Lean: the implications for information management and IM & T

Paul Brady, Principal Facilitator, Lean Healthcare Academy

Andrew Ruck, Director, HealthSystems Group Ltd
Contents

1. Introduction to Lean
2. Lean, Six Sigma & Lean Six Sigma
3. Some Lean Projects
4. Information Management and Lean
5. Lean and IM & T Systems
6. Conclusions
1. Introduction to Lean
What is Lean?

A way of thinking.
- A philosophy.
- A mind set.
- An approach.

It is about adopting organisational wide continuous improvement (CI)

-Paul Brady 10/06

Working together to champion Lean within the NHS
What is the value you provide?

In Healthcare there are typically only 4 types of value add.

- Prevention
- Diagnosis
- Treatment
- Care

+ any decision point relating to these 4
Lean Principles

1. IDENTIFY THE VALUE STREAM
2. SPECIFY VALUE
3. FLOW
4. PULL
5. PERFECTION

Relentlessly eliminating waste
There are only 2 types of activity in this world

1. A **Value Adding** activity is one which advances a process to the benefit of the customer (who may be the patient or another department)

2. A **Non-Value Adding** activity is one which moves the product or operation for internal use only, or creates “Waste”
What is Lean?

Based on two main philosophies:

1. Elimination of waste to maximise flow.
   - Value added.
   - Non-value added.

2. Respect for people.
   - Maximising the potential of people
   - Empowering them so they can do their job
# The 8 Wastes

<table>
<thead>
<tr>
<th>Waste</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Transportation</td>
<td>(of patients or documents in the process)</td>
</tr>
<tr>
<td>Inventory</td>
<td>(Physical inventory or waiting lists)</td>
</tr>
<tr>
<td>Motion</td>
<td>(Of staff in or around the process)</td>
</tr>
<tr>
<td>Waiting</td>
<td>(For people, information, treatment, waiting for everything)</td>
</tr>
<tr>
<td>Overproduction</td>
<td>(eg. Duplication, doing too many follow-ups, referrals)</td>
</tr>
<tr>
<td>Overprocessing</td>
<td>(e.g. too many blood tests or other investigations)</td>
</tr>
<tr>
<td>Defects/rejects</td>
<td>(Clerical, medical errors doing it wrong!)</td>
</tr>
<tr>
<td>Underutilisation</td>
<td>(the biggest waste, not utilising your biggest asset- your people)</td>
</tr>
</tbody>
</table>

*Working together to champion Lean within the NHS*
A few words on Lean and tools

Tools in this overview

A. 6S workplace organisation
B. SOPs standard operating procedures
C. Visual Management
D. Process Flow
E. Streaming
A. 6S workplace organisation

What is 6S?

A way of organising so all staff are involved in organising the workplace and everything has a place making it a safer, more controlled environment to work in. Including PC data and documents.
A+E resus- Trolley layout

After

Even difficult to store items are grouped by size and separated by laminated dividers.
B. Standard Operations

What is the Standard Operation?

“The best method currently available to perform a specific task, ensuring that safety, quality, cost, and delivery targets are achieved”.
Hand Held Metal Detector Protocol

Once calibrated, no further adjustment is required until you wish to change the setting. Note: the potentiometer is a 20 turn device with slipping clutch and cannot therefore be over-tuned. When searching, please be sure to sweep target with a gentle movement.

Please retain these instructions for future reference.
# How to enter DNA on PAS

<table>
<thead>
<tr>
<th>Name</th>
<th>Administration of patients that did not attend (DNA) an outpatient appointment</th>
</tr>
</thead>
<tbody>
<tr>
<td>DOC.No</td>
<td>SOP 807</td>
</tr>
</tbody>
</table>

3. Attach a name label to all three copies as shown in diagram. Complete the clinic information on the form as shown. Complete GP details (hand write or use sticky labels) on the form as shown.

4. Attach the DNA form onto the corresponding set of notes. Notes are passed onto the Dr at the end of the clinic for decision.

At the end of the clinic, click the DNA button at the bottom of the screen.

A DNA popup screen appears; check the tick box beside the patient you wish to DNA then click the DNA button.

Click the "Submit DNA Reason" Button and you will be returned to the reception list with an "N" denoting the patient as a DNA.

Retrieve notes with the DNA form completed back from Dr.

Now select the patient and click ENCC tab at the top of the screen. You will then be taken through to an encounter selection screen.

Select the appointment you wish to enter, a DNA will be shown in the visit description and then press the continue button.

