

High  
Returns

Pharming  
cows

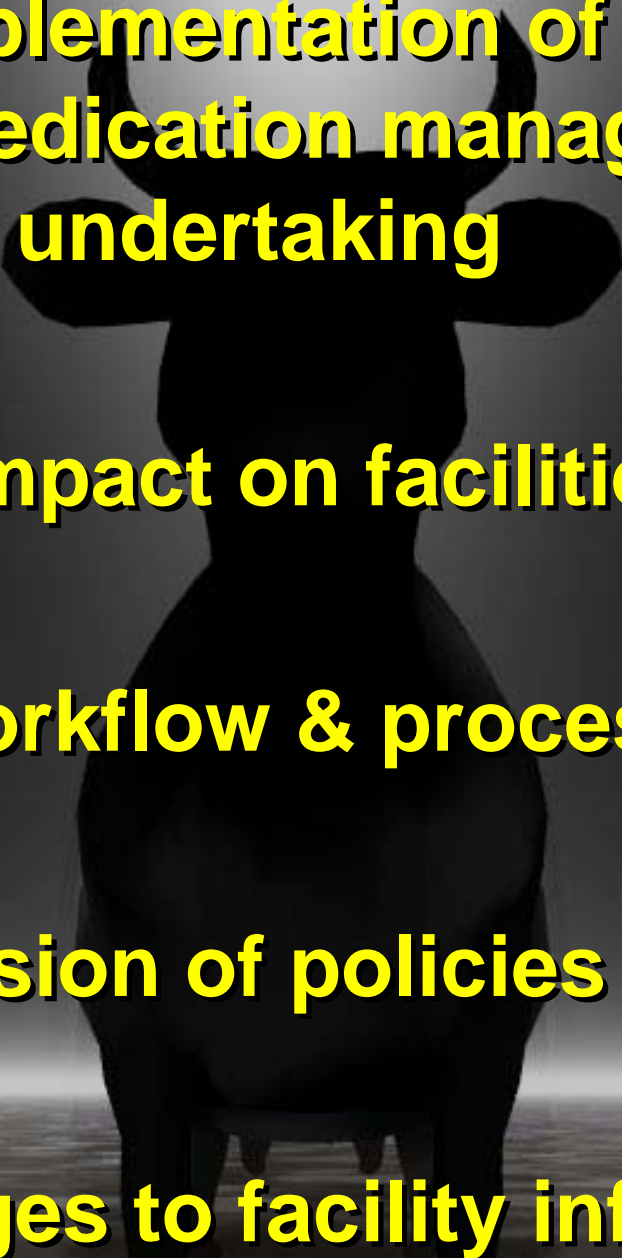




**R Richman\*, J Cullen+, J Laurens+,  
G Tsaprounis\*, N Seggaert\* & R Burke+**

Daisy

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Sydney South West Area Health Service, Sydney, NSW.**

- 
- A silhouette of a water buffalo stands in the center of the frame, facing forward. The background is a gradient of dark grey to light grey, suggesting a sunset or sunrise over a body of water. The buffalo's horns are prominent and curved. The overall mood is somber and contemplative.
- **Design & implementation of an integrated electronic medication management system is a complex undertaking**
  - **Significant impact on facilities & end users**
  - **Extensive workflow & process changes**
  - **Lengthy revision of policies & procedures**
  - **Costly changes to facility infrastructure**

- 
- A silhouette of a bull stands on a beach, facing the viewer. The background is a sunset or sunrise over the ocean, with a bright glow on the horizon and a dark sky. The bull's horns are prominent, and its body is dark against the lighter background.
- **Enthusiastic & committed committee members**
  - **Ongoing engagement of clinical champions**
  - **Active promotion at the Executive level**
  - **Adequate & right skill mix of resources**
  - **Adequate time allocated to training**

**Why do it?**

4. DIABETIC MANAGEMENT CHART

5. EYE CHART

Patient clearly identified

Allergies & alerts

intention not clear.

