NORTHERN IRELAND MEDICINES OPTIMISATION INNOVATION CENTRE

Integrated Medicines Management
Maximising and Measuring Impact

COP EIP AHA Brussels 10/12/15
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Optimisation,
DHSSPS

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Director Medicines
Optimisation Innovation
Centre
PREDICTED OUTCOMES

• Decreased length of stay
• Decreased readmission rate
• Reduced wastage of patients’ own drugs
• More accurate drug history
• Improved medicine use
• Improved use of nursing and doctors time
• Improved patient safety
• Faster discharge
TARGET POPULATION

• 65 years or older and / or a previous hospital admission within the last 6 months

• Taking at least 4 or more regular medications

• Taking high risk drugs

• Received IV antibiotics on day 1 of admission
HOW WAS IT INITIATED?

• Business case was produced indicating the work that was proposed
• Resources required to undertake
• Training programme
• Development of standard operating procedures
• Process measures
• Clear outcome measures
• Research based methodology
INTEGRATED MEDICINES MANAGEMENT (IMM) IN NORTHERN IRELAND – TASKS UNDERTAKEN

Team of Pharmacists and Technicians

- Communication with primary care on admission
- Accurate drug history- medicines reconciliation
- Management of patients’ own drugs
- Inpatient management including counselling
- Pharmacist discharge and counselling
- Communication with primary care on discharge
INTEGRATED MEDICINES MANAGEMENT (IMM) IN NORTHERN IRELAND

- Drug history at admission reduction of 4.2 errors per patient
- Length of stay reduced by 2 days
- Increased time to readmission (20 days)
- Kardex monitoring (inpatient) 5.5 interventions per patient
INTEGRATED MEDICINES MANAGEMENT (IMM) IN NORTHERN IRELAND

- Faster medication rounds > 25 minutes per day saved
- Faster discharge > 90 minutes quicker
- More accurate discharge < 1% error rate compared to 25% by medical staff
- Reduced risk adjusted mortality rate
## IMPROVED MEDICINE USE

There was a significant improvement in the Medication Appropriateness Index (MAI)

<table>
<thead>
<tr>
<th></th>
<th>Admission</th>
<th>Discharge</th>
</tr>
</thead>
<tbody>
<tr>
<td>Control</td>
<td>13.16</td>
<td>9.97</td>
</tr>
<tr>
<td>Intervention</td>
<td>17.48</td>
<td>5.69</td>
</tr>
</tbody>
</table>

(Burnett, Scott, Fleming et al. Am J Health System Pharm. 66;854-9 2009)
RISK ADJUSTED MORTALITY INDEX
INTERMEDIATE CARE – CONSULTANT PHARMACIST

- Improved MAI
- 1122 interventions in 453 patients
- 42.9% patients phoned post discharge required one or more interventions
- ROI 2.35-4
NURSING HOMES – CONSULTANT PHARMACIST

- Improved MAI
- 2.7 interventions made per patient
- Reduced ED attendances
- ROI 2.39-3
Readmission Information, Rate of 30 days Readmission for Intervention Group is 19%, for Control Group 70%

Bar chart showing the comparison between control and intervention groups for the sum of total, readmission, 30 days readmission, and no-readmission events.
ENABLING TECHNOLOGY

• Bespoke locker  (Hospital Metalcraft Ltd UK)
• Safe therapeutic economic pharmaceutical selection (STEPSelect) – Digitalis Ltd Amsterdam
• Electronic pharmacist intervention clinical system (EPICS) – (Yarra Software Ltd Belfast)
• Medicines reconciliation software (Writemed) – (Yarra Software Ltd Belfast)
• Antimicrobial surveillance system (LAMPS) – (Yarra Software Ltd Belfast)
EPICS

Electronic Pharmacy Intervention Clinical System
## Eadon Grading System

### Intervention Grade Analysis: 1 Jan 13 to 30 Sept 15

<table>
<thead>
<tr>
<th>Intervention Grade</th>
<th>Definition</th>
<th>2013</th>
<th>2014</th>
<th>2015 (year to date)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Number</td>
<td>% of Total</td>
<td>Number</td>
</tr>
<tr>
<td>1</td>
<td>Detrimental to patient care</td>
<td>0</td>
<td>0.00%</td>
<td>1</td>
</tr>
<tr>
<td>2</td>
<td>Of no significance to patient care</td>
<td>20</td>
<td>0.04%</td>
<td>4</td>
</tr>
<tr>
<td>3</td>
<td>Significant but does not improve patient care</td>
<td>2,859</td>
<td>5.74%</td>
<td>2,026</td>
</tr>
<tr>
<td>4</td>
<td>Significant and improves the standard of care</td>
<td>45,190</td>
<td>90.78%</td>
<td>51,471</td>
</tr>
<tr>
<td>5</td>
<td>Very significant; prevents major organ failure or similar</td>
<td>1,513</td>
<td>3.04%</td>
<td>1,241</td>
</tr>
<tr>
<td>6</td>
<td>Potentially life-saving</td>
<td>17</td>
<td>0.03%</td>
<td>7</td>
</tr>
<tr>
<td>Ungraded</td>
<td></td>
<td>182</td>
<td>0.37%</td>
<td>85</td>
</tr>
<tr>
<td><strong>TOTAL</strong></td>
<td></td>
<td>49,781</td>
<td></td>
<td>54,835</td>
</tr>
</tbody>
</table>
Writemed - Medicines Reconciliation Software
## Discharge Information