You will need to fill in the Visit outcome and Visit Status section of the screen and then press the Save Data button.

You will need to fill in the Visit outcome and Visit Status section of the screen and then press the Save Data button.

The message in the bottom prompt line will say update successfully and then press the back out button. This will take you back to the encounter selection screen, press the back out button once again to return to the reception screen.

No RTT status needs to be completed as the patient has not...
C. Why use Visual Management?

“The body is stout, with arched back; the limbs are short and stout, armed with strong, blunt claws; the ears long; the tail thick at the base and tapering gradually. The elongated head is set on a short thick neck, and at the extremity of the snout is a disc in which the nostrils open. The mouth is small and tubular, furnished with a long extensile tongue. A large individual measured 6 ft., 8 in. It is pale in colour with darker areas.”

Hello,
I’m an Aardvark!
Examples of visual management

- Standardised trust wide action list for projects
- Daily meeting board for Pre-op. By the team for the team
- Communications room at ANHST
  - Trust senior managers, 1 hour per week trust wide

Working together to champion Lean within the NHS
D. Process Flow analysis
Identifying the “Hidden Process”
Understand-Validate-Improve

Process Flow

Examine the “Current State” map. Identify the value added steps.

Build the “Future State” new process around the value added steps.

It may not be possible to jump straight to the Future State.

Working together to champion Lean within the NHS
The Adult Continence & District Nursing Services provide a universal service across Stockport, promoting & treating and managing around 2000 patients towards achieving continence. The team have been given the challenge of improving access, waiting & treatment times whilst maintaining a quality service.

‘Lean’ thinking methods were used to achieve this service improvement with the support of the Lean Healthcare Academy.

**Recon**

Recon membership consisted of a combination of PCT staff from Continence & District Nursing Services. The District Nursing team have an active caseload of around 3200 patients at any given time. Along with members of the Service Users Group and the Stockport Residential Homes Network they were able to provide a balanced view regarding the service.

The Residential Homes Network serves 1400 people in 60 care homes (of which 50% of this population use the Continence Service). Borough Care were also part of the RECON team, they are the largest care home provider in Stockport (delivering 35% of services). Their involvement was invaluable to RECON as it provided the opportunity for their 500 clients to have a say.

**Referral Pathway Stages**

What Did The Team Find?

1. RECON found that the 2 major continence service providers (District Nursing & Continence Team) had gradually, over the years, adapted referral systems to suit their needs. This resulted in 2 systems running in tandem. Processes for assessments seemed to be over complicated & confusing to the service users
2. It was shown that administrative duties were being carried out by the specialist continence nurses; clearly this was not the best use of trained practitioners skills and resources
3. Waiting times for assessments and reassessments had increased for both services

**The Future State**

- Clearly defined referral pathway
- Reduction in waiting time from 20 to 4 weeks
- ‘Freeing up’ of specialist Continence Nurse time by 40%
- Ability to utilise additional time for primary prevention

88% Better!
Whole OPA pathway

C+B appointment

Non C+B appointment

Non C+B call centre process

Clinic prep

Clinic outcome

Consultant review process

Follow up

Medsec's process

Adding patient to waiting list

Working together to champion Lean within the NHS
Capacity and demand management

Using statistics (SPC) to set optimum levels of capacity in line with true demand.

Understand true demand
Understand true Activity and capacity

Reduce variation

Optimise current capacity (≠ 100% utilisation)

Introduce Pull

Make the process flow

Working together to champion Lean within the NHS
Capacity and demand management

Understanding variation is key to managing a service.

Example 1
- (UCL)-12
- Average- 10
- (LCL)-8

Example 2
- (UCL)-16
- Average-10
- (LCL)-4

Compare the above examples if it was clinic slots how many would you set?

Set your **ACTIVITY** at 80% of your UCL. Then your queue will not grow

A.K. Erlang
- He was very clever and Danish

Example 1- 80%= 9.6
Example 2- 80%= 12.8

Working together to champion Lean within the NHS
The 80% rule vs Efficiency

Average - 10

If you run at average you will fail 50% of the time.

(UCL) - 16

If you run at UCL you will be over-resourcing, waiting round for the unusual.

80% = 12.6

If you run activity at 80% of UCL then you will optimise resource usage and have flex in the system.

Flexibility in system

Size of Queue

Working together to champion Lean within the NHS
E: Streaming & Activity management

Measure what you do. Look at the “types” of work.

