CANCER

DIAGNOSTICS

HEART

LUNG

STROKE

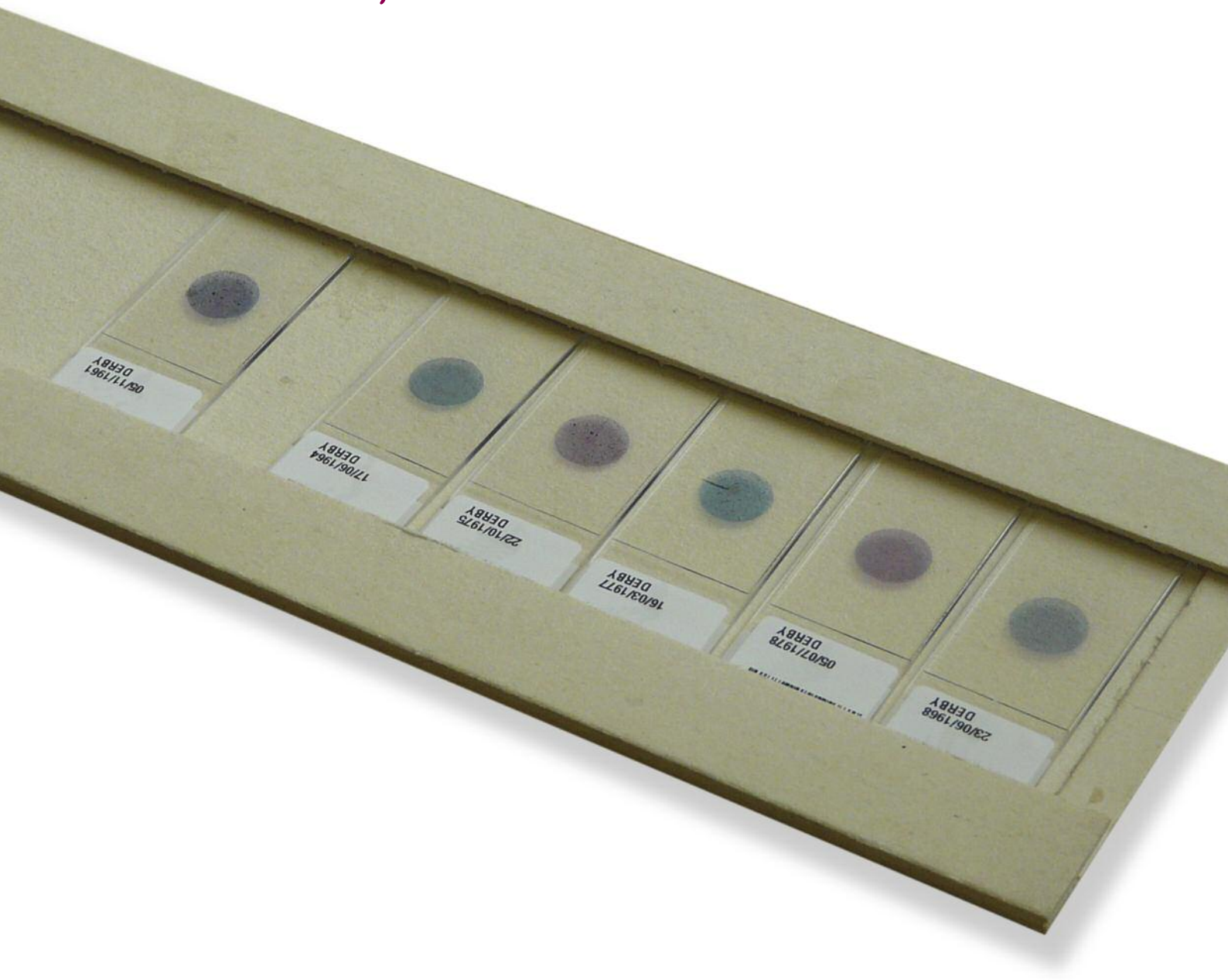
NHS

NHS Improvement

NHS Cervical Screening Programme (NHSCSP)

Continuous improvement in cytology: sustaining and accelerating improvement

"Clinical excellence in partnership with process excellence"



Contents

1. Foreword

In November 2009, following a period of testing changes across the complete cytology pathway, NHS Improvement published the '*Cytology Improvement Guide*', which documents the learning from the phase 1 national cytology pilot sites,

Since then the 14 day standard for cervical cytology has been confirmed as a tier one vital sign in the Revision to the Operating framework for the NHS in England 2010/11(June 2010)

The new white paper '*Liberating the NHS*' sets out plans to ensure the patient is at the heart of everything we do, and has a focus on clinical outcomes. It also recognizes that the NHS scores relatively poorly on being responsive to the patients it services. Too often patients are expected to fit around services, rather than the other way around.

The work of the Cytology Improvement Programme has demonstrated that simple changes to the process can deliver improvements in quality, safety, and productivity, to deliver an equitable service for all women, while ensuring they are at the heart of the process.

Professor Mike Richards CBE
National Cancer Director

Professor Julietta Patnick CBE
Director NHS Cancer Screening Programme

This document builds on the learning from phase 1, demonstrates the importance of sustainability, and demonstrates how implementing what we know works can accelerate the pace of change.

Professor Julietta Patnick CBE
Director NHS Cancer Screening Programme

Professor Mike Richards CBE
National Cancer Director

2. Executive summary

Following the initial success of the 10 phase one pilot sites to 'ensure that all women receive the results of the screening tests within two weeks by 2010', the next challenge was that of sustainability.

These pilot sites have continued to embed their improvements throughout all stages of the pathway, developing a culture of continuous improvement in their daily work.

All have found sustainability challenging with additional learning being developed through the rigour of root cause analysis of those samples falling outside 14 days.

Their learning was, '**never assume you know what the problem is**'. Detailed analysis demonstrated the importance of data, rather than hunch or assumption.

In phase two, six pilot sites were challenged to:
- Test the learning from phase one using the *Cytology Improvement Guide* (November 2009)
- Accelerate the pace of implementation

Phase two further evidenced the importance of the following four key changes identified in phase one:
- Focus on the whole end to end pathway
- Adopt small batch sizes
- Keep samples moving
- Establish first in first out.

The key mechanisms required to achieve this also hold true:
- Empowered staff
- Daily meetings
- Visual management techniques
- Information to support the process.

In addition it is important to:
- Baseline any backlog and establish a plan for removal
- Ensure Executive support to remove blockages
- Perform root cause analysis to identify the true problem
- Understand the challenge of consolidation of services.

Teams have also been trained to understand the cost of poor quality (defects) and reduce and eliminate the causes in a way that supports the interests of women and the cytology service.

Improvements made are aligned to the Quality, Innovation, Productivity and Prevention (QIPP) strategy.

Quality
- A 'right first time' approach
- Guaranteed and predictable results

Innovation
- Robust problem solving using A3 thinking
- Visual management

Productivity
- Removal of duplication
- Reduction and elimination of waste
- Reductions in overtime and outsourcing
- Appropriate use of skill mix

Prevention
- Timely referral to colposcopy and treatment

This programme of work has demonstrated benefits to over **one million women**.

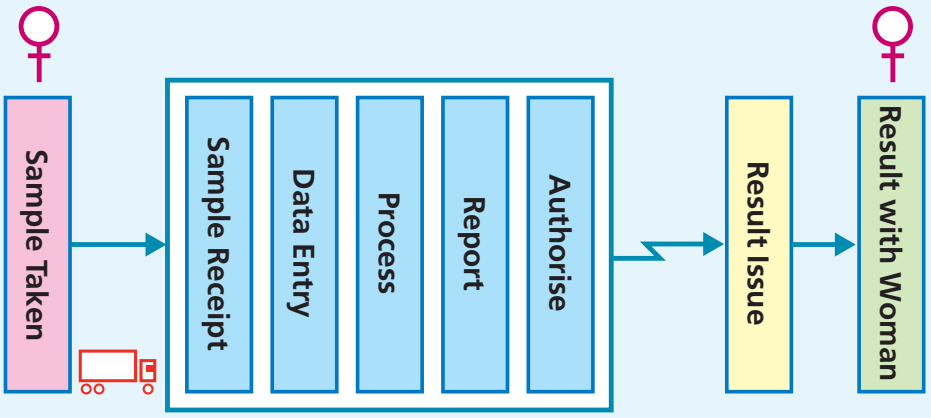
Improvements in quality and productivity have been published by NHS Evidence www.evidence.nhs.uk in both the 'Recommended' and 'Long Term Conditions' sections.

This document is designed to be used in conjunction with the first *Cytology Improvement Guide - Achieving a 14 day turnaround time in cytology* (November 2009), Cytology Self Assessment Tool (refer to page 56) and our *Bringing Lean to Life* document. All of these documents can be found on our website at: www.improvement.nhs.uk/diagnostics

3. Introduction

Phase one identified issues across each step of the pathway

Figure 1: Identified issues across each step of the pathway



PATHWAY PROBLEMS	Primary Care	Laboratory	Recall Agency
	• Training of smear takers • Inconsistent use of NHS numbers/patient ID parameters • Transport - delivery times/routes • Samples left at surgery • Incorrect info/demographics • Illegible forms • Multiple request form formats • Missing/wrong smear taker codes • 25% out of scope samples	• Data entry issues • Writing on forms • Double look-up/printing from Open Exeter • Skill mix/staffing • Processor reliability • Over printing labels • Matching forms/slides • Returned samples/cards • Excessive checks • Backlogs • Staff morale • Sending out processing/ screening to other labs	• Results issued weekly • Large volume of manual matching • Manual enveloping/leaflets • Variable postage • 'Abnormals' sent out by GP • Route to colposcopy (no direct referral) • Manual checking of electronic data • Print jobs not believed • IT issues • Variable out of area processes

The key components to close the gap between these problems and the ideal pathway are detailed in the phase one publication.

An assessment of the steps within the cytology end to end pathway reveals there is just 5.5 hours of true value added steps from the 'customer' point of view.

Whilst the work with the pilot sites has focused on the 14 day turnaround time, teams have also been testing whether a seven day turnaround is achievable and sustainable, as highlighted in the ScHARR Report (2006).

4. Site overview

The following sites were selected by the National Cancer Screening Programme to work with NHS Improvement to pilot changes and test the learning to deliver improvements in the cytology pathway.

There are NHS Improvement sites in each Strategic Health Authority. Contact with these sites is recommended to spread their learning.

A table of site data is available in the appendices.

Phase 1 and Phase 2 Cytology Pilot Sites

Phase 1 Cytology Pilot Sites

Phase 2 Cytology Pilot Sites

Phase 1 Cytology Pilot Sites

1 Leeds PCT and The Leeds Teaching Hospitals NHS Trust

2 Hull Royal Infirmary and Hull and East Ridings PCTs

3 Pennine Acute Hospitals NHS Trust

4 Norfolk and Waveney Cellular Pathology Network (Norfolk and Norwich University Hospital NHS Foundation Trust

5 West Anglia Pathology Cytology Laboratory (Cambridge University Hospitals NHS Foundation Trust, Addenbrookes Hospital and Anglia Support Partnership)

6 Barts and The London NHS Trust

7 Somerset and West Dorset Cervical Screening Service (Taunton and Somerset Hospitals NHS Trust)

8 Ashford and St Peter's Hospitals NHS Trust

9 North West London NHS Trust (Northwick Park Hospital)

10 Central Manchester University Hospital NHS Foundation Trust

Phase 2 Cytology Pilot Sites

11 Newcastle upon Tyne Hospitals NHS Foundation Trust

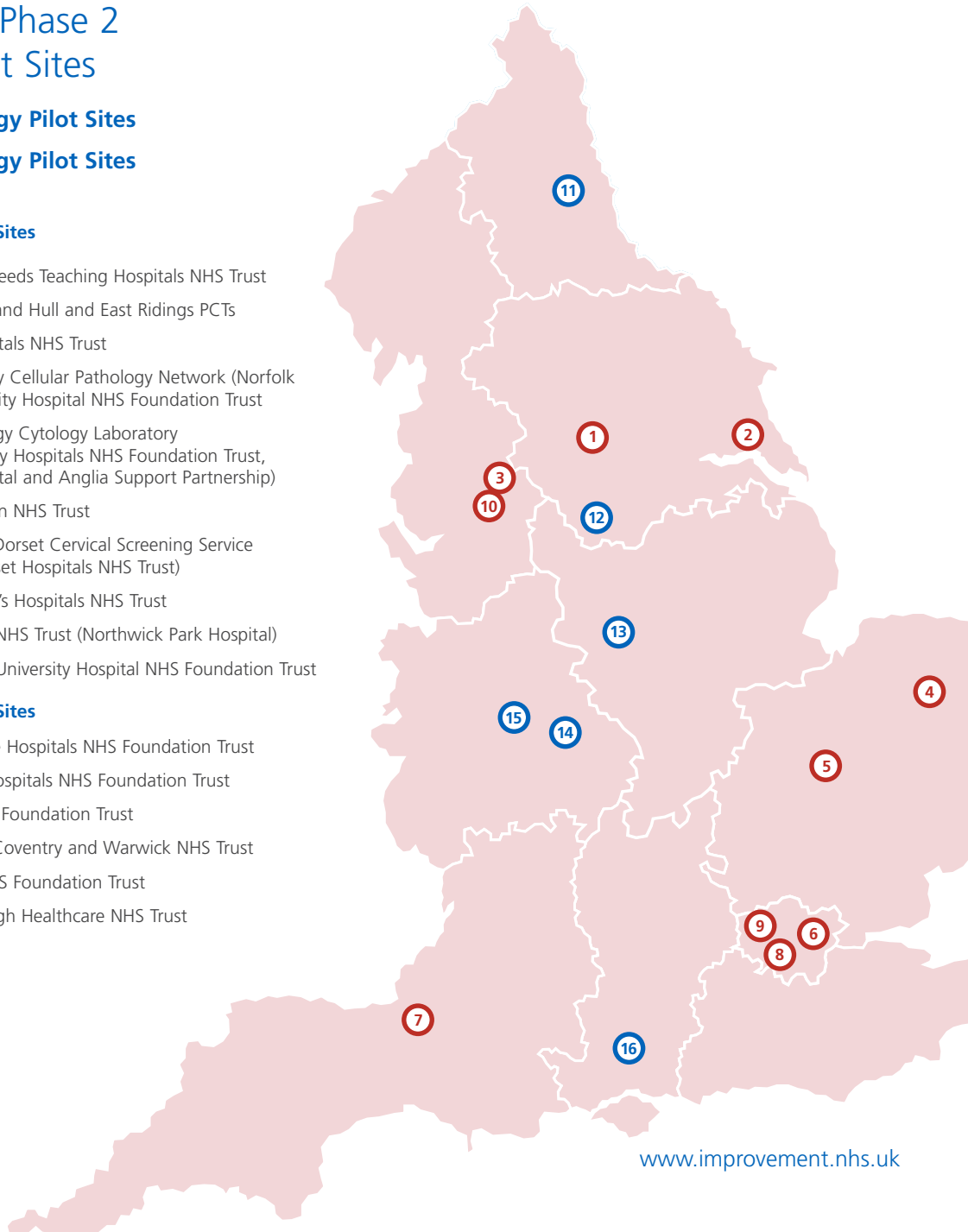
12 Sheffield Teaching Hospitals NHS Foundation Trust

13 Derby Hospitals NHS Foundation Trust

14 University Hospitals Coventry and Warwick NHS Trust

15 Heart of England NHS Foundation Trust

16 Winchester & Eastleigh Healthcare NHS Trust



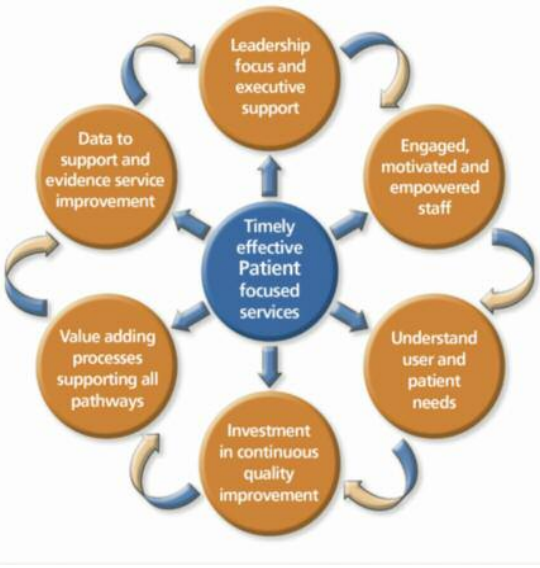
5. Phase one: Sustainability

One of the greatest challenges to improvement is sustainability. An improvement implemented today and gone tomorrow is not an improvement.

The presence of certain factors is crucial not only to ensure sustainability but to foster a culture of continuous improvement.

The following were identified by the Pathology Service Improvement Team in 2006 in the document '*Learning from Pathology Service Improvement Pilot Sites and Improvement Examples.*'

Figure 2: Factors for achieving sustainable improvements



These elements are consistent with redesign in other clinical services including the Cancer Services Collaborative and are not unique to pathology.

The work of the phase two sites has continued to evidence the importance of strength in all the areas identified above.

Root cause analysis

Approximately 24 months after the phase one sites began their improvement work they were asked to undertake a root cause analysis (RCA) of all samples falling outside 14 days.

