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First steps in improving phlebotomy: The challenge to improve quality, productivity and patient experience

May 2011

“When considering improvement projects and particularly when seeking to use Lean methodology, it is key that we understand the service from the patient’s perspective. It is surprising what can be observed and some simple suggestions for improvement that can come from these observations.

Apply the same methodology to as much of the processes as is possible, don’t blindly accept that the current process is the best way of delivering.”

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Foreword

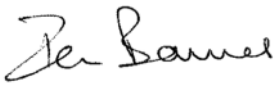
Pathology services lie at the heart of healthcare services provided to patients as they are essential to the delivery of 70% of all clinical interventions affecting diagnosis, treatment and long term monitoring of care. The vision for NHS pathology services puts patients first by providing services which are:

- clinically excellent
- responsive to users
- cost effective
- integrated.

Effective phlebotomy services are the first step to providing quality pathology tests. Phlebotomy services can be provided by a range of healthcare professionals in a wide variety of settings. Wherever they are provided, it is essential the patients needs are considered to ensure samples are taken as local to the patient as possible, with ease of access, in a timely manner that allows early decision making regarding patient, diagnosis, treatment and monitoring.

The pilot sites supported by NHS Improvement have clearly demonstrated that a greater patient focus and improvements in quality of services can be achieved by applying small measurable changes that have significant benefits.

I would endorse and commend this document as a first step in improving phlebotomy services.



Dr Ian Barnes
National Clinical Director for Pathology

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National Clinical Director for Pathology

Executive summary

In Lord Carter's review of pathology services, the importance of improving access to phlebotomy was referenced. Working in partnership with the Department of Health Pathology Programme, NHS Improvement supported four pilot sites to test whether Lean methodology could meet the challenge of improving the quality, productivity, and patient experience for phlebotomy services.

Multidisciplinary teams worked collaboratively to test and implement changes that deliver improvements for patients, staff and users of the service.

Staff were trained to apply Lean methodology to their work, the intention being to ensure continuous improvement beyond the period of NHS Improvement involvement.

Some of the improvements included:

- 59% reduction in average waiting time for patients attending the walk-in phlebotomy clinic
- 32% increase in phlebotomy productivity on wards, from 8.85 to 11.7 patients per hour
- 19% reduction in the turnaround times for viewing a blood result in A&E from time the blood was taken
- 100% reduction in phlebotomy service related complaints, with positive comments now being regularly received
- 76 % reduction in staff absence
- 22% increase in number of patients bled within 15 minutes of arrival due to improved staff scheduling.

Key learning has demonstrated success is achieved through:

The power of data
Understanding current performance is key and enables services to get back in control of their performance, however, getting this information can be difficult.

"Getting hold of good consistent data has been a challenge"

Go and see

"Unless you understand the problem and what it entails and get all the details, you can't do anything. Go and look for yourself to get the information."

Phlebotomists' calling through patients for bleeding

"Only when we sat in the waiting room as a patient did we see that the system of calling through patients wasted time, and by implementing a simple change we saved time."

Establishing measurable standards
To allow users and providers to deliver integrated clinical pathways to manage effective patient care.

Staff trained in Lean methodology
Training and empowering staff to use tools and techniques to focus on seeing and removing the wastes. Make use of tools and techniques to focus the service around the customer.

"Process mapping was a great tool to make our process visible and highlight the wastes. Understanding our capacity and demand was important".

Next steps
We now recognise this is a vast area of opportunity and further work is ongoing which will be shared in the future.

Why phlebotomy?

Each year in England approximately 800 million pathology tests are processed and reported, costing the NHS an estimated £2.5 billion per annum, of these 90% involve the taking of a blood sample. As with many areas of the NHS demand continues to increase and the pressing challenge facing pathology services is how to deliver more for less. This challenge was articulated by Lord Carter in his review of Pathology Services where he concluded 20% or £500 million was the scale of the opportunity. Focussing on:

- **Improving access to phlebotomy**
  To facilitate the delivery of an efficient and high quality service which is responsive to the needs and wishes of patients, with samples collected at times and in places which are convenient for patients. (Lord Carter Report of the second phase of the independent review of NHS Pathology Services in England).

- **Establishing performance standards**
  Clear performance standards for the delivery of the service should be developed, and for ensuring the effective use of the pathology service**.**

- **Improving quality and safety:**
  - Quality of service to the public
  - Clinical quality (by reducing specimen labelling errors)
  - System quality.

Lord Carter in his review of pathology recognised that: 'In this country, it is generally phlebotomists who collect samples from patients in hospital and those attending outpatient clinics". With this scale, phlebotomy offered the greatest opportunity to focus on a patient facing process, bring issues to the surface, and contribute to significant improvement.

NHS Improvement was tasked to address some of the issues of phlebotomy services and in particular:

- Improving access to phlebotomy services for patients and clinicians
- Improving productivity to provide a more cost effective service
- Improving patient experience
- Investigating the impact efficient phlebotomy services can have on the whole patient pathway by:
  - Admission avoidance
  - Reduced length of stay.

Summary of learning

What we have learned?
'Voice of the project leads'

We started out to explore phlebotomy services to understand if improving efficiencies, and access can have an impact on the whole patient pathway, speeding up decisions to treat, avoiding admissions and ultimately speed of discharge and length of stay. So what has been learned?

It is challenging
Whilst many of the trials, pilots, and improvement suggestions seem simple making them happen is not easy. Common sense it seems is not common practice. Change is never easy and any improvement project will require dedication, focus and clear outcomes to maintain momentum and deliver results, issues which are compounded when staff on pilot sites tried to drive improvement projects as well as doing the day job.

"Allocating time and fitting it around the day job has been really difficult."

The power of data
Understanding current performance is key and enables services to get back in control of their performance, however getting this information can be difficult.

"Getting hold of good consistent data has been a challenge."

Without national targets and goals means that performance data outside of A&E is rarely collected and analysed. Simply understanding daily and hourly demand allows staff to be in better control of the service, ensuring staffing levels are appropriate to meet anticipated demands; Delivering a predictable service to patients whilst resources are used efficiently.

"Rota management and staff capacity has improved as a result of understanding the data. Waiting times were on the increase and seeing where additional hours and staff were needed has helped improve things."

Go and see

"Unless you understand the problem and what it entails and get all the details, you can't do anything. Go and look for yourself to get the information."

"Encourage staff to view the service from the patients perspective. Asking the staff to sit and watch helped them to identify the key wastes."

"When considering improvement projects and particularly when seeking to use Lean methodology it is key that we understand the service from the patient's perspective. It is surprising what can be observed and some simple suggestions for improvement that can come from these observations. Apply the same methodology to as much of the processes as is possible, don't blindly accept that the current process is the best way of delivering."

Establish measurable standards - Make them visible

Base lining the phlebotomy service highlighted the lack of clear measurable standards that were visible to staff and users. Establish clear measurable standards in conjunction with users to ensure that the service is focused on patients' needs and best outcomes. If there is some measure of good performance this seems to add clarity and focus to what everyone is trying to achieve.

In Doncaster, a maximum 30 minute wait time standard was set.

"Staff focused on the 30 minute standard and this has been really successful."

Phlebotomy in isolation?

The feedback from pilot sites was that while there were key areas of focus that delivered tangible benefits phlebotomy in isolation cannot deliver the significant benefits to discharge and other hospital processes. When asked at the start of the process whether phlebotomy was an issue many replied it was, but once improvements were made it became clear that issues with other diagnostic pathways, bed management, discharge letters and pharmacy required improvement.

Fixing phlebotomy in isolation does not have a profound effect on the whole patient pathway, but the benefits are still significant to the patient, and can deliver efficiencies.

"On the wards they have much bigger issues like bed management and IT systems."

Common themes

While there were a number of improvement suggestions trialled with varying degrees of success there appear to be some common themes and learning.

Manage with data

Collect and understand data, use it to design the service. Manage the flow by reducing peaks and troughs and keep the service as efficient as possible. Share performance data with staff and users. Establish dashboards to display metrics and empower staff to fix problems daily.

Staff trained to apply Lean tools

Train and empower staff to use tools and techniques to focus on seeing and removing the wastes. Make use of tools and techniques to focus the service around the patient needs.

Communication

Most of the sites piloted ideas to improve communication between phlebotomists and ward staff providing a range of benefits. Phoning ahead to manage demand gave phlebotomists the chance to know what level of work was waiting on the wards and respond. Simple visual flags to indicate when phlebotomists were on the ward, indicating when patients had been bled so doctors did not have to waste time checking.

Common wastes

Significant efficiencies were found across the sites by simply focusing on common wastes identified through process mapping and observing the process. Reduce walking by having phlebotomy trolleys stocked on the ward, to an agreed standard.

Dedicated phlebotomists

Having phlebotomists dedicated to wards and outpatients across a number of sites increased productivity as measured by bleeds per hour. It appears that this is the result of better working between ward and phlebotomy staff, increased communication, and phlebotomists starting to build relationships with patients on the ward. Recognising the need for blood samples to be taken as soon as the decision is made for the test will require non phlebotomy staff to provide this service out of core hours.

Delivering samples to the laboratory

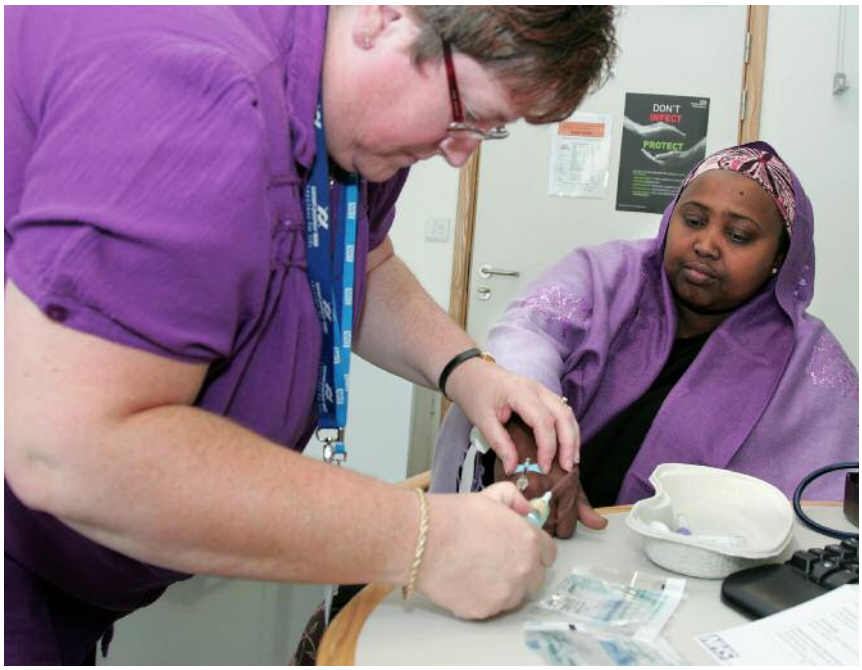
Understand when ward rounds take place. Ensure that blood results are available for rounds by bleeding patients earlier in the morning. Employ Porters or volunteers to collect and deliver samples little and often to the laboratory. Utilise air tube systems where available.

