High Returns Pharming COWS

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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
- 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?
<table>
<thead>
<tr>
<th>Drug Name and Form</th>
<th>Dose</th>
<th>Route</th>
<th>When to start</th>
<th>Signature</th>
<th>Time given</th>
</tr>
</thead>
<tbody>
<tr>
<td>Green</td>
<td>1</td>
<td>po</td>
<td>be given</td>
<td></td>
<td>2400</td>
</tr>
</tbody>
</table>

Patient clearly identified

Intention not clear.

NB: It was charted & given TWICE ONLY and PRE-OP MEDICATION

No confusing abbreviations

Signatures clear

Clear Order Sentence

Clear administration directions

Generic drug names

Times clear
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
- Enforce processes
SSWAHS eMM Project Scope

- 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

- 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

- 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
# Decision Support

## amoxicillin-clavulanate (Augmentin Duo Forte)

<table>
<thead>
<tr>
<th>Status</th>
<th>Type</th>
<th>Severity</th>
<th>Event</th>
<th>Name</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>penicillin</td>
</tr>
</tbody>
</table>

## 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 (HACEK) have been found to produce aminoglycoside-resistant genes. Gentamicin is indicated for the treatment of severe infections due to susceptible organisms such as bacillus, nocardia, gram-negative infections, peritonitis, gastrointestinal, and urinary tract infections, and osteomyelitis. It provides synergy with other antimicrobial agents such as penicillin, ampicillin, and vancomycin for severe 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 use with gentamicin-impregnated PMMA beads is an orphan drug for the treatment of chronic osteomyelitis of posttraumatic, postoperative, or hematogenous origin. Intrathecal injections of gentamicin have had beneficial effects in the treatment of Krabbe'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 to protracted periods of time, the elderly, and dehydrated patients.

**gentamicin - Furosemide (Interaction)**

Gentamicin-furosemide: MAJOR MONITOR CLOZESLY. The combination of loop diuretics and parenteral aminoglycoside antibiotics or oral aminoglycosides 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 drugs.
System Functionality

- Verification of orders by pharmacists
- Nurses view medication orders & record administration on MAR
### Current date/time

**Current date/time:** 10/06/2009 15:50

### Administered

**Administered:** 50 mg Aspirin

### Overdue

**Overdue:**
- 32 mg Atorvastatin
- 32 mg Candesartan

### Medication due

- 20 mg Atorvastatin
- 32 mg Candesartan

### Assessment

- 5 mg Metformin
- 5 mmol/L Lactate
Foundations for Success

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

- 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

- 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

- Doctors familiar with PowerChart
- Extensive training program
- Increased pharmacist role
- Super users
- Well planned conversion process
Key Implementation Success Factors

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

- 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

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

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

- Improved allergy documentation
- Information at point of prescribing
- Forced compliance with national standards
- Information across admissions
- Improved chart access
- Reduced workload to maintain ward stock levels
- Nursing hours saved
- Remote access
- Decision support assist treatment decision
- Comprehensive views
- Compliance with prescribing standards
- Legible orders
- Due doses clear
- Less medication incidents
- Drug interaction alerts
- Correct patient identification
- Audit Trail
- Abbreviations eliminated
- Duplicate order check
- Improved time to co sign orders
- Reason for drug omission
- Order sets drive practice
- Integrated
- Reduced telephone orders
- Pharmacy label matches Dr order
Increase Pharming Capacity?

- Go live in Surgical ward
- Implement additional PharmNet functionality
- Develop functionality not available in PharmNet
- Roll out eMM to all Concord Hospital inpatient settings including Emergency Department & PAC
- Implement in outpatients at Concord Hospital