NORTHERN IRELAND MEDICINES OPTIMISATION
SCALING UP INNOVATION ACROSS EUROPE

• Northern Ireland - Who are we?
• Challenge faced – medicines optimisation
• Strategic approach to upscaling good practice
• Upscaling case studies - Home and Away
• Work with us
Cathy Harrison
Head of Medicines
Optimisation, DHSSPS

Prof Mike Scott
Director Medicines
Optimisation Innovation Centre
Smarter Medicines Better Outcomes
Smarter Medicines Better Outcomes
University of Ulster and Queens University Belfast
Top ranking schools of Pharmacy in the UK

Smarter Medicines Better Outcomes
NORTHERN IRELAND

Smallest UK country
Devolved Government
1.8m population
Post conflict health legacy
£550m medicines costs pa
14% of total HSC costs
History of Reform and Innovation

Policy driven

Pharmaceutical and Technology Industries

Regional innovation programmes

EU funding

R&D Partnerships /Academia

UK Government Innovation Schemes

Smarter Medicines Better Outcomes
<table>
<thead>
<tr>
<th>Category</th>
<th>Good Practices</th>
</tr>
</thead>
<tbody>
<tr>
<td>Procurement</td>
<td>• STEPSel ect</td>
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<tr>
<td>Selection</td>
<td>• Northern Ireland Medicines Formulary</td>
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<tr>
<td>Prescribing</td>
<td>• Prescribing Policies</td>
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<tr>
<td>Supply</td>
<td>• Extended supplies on hospital discharge</td>
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<td></td>
<td>• Repeat Dispensing</td>
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<tr>
<td>Adherence</td>
<td>• Medicines Use Reviews</td>
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<tr>
<td>Meds Reconciliation</td>
<td>• Integrated Medicines Management Service</td>
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<tr>
<td>Polypharmacy</td>
<td>• Pharmacist led clinical medication review</td>
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<tr>
<td>Governance</td>
<td>• Medicines Governance Networks</td>
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<tr>
<td>Cost effectiveness</td>
<td>• Pharmaceutical Clinical Effectiveness (PCE) programme</td>
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</tbody>
</table>
EUROPEAN INNOVATION PARTNERSHIP ON ACTIVE AND HEALTHY AGEING

- 2013
- EU Reference site
- 3 stars
THE CHALLENGE – SUB-OPTIMAL OUTCOMES FROM MEDICINES

- 3-6% of hospital admissions due to adverse effects, rising up to 30% in the elderly
- 1 in 15 hospital admissions are medicine related with two thirds being preventable
- 1 in 20 of GP prescriptions contain an error
- 30-50% non-adherence to prescribed medication
- 2.5 million doses are administered in the average acute hospital (215,000 errors)
- In the UK(2007) it is estimated that such errors cost £770M
- Variance in practice

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MEDICINES OPTIMISATION

Defined by NICE as ‘a person centred approach to safe and effective medicines use to ensure the best possible outcomes from their medicines’
MEDICINES OPTIMISATION QUALITY FRAMEWORK

• Medicines Optimisation Model

• Quality Standards

• Innovation and Change Programme
REGIONAL MODEL

QUALITY STANDARDS

Medicines Optimisation

Hospital  General Practice  Community Pharmacy  Social Care

Safety  Effectiveness  Patient/Client Focus

Smarter Medicines Better Outcomes
INNOVATION AND CHANGE PROGRAMME

Key goal – identifying and scaling up good practice

1. Prioritised work plan for medicines optimisation
   • What to scale up and how to scale up

2. Medicines Optimisation Innovation Centre
   • Develop, test, upscale regionally and in other countries

3. Network of partners and knowledge transfer
   • Collaborations, business agreements, links

4. Outcome Measurements
   • Demonstrating quality improvements
MEDICINES OPTIMISATION INNOVATION CENTRE

• Research
• Quality Improvement
• Knowledge transfer
• Innovation
PRACTICE UNIT

• Antrim Area Hospital Academic Clinical Pharmacy Practice Unit was set up in 1994

• School Of Pharmacy, Queens University of Belfast
OUTPUTS

• Over 60 papers
• Almost 100 posters and abstracts
• 13 PhDs
• 50 MSc and Diplomas
INTEGRATED MEDICINES MANAGEMENT
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
HOW CHANGE MANAGEMENT WAS IMPLEMENTED

• Extensive pre implementation discussion with all key stakeholder groups

• Workshops and presentations

• Roadshows

• Oversight group

• Operational group
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

![Graphs showing the risk adjusted mortality index over time for different categories.](image-url)
HEALTH SERVICE JOURNAL AWARD 2003
NATIONAL AWARDS

• Health service journal award 2004
• RPSGB Pharmaceutical care award 2004
• GHP/UKCPA antimicrobial management award 2008
• RPSGB Pharmaceutical care award 2014
• British Geriatric Society conference 2014
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>
Live Automated Microbiology Pharmacy Surveillance System (LAMPS)
Adherence to Empirical Antibiotic Guidelines

% adherence to NHSCT empirical antibiotic guidelines for Antrim from 01/09/2012 to 31/10/2012

(Data was not recorded during July/August 2010)
Writemed - Medicines Reconciliation Software
# January 2014 KPIs - EPICS Pharmacy Intervention Report for 18/01/2014 to 24/01/2014