Understanding the needs of patients and users

The importance of patient feedback
A number of websites exist where patients are encouraged to provide feedback on their experience. One example is www.patientopinion.org.uk

The first challenge – Have you looked at the feedback about your organisation on this website?

The second challenge - Who is responsible for providing feedback to comments made about your organisation?



> The doctor saw her on Friday morning and said she could go home but the nurse pointed out that there were some blood test results that were still to arrive and he then agreed to keep her in hospital until Monday.

Patient relative

> My partner was waiting in A&E (after triage) for two hours while blood tests could have been run - eventually when blood was taken she had to wait another two hours for results.

Patient relative

> Waiting for results seemed to be a delaying factor - I felt that more rapid results could have saved some of my bed occupation time.

Patient

Telling the patient story

Before embarking on wholesale changes to phlebotomy services it is important to understand and define value from the patients' perspective. This is central to understanding what is important to patients and clinicians and provided areas to focus the improvement. This took the form of data analysis, stakeholder and staff feedback, and patient experience.

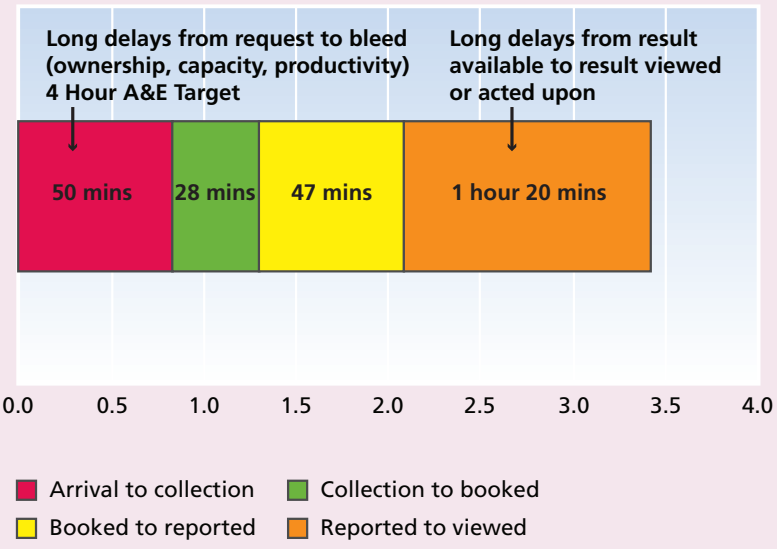
The end-to-end pathway provided evidence of the improvements already made in laboratory processes, and focussed on the potential for improvement in other parts of the pathway

Often we only look at the laboratory, but it is in the whole pathway where the big wins appear to be.

The Emergency Care Pathway: Whiston Hospital

There were perceived delays in the laboratory that were causing patients to breach the A&E four hour target. As a result of working with the Emergency department team we have been able to identify the complete blood pathway and have engaged with key staff from the Emergency department.

Time from arrival in department to result viewed



PATIENT STORY

The inpatient pathway

The following is a patient story of how poor processes can have a dramatic effect on the patient:

- Specimen taken 7.30 a.m. (for Gentamicin levels) - phlebotomist noted 'patient very collapsed and not enough blood to do U&E, Full Blood Count and Gentamicin'
- Sample arrived in the laboratory 8.30 a.m.
- Local lab analyser has been defective for the last 14 months (policy is all microbiology samples are analysed at hospital 10 miles away)
- Lab staff spent two hours trying to contact the Senior House Officer (SHO) to ascertain which test was more important the U&E or the Gentamicin?
- Sample put on first transport to external lab at 10.30 a.m.
- Result back on ICE (I.T. System) at 11.45 p.m.
- SHO contacted at 1.46 a.m. regarding result
- Phlebotomist didn't realise the significance of not being able to get blood out for this patient at 7:30 a.m. (i.e. collapsed from septic shock?)
- Nurses left in a quandary as to whether to give the three more doses of Gentamicin due at 8.00 a.m. 4.00 p.m. and midnight.

Our approach: Lean thinking - putting patients first

> Too often, patients are expected to fit around services, rather than services around patients.

Liberating the NHS –
Department of Health White Paper (December 2010)

At the heart of Lean thinking are customers, our patients, and seeking to understand what parts of our processes they believe are valuable. In our experience with or as patients we may all agree that of value is safe, timely, high quality care. Very few of us would consider waiting, queuing, endless paperwork, or mistakes to be a valuable part of any service we would be prepared to pay for.

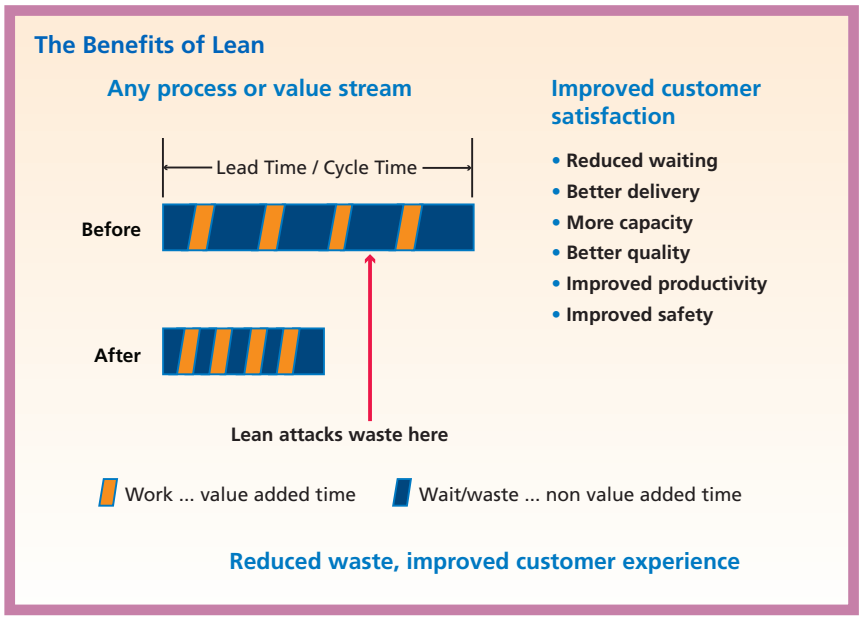
> Lean thinking is a way of streamlining the patient journey and making it safer, by helping staff to eliminate all kinds of waste and to treat more patients with existing resources.

Jones, www.leanuk.org

The key to lean improvement is:

> Go see, ask why, and understand the root cause of the problem you are solving.

David Fillingham, Lean Healthcare



Continuous improvement in Lean methodology focuses on five key steps

1. Specify value - The elimination of waste is the main characteristic of Lean. Waste is everything that doesn't add value to the patient or process. There are three types of work:

- **Value add** – When you are adding value to the patient/process (e.g. prescribing medication, providing physiotherapy, reporting an image)
- **Necessary waste** – When you are not adding value but it is a necessary step. (e.g. incubation in a microbiology laboratory)
- **Unnecessary waste** – Where you are not adding value and these steps could be removed (e.g. walking to get or find items, waiting for staff, machines and medication).

The wastes can be remembered by the name **TIM A WOODS** (Lean office at Cooper Standard, Plymouth UK)

T	TRANSPORT
I	INVENTORY
M	MOTION
A	AUTOMATING (an inefficient process)
W	WAITING
O	OVER PROCESSING
O	OVER PRODUCTION
D	DEFECTS
S	SKILLS UTILISATION

Reference: '*Bringing Lean to Life*', NHS Improvement

2. Identify the value stream steps - A current state value stream map is a visual representation of all the actions currently required to deliver a product or a service.

3. Make value flow - Flow is the continual movement of value adding activities from the beginning to the end of the value stream. Processes which add value to the patient should not be held up by any non value adding steps or waste in the system.

4. Pull value through the process from actual demand - Flow and pull work to keep the entire value stream moving. "Flow where you can, pull where you must" Jeffery K. Liker, The Toyota Way, 2004

5. Continually improve and strive for perfection - Continuous improvement is the final lean principle, which is to strive for perfection through continuous improvement. It is important to develop staff and give them the capability, autonomy and empowerment to solve the problems as they encounter them on a daily basis.

"More often than not the process is to blame not the people. To improve the process do so by striving for 'clinical excellence in partnership with process excellence'."

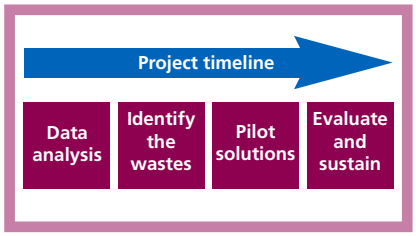
Continuous improvement in Cytology, NHS Improvement

Project approach

The experience from previous learning has demonstrated that the factors in the graphic on the right are vital to achieving sustainable improvement.

Understand the current process

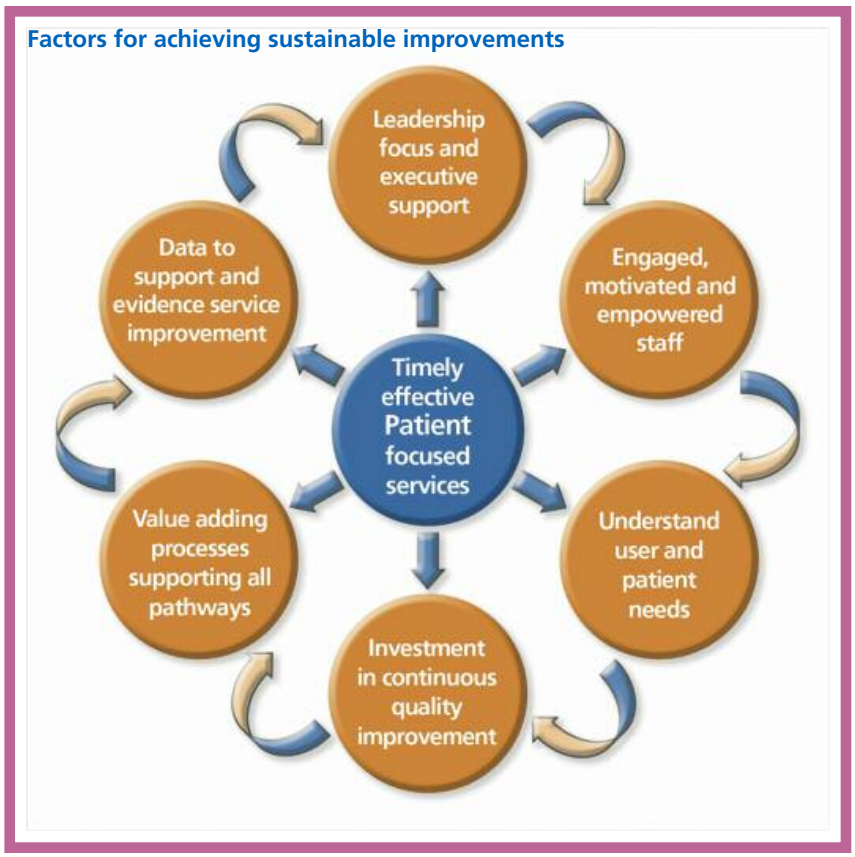
In healthcare, we are used to taking clinical measures such as temperature, pulse, blood pressure, respiration rates, urine outputs etc in order to understand the current status and demonstrate if conditions are getting better or worse.