Legible

NB it was checked & given

INICE ONLY and PRE-OP MEDICATION

Drug Name and Form

Dose

Route

When to start

be given

be given

Signature

Time  
given

Generic drug names

Green

T

12/3  
po

2400

Signatures clear

2400

No confusing abbreviations

Times clear

Clear Order Sentence

Clear administration directions

# **Electronic Medication Management (eMM)**

A silhouette of a bull stands on a beach, facing the viewer. The background is a sunset or sunrise over the ocean, with a bright horizon line and a dark sky. The bull's horns are prominent, and its body is dark against the lighter background.

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



# SSWAHS eMM Project Scope

A silhouette of a bull stands on a beach, facing the viewer. The background is a sunset or sunrise over the ocean, with a bright glow on the horizon and a dark sky above. The bull's horns are prominent, and its body is dark against the lighter background.

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

# Rationale for Approach

A large, dark silhouette of a bull stands in the center of the slide, facing forward. It has prominent horns and a sturdy build. The background is a dark, gradient sky with a horizon line, suggesting a sunset or sunrise over water.

- **More benefits in electronic prescribing, basic decision support & medication administration**
- **Minimum decision support minimises 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**



# SSWAHS eMM Project

## Integration of Cerner PowerChart functionalities & solutions

- Prescribing – PowerOrders
- PharmNet – Pharmacy verification/dispensing
- Medication Administration Record (MAR)- Charting administration of medications
- Decision support

# System Functionality

A large, dark silhouette of a bull stands in the center of the slide, facing forward. The bull's head is at the top, with its horns visible. Its body extends down to the bottom of the frame. The background is a dark, gradient sky with a lighter area at the top, suggesting a sunset or sunrise. The water in the foreground is dark and reflects the light from the sky.

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

Taskbar: Task Edit View Options Current Help

As Of 5:54 PM All orders 5 days back

Age: 82 years Sex: Male Location: 11S: 1117: B \*\* Allergies \*\*  
DOB: 3/01/1922 MRN: Fin Number: BC-0000017 Inpatient [1/11/2004 5:16]

Patient Information Patient Summary Results Clinical Notes Form Browser Orders Reference Text Browser MAR Medication Profile FBC Graphing

Power Orders

View

- Orders for Signature
- Plans
- Orders Profile
  - ☒ Non Categorized
  - ☒ Problem List
  - ☒ Condition
  - ☒ Allergies
  - ☒ Patient Status
  - ☒ Vital Signs & Measurements
  - ☒ Activity
  - ☒ Dietary
  - ☒ Patient Care
  - ☒ Continuous Infusions
  - ☒ Medications
  - ☒ Laboratory
  - ☒ Diagnostic Tests
  - ☒ Consults
  - ☒ Research Protocols
  - ☒ Surgical Procedures
  - ☒ Ancillary Services
  - ☒ Ordersets

Related Results

Search Results

Find: geria Search Search within: All

Geriatric Admission  
**Geriatric Admission Set**  
Gestational Diabetes Screening  
GGT  
GHPS  
GI Assessment  
GI Consult  
GI Service  
GI/GU Asmt, Me  
GI/GU Assessme  
GI/GU Assessme  
Glasgow Coma S  
Global Assessme  
Glucose Fasting  
Glucose Random  
Glucose, .5 hour  
Glucose, 1 hour  
Glucose, 2 hour  
Glucose, 3 hour  
Glucose, Urine (Bedside Test)  
Glucose, Capillary  
Glut Sets  
Gluten Restricted Diet  
GTT 3 Hour  
Guaiac Stool  
Guthrie Orderset  
GY Final  
G\_CSF  
H&H  
Haemodialysis IV Assessment  
Group Therapy, Outpatient  
GT Feedings, Pediatric  
Harris Hip Score  
HAV

Done

Orders for Signature  
Rows Selected ( 0 )

11/02/04 17:59:00

<input checked="" type="checkbox"/>	Coloxyl with senna	Ordered	2 TAB, PO, BD, PRN, Constipation, Routine, 11/01/04 18:00:00, 1 DAY(S), Stop: 11/02/04 17:59:00
<input checked="" type="checkbox"/>	frusemide	Ordered	40 MG, PO, BD, 11/01/04 18:00:00, 1 DAY(S), Stop: 11/02/04 17:59:00
<input checked="" type="checkbox"/>	gentamicin	Ordered	240 MG, IV, ONCE, 11/01/04 18:00:00, 1 DAY(S), Stop: 11/02/04 17:59:00 Gentamicin is not to be given concurrently with Penicillin Intravenously An interval of at least 60 minutes is required
<input checked="" type="checkbox"/>	paracetamol (Panadol)	Ordered	1 GM, PO, Q6H, PRN, Pain/Mild, 11/01/04 18:00:00, 1 DAY(S), Stop: 11/02/04 17:59:00

Details

PROD GERRY November 01, 2004 5:55 PM

Start PowerChart Organizer for...