The detailed analysis demonstrated the following root causes:

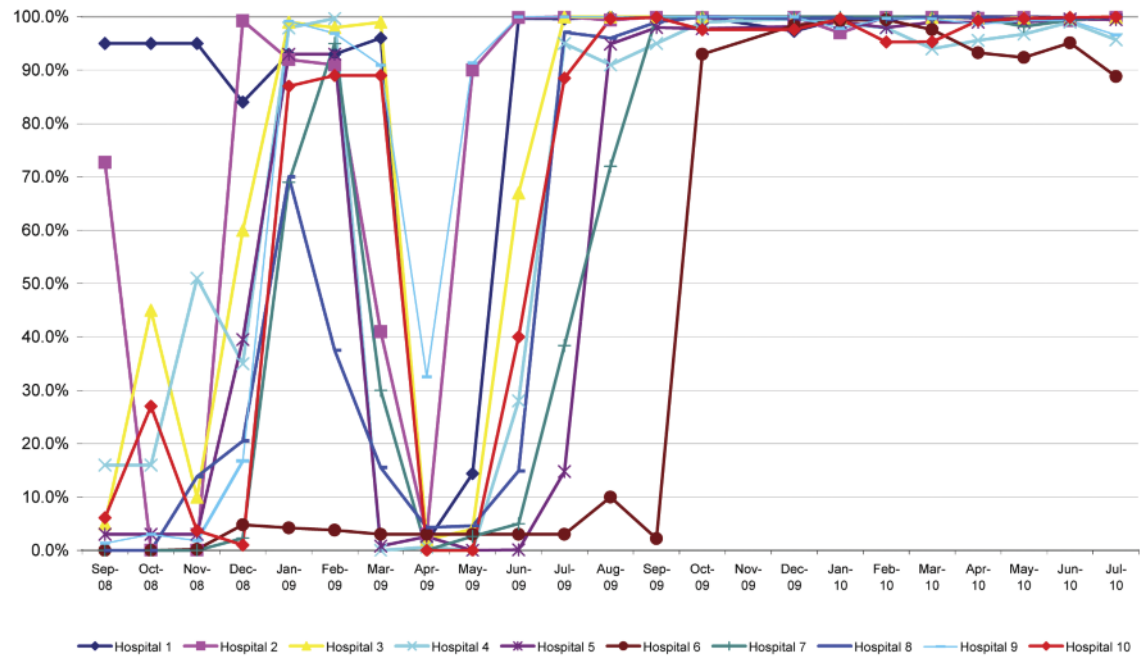
- **Delays transferring samples from primary care to the laboratory.** This was the greatest cause and was essentially due to samples being held over in primary care. All practices concerned have daily transport available. The problems are being addressed by identifying the practices and reinforcing training and communication
- **Annual leave, restricted year end leave carry over and Easter Bank Holiday.** These can be addressed by appropriate staff planning and operational management
- **Missing data and information/zero tolerance of defects.** Recommendations are to audit non-compliance, training and communication. Case studies are available at: www.improvement.nhs.uk
- **Surge in demand one year on from Jade Goody's death.** Repeat recall tests following the 2009 surge in abnormal results
- **Recall agency delays – out of area**
- **HPV – processing delays from external providers.** Additional issues were caused during the air travel restrictions due to volcanic ash which prevented delivery of consumables.

Root cause analysis has prompted these sites, in partnership with their PCTs, to take proactive steps to eliminate these issues through:

- Identification of practices responsible
- Ongoing training and reinforcement of standard work
- Demand and capacity planning to ensure appropriate staffing levels.

Phase one sustainability is reflected in figure 3 on the next page.

Figure 3: Phase one cytology - percentage in 14 day turnaround



Case study 1

Root cause analysis of samples breaching 14 day TAT

Barts and The London NHS Trust

Summary
Root cause analysis reveals the causes for samples which have breached the 14 day turnaround time.

Understanding the problem
Analysis of turnaround times identified tests taking longer than 14 days from sample taken to anticipated delivery of the result letter.

Failure to sustain the 100% 14 day turnaround time for all samples has almost always been due to delay by GP practices sending samples to the laboratory.

- The problem was identified in statistical process control graphs
- Key dates for each sample were extracted - sample date, receipt date, registration date, screening date and date the file was sent to call/recall
- Call/recall supplied a list of laboratory numbers with the date the letter was printed
- The laboratory extract and call/recall lists were cross linked in an Access Database to provide a comprehensive data file for the whole pathway.

The waste identified was that of waiting.

How the changes were implemented
- Data for outlier tests was sent to PCT leads and the sample taker
- The sample taker visited the GP practices where the delay in sending the sample to the laboratory was the reason for the breach.

Measureable outcomes and impact
Since October 2009, 74 tests have been delayed by practices failing to deliver samples in a timely manner. Root cause analysis and direct contact with practices has reduced the number of tests delayed from:
- 19 in October 2009
- 9 in April 2010.

Of 173 practice addresses:
- 31 practices were delaying samples between October and December 2009
- 10 practices were delaying samples between January and April 2010.

Ideas tested which were successful
Visiting practices was the idea of the cancer screening nurse and has proved to be the most effective approach.

Ideas tested which were unsuccessful
Initial email lists sent to PCT leads without explicit instructions to undertake a root cause analysis were not successful.

How will this be sustained and what is the potential for the future /additional learning?
Whilst the feed back processes have reduced the number of practices causing delays, there are still a few practices who continue to delay samples.

A continued collaborative approach between the laboratory and PCT leads is needed to continue to identify and reduce these delays.

Contact
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Case study 2

Addressing delays from primary care

Ashford and St Peter's Hospitals NHS Trust

Summary

Samples that have taken five days or more to get to the laboratory are quickly identified and processed. A letter is sent to the woman's GP to request that they investigate the cause of the delay. An incident report form is completed when the 14 day turnaround has been breached.

Understanding the problem

The laboratory monitors how well the specimen transport system is performing by checking the 'date taken' on all samples as they arrive in the preparation room. During April and May 2010, specimens more than 14 days old when they arrived were investigated.

The team started by telephoning the sample takers to understand the cause of the delay. This information was collated in incident report forms that were passed on to the quality manager.

A transport problem was suspected however the root cause was that samples were spending prolonged periods stored in the GP surgeries before they entered the transport system.

How the changes were implemented

The initial approach was to telephone surgeries whose samples were overdue but the sample takers (usually practice nurses) were hard to contact and not always able to help.

A letter template was then prepared that could be quickly completed and sent to the woman's GP. The letter and a copy of the request form are sent to the GP whenever a sample arrives that is over five days old.

All overdue specimens that arrive in the laboratory are processed urgently and sent for immediate screening. Negatives are reported straight away by the screening room staff while abnormals are passed to the consultant clinical cytologist for immediate reporting. The aim is to have the result leave the laboratory within 24 hours of the samples arrival.

Measurable outcomes and impact

Delayed samples are identified, processed and resulted within 24 hours of their arrival in the laboratory. The causes of the delays are being investigated via letters sent to the woman's GPs (see table 1 below)

So far the explanations offered have varied but sample takers are being focused on getting samples to the lab promptly.

Ideas tested which were successful

- Identifying delayed tests as soon as they arrive in the laboratory
- Rapid processing and reporting of delayed tests
- Contacting the GP by letter to request an explanation for the delay.

Ideas tested which were unsuccessful

Telephone calls to sample takers whose samples had arrived too late to achieve the 14 day target had a poor success rate due to availability of sample takers

How this improvement benefits patients

This process is intended to improve the overall reliability of the screening programme by ensuring that smear takers understand the importance of sending samples to the lab promptly.

How will this be sustained and what is the potential for the future /additional learning?

This process will continue to help identify any weaknesses in sample taker procedures and to pick up any problems with the specimen collection and transport system.

Contact

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Table 1: Causes of delays

Date sample taken	Date of arrival in laboratory	Time in days	Reason given for delay
16/03/2010	23/04/2010	37	Surgery unable to explain delay
23/03/2010	12/04/2010	20	Three samples sent to another laboratory by a new practice nurse, returned to GP and then sent to correct lab
29/04/2010	07/05/2010	8	No explanation for delay but promised to send future samples ASAP.
12/05/2010	17/05/2010	5	Sample taken Wednesday but GP too busy to fill in a request form until Friday
20/05/2010	02/06/2010	12	Six specimens locked in fridge by a new practice nurse, discovered days later and sent to lab
26/05/2010	02/06/2010	7	Delayed by staff illness followed by a bank holiday, measures put in place to prevent a recurrence

6. Phase two: Accelerated implementation

Phase two of the Cytology 14 Day Turnaround Time Programme was established to test the learning from phase one for repeatability and scalability.

The additional challenge was to accelerate the achievement of this vital sign to six months.

The changes made in phase one were proved to result in the elimination of waste and reduction in turnaround times.

The progress towards a 14 day turnaround by the phase two sites within the accelerated timescale has varied due to a number of factors:

- Baseline starting position against 14 days
- Backlogs that existed at the start of the programme
- Staffing capacity insufficient to meet demand on the service
- Absence of senior management to support operational service delivery
- Lack of technology.

The A3 document on page 14 shares the Newcastle Cytology team's assessment of their current position and plans to continue to embed Lean as their management system.

Achieving the cultural shift

> The most important factors for success are patience, a focus on long-term rather than short-term results, reinvestment in people, product and plant, and an unforgiving commitment to quality.

Robert B McCurry, former executive VP, Toyota Motor Sales

> I am personally quite pleased that we are consistently turning around material within 14 days. But I am far more pleased with how much safer we are now than 15 months ago and how much more staff engagement we have. These are the real measures of success to my mind .

Dr Simon Knowles, National Clinical Lead, Cytology Service Improvement

Case study 3

Newcastle Cytology Lean Management System A3

Newcastle upon Tyne Hospitals NHS Foundation Trust

Define the problem/opportunity:
(Why are you talking about it? What are you trying to solve/improve?)

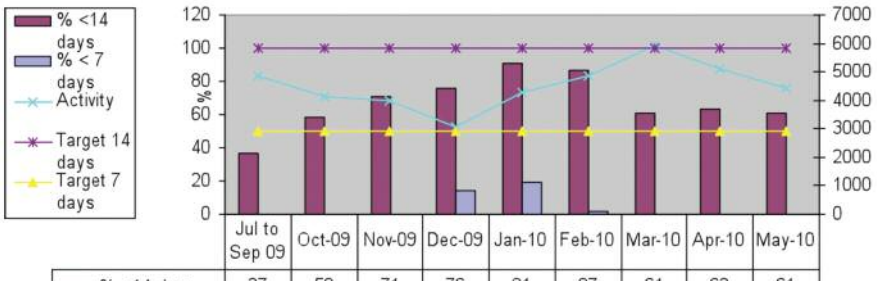
The Newcastle Cytology Lean team want to ensure an embedded Lean Management system. The aspiration is for a long term, sustained philosophy of daily problem solving and on going improvement beyond the support of NHS Improvement.

Current Condition:
(What happens now? Be visual – value stream map, graphs, facts and measurements etc)

- The principles and tools of Lean methodology have been introduced.
- Most of the 'just do its' detailed in the Cytology Improvement Guide (NHS Improvement 2009) have been implemented and tools applied to the process to smooth and level flow.
- Establishing a culture of daily problem solving is required by coaching the team in Lean principles and establishing transparency in performance and process issues across all areas of the lab (including specimen reception, the office and screening rooms).

Performance against plan as of May 10 = 61%

Gynaecology Cytology % TAT and activity: Performance against target



	Jul to Sep 09	Oct-09	Nov-09	Dec-09	Jan-10	Feb-10	Mar-10	Apr-10	May-10
% <14 days	37	58	71	76	91	87	61	63	61
% < 7 days		0	0	14	19	2	0	0	0
Activity	4881	4141	3986	3072	4265	4862	5949	5092	4412
Target 14 days	100	100	100	100	100	100	100	100	100
Target 7 days	50	50	50	50	50	50	50	50	50

Goal:
(State the specific SMART target(s). State in measurable or identifiable terms)

To be a Lean exemplar site by meeting the criteria set by NHS Improvement:

- 100%TAT within 14 days
- 50% TAT within seven days
- All staff think Lean
- Good measures
- All staff talk Lean
- Good visual management
- Clear evidence of how Lean has been used
- Engaged staff
- Lean culture
- Daily meetings/problem solving
- Evidence of 5S
- Leadership
- Standard work

Gap analysis:

75% of staff received Lean awareness training, with six members of the team being on the core Lean group.
Even with daily huddles and completed process production documentation in each area, the team recognises that more work is required to achieve a Lean culture.

Responsible: Mr David Evans - david.evans@nuth.nhs.uk

Team members: Cytology Team

Proposed counter measures
(What will it look like? Be visual i.e. future state value stream map)

Within the next four months, the daily focus of the team will be on performance against the 14 and seven day turnaround times - levelling workload across the laboratory so that work flows to takt with no backlog.

By October, all areas of the lab will be operating without: overproducing, waiting, and defects; and with minimal motion within and between processes; and any areas of overprocessing identified and plans in place to remove it.

An experimental approach to problem solving and potential countermeasures will be in place using the PDSA cycle.

Action Plan

Action – What, Why, How?	**Who?**	**When?**	**Progress Status** (i.e. completed, in progress)
Team Huddle every day	All	Daily	In Progress
Establishment of 3 Cs (Concern, Cause and Countermeasures)	DE/CB	Daily	TBC
Root Cause Analysis of SPCs	CB	Weekly	TBC
Visually monitor Goal vs Actual at each step	All	Hourly	TBC
Agree Report out date	DE	Aug 10	In Progress
Raise Transport issues – no tracking, no service level agreement , review of scheduled pick ups, audit of pick up times – with Transport sub –group	DE	Aug 10	In progress
Instigate a 'name and shame' policy for persistent offenders of 'zero tolerance' policy	CB	July 10	In Progress
Raise issue of uneven rate of smear taking at local and national level	DE	Aug 10	In progress
Increase downloads to FHSA on Friday	CB	July 10	In progress

Results and Measures

Criteria set by NHS Improvement will be met, evidenced and assessed as achieved.

Next steps

Share with exec sponsor – Invite to report out in late August , Early September 2010

7. Learning for the future

The four key changes identified in phase one have been further evidenced as critical to success

1. Focus on the whole end to end pathway
Each core project team contained membership from the PCT(s), laboratory and results agencies. Within the laboratory, each staff group/function was represented.

Every member of the core team was asked to 'go see' the whole pathway. Value stream mapping techniques brought what they saw together to visualise the whole pathway and highlight where samples and reports were waiting.

The multiple organisations involved in providing the cervical screening service then worked together to identify improvements.

Starting with the point at which the sample is taken, laboratories have worked collaboratively with their PCT screening leads to raise awareness of their 14 day turnaround projects within the primary care community. Sample taker introductory and update training events have been held during which project content has been communicated and received very positively.

2. Small batch sizes
Teams in phase two have further evidenced the value of small batches in keeping samples and reports flowing through the pathway.

3. Keep samples moving
The principle of 'today's work today' can be facilitated by ensuring

- Samples are sent from primary care daily – even if there is only one
- Flow of samples, using pull systems where necessary
- Multiple (or optimal) daily downloads to the results agency with letters sent same day.

4. First in, First out (FIFO)
Whilst the vital sign requirement is to deliver results to women within 14 days of their test, sites have also tested their capability to deliver within seven days as highlighted by the ScHARR report (February 2006)

Sustaining a seven day turnaround for the majority of samples provides some flexibility to manage peaks in demand, unexpected resource challenges and removes the need to operate separate 'urgent' work streams.

Case study 4

Communication to improve the pathway

Derby Hospitals NHS Foundation Trust

Summary

Two way communication between primary care and the laboratory is vital in ensuring the 14 day turnaround times are achieved.

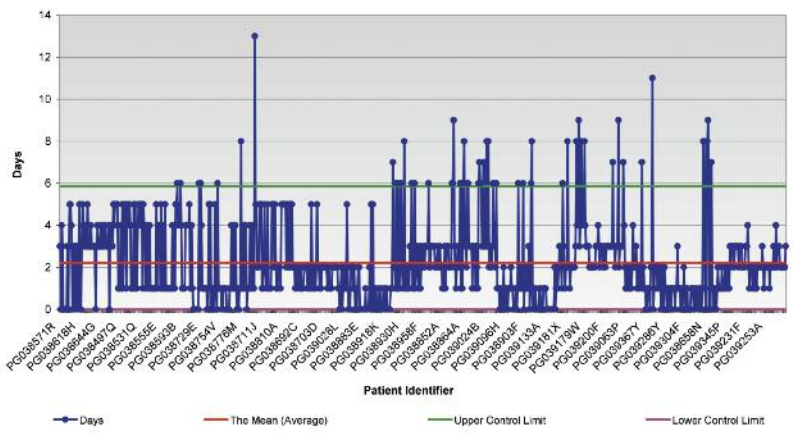
Understanding the problem

SPC charts were used to identify delays along the processing pathway – outliers show where delays are occurring (see figure 4):

Root cause analysis of the outliers identified what was causing delays in primary care:

- Sample batching within practices
- Lack of daily courier collections
- Overnight delays due to courier transfers at other hospitals
- Inaccurate completion of cytology request forms which were returned to senders for correction.

Figure 4: Sample taken to received in lab - Baseline data (August 2009)



How the changes were implemented

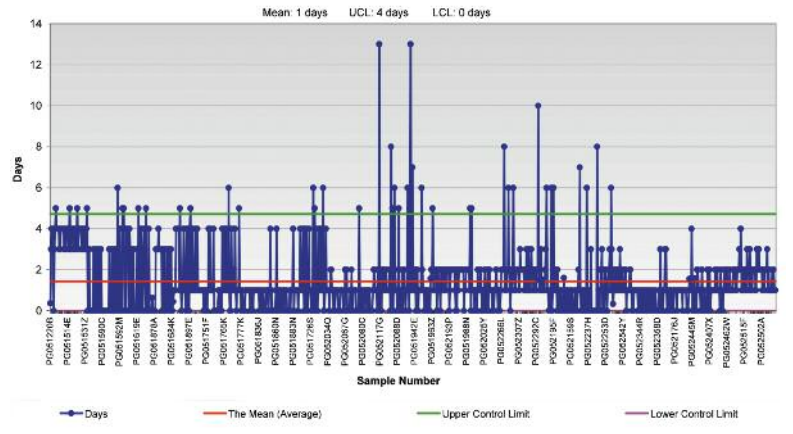
Various methods of communication were used to highlight delays and implement changes:

- Newsletters sent by cytology laboratory to inform primary care of the improvement work being undertaken, emphasising the importance of completing the request form accurately and asking that samples are not batched
- Letters sent from PCT screening commissioners outlining policy for out of scope samples. Clear message that these samples would not be processed by the laboratory
- Telephone calls by PCT leads to practices and clinics to re-confirm courier frequencies and times. Calls made to practices that were batching samples
- E mail correspondence by PCTs to sample takers providing feedback on progress of the improvement project
- Face to face discussions at introductory and update sample taker courses and practice nurse forums. Opportunities for sample taker feedback and comments encouraged
- Workshops held to pilot the use of pre-populated Open Exeter HMR101 forms

Measurable outcomes and impact

- Number of outliers reduced following communication and implementation of changes (see figure 5 below).
- 213 sample takers attended meetings and courses from Nov 2009 - May 2010
- Example of form filling guidance communicated to sample takers at update courses.