To improve your current process, data is required to understand the root cause of the problem you are trying to address, a set of measures need to be agreed.

Measures might include:

- Quality – End to end turnaround times
- Cost – Improve productivity
- Morale – reduce staff time doing wasteful activities
- Patient experience – reduction in waiting times.



It isn't always easy to collect data for this baseline. If you can't get the information from the electronic systems, you will need to collect the information manually.

Data and measures are also important to demonstrate and prove that change has occurred, and what difference this makes for all those involved in the process including patients and staff. Whether the change was a success or a failure, you still need to demonstrate it!

Map the process

A critical starting point in any problem solving or improvement work is to map the process in its current state. One of the tools used to capture the current state or 'as is' performance is the value stream map (VSM).

Current State VSM

A current state value stream map is a visual representation of all the actions currently required to deliver a product or a service. The output however is more than just the current state, you

also look to map where the value in the process happens, and where waste in the process is. This then guides group discussions and problem solving to produce tangible solutions and ideas to reduce the waste and increase the value in the process. Remember as defined earlier in this booklet value can only be defined by the end customer. In healthcare the customer is usually the patient. Value is any activity that directly contributes to satisfying needs of the patient. Any activity that doesn't add value is defined as waste.

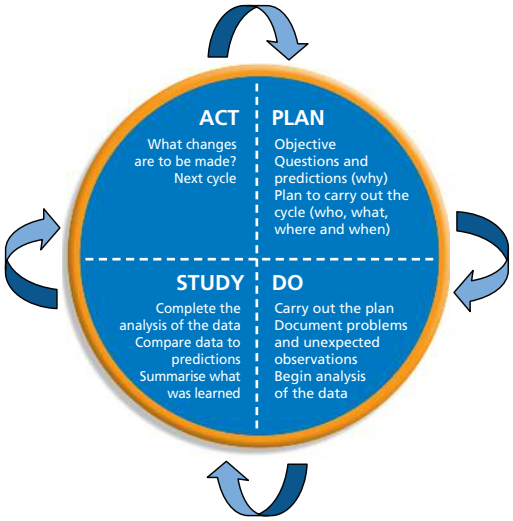
Future State VSM

Once you understand the current picture of what really happens throughout the value stream, you can begin to agree what needs to happen and then analyse the gap between the current and future states. From your current state map you will be able to identify where the significant problems occur. This might be the most prevalent waits and delays, the largest amount of work in progress between process steps or where there is considerable duplication. Once the future state Value Stream Map is completed, it is then essential to review measures, analyse the gap between current and future state and then agree an action plan to trial the changes.

Take action and pilot solutions

Take action, pilot suggestions for improvement, measure the effect and continue to improve until you have a workable solution to reduce waste. Even small scale pilots can provide enough data and feedback to establish if the solution delivers benefits and increases value, before rolling out large service wide changes that are untested.

PDSA cycle for learning and improvement



Once suggestions for improvement have been tested on a smaller scale and demonstrated they work, only then can we we roll out those changes across the whole service. This will require planning, consideration for potential obstacles, and a plan to manage those changes. However, changes are made in the knowledge that they have been piloted, have demonstrated their success and how they improve the process.

Continuous improvement

Continuous improvement is the final Lean principle, which is to strive for perfection by embracing the Lean philosophy and tools. The staff are a fundamental part of Lean. It is important to develop staff and give them the capability, autonomy and empowerment to solve the problems as they encounter them on a daily basis. Teaching and expecting rigorous problem solving by all staff is the only sustainable way to strive for perfection.

Areas to focus on

Having defined patients' value, the mapping, waste identification and staff discussion began to focus on key areas and potential for improvement:

- Understand the end to end pathway – don't assume the fault lies with the laboratory
- Capacity and demand – understand daily/hourly demand and capacity
- Use visual management to demonstrate performance
- Engagement with clinical teams
- Productivity – How to improve the number of patients bled per hour
- Use the evidence to design the service.

The pilot sites

NHS Improvement worked with the following pilot sites:

Doncaster and Bassetlaw Hospitals NHS Foundation Trust (Doncaster Royal Infirmary)
Doncaster Royal Infirmary is one of the key hospitals in the Doncaster and Bassetlaw Hospitals NHS Foundation Trust. The hospital provides a full range of services appropriate to a large district general hospital in 800 beds. Each year the hospital treats around 150,000 patients along with 95,500 A&E patients (combined figures for Doncaster Royal Infirmary and Montagu Hospital).

St Helens and Knowsley Teaching Hospitals NHS Trust (Whiston Hospital)
Whiston Hospital is one of two Merseyside hospitals (along with St Helens Hospital) managed and run by St Helens & Knowsley Teaching Hospitals NHS Trust. The new hospital offers the full range of acute healthcare services along with specialist burns care through the Mersey Regional Burns and Plastic Surgery Unit. It has 15 operating theatres, diagnostic facilities, and over 800 beds.

West Middlesex University Hospital NHS Trust
The West Middlesex University Hospital is a busy urban acute hospital located in Isleworth, West London providing services primarily to residents of the London Boroughs of Hounslow and Richmond upon Thames. Employing some 2,250 people (including our partners in Ecovert FM), the hospital has over 400 beds. The Trust has an annual budget in excess of £130 million and provides services to a population of around 400,000.

The Dudley Group of Hospitals NHS Foundation Trust (Russell's Hall Hospital)
Russell's Hall Hospital is the largest of three hospitals in The Dudley Group of Hospitals providing the full range of surgical and medical specialties for its inpatient services, together with some outpatient and therapy services with over 750 beds.

South Warwickshire NHS Foundation Trust (Warwick Hospital)
While working with our pilot sites, NHS Improvement had an opportunity to link with South Warwickshire NHS Foundation Trust who are taking part in a flow cost and quality programme with the Health Foundation.

CASE STUDY ONE.

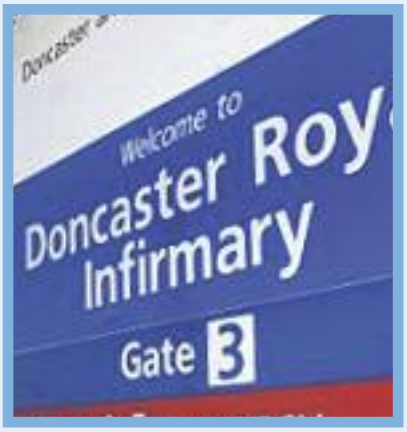
Doncaster Royal Infirmary
Outpatient phlebotomy improvements

Summary
59% reduction in average waiting time for patients attending the walk-in phlebotomy clinic at Doncaster Royal Infirmary (DRI)

Understanding the problem

Patients attending the phlebotomy walk-in service at DRI often had to wait over an hour to have their blood taken. Regularly it was standing room only in the waiting area, staff morale was low and staff absence was high. The long waiting times for phlebotomy led to knock-on problems in outpatient clinics, leading to complaints from clinicians and patients. A high number of primary care patients also attended the walk-in service and were equally dissatisfied with waiting times.

The phlebotomy area was co-located with the pathology laboratory so all outpatients had to travel round the hospital site to have their blood taken. Patients reported to a receptionist as they arrived, who checked their identification and placed their request form in a box in order of arrival. As each phlebotomist became free, they took the next request form from the box, walked out into the waiting area, called the patient by name and waited for the patient to respond and return to the blood taking area with them.



A receptionist recorded the waiting time for phlebotomy on the hour, every hour over many months.

Staff issued a questionnaire to all patients attending the walk-in clinic throughout the week of 23-27 November 2009, to provide feedback on why they had chosen to attend DRI for phlebotomy and to gain information about how long they had to wait.

Phlebotomists sat in the patient waiting area and observed the process from the patients' point of view. Phlebotomists timed each stage of the process and then agreed which steps were value creating and which were 'waste'.

How the changes were implemented

- Numerous formal and informal meetings and discussions with the phlebotomy team to agree changes.
- The walk-in clinic relocated to the main out-patient area.
- A patient queue management system was installed. This system enables each phlebotomist to call the next patient through to their cubicle as soon as they are ready, using a small keypad. The patients see a number display and hear an audible announcement in the waiting area. The keypad informs the phlebotomist how long the patient has waited to be called, and how many people are in the queue.
- A dashboard was developed, utilising the output data from the patient queue management system. The team print the dashboard to create a very visible display of daily, weekly and monthly performance.
- Demand information was requested from every inpatient ward each morning before the phlebotomy round started to assist overall rota management.
- The staff rota was co-coordinated across inpatient services and the walk-in clinic to match capacity to demand as closely as possible, with a number of changes being made over time.

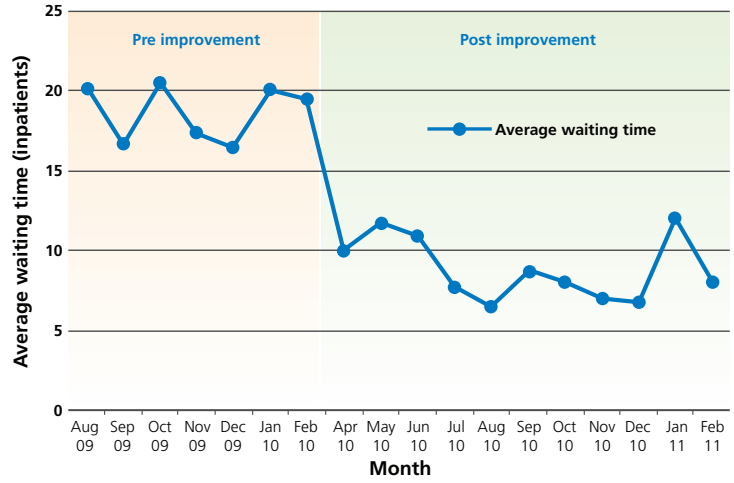
Measurable outcomes and impact

- 59% improvement in average waiting time.
- Average waiting time improved from **18.6 to 7.6 minutes**.
- 53% improvement in maximum waiting time
- Maximum waiting time reduced from **87 to 41 minutes** (averages per month)
- Reductions in average and maximum waiting times achieved despite increasing demand, and with no increase in staff numbers.
- 12,699 hours of waiting time saved since improvement work (approx. 1,154 less waiting hours per month).
- Feedback has been hugely positive, transforming 10 written complaints in 2009/10 to 21 written compliments in 2010/11 along with hundreds of verbal compliments.