**Totals of all completed interventions for all Clinical Pharmacy Staff**

## Totals for Antrim Hospital

<table>
<thead>
<tr>
<th>Patient Numbers</th>
<th>Number of admissions to the Hospital (excludes day cases, ward attenders, renal patients)</th>
<th>Number of discharges from the Hospital</th>
</tr>
</thead>
<tbody>
<tr>
<td>Wards suitable for clinical pharmacy service</td>
<td>409</td>
<td>533</td>
</tr>
<tr>
<td>Wards with clinical Pharmacy service</td>
<td>368</td>
<td>485</td>
</tr>
</tbody>
</table>

## Admission interventions

<table>
<thead>
<tr>
<th>Number of Med rec at admission</th>
<th>Total No of interventions</th>
<th>No. of unique patients</th>
<th>All wards % of patients</th>
<th>wards with clinical pharmacy service %</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>330</td>
<td>322</td>
<td>78.73%</td>
<td>87.50%</td>
</tr>
</tbody>
</table>

Total number of interventions on Med Rec at admission (as % of med rec admission) | 831 | 306 | n/a | 95.03% |

## Med Rec interventions

<table>
<thead>
<tr>
<th>Number</th>
<th>% of medrec's</th>
<th>All wards % patients</th>
<th>wards with clinical pharmacy service %</th>
</tr>
</thead>
<tbody>
<tr>
<td>24 hours of admission</td>
<td>254</td>
<td>78.88%</td>
<td>62.10%</td>
</tr>
<tr>
<td>24 - 48 hours of admission</td>
<td>44</td>
<td>13.66%</td>
<td>10.76%</td>
</tr>
<tr>
<td>After 48 hours of admission</td>
<td>27</td>
<td>8.39%</td>
<td>6.60%</td>
</tr>
</tbody>
</table>

## Discharge interventions

<table>
<thead>
<tr>
<th>Number of Med rec at discharge</th>
<th>Total No of interventions</th>
<th>No. of unique patients</th>
<th>All wards % of patients</th>
<th>wards with clinical pharmacy service %</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>397</td>
<td>359</td>
<td>67.17%</td>
<td>79.81%</td>
</tr>
</tbody>
</table>

Total number of interventions on Med Rec discharge (as % of med rec at discharge) | 671 | 265 | n/a | 74.02% |
KNOWLEDGE 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
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
CURRENT DISCUSSIONS

• Croatia
• Estonia
• Germany
• Latvia
• Lithuania
• Poland
• Slovenia
EDUCATION AND TRAINING
COLLEAGUES FROM -

• Sweden
• Norway
• South of Ireland
• Poland (Erasmus programme)
• Spain (Hospital Pharmacists Association)
• The Netherlands (Orbisch Medisch Centrum Sittard)
• Jordan (Exchange Programme)
• Palestine
• Estonia
• England
• New Zealand
Dr. Hugo van der Kuy
Zuyderland Medical Centre
Hospital Pharmacist
Clinical Pharmacologist
Director of Pharmacy
Research Co-ordinator
Board Member of Medical Staff
RESEARCH TOPICS

- Medication reviews
- Polypharmacy
- Clinical Rules
- Pharmaceutical care in oncology

- 4 persons were supported with their PhD
- 4 persons are still doing their PhD
Digitalis established > 25 yrs ago in Amsterdam
Knowledge management: tools aimed at rational use of medicines:
  - ePrescribing: decision support (Prescriptor®)
  - Formulary management implementation (STEPSelect®)
  - Medication surveillance & reconciliation (Clinical Rules®)
“Integrated Medicines Management” (IMM) or “Medicines Optimisation”: Selection and Decision Support Tools to manage “the right drugs”
Implemented MO system in Northern Ireland together with the NHS (Medicines Optimisation Innovation Centre);
Offices in Amsterdam and Dublin, multidisciplinary staff of (hospital) pharmacists, ICT and health economist
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
Stages of STEPSelect Process

1. Clinical Evaluation
2. Safety & Risk Assessment
3. Budget Impact Analysis
4. Final Selection of Product Lines

Smarter Medicines Better Outcomes
Stimulating Innovation
Management of Polypharmacy and Adherence in the Elderly

Cathy Harrison
EIP AHA Conference of Partners
10th December 2015

This presentation is part of the SIMPATHY project (663082) which has received funding from the European Union’s Health Programme (2014-2020)
CONSORTIUM AND OBJECTIVES

Inappropriate Polypharmacy
A Major Health Issue

50% of the people taking 4 or more medicines don’t take them as prescribed.

Changing the approach to multiple prescriptions requires a “collective” and joint effort involving different stakeholders.

Will
Clinicians, policy makers across EU share learning on implementation with case studies and benchmarking

Execution
Tools shared across EU

Ideas
Co-production tools for implementing polypharmacy with multidisiplinary team

www.simpathy.eu
European Connected Health Alliance

*The Global Connector in Healthcare*
*We bring people, organisations, needs and solutions together*

Medicines Optimization inter-ecosystem group

www.echalliance.com / info@echalliance.com
CURRENT MEMBERS

• Czech Republic
• Denmark
• England
• Estonia
• Greece
• Finland
• Northern Ireland
The SIMPATHY project has received funding from the European Union’s Health Programme (2014-2020)
HELP US

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• EJHP doi.10.1136/ejhpharm-2014-000512