Figure 5: Sample taken to received in lab (May 2010)



Mean time for 'sample taken to receipt in lab' decreased during the six month project:

- from **2.22** days to **1.37** days

Ideas tested which were successful

- Transportation changes - following root cause analysis the courier service changed from pick up at a local community hospital to three individual practices
- Primary care participation - Open Exeter Workshop piloted and 10 GP practices now have Open Exeter access. Comments and suggestions to be incorporated into full PCT rollout in 2010
- Right First Time – communication with sample takers resulted in this approach.

Ideas tested which were unsuccessful

A zero tolerance policy was considered including the disposal of samples. PCT commissioners were concerned that women would be disadvantaged hence the development of a 'right first time' approach encouraged through communication.

How this improvement benefits women

Communicating information to sample takers has improved turnaround times. Quicker results for women reduces anxiety.

How will this be sustained and what is the potential for the future /additional learning?

- Continued monitoring of information will ensure outliers are identified and investigated
- Ongoing communication with primary care will ensure messages are relayed and feedback received
- Closer links with primary care have resulted from this project.

Contact

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Top tips for sample takers

- **Ensure the form is fully completed and the vial is labelled correctly**
- **Screw lids on securely**
- **If two brushes are used, put both in one pot but ensure that this is clearly indicated on the form**
- **Date of last test is given**
- **Correct reason for smear is stated.**

8. Ideal pathway

Reduction and elimination of waste from typical cytology pathways has resulted in the development of this ideal pathway model.

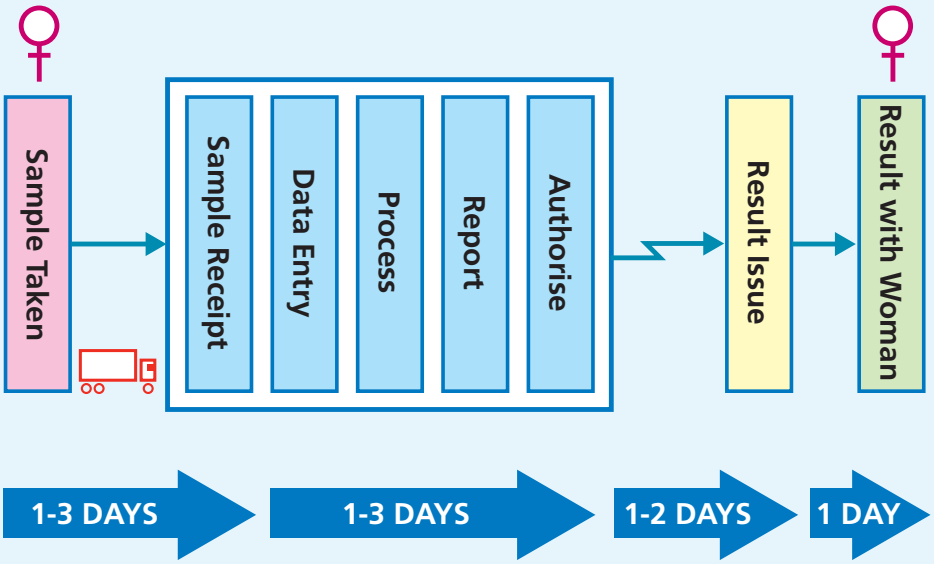
The following case studies build on those published in the first cytology learning document and further evidence the value of recommended improvements.

Voice of the customer

The programme has focused on achieving a 14 day turnaround time that ensures where required women are referred to the appropriate cancer pathway in a timely manner.

Further opportunities should be sought to understand the voice of the customer as supported in the case study from Newcastle.

Figure 6: The ideal pathay



RECOMMENDED ACTIONS	Primary Care	Laboratory	Recall Agency
	• Use of electronic pre populated HMR101 and order comms • Request form and vial identification and labelling right first time • Daily transport for sample collection	• Sample receipt, data entry, process and report in one to three days • Samples received, booked in, processed and authorised right first time • Small batch sizes (six samples) • First in first out (FIFO) • Report abnormals daily	• Multiple daily downloads • Results transferred and posted right first time • Daily posting of results

Case study 5

Continuous improvement to a four day pathway

The Leeds Teaching Hospitals NHS Trust

Summary
Continuous improvement has created a four day end to end pathway for some women.

Understanding the problem
By the end of the phase one project the team had achieved:

- 98% of results received by women within 14 days
- 58% of results received by women within seven days.

The data suggested that with further improvement the turnaround time could be reduced further.

How the changes were implemented

- The seven day pathway was analysed to determine the necessary measures to improve to a four day pathway (see table 2 below)
- Assumed one day for first class post
- To enable the woman to receive a result by day 4, only samples that were authorised before the 11.30am download on day 3 could meet this goal
- To facilitate screening/ authorisation of results by 11.30am on day 3, samples must be processed on day 2
- Processing of samples would need to occur no later than day 2
- Samples must be registered by lunchtime on day 2
- Samples must be received by the laboratory no later than the morning of day 2, but ideally received the same day as taken.

Table 2: Seven day pathway

Seven Day Pathway						
Day 1	**Day 2**	**Day 3**	**Day 4**	**Day 5**	**Day 6**	**Day 7**
Samples taken and some received in lab.	Rest of samples received in lab. Registered and some samples processed.	Rest of samples processed. Slides pre-screened. Some screened for end of day download.	Day three results in post. Remaining samples pre-screened and screened.	Day three results received by woman.	Day four results received by woman.	Sunday (day of rest!)

Table 3: Four day pathway

Four Day Pathway			
Day 1	**Day 2**	**Day 3**	**Day 4**
Samples taken and majority received in Lab. Some registered	Rest of samples received in lab. Remaining registered and all samples processed. Some slides pre-screened/screened.	Remaining slides pre-screened/ screened by 11.10am download. Results letters issued.	Results received by woman

Measurable outcomes and impact

By June 2010:

- 98% of results were received by women within seven days
- 47% of results were received by women within four days.

Phone calls received from practices whose patients had commented on the speed of their result.

Ideas tested which were successful

- Smaller batches of slides per tray (from eight to six)
- Hourly scheduled deliveries to/ from each area
- One co-ordinated transfer of work throughout the department at each delivery.

Ideas tested which were unsuccessful

Reducing batches of forms for registration from 12 to six resulted in forms being registered and sent to lab out of numerical sequence making processing of samples very difficult.

How this improvement benefits women

- Additional 40% of women now receive their result within seven days
- 47% of women now receive their result within four days.

How will this be sustained and what is the potential for the future /additional learning?

- Work with transport services and practices to:
  - increase % of samples received in lab on day taken
  - spread the delivery of samples more evenly throughout the day
- Daily scheduling of work requests (when/volume) and actions to corrects missed plans.

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Case study 6

Voice of the customer

Newcastle upon Tyne Hospitals NHS Foundation Trust

Summary
Women were advised in a letter from the recall agency that they could expect a result within eight to ten weeks. When they received a result within considerably less time some became concerned and telephoned.

The wording of the letter was changed to reflect current performance and the number of phone calls was reduced significantly.

Understanding the problem

It was identified from the volume of telephone calls received within the department that women were confused by the wording in their invitation letters which stated that a result would be received within eight to ten weeks.

Prior to the 14 day turnaround programme, eight to ten weeks was the length of time it took for results to reach women in the area.

This was identified as the 'waste of defects' in a staff daily huddle. The team were spending time answering calls and reassuring women who had received their results much earlier than they expected.

How the changes were implemented

The invitation letter was changed to state that the woman would receive her result letter within three weeks of the test date.

Measurable outcomes and impact

- 99% reduction in telephone calls from patients
- Staff time saving of approximately **two hours** per week
- Improved patient experience.

How this improvement benefits women

This saving in staff time is being used on value add processes and women are more accurately informed.

How will this be sustained and what is the potential for the future /additional learning?

As turnaround times continue to improve the letter will be further updated to ensure women are accurately informed.

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9. Primary care

To achieve a 14 or seven day turnaround time, the focus within primary care needs to be on getting the sample and request form right first time and ensuring that it is on the next available transport run.

Use of Open Exeter produced HMR101

Moving to the use of electronic pre-populated HMR101 request forms from the Open Exeter system:

- Improves patient safety – forms are pre-populated with demographics and screening histories. Risks associated with misreading handwritten forms are removed.
- Saves sample takers time completing blank forms
- Saves laboratory time deciphering handwriting
- Saves laboratory time looking for information located differently on multiple form types.

Use of electronic requesting

Where available, use of electronic requesting for every sample:

- Ensures correct demographics are recorded
- Samples do not need to be returned for correction or clarification
- Removes the risk associated with handwriting interpretation

Right first time

Learning in phase two has highlighted the need to consider the approach taken with two of the 'just do it' recommendations contained in the first *Cytology Improvement Guide* -

1. Enforce a policy for refusing 'out of scope' samples and ensure GPs and sample takers know the correct pathway for symptomatic women. The aim of this is to stop inappropriate testing and to ensure appropriate interventions or referrals are made in line with Cancer Screening Policy.

Figure 7: Example of a 'right first time' visual aid

Cervical screening - implementing good practice

DON'T FORGET

As from 1 April 2010
Laboratories will not process the following samples

Age	Frequency of screening	Unacceptable samples
<25	N/A	Under 24 years 6 months and not scheduled for a test
Screening starts at 25		
25-49	3 yearly	Less than 30 months since previous routine negative
49-64	5 yearly	Less than 54 months since previous routine negative
Screening ends at 64		
65>	N/A	65 years and over with previous consecutive routine negative tests in last ten years

2. Implement a non-acceptance policy for incorrect forms/vials. The main aim of this is to ensure quality and safety that guarantees the right sample is reported to the right woman. The additional time required for staff to deal with omissions, errors, logging returns, telephoning surgeries etc is eliminated.

These recommendations are aimed at achieving a service where every test is completed correctly and sent immediately to the laboratory in a correctly labelled vial with a fully completed standardised request form. Every sample should be 'right first time'.

Following the experience of a number of sites, there are some further recommendations to support implementation.

- **Measure defects** - Identify how many samples and forms are received that cannot be booked in and processed without the need to:
  - search for information (wrong form)
  - look up information (missing codes)
  - telephone the sample taker (missing information)
  - return for correction (not recommended) or dispose of sample (when woman's identity compromised only).

In phase two up to 47% of all samples and forms had either an error or an omission. Not all of these errors compromised the identify of the woman but all required additional work and were in Lean terms considered 'defects'.

It is important to establish a rigorous process to achieving a 'right first time' approach including:

- **Root cause analysis** – understand why these errors have occurred
- **Engage stakeholders** – communicate your findings to all relevant stakeholders including (but not limited to) GPs, sample takers, screening leads, PCTs, QARC
- **Agree a collaborative approach across the whole pathway** – agree what the standard is, communicate frequently using all available avenues
- **Consider how errors will be handled and by whom** – agree where responsibility for errors sits and how they will be addressed. What action will be taken by PCTs to ensure sample takers deliver 'right first time' samples every time?
- **Establish a timescale for training and implementation** – communicate this widely.

NHS CSP guidance is that **ANY** sample received where the woman's identity or safety is compromised should be disposed of. Where a sample taker fails to indicate whether the cervix has been visualized the sample should be reported as inadequate by default.

Other errors or omissions should be agreed upon either locally or regionally. A whole pathway approach involving all stakeholders is therefore essential.

The case studies demonstrate the different approaches that have been taken to achieve right first time and include the learning from each site concerned.

Transport

A percentage of the turnaround time for samples is taken up with transportation to the laboratory.

It is essential that every sample taken is sent via the next available transport van which should be at least daily. Samples should not be batched or held within surgeries or clinics.

Case study 7

Changing to Open Exeter HMR101

University Hospitals Coventry and Warwick NHS Trust

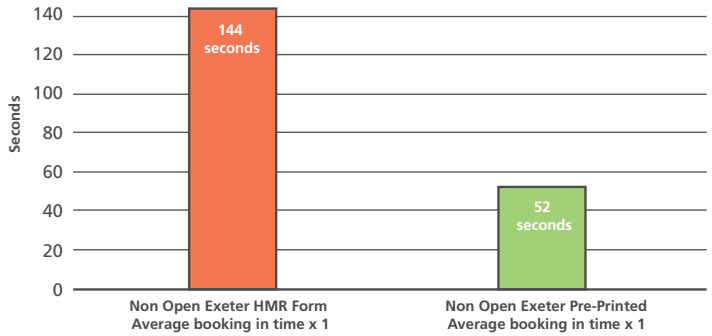
Summary

By early July 2010, three months after requesting sample takers use Open Exeter HMR101:

- The booking in backlog of **5,000** forms had been reduced to **zero**
- Both screeners and clerical staff find the new form much easier to use
- Reduction in the number of incorrect reports put on the computer by the screeners.

Turnaround time from collection to reporting has improved dramatically:
- November 2009: **7.1%** in 14 days
- July 2010: **92.2%** in 14 days.

Figure 8: University Hospitals Coventry and Warwick NHS Trust - Booking in times: Old style HMR 101 forms vs Open Exeter printed HMR 101



Understanding the problem

In April 2009, the Cervical Cytology Services at Warwick, George Eliot and University Hospitals Coventry and Warwick (UHCW) merged into one lab on the UHCW site in Coventry. The three laboratories had over 20 years of cervical cytology history on their respective databases and each used a different computer system. Although a decision was made that the historic data would be transferred to the newly merged lab at UHCW, this had not happened by the time of the merger and has still not been completed 18 months later.

Screeners in the newly merged lab did not have the sample history for any Warwickshire women (40,000 women a year) and each case had to be looked up on Open Exeter and the history manually written on the request form and entered onto the UHCW computer system.

The laboratory received multiple formats of forms:
- Single copy HMR101 forms
- UHCW's own designed HMR101 form
- Old style green multi-copy HMR101 forms
- Open Exeter A4 PDF one previous sample displayed
- Open Exeter A5 PDF (2003) two previous samples displayed.
- Each form had information in different places which was confusing for booking in and screening staff who had to search for information
- Booking in a single sample including the look up on Open Exeter and writing the history on the form was taking an average of two minutes 22 seconds
- Where screeners did not have the complete history or missed information on the multiple form formats, errors were made in the recall management. These were not picked up until the data was downloaded to the recall agency creating unnecessary work for a senior member of the laboratory team who corrected the error
- By the summer of 2009, the laboratory had a backlog of 5,000 samples awaiting booking in.

How the changes were implemented

Very early on after the merger the Lab and the PCT decided that all Coventry and Warwickshire surgeries would be encouraged to use Open Exeter and move to pre-printed Open Exeter HMR101 forms (version A5 PDR 2009) which have all the cervical cytology history printed on them:
- The recall team drove the change programme by writing to all practices, setting up user access and visiting all practices to provide training
- An intensive education and training programme was initiated by the PCT in the summer of 2009 to encourage surgeries to use Open Exeter and the laboratory introduced a non-acceptance policy for the use of anything other than the pre-printed HMR101 forms in April 2010.

Measurable outcomes and impact

By May 2010, the use of Open Exeter HMR101 forms had dramatically increased.
- **11%** in May 2009
- **92.35%** in May 2010.

Time taken to book in each sample dropped from:
- **144 seconds** in May 2009
- **52 seconds** in May 2010.

The laboratory deals with approximately 70,000 samples per year meaning a time saving **1,789 hours** per year.

How does this improvement benefits women

The removal of waste from the process has contributed to a reduction in the end to end turnaround for all women

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Case study 8

Right first time

University Hospitals Coventry and Warwick NHS Trust

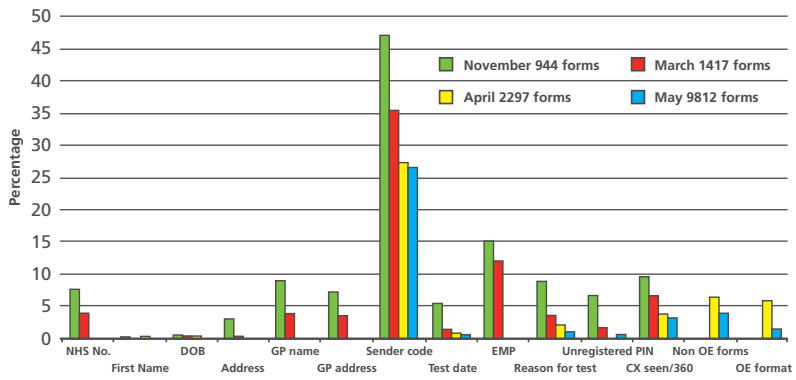
Summary
Achieving right first time for all samples requires a planned collaborative approach involving and engaging all key stakeholders.

Understanding the problem

The scale of the perceived problem was confirmed with a data collection exercise to identify the type and volume of errors as well as the staff time to deal with them.

A simple table was used at booking in to identify errors. Process sequence charts were used to understand the processes staff were required to follow to deal with errors (see figure 9).