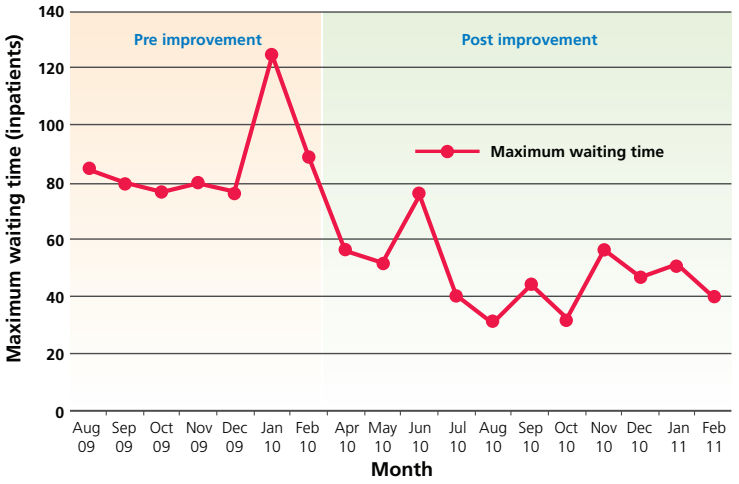
The following quotations are taken from some of the written compliments received:

"I have been attending phlebotomy for 12 years as a patient of Dr M. Since your reorganisation in the last few months, the reduction in waiting time is both significant and welcome. Well done in improving so much the patient experience"

Reduction in average waiting time

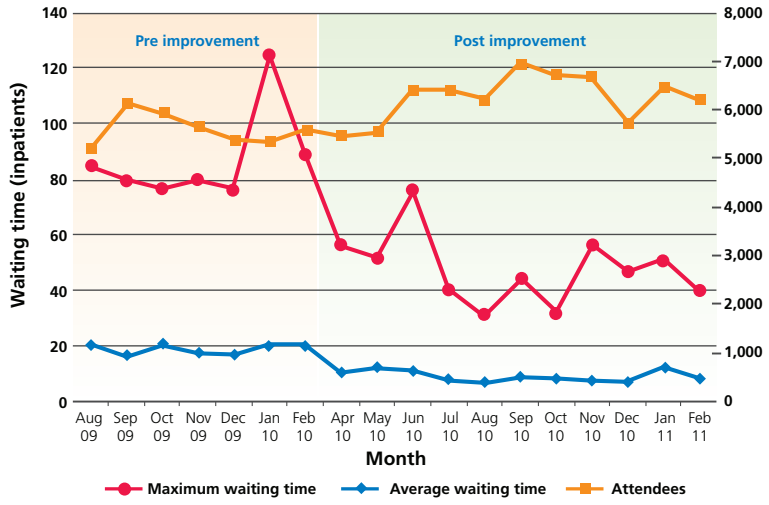


Reduction in maximum waiting time

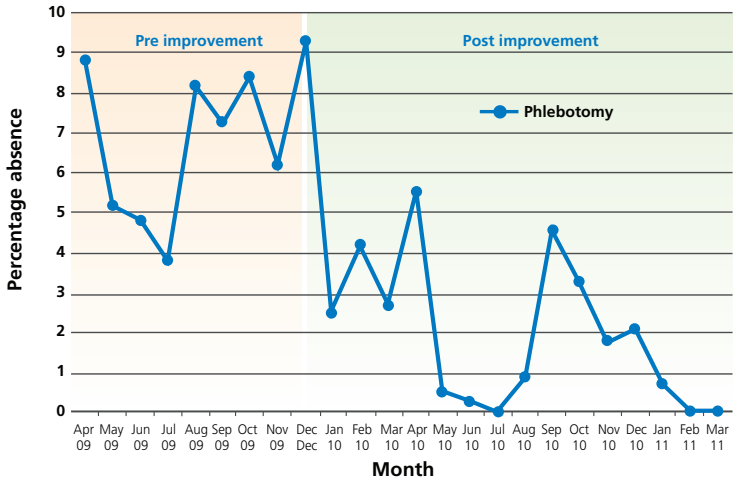


"This is so much better than before, in and out, clean area and friendly staff"

Reduction in waiting time while activity increases



Staff absence - Phlebotomy (DRI)



- Feedback from clinicians has been equally positive, with many consultants contacting phlebotomy staff to inform them how pleased they are that their patients are being seen quickly.
- No issue with seating in the waiting area as the queue does not build up.
- Most outpatients do not have to travel round the hospital corridors to have their blood taken, as phlebotomy is now co-located in the main outpatient area. In addition, the free park and ride bus stops just outside the phlebotomy and outpatient waiting area.
- Staff morale has improved significantly. The phlebotomy team meets regularly in work hours. Communication folders and notice boards have been introduced and most staff participate in social functions outside work:
  - Since the improvement work commenced, staff absence has reduced from **6.6% to 1.6%** over the last twelve months.
  - 926 more staff hours at work that were previously absent in a year.

Ideas tested which were successful

- Installing patient queue management system:
- Removing waste (phlebotomist no longer going into waiting area to call patient).
- Phlebotomist able to see waiting time of current patient and number of patients in queue on keypad.
- Dashboard displays created using data from system – to make performance very visible. Daily, weekly and monthly dashboards are used (see examples on the right).
- Data from system used to match staff rotas (capacity) to demand as closely as possible.
- Reducing phlebotomy hours on inpatient wards and moving them to walk-in clinic.
- Relocating to main outpatient area.

How this improvement benefits patients

- Significant reduction in waiting time for patients.
- On average every patient waits only 7.6 minutes, rather than 18.6.
- Visual and audible display in waiting area, so improvement for patients with hearing difficulties.
- Outpatient clinics not held up by patients queuing to have blood taken.

Daily dashboard example

Monthly dashboard example

How will this be sustained, potential for the future and additional learning

- Ongoing use of data by management team and phlebotomists.
- Visible displays of performance to staff and patients.
- Roll-out of patient queue management system, staff processes and rotas to Bassetlaw hospital walk-in clinic (positive patient feedback and evidence of waiting time improvements used to achieve business case approval).
- Fine-tuning of staff rotas in line with demand.
- Data used to support recruitment as activity increases (evidence for funding application).

Contact

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CASE STUDY TWO.

Doncaster Royal Infirmary
Increased phlebotomy productivity on inpatient wards

Summary
32% increase in phlebotomy productivity on wards, from **8.85 to 11.7 patients per hour**.

Understanding the problem

- Phlebotomists were frequently reaching the end of their shift, running out of time, and leaving some inpatient wards without a phlebotomy service. Different phlebotomists went to each ward each day, working in pairs, and there was little or no teamwork between phlebotomists and ward staff.
- The phlebotomists were unable to bleed some patients.
- The ward phlebotomists would collect together to get specimens ready for transport to the laboratory, have a break, and would phone the manager to inform her how many patients had not yet been bled.
- Staff morale was low and absence levels were high.
- Feedback from wards was poor.

Ward 26 (a respiratory medical ward) agreed to work with the phlebotomy team to improve the service.

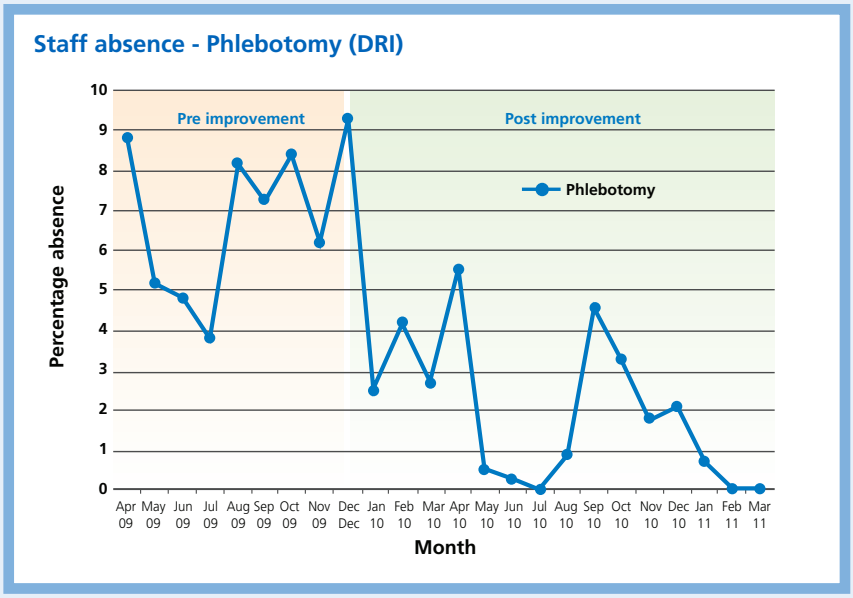
Phlebotomy representatives observed what was happening on ward 26, then met with a team of staff from ward 26, listened to their views of the phlebotomy service and ascertained what changes they would like. The phlebotomists then shared this information with their colleagues.

A team of phlebotomists and ward staff undertook a process mapping exercise. Phlebotomists timed each stage of the process and the team then agreed which steps were value creating and which were 'waste'. Changes were agreed and implemented to reduce 'waste' and thereby increase value as a percentage of the total service time.

How the changes were implemented

- Suggestions from staff from process mapping session and other meetings.
- Demand information was requested from every inpatient ward each morning before the phlebotomy round started.
- The staff rota was coordinated across inpatient services and the walk-in clinic to match capacity to demand as closely as possible, with a number of changes being made over time.
- Every ward was asked to indicate their ideal time for the phlebotomy round.
- Separate ward and walk-in clinic phlebotomy teams were established.
- Only one phlebotomist goes to each ward instead of working in pairs, so they are on the ward for longer; therefore, there is a greater opportunity for the doctor to place additional requests.
- 'Phlebotomist on the ward' magnets are displayed on the ward 'status at a glance' boards to indicate their presence.

- Same phlebotomist on each ward each day, so soon built rapport with ward team. Also got to know 'their' patients, so fewer unable to bleed events.
- Ward phlebotomy trolleys were established, rather than phlebotomist having to transfer a trolley between wards (reduce time waiting for lifts, and improve infection control) and a standard layout agreed for each trolley.
- Pilot on ward 26 to test out changes.
- Discussion at matron's meetings to agree roll-out across all wards.
- Proposed trolley changes coordinated as part of electronic requesting and reporting system.



Measurable outcomes and impact

- **32% improvement** in productivity on inpatient wards.
- **33% reduction** in phlebotomy staff hours on inpatient wards, yet wards no longer left without a service.
- Positive feedback from ward staff and phlebotomists.
- Reduction in number of 'unable to bleeds'.
- Staff morale has improved significantly and phlebotomist absence has reduced from **6.6% to 1.6%**. The phlebotomy team meets regularly in work hours. Communication folders and notice boards have been introduced and most staff also participate in social functions outside work.
- 926 more staff hours at work that were previously absent in a year.

Ideas tested which were successful

- Establishing a ward-based phlebotomy team.
- Named phlebotomist per ward.
- Only having one phlebotomist to service each ward, so they are on the ward for a longer period.
- Displaying 'phlebotomist on ward' magnets.
- Delaying coffee breaks until ward work is completed.
- Reducing phlebotomy hours on inpatient wards and moving them to walk-in clinics (matching capacity to demand).
- Changing the order in which phlebotomists attend each ward to align the service with ward rounds.
- Varying how specimens are transported to the laboratory to ensure they are processed as soon as possible.
- Use of ward-based trolley for phlebotomy, rather than taking a trolley from phlebotomy round every ward.
- Standard layout for every trolley agreed and implemented.