### Discharge Details
- Date: 11/03/2014
- Hospital: Antirin
- Ward: C6

### Patient Details
- Name: MR CHARLES TESTADD
- HCN: 00000000
- Casenote: NHT00000000
- Address: 280 00000000
- Postcode: BT00 0000
- Age: 00000000
- Sex: Male

### Allergies / Medicine Sensitivities

<table>
<thead>
<tr>
<th>Date</th>
<th>Medicine (generic)</th>
<th>Allergen</th>
<th>Type of Reaction</th>
<th>Nature Of Reaction</th>
</tr>
</thead>
<tbody>
<tr>
<td>11/03/2014</td>
<td>Penicillin</td>
<td></td>
<td>Allergy</td>
<td>anaphylaxis</td>
</tr>
<tr>
<td>11/03/2014</td>
<td>NSAIDs</td>
<td></td>
<td>Sensitivity</td>
<td>causes wheeze</td>
</tr>
</tbody>
</table>

### Discharge Medication

<table>
<thead>
<tr>
<th>Medication</th>
<th>Dosage</th>
<th>Instruction</th>
<th>Status</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bisoprolol 5mg tablets</td>
<td>5 mg</td>
<td>with food</td>
<td>Oral</td>
<td>New</td>
</tr>
<tr>
<td>Warfarin 1mg tablets</td>
<td>as per INR blood result</td>
<td>Oral</td>
<td>New</td>
<td>For DVT. INR range 2.0 - 3.0</td>
</tr>
</tbody>
</table>

### Clinical Pharmacist Recommendations

INR on 11/3/14 2.0. GP - Please recheck INR on 13/3/14 and review warfarin dose.

**Discharge Writer Name:** Ms superuser  
**Signature:** Ms superuser  
**Designation:** PHARMACIST - LEVEL 3

**Date:** 11/03/2014  
**Bleep Number:**

---

**Planned**  
**Transcription Check**  
**Clinical Check**  
**Labelled**  
**Dispensed**  
**Final Check**  
**Dispensed from the 1st line**
HOSPITAL PRESCRIBING £ PER NEED WEIGHTED PATIENT (MCKINSEY REPORT)

- N.Ireland £58
- N.Ireland 7% £54
- N.Ireland 16% £50
- England £64
Digitalis - Team

- Rob Brenninkmeijer, MSc, Pharmacist, Managing Director
- Frans van Andel, MPH, MSc, PhD, Health Economist, Director New Projects Digitalis
- Rob Janknegt, MSc, PhD, Hospital Pharmacist and Clinical Pharmacologist at Orbis Hospital Sittard Netherlands and Scientific Director of Digitalis; Deputy Editor-in-Chief GABI (Generics and Biosimilars Initiative Journal)
- Rolf Hofkes, MSc, Pharmaceutical Sciences, programmer, project management
- Rens Jaspers, MSc, project management, content management
TRANSFER SUCCESS

- Regional in Northern Ireland
- Numerous Trusts in England
- Uppsala in Sweden
- Skane in Sweden
- Tallaght Hospital in Southern Ireland
- Drogheda Hospital In Southern Ireland
- Central Norway
• Decreased medication errors at discharge
• No patient experienced a potentially severe medication error
• Improved medicines appropriateness index (MAI) in over 65s
• Improved MAI from pre-admission to admission
• Improved MAI from admission to discharge
TALLAGHT HOSPITAL DUBLIN IRELAND
TAMMY GRIMES ET AL

- Decreased medication errors at discharge
- No patient experienced an potentially serious medication error
- Improved medicines appropriateness index (MAI) in patients over 65
- Improved MAI from pre-admission to admission
- Improved MAI from admission to discharge
• Patients over 80 years of age
• 16% reduction in hospital visits
• 47% reduction in ED attendances
• 80% reduction in drug related admissions
NORWAY
Janne Kutschera-Sund

- IMM model in all seven hospitals in Central Norway - Namsos, Levanger, St Olavs University Hospital in Trondheim, Kristiansand, Molde, Alesund, and Volda

- All four regional hospital pharmacy trusts have agreed on the model

- Thirty full-time pharmacist positions

- One PhD in progress plus six Masters linked to IMM
KEY MEASURES FOR AN OPTIMISED MEDICINES SYSTEM

- % Medicines reconciled by pharmacy at all patient journey points
- Medicines appropriateness index (MAI) value
- Admission due to a medicine issue
- Length of hospital stay
- Re-admission rate due to medicines issues
- ED attendances due to medicines issues
- Prescribing costs
- Wastage value
- Medicines Administration Error rates (MAE)
HELP US

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