Use Pareto/Glenday Sieve to stream them

Queue or activity

Green stream

Runners - common routine tasks, uncomplex high volume - Daily tasks

Amber stream

Repeaters - Regular tasks, medium volume typically weekly tasks

Red stream

Strangers - Rare tasks, complex (interesting), very low volume typically long and complex tasks

Manage activity to maximise flow. Separate Runners, repeaters and strangers. Never let a repeater or stranger interrupt the runners.
Lean is...

stability  continuous flow  synchronous production  pull system  level production  continuous improvement

6S  standard operations  SMED  I/W costs and review (6 sigma)  TPM  process maps  problem solving  process FMEA

People

SMED  M/C capability review  Zero breakdown  Visual signs  layout changes  research  component supply  pull system  level production  benchmarking institutes  learning initiatives  coaching

Benchmark

6S  standard operations  SMED  I/W costs and review (6 sigma)  TPM  process maps  problem solving  process FMEA

People
2. Lean, Six Sigma & Lean Six Sigma
6 Sigma

- Six Sigma Methodology for Process Improvement Based on understanding and eliminating variation and defects.
- Goal: Exhibits no more than 3.4 DPMO => 99.9997% perfection (6 Sigma compliance)
- In health, probably most relevant for diagnostic services

<table>
<thead>
<tr>
<th>99% (3.8 Sigma)</th>
<th>99.99966% (6 Sigma)</th>
</tr>
</thead>
<tbody>
<tr>
<td>20,000 lost articles of mail per hour</td>
<td>Seven articles lost per hour</td>
</tr>
<tr>
<td>5,000 incorrect surgical operations per week</td>
<td>1.7 incorrect operations per week</td>
</tr>
<tr>
<td>Two short or long landings at most major airports each day</td>
<td>One short or long landing every five years</td>
</tr>
<tr>
<td>200,000 wrong drug prescriptions each year</td>
<td>68 wrong prescriptions per year</td>
</tr>
</tbody>
</table>

Working together to champion Lean within the NHS
Six Sigma Process: DMAIC

Goal: Exhibits no more than 3.4 DPMO => 99.9997% perfection

1. Define
   - What are our metrics?
   - What is a defect?
   - What are our objectives?

2. Measure
   - Identify Critical to Quality (CTQ) Variables: Y’s
   - Map the Process
   - Develop and Validate Measurement Systems
   - Target Opportunities and Establish Improvement Goals

3. Analyze
   - Benchmark and Baseline Processes, Calculate Yield and Sigma
   - Make sure Xs are controllable and reliable
   - Verify time effect and define CNX, SOP

4. Improve
   - Use Design of Experiments
   - Isolate the “Vital Few” from the “Trivial Many” Sources of Variation
   - Test for Improvement in Centering

5. Control
   - Set up Control Mechanisms
   - Monitor Process Variation
   - Maintain “In Control” Processes
   - Use of Control Charts and Procedures

Key X’s become Y’s
Lean 6 sigma

Pick n mix of the most appropriate parts of both methodologies

*DO NOT* get hung up on the label. If it works for you, use it!
3. Some Lean Projects
South Central SHA

Challenges

• Reduce waiting time from referral to definitive treatment to a minimum of 18 weeks by December 2008 in line with the NHS plan for 2004.
• To redesign 27 Patient Pathways across 9 Primary Care Trusts over 8 months.
• Transfer of knowledge and skills to client experts.

Results

• Reduction in lead times in assessment and treatment centres
• Increased capacity
• Reduced demand through feedback to GP’s of inappropriate referral
• Improved right pathway (right treatment e.g. surgery or physio)
  - GP’s doing further investigation before referral
• Reduced wait time in Outpatients (in some cases over 40 weeks)
Buckinghamshire PCT - Muscular skeletal (shoulder) ultrasound treatment

Challenges

• Wait time to outpatients of 8 weeks
• Wait time into surgery of 25 weeks
• Wait time for Ultrasound of 12 weeks (within the 25 weeks surgical wait time)
• Surgical wait time reductions in place so Ultrasound could become a bottleneck
• Wide variation between radiologists - from 6 patients/hour to 3/hour
• No agreed best practice between radiologists
• No performance measures or agreed appropriate length for an ultrasound slot
• Clinics starting late and ‘no shows’

Results

• Increases in capacity of MSK ultrasound ranging from 25% to 33%
• Maintain maximum 2 week wait time from Outpatients to Ultrasound
• Identified potential for further productivity improvement
• Hourly planned versus actual performance highly visible
• Peer reviews to share knowledge and ensure best practice for the benefit of the patients
Southampton University Hospitals - A & E Department