How this improvement benefits patients

- Happier staff.
- Phlebotomist gets to know the patients on their wards, which:
  - increases their success rate at obtaining high quality blood samples.
  - means they can spot when a request form is missing.
  - builds rapport with the patient and helps to put them at ease.
- Enables blood to be taken as soon as possible after the clinician requests it, and transported to the laboratory for analysis, thereby supporting timely treatment or discharge of patients.

How will this be sustained, potential for the future and additional learning

- Ideas piloted on ward 26 have been rolled out to other wards following discussion at matrons' meetings.
- Use of ward-based phlebotomy trolley to be rolled out as part of the electronic requesting and reporting system implementation (a 'clinical cart' is being developed that will combine provision of IT hardware and software with the facility to transport phlebotomy and other clinical consumables).
- Ongoing use of data by management team and phlebotomists.

Contact

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CASE STUDY THREE.

Whiston Hospital (St Helens & Knowsley) - A&E Department

Reduced turnaround times (TAT) and reduced admissions

Background

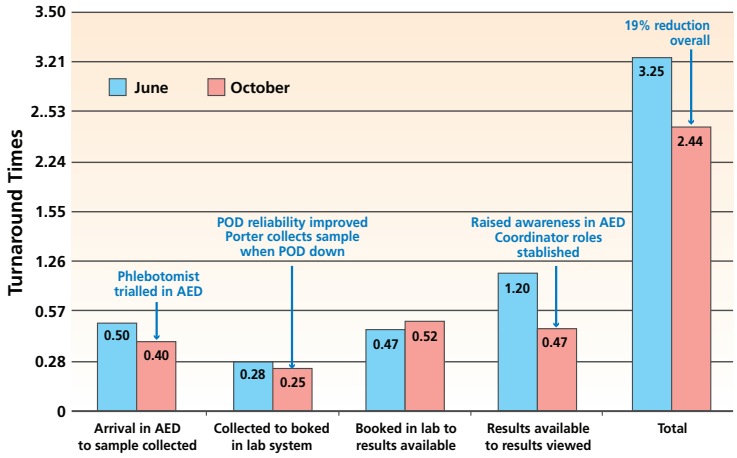
Whiston Hospital is a new PFI which opened in March 2010, with 900 beds, approximately 250 A&E patients attending per day, pathology had approximately 100 patient bloods per day. The location of this unit was approximately 100 meters away from the existing pathology service. National target four hour wait – impact on moving patients / admissions high – charges to PCT, how could this be challenged (see EAU on the following page).

Summary

As a result of working with the Emergency department team we have been able to identify the end-to-end blood pathway and have engaged with key staff from the Emergency department. A measure of the end-to-end blood pathway was undertaken, and a process mapping day held to map the patient's journey. This process produced an action plan and meetings were then held every two weeks to monitor the introduction of the changes.

The process showed an overall reduction in the blood pathway of 19%.

Whiston A&E blood pathway



Understanding the problem

To understand and measure the performance of the blood pathway within our Emergency services department. To investigate the impact the blood pathway has on hospital admissions.

This engagement with our emergency department identified a possible link between the blood pathway and admissions to the Trust. We were confident that the existing blood pathway could be improved and wanted to use the hospital admissions data as an indicator / measure of this improvement.

Data collection for this area falls under the following headings:

- Emergency blood pathway
  - Patient arrival time in the emergency department - **Arrived**
  - Patient has blood collected - **Transport**
  - Patient blood samples are booked in to the pathology computer - **Received**
  - The pathology process is completed (i.e. Emergency department staff are able to view results) - **Authorised**
  - Results are viewed in the Emergency department - **Viewed.**
- Hospital admissions (expressed as a percentage).

Data was extracted electronically from both the emergency department system and the pathology computer. Some manual data extraction was also carried particularly for results viewed. Time collected was only provided on approximately 40% of requests. Completed data sets were processed and the outcomes discussed to improve the level of understanding at the appropriate workstream meetings.

Outcomes

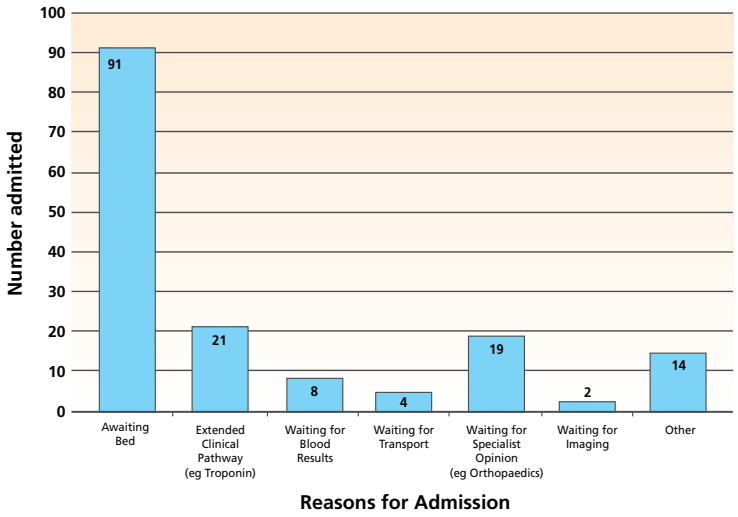
All relevant departments were engaged in the process mapping event. Actions were captured in a plan; this was then delivered over several weeks with varying success.

The following changes were made:

- Take blood samples earlier in the patients journey.
- Transport changes
  - Trust air tube system – Improve
  - Improve air tube failure reporting process
  - Improve access to porters when/if air tube fails.
- Action pathology blood results earlier by viewing using patient enquiry or scrolling screens.
- Improve team work between Trust phlebotomy team and emergency assistants, this resulted in improved coverage of previously un-staffed sessions.
- Re-launch clinical nursing lead for every shift to provide support and standard working.
- Frequent meetings to discuss and sustain improvements / introduce new changes.

Following on from the action plan it was clear that we needed to identify those patients that had been admitted to hospital due to a delay in the blood pathway. After discussions with the medical admissions unit ward manger we felt it was best to concentrate on a unit called the emergency admissions unit.

Reasons for admission



Emergency Admissions Unit (EAU)

This 16 bed unit accepts patients for a whole variety of reasons / conditions. We decided to look in detail at four days over a period of two weeks. To gather information we used the EAU ward admissions register and the trust Electronic Document Management System (EDMS) for all patients admitted over the period. See results above.

The outcome of this work was shared with the Emergency department mangers that used this and other data to introduce planned pathways for specific conditions. This work is ongoing and therefore the outcome can not be fully assessed at this stage. It is felt however that it will have an impact on the hospital admission rate.

Challenges

- Consistent engagement over time.
- Data quality and understanding of the impact.
- Extraction of data, time consuming and therefore this had to be limited.
- Introduction of changes /timescale.
- Multi team working, efforts being made to co-ordinate the different teams.
- Changes to targets.
- PCT structure /changes.

Contact

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CASE STUDY FOUR.

Whiston Community Clinics (St Helens & Knowsley)
Scheduling and flow of start time

Along with other national sites we set out to answer the following questions:

- Are patients waiting excessive days before having blood taken?
- Are patients waiting for long periods when they arrive at a phlebotomy session?
- Are patients travelling excessively to have blood taken?
- How is the capacity in relation to the demand?

Understanding the problem

Our initial plan was to concentrate on primary care based staff and then incorporate any transferable improvements/changes to our secondary care based team. As there was no data available with regards to accessing phlebotomy we collected data to form a baseline and enable us to understand the process. All the data needed to be collected manually. On analysing this data it was felt that there were long waiting times for patients to be able to gain access to phlebotomy clinics and then each patient would have encountered long waits in various settings for their blood to be taken.

- The data showed that the community clinic we had chosen showed delays from the request being made to the patient arriving to have blood taken but that these were predominately due to patient choice – **No action taken.**
- The data showed patients who had arrived at a community phlebotomy session were waiting an excessive amount of time before they had their blood taken – **Main focus for action.**
- The data showed the distance patients travelled was not excessive, so choice was acceptable – **No action taken.**
- The demand on occasions did exceed capacity but this was felt to be limited, this area needs to be reviewed on a regular basis as the percentage increase in workload changes.

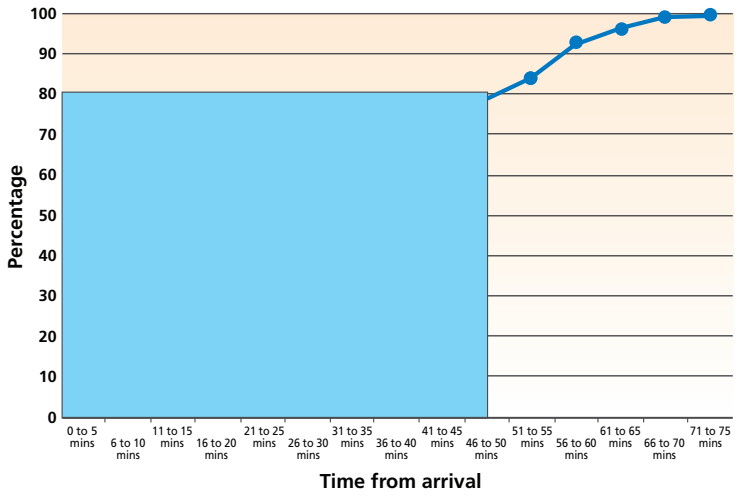
This years increase for primary care will see a further 28,000 (M11 forecast) patients being bled compared to the previous 12 months of April 09 – March 10. This equates to another 1.65 WTE phlebotomy hours required to deliver this additional capacity - Action taken, we have increased our service by three additional community sites all at the request of the PCT's, lessons learnt have been used at these new sites

We undertook reviews of several phlebotomy areas, one of these areas had recently been handed over to our team and we had changed the service significantly but some issues remained. This service was based in a new PFI PCT build called Newton Community Hospital. The phlebotomy service was an on demand service. All patients were handed a number on arrival by the PCT receptionist, and once our limit had been reached for that session all other patients were then turned away.

With demand and service provision offset, the majority of patients waited at least half an hour or more to be bled:

- **50% of patients** waited up to half an hour to be bled.
- **80% of patients** were seen in 50 minutes from arrival.

Percentage time to be seen from arrival



Our team decided to drill down our data and improve the phlebotomy service at our chosen clinic; we looked at all the factors below:

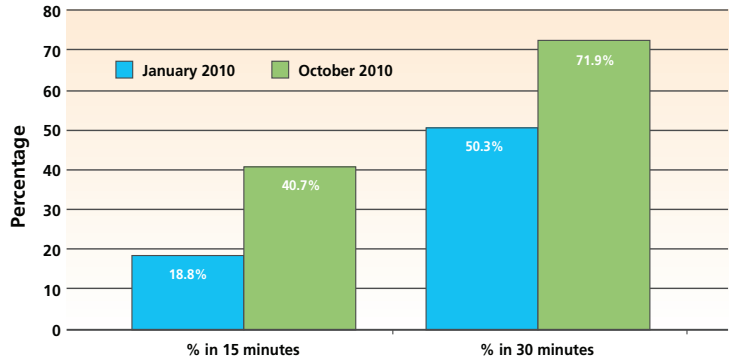
- Capacity and demand.
- Service delivery - start time.
- Patient flow.
- Staff moral / patient experience.