Figure 9: University Hospitals Coventry and Warwick NHS Trust - Request form percentage defects (Nov 2009, March, April, May 2010)



How the changes were implemented

- 'Out of scope' samples were defined locally as those from women under the age of 24.5 years as they are called before their 25th birthday.
- Incorrect forms were defined as specimens received with anything other than an Open Exeter downloaded HMR101 A5 size form
- Defects were defined in two categories:
  - Serious defects where the woman's safety may be compromised including unlabelled vials or significant mismatches of information between form and vial
  - Minor defects where necessary information for the smooth flow of the sample through the laboratory is missing and requires extra work on the part of the laboratory. This can include missing practice codes, missing or incorrect sample taker PINs, lack of test date, failure to confirm that the cervix was visualised or that a 360 degree sweep was taken
- A policy was devised and a copy sent out by the PCTs to all practices, Genito-Urinary Medicine (GUM) and Family Planning clinics together with a visual management aid to form filling and vial labelling
- In between notification of the impending policy and its implementation, sample takers would receive a notification where a sample was 'defective' in some way so that they could correct their process to prevent a reoccurrence
- Sample taker training was provided by the PCT to assist with accessing and completing the required HMR101 form.
- Sample takers were also sent the NHS Clinical Practice Guidance for the Assessment of Young Women aged 20 -24 with Abnormal Vaginal Bleeding.
- Sample takers received a reminder three weeks after the original notification and then again one week before the planned implementation of the policy
- Hospital clinics were notified internally by the project lead.

Following a significant challenge from a small number of GPs advice was sought from the Trust Solicitor and Medical Defence Union.

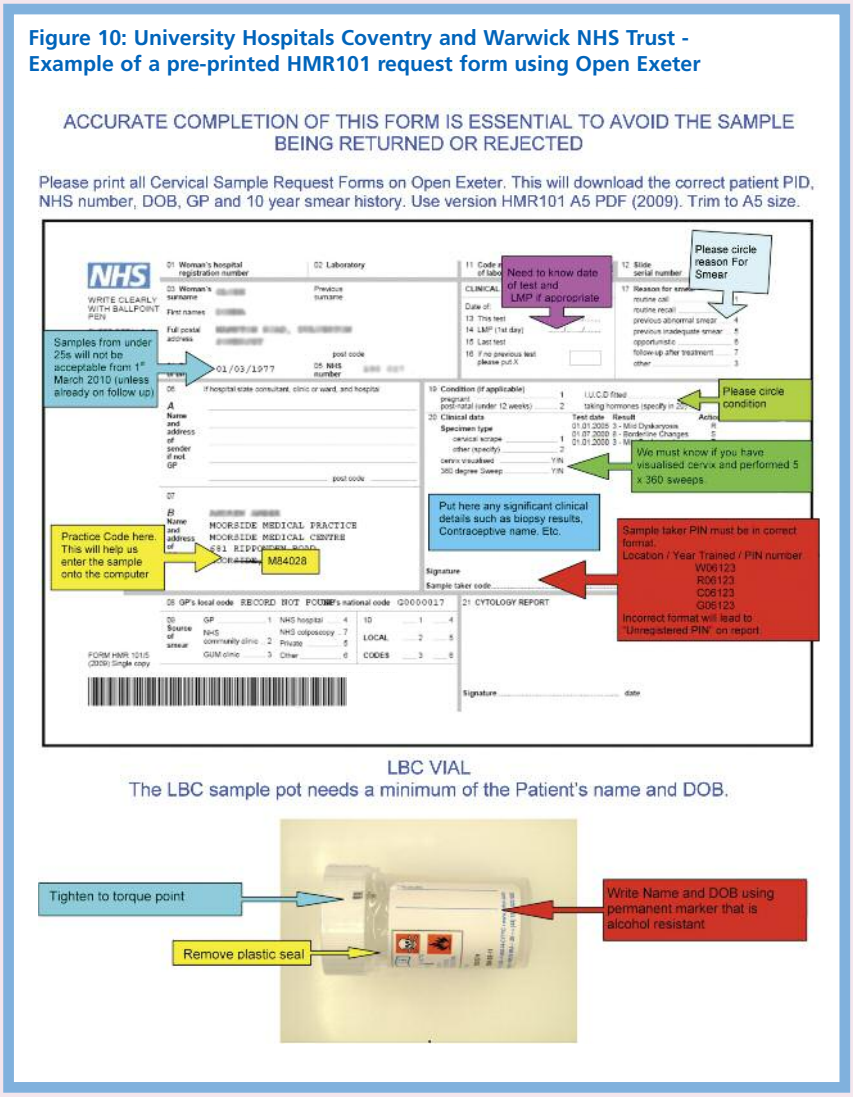
- On their advice the policy was amended to confirm that samples would only be disposed of where the woman's identity or safety is compromised or where the sample is out of scope as previously defined.
- The remainder of samples are reported but additional commentary is added to the report highlighting the errors to the sample taker.
- Errors are reported on a monthly basis to the PCTs.
- The laboratory has chosen to continue to report samples where cervix visualized and/or 360 degree sweep is not confirmed. A note is added to the report that this information was missing from the request form and it is the responsibility of the sample taker to decide whether to recall the woman. This decision was made on the basis that the 10% of samples missing this information being reported as inadequate would require additional screening resource that is not available
- All samples are electronically recorded on the lab system rather than in a manual log as this enables accurate and fast analysis of any errors.

Measurable outcomes and impact

Errors have fallen dramatically across all categories and time spent managing errors has fallen accordingly.

The time taken to book in a sample has been **reduced by 50%.**

Figure 10: University Hospitals Coventry and Warwick NHS Trust - Example of a pre-printed HMR101 request form using Open Exeter



How this improvement benefits women

Sample taker attention has been drawn to the importance of correct data and process to ensure a quality sample as well as a good experience for the woman. Time savings have enabled the laboratory to continue to reduce their backlog and turnaround times.

How will this be sustained and what is the potential for the future /additional learning?

Continued reporting of errors back to the source will enable sample takers to improve their processes to prevent a reoccurrence.

Contact

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Ideas tested which were unsuccessful

- Problems occurred early during implementation as 'out of scope', 'incorrect/forms and vials' and 'defects' was not clearly defined within national guidance and could not initially be agreed with GPs locally
- The term 'zero tolerance' was not liked by many and was felt to have 'policing' connotations. This impacted on successful engagement with the intention of the policy which was to ensure samples were right first time.
- If a 'defective' sample is sent back to the sample taker or held on to until more information is obtained to be able to process it wait time is added and achievement of the 14 day turnaround is compromised. The laboratory initially decided with the support of their two PCTs to discard such samples.

Case study 9

A3 thinking for transport problems

Newcastle upon Tyne Hospitals NHS Foundation Trust

Summary

- The laboratory receives samples from three primary care trusts (PCTs) across NHS North of Tyne
- The percentage of samples received within three days increased from **73% to 97%**.

Understanding the problem

Delays in samples reaching the laboratory were evident across all three PCTs although the majority of delayed samples were generated within one which serves a geographically large, sparsely populated area. The transport pathway was carefully mapped in order to explore this further. Key problems identified included:

- Potential batching of samples at provider clinics and surgeries
- Complex transport routes with multiple hand offs
- Lack of segregation of cervical cytology specimens from other samples during transportation
- Failure to deliver samples directly to the laboratory.

How the changes were implemented

- A multidisciplinary group including representatives from the laboratory, estates, primary care, public health and commissioning was established to understand the problems in transporting specimens to the laboratory
- A turnaround time of three days or less was set for samples reaching the laboratory from provider clinics
- Actual transport times were audited over a one week period on two separate occasions. Where outliers were identified the responsible sample takers were contacted directly in order to explore underlying issues.

Measurable outcomes and impact:

After excluding any returned samples, the proportion of samples reaching the laboratory within three days increased on average from **73% to 97%** (see table 4 below).

The laboratory now receives two daily batches of samples from the collection point enabling processing to start earlier in the day.

Ideas tested which were successful

- Introduction of pink specimen bags to allow separation of cervical cytology specimens from others collected by couriers
- Delivery of samples directly to the cytology laboratory reception rather than via the post room
- Provision of an additional courier run from one of the intermediary collection centres to ensure a more constant flow of specimens
- Development of a communications plan engaging local leaders as figure heads to ensure dissemination of key messages to stakeholders.

Ideas tested which were unsuccessful

It was suggested that it might be more efficient for the more remote practices to send samples in via the post rather than have them picked up by courier. We ran a pilot scheme but unfortunately it proved to be very unpopular with the GP practices.

How this improvement benefits women

Reducing transport time makes compliance with the 14 day turnaround more achievable and sustainable.

Table 4: Newcastle upon Tyne Hospitals NHS Trust - Proportion of samples reaching the laboratory within three days

Transport Provider	Count	Average transport time (days)	No. of cases - to or < 3 days	% of cases - to or < 3 days	No. of cases > 3 days	% of cases > 3 days
North Tyneside (Northumbria)	423	1.93	408	96.45	15	3.55
North Tyneside	269	1.59	261	97.03	8	2.97
Newcastle	462	0.97	451	97.62	11	2.38
TOTAL	**1154**	**1.46**	**1120**	**97.05**	**34**	**2.95**

Women will benefit from knowing the result of their test sooner reducing anxiety and, if required faster referral to the cancer pathways.

How will this be sustained and what is the potential for the future /additional learning?

A number of additional challenges have been identified which will be addressed in the future. These include the development of a robust tracking system for individual specimens to identify and monitor delays at different stages throughout the pathway.

Evidence from this project is currently being used to:

- Highlight the need for further improvement of the whole pathology transport infrastructure
- Undertake detailed analysis of routes, schedules etc
- Accompany drivers to understand some of the difficulties faced in collecting samples.

The return journey of send back samples needs to be mapped to ensure their speedy return to the practice.

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10. Laboratory

Within the laboratory, teams have focused on keeping samples moving from the point of entry at specimen reception through to the time the result is transferred to the recall agency.

This has been made possible by reducing and eliminating the waste, using visual management, 5S and standard work.

Case study 10

Removing the waste of over processing at specimen reception

Sheffield Teaching Hospitals NHS Foundation Trust

Summary

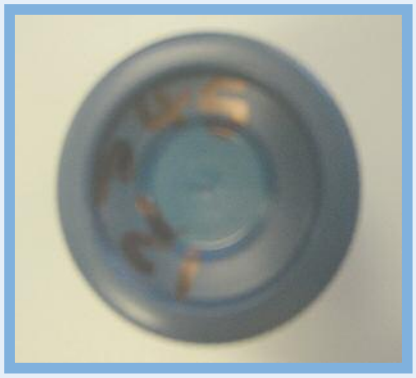
The removal of a step at specimen reception has removed over one hour a week for a workload of 34,000 and will save three hours on a workload of 96,000 following consolidation.

Understanding the problem

The core team looked objectively at how samples were received, checked and labelled in the reception area.

- Samples are received and details checked on the vial to ensure that they match details on the request form
- Each sample is given a unique number and the label is applied to the form and vial
- Each vial has the number written on its top as well as having the sample number label on the body of the vial.

The core team recognized this as a waste of over processing.



How the changes were implemented

The core team recognized that they could see no benefit from writing the number on the vial lid. This was a practice that has always been undertaken but the need had never been questioned.

It was agreed at the daily huddle that the number would no longer be written on the vial top.

Measurable outcomes and impact

- Six seconds have been saved per specimen by not labelling the vial top with the laboratory number
- Taking into account the increased workload of 96,000, **160 hours** per year are saved equating to three hours per week.

Ideas tested which were successful

The idea came from the core team as they were doing a walk round of the work flow through the preparation area. It was also felt that the numbering was difficult to see and provided no added value to the service.

How this improvement benefits patients

The time saved will be invested elsewhere in the lab on value add activities.

How will this be sustained and what is the potential for the future /additional learning?

There will continue to be periodical reviews around the department to assess the value of each step of the process.

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Case study 11

Creating a work cell for specimen reception and booking in

Winchester and Eastleigh NHS Trust

Summary
Specimen reception has been relocated and combined with the booking in function removing the wastes of motion, transport, waiting and over processing.

Understanding the problem
When the equipment was installed for LBC processing, specimen reception was relocated to a distant location within the histology laboratory where space happened to be available within the cut up area.

The workspace was cramped and out of sight of the rest of the cytology team. It was located at the furthest point from the processing room and admin office and samples were therefore being transported.

How the changes were implemented
- Following discussion with the laboratory team, it was agreed that the admin office would become a work cell as a PDSA (plan, do, study, act)
- The desks are covered with disposable non-absorbent paper to make them suitable and staff members wear disposable plastic aprons to adhere to PPE procedures
- Samples are handled one at a time - unpacked from the plastic bag, checked, labelled and booked in
- Staff work in batches of 24 which matches the Surepath equipment capacity
- Forms and pots move into the processing room together and are divided into two batches of 12 when they come off the cover slipper.

Measurable outcomes and impact
By combining the previously separate processes into a single work cell, samples are opened, checked and booked in one at a time. 73 seconds per sample has been saved which equates to **781 hours** per year.

How this improvement benefits women
Time savings have been reinvested into value add process steps contributing to a reduction in the turnaround time.

How will this be sustained and what is the potential for the future /additional learning?
The work cell is to be made permanent but will move into an adjacent office space where the flooring is due for replacement. Appropriate flooring will be laid and the function moved as the current location has recently been carpeted.

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Case study 12

Achieving first in, first out according to date test taken

Cambridge University Hospitals NHS Foundation Trust, Addenbrookes Hospital

Summary
Having removed priority workstreams during phase 1, the laboratory has identified a further improvement opportunity that relies on identifying, tracking and ultimately screening samples that are nearing 14 days turnaround time.

These samples were often spread throughout the waiting work and had to be pulled out and prioritised for screening ahead of the rest of the workload.

Changing to working in date sample taken order was accepted as the most appropriate way to ensure true first in, first out.

The department continues to meet the 14 day TAT and planning the deployment of staff has been easier.

Understanding the problem

- A department workload increase coincided with a staff shortage in both the admin and screening teams
- Some screening staff also do data entry and it was becoming difficult to assess where to deploy staff to have the greatest impact on maintaining performance
- The Cyres IT system is used to identify those cases that require reporting to ensure the 14 day turnaround is met. However, cases not yet booked onto the Laboratory Information Management System (LIMS) were not identified by this monitoring
- Due to a developing backlog, up to 150 cases were being identified that required pulling through to meet the turnaround time but these would be spread throughout the workload waiting to be screened. This meant that a priority work stream was in effect being reintroduced.

How the changes were implemented

- Staff suggested a PDSA (plan, do, study, act) to sort cases at an earlier stage into the order of the date the sample was taken
- Two different methods were proposed:
  1. At the unpacking stage sort the samples into 'date taken' order where possible. Then label samples keeping them in 'date taken' batches
  2. Sort the request forms after labelling into 'date taken' order. Forms to be kept in 'date sample taken' order in batches of 10 where possible. Slides kept in numerical order. Screener matches slides with each batch of request forms as they take them
- Daily huddles were used to discuss and monitor the PDSA. Times were recorded before and after the changes
  1. Unpacking in the previous way versus unpacking and sorting into date taken order
  2. Time taken to sort forms in the admin office versus time taken to match forms and slides.

Measurable outcomes and impact

Both options resulted in samples being reported in order of the date the sample was taken.

- **Option 1** - took slightly less time per sample but due to the current timings of the deliveries and current staff available to complete this task individuals were working past their finish time of 5pm
- **Option 2** - was successful but introduced a level of complexity that took staff time to get used to. There were concerns about mismatches between forms and slides and time taken to pick up the cases increased. There was an additional impact on filing as batches were not in numerical order.

Ideas tested which were successful

Option 1 - will be implemented once a reconfiguration of existing vacant posts enables appointment and training of Band 2 Biomedical support workers for the prep room and data entry.

Option 1 - helps ensure the oldest samples are processed, stained and available for screening first.

Ideas tested which were unsuccessful

The option 2 approach meant the forms available did not consistently match up to the slides that were available. This could be managed by adding additional sorting complexities but this places additional pressures on the data entry staff and is not Lean!

Additional visuals had to be introduced to support the process of slide matching but it was agreed that this approach was overall adding waste back into the process.

How this improvement benefits women

The department is consistently meeting the 14 day TAT, despite the increase in workload

How will this be sustained and what is the potential for the future /additional learning?

The laboratory will progress with implementing option 1 once the staff configuration is correct. This will ensure the department stays on track with 14 day TAT and also help identify potential non-achievement much faster allowing the department to respond quickly and proactively rather than reactively.

Workflow will be more efficient and pressure on staff reduced.

The department is planning to recruit more Band 2 staff to man the prep room until 5.30 pm rather than 5pm as at present.

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Case study 13

Stop to fix - removing the waste of waiting

Derby Hospitals NHS Foundation Trust

Summary
While undergoing lean training the batching of clerical queries was identified as a waste of waiting.

A 'stop and fix' approach was implemented followed by the introduction of a rota and all staff underwent IT refresher training.

Understanding the problem

- Waste identification sheets highlighted that potential clerical errors were a concern. For example mismatches between form and computer system
- The waste of waiting was also identified by screening staff who felt they were not receiving a prompt response to clerical errors picked out at screening
- The relevant forms were being batched in a basket and only being dealt with when a member of the clerical team was available. This was delaying reports for up to one week
- A focus group session with the clerical team revealed a lack of clarity with regard to roles and responsibilities and also highlighted the need for refresher training.

How the changes were implemented

- IT refresher training implemented for all staff
- The creation of a 'stop and fix' policy, where one person is responsible for resolving queries immediately as they arise was suggested by staff
- The idea was discussed and agreed at a huddle
- A visual rota was introduced to give direction to the clerical staff and screeners showing who was responsible for 'stop and fix'.

Measurable outcomes and impact

- The visible rota has eliminated the batching of forms and simplified the process
- Clerical staff know who is on 'stop and fix' duty and that person expects to be interrupted
- Screening staff know who to ask to amend errors.

There is now no delay of work waiting to be processed and screened. An audit confirmed a reduction in waiting time to three minutes per sample.

Clerical staff are satisfied with the new rota. They have commented that they feel under less pressure to complete large batches of queries at one time. This has resulted in improved teamwork and boosted team morale.

Ideas tested which were successful

IT refresher training was provided for all members of staff which improved confidence in the use of the computer system.

Screening staff were encouraged to correct mistakes themselves and ultimately log them.

Ideas tested which were unsuccessful

Initially the 'stop and fix' rota was not supported by a visual aid. This meant that the clerical staff were still unsure who was responsible for carrying out the task each day.

How this improvement benefits women

The introduction of the 'stop and fix' rota had the effect of reducing batch sizes and waiting times, enhanced work flow and ultimately led to a reduced TAT.

