chart

# Tapering Dose Orders

Find: prednisolone Search Starts with: [v]  
Folder: Search within: All  
prednisolONE  
PrednisolONE Sodium Phosphate ...  
prednisolONE prednisolONE o...

Search for & select required medication

Order Sentences for: prednisolONE

- 6 mg, Oral, Tab, daily after food
- 7 mg, Oral, Tab, daily after food
- 8 mg, Oral, Tab, daily after food
- 9 mg, Oral, Tab, daily after food
- 10 mg, Oral, Tab, daily after food
- 20 mg, Oral, Tab, daily after food
- 25 mg, Oral, Tab, daily after food
- 30 mg, Oral, Tab, daily after food
- 1 mg, Oral, Susp, daily after food
- 2 mg, Oral, Susp, daily after food

OK Cancel

Select starting dose in Order sentence screen

Details for prednisolONE

Order details

START Date and Time [26/11/2008 7:30]

Dose [20]  
Dose Unit [mg]  
Route [Oral]  
Form [Tab]  
Frequency [daily after food]

In details section of order, click on Tapering Dose icon

Start: \*Dose 20 \*Unit mg \*Route Oral \*Frequency daily after food \*Start 26/11/2008 0730 Australia/Sydney

Taper Details

Reduce by 5 mg every 2 day

\*Final Dose 5 mg

Stop final dose after 2 day  
 Continue until instructed to stop

Calculate Steps

A tapering screen appears, fill in Taper details

Click "calculate steps" to create tapering orders

Planned Regimen

Dose	Unit	Route	Frequency	Start	Last Dose	Doses
20	mg	Oral	daily after food	26/11/2008 7:30 Australia/Sydney	27/11/2008 7:30 Australia/Sydney	2 Dose(s)
15	mg	Oral	daily after food	28/11/2008 7:30 Australia/Sydney	29/11/2008 7:30 Australia/Sydney	2 Dose(s)
10	mg	Oral	daily after food	30/11/2008 7:30 Australia/Sydney	01/12/2008 7:30 Australia/Sydney	2 Dose(s)
5	mg	Oral	daily after food	02/12/2008 7:30 Australia/Sydney	03/12/2008 7:30 Australia/Sydney	2 Dose(s)

# Sliding Scale Order

Find:

Folder: S

Actrapid HM

In mediation list – add an order for a sliding scale medication

Details for insulin neutral (Actrapid SLIDING SCALE)

Details | Order Comments

Remaining Administrations: (PRN) Stop: (Unknown)

Order details

START Date and Time: [28/05/2009 14:...

Freetext Dose: [4 to 10 unit]

Dose

Dose Unit

Route: [Subcut]

Form: [Inj]

Frequency: [TDS before food]

PRN: [Yes]

PRN Reason: [Other: See comments]

Max Doses / 24 hr

Detail values

Requested Start Date/Time: 28/05/2009 1412

Next administration:

Following administration:

0 Missing Required Details

Sign

Sliding scale dose defaults to 4 to 10 units. Edit details if required

Details for insulin neutral (Actrapid HM)

Details | Order Comments

Order Comments

Blood Glucose Level

10 - 14 mmol/L	give 4 unit
14.1 - 18 mmol/L	give 6 unit
18.1 - 22 mmol/L	give 8 unit
22.1 mmol/L	give 10 unit

Call if greater than 22 mmol/L


In Order comments – a default sliding scale is available. This can be modified as required

insulin neutral (Actrapid SLIDING SCALE)	PRN	4 to 10 unit	Not previously given
4 to 10 unit, Subcut, Inj, TDS before food, PRN			
Other: See comments, Max Doses / 24 hr = 3, SLIDING SCALE - Endocrine Team review strongly recommended. Administration time is a guide only:			
MUS Blood Glucose Level			
Bloo 10 - 14 mmol/L	give 4 unit		
insu 14.1 - 18 mmol/L	give 6 unit		
Glu 18.1 - 22 mmol/L	give 8 unit		
22.1 mmol/L	give 10 unit	Call if greater than 22 mmol/L	

In MAR nurses are able to see the sliding scale for this patient before they administer the insulin

# Administering medication that requires a witness

All Schedule 8 and Schedule 4D medication administrations will prompt for a witness

 morphine 10 mg, Oral, Liquid, q4 hr, PRN, Pain	PRN		10 mg Not previously given
morphine			

Click once on Medication Task

morphine: DWARF, Happy

morphine  
10 mg, Oral, Liquid, q4 hr, PRN, Pain

\*Performed date / time: 05/10/2007 0900

\*Performed by: Trainmed, Two

\*Witnessed by: Kidman, N

No record of last documented administration.

\*morphine: 10 mg

Diluent: <none> ml

\*Route: Oral Site:

Reason: Pain

Not Given

Reason:

Comment...