All of the baseline data required could be easily accessed with the exception of staff moral / patient experience. This was collected by improving staff feedback with senior members of staff and monitoring patient complaints from this clinic.

By starting the service 30 minutes earlier the phlebotomist was able to reduce the number of patients waiting more than 30 minutes significantly. We also provide additional phlebotomy resource on a Tuesday. We are reviewing the requirement for an afternoon session; however this will depend on future workload and demand.

From November 2009 – October 2010 we received eight complaints, most of these were in relation to patient flow and excessive waiting times. A few of these were centered on patients being asked to return to the clinic another day due to the capacity being exceeded. The number of patients bled per three hour session on average is 45. The data showed that within the first hour over 25 patients were attending the clinic which made it difficult for a single phlebotomist to match the demand.

Percentage bled



Results

January 10

- 50% patients bled within 30 minutes

October 10

- 72% patients bled within 30 minutes.

January 10

- 19% patients bled within 15 minutes.

October 10

- 41% patients bled within 15 minutes.

Overall average time to be bled has fallen from 33 minutes in January 2010 to 23 minutes in October 2010.

250 patients are bled per week, on average 10 minutes per patient time saved, this equates to more than 2,100 hours patient waiting (or 90 days) saved per year.

The PCT staff within the clinic are happier as fewer patients are complaining, our phlebotomy staff are happier and are returning to the main St Helens Hospital base earlier, this helps productivity at this site and also staff morale as they are supporting their colleagues at St Helens Hospital over lunch times.

Blood samples are returning to the laboratory earlier therefore turnaround times (TAT) and reporting to the GP will be improved, with the number reported on the same day being higher than previous.

Contact

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CASE STUDY FIVE.

West Middlesex University Hospital
Dedicated ward phlebotomist

Improved relationship between phlebotomists, doctors, staff on the wards and patients by providing a dedicated phlebotomist to the pilot wards. Extending the existing two week phlebotomy ward rota to three months.

Understanding the problem

Project problem statement: The aim of the project was to improve the efficiency and flow of the inpatient phlebotomy pathway from the moment the request is made through to the result being viewed. By improving this we then hope to impact on delays in results being delivered which in turn should reduce length of stay by allowing prompt and informed decisions to be made with regards to patient discharge.

Identification: The issue of a lack of team working between the phlebotomists and the ward staff was identified via initial feedback from the phlebotomy team when the project was first introduced. Phlebotomists described feeling isolated and almost like an intruder on the wards. Ward staff and doctors both reported not being sure if the phlebotomist was on the ward as they didn't recognise them.

Data collection: Qualitative data was collected via discussion and feedback at phlebotomy team meetings, junior doctor meetings and meetings with nursing staff and surveys.

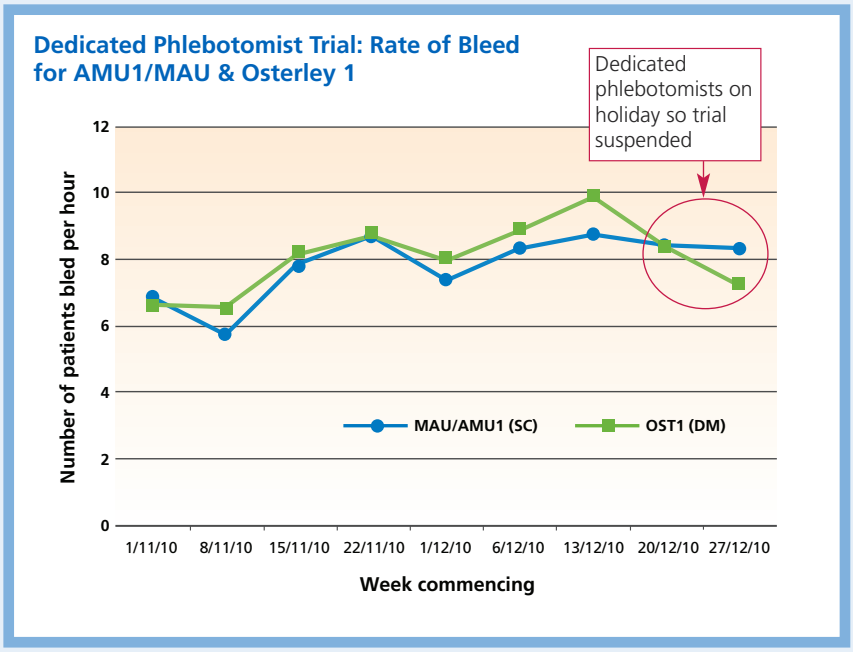
Waste: The feedback showed the frequent change over of phlebotomists on the pilot wards was leading to low morale for the phlebotomists. It was also introducing delays with doctors not realising who the phlebotomists were and subsequently not passing newly created urgent requests to them when they were on the wards.

How the changes were implemented

- Solution identified – A dedicated phlebotomist on each of the pilot wards was proposed, and three months was agreed as a reasonable period of time. A longer period was not thought to be practical as different wards and outpatient clinics accommodate quite different patients, so it is important for the phlebotomists' personal development to gain regular experience in each of these areas.
- A dedicated phlebotomist was allocated to each of the pilot wards for a three month period.

Measurable outcomes and impact

Working relationship between the phlebotomist and the ward staff was improved. Phlebotomists also reported an additional benefit of getting to know the patients better which facilitated the phlebotomy process. This was found to be especially true on the medical ward which had a slower turnover of patients compared to the acute medical unit. The number of patients bled was also seen to increase over the duration of the three month roster period on both wards.



Ideas tested which were successful

- The idea of introducing a dedicated phlebotomist onto the wards to improve team working between the doctors, ward staff and the phlebotomy team came from feedback given by the all three staff groups when the project was first initiated.
- A process mapping session was held involving all staff groups involved in the phlebotomy pathway i.e. junior doctors, nursing staff, phlebotomists and laboratory staff. This session helped to develop the solution of introducing a dedicated phlebotomist.

How this improvement benefits patients

The benefit to the patients has come from ensuring that doctors, ward staff and phlebotomists work as a team. Leading to better communication which in turn facilitates the patient's phlebotomy pathway and reduces delays due to lack of communication. Patients on the longer stay medical ward also benefitted from getting to know their phlebotomist over the course of a few days.

How will this be sustained, potential for the future and additional learning

This initiative has led to an improved working relationship between the doctors, the ward staff and the phlebotomists and has helped to improve the efficiency of the phlebotomy rostering to continue to provide a dedicated phlebotomist on all wards is being put in place.

Contact

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CASE STUDY SIX.

West Middlesex University Hospital

Phlebotomy column on real-time patient management whiteboard

Improved communication between phlebotomists and doctors to ensure that any outstanding blood test requests left following the phlebotomists round are highlighted immediately so that doctors/nursing staff can arrange to take the blood thus minimising delays to patient results being returned.

Understanding the problem

Project problem statement: The aim of the project was to improve the efficiency and flow of the inpatient phlebotomy pathway from the moment the request is made through to the result being viewed. By improving this we then hope to impact on delays in results being delivered which in turn should reduce length of stay by allowing prompt and informed decisions to be made with regards to patient discharge.

Identification: The problem of poor communication between the phlebotomists and the doctors was identified via initial feedback from doctors on the pilot areas when the project was first introduced. Doctors explained how they were unaware of which patients had been bled by the phlebotomist and which patients still required bleeding following the phlebotomists ward round. This led to doctors sometimes having the false impression that their patient had been bled only to find out a few hours later when searching for the test results that the bloods had not been taken, thus delaying the test, result and possible discharge of the patient.

Data collection: Data was collected manually and electronically for the whole pathway, via the phlebotomist's daily paper ward record sheet, the ICE order comms system and Winpath lab computer system.

Data collected:

- Date/time of request.
- Date/time patient bled.
- Date/time logged on laboratory system.
- Date/time result reported.

Waste: The data from request to bleed time highlighted a large number of cases where there were long gaps between the request being placed and the patient being bled. Feedback from the doctors however showed that many of these related to requests that were placed with the intention of their being a long gap i.e. cases where the doctor had placed the requests in the evening ready for the next morning with the intention of the patient being bled in the morning and not that night. However there were cases identified by the doctors where the expected morning bleed had not taken place and patients had not been bled until mid afternoon thus introducing a 2-4 hour delay.

How the changes were implemented

- Solution identified – phlebotomy column added to the patient management whiteboard on each of the two wards. Doctors to indicate which patients required bleeding by placing a (/) in the column against the patient's name. The phlebotomist at the end of their round to then cross this mark (X) if the patient had been bled and leaves the mark (/) if they had not been able to bleed the patient. In this way doctors could see at a glance which patients still required bleeding. The solution was introduced on both pilot wards and was trialled successfully for a number of weeks.
- The Trust then introduced an electronic patient/bed management system (in real-time) which replaced the manual whiteboard.
- A phlebotomy column was added to the electronic whiteboard view on the real-time system and instead of a (X) being used the doctors were asked to put an (R) in the column for patients who required bleeding and the phlebotomists would then put a (B) for bled or (F) for fail in response at the end of their round. This was trialled for two weeks on one of the pilot wards and then feedback obtained. Feedback from the junior doctors stated that their input into the column was felt to be a duplication of information they already had to hand on their paper patient lists but that the phlebotomists entry was extremely useful for them and did help to ensure no outstanding bloods were missed. The addition of a date in the entry was requested to help avoid any confusion for patients having more than one blood test over the course of their admission.
- The trial was adapted with only the phlebotomist entering information as to which patients they had bled and rolled out across both pilot wards.

Measurable outcomes and impact

Communication between the phlebotomist and the doctors was greatly improved which benefited not only the patients but also the working relationship between the two staff groups.

Ideas tested which were successful

The idea of introducing a measure to improve communication between the doctors and the phlebotomy team came from feedback given by the junior doctors when the project was first initiated.

A process mapping session was held involving all staff groups involved in the phlebotomy pathway i.e. junior doctors, nursing staff, phlebotomists and laboratory staff. This session helped to develop the solution of introducing a phlebotomy column initially on the manual patient management whiteboard (and subsequently on the electronic whiteboard in real-time).

The junior doctors entering which patients required bleeding into the phlebotomy column was unsuccessful as it was felt by the doctors to be a duplication of information they already had to hand on their paper patient lists and information the phlebotomists also already had (via the request forms) so was not seen to be beneficial.

		In the last week, number of delayed discharges due to:			
		Communication	Delay in bloods being taken	Results not being back	Quality of service
Both wards	Baseline	3.4	7.1	6.8	4.3
	Follow-up	5.0	4.0	4.3	7.1
Variance		1.6	-3.1	-2.5	2.9

Doctors reported improved communication.