Challenges

• Improving Patient experience
• Achieving 98% conformance to maximum 4 hour stay in the department

Results

• Improved baseline performance from 86% to 99.3% conformance to 4 hour target
• Engagement from staff and clinicians
• Improved Value Add and resource to improve patient experience
• Savings in the order of £1.2 million on Agency Staff
• More flexibility and space to deal with peaks Preparation teams ensure patient at assessed early by senior doctor
• Provides speed, focus and improved clinical management
• Reduces wait for Analgesia thus improves patient care

Working together to champion Lean within the NHS
## Southampton University Hospitals - A & E Department

**Challenges**

- Improving Patient experience
- Achieving 98% conformance to maximum 4 hour stay in the department

**Results**

- Improved baseline performance from 86% to 99.3% conformance to 4 hour target
- Engagement from staff and clinicians
- Improved Value Add and resource to improve patient experience
- Savings in the order of £1.2 million on Agency Staff
- More flexibility and space to deal with peaks Preparation teams ensure patient at assessed early by senior doctor
- Provides speed, focus and improved clinical management
- Reduces wait for Analgesia thus improves patient care

*Working together to champion Lean within the NHS*
4. Information Management and Lean
Continuous Incremental Improvement

A key principle is **Kaizen**

Continuous Improvements

Traditional approach is to rely on Management/Senior management to make big steps forward.

The lean philosophy is to include **EVERYONE** and charge them with making small incremental improvements as well as supporting the step changes.

As a result the organisation moves forward faster.
So....

NHS people using Lean will:
- identify Key Performance Indicators for a process redesigned using Lean
- They then need to control the process using KPI’s and make adjustments

• This requires:
  - A capacity for producing and manipulating KPI’s
  - aka basic competence in use of excel, access etc
  - Confidence in using the results to make change

• …. requests for central information management resources to IM & T Dept for multiple mini projects = DELAYS
Danish Help Desk Film
5. Lean and IM & T Systems
So... we can expect that NHS people using Lean will be:

Identifying opportunities to automate through the implementation of new IM & T solutions
But we already have a way of handling this

- Process change owner makes business case to IM & T - process re-engineering benefits specified
- IM & T prioritises within available budget
- ... or includes in bid for next year’s funding, if not coming from CfH
- Procurement launched
- Market solutions proposed
- Solution implemented
- Benefits realised?
And this is how long it may take

<table>
<thead>
<tr>
<th>Process change owner makes business case to IM &amp; T - process re-engineering benefits specified</th>
<th>Duration - c 36 months?</th>
</tr>
</thead>
<tbody>
<tr>
<td>IM &amp; T prioritises within available budget</td>
<td>2 months</td>
</tr>
<tr>
<td>... or includes in bid for next year’s funding, if not coming from CfH</td>
<td>1 - 12 months</td>
</tr>
<tr>
<td>Procurement launched</td>
<td>12-24 months, depending on priority</td>
</tr>
<tr>
<td>Market solutions proposed</td>
<td>6+ months, depending on size</td>
</tr>
<tr>
<td>Solution implemented</td>
<td>3-6 months</td>
</tr>
<tr>
<td>Benefits realised?</td>
<td>6-18 months</td>
</tr>
<tr>
<td></td>
<td>3 months</td>
</tr>
</tbody>
</table>

Working together to champion Lean within the NHS
And this also may happen…….

- Process change owner makes business case to IM & T - process re-engineering benefits specified
- IM & T prioritises within available budget
- … or includes in bid for next year’s funding, if not coming from CfH
- Procurement launched
- Market solutions proposed
- Solution implemented
- Benefits realised?

- ? Folded into similar projects
- Very limited local IM & T budgets
- Business case may or may not draw on benefits targeted from re-engineered process
- Market solutions on market will have additional functionality and may not support re-engineered process as expected
- Solution implemented may not be able to support re-engineered process
6. Conclusions
A few words on Lean and tools

Working together to champion Lean within the NHS
By now you will be in one of three states:

- Confused
- Enthused
- Asleep
Back Up slides
Problem solving

Structure problem solving methods such as
♦ 5 Whys
♦ FMEA
♦ Poka Yoke
♦ Fishbone diagrams

Getting to the root of problems and genuinely preventing re-occurrence

Working together to champion Lean within the NHS