Witnessing nurse types their *surname, (comma) first name* into witness by field

Verify user

CERNER

User Name: TRAINM3



Password:

Domain: PMOCK

OK Cancel

Witnessing nurse is required to put in their password

# Medication Requests

Medications	26/04/2007 12:00	26/04/2007 14:22
<b>Scheduled</b>		
 <b>digoxin</b> 62.5 µg, 1 tab(s), Tab, Oral, mane, Routine, 26/04/2007 14:22:00, 8 day(s), Stop: 04/05/2 8:00:00		
<b>digoxin</b>		
<b>Pulse Rate</b>		
 <b>fluoxetine</b> 40 mg, 2 cap(s), Cap, Oral, mane, Routine, 26/04/2007 14:22:00		
<b>fluoxetine</b>		

Right mouse click the Medication Order

Select Med Request

**Medication Request** [X]

Reason:

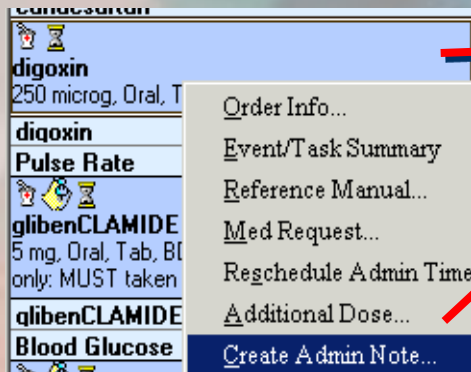
- (None)
- Dose increased
- Dropped or spilt or damaged
- Insufficient for next dose
- Lost medication
- Patient vomited

Select the appropriate reason (further info can be typed into the comment box)

Click **OK**. This request will be printed out in Pharmacy Department

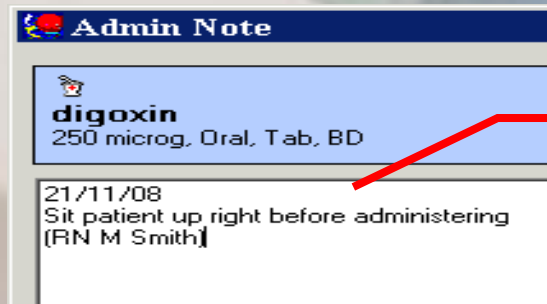
# Creating & Viewing an Admin Note

Nurse to nurse communication

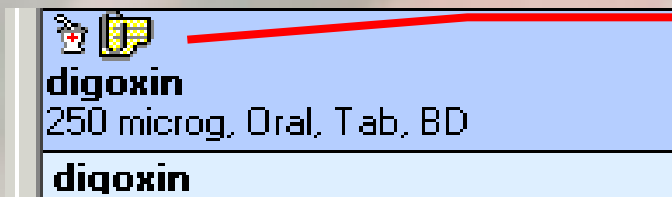


Right mouse click the Medication Order (not the task)

Select Create Admin Note



Type in message, along with date and name & designation, click OK



An Admin Note Icon appears above Drug name. Click on it once to open it

# Improved Quality of Information

- Allergy information improved from 86.6% to 100%
- Correct patient identification
- All orders are legible
- Clarity of prescribers name improved from 66% to 100%
- Audit trail of who administered/ordered medications
- View historical, current & future medication events
- Pharmacy review interaction overrides

# Improved Medication Safety

- Prescribers alerted to an allergy & drug interaction when ordering a drug
- Documented reason for drug omission improved from 86.4% to 100%
- Compliance with prescribing standards has improved with eMM to be near or 100%
- 100% compliant with abbreviation policy
- Auditable trail enables close monitoring of work practices

# Improved Medication Safety



- **Order Sentences**
  - **Guide dosing**
  - **Reduce variance**
  - **Time saving**
- **Tallman letters**
- **Common doses**

# Improved Medication Safety

- Warfarin Regimen Daily Order Care Set
- Methotrexate order sentences specify day of week
- Patch Order Sets includes patch removal
- Fentanyl Patch order sentence incorporates removal
- Times adjusted to be appropriate for care eg Parkinson Disease

# Improved Medication Safety

- **Order sentences for IV drugs include administration instructions**
- **IV antibiotics order sentence includes first dose requirements**
- **Oral hypoglycaemics/insulin dose at appropriate time to food intake**
- **Population of times for medication needed 2<sup>nd</sup> daily**
- **Align with safety features of NIMC**

# Improved Patient Safety

- Access to medication history on readmission
- Integrated with other real time clinical information eg lab results
- Remote access for after hours review by consultants
- Decision support at point of prescribing to assist in Rx decisions
  - Flow sheets
  - Related results
  - Rules

# Improved Efficacy

- **Improved chart access**
- **Order sets of common drugs & protocols**
- **Reduced workload to maintain ward stock levels**
- **Improved time to co-sign orders**

# Improved Efficacy

- Time saved by direct link to pharmacy
- Pharmacy review of medication can take place remotely
- Reduced pharmacist interventions for incorrect orders
- Phone orders less frequent

# Lessons Learnt

- **Early consultation across a range of users**
- **Ensure clinical involvement in decision making**
- **Extensive planning & development**
- **Good governance structure**
- **Acknowledge/accept unlikely to be quicker than handwritten BUT SAFER**
- **Rationalisation of decision support**