Also reporting more bloods taken, fewer delayed discharges due to waiting for results and overall a significant improvement in services.

How this improvement benefits patients

The benefit to the patients has come from ensuring that any outstanding bloods not taken by the phlebotomist are identified promptly and addressed by the doctors or nursing staff on the ward. Thus minimizing delays to the patient's bloods being tested and results being available to inform the patient's clinical management and potential discharge.

How will this be sustained, potential for the future and additional learning

This initiative has led to an improved working relationship between the doctors and the phlebotomists and has helped to improve the efficiency of the phlebotomy pathway. This in turn has ensured that pathology information is available to clinicians to inform their decisions as early as possible for all patients in the pilot wards.

Contact

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National Service Improvement Project for Phlebotomy – Doctors Survey

Thinking about the previous week please score the following areas by marking the scale at one of the numbered points.

1. **Communication between phlebotomy team and the ward staff:**
   Very good/ consistent — Very poor/ very inconsistent
   10 9 8 7 6 5 4 3 2 1

2. **How often were you aware of the outcome of requests put out for the phlebotomists by the time the phlebotomy round had finished, i.e. did you know which requests had been completed and which had not?**
   Always — Never
   10 9 8 7 6 5 4 3 2 1

3. **How useful did you find the phlebotomy column on Realtime in helping you to know which requests had been completed and which had not?**
   Really useful — Not useful at all
   10 9 8 7 6 5 4 3 2 1

4. **How often were patient discharges delayed due to delays in the patient's bloods being taken?**
   Very often — Very rarely
   10 9 8 7 6 5 4 3 2 1

5. **How often were patient discharges delayed due to delays in results coming back even when bloods were sent promptly?**
   Very often — Very rarely
   10 9 8 7 6 5 4 3 2 1

6. **How satisfied were you with the quality of the phlebotomy service provided?**
   Very satisfied/ consistently good — Very unsatisfied/ consistently poor
   10 9 8 7 6 5 4 3 2 1

7. **How many shifts did you work over the last week?**
   7 ☐ 6 ☐ 5 ☐ 4 ☐ 3 ☐ 2 ☐ 1 ☐

8. **How often this week have you had to work past the end of your shift?**
   7 ☐ 6 ☐ 5 ☐ 4 ☐ 3 ☐ 2 ☐ 1 ☐

9. **How often was this due to waiting for blood results to come back?**
   7 ☐ 6 ☐ 5 ☐ 4 ☐ 3 ☐ 2 ☐ 1 ☐

10 . **Is there anything that could be done to improve the service?**

_____

_____

Please return your completed survey to your ward clerk Glenda on Osterley 1 or Verena/Greg on AMU1.

CASE STUDY SEVEN.

West Middlesex University Hospital
Early morning bleed

To establish if the time of a patient's discharge from hospital can be achieved earlier in the day by their bloods being taken at 7 am on the morning of their estimated discharge and the results returned prior to the doctor's ward round on the acute medical unit.

Understanding the problem

Project problem statement: The aim of the project was to improve the efficiency and flow of the inpatient phlebotomy pathway from the moment the request is made through to the result being viewed. By improving this we then hope to impact on delays in results being delivered which in turn should reduce length of stay by allowing prompt and informed decisions to be made with regards to patient discharge.

Identification: From review of times patient's results were available compared to the timing of the doctors' ward round and following feedback from the junior doctors.

Data collection:

- Number of patients with a same day discharge who had outstanding blood test requests.
- Date/time of early morning bleed.
- Date/time bloods logged on lab system.
- Date/time result reported.
- Date/time patient discharged.

Analysis to be undertaken comparing results for patients involved in the trial to other patients on the ward during the same period and averages for previous months.

Waste: Patients waiting to go home same day whose discharge is delayed due to their results not being back in time for the doctors' ward round.

How the changes were implemented

- Solution identified – The phlebotomy early morning round starts at 8.00am, it was felt that an earlier bleed was required to get the results back by the doctors ward round.
- Data was collected every two weeks to identify how many patients each day were due to be discharged same day and also had an outstanding blood request. This was done to allow us to estimate the size of the workload and the capacity required to undertake it during the trial.
- A daily sample size of two patients per day was agreed with the lead nurse and matron for the ward.

Measurable outcomes and impact

- The data seemed to suggest that there were not that many patients that had a blood request, were scheduled for discharge, and actually went home. Only 10 of the trial sample of 48 patients were discharged form the trial ward on the same day, suggesting that prioritising phlebotomy for discharge may be difficult unless a better indication of the patient's position on the discharge pathway can be given.

Trial Period	07/03/2011 9/04/2011
Number of sample patients reviewed as eligible to go home same day during trial.	**48**
Number of patients reviewed as eligible to go home same day during trial but no blood request form available for the early bleed or no bloods required.	**24**
Number of patients bled early.	**24**
Number of patients bled early but not discharged same day.	**4**
Number of patients in trial bled early but transferred rather than discharged.	**10**
Number of patients in trial bled early and discharged same day	**10**

On trial	Admission date/time	Date/time patient bled	Results authorised date/time	Discharge date/time
YES	12/03/2011 17:39	13/03/2011 05:00	13/03/2011 07:55	13/03/2011 16:19
YES	31/03/2011 09:29	01/04/2011 06:00	01/04/2011 08:23	01/04/2011 18:31
YES	14/03/2011 15:15	16/03/2011 08:00	16/03/2011 10:24	16/03/2011 17:23
YES	15/03/2011 22:57	17/03/2011 06:00	17/03/2011 08:53	17/03/2011 15:36
YES	14/03/2011 21:23	16/03/2011 08:00	16/03/2011 10:12	16/03/2011 13:22
YES	16/03/2011 16:53	18/03/2011 07:00	18/03/2011 08:24	18/03/2011 15:17
YES	19/03/2011 07:42	21/03/2011 07:25	21/03/2011 10:28	21/03/2011 13:00
YES	31/03/2011 08:20	01/04/2011 06:00	01/04/2011 08:33	01/04/2011 17:02
YES	26/03/2011 21:14	30/03/2011 06:00	30/03/2011 10:03	30/03/2011 13:18
YES	04/04/2011 02:08	05/04/2011 06:30	05/04/2011 08:24	05/04/2011 11:57

When looking at the patients that where bled the number of data points where so few that any firm conclusions may be difficult to draw, but some further observations were of interest.

- Despite similar bleed times the discharge times were very variable regardless of when the report was authorised indicating other issues were delaying discharge not the timing of the blood results.

Ideas tested which were successful

- The night staff were able to bleed those patients indicated as planned for discharge enabling bloods to get to the lab quicker.

Ideas tested which were unsuccessful

- Ultimately the early bleeds did not in this trial lead to significantly quicker discharge.

How will this be sustained, potential for the future and additional learning

Based on the feedback form doctors it was believed that earlier bleeds and test results would have a positive impact for patients. The benefit to the patients is that their discharge from hospital will not be delayed waiting for pathology results and may mean that they can go home earlier in the day. However while the patients were able to be bled earlier the desired impact on discharge was not evident and this trial has raised some interesting questions that require further analysis and investigations:

- Why do so many doctors and nurses have the perception that blood test results often delay discharge?
- If this perception persists, can this be improved by a closer working relationship between ward staff and phlebotomy staff as indicated in an earlier trial documented in this publication (case study 5 *Dedicated ward phlebotomist*).
- If blood tests do not delay discharge, what is holding up earlier discharge and what can be done to better align all the tasks that need accomplishing to ensure patients can leave earlier?
- Based on these results, it is not clear if sustaining early bleeds is suitable at the moment until more is done to understand how this can lead to earlier discharges, which seem to include other patient pathways aligning to enable discharge.

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CASE STUDY EIGHT.

Warwick Hospital
Earlier start for bleeding patients

Availability of blood results by 10.30 am from samples taken that day have increased from less than 15% to 100% of full blood count (FBC) and 70% of chemistry blood results.

Understanding the problem

All Warwick Hospital inpatient blood results (apart from intensive care) are at least 24 hours out of date when reviewed on the consultant or junior doctor rounds. This was a major safety issue. We created a multidisciplinary team of a consultant, junior doctor, ward sister, phlebotomist, portering manager, lab receptionist and technicians to map the process and understand the main delays in the in-patient blood process. We discovered that the blood tests requested on the ward round on day one, were drawn by the phlebotomists after 8 am on day two while the ward round was happening. The bloods were delivered to the laboratory after the ward rounds had ended. These inpatient blood samples hit the lab just as the outpatient and GP samples were coming in, meaning the results were not available until the late afternoon when the doctors were no longer on the wards. As a consequence, results were not reviewed until the following day's ward round on day three.

This also resulted in patients being given inappropriate treatments: e.g. patient on anticoagulation therapy will be given inappropriate does of anticoagulation, antibiotics (gentamicin, intravenous fluids and other drugs based on an out-of-date result.

The main delay is due to:

- The phlebotomists rounds (9 am to 11.30 am) occurring while the doctors are doing their rounds.
- The inpatient bloods samples are delivered to the lab in a big batch just as the GP practice and outpatients samples are arriving in the lab.
- The results are not processed until the afternoon when the doctors are elsewhere.

How the changes were implemented

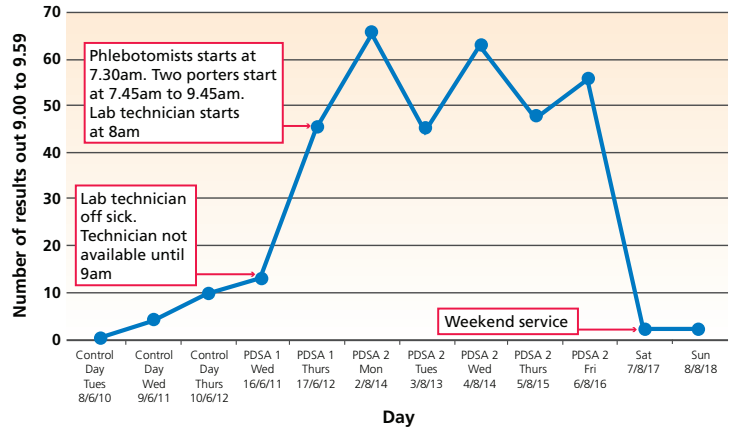
- Night nurses ensure the blood requests are where the patients are (have patients moved wards?).
- Night nurses label the blood forms with bed, bay and barrier status to reduce the wasted time of the phlebotomists hunting for patients.
- Phlebotomists start at 7.30 am and leave earlier in the day.
- The domiciliary phlebotomists join the inpatient or outpatient phlebotomists to keep the hospital work flowing to the lab in the early morning before going out to do the domiciliary visits.
- Review of phlebotomists' infection control technique: only gloves required, not gowns, for non barrier nursed patients, saving money and time between patients.
- Porters start at 7.45 am and follow the phlebotomists round the wards delivering small numbers to bloods samples to the lab.
- One lab technician starts at 8 am and processes the blood samples as soon as they arrive.

