Just a spoonful of sugar…

Lessons learnt on the road to Medication Management

Bob Ribbons
Manager, Clinical Informatics
Peninsula Health. Frankston, Victoria.
Overview

- Provide a definition of Medication Management.
- Review our initial attempts to introduce inpatient e-Prescribing in 2003 and again in late 2004.
- Briefly describe outcomes, lessons learnt & subsequent improvements resulting in decreased medication errors.
- Share innovative developments on the road to introducing Medication Management using the ORION Health eOrders 3.0 Module.
Definition

The Medication Management Process

- e-Reconciliation
- e-Prescription
- e-Dispensing
- e-Administration

On Admission: e-Prescription → e-Dispensing → e-Administration

At Discharge
The Concerto™ MAP CIS in use for discharge e-prescribing since 2002.

Initial e-Prescribing pilot commenced on one Medical Unit in July 2003 using Soprano Order Entry 1.2.

e-Prescribing ONLY.

Once prescribed, a computer generated chart was printed on ward.

Asynchronous.
Outcomes

ACUTE Pilot...withdrawn after 8 wks!

SUB-ACUTE Pilot...

- Successful implementation
- Production of legible med chart
- Used for 100% of routine medication orders (excludes IV, stat & telephone orders)
- System on-going & now viewed as accepted part of safe clinical practice
Formal analysis resulted in identification of six separate impediment clusters...

![Figure 1. Cause & Effect Diagram](image)

- **Process / Procedures**
  - Workflow issues
  - Synchronising of electronic and printed chart
  - Help desk not user friendly / queues. Doctors won’t use it.
  - Help desk not tiered.

- **Training**
  - Doctors are constantly interrupted and they are training on their own time
  - No 24 hour / 7 day IT support for doctors newly trained

- **Equipment**
  - Insufficient hardware
  - Trolleys unfriendly (for handling files and laptop)

- **Environment**
  - Heavy workload during winter for pilot unit (and understaffed to start with 1 intern)

- **Cultural**
  - Lack of engagement with senior clinical management (e.g. slowing ward rounds)

- **Technology**
  - Poor response time of software
  - Inadequate interaction and allergy checking

**Effect**
- Poor e-Prescribing uptake.

Process / Procedures…
- Failed to understand workflow.
- Lack of convenient space on the wards to store wireless laptops.

Training…
- Training sessions constantly interrupted.
- No round the clock support.

Equipment…
- Insufficient!
- Wireless laptops NOT the answer.
Environmental…
- Lack of convenient space on the wards to store wireless laptops.

Cultural…
- The culture of the ward round (reluctance of SMOs).
- Clinicians reluctant to accept systems that interfere with traditional work flow.
- Adherence to traditional handwritten methods → tension between nursing and medical staff.

Technology…
- Slow and did not support class level allergy checking.
June – November 2004…

- A subsequent attempt at implementing a full Computerised Provider Order Entry (CPOE) system including:
  - e-Prescribing,
  - Lab & Rad ordering
  - Allied Health

- Underlying Drug Data Base found to be “not fit for purpose”.

- Project halted pending identification of alternative.
Lessons Learnt

- Integration of hospital systems and workflows is a time consuming, highly complex task.
- Critically important to understand clinical workflows
- ‘Close the loop’.
- Medication Management must be considered as ‘business critical’ and have appropriate resources allocated to it.
- Effective change management is paramount!
- Critical to get POCC right (Multi platform approach).
Subsequent Results

Medications e-prescribed...↑ from 1,948/month in March ’03 to 13,403/month in July ’08.

↓ of 19% in medication errors achieved using Soprano application for discharge e-prescribing (Lam, 2003).

Medication errors ↓ from 5.37 /100 items to 4.36 /100 items.