PMOCK BURKER November 02, 2007 4:36 PM

start Inbox - Mic... Journal oct ... USB DISK (E:) Microsoft P... Citrix Progr... PowerChart... MEDS, Inte... Type to search 4:29 PM

# Decision Support

**Decision Support**

IDENTIFIED ORDER:  
**amoxicillin-clavulanate (Augmentin Duo Forte)**

Show: **Allergy**

Status	Type	Severity	Overrid...	Name
	<b>A</b>	<b>●</b>		penicillin
	<b>A</b>	<b>●</b>		penicillin

Drug Reference | Education Leaflet | Reference

amoxicillin-clavulanate (Augmentin Duo Forte) Search

**amoxicillin-clavulanate (Augmentin Duo Forte)**

**Decision Support**

IDENTIFIED ORDER:  
**gentamicin**

Show: **Drug**

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...

Drug Reference | Education Leaflet | Reference

gentamicin 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.

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

OK

PROD | GERRY | November 01, 2004 | 5:44 PM

EN 5:44 PM



# System Functionality

A large, dark silhouette of a bull stands centrally in the background. The bull is facing forward, with its head slightly lowered. The background is a dark, gradient sky with a bright, hazy horizon line, suggesting a sunset or sunrise over a body of water.

- **Verification of orders by pharmacists**
- **Nurses view medication orders & record administration on MAR**

EMM, Patient10 X

List Recent MRN

EMM, Patient10

DOB:14/12/1986

Age:22 years

Sex:Male

MRN:1067112

\*\* Allergies \*\*

Location: 10; 1; 00

CRGH Inpatient [15/01/2009 14:12 <No - Discharge date>]

Print 2 minutes ago

Menu

MAR



10 June 2009 3:47 - 11 June 2009 3:47 (Clinical Range)

Time 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
<input checked="" type="checkbox"/> Scheduled	<b>Scheduled</b>					
<input checked="" type="checkbox"/> Unscheduled	<b>allopurinol</b> 50 mg, Oral, Tab, BD					50 mg
<input checked="" type="checkbox"/> PRN	<b>allopurinol</b> 50 mg, Oral, Tab, BD					
<input checked="" type="checkbox"/> Continuous Infusions	<b>atorvastatin (Lipitor)</b> 20 mg, Oral, Tab, BD					20 mg
<input checked="" type="checkbox"/> Future	<b>atorvastatin</b> 20 mg, Oral, Tab, BD					
<input checked="" type="checkbox"/> Discontinued Scheduled	<b>candesartan (Atacand)</b> 32 mg, Oral, Tab, BD					32 mg
<input checked="" type="checkbox"/> Discontinued Unscheduled	<b>candesartan</b> 32 mg, Oral, Tab, BD					
<input checked="" type="checkbox"/> Discontinued PRN	<b>digoxin</b> 250 microg, Oral, Tab, BD					250 microg
<input checked="" type="checkbox"/> Discontinued Continuous Infusion	<b>digoxin</b> 250 microg, Oral, Tab, BD					
	<b>Pulse Rate</b>					
	<b>glibenCLAMIDE (Daonil)</b> 5 mg, Oral, Tab, BD, Administration time is a guide only: MUST taken with meals					5 mg
	<b>glibenCLAMIDE</b> 5 mg, Oral, Tab, BD, Administration time is a guide only: MUST taken with meals					
	<b>Glucometer Result</b>					

Administered

Current date/time

Overdue

Medication due

Assessment

# Foundations for Success

A large, dark silhouette of a bull stands in the center of the frame, facing forward. The bull is positioned in front of a bright, hazy background that suggests a sunset or sunrise over a body of water. The water's surface is visible at the bottom of the image, with gentle ripples. The overall mood is contemplative and powerful.