How will this be sustained and what is the potential for the future /additional learning?

If a member of the clerical team is absent the rest of the team adapt the rota on a daily basis as necessary.

Daily 'huddles' are used as a forum to discuss other clerical problems as they arise.

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Case study 14

Productivity improvement in screening - removal of key strokes

Pennine Acute Hospitals NHS Trust

Summary

Introducing the use of hot keys by screeners has saved time, removing the waste of over processing.

Understanding the problem

- Entering a negative report and management previously required 16 key strokes
- Using hot keys can reduce the number of key strokes to as little as two.

How the changes were implemented

- A member of the laboratory team asked his colleagues at a daily huddle how many of them were aware of and used hot keys for reporting
- Whilst a small number of people were familiar with them the majority were not and it was agreed that everyone would receive 1-2-1 tuition
- It took a couple of weeks to get to the stage where everyone knew how to hot key a report.

Measurable outcomes and impact

The time to enter results and comments onto the computer system has reduced from **20 seconds** to **four seconds** per case.

The estimated annual time **saving is 225 hours** based on approximately 200 cases per day.

Ideas tested which were unsuccessful

Not every staff member was comfortable with changing their process. They preferred the way they had always typed reports.

The time savings were explained and the majority of the team are now comfortable with the faster reporting process. Whilst a few people have continued with the old process, their reporting speed is acceptable.

How this improvement benefits women

A further small change has been made which has contributed to reducing the end to end turnaround time.

How will this be sustained and what is the potential for the future /additional learning?

The system has further hot key capabilities beyond cytology reporting which will be exploited as much as possible to save time elsewhere in the pathology service.

Contact

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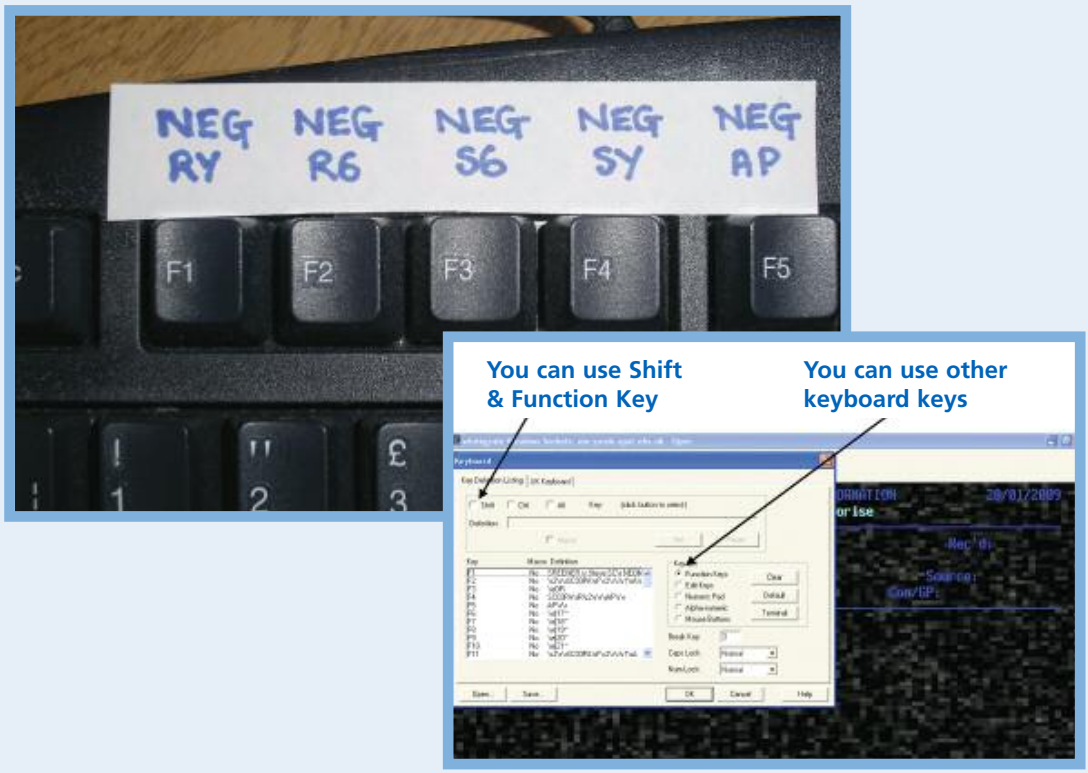


Case study 15

Removing the waste of over processing - code checking

Derby Hospitals NHS Foundation Trust

Summary

Removal of an unnecessary checking step in the screening room has saved **five hours** of senior time per week with no detriment to quality.

Understanding the problem

The value stream map and staff suggestions identified the code checking of forms as a waste of waiting. Forms were batched and left waiting for the management code to be checked by the next available senior member of staff.

Ideally this check should have been carried out three times a day. However, occasionally this would only be completed once a day and the wait could range from one hour to six hours.

It was also identified following the spaghetti mapping exercise of the screening room that the code checking table was situated in the wrong position. This caused disruption for colleagues nearest the table during their screening time.

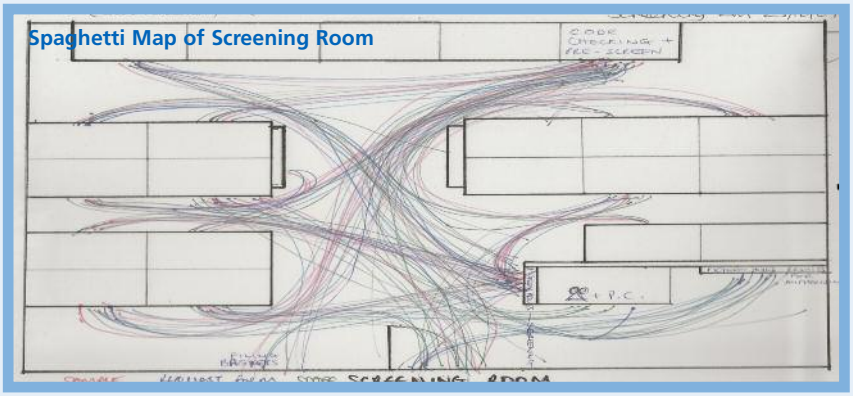
How the changes were implemented

The initial change was to move the location of the task to make waiting work more visible to seniors and reduce disruption in the screening room.

When this proved to be unsuccessful, further discussion examined the purpose of the check and it was agreed that it should be part of the rapid reviewer's tasks.

Measurable outcomes and impact

- An audit was completed detailing the amount of time spent by a senior member of staff to carry out this process. The time saving was one hour per day, the equivalent to five hours per week or **260 hour**s per year. This time has been utilised for other value add duties
- Work flow improved in the screening room and the batching of forms for result entry was removed
- The invalid returns have not increased since stopping the code checking by senior members of staff.



Spaghetti Map of Screening Room

Ideas tested which were unsuccessful

- Following discussion at a daily huddle, it was agreed that the relocation of the checking station to a more central location within the room was a good idea. It was thought that this would serve as a more visual indicator for the senior staff
- To illustrate the impact of the change, another spaghetti map was completed. This demonstrated that staff movement remained the same but disruption was reduced
- The relocation proved to be an inadequate visual reminder to the senior team
- Further discussions lead to the role of code checking becoming the responsibility of the screener performing the rapid review.

How this improvement benefits women:

As the recall management of the women is now part of the rapid screeners routine, work continually flows throughout the day. Quality is not affected and TAT has improved by one day.

How will this be sustained and what is the potential for the future /additional learning?

This will be sustained by the continual monitoring of invalid returns.

Contact

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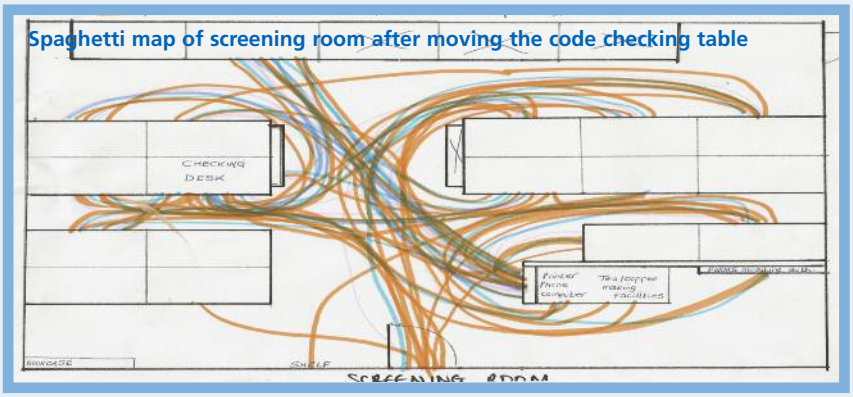

Spaghetti map of screening room after moving the code checking table

Case study 16

Simplifying manual logs - removing the waste of over processing

Derby Hospitals NHS Foundation Trust

Summary
At the start of the lean project, eleven handwritten log books were in use by laboratory and screening staff. After discussion with the team it was decided to either remove, combine or simplify them.

Handwritten logs were replaced with electronic versions using a simple coded key that saved time, duplication and maintained flow of work.

Understanding the problem

It was highlighted in staff feedback and whilst gathering data for the value stream map that numerous handwritten log books were in use

It was evident that this was the waste of over processing. Some of the information collected was duplicated and some of it was never analysed.

How the changes were implemented

In order to decide whether any of the log books could be eliminated, combined, simplified an initial discussion during a huddle focused on which log books were unnecessary and could be removed immediately.

11 books were reduced to eight within one week.

Combination and simplification of certain log books was discussed in detail with the relevant staff that made use of them. A decision was made to retain some logs whilst others were combined and put onto the server accessible by all staff.

Measurable outcomes and impact

By combining and simplifying log books approximately **five hours** per month has been saved.

Ideas tested which were successful

Remaining log books were combined and converted into an electronic version. To make this version more user friendly a coded key was added.

Less information was therefore needed to be input by members of staff. All members of the team have full access to the shared server.

How this improvement benefits women

Time saved has been reinvested in value add tasks contributing to a reduction in the turnaround time.

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Table 5: Logs used and time taken to complete

Name of log	Frequency of use	Time to complete	Total time	Outcome
High Risk Samples	X3 per month	2 mins	6 mins	Removed
Screeners Day Book	X1 per day	1 min	30 mins	Removed
Practice Nurse Visits	X2 per month	2 mins	4 mins	Removed
Specimen Reception Queries	X5 per day	2 mins	10 mins	Combined
Clerical Errors	X5 per day	2 mins	10 mins	Combined
Sendbacks	X3 per day	2 mins	6 mins	Retained
Specimen Receipt	X5 per day	1 min	5 mins	Simplified
Semen Analysis	X3 per week	1 min	3 mins	Retained
Consumables	X1 per month	1 min	1 min	Retained
Machine Breakdown	X1 per month	3 mins	3 mins	Retained
Reprep	X2 per week	1 min	2 mins	Retained

Case study 17

Removing the wastes of over processing and motion

Winchester and Eastleigh NHS Trust

Summary

Previous history slides are no longer retrieved prior to passing abnormal slides to the checking stage saving **72 hours** of screener time and removing 93 km of walking per year.

Understanding the problem

Following the completion of a value stream map and process sequence charts for the screening process, the core team questioned the process step of pulling all previous slides for any woman whose sample is being referred for checking:

- Screeners would check previous histories, walk to the local slide filing store opposite the screening room, then along the corridor to the archive filing room, often returning to their PC to check if the woman's name had changed if the slides could not all be found
- Several people, including consultant pathologists, were asked why these slides were being pulled out. No one could say for sure – the checkers were not looking at them and the pathologists also confirmed that they did not need them.

How the changes were implemented

Having checked with all stakeholders and after discussion at the huddle, the process step was removed.

Measurable outcomes and impact

Removal of the step has saved screeners **72 hours** and 93 km per year. There is a further saving in the re-filing time which has not been quantified.

How this improvement benefits women

Screeners' time has been reinvested in value add work of screening contributing to a reduction of the turnaround time.

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Case study 18

Reducing time spent slide filing

Norfolk and Norwich University Hospital NHS Foundation Trust

Summary

The process of filing has been simplified preventing the accumulation of trays of slides. Time spent filing has reduced as have filing errors.

Understanding the problem

- One of the factors affecting the flow of work through the lab was the slide filing process. Trays of reported slides would accumulate in the filing room in no particular order
- The process of filing by office staff was inefficient as the slides were not necessarily in numerical order and were being separated into normal and abnormal
- If a slide needed to be retrieved before it had been filed, additional time could be wasted searching through the pile awaiting filing
- Filing was being done by office staff once or twice a week and was taking about four hours.
- The slides would be filed in two separate files 'normal' and 'abnormal'.

How the changes were implemented

Agreement was reached within the team to file all the slides together.

A further PDSA was performed by two of the screening staff. They assessed impact on screening time of self-filing and in view of its success; all screeners are now filing their own slides.

Measurable outcomes and impact

- Immediate filing of screened slides, taking one minute per tray; releasing approximately four hours of office staff time per week
- Because the slides are in numerical order, fewer filing errors occur
- Filing all slides together is simpler and makes slide retrieval easier.

How this improvement benefits women

Wasteful steps have been eliminated, releasing time to concentrate on value add activities to help reduce TAT.

How this improvement benefits the organisation

Identification of wasteful steps in the process and the use of PDSA testing cycles is now regularly used by the cytology staff to assess impact of changes made to ensure they have made an improvement.

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Case study 19

Implementing a 'pull' based scheduling system to reduce backlogs

The Leeds Teaching Hospitals NHS Trust

Summary
A pull based scheduling system for deliveries allows work to flow through each department preventing build-up of work at any stage of the process.

Understanding the problem

- Work was piling up in different areas creating bottlenecks
- Work in progress figures were collated on a weekly basis in each area, and a chart was produced identifying how much work was pending in each section.

The waste of waiting was identified from the figures with over-processing in some areas.

How the changes were implemented

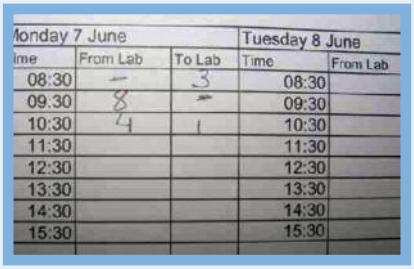
- Daily workload targets are calculated based upon the previous day's deliveries (demand) and required processing time (capacity)
- Decided upon hourly scheduling for transfer of work across all areas as this correlates to analyzer processing cycle-time
- Each department has its own daily processing schedule board
- Slide tray batch sizes were reduced from **eight to six** to facilitate timely deliveries and better distribution of work
- Transfer of work was scheduled so times were coordinated to allow one staff member (water spider) to both collect and deliver to all departments. This is performed by trainees on a daily rota
- Required 'buffer' work quantities are incorporated into daily schedules to account for known staff resource shortfalls which cannot be covered
- Reasons are logged when deliveries are late or not in the planned quantity
- The next scheduled delivery is used to re-balance earlier shortfalls in volumes of delivered work.

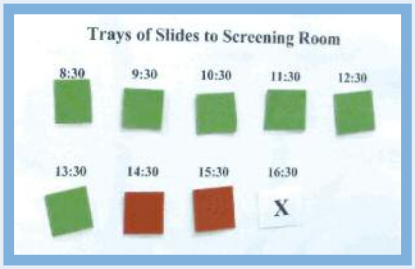
Table 6: Work pending at each stage

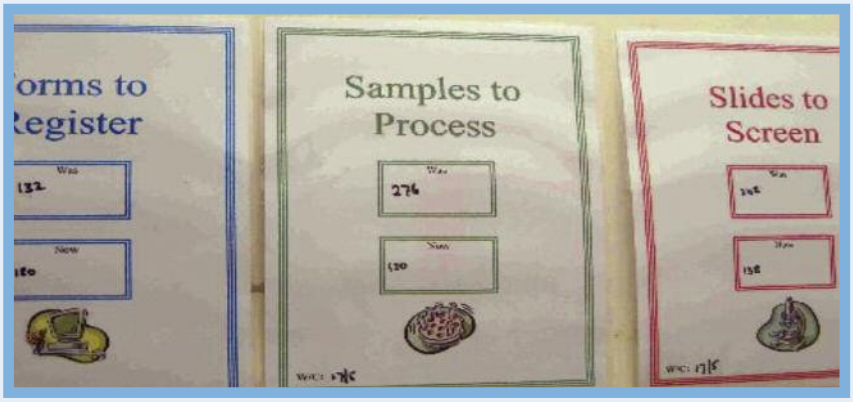
Date	To register	To process	To screen	Total
04/01/2010	156	36	68	260
11/01/2010	24	48	128	200
18/01/2010	156	96	288	540
25/01/2010	192	132	300	624
01/02/2010	372	84	232	688
08/02/2010	516	132	248	896
15/02/2010	430	144	264	838
22/02/2010	288	156	276	720
01/03/2010	156	144	300	600
08/03/2010	48	132	288	468
15/03/2010	276	108	272	656
22/03/2010	228	108	304	640
29/03/2010	228	84	392	704
05/04/2010	418	144	280	842
12/04/2010	228	48	392	668
19/04/2010	36	120	248	404
26/04/2010	78	120	168	366

Measurable outcomes and impact

- **Reduction in steps** – one person delivers scheduled work to each department in one delivery run (66% reduction in motion)
- **Over and under processing reduced** by daily scheduled flow of work
- **Bottlenecks in work flow eliminated** as required staff resource can be allocated to where and when needed as a result of multi-skilling across tasks and depts
- **On Time In Full (OTIF) deliveries/quantities tracked daily** – current schedule efficiency target of 80% exceeded across all departments
- **Reduction in waiting time waste** – areas never have to wait more than one hour before work is delivered, corresponding to reduction in TATs for results
- **Eight scheduled daily deliveries** – optimize throughput of in-progress work.