A recent audit of errors related to Oxycodone dosage forms had ↓ from 3.4% to 1.2%. 
Current Development Process cOrders 3.x

- More systematic analysis (lit reviews, white paper, workflow analysis etc).
- Successful ORION clinical workshops.
- FDB Workshops.
- Use of ‘ORION Central’ provides a unique development environment using a collaboration & knowledge management tool.
- ‘User Stories’ to better define application requirements.
- Use of DMZ to access product development.
Medication Management Solution Development

- PBS support is critical.
- Formulary Support (Formulary Vs Non Formulary Medications).
- Barcoding; ~ 90% of products now have EAN barcodes.
- Encounter linking.
- Order Sets & Drug Templates (pre-loaded instructions).
- Complex orders (e.g. tapering Warfarin & Prednisolone).
- Robust Level 2 CDSS (Allergies, Drug/Drug using mapped SMOMED-CT to ICD-10 codification).
- Disaster recovery.
Conclusion

- Several “bitter” experiences!
- Implementing Medication Management is a complex & resource intensive task.
- Results indicate e-Prescribing can be successfully implemented in sub-acute areas.
- CIS vendors need to adopt innovative ‘client centric’ methods of application development.
- Medication Management is a difficult pill to swallow...requiring a systematic approach to socio/technical, change management, environmental & process issues.
IN PARTNERSHIP,

Building a
Healthy Community

Acknowledgments:

Another new team member by Dana Thomas at 6/16/2008 09:02
Please welcome Dr. Lloyd McCann (Clinical Consultant). Lloyd is working on the user stories for discharge and outpatient prescribing. He will be posting these for your review shortly.

New team members by Dana Thomas at 6/16/2008 16:14
Please welcome Wendy Butler (Business Analyst) and Dr. Manoj Patel (Clinical Consultant). Manoj and Wendy will be helping the Orion team complete this development. They will shortly be posting information about 'Medication Chart' and 'Allergies and Alerts' for your review.

Accessing Orders Demo by Timothy Beaufi at 6/23/2008 13:43
For those of us who have misplaced the URL for accessing the Orders demo here they are again (User: "clinician", Password: "password"):
- http://192.168.20.17/concerto/Login.htm (Internal Orion Health URL)
- http://202.37.75.132/concerto/Login.htm (External Orion URL)

Sub-communities

All Content

Filter by tag groups

Show All  User Stories (3)

<table>
<thead>
<tr>
<th>Author</th>
<th>Subject</th>
<th>Replies</th>
<th>Last Activity</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lloyd McCann</td>
<td>Discharge Prescriptions User Stories</td>
<td>43</td>
<td>2 months ago by Lloyd McCann</td>
</tr>
<tr>
<td>Manoj Patel</td>
<td>Medication Chart User Stories</td>
<td>37</td>
<td>2 months ago by Manoj Patel</td>
</tr>
<tr>
<td>Wendy Butler</td>
<td>Consolidated User Stories for Allergies and Alerts</td>
<td>2</td>
<td>3 months ago by Wendy Butler</td>
</tr>
<tr>
<td>Drug</td>
<td>Prescription Information</td>
<td></td>
<td></td>
</tr>
<tr>
<td>------</td>
<td>--------------------------</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Atenolol 50mg Tablets</td>
<td>Take ONE tablet in the MORNING</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Morphine SR 20mg Capsules</td>
<td>Take ONE capsule TWICE a day</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Aspirin + Codeine 300/8mg Disp. Tablets (Aspalgin)</td>
<td>Take ONE or TWO tablets every SIX hours when needed for pain. Maximum 8 tablets in 24 hours.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Warfarin Tablets</td>
<td>Take according to dosage chart or administration chart</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Metoclopramide 10mg Tablets</td>
<td>1 tds prn for nausea</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Trimethoprim + Sulfamethoxazole 160/800mg Tablets</td>
<td>1 bd</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Levodopa + Carbidopa 250/25mg Tablets</td>
<td>1 tablet at 8am, midday and 8pm</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**DOSE CODE**
- A = Absent from Ward
- F = Fasting
- S = Self Administered
- L = On Leave
- R = Refused
- N = Medication Not Obtainable
- V = Vomiting
- WH = Withheld
- X = Doctor's Instructions
- I = No IV Access

**PRESCRIBING MEDICAL OFFICER**

Kate Allan