- **Extensive planning & development**
- **Early consultation across a range of users**
- **Good governance structure**
- **Ensure clinical involvement in decision making**

# Foundations for Success

A silhouette of a bull stands on a beach, facing the viewer. The background is a sunset or sunrise over the ocean, with a bright horizon line and a dark sky. The bull's horns are prominent, and its body is dark against the lighter background.

- Acknowledge & address concerns early on
- Early planning for workflow changes
- Assess basic level of computer skills
- Advocacy & leadership by senior clinicians to junior staff
- Promote at every opportunity



# Foundations for Success

A silhouette of a bull stands on a beach, facing the viewer. The background is a sunset or sunrise over the ocean, with a bright glow on the horizon and a dark sky. The bull's horns are prominent, and its body is dark against the lighter background.

- Acknowledge/accept unlikely to be quicker than handwritten BUT SAFER
- Rationalisation of decision support - maximum patient safety:minimum workflow impact
- Balance between benefits & process
- Evaluation & audits

# **Key Implementation Success Factors**

A large, dark silhouette of a bull stands in the center of the slide, facing forward. Its head is at the top, with horns visible. The body is broad and tapers slightly towards the legs. The bull is positioned behind the text, which is overlaid on the image.

- **Doctors familiar with PowerChart**
- **Extensive training program**
- **Increased pharmacist role**
- **Super users**
- **Well planned conversion process**

# **Key Implementation Success Factors**

A black silhouette of a bull stands centrally in the background, facing forward. The bull's head is at the top, with its horns visible. The body extends downwards, and its legs are positioned at the bottom. The background is a dark gradient with a horizontal light band across the middle.

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

# Challenges

A silhouette of a bull stands centrally against a background of a sunset or sunrise over water. The sun is a bright, glowing orb at the top center, casting a light path down the bull's back. The water in the foreground is dark with gentle ripples.

- **Informing staff on non electronic wards**
- **Downtime & transfer processes**
- **Reconciliation of data**
- **Speciality medication charts**



# Challenges



- **Workarounds**
  - **Not all functionality was implemented**
  - **Not all functionality worked**
  - **Not all processes were electronic**
- **Loss of staff knowledge**
- **Conversion**

# Challenges

A silhouette of a bull stands centrally in the background. The bull is facing forward, with its head slightly lowered. The background is a dark, gradient sky with a bright, glowing horizon line that creates a lens flare effect. The overall tone is dramatic and somewhat somber, fitting the 'challenges' theme.

- **Maintaining current good work practices**
- **Change management /tweaking**
- **System Downtimes**
- **Functionality - next code upgrade or enhancement**
- **Reluctant senior clinicians**

# Challenges

A large, dark silhouette of a bull stands in the center of the slide, facing forward. The bull's head is at the top, with its horns curving upwards. Its body is broad and muscular, and its legs are visible at the bottom. The background is a dark, gradient sky with a lighter horizon line, suggesting a sunset or sunrise over a body of water.

- **Technical support**
- **IM&TD solve ward issues**
- **Device configurations**
- **Workforce Shortages - Agency Staff**
- **Outliers**

# High Returns

Due doses clear

Less medication incidents

Improved allergy documentation

Drug interaction alerts

Information at point of prescribing

Correct patient identification

Forced compliance with national standards

Audit Trail

Information across admissions

Abbreviations eliminated

Duplicate order check

Improved chart access

Reduced workload to maintain ward stock levels

Nursing hours saved

Improved time to co sign orders

Allergy alerts

Remote access

Reason for drug omission

Decision support assist treatment decision

Order sets drive practice

Comprehensive views

Less medication incidents

Integrated

Compliance with prescribing standards

Reduced telephone orders

Legible orders

Pharmacy label matches Dr order



# Increase Pharming Capacity?

- Go live in Surgical ward

RIGHT PATIENT = WARD 15

- Implement additional PharmNet functionality

RIGHT DRUG = MUD CAKE

- Develop functionality not available in PharmNet

RIGHT DOSE = 1 SLICE bd.

- Roll out eMM to all Concord Hospital inpatient settings including Emergency Department & PAC

- Implement in outpatients at Concord Hospital