Ideas tested which were unsuccessful

- Initially reduced batches of forms for registration from 12 to six. However, forms were being registered and sent to the lab out of numerical sequence as not all staff members were working to the standard process and processing times
- Daily 'end-of-day' meeting involving each department to agree next day work schedule and balance resourcing to meet this. All logged issues that prevented schedule adherence are reviewed with countermeasures, owners and completion tracked on 3Cs board
- Three 'bite sized' pieces of work delivered through the day means maximum waiting time never exceeds **one hour** in any section, allowing any problems in particular areas to be highlighted quickly and prompt action to be implemented.

How this improvement benefits women

Increased work throughput from daily scheduling has contributed to reduction in TAT average:
October 2009 = 9 days
June 2010 = 4.6 days

How will this be sustained and what is the potential for the future /additional learning?

- Constant monitoring of the scheduling system allows changes in batch size and frequency of deliveries to be altered in line with workload demands

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Case study 20

Electronic 100% file check replaces a manual 10% one

Barts and The London NHS Trust

Summary

The introduction of an electronic 100% file check between the results agency and laboratory results file has reduced time spent manually checking files.

It also ensures that all errors are detected rather than a proportion of possible errors in performing only a 10% manual check.

The changes exceed the minimum Quality Assurance Reference Centre (QARC) requirements.

Understanding the problem

- The QARC recommends a 10% check of the file which is sent from laboratory to call recall
- The 10% check at Barts and The London NHS Trust was infrequent and, when completed, a member of staff manually checked one in ten laboratory numbers with the information against Open Exeter
- The team did not have full confidence in the 10% check as it didn't check every patient on the file. They wanted to improve quality and safety by checking 100% of the results and recall code in each file.

How the changes were implemented

- The team also wanted the check to be computerised rather than manual
- The call recall centre were asked to download the laboratory number, result and recall code into an Excel spreadsheet and send the file to the laboratory
- The laboratory extracted the same information from their laboratory system (WinPath) and both sets of information were downloaded into Microsoft Access and cross linked
- A simple sort of the data in Access clearly shows any discrepancies between the two sets of information.

Measurable outcomes and impact

- An infrequent manual file check of 10% increased to a regular 100% electronic file check
  - From one day for the data manager to check 10% of the file
  - Now 30 minutes to check 100% of the file
- Safety and quality have both increased
- Since the new system has been introduced mismatches between the two systems are being intercepted. Before the system was introduced there was a 90% chance that these cases would not have been detected.

How this improvement benefits women

This initiative has an impact on all women as all results and recall codes are verified.

How will this be sustained and what is the potential for the future /additional learning?

The new process will be sustained as it is simple to carry out and can be completed in a timely manner.

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11. Recall agency

For the final stage of the pathway, laboratories and recall agencies have focused on:

- Multiple daily downloads (where possible)
- Results transferred and posted right first time
- Daily posting of results.

Case study 21

Removal of invalid data slips

Winchester and Eastleigh NHS Trust

Summary
Women are receiving their result letter sooner as a result of the creation of an electronic process to obtain correct management information.

Understanding the problem
Once the download of results sent from the laboratory has been processed at recall, manual rejects are printed. A number of rejects are caused by incorrect patient management decisions with regards the required recall. These invalid data slips were being posted to the laboratory.

On receipt the laboratory would correct the information which would then wait to be sent with the next electronic download.

The process was delaying the result letter to the woman by up to a week.

How the changes were implemented
- The recall agency now telephones the laboratory and agrees the necessary correction
- The laboratory continues to produce the required letters to the results agency and GP to complete the audit trail but this no longer delays the result letter production
- A letter is now issued to the woman on the same day that the original result is received.

Measurable outcomes and impact
Up to seven days removed from the turnaround time for approximately 120 women each year.

Ideas tested which were successful
This change was part of a review of the optimum time to download results to the recall agency. Overnight processing requirements limited the options and prevent twice daily downloads.

The laboratory and recall agency agreed to change the download time to 4pm daily. This allows time to confirm a successful download before the laboratory closes and maximises the number of results that run through the overnight processing in the recall system. The recall agency completes the matching process by 9:30am the following day when all letters are issued.

How this improvement benefits women
All women are now having their letter posted to them 24 hours after the laboratory reports the result.

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12. Key mechanisms for change

To ensure ownership and sustainability of improvements in the process, it is essential to provide all staff involved in delivering the service with an understanding of the principles of Lean methodology. This enables them to contribute to suggestions for improvements and to understand the rationale for changes that are being made to their work place and routine.

Test staff suggestions for change using the Plan, Do, Study, Act cycle described in the *Cytology Improvement Guide* (Nov 2009).

- Understand who your stakeholders are and engage them early, including executive, clinical and managerial leads
- Decide how and to whom you will escalate any issues that have the potential to block improvements
- Communicate progress regularly to your stakeholders and service users.

Engagement

It is well acknowledged that change is difficult for most people. Lean is about a permanent shift to a continuous improvement culture within which everyone feels able to identify problems, solutions and opportunities for improvement.

Leadership is the key to how successfully teams can make this transition. An engagement surveying tool has been developed during phase two to both measure and to guide managers through working with the feedback.

The question set is based on the work of the Gallup Organization and Marcus Buckingham and Curt Coffman published in *First, Break all the Rules*.

The aim of the survey is to encourage and support a culture of open and honest feedback within the work area which will help motivate leaders at all levels to take action on results and improve their own leadership capability.

It is essential to recognise that surveying in isolation using these questions may eventually lead to a reduction in engagement. Results should be shared with all staff, verbatim comments carefully considered and time dedicated to planning visible action to address issues impacting on engagement.

The questions in the survey are:

1. I am clear what my duties and responsibilities are
2. I have everything I need to do my job
3. I understand the Trust vision and objectives and know how my job contributes to them
4. There is a good fit between the job I do and my skills and abilities
5. I can identify and implement improvements in my work and the work environment
6. I receive regular feedback on my performance
7. I get the help and support I need from my manager
8. At work my opinions seem to count
9. As a team, I feel we are committed to doing our best
10. There are opportunities to grow and develop.

An online toolkit is available at: www.improvement.nhs.uk/diagnostics/ToolsandTemplates/tabid/95/Default.aspx along with further useful information and reading.

Case study 22

Improving communication and teamwork

Derby Hospitals NHS Foundation Trust

Summary

It was clear from the start of the lean process that communication is the key element to achieving successful change and the core team recognised from staff suggestions that this was an area for improvement.

Following the recommendations from the phase one pilot sites, all staff were trained in Lean principles to ensure full engagement. They were positively encouraged to make suggestions and take part in discussions as well as offering feedback and solutions for potential problems.

Understanding the problem

Staff suggestions and the engagement survey identified communication as an area that needed further development.

Although a structure for team meetings was in place it was not always adhered to. The team had little opportunity to raise issues. The survey highlighted that staff were becoming despondent and losing confidence in their ability to put forward concerns and new ideas.

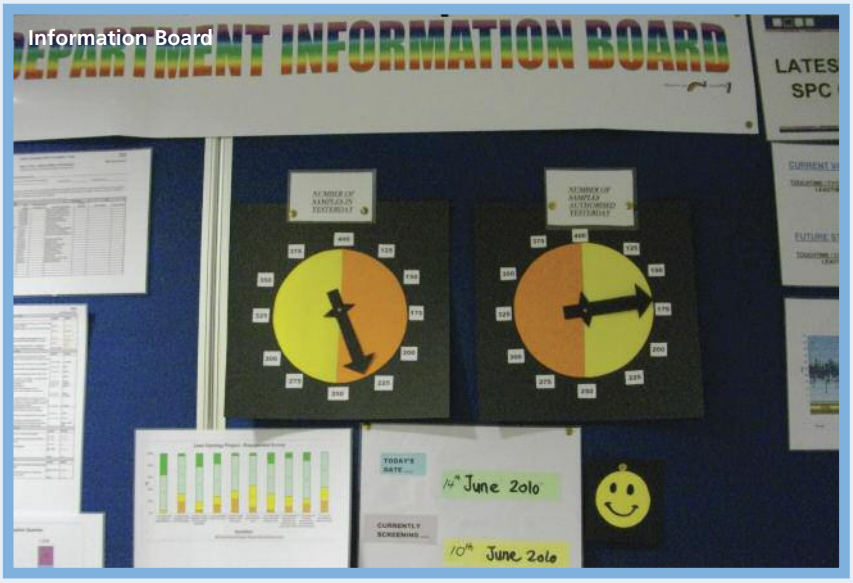
It became clear that at the beginning of the NHS Improvement process that colleagues felt changes were being implemented too quickly and without consultation of the wider team.

Staff requested that they receive timely and appropriate feedback in the future.

How the changes were implemented

Immediate measures were put in place as a direct result of the successful Just Do It's (JDI's) learned from phase one pilot sites:

- Daily huddles – an opportunity for all members of the team to attend an open discussion where ideas were encouraged



Information Board

- Staff suggestions – ideas could be put forward anonymously by accessing a designated area on the server. There was also a post box for handwritten suggestions. The option to approach a member of the core team with concerns and ideas was positively encouraged
- Communications board – members of the wider team were invited to participate in the creation of an ideas and information board which covered mainly work related issues but also social events
- Small focus groups were organized for colleagues within their peer groups. Without members of the management team present, staff felt confident enough to air their problems and even agree on solutions as a team.

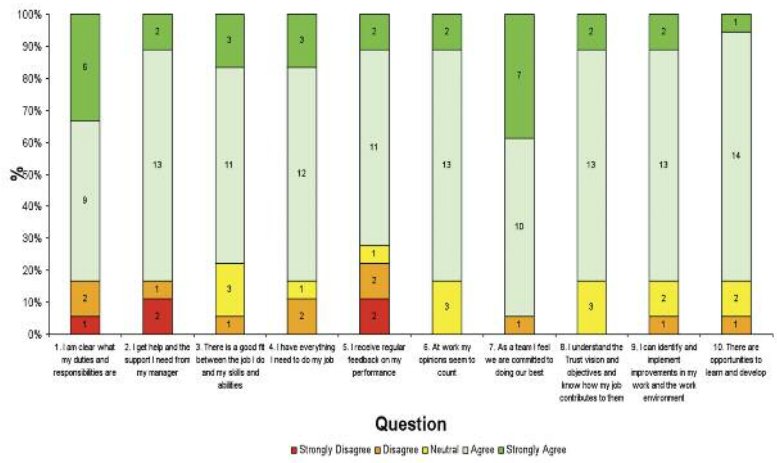
Measurable outcomes and impact

The second engagement survey carried out showed less neutral responses. Staff had been encouraged to give opinions rather than a neutral answer wherever they felt they could and this resulted in more red areas.

The overall response was more positive as staff felt more comfortable to give honest answers and the management team have greater clarity of the issues impacting staff and the possible solutions (see figure 11).

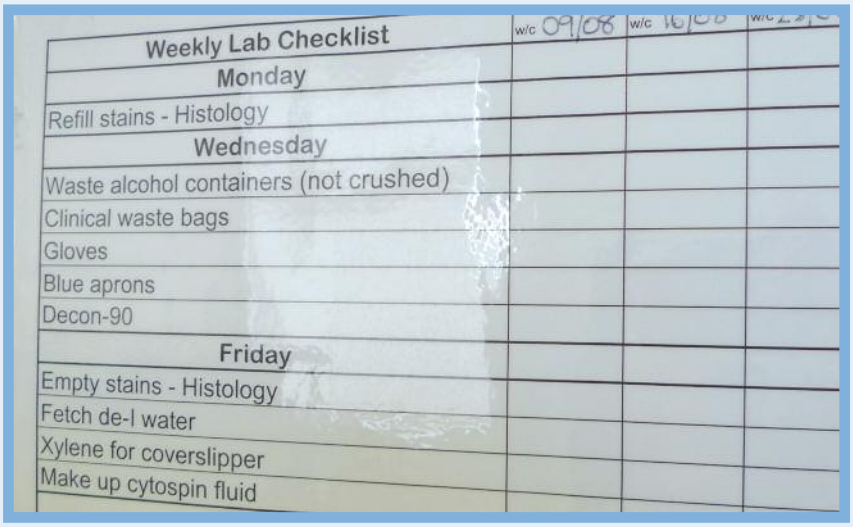
As a direct result of positive input during a clerical focus group meeting a visual management tool was agreed on. This consisted of an action/tracker chart detailing issues raised and feedback received.

Figure 11: Lean Cytology Project - Engagement Survey 2



Visual management was also introduced in the laboratory in the form of daily/weekly/monthly check lists. This has served as a visual reminder for timely, shared replenishment of stock by all team members.

Some jobs were not being completed due to a lack of communication. Stock replenishment now has a visual reminder /check list so stock is replenished before it runs out.



Ideas tested which were successful

The focus groups resulted in staff feeling empowered to raise concerns and test their own solutions within their own team.

The communications board proved successful pathology wide promoting interest from all areas.

How this improvement benefits women

Increased engagement, versatility and adaptability of staff who are working better as a team, ensuring an improvement in the quality of the processes. This results in more right first time and a continual flow of work.

How will this be sustained and what is the potential for the future /additional learning?

- Regular huddles will continue
- Maintain the staff suggestions folder on the server
- Continue with the focus groups not lead by line managers with a view to incorporating a two way communication pathway
- Communications board continually updated by all members of the team.

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Daily huddles

A further mechanism for engaging staff is 'huddling'.

A huddle is a **DAILY**, short and snappy gathering of a team led face to face by the team's manager. Taking no more than 15 minutes each day, they should be conducted in a high involvement style.

There are three key elements to include in every huddle:

1. Focus – on key goals and responsibilities for the day
2. Clarity – clear, relevant and timely information to help staff perform their daily roles
3. Commitment – to listen and act on staff views, ideas, concerns and to feed back progress.

Figure 12: Great huddles

More supporting information is available at: www.improvement.nhs.uk/diagnostics

Decision making in a huddle – Fair process

Many people think that in order to be fair, a process must be either consensual or democratic. Not so. Although a fair process gives every idea a chance, it is the merit of the idea – not the agreement of all involved – that drives the decision making

What constitutes a fair process? There are three principles

1. Engagement – getting individuals involved in decisions by asking for their opinions and allowing them to refute the merits of one another's assumptions and ideas. Not only does this sharpen everyone's thinking, it communicates management's respect for their people's ideas which, in turn, generates a higher level of commitment from those involved.

2. Explanation – helping everyone affected understand the reasons for the financial decisions. Giving explanation helps people see how their own opinions have been taken into consideration and builds their trust in management's intentions.

3. Expectation clarity – making explicit the new rules of the game once the decision has been reached. What are the new requirements? Who will be responsible for what? How will individuals be evaluated? It matters less what the new expectations are than that they are clearly communicated and understood.

Fair process profoundly influences attitudes and behaviours critical to high performance. It builds trust and unlocks ideas. With it, managers can achieve even the most painful and difficult goals while gaining voluntary cooperation of the people affected. Without fair process, even outcomes that people might favour can be difficult to achieve.

Consider this example
Faced with sharply decreasing domestic demand, an elevator company brought in consultants to help devise a plan for shifting to a more efficient manufacturing process. The plan itself was sound; it gave employees greater autonomy and placed a high priority on preserving jobs. But the process of developing the plan kept employees in the dark. The need to cut manufacturing costs was never explained, employees were never introduced to the consultants who suddenly appeared one day, and the final decisions were simply presented - without employees having had a chance to offer input. Not surprisingly performance plummeted and employees trust in management evaporated.

Taken from Fair Process: Managing in the Knowledge Economy by W.Chan Kim and Renee Mauborgne - a Harvard Business Review On Point Publication (March 2000)

Think about your huddles. Are you practicing the '3 Es' every day? Do your team just see them as 'time away from the bench' whilst you tell them what they need to know before going 'back to work', or are you having a two way discussion?

Remember, fair process doesn't mean that decisions are made on the basis of voting or 'who shouts loudest'.

It is sometimes easy to assume that people are only concerned with what is best for them. There is evidence that when the process is perceived to be fair, most people will accept outcomes that are not wholly in their favour. People realise that compromises and sacrifices are necessary.

Case study 23

Sustaining huddles

Barts and The London NHS Trust

Summary
A daily meeting was introduced during phase one of the 14 day turn around project. In phase two the approach and information given at the meeting has been altered.

How the changes were implemented

- Procurement of a white board to display the rota for the week
- Visual management used to identify the roles of each staff member for each day including screening, checking, practical work, supervision, annual leave or training courses
- Daily laboratory targets are indicated on the board
- Individual screening targets, in terms of numbers of trays to be screened, were set for each screener taking into account the daily laboratory target and the duties of the screener
- The supervisor, who is responsible for the work flow for the day leads the huddle
- Problems are identified and corrected straight away.

Measurable outcomes and impact
The laboratory contribution to the 14 day turn around has been maintained with the process from reception to screening remaining steady at two days.

The supervisor is more empowered and engaged in delivering the targets.

Ideas tested which were successful
The huddle has been led by the laboratory manager or the service manager.

A section on the notice board called 'need to know' was successful in ensuring that the huddle chair and all staff were made aware of important issues such as training events of external quality assurance assessments.

Ideas tested which were unsuccessful
Allowing staff to remain at their desks, some distance away from the notice board, was not successful as some staff were not engaged in the meeting.

It is important that everyone stands together, away from workstations to ensure all are engaged and involved in the huddle as it is a short timeframe within which to listen and communicate.

How will this be sustained and what is the potential for the future /additional learning?
The daily huddle has helped to improve work flow and correct problems in a timely manner. More regular meetings in histology with reception MLAs has been discussed.

