THE APPLICATION OF LEAN PRINCIPLES TO THE MEDICATION USE PROCESS ON A MALE MEDICAL WARD

Harnett A., Lynch P., Storan C., Hayes M., Ledwith A.

Presented by Anne Harnett
INTRODUCTION

Mid-Western Regional Hospital

University of Limerick

HOSPITAL OPTIMISATION PROGRAMME EXEMPLAR (HOPE) PROJECT
AIM

The aim of this project was to apply lean methods to the medication use process on a male medical ward in order to enhance pharmaceutical care of patients.
### DMAIC (DEFINE, MEASURE, ANALYSE, IMPROVE, CONTROL) FRAMEWORK

**A3 TITLE:** Medicine Management Technician

<table>
<thead>
<tr>
<th>Team Leader: Anne Harrett</th>
<th>Chair Champion: Mark Spoiling</th>
</tr>
</thead>
<tbody>
<tr>
<td>Team Members: Anne Harrett, Carmel Storan, Patrick Lynch, Mary Hayes, Kevin Phelan</td>
<td>Start Date: 16/10/10 End Date: 31/03/11</td>
</tr>
</tbody>
</table>

**Date Last Updated:** 30/03/2011

**Progress:** 1 2 3 4 5 6 7 8

#### 1. Problem Definition (Impact on Customers)

- **Impact:** Stock holding on wards is large, difficult to identify and find medication, patient doses sometimes missed, medication wasted because:
  - Where the level of stocks held in each ward may not dynamically match patient needs.
  - Medication are overstocked, in relation to storage space available, making it difficult to find the medication that are needed.
  - Nursing staff don’t always know where a medication is a stock item.
  - Stock staff don’t always know that a medication has been supplied, difficulty with generic versus brand name prescribing and translation.
  - Turnaround time in pharmacy can lead to delay in availability of medications.
  - Non-stock drugs are not always returned and in the case of pharmacy, non-retail goods can’t be returned after stock has been received.

#### 2. Current State Measurements (Quality, Cost, Time, People, Health & Safety)

- **Impact:**
  - The typical values of stock held in 1 ward on a weekly basis.
  - Increases from a high of €655 (34%) to €1020 (27%) over a three week period.
  - A one week analysis of 160 medical patients identified 65 missed doses, 59 on green, 13 orange and 2 red.
  - The stock list contains 252 items.
  - 11% of 366 prescribed proprietary drugs required the nurse to identify a different proprietary/ generic drug.
  - Stock supplied on 19 of 21 days. In one 4 day week, 5 visits, 12 items (11 non-stock, 1 stock).

#### 3. Future State Goals & Timelines

- **Goal:** Reduction in missed doses to less than 1 per 10 patients. At least 60% of the stock to move each week.
  - Pharmacy to endorse brand name prescriptions which are not stocked in pharmacy with stocked item brand and generic name.
  - Reduce the stock list from 252 to 210 items.
  - Reduce the need to visit pharmacy.

#### 4. Perform Root Cause Analysis

- **Root Cause:**
  - The question that was asked was “Why do we get missed doses?”
  - For list of possible causes see sheet named “causes”

#### 5. Improvement Activities, Responsibilities, Timelines

- **Activities:**
  - Introduce a “borrow book”
  - Write guide on drugs stored in the fridge.
  - Attach copy of drug list to trolley.
  - Clean drug trolley once or twice weekly.

- **Responsibilities:**
  - Medicines Management Technician
  - Other wards

- **Achieved (see box 3):**
  - Missed doses reduced to less than one in 10 (21 in 235 patients)
  - Value of stock items decreased by €60 from €650
  - Number of lines reduced by 12%

- **Gaps:**
  - Continue with medicines management technician on Ward 3.
  - Introduce other wards to medicines management technician.
  - Complete additional LEAN projects.

#### Lessons Learnt

- **Time consuming. Think about sustainability at the outset. Change is difficult.**
- **Become aware of how LEAN can be applied to problems. Everything is in a process.**
- **LEAN is not rocket science but sometimes we are too involved to see the solutions.**

---

**University of Limerick**

[Logo]
DEFINE

• High value stock holding
• Drug unavailable for administration

MEASURE METRICS

• Value of ward stock
• Missed dose endorsement

ANALYZE

• Set future state goals
• Perform Root Cause Analysis
  ❖ People,
  ❖ Infrastructure
  ❖ Methods
  ❖ Drugs / Materials

IMPROVE

• Deploy Medicines Management Technician
• Proactive vs Reactive oversight of process

CONTROL

• Compare against future state goals
• Accept / Reject improvement

LEARN METHODOLOGY
Root Cause Analysis
## Improvement activities

<table>
<thead>
<tr>
<th>DIMENSION</th>
<th>PROBLEM</th>
<th>SOLUTION</th>
</tr>
</thead>
<tbody>
<tr>
<td>People</td>
<td>Waiting time in pharmacy means nurse will delay trip</td>
<td>More comprehensive ordering by medicines management technician may address this.</td>
</tr>
<tr>
<td>Methods</td>
<td>Drug not ordered from pharmacy</td>
<td>More comprehensive ordering by medicines management technician may address this.</td>
</tr>
<tr>
<td>Building/Infrastructure</td>
<td>Medicines for return to pharmacy remain on ward and shelves become very crowded</td>
<td>Medicines management technician to remove non-stock drugs from the ward at patient discharge.</td>
</tr>
<tr>
<td>Drugs / Materials</td>
<td>Nurse does not recognise drug brand name as prescribed.</td>
<td>11% of prescription brand prescribed not stocked. Dual endorse generic and brand name in pharmacy box where appropriate.</td>
</tr>
</tbody>
</table>
Achievements Missed Doses

UK NPSA MISSED DOSE SEVERITY GRADING

RED FLAG  ->  ↓ 50%
AMBER FLAG  ->  ↓ 62%
GREEN FLAG  ->  ↓ 32%
Number of drug lines held as stock

% Volume stock before
% Volume stock after

- % Volume stock before: 100
- % Volume stock after: 85
Average % Stock Value Consumed over 3 week Period

BEFORE

- 68% Stock static
- 32% Stock actively consumed

AFTER

- 48% Stock static
- 52% Stock actively consumed
Achievements

Weekly Drug Returns 3D (€)

Total value of drug recycling **before** € 3,654 over 56 days

Total value of drug recycling **after** € 15,879 over 56 days
Non-Stock

BEFORE

Returns 4%

Stock 26%

Non-Stock 70%

AFTER

Stock 23%

Non-Stock 60%

Returns 17%
Experiences & lessons learned

• Lean tools, such as process mapping allowed the identification of a tangible metric measure that really measured the outcome of the process i.e. in this case did the patient receive the drug?
• Cost savings and efficiencies were collateral benefits but were not the main outcome of the process
• Lean methodology provided a neutral framework for collaborative discussion.
Thank you for listening

Gratefully acknowledge the contribution of the following people to the project:

Patrick J Lynch, Senior Clinical Pharmacist MWRH
Carmel Storan, Pharmacy Technician
Mary Hayes, Clinical Nurse Manager 1
Anne Ledwith, Academic Mentor, University of Limerick
Jennifer Mullen, University of Limerick
Professor Eamon Murphy, University of Limerick
Kevin Phelan, Black Belt Lean expert
The staff of the Department of Pharmacy, MWRH.