Measurable outcomes and impact

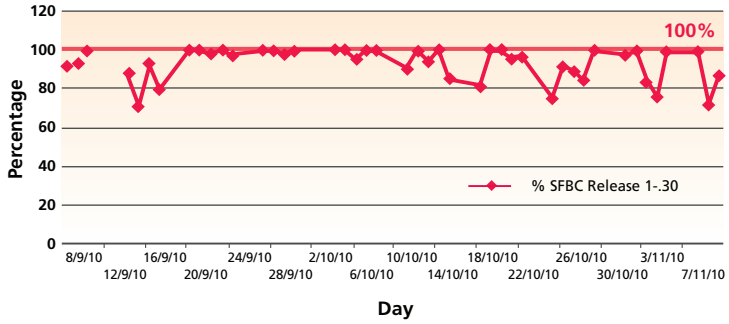
- From **< 15%** blood results back by 10.30 am on the day of request, to **100%** of FBC and 70% of chemistry blood results.
- Safer care: consultants and registrars have now noticed the change in the blood result availability: right care, on time, every time for inpatients.
- Predictable system; if a blood result is not back by 10.30 am then the chances are that the blood sample is abnormal: this is a warning that the doctors must phone the lab to check on sample and review the patient at lunchtime.
- One day off the length of stay (LOS) for those patients where the blood result is the key to discharge.
- No increase in cost.

Plan Do, Study Act Cycles 1 and 2 (June and August 2010)

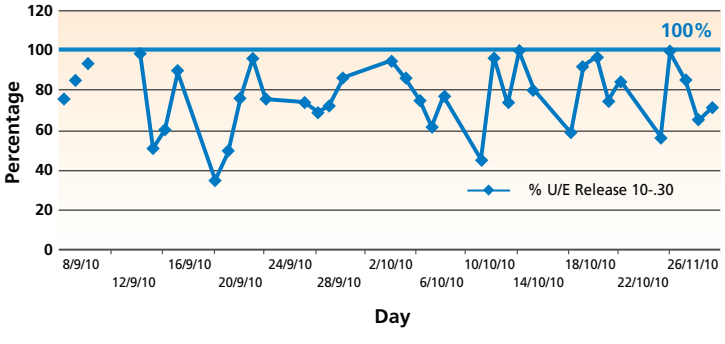
Number of inpatient U&E results out 9am to 9.59am



Percentage of inpatient FCBs released by 10.30am - PDSA 3



Percentage of inpatient U&E released by 10.30am - PDSA 3



Ideas tested which were successful

Mapping the process.
Trialing the earlier start times for:

- Phlebotomists.
- Porters.
- Laboratory staff to book in the samples.

How this improvement benefits patients

- Potential for reduced length of stay.
- Safer care – Referring clinicians have the right result in a timely manner to give best possible care.

How will this be sustained/ potential for the future/ additional learning

Benefits gained are now being applied to the emergency care pathway. All emergency diagnostic bloods for A&E and Medical Assessment Unit are now delivered by the air-tube with a 50 minute TAT as the target. This allows for a target of two hours from arrival at hospital to a consultant plan for treatment (which may include discharge) for all emergency patients.

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CASE STUDY NINE.

Russells Hall Hospital (Dudley)

Faster return of specimens from acute ward

Following observations of the process one area of delay in the system came from waiting to transport samples from wards back to the laboratory as a drop off system was in operation. Getting samples transported more frequently may enable samples to get to the laboratory quicker and in smaller batches, with anticipated potential benefits being faster turnaround of blood results for acute ward and delivery of specimens back to the laboratory smoothed.

Understanding the problem

Project problem statement: There is often a delay in getting blood specimens taken by the ward phlebotomists back to the laboratory after collection. Minimising this delay could enable results to be available more quickly and potentially help timely discharge; in addition we wanted to understand the broader benefits for the laboratory that may be derived by smoothing the flow of samples received for analysis.

Identification: Ward A1 is an acute, short-stay ward where timely return of results is essential to the rapid discharge of patients. There had been instances where A1 had not had all their patients bled as they were the last ward to be bled in their group.

Data collection: Qualitative data was collected via discussion with the senior management, medical representatives and matron for ward A1. We also held a process mapping day with some of our phlebotomists which helped us understand the overall process a little better.

Waste: Up to an hour or more could elapse between the first specimen being taken and it appearing back in the laboratory

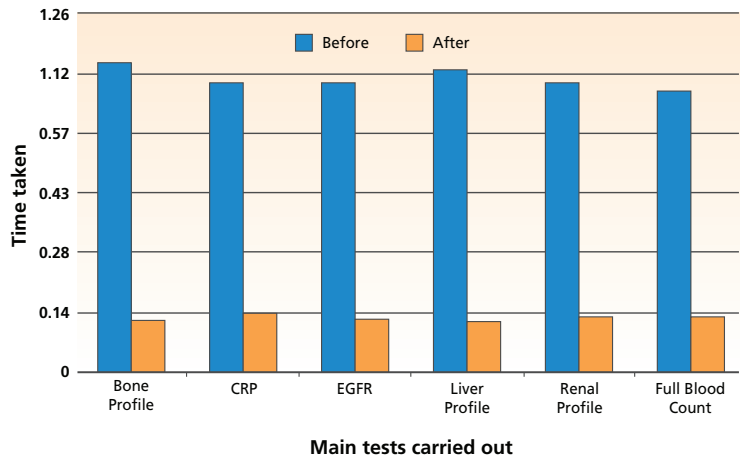
How the changes were implemented

- Solution identified: There had already been discussion about changing the order of the wards so that A1 was bled first. This was first trialed for two weeks to ensure there was no adverse effect on the other wards.
- Additional resource was to be identified to bring specimens back to the laboratory earlier and more frequently, and to book these specimens in as soon as possible. This was to be trialled for two to three weeks in the first instance.

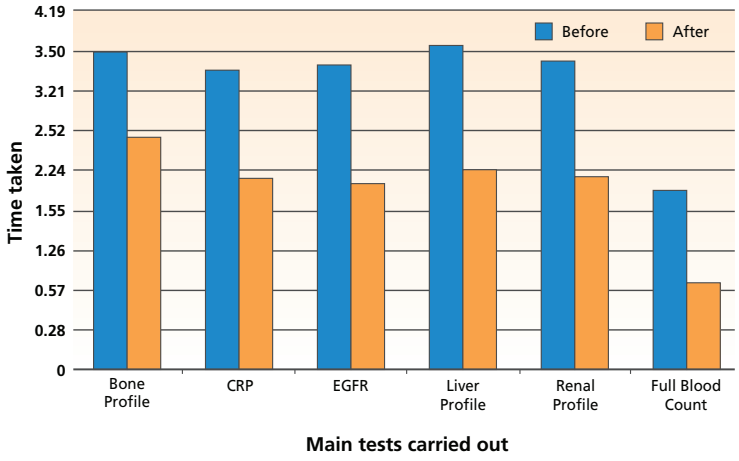
Measurable outcomes and impact

Bringing the specimens back earlier and more regularly resulted in the average delay between specimen collection and receipt back in the laboratory being reduced from over an hour to just 13 minutes for the main tests requested. The overall time from specimen collection to results being available reduced from an average of three and a half hours to just over two hours.

Average time taken from specimen collection to receipt in laboratory



Average time taken from specimen collection to results being available



Ideas tested which were successful

- The use of hospital volunteers to bring the specimens back to the laboratory.
- Getting samples back to the laboratory sooner delivered quicker results to the ward.
- Smaller batches in to the laboratory smooths the flow, contributing to quicker turnaround times, resulting in improved morale of the laboratory staff.

How this improvement benefits patients

What became clear from the results is that while there are significant patient benefits from the trial there were also benefits for staff in particular the laboratory staff.
It should also be noted that the hospital volunteers also enjoyed the responsibility of assisting with processes, making a significant contribution to improving patient care.

- Blood results are back with the ward earlier in the day for decision making.
- Earlier decision making has potential to assist with earlier discharge.
- Smoother flow and smaller batches into the laboratory benefited laboratory staff and flows of work.

How will this be sustained/ potential for the future/ additional learning

- Continued use of hospital volunteers is being explored for ward A1.
- Further investigation into future proofing this approach, can volunteers remain or do we need a member of staff.
- The next step is to explore how results back quicker can drive clinicians to make decisions sooner, and ultimately assist in speeding up discharge.
- A questionnaire is being circulated around all wards to gain feedback on the current phlebotomy service and when ward rounds take place. This information will be used to optimise the time of return of specimens from all wards.

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NHS Improvement – Diagnostics Publications

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Continuous improvement in cytology - sustaining and accelerating improvement (September2010)

Learning how to achieve a seven day turnaround time in histopathology (November 2010).

Bringing Lean to Life (May 2010).

Department of Health

Equity and Excellence: Liberating the NHS (2010).

Report of the Review of NHS Pathology Services in England (August 2006). Chaired by Lord Carter of Coles (An Independent Review for the Department of Health)

Report of the Second Phase of the Review of NHS Pathology Services in England (December 2008). Chaired by Lord Carter of Coles (An Independent Review for the Department of Health)

Other References

Improving quality and safety by reducing Specimen labelling errors (ASCP Layfield / Anderson)

Useful reading

A3 Problem Solving for Healthcare
Cindy Jimmerson
ISBN 978-1-56327-358-2
Demonstrates how to use A3 to problem solve. Contains practical examples from USA healthcare that can be easily translated to UK.

Lean Healthcare – Improving the patient's experience
David Fillingham
ISBN: 978 -1- 904235-56-9
Written by CEO of Bolton NHS Trust as an account of his experience of the long term perspective of using Lean to support whole healthcare.

The Toyota Way
Jeffrey Liker
ISBN: 978-0071392310
Explains Toyota's unique approach to Lean Management – the 14 principles that drive their quality and efficiency obsessed culture.

Creating a Lean Culture
David Mann
ISBN: 978-1-56327-322-3
Helps Lean leaders succeed in transformation. A critical guide to developing and using a lean management system.

The New Lean Toolbox
John Bicheno
ISBN: 0 954 -1-2441 3
A guide to Lean tools and concepts

Learning to See
Mike Rother & John Shook
ISBN: 0-9667843-0-8
An easy to read practical workbook for creating a value stream map to evidence waste in a process.

Managing to Learn
John Shook
ISBN: 978-1-934109-20-5
How A3 enables an organisation to identify, frame, act and review progress on problems, projects and proposals.

Making Hospitals Work
Marc Baker and Ian Taylor with Alan Mitchell
A Lean action workbook from the Lean Enterprise Academy.

First break all the rules
Marcus Buckingham and Curt Coffman
What the worlds greatest managers do differently.

Value stream mapping for healthcare made easy
Cindy Jimmerson
ISBN: 978-1-4200-7852-7
Demonstrates why value stream maps are a fundamental component in applying Lean.

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Our thanks go to all the pilot sites that have tested and implemented changes and produced the case studies for others to benefit from.

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