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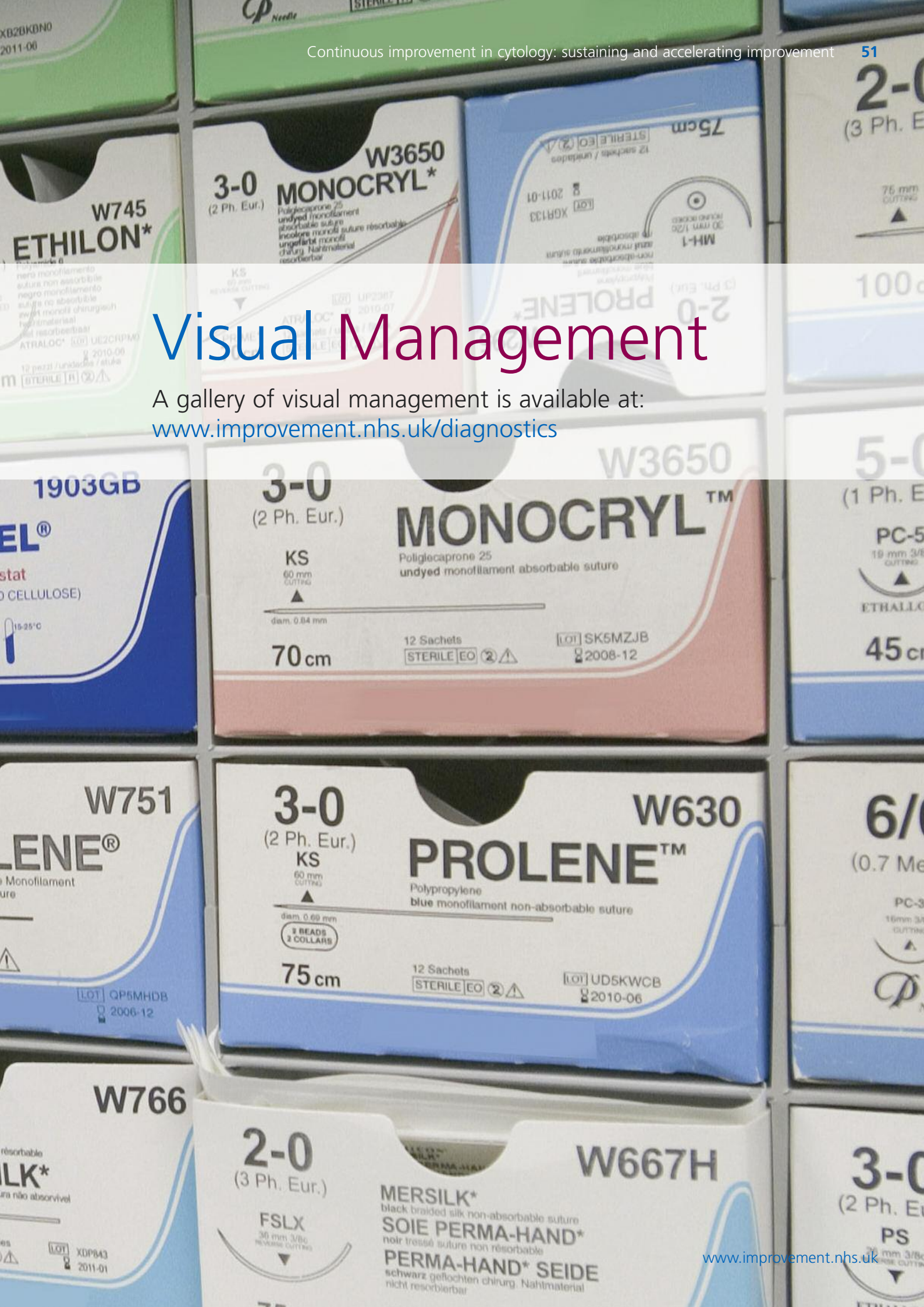
Visual Management

A gallery of visual management is available at:
www.improvement.nhs.uk/diagnostics



Case study 24

Visual management

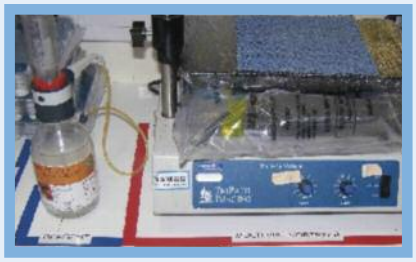
The Leeds Teaching Hospitals NHS Trust

Summary

Visual management provides an 'at a glance' means of observing which tasks have been completed and which are outstanding.

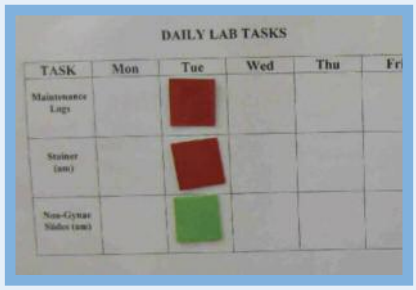
Understanding the problem

- Lack of communication between all departments regarding levels of work in progress
- Necessary to ask numerous colleagues to establish current work state
- Core and support tasks e.g. equipment checks, dealing with deliveries, were missed due to assumptions that someone else had already completed them
- Wastes of waiting and motion experienced due to constant need for staff members to chase/check whether work had been completed
- Visual management for 'everything in its place' already implemented and aiding efficiency. This highlighted the use of additional visual cues to act as prompts for task completion.

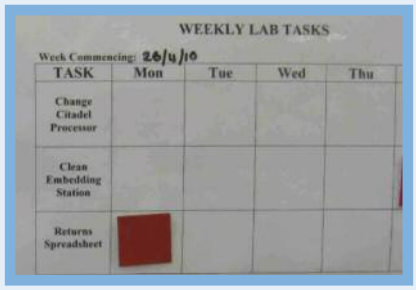


How the changes were implemented

- Task lists were compiled for each area with supporting staff member rotas identifying who is designated to perform the tasks
- Daily (am/pm) and weekly duties were identified and charts drawn with red/green tags to indicate whether task was pending or completed



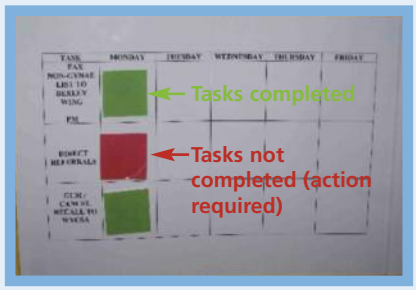
- Visual prompts were sited in work areas to promote standard working practices.



- Visual charts used as triggers to initiate actions if tasks not completed
- Daily 'late-afternoon' all-department seniors meeting used to verify all planned daily activities were either complete or 'on-track.'

Measurable outcomes and impact

- Visual task lists provide platform to communicate crucial info quickly.
- Triggers necessary actions at given times throughout the day



- Required duties completed at allotted am/pm times on daily task list
- Reduces waste in form of time taken for verbal communications with numerous staff members 127 hours per year
- All staff can see current state of play at any given time
- Staff morale improved as no frustrations due to lack of communication
- Standard working practice put into operation.

Ideas tested which were successful

- The use of visual management is a success
- Use of red/green tags on task charts both serve as 'at-a-glance' completion and early-warning monitoring of potential delays
- Visual prompts in work areas remind staff to take action i.e. to filter stains because they were placed at point of use (on equipment).

Ideas tested which were unsuccessful

Positioning of visual management was not at point-of-use initially. Staff did not observe notices so they were moved to more appropriate positions (e.g. on stainer lid).

How this improvement benefits women

Continuous improvements in efficiency through removal of waste reduce TAT's for results.

How will this be sustained and what is the potential for the future /additional learning?

- Visual management can be adapted to fit the needs of a changing workplace:
  - Agreed changes to how often (or when through the day) tasks are performed can be reflected visually and immediately on daily task boards
  - Extra tasks can equally be added as can creation of new visual cues when standard tasks are changed.

High quality of work maintained through recording changes on SOPs ensuring all (not just some) staff members now complete routine tasks at allotted times.

Contact

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Case study 25

Visual management for processing blood stained samples

Barts and The London NHS Trust

Summary

Improved process for identifying bloodstained Liquid Based Cytology (LBC) vials at the reception stage and reduction of previous delays in processing such samples.

Understanding the problem

Not all bloodstained vials were being sent for processing with acetic acid to remove the blood at the initial reception stage. Many bloodstained samples were processed as routine samples on the T3000 machine and required later reprocessing with acetic acid.

- Large number of samples that were sent back for reprocessing – five or six per day
- These samples were being tracked in two ways. A visual alert was attached to reprocessed work as it then required fast tracking through the rest of the laboratory. A list of incomplete work from the laboratory computer system was also used to keep a track on the progress of delayed samples
- The wastes identified were defects (and subsequent reworking), over processing (double tracking), waiting and motion (of staff completing the rework and tracking the samples).

How the changes were implemented

- Photographs of bloodstained samples were taken and made into a laminated visual management sheet to be used at reception
- The visual management sheet showed which samples could be routinely processed on the T3000 machine and which samples needed to be treated with acetic acid
- The request forms from samples treated with acetic acid were tagged with a blue flag as these were out of step with the routine work making them easy to identify and ensuring that the samples were screened in order (first in first out).

Measurable outcomes and impact

The number of samples sent back for reprocessing has reduced to one or two per day. Based on a reduction of reprocessed work of four samples per day the yearly consumable savings equate to **£3,243.93** per year.

The turn around for previously re-processed bloodstained samples has improved by one to two days.

By processing the acetic acid treated samples on the T3000 machine (previously done on a T2000) one hour of MLA time has been saved per day.

Ideas tested which were unsuccessful

Initially the reprocessed samples were processed on the T2000. This was a manual process and meant that one MLA was tied to the machine for an hour per day.

How will this be sustained and what is the potential for the future /additional learning?

The changes have become standard procedure for dealing with bloodstained samples at specimen reception.

Contact

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13. Information to support the process

Data should be used to evidence the performance of each process across the whole pathway.

Statistical Process Control

Statistical process control and pathway analyser tools are available on the NHS Improvement system at www.improvement.nhs.uk/improvementsystem

Cervical Screening Statistical Enquiry (CSSE) - Open Exeter

A CSSE produces a 'skyline' plot of turnaround data from the date of test to the expected date of delivery of the letter.

Cyres is available at all recall agencies and in some laboratories.

Instructions for running this report can be found at: www.improvement.nhs.uk/diagnostics

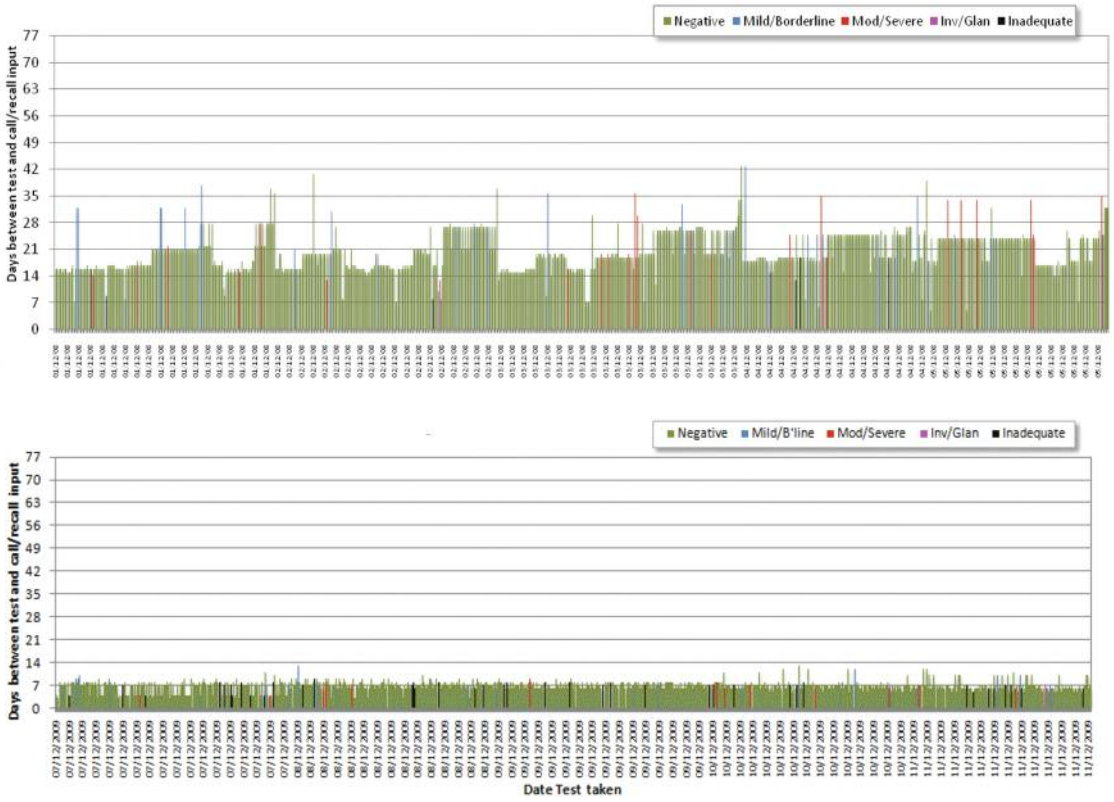
Understanding short and long term demand

Laboratories should monitor the pattern of demand to ensure operational resource planning matches peaks and troughs.

Recall agencies can inform the laboratory of the number of women invited for screening each month. Known response rates and delays can be applied to predict short term workloads.

PCTs are in a position to advise laboratories on longer term population forecasts that should drive succession planning.

Figure 13: Examples of a Cervical Screening Statistical Enquiry skyline plots



14. Measures

As detailed in the first *Cytology Improvement Guide*:

- Section 6, 'Understanding where you are', and
- Section 9, 'Establish the measures',

Suitable measures need to be identified and agreed at the start of any improvement project in order to assess the impact of changes being tested. As a minimum, these should consist of the global measures outlined below, with additional sub-measures being identified locally.

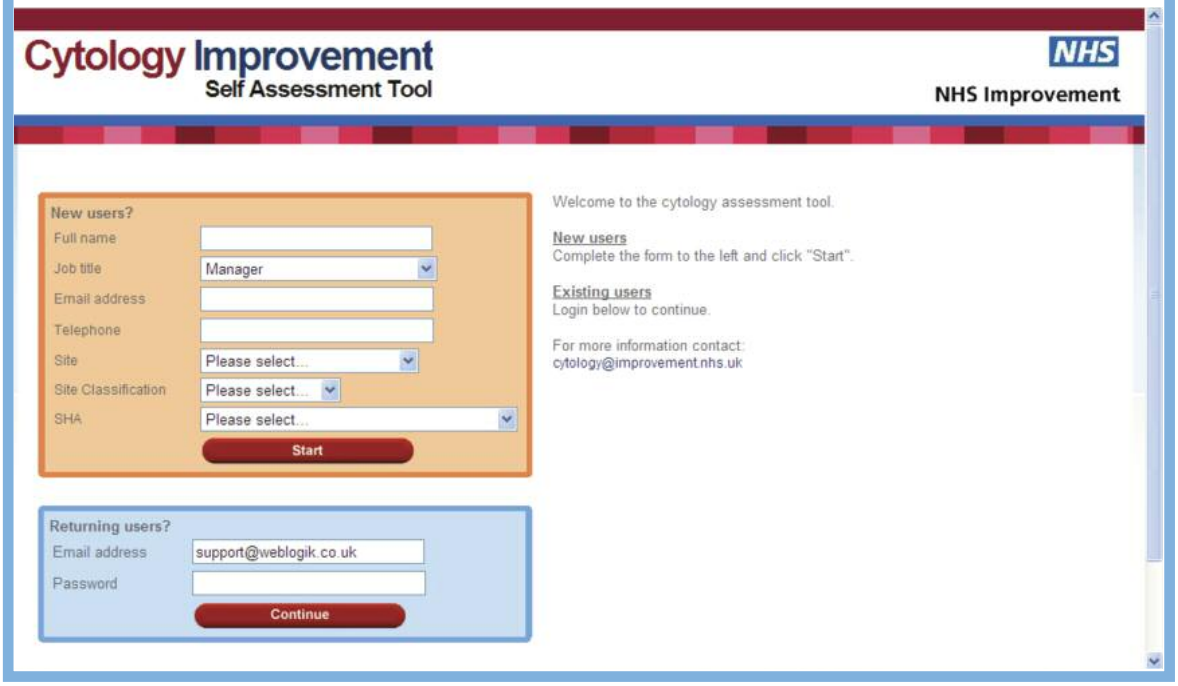
Figure 14: Example of suitable measures identified and agreed at the start of an improvement project

Delivery	Safety/quality	Efficiency/ effectiveness/cost	Team development and leadership	Responsive to patients and users
• 100% of results within 14 days • 50% of results within 7 days	• 100% defect free request cards (defect free to be agreed at local level) • 100% appropriate and within scope testing • Reduced defects within the system (eg data entry errors, non hits at recall	• Time saved by reducing waste • Reduction in overtime • Cost avoidance by bringing work in-house • Productivity savings from demand and capacity monitoring	• Engagement survey % improvement • 100% staff attended Lean awareness training • Reduction in staff sickness	• TAT shared with 100% of users

Global measure
Sub-measure/potential local measure

15. Cytology Self Assessment Tool

Figure 15: Cytology Self Assessment Tool



As outlined in the first *Cytology Improvement Guide*, a simple web-based tool has been developed to help with identifying improvement areas across the whole pathway.

The tool enables assessment of the process flow, communication across the pathway, staff engagement and development, prevention of defects, sample taker training; and provides:

- A graphical representation of what the service looks like
- An overall percentage score for how the service is performing
- Percentage scores across all sections of the pathway to show areas of strength and weakness
- Recommendations from other teams and direction on where to look for help
- Print out of the score and graph
- An opportunity to compare the service with peers (anonymously).

Access the tool at:
www.improvement.nhs.uk/cytology/assessmenttool

16. Consolidation of services

In February 2006, the University of Sheffield, School of Health and Related Research (ScHARR) report made five key recommendations including 'merging workload from smaller laboratories' which would result in potential savings.

During phase one and phase two, a number of changes to service provision have been commissioned which have impacted on a number of the pilot sites, including:

- **Central Manchester University Hospital NHS Foundation Trust**
- **Anglia Support Partnership**
- **West Anglia Pathology Cytology Laboratory**
- **Sheffield Teaching Hospitals NHS Foundation Trust**
- **East Midlands Screening Services.**

During the period of consolidation it is important to stick to the key principles established from the original improvement activity.

Full case studies will be developed post consolidation to demonstrate the benefits and learning and will be available at: www.improvement.nhs.uk/diagnostics

Case study 26

Consolidation of cytology laboratories

West Anglia Pathology Services Cytology Laboratory

Summary

Consolidation of Addenbrookes, West Suffolk and Hinchingbrooke Cytology Laboratories into a single site in 2004/5, coupled with being an NHS Improvement phase one pilot site in 2008/9, provides flexibility to manage fluctuation in demand and ensure 70,000 women locally receive a predictable service delivering the 14 day turnaround vital sign.