# Lessons Learnt

- **Assess basic computer skills**
- **Extensive training program**
- **Increased pharmacist role in training**
- **Super users**
- **Well planned conversion process**

# Lessons Learnt

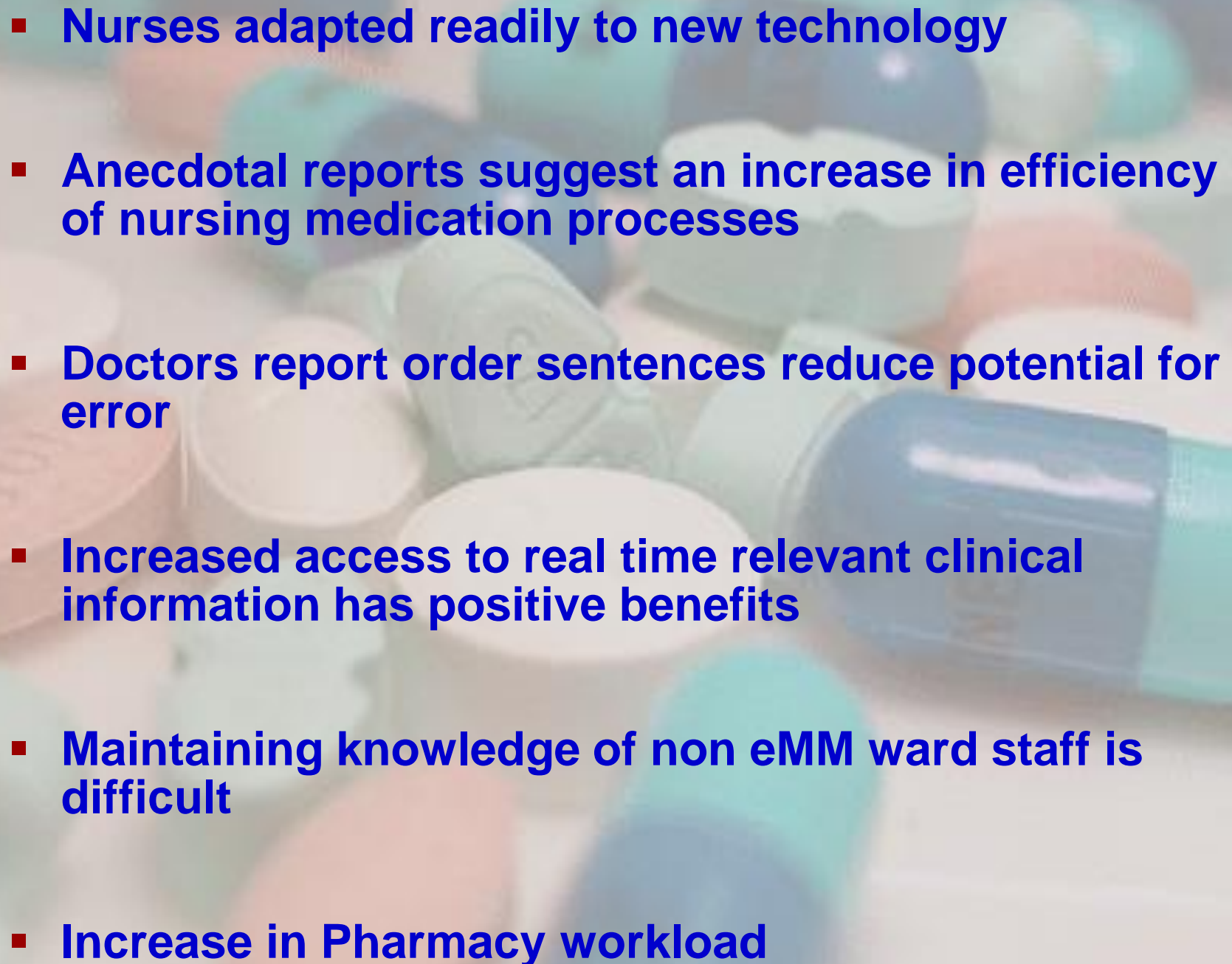
- **24/7 clinical & technical support**
- **Quarantine ward**
- **Rapid turn around of issues**
- **Ownership & control**
- **Ongoing improvements to order sentences & functionality**

# Lessons Learnt

- **Informing staff on non electronic wards**
- **Downtime & transfer processes**
- **Downtime administration document**
- **Reconciliation of data**
- **Workarounds**

# Lessons Learnt

- **Specialty medication charts**
- **Increased time component for pharmacist**
- **Increased time to place order for single medication than on NIMC**
- **Impact of reconciliation process on eDRS**
- **Loss of staff knowledge**

- 
- **Nurses adapted readily to new technology**
  - **Anecdotal reports suggest an increase in efficiency of nursing medication processes**
  - **Doctors report order sentences reduce potential for error**
  - **Increased access to real time relevant clinical information has positive benefits**
  - **Maintaining knowledge of non eMM ward staff is difficult**
  - **Increase in Pharmacy workload**