Understanding the problem

Addenbrookes, West Suffolk and Hinchingbrooke Cytology laboratories underwent a review of the sustainability of their services. Difficulties in meeting turnaround times and recruiting staff, coupled with space restrictions, fluctuating workloads and the need to convert to Liquid Based Cytology (LBC) led to the PCTs and laboratories agreeing to merge the three sites and build a new facility. West Anglia Pathology Services Cytology Laboratory was created.

How the changes were implemented

A whole end to end pathway collaborative approach was adopted with all PCTs, laboratories and recall agencies involved. A consolidation plan was established which detailed workforce planning, transport, technical and operational delivery, premises and equipment, IT and new technology.

Staff consultation (four meetings) took place during the preparation process at each location so that staff could raise concerns. There was an opportunity to visit the unit prior to the move and meet staff from the different sites. A decoration committee was formed with representation from the different sites to choose desks, layouts and colour schemes giving input into the working environment.

Key changes implemented throughout consolidation

- Staff suggested and voted on the new department's mission statement
- Feedback to practice managers and samples takers regarding turnaround times and importance of right first time samples
- Suitable transport links established to ensure timely transfer of samples to laboratory
- Preparation for and management of different laboratory systems
- Staff communication groups established
- A staff suggestions box and board was created
- Daily demand and capacity planning. Using NHS Cancer Screening Programme (NHSCSP) guidance, a daily target of 25 slides per screener was set with monthly performance tracking and feedback to screeners
- Team target established to sign out more cases than received (to reduce backlog) with weekly monitoring of the outstanding cases
- Appointment of Consultant BMS to support abnormal pathway
- Changes made to routine/contracted hours and overtime restrictions. More slides screened within routine hours, reducing £/slide rate
- Review of standard operating procedures in line with new ways of working
- Changes made to priority work stream making more cases routine and improving overall TAT.

Following the success of the consolidation, West Anglia Pathology Services Cytology Laboratory was selected as an NHS Improvement phase one pilot site. The principal aim was to identify practical ways to further reduce turnaround times and improve quality, safety and productivity in line with the Cancer Reform Strategy commitment that all women will receive their screening tests results within two weeks by 2010.

Changes implemented during the pilot project

- Improved visual management throughout lab
- Small batch sizes for processing and screening
- Target date established
- Daily lab briefings
- Improved communication/ suggestions board
- 'Pat on the back' board to feedback compliments received
- Removal of priority workstream
- Removal of waste, introduction of more standard working, 5S.

For further details, refer to the *Cytology Improvement Guide* (November 2009) at: www.improvement.nhs.uk/diagnostics – case studies 8, 21, 23, 26 and 31.

Changes implemented to sustain the 14 day TAT

- Work sorted into date taken order from point of receipt.

Measurable outcomes and impact

Key outcomes

- 2005 TAT (pre-consolidation): 12% results within 14 days
- 2007 TAT: 31% results within 14 days
- 2008 TAT: 95% results within 14 days, 6% within seven days
- 2010 TAT: 100% results within 14 days, >90% within seven days
- Overtime ceased
- Ideal workforce structure established using BSCC guidelines
- Business continuity strategy in place including demand and capacity planning.

Ideas tested which were successful
Prior to consolidation all staff involved were invited to visit the temporary and new premises and meet new colleagues.

- Post consolidation, daily huddles have allowed for two way communications and ensured any questions or concerns can be raised and acted upon in a timely manner
- Regular cytology updates via newsletters, website and at sample taker training events have ensured service progress and improvements are communicated to all involved
- Adequate provision of computer systems (LIMS and individual PCs) has ensured all staff can perform their daily duties as and when required
- Assessing and adjusting daily/weekly capacity plans to meet demand ensures predictable turnaround times can be achieved.

Ideas tested which were unsuccessful
Communication could have been better during the consolidation process. This is key to a successful, smooth changeover.

How this improvement benefits patients
70,000 women locally receive a predictable service delivering the 14 day turnaround vital sign.

How will this be sustained and what is the potential for the future /additional learning?
Root cause analysis of 14 day turnaround breaches will continue to be performed and countermeasures will be tested accordingly.

Cyres database will continue to be used to integrate colposcopy and lab information, which improves failsafe and quality management.

Should a similar consolidation activity occur in the future, lean principles will be applied by value stream mapping the current service(s) with all staff and developing the future state service with minimal waste. Working environments would be set up to keep samples flowing throughout the pathway.

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Case study 27

Consolidation of the primary care screening service

Anglia Support Partnership

Summary
Consolidation of East Anglia Family Health Service (FHS) functions into a single regional support service, coupled with being an NHS Improvement phase one pilot site in 2008/9, ensures over 150,000 women locally receive a guaranteed and predictable call/recall service in line with the 14 day turnaround vital sign.

Understanding the problem

In 2007, a review of the FHS primary care service functions in Norfolk, Suffolk and Cambridgeshire was undertaken and it was decided to create a single regional service, run by Anglia Support Partnership, covering five PCTs.

With this, four key challenges arose for the cervical screening service:

1. Integrate three ways of working into a single standardised structure.
2. Maintain communication channels with PCTs, primary care and laboratories.
3. Ensure women are recalled on time and result letters are posted promptly.
4. Complete the 14 day turnaround time project with NHS Improvement.

The plan was to move to a single service which would still operate out of the three offices, followed later by a move to two offices in January 2010. As a result, staff from the three primary care services offices felt apprehensive and were concerned about their future.

How the changes were implemented

A detailed changeover plan was created which included workforce planning, technical and operational delivery, premises and equipment.

Regular face-to-face primary care services staff consultation briefings were conducted for all three offices, using standard agendas and positioning statements. At every opportunity, staff were reassured that they would not be asked to work harder or faster, but simply work differently. They were given recognition for their efforts in delivering safe and reliable services and were asked to continue with this.

Three staffing structures were integrated into a single structure and three versions of job descriptions were reviewed and standardised to ensure that tasks would be completed in the same way, regardless of location. All staff were trained to the same new standards.

Communication with PCTs was standardised to ensure that consistent messages were provided and GP practices were informed of the new regional service plans and their new contact details.

At the same time, IT and telephony systems were reviewed and improved. Remote access was installed so that the three FHS databases could be shared. With dedicated informatics support, thorough testing was carried out prior to the office changes to ensure there would be no interruption to service.

Through involvement with the NHS Improvement 14 day turnaround time project, the following changes were also made:

- Review of postage and implementation of first class post
- Improved dispatch timing for result letters
- Improved automatic hit rate on lab link files
- Enhanced use of Open Exeter in relation to data collection/ programme monitoring, particularly the Cervical Screening Statistical Enquiry (CSSE) which generates skyline plots (see next section).

Measurable outcomes and impact

A single regional primary care support service has been established, operating from two locations, ensuring that women are recalled on time and result letters are posted promptly. Through the use of the CSSE application, weekly skyline plots can be generated which allows for real time monitoring of the 14 day vital sign (see graphs on page 61)

Positive feedback from PCTs and primary care has been received since the move to two offices in January 2010. There has been no interruption to services and the changeover was completed within 24 hours.

Ideas tested which were successful

Regular communication with all staff and stakeholders involved has ensured smooth changeovers with no interruption to services.

By creating standardised job descriptions and training all staff to the same new standards, a more flexible workforce has been created that can respond to demand changes such as the increased uptake of cervical screening tests following the news of the terminal illness and death of Jade Goody.

Adequate provision of IT systems has ensured that all staff can perform their daily duties as and when required.

Ideas tested which were unsuccessful

Although all ideas tested were successful, one point of caution would be the time allocated to arrange IT changes such as security settings, remote access and integrated telephony systems. Ensure you dedicate sufficient time for these activities and link in with IT support at the earliest opportunity.

How this improvement benefits patients

Over 150,000 women locally receive a predictable call/recall service in line with the 14 day turnaround vital sign.

How will this be sustained and what is the potential for the future /additional learning?

The CSSE application has recently been updated and allows the 'anticipated date of delivery' to be extracted and included in the skyline plot. The full end to end turnaround time can now be monitored with ease (see section 13, Information to Support the Process, for further details).

Contact

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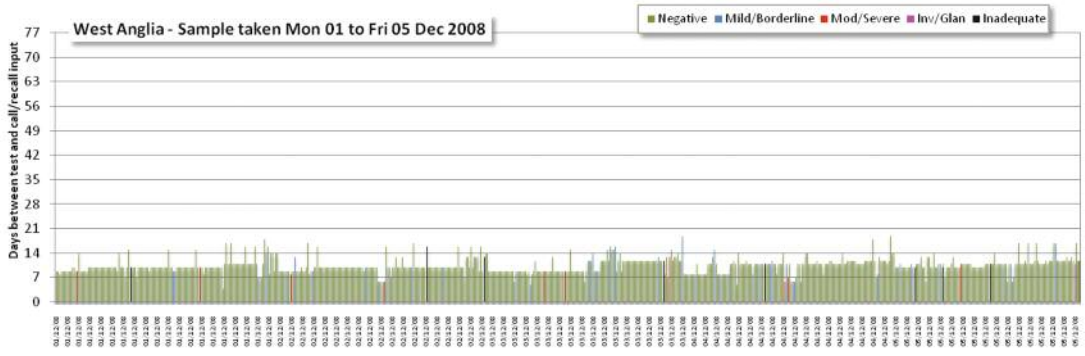
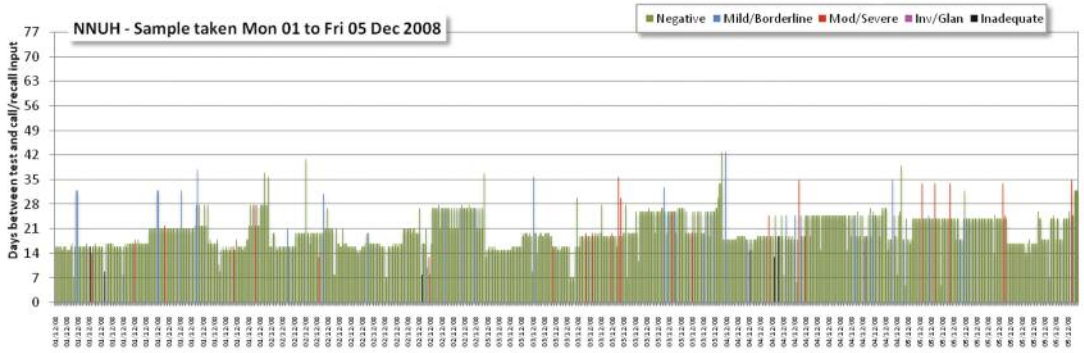
Figure 16: Skyline plots showing real time monitoring of the 14 day vital sign

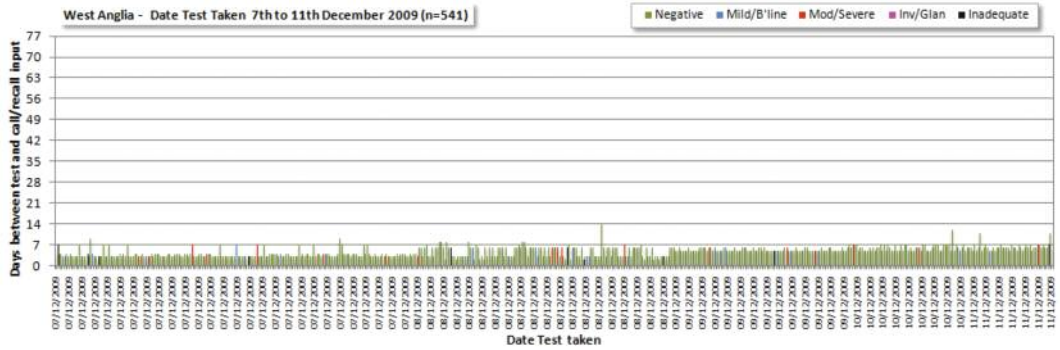
West Anglia TAT December 2008 – Sample taken to call/recall input



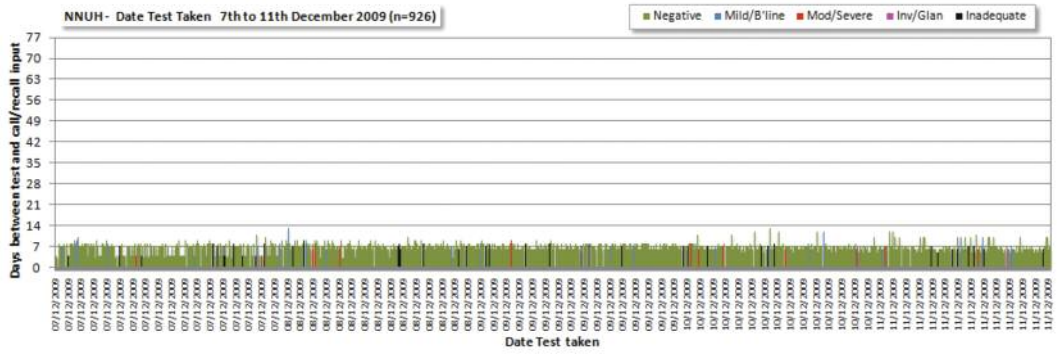
NNUH TAT December 2008 – Sample taken to call/recall input



West Anglia TAT December 2009 – Sample taken to call/recall input



NNUH TAT December 2008 – Sample taken to call/recall input



17. Appendix

Phase	No.	Pilot Site	SHA	Annual volume	Lab Processor	Lead Contact & Email
One	1	Leeds PCT and The Leeds Teaching Hospitals NHS Trust	Yorkshire & the Humber	99,000	Surepath	Mrs Hazel Eager hazel.eager@leedsth.nhs.uk
	2	Hull Royal Infirmary and Hull and East Ridings PCTs	Yorkshire & the Humber	65,000	Surepath	Ms Susan Gilbert susan.gilbert@hey.nhs.uk
	3	Pennine Acute Hospitals NHS Trust	North West	45,500	Surepath	Mr Richard Lambert richard.lambert@pat.nhs.uk
	4	Norfolk and Waveney Cellular Pathology Network (Norfolk and Norwich University Hospital NHS Foundation Trust	East of England	66,000	Thinprep	Dr Xenia Tyler xenia.tyler@nnuh.nhs.uk
	5	West Anglia Pathology Cytology Laboratory (Cambridge University Hospitals NHS Foundation Trust, Addenbrookes Hospital and Anglia Support Partnership)	East of England	70,000	Thinprep	Ms Roseanna Bignell roseanna.bignell@addenbrookes.nhs.uk
	6	Barts and The London NHS Trust	London	65,000	Thinprep	Mr Geoffrey Curran geoffrey.curran@bartsandthelondon.nhs.uk
	7	Somerset and West Dorset Cervical Screening Service (Taunton and Somerset Hospitals NHS Trust)	South West	50,000	Thinprep	Dr Simon Knowles simon.knowles@nhs.net
	8	Ashford and St Peter's Hospitals NHS Trust	South East Coast	35,900	Thinprep	Mr Behdad Shambayati behdad.shambayati@asph.nhs.uk
	9	North West London NHS Trust (Northwick Park Hospital)	London	60,000	Thinprep	Dr Tanya Levine tanya.levine@nwlh.nhs.uk
	10	Central Manchester University Hospital NHS Foundation Trust	North West	102,900	Surepath & Thinprep	Ms Yvonne Hughes yvonne.hughes@cmft.nhs.uk
Two	11	Newcastle upon Tyne Hospitals NHS Foundation Trust	North East	59,000	Surepath	Mr David Evans david.evans@nuth.nhs.uk
	12	Sheffield Teaching Hospitals NHS Foundation Trust	Yorkshire & the Humber	100,000	Surepath	Mrs Kay Ellis kay.ellis@sth.nhs.uk
	13	Derby Hospitals NHS Foundation Trust	East Midlands	59,000	Surepath	Mrs Alison Cropper alison.cropper@derbyhospitals.nhs.uk
	14	University Hospitals Coventry and Warwick NHS Trust	West Midlands	70,000	Thinprep	Dr Steve Ferryman steve.ferryman@uhcw.nhs.uk
	15	Heart of England NHS Foundation Trust	West Midlands	45,000	Thinprep	Dr Bruce Tanchel bruce.tanchel@heartofengland.nhs.uk
	16	Winchester & Eastleigh Healthcare NHS Trust	South Central	38,500	Surepath	Mr Craig Roberts craig.roberts@wehct.nhs.uk
Total Samples: 1,030,800						

18. Acknowledgements

Our thanks go to all the phase one and phase two pilot sites who have tested and implemented changes and diligently produced the case studies for others to benefit from their pioneering efforts.

19. Contact details

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DH INFORMATION READER BOX

Policy HR / Workforce **Management** Planning / Performance Clinical	Estates Commissioning IM & T Finance Social Care / Partnership Working
Document Purpose	Best Practice Guidance
Gateway Reference	?????
Title	Continuous improvement in cytology: sustaining and accelerating improvement
Author	NHS Improvement
Publication Date	5 October 2010
Target Audience	PCT CEs, NHS Trust CEs, SHA CEs, Foundation Trust CEs, Medical Directors, Directors of Nursing, Directors of Finance, Allied Health Professionals, GPs, Service Improvement Personnel
Circulation List	
Description	The Cancer Reform Strategy made a promise that all women would receive their screening test results within two weeks by 2010, the next challenge was sustainability. This publication demonstrates how the pilot sites have continued to embed their improvements throughout the cytology pathway. It includes practical examples in reducing turnaround times, improving quality, safety and productivity.
Cross Ref	Cytology improvement guide: achieving a 14 day turnaround time in cytology
Superseded Docs	N/A
Action Required	N/A
Timing	
Contact Details	NHS Improvement 3rd Floor, St John's House, East Street, Leicester LE1 6NB Tel: 0116 222 5184 **www.improvement.nhs.uk**
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Publication Ref: IMP/comms